BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,

Principal Bench, New Delhi

Appeal No. 36/2020

Larsen & Toubro Limited

Applicant

Vs.

Sanghi Industries Limited & Ors.

Respondent(s)

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(Nazimuddin)
Scientist-E
Central Pollution Control Board,
Parivesh Bhawan, East Arjun Nagar
Delhi- 110032.

Date: 17.08.2021
Place: Delhi

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Report of the Special Expert Committee as per the Order dated 21/01/2021 of Hon'ble National Green Tribunal in Appeal No. 36/2020: Larsen & Toubro Limited Vs Sanghi Industries Limited & Ors.

Reference is invited to the Order dated 21/01/2021 of Hon'ble National Green Tribunal (NGT) in Appeal No. 36/2020: Larsen & Toubro Limited Vs Sanghi Industries Limited & Ors. with respect to the proposed cement grinding unit of M/s. Sanghi Cement at Hazira, Gujarat for which prior Environment Clearance (EC) was accorded by State Level Impact Assessment Authority (SEIAA) Gujarat on 23/08/2019 under the provisions of the Environment Impact Assessment (EIA) Notification, 2006. The operative paragraph of the Order dated 21/01/2021 is reproduced below:

"*22. Accordingly, we refer the issue of assessment of carrying and load bearing capacity of the Panchayat road in question and evaluation of EIA and EMP prepared by the project proponent to the EAC of the MoEF&CC dealing with the cement plants, along with the representatives of CPCB, NEERI and IIT Mumbai. The CPCB will be the nodal agency for coordination and compliance. Coordination with the EAC may be through the MoEF&CC. The Committee may assess how generation of dust and causing of noise pollution by movement of large number of heavy vehicles will be neutralized, given the carrying and load bearing capacity of the Panchayat road in question.*

The Expert Committee may furnish its report to this Tribunal within three months by e-mail at judicialngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF.

23. The appellant, the Suvali Gram Panchayat and the project proponent may file their respective written submissions to the CPCB within two weeks for consideration by the Committee. A copy of this order be forwarded to the MoEF&CC, CPCB, NEERI and IIT Mumbai by e-mail for compliance.

List for further consideration on 14.07.2021".

2. In pursuance to the Order dated 21/01/2021 of Hon'ble NGT, meetings of Expert Committee were convened by the Ministry of Environment, Forest and Climate Change (MoEF&CC) on 13/04/2021, 17/05/2021 & 12/07/2021 through Video-Conferencing (VC). The Expert Committee specially comprised for the purpose consisted of Expert Appraisal Committee of Industry 1 dealing with the Cement Sector, experts from Indian Institute of Technology, Mumbai and National Environmental Engineering Research Institute (NEERI), Nagpur along with the representative from Central Pollution Control Board (CPCB) as directed by the Hon'ble NGT. The report was finalized in its meeting held on 12/07/2021 through video-conferencing. The meetings of the Special Committee were held under the Chairmanship of Dr. Chhavi Nath Pandey, Chairman of Expert Appraisal Committee of Industry 1 sector.

3. The following documents had been examined by the expert members:

i. Documents submitted by M/s. Sanghi Industries Limited for obtaining Environment Clearance from SEIAA, Gujarat [Form I, Public Hearing proceedings, Form 2, additional information reply submitted by the project proponent, Final EIA report and EC dated 23/08/2019].

ii. Written submissions received from Central Pollution Control Board (CPCB) and circulated by M/s. Sanghi Industries Limited, M/s. Larsen and Toubro and Suvali Gram Panchayat.

iii. Additional written submissions filed by L&T vide email dated 16/04/2021 [Documents indicating the forests around the proposed project site, Color maps indicating distance of the project site from the forests, mangroves and sea and Excerpts from National Wetland Atlas showing that the area around Hazira industrial area falls under the wetlands] and by M/s. SIL vide email dated 15/04/2021 [SUDA Application form and payment receipt, Note on noise and dust control measures due to the truck movement, Road map network of Surat City, Map showing location of the project site and consent to establish granted by GPCB], 01/07/2021 and 05/07/2021.

4. From the aforesaid documents submitted by CPCB, the Committee noted that following are the grounds of challenge by L&T and interveners viz. Suvali Gram Panchayat:

i. EC granted by SEIAA, Gujarat to M/s. Sanghi Industries Limited (SIL) ***[herein after referred as Project Proponent (PP)]***is for setting up of a 2.0 Million Tons Per Annum (MTPA) standalone cement grinding unit at Survey No. 125/1, 125/2, 126/1+2+3, Hazira Industrial Area, Village: Shivrampur, Taluka Choryasi, District Surat, Gujarat.

ii. Dust emission will occur due to movement of trucks.

iii. Transportation of cement and raw materials will cause disturbance to the peace of village life and damage to health.

iv. There is no provision in the EIA for parking space for the trucks.

v. Discrepancies in the EIA report:

a. EIA report does not have potential of compliance with the environmental norms.
b. Unaddressed public concerns with respect to increased air and water pollution raised during public hearing.
c. About 1100 children studying in Navchetan Vidyalaya in Shivrampur village located at a distance of 1.3km from the plant, will also be adversely affected.
d. Cement dust will affect the fertility (quality) of agricultural land & will also emanate into the water resources of village Suvali. People/ animals will suffer from disease due to air pollution.

5. Shri. Ayush Puri, Advocate representing Suvali Gram Panchayat in his submissions emphasized the following points for consideration of the Expert Committee:

i. The sites of GIDC Pandesara and GIDC Sachin located in Surat were declared as severely polluted areas by an office order dated 11/11/2019 issued by the Gujarat Pollution Control Board (GPCB). The SIL project site is located at considerable distance of 14 km after buffer zone of 5 km from GIDC Pandesara and GIDC Sachin. The proposed unit should not be allowed to set up as it would cause further pollution in the area around Surat.

ii. Land Survey no. 498-1, Village Suvali, and measuring 20 Acres i.e., approx. 80,000 sq. m., has been allotted to Marine Sector Commander, Hazira (Superintendence of Police) under Home Ministry of Gujarat for development of residential cum office complex of Marine Task Force, Hazira. The map is attached as Annexure 5 of the written submissions by the panchayat. However, the project though sanctioned has not yet come up. The aerial

distance of SIL project site to this residential complex is approx. 1.6 km in Suvali village.

iii. Variable information submitted by the PP regarding coal consumption. Initially, it was stated that the coal requirement would be 252TPD. However, later the project proponent while submitting reply to the additional information sought by the SEAC, stated that they will use imported coal and requirement of the same would be to the tune of 6.9 TPH.

iv. Substantial concerns were related to carrying and load capacity of the approach road that would be used by PP for transportation. It is the concern of the Panchayat that the particular road does not have the carrying capacity for transportation of 34 Ton trucks. Further, it was stated in the Draft EIA that the trucks deployed would be of 20 Ton capacity, however, the final EIA showed 34-ton truck capacity, thus there has been variation in the documents submitted by the PP.

v. The EIA report avoids mention to facilities like disposal of discarded containers, allocation to finished storage area, loading and unloading area, parking area for trucks, canteen area, etc.

vi. In the public hearing that was held for the proposed project at the project site, many villagers from adjoining villages raised several detailed queries which were either evaded or given incorrect assurances. The responses of SIL were unsatisfactory.

vii. There is no application of mind in granting of EC and it has been granted in a mechanical manner.

viii. The proposed facility is nearby a boarding school which has a strength of 1200 children and thus presence of such a unit in the vicinity would cause health hazards. The letter from the Medical officer of the Suvali Gram Panchayat has been annexed stating that large industries are located in area of Hazira, Mora, Suvali which have spread cancer, TB, skin diseases which have seriously affected the health of the people. Thus, no further industries should be set up. The Suvali village is 1.89 kms from the proposed SIL project site.

6. Shri. Raj Panjwani, Learned Senior Advocate made following written submissions on behalf of Larsen and Toubro.

i. The proposed cement manufacturing unit is a red category industry based on CEPI score due to their high pollution levels. Since cement manufacturing is also one of the most obnoxious and polluting process, the unit needs to follow stringent checks and balances.

ii. Failure to adhere to 'Precautionary Principle' would lead to causing of health hazards to nearby boarding school comprising 1100 students and a population of 3000 – 5000 people adjoining the project site. The boarding school is located less than a kilometer away from the unit. This concern has been raised by the local population vide some letters sent by them.

iii. The Project Proponent has misrepresented/ concealed environment sensitivities like presence of mangrove forests, wetland and migratory birds in the project area, conversion of agricultural land for industrial purpose in

their pre- feasibility report, Form 1 and the impugned EC. The Project Proponent has denied any presence of sensitive flora and fauna within 15 kms of the proposed project location boundary as per the data submitted by them in Form – 1. The EIA report also fails to mention presence of any mangroves which as seen from the map are only 2 kms away. The Book titled 'High in the Sky at Hazira' by Essar has published that the Hazira Industrial area is home to 68 migratory species spending quarter of a year in the region.

iv. The project proponent in their EIA report has stated that there are no forests within 10 kms radius of the project site, however, there is 17 sq.km forest area at a distance of 3 kms from the project site. L&T have made an application to the forest department seeking the area breakup of the wetlands, forests and mangroves in the Hazira Industrial Area.

v. The Hazira industrial area has the city's largest wetland covering 41.42% of the area. The distance of the proposed cement plant is 3.62 km from Arabian Sea and 0.89 kms from Tapi River as stated by the Project proponent in Form-1. The project proponent has not demonstrated in its EIA report any steps taken for the conservation of the wetlands surrounding the project. The plant is thus in violation of the rule 4 of the Wetlands Rules 2010 and 2017.

vi. Inadequate land allotment has been done by the project proponent as they do not provide for finished products, storage area, loading and unloading area, product transfer area, parking areas for the used trucks and other amenities. This is in violation of the factories Act, 1948, which lays down the mandate for setting up of such amenities in the industrial project.

vii. The EIA fails to take into consideration where the 363 trucks (Refer EIA @Page 301 –Table 4.17) would be parked for loading and unloading of materials. Further, the panchayat road, which is only 7.5mts in width would not be able to handle 363 trucks of 34 tonnes as it is a kaccha road as mentioned by the Project Proponent in its EIA report as the alternative route for transportation. Furthermore, no evaluation of the impact of trucks, primarily the dust generated by them while operating on the kaccha road has been done by them.

viii. The impact of coastal mode of transportation used for supplying raw material and taking finished products by the project proponent has been done in the EIA, PFR, impugned EC.

ix. The project proponent has failed in providing clarity with respect to green belt on the project site as they stated they will develop 33% green belt out of which green belt of width 6 mts - 8mts will be on the periphery. However, the plan of the project proponent is not substantiated by the layout plans as submitted by the Project proponent.

x. Furthermore, the armoured system complex of L&T is a defense installation for the purpose of environmental sensitivity, as is mentioned in Report1 form B, which was not mentioned by the Project Proponent in its Form 1 and the EIA report. However, the Ministry of Defence in its affidavit has stated that the complex does not qualify for a Defense Establishment which is nothing but an erroneous stand taken by the Ministry of Defence.

xi. The EIA placed on record by the project proponent states that it would require 278 Kilo Liter (KL) of water every day. However, no source of water, no pipelines are in place and no requisite authorization have been placed on record for the procurement of water from the irrigation department.

xii. That in 2017, Government of Gujarat issued a revised draft plan of the earlier notification dated 12/10/2017 laying down the Comprehensive General Development Regulations, 2017, under which various industrial zones have been classified, wherein cement qualifies as an obnoxious and hazardous industry. Furthermore, on 8/10/2020, Surat Development Authority (hereinafter 'SUDA') published the Sanctioned Development Plan, 2035 showing various categories including General Industrial Zone and Obnoxious / Hazardous Industrial Zone. The Proposed cement project site falls under the General Industrial Zone and thus it would be appropriate if a red category industry is not set up in the area.

xiii. That the Hon'ble NGT vide order dated 19/08/2019 in the matter titled 'Original Application No. 1038/2018, news item published in the Asian Age authored by Sanjay Kaw Titled 'CPCB to rank industrial units on pollution levels' directed that the viability of red category units be determined on the basis of the Precautionary Principle by an appropriate mechanism. Thus, keeping in view of the pollution that could be caused by such an industrial unit, such a plant should not be permitted.

7. Mr. Aniruddh Wadhwa, Advocate made following written submissions on behalf of M/s. SIL.

i. The Consent to Establish was granted to the Unit by GPCB on 10/03/2019.

ii. The TOR issued for EIA and MoEF&CC guidelines for obtaining EC prescribe the requirement by the Project Proponent to conduct an assessment of carrying and load bearing capacity of the proposed transportation route. However, the said study has been carried out and enclosed as Annexure 14 of the written submission.

iii. The parking area in the said plant site is 4716 m^2(nearby the packing plant) as stated in the traffic study report conducted by the project proponent. (As laid out in the parking layout plan).

iv. The Project Proponent has submitted its application to Irrigation department for obtaining permissions for water. A letter to that effect was annexed.

v. The panchayat road is a pucca road measuring 1.62 kms from NH-6 to the proposed grinding unit and has a carrying capacity 1250 Passenger Car Unit (PCU)s on which on an average 190 PCUs travel per hour.

vi. Approach road (panchayat road) is more than 15 mts wide and the total PCU per day of the plant will be 363.

vii. The speed limitations on all the trucks will be 10 kmph to control noise pollution within the plant and all trucks with valid Pollution Under Control (PUC) Certificate will only be operated by the unit along with creation of paved roads on the premises.

viii. Raw material which is in solid form (i.e. clinker and gypsum), is proposed to be transported in trucks/ automated tippers completely covered in tarpaulin. Fly ash is proposed to be transported in blousers (specially designed closed cylindrical container trucks).

ix. Green belt will be developed in an area of 33.98% as proposed in the layout plan, along the boundary of the proposed unit to further curb pollution.

x. To control dust generation during transportation, measures such as water sprinkling and spray water over the roads and material for dust settlement will be undertaken regularly.

xi. Proposed transportation route has the requisite load bearing capacity, is not adjacent to any village and the vehicular movement will have minimal impact on Suvali village.

xii. State of the art energy efficient machinery will be installed wherein minimum pollution will be generated.

xiii. Large-scale socio-economic development of the region will be done and thus the project will only create positive impact and will generate revenue and employment in the surrounding area.

xiv. L&T had separately submitted representation to SEIAA pertaining to the issues against the Project Proponent for which point wise reply was submitted by the Project Proponent to SEIAA, answering all the queries raised by them. Only thereafter the EC was granted.

xv. The land surrounding the Unit is mostly owned by L&T. The list of other existing industries in the study area is given below:

S.No.	Name of Industry	Aerial Distance from Appellant's Armor Unit - KM	Aerial Distance from the Proposed Unit (KM)
1.	L&T Defence	-	1.38
2.	L&T Heavy Engineering	1.81 km	1.41
3.	L&T MHPS Turbine Generators Pvt. Ltd.	0.90 km	1.24
4.	L&T Special Steel and Heavy Forging	1.01 km	1.03
5.	L&T Piping	0.33km	0.3
6.	Reliance	3.25 km	3.23
7.	NTPC	4.70km	4.97
8.	KRIBHCO	6.40km	5.50
9.	GAIL	6.00km	8.87
10.	ONGC	8.70km	9
11.	CAIRN India	1.80km	1.70
12.	Adani Wilmar	1.30 km	1
13.	Essar Steel	5.07 km	4.77
14.	Adani Port	7.20 km	9.5
15.	Hazira LNG & Port	6.56 km	6.56
16.	ABG Cement	4.7 km	5.15
17.	Ultratech Cement	8.6 km	8.55
18.	Ambuja Cement	9 km	9.12

xvi. The project proponent uses state of the art Vertical Roller Mill Technology which is both energy as well as space efficient.

8. **Observations by the Expert Committee on the presentations and written submissions of Suvali Panchayat, L&T and SIL:**

i. As per the available records, Surat with the Comprehensive Environment Pollution Index (CEPI) of 76.43 falls under the category of critically polluted

areas (Areas: Pandesara Cluster and Sachin cluster) The project site of M/s.SIL is located at a distance of 14 km from buffer zone of Pandesara Cluster and Sachin cluster. The Hon'ble Supreme Court vide its Order dated 22/09/2020 in Civil Appeal Diary number 19271/2020 imposed a stay on the operation of the impugned orders dated 10.07.2019, 23.08.2019 and 14.11.2019 passed by the National Green Tribunal, Principal Bench, New Delhi with respect to CEPI areas.

ii. The Suvali village is located at a distance of 1.89 kms from the proposed SIL project site. It does not fall on the transportation route from highway to the SIL plant, nor located in downwind direction from the plant, hence is not likely to be affected by stack emissions from the plant.

iii. Public hearing for the project under the provisions of the EIA Notification, 2006 was held on 22/03/2019. As per the proceedings, 117 participants attended the hearing.

iv. As per the EC accorded on 23/08/2019, the issue of coal consumption has been taken into cognizance and as per condition no. 35, the imported coal consumption for the project is reported to be 182 MT/day. Further, as per condition no.13 of EC dated 23/08/2019, PP shall not use lignite and pet coke as a fuel.

v. The learned counsel for Suvali panchayat also raised issues pertaining to concerns related to another village namely Shivarampur, but the learned counsel did not have any authorization from the village Panchayat to present their case.

vi. The proposed project of M/s. SIL involves setting up of stand-alone cement grinding unit of 2 MTPA capacity. The major source of pollution from this unit will be particulate matter and fugitive dust emissions from handling raw materials which can be mitigated by adopting adequate environmental safeguards.

vii. The land area envisaged for the project is 4.856 ha and it is sufficient for the proposed project activity of M/s. SIL.

viii. PP has not addressed several aspects in the Form I inter-alia pre-construction site investigation, construction work, quantum of resources, solid and liquid waste generation, existence of vulnerable group and eco sensitive areas such as mangroves, hospitals in the study area with direction and distance, mitigation measures, occupational diseases etc.

ix. As per the affidavit of the Ministry of Defence, the L&T complex does not qualify for a Defence Establishment.

x. The concerns of L&T on SIL project were submitted to SEIAA on 5/4/2019 and 22/04/2019 which have been responded by the PP to SEIAA on 23/05/2019. Subsequently, on review of the submissions, the EC was accorded to the SIL on 23/08/2019 by SEIAA.

xi. As per the Surat Urban Development Authority (SUDA) notification dated 8/10/2020, the proposed cement grinding unit project site falls under the General Industrial Zone and red category industry is not allowed to be set up

in the area. However, the EC to M/s. SIL was granted on 23/08/2019 which was prior to 8/10/2020 i.e. issuance of SUDA Notification. It may also be noted that the proposed unit is not an integrated cement plant. It is a grinding unit where, clinker (brought from outside), fly ash and slag (waste materials from power plants and steel plants) are ground and converted to a useful green cement. Clinkerization process makes the cement plants a red category industry due to pollution of particulate matter, SO_2, NOx and Carbon Monoxide. In grinding units only particulate matter is emitted during grinding and that too much less than that in the clinkerization process.

xii. PP has submitted an application to SUDA on 7/09/2019 for obtaining requisite permission as per the prevailing regulatory norms. The application is reportedly under process by SUDA and the approval is yet to be accorded.

xiii. The impact on existing traffic was mentioned in the EIA report at page 97 and additional information was sought by SEIAA with respect to the transportation aspect. The material and finished product quantity along with number of trucks required are as below:

S.No.	Raw Material & Product	Quantity Million TPA	Quantity TPA	Quantity TPD	Source	Mode of Transport	No. of Vehicles (Truck/day)
1.	Clinker	2.0	20,00,000	6061	Captive	Sea	184
2.	Additives like Gypsum, Fly Ash, Slag				Purchase	Road	
3.	Fuel	0.06	60,000	182	Purchase	Road	
4.	Cement	2.0	20,00,000	6061	Captive	Road/Sea	179
Total No. of Trucks Required							**363**

xiv. As per the written submission made by the project proponent on 15/04/2021, and as per new recommendations of IRC (https://thelibraryofcivilengineer.files.wordpress.com/2015/09/irc-sp-41.pdf), the equivalent PCU factor for 4-6 Axle Truck/Trailer (fast moving) vehicle is 4.5. The modified equivalent PCU for proposed project will be as follows:

No. of trucks required per day = 363

Equivalent PCU factor for 4-6 Axle = 4.5

PCU per day for 363 Trucks = 363 x 4.5 = 1633.5 per day or 68.06 say 68 PCU per hr. The modified traffic scenario considering 68 PCU per hr presented in table below:

Modified Traffic Scenario in case of 68 PCU and LOS

S.No	Road	Increased PCUs	Modified V(Volume in PCU per hr)	C (Capacity in PCU per hr)	Modified V/C Ratio	LOS (Level of Service)
1.	National Highway 6	68*60%= 41	1421+41= 1462	3000	0.48	C
2.	State Highway 168	68*40%= 27	743+27= 786	1250	0.62	D
3a.	Approach Road/Panchayat Road*	68	190+68= 258	1250	0.21	B
3b.				900	0.28	B

*For considering modified PCU factor of 4.5, the LOS value of Approach road / Panchayat Road (Sr. No. 3.a) will change from A to B i.e. Excellent to Very Good.

In this scenario, the impact can be further reduced by utilizing the trucks bringing clinker for cement dispatch to the sea route. As per the present market condition, about 118 trips can be reutilized (same truck will be used for clinker in up and cement in down) which will negate approx. 20 PCU per hour (actual

22). Thus only 68-20 = 48 PCU per hour will be the net impact as per the previous scenario of traffic.

PP has also made a provision for parking of trucks and trailers. The trucks and trailers would be covered with tarpaulins as mentioned in the EC granted by SEIAA.

xv. In addition to the written submission referred at point xiv above, another study report of M/s. Multimedia Consultants has been made available to the Committee on 1/07/2021. As per the said report **(copy enclosed along with SIL written submission)** and considering 10 years design life, vehicle damage factor of 2.89 and growth rate of 5 %, the resulting traffic will be 2 MSA (Million Standard Axle) which is a miniscule increase to the existing traffic.

xvi. It has been reported that the Panchayat Road is found to be having a carrying capacity of 1250 PCU per hour on which an average 190 PCUs travel per hour. 48 PCU per hour will be the net additional impact on the existing traffic due to the SIL project. SIL has submitted a traffic management plan and presented that the approach road (Panchayat Road) is "Pucca" (Metal tarred) and having a current width of more than 15 meters throughout the entire 1.2 kms stretch from the Highway to the plant.

xvii. The Panchayat Road of 1.2 km only, for which the load bearing capacity was impugned by the L&T, was constructed by L&T Limited itself pursuant to directions of the Hon'ble High Court of Gujarat in Special Civil Appeal No 10850/2009 titled as "Sukhabhai Bhikhabhai Aahir & 29 others. Vs. Principal Secretary & 3 others". Furthermore, the Panchayat Road has been disclosed

and sanctioned to be a 22-meter-long road under the sanctioned SUDA Development Plan. The Panchayat Road has been constructed pursuant to judicial directions and in accordance with applicable regulations and standards, is a 'Pacca' road and is in fact being used for movement of commercial vehicles such as the 34 tonner trucks proposed to be used by the SIL.

xviii. The panchayat road under question is also being used by other industries existing in the area mentioned at paragraph 7(xvi) above for several years. It may be noted that this road is being used by heavy industries such as Larsen & Toubro.

xix. The water requirement for the project is 278 KLD and as per the condition no. 28 of the EC dated 23/08/2019 necessary permission from the concerned Competent Authority has to be obtained for the water withdrawal.

xx. Mangroves exist at a distance of 1.4km from the project site on the other bank of Tapi river. As per the provisions of Coastal Regulation Zone (CRZ), 2019, Mangroves (in case mangrove area is more than 1000 square meters), a buffer of 50 meters along the mangroves is required to be provided. In the present case, the distance of 1.4km is much more than the required buffer zone of 50 meters.

xxi. No evidence or credible document has been made available by representative of Suvali Gram Panchayat as well as L&T in support of their contentions with respect to existence of notified wetlands in the project area, pollution & health

concerns and degradation of agricultural land due to the proposed standalone cement grinding unit of M/s. SIL.

9. Recommendations

On the basis of observations, the Committee is of the considered view that the EC dated 23/08/2019 accorded by SEIAA can be sustained subject to the stipulation of the following additional conditions in order to further to safeguard the environment and address the concerns of appellants.

A. <u>M/s. Sanghi Industries Limited</u>

i. Particulate matter from the stacks shall not exceed 30 mg/Nm^3.

ii. M/s. SIL shall develop a green belt of 15 meters width around the boundary limits of its factory by planting native and high foliage trees with a tree density of 2500 trees per hectare.

iii. Wheel Washing Facility at exit gate shall be provided and used.

iv. CCTV Monitoring of Plant and Gates shall be carried out to ensure that all materials are transported in covered trucks having valid Pollution Under Control (PUC) Certificate.

v. Coal will be stored in the covered shed and fly ash in silos.

vi. All unpaved areas which are not covered by the green belt shall be covered by suitable form of vegetation such as lawn and landscaping etc.

vii. M/s SIL shall use ultra-low NOx burner, flue gas recirculation and auto combustion control system.

viii. All the industries in this area are likely to augment their respective capacities in future. This may, in future, require periodical maintenance and strengthening of the village panchayat road presently being used by all the industries in this area. It is therefore suggested that the Surat Urban Development Authority which is presently maintaining the road may be directed to ensure the periodic maintenance and strengthening of the village panchayat road in question in future.

ix. The Stack height of coal combustion system shall be minimum 30 meters height.

x. Noise level at the boundary wall shall be monitored as per the prescribed Noise Pollution (Regulation and Control) Rules, 2000 and report in this regard shall be submitted to Regional Office of the Ministry as a part of six-monthly compliance report.

Enclosures:

1. Written submissions of Suvali Gram Panchayat
2. Written submission of L&T and additional submissions made on 16/04/2021
3. Written submission of SIL and additional submissions made on 15/04/2021, 1/07/2021 and 05/07/2021.

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SANGHI CEMENT
Turning Dreams into Concrete Reality

Date: 12.03.2021

By Registered Post and E-mail

To,
The Member Secretary
Central Pollution Control Board
Parivesh Bhawan
East Arjun Nagar
Delhi-110032
Email: mscb.cpcb@nic.in

Sub: Preliminary Submissions of Sanghi Industries Ltd. (Respondent No. 1/Project Proponent), pursuant to the Order dated 22.01.2021 passed by the Hon'ble NGT in the Appeal No 36/2020 (earlier No 66/2019 (WZ)), titled as 'Larsen & Toubro Ltd. v Sanghi Industries Ltd. & Ors'.

Ref: 1) Order dated 22.01.2021 passed by the Hon'ble NGT in the Appeal No 36/2020 (earlier No 66/2019 (WZ))
2) Communication dated 03.03.2021 issued by Mr. Ankur Tiwary, Sc.D, CPCB

Dear Sir,

We are submitting herewith the Preliminary Submissions of Sanghi Industries Ltd. (Respondent No. 1/Project Proponent), pursuant to the Order dated 22.01.2021 passed by the Hon'ble National Green Tribunal in the Appeal No 36/2020 (earlier No 66/2019 (WZ)), titled as 'Larsen & Toubro Ltd. V Sanghi Industries Ltd. & Ors and communication dated 03.03.2021 issued by Mr. Ankur Tiwary, Sc.D, CPCB for kind consideration of the Esteemed Committee Members constituted as per directions of the Hon'ble National Green Tribunal.

The written submissions are submitted along with annexures. (Letter Pages from 1 to 24 and Annexures from page 1 to 234.)

The entire record of pleadings (and submissions of the Project Proponent) in the instant case before the Hon'ble NGT has been shared with the Nodal Officer of this Ld. Committee, Mr. Ankur Tiwary (Sc.D, CPCB) by our Advocates on record (Wadhwa Law Chambers) before the Hon'ble National Green Tribunal. Counsel for the Project Proponent vide the email dated 08.03.2021.

We remain available for any further clarification and submissions.

Thanking you,

Yours faithfully,
for **Sanghi Industries Limited**

Gaurang Bhatt
Sr. Vice President

Encl: a.a.

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Date: 12th March 2021

To,
The Member Secretary
Central Pollution Control Board
Parivesh Bhawan
East Arjun Nagar
Delhi-110032
Email: mscb.cpcb@nic.in

WITHOUT PREJUDICE
BY E-MAIL AND REGISTERED POST

Re: Preliminary Submissions of Sanghi Industries Ltd. (Respondent No. 1/Project Proponent), pursuant to the Order dated 22.01.2021 passed by the Hon'ble NGT in the Appeal No 36/2020 (earlier No 66/2019 (WZ)), titled as 'Larsen & Toubro Ltd. v Sanghi Industries Ltd. & Ors'.

1. The instant Preliminary Submissions are being filed by Sanghi Industries Ltd. ('**Project Proponent**'), pursuant to the liberty granted by the Hon'ble NGT vide the Order dated 22.01.2021 (enclosed hereto as **Annexure 1**) in the captioned Appeal and the communication dated 03.03.2021 issued by the Mr. Ankur Tiwary, Sc.D, CPCB. Pursuant to the said liberty granted, the Project Proponent submits as follows:

BACKGROUND OF THE PROJECT PROPONENT: SANGHI INDUSTRIES LIMITED

2 The Project Proponent- Sanghi Industries Limited (the Respondent **No 1** in the captioned Appeal) is one of the leading enterprises in the Cement manufacturing and marketing industry in India and has enjoyed impeccable credentials and reputation for more than the

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last 2 decades.

3 It may be noted that the Project Proponent, since its inception, has emphasized and continuously worked towards developing and operating state of the art cement manufacturing facilities while simultaneously ensuring achieving its goals by being energy efficient, and promoting sustainable development. As a result of its pursuit of these endeavors, the Project Proponent has received many awards and recognition from institutions of National and International repute including *inter alia* awards from the Central Government.

PROPOSED UNIT AND ITS LOCATION

4 Presently, the Project Proponent owns and operates a '4 MMTPA integrated Cement Plant' at Sanghipuram, Taluka: Abdasa, District: Kutch of Gujarat State. The said Kutch Plant has been in operation since the year 2002. Furthermore, and in order to cater to rapid growth, development and consequent demand for cement, the Project Proponent is expanding its Kutch Plant to a capacity of '8 MMTPA' and will commence the production at such enhanced capacity shortly.

5 To handle the growing demand for cement, the Project Proponent has planned to set up a '2.0 Million TPA Standalone Grinding Unit' ('**Proposed Unit**') in the Surat District (at the Hazira Industrial Area) which is currently undergoing rapid industrial development, and has displayed high demand for cement.

6 It is pertinent to mention here that Standalone Grinding Units are usually set up in close proximity of potential markets, with the primary objective of meeting market demand and provide easy and

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ready availability of cement in a relatively short time and at economical prices. It is further submitted that cement- being a 'low volume, high logistic cost product' is therefore, anyway required to be set up near major potential markets in order to promote operations in an economical manner.

7 Accordingly, the Project Proponent is setting up the Proposed Unit in the heart of the Hazira Industrial Area, on the land situated at Survey No 125/1, 125/2, 126/1+2+3, Village Shivrampur, Tal. Choryasi, District Surat. It is pertinent to note that the Project Proponent has purchased the said land in order to set up the Proposed Unit.

8 In this context, it is pertinent to note that the Hazira Industrial Area is known as "Gateway Port" to serve the hinterlands of North West and Central India. It is one of the most industrialized areas in the country. Presently the Hazira Industrial Area includes mega projects such as **petrochemicals, fertilizers, heavy engineering, steel, cement, energy, edible oil, LNG Terminal, Port and Port related activities etc.** having investment of more than 1.8 lakhs crores. More than 20 super-large and large industrial projects are existing in Hazira Industrial Area since more than 15 years including BPCL, Cairn Energy, Essar Power, Essar Steel (Arcelor Mittal), Hindustan Petroleum, L&T, Reliance, NTPC, GSECL, Vadraj Cement (ABG Cement), Ambuja Cement, Ultratech Cement, Adani Wilmer etc.

9 Being one of the most industrialized zones in India, the Hazira Industrial Area has good infrastructure, and has a very good road network having National Highways No 53 (now NH 6), State Highway No 186 and various internal pakka metallic panchayat roads maintained by the Roads and Building Department for last

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mile connectivity to the various industrial units. It may be noted that all of the industries located in the Hazira Industrial Area are using the same existing road network infrastructure.

GRINDING UNITS: INDIA AND ABROAD

10 It is submitted that at present there are about 105 standalone grinding units in India with about a total cumulative 175 MTPA capacity. The existing standalone grinding units are in operation in various states across India including *inter alia* Andhra Pradesh, Gujarat, Uttar Pradesh, and West Bengal. There are also about 62 standalone grinding units with about a total cumulative 110 MTPA capacity in operation globally. It is further understood that certain cement grinding units are already in operation at Surat as well as in the periphery of Surat. A tentative list of Grinding Units in India and Abroad as known to the Project Proponent is attached herewith at **Annexure 2.** In fact, recently, Environment Clearances have been granted to many such Stand-alone Grinding Units in India itself. A list of the Environment Clearances granted to various companies across India in the last five years is attached herewith and marked as **Annexure 3.**

11 In fact, it is pertinent to note that as many as 3(three) Grinding Units currently operate within a radius of 10 kms from the present location of the Proposed Unit in the Hazira Industrial Area. These are:

a) 2 MMTPA capacity Griding Unit of Ultratech Cement is currently operating at Magdalla, on the bank of the Tapi River since 1998. It may be noted that this Grinding Unit was set up by none other than the Appellant itself in 1998 and then subsequently sold to Ultratech Cement in the year 2004;

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b) Ambuja Cement is operating 1.5 MMTPA Grinding Unit since 1993 at Magdalla on the bank of Tapi River; and
c) ABG Cement (now known as Vadraj Cement) has also set up 6 MMTPA Grinding Unit in the year 2009-10, and which is also currently operating in Hazira Industrial Area.

12 It is evident from the above that setting up of Standalone Grinding Units is very common in close proximity potential markets to meet market requirements, and particularly also within the Hazira Industrial Area. As such, the Proposed Unit is being set up by the Project Proponent in the heart of an Industrial Area, which already has other Cement Grinding Units, and where several other industries of varying nature are also already in operations since decades.

VERTICAL RAW MILL TECHNOLOGY: PROPOSED TO BE EMPLOYED BY THE PROJECT PROPONENT

13 The Vertical Raw Mill (VRM) Technology (proposed to be employed by the Project Proponent) has gained popularity over the years due to benefits relating to energy efficiency, consistent quality, space, cost saving and improvement to equipment efficiency and reliability. The International Cement Review (ICR), a leading Magazine delivering unrivalled business insight, market knowledge and technical expertise to the global cement industry has recently reported that VRMs have been employed by various leading standalone grinding units. These *inter alia* include as UltraTech Cement Ltd., Mumbai; and Shree Cement, Pune, Maharashtra from India; and by Crown Cement (purchased from Loesche GMBH); and by Premier Cement (purchased from FLSmidth) abroad. Copies of Articles on Vertical Raw Mill published in International Cement Review, August 2020 and December 2020 is attached is annexed

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as **Annexure 4.**

14 In line with the leading national and international Industries, the Project Proponent has also proposed to adopt the 'Vertical Raw Mill' Technology for its Proposed Unit. Towards this end, the Project Proponent has finalized state of the art VRM technology from *'Loesche GmBH'* which is a leading manufacturer of plants, equipment and logistics provider for cement, mining, power industries across the globe. It is noteworthy that Loesche is one of the world leading manufacturers of Cement Plants which has, as on date, set up plants in various countries across the globe. Furthermore, the equipment manufactured by Loesche is renowned for adhering to internationally accepted environmental norms. More importantly, Loesche has supplied VRMs to various cement manufacturers in India and abroad. The list of enterprises to whom VRMs have been supplied by Loesche, along with the technical brochure depicting the working of the Loesche VRMs is attached herewith as **Annexure 5.**

BACKGROUND OF THE APPELLANT: LARSEN & TOUBRO

15 The Appellant is one of the largest industrial conglomerates (L&T Group) in India, having a diversified portfolio across various industrial sectors. The Appellant itself owns and operates various 'red' and 'orange' category units including within the Hazira Industrial Area.

APPELLANT'S ROLE IN THE CEMENT SECTOR

16 The Appellant was, at one point, one of the most well-known brands in the Cement Sector in India. The Appellant ventured into the cement industry in the 1940s and is known to have offered

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solutions in turnkey construction of major integrated Cement Plants across the country. In fact, it may be noted that the Appellant itself, in collaboration with Fuller USA, had once offered to develop a cement manufacturing unit for the Project Proponent on a turnkey solution in the year 1996-97.

17 It is interesting to note that apart from offering turnkey solutions for development of cement manufacturing enterprises, the Appellant itself was operating 8 cement plants having a cumulative manufacturing capacity of 16.5 MTPA at various locations in the country including in the Hazira Industrial Area. Out of the said 8 units, 3 grinding units of the Appellant were located at Magdalla (Gujarat) which is within a 10 KM radius of the Proposed Unit, Durgapur (West Bengal) and Ratnagiri (Maharashtra). However, in or around 2004, the Appellant, due to strategic reasons, demerged their cement business and sold the same the Aditya Birla Group, i.e. now known as Ultratech Cement.

L&T'S HAZIRA COMPLEX (INCLUDING THE ARMOUR SYSTEM COMPLEX)

18 It is submitted that the Appellant is currently operating about 5-6 units in the Hazira Industrial Area which are spread over an area of 200 acres, since many years. These units of the Appellant, including its alleged armoured system complex have been operating in the vicinity (within a 10KM radius) of as many as 3 other Grinding Units, including one previously belonging to the Appellant). Furthermore, many of the other industries operating in its vicinity have been categorized as 'Red' or 'Orange' category. As such, it is a matter of fact that the Appellant set up its alleged Armoured System Complex, which surrounds the Proposed Unit of the Project Proponent, being fully aware of the industrial activity (including the highly polluting industrial activities) being carried

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out in the nearby areas of its alleged armoured system complex.

APPELLANT'S ATTEMPTS TO PURCHASE LAND OF THE PROJECT PROPONENT

19 It is a matter of record that the Appellant owns the entirety of the land surrounding the land on which the Proposed Unit is being set up by the Project Proponent. In fact, the Appellant had made repeated attempts to purchase the Respondent No 1's land on which the Proposed Unit is being set up.

***MALA FIDE* MOTIVES OF THE APPELLANT**

20 The Appeal (details of which are set out below) was preferred by the Appellant on false pretexts and apprehensions that the Proposed Unit would pollute and hinder the operations of the Appellant's alleged armoured system complex. However, admittedly, no challenge or grievance was ever raised by the Appellant to the operation of any other industrial units (including the existing Grinding Units) in the Hazira Industrial Area. Furthermore, the Appellant itself previously being in the Cement Industry, is well aware of the state-of-the-art systems being employed by the Project Proponent which tends to any and all environmental concerns. As such, the grievance of the Appellant does not pertain to any *bona fide* environmental concerns and is devoid of any basis or merit.

21 It is further submitted that the Appeal before the Hon'ble NGT was preferred by the Appellant to prevent *bona fide* industrial activity by the Project Proponent for the Appellant's own private greed of owning the land whereupon the Project Proponent is setting up the

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Proposed Unit. In this regard, it is relevant to note that this is not the first instance where the Appellant has sought to prevent *bona fide* third parties from enjoying public roads and land in the vicinity of its units. Previously, nearby villages and other industrial units have been compelled to initiate judicial proceedings against the Appellant as a result of the Appellant prevent third parties from using and enjoying public roads which lead up to the units of the Appellant. Even in the instant case, when the (frivolous) grounds raised by the Appellant in the Appeal were found to be unmerited in view of the replies filed by the various authorities, the Appellant sought to collude with the Suvali Gram Panchayat (Respondent No 6) in order to raise a new ground of alleged load bearing incapacity of the panchayat road in question. As submitted above, this issue is baseless, and the Project Proponent has duly addressed any grounds raised in this regard.

22 It is submitted that the issues raised by the Appellant in the instant Appeal, being related to the alleged usage of the public roads (as below) by the Project Proponent shows that the Appellant has therefore preferred the instant Appeal with oblique and *mala fide* motive of preventing usage and enjoyment of public roads and land in the vicinity of its units by any person/ party other than the Appellant itself. True copies of orders passed by the Hon'ble Gujarat High Court in Special Civil Application No. 10850 of 2009, and Special Civil Application No. 12912 of 2019, being Writ Petitions filed against the Appellant are annexed herewith as **Annexure 6**.

ENVIRONMENT CLEARANCE DATED 23.08.2019

23 The Project Proponent applied for an Environment Clearance for setting up the Proposed Unit in compliance with the Environment

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Impact Assessment Notification, 2006 issued by Ministry of Environment of Forests & Climate Change. It is pertinent to note that in terms of the EIA Notification, 2006, the Proposed Unit falls under category B and the Project Proponent has followed the prescribed procedure under the said EIA Notification, 2006. To this effect, the Project Proponent submitted its EIA Report pursuant to the ToR issued by the SEIAA, and even conducted a Public Hearing dated 23.03.2019, addressing thereafter, all objections (including of the Appellant).

24 It is relevant to note that the representatives of the Appellant, Larsen & Toubro Ltd., attended the Public Hearing held in respect of the Proposed Unit, and sought clarifications from the Project Proponent, all of which were responded to, and which are on record in the Minutes of the Meeting of the Public Hearing.

25 Subsequently, the Appellant raised certain concerns before the SEIAA vide their letters dated 05.04.2019 and 22.04.2019; and sought solutions from the Project Proponent in terms thereof. It may be noted that by way of the said representations, the concerns of the Appellant were limited to the apprehension that setting up of the Proposed Unit could adversely impact the operations of the various L&T Units located in the vicinity of the Proposed Unit. It may be noted that as part of its suggestions, the Appellant even asked the Project Proponent to consider shifting the location of its Proposed Unit.

26 Accordingly, in the meeting held on 16.04.2019 (497th meeting), the SEAC after detailed deliberation (including in respect of the representation and grievances of the Appellant) decided to consider the proposal of the Project Proponent only after submission of additional details by the Project Proponent. It may be

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noted that the Project Proponent was directed to address inter alia the issues regarding (i) representations of the Appellant; (ii) Proposed transportation routes to be adopted by the Project Proponent and impact of vehicular movement on surrounding area; and (iii) detailed mitigation measures proposed to be adopted by the Project Proponent to reduce pollution from vehicular movement. Copy of the minutes of the 497th SEAC meeting dated 16.04.2019 is attached herewith **as Annexure 7.**

27 The SEAC had personally heard the Appellant in the meeting held on 18.04.2019(498th Meeting) towards the Appellant's concerns. Thereafter, the minutes of the said meeting record that "At the end of discussion on the concerns raised during discussion, M/s L&T Limited agreed to have agreeable solutions of their concerns." Copy of the minutes of the meeting held on 18.04.2019(498th Meeting) is attached herewith as **Annexure 8.**

28 In response to the queries raised by SEAC on 16.04.2019, the Project Proponent submitted a point-wise reply vide its letter dated 23.05.2019 addressing each of the queries and clarifications sought by both the SEAC as well as the Appellant, Larsen & Toubro Ltd. Copy of the said reply dated 23.05.2019 is attached herewith as **Annexure 9.**

29 The SEAC in its meeting dated 12.06.2019 (514th meeting) considered, in detail, the submissions made by Project Proponent vide its letter dated 23.05.2019 and found the Project Proponent to have addressed all queries and clarifications so raised, satisfactorily. The SEAC noted that the Project Proponent had undertaken all necessary mitigation measures to control all pollution at source. In view of the same, the SEAC unanimously decided to recommend for grant of Environment Clearance on 12.06.2019. Copy of the relevant pages of the minutes of the said

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meeting pertaining to the proposed project of the Project Proponent are annexed herewith as **Annexure 10**.

30 The SEIAA in its meeting dated 16.07.2019 (253rd meeting) after detailed discussion decided to grant the Environment Clearance to the Project Proponent with all conditions recommenced by SEAC. Copy of the minutes of the said 253rd meeting dated 16.07.2019 of the SEIAA is annexed herewith as **Annexure 11**.

31 It is submitted that the SEAC had applied its mind in respect of the EC of the Project Proponent. This is *inter alia* evident from the fact that the SEAC, after consideration of various issues, imposed *certain additional conditions at the time of grant of the EC* in favour of the Project Proponent. Accordingly, the EC was granted in favour of the Project Proponent on 23.08.2019.

APPEAL NO 36 / 2020 (EARLIER APPEAL NO 66 / 2019 (WZ)) BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL TITLED AS *'LARSEN & TOUBRO LTD. V SANGHI INDUSTRIES LTD. & ORS.'*

32 The Impugned EC dated 23.08.2019 granted in favour of the Project Proponent was challenged by the Appellant before the Hon'ble National Green Tribunal by way of Appeal No 66/2019 (WZ). The primary ground raised by the Appellant in the said Appeal was that the Appellant's Unit is a defence installation and that setting up of the Proposed Unit in its vicinity was prohibited under the Official Secrets Act, 1923. The grounds raised by the Appellant were responded to by the Project Proponent, (Respondent No 1), the SEIAA (Respondent No 3), the State of Gujarat (Respondent No 4) and the Ministry of Defence (Respondent No 5).

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33 It may be noted that a perusal of the reply of the Ministry of Defence (Respondent No 5), clearly establishes that the ground taken by the Appellant of its Unit being a defence installation was unfounded. Moreover, the State of Gujarat (Respondent No 4) clarified that setting up of the Proposed Unit by the Project Proponent was not prohibited under the Official Secrets Act, 1923. The SEIAA (Respondent No 3) also asserted that all the environmental aspects and also grievances raised by the Appellant were examined in detail prior to the grant of Impugned EC dated 23.08.2019 in favour of the Project Proponent.

34 In view of the stand taken by the respective Respondents viz. SEIAA, Ministry of Defence (GOI) and State of Gujarat, it became evident that the grounds raised in the Appeal were baseless and unfounded in law or fact.

35 The Appellant, in the meanwhile, and realizing the frailties of its grounds raised in the Appeal, caused one Suvali Gram Panchayat (arrayed as Respondent No 6) to intervene in the Appeal by way of I.A. No. 28 of 2020. Suvali Gram Panchayat (Respondent No 6), albeit belatedly, raised various misconceived pleas in its reply to the appeal inter alia with respect to transportation activity of the Project Proponent on the Panchayat Road. To this effect, Suvali Gram Panchayat filed a misleading map to allege that the Project Proponent is planning on using a 'kaccha' road which is adjacent to Suvalli Village, not having adequate load bearing and carrying capacity, and that the use of the said Panchayat Road would lead to dust pollution. A Copy of the Map shown by the Appellant company before the Hon'ble NGT is annexed herewith as **Annexure 12**. It is pertinent to mention that the Respondent vide the Additional Written Submissions dated 20.01.2021 highlighted

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that the Appellant has put incorrect facts before the Hon'ble Tribunal. A copy of the Google Earth map showing the transportation routes to the proposed site as proposed to be used by the Project Proponent is annexed herewith and annexed as **Annexure 13**.

PROCEEDINGS ON 06.01.2021 BEFORE THE HON'BLE NGT AND THE ORDER DATED 22.01.2021 PASSED BY THE HON'BLE NGT

36 On 06.01.2021, the Appellant raised various feeble issues before the Hon'ble NGT in challenge to the Impugned EC. It is submitted that the said issues raised by the Appellant have been adequately responded to by the Project Proponent by way of its Written Submissions dated 30.07.2020 (**@ pp 1977-2115**) and the Additional Written Submissions dated 20.01.2021. The contents of the said Written Submissions (dated 30.07.2020 and 20.01.2021) of the Project Proponent are not being repeated herein but may be read as part of the instant Submissions.

37 During the hearing on 06.01.2021, the Hon'ble NGT after hearing the submissions of the Appellant, was pleased to limit its scope of inquiry to only the following two arguments of the said parties:

i. Whether the Panchayat road forming part of the approach road to the Proposed Unit has the load bearing capacity to handle the vehicular traffic of the Proposed Unit; and
ii. Whether the Project Proponent has conducted an assessment *qua* impact of dust generation during transportation and has proposed any mitigation measures in respect thereto.

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38 By way of the Order dated 22.01.2021, the Hon'ble NGT has constituted the instant Ld. Committee comprising of EAC (MOEF&CC), CPCB, NEERI, and IIT Bombay to only consider *"the issue of assessment of carrying and load bearing capacity of the Panchayat road in question"*. It is submitted that the entire record of pleadings and submissions of the Project Proponent) in the instant case before the Hon'ble NGT has been shared with the Nodal Officer, Mr. Ankur Tiwary (Sc.D, CPCB) by the Counsel for the Project Proponent vide the email dated 08.03.2021. The references in the instant submissions to the documents and page numbers are to the record as maintained by the Hon'ble NGT. Furthermore, vide the said order dated 22.01.2021, the parties to the Appeal were granted liberty to submit the Written Submissions before the Nodal Agency, viz. the Central Pollution Control Board (CPCB).

SUBMISSIONS TO THE LD. COMMITTEE

39 Accordingly, in respect of the issues so raised and referred to this Ld. Committee, it is submitted as follows:

I. Assessment of carrying and load bearing capacity of the Panchayat Road in question.

40 At the outset, it is submitted that the Terms of Reference issued to the Project Proponent for conducting the Environment Impact Assessment Report, do not require the Project Proponent to conduct an assessment of the load bearing capacity of the proposed transportation route. Moreover, neither do the applicable

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MOEF&CC guidelines, notifications for obtaining an Environment Clearance, require the Project Proponent to conduct an assessment of carrying and load bearing capacity of the proposed transportation route.

41 It is submitted that the issue is premised on a (wholly incorrect) submission by the Appellant that a part of the approach road to the Proposed Unit, viz. the Panchayat Road is allegedly a 'narrow' and 'kaccha' road and which is also adjacent to a village. Contrary to the misrepresentation of the Appellant, the transportation route proposed for handling raw material/ finished product does not pass through the Suvali Village.

42 The Panchayat Road proposed to be used is only about 1.2kms and not the stretch which is adjacent to the village as alleged. This transport route has been submitted to SEIAA and considered by SEAC in its 514th meeting held on 12.06.2019 (***See:*** paras 16-19 of the Additional Written Submissions of the Project Proponent dated 20.01.2021). The stretch of the Panchayat Road proposed to be used is a '22-meter-wide sanctioned road' as per the SUDA Masterplan. (***See:*** The certified part-plan dated 09.11.2020 annexed to the Additional Written Submissions of the Project Proponent dated 20.01.2021). The transportation route to the Proposed Unit consists of National & State Highways, for which a traffic study is included in the EIA Report.

43 Since the issue of a traffic study of the panchayat road in question was raised for the first time in the proceedings before the Hon'ble NGT, the Project Proponent caused the preparation of a fresh traffic study and assessment of the carrying and load bearing capacity of *inter alia* the Panchayat road in question. The said Traffic Study Report after conducting a through assessment, records as follows:

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> *"From the baseline study and various discussion on probable impacts of all the operational activity, it has been concluded that this project will create more positive impact and will generate the revenue and employment (280 Nos.) in the surrounding area. On the above facts and baseline study, the proposed cement grinding unit which will add only 48 PCU is recommended for the commencement with proper mitigation measure as suggested above. There is no change in Level of Service (LOS) on approach road /Panchayat road due to traffic projection of cement grinding unit."*

Copy of the Traffic Study Report Issued by Akone Services, annexed to the Additional Written Submissions of the Project Proponent dated 20.01.2021 is annexed hereto as **Annexure 14**.

44 Furthermore, the Traffic Study dated 20.01.2021 shows the following:

a. The approach road (Panchayat Road) is found to be a 'Pucca' (metal tarred) having a current width of more than 15 meters throughout the entire 1.2 kms stretch proposed to be used; and the LOS for the approach road (i.e. the stretch of the Panchayat Road proposed as the transport route) is found to be 'very good'.

b. The Panchayat Road is found to be having a carrying capacity of 1250 PCU per hour on which on an average 190 PCUs travel per hour. (***See:*** @ Chapter 2.2 of the Traffic Study Report annexed to the Additional Written Submissions dated 20.01.2021).

c. This shows that the stretch of the Panchayat Road forming part of the proposed transportation route is well equipped to handle movement of trucks (about 48 trucks per hour) proposed to be deployed by the Project Proponent in terms of the Impugned EC.

d. The LOS for the same was also found to be good. (***See:*** Chapter 3.10 of the EIA Report, @ **pp 1304-1306**).

45 Without prejudice to the above, it is also relevant to note that contrary to the submissions made by the Appellant, the transportation route proposed by the Project Proponent is one the two alternative sanctioned roads available for transportation of material to the Proposed Unit, and has been chosen by virtue of being the shortest route. The alternate route available, is also a sanctioned road within the industrial zone, and which is currently also used for vehicular movement of trucks by various industries including the Appellant. (***See:*** Map depicting alternative transport routes annexed to the Additional Written Submissions of the Project Proponent dated 20.01.2021)

II. <u>Assessment of dust generation caused during transportation and measures proposed to mitigate the same</u>

46 In terms of the facts set out above, viz. that the proposed transportation route has the requisite load bearing and carrying capacity, and that the proposed transportation route is not

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adjacent to any village, the impact of vehicular movement will have minimal/negligible impact on Suvali Village. This is also borne out from the Ambient Air Quality, and Air Quality Index study recorded in the EIA Report and also the Traffic Study Report dated 20.01.2021.

47 Be that as it may, it is submitted that Chapter 4 of the EIA Report of the Project Proponent contains a detailed study of 'Impact Prediction and Mitigation Measures'. This *inter alia* deals with the impact assessment of various parameters (such as air, water, noise, soil, hydrogeology, etc.) and measures to control, mitigate and minimize impact on the environment from various operations of the Proposed Unit.

48 In terms of the same, the Impact Assessment and Mitigation Measures in respect of 'Air' and 'Noise' Pollution due to transportation has been assessed in two parts, viz. (i) during construction of the Proposed Unit; and (ii) during operation of the Proposed Unit.

a. **Air Environment:** The assessment of impact prediction of transportation and mitigation measures in respect of 'Air' environment is analyzed in the EIA Report at Table 4.5 for the construction phase (@ **P 1335**); and at Table 4.24 for the operation phase (@ **P 1348-1349**).

b. **Noise Environment:** The assessment of impact prediction of transportation and mitigation measures in respect of 'Noise' environment is analyzed in the EIA Report at Table 4.8 (@ **P 1337**) for the construction phase; and at Table 4.27 for the operation phase (@ **P1350**).

49 Furthermore, the EIA Report also contains a detailed study of the Air Quality Index and Air Quality Modelling Study to assess the

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impact from the of operation the Proposed Unit on the surrounding villages. For Suvali Village, which is about 1.341 Kms away, the resultant concentrations for PM10, SO2 & NOx are also found to be within the permissible parameters. (**See:** Chapter 4.3.3 and 4.3.4 of the EIA Report **@ pp 1342-1348**). After analyzing all of the above, the EIA Report concludes that any adverse impact on the surrounding environment would be mitigated with adoption of the mitigation measures proposed. **(@ P 1353)**

50 It is relevant to note that the queries regarding the said mitigation measures proposed by the Project Proponent were raised by the SEAC on 16.04.2019, and which were clarified by the Project Proponent through the information submitted along with the letter dated 23.05.2019 addressed to the SEAC. The Project Proponent vide the said letter dated 23.05.2019 had submitted detailed information regarding transport plans, and APCMs for transportation as well as various other aspects in respect of the operation of the Proposed Unit. (***See:*** Traffic Management Plan and sound APCM/ EMP proposed as part of details submitted to SEAC vide letter dated 23.05.2019 **@ pp 1195-1212**).

51 The salient features of the said mitigation measures proposed by the Project Proponent, particularly in respect of transportation, are as follows:

a. Raw material which is in solid form (i.e. Clinker and Gypsum), is proposed to be transported in trucks/ automated tippers completely covered in tarpaulin. Fly Ash (powdered form) is proposed to be transported in bousers (specially designed closed cylindrical container trucks). **(@ P1210)**

b. Finished Product, i.e. bagged cement shall be transported in completely tarpaulin covered trucks/tippers, and loose cement shall be transported in specially designed bousers. **(@ P 1199)**

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c. *Photographs of the bousers, covered trucks and tippers proposed to be used for transportation* of material were submitted by the R-1 before the SEAC. (**See:** Colour photographs annexed to the Additional Written Submissions of the Project Proponent dated 20.01.2021)

d. Respondent No 1 has undertaken to *provide water sprinkling systems, and spray water over the roads and material*, to negate any remaining possibility of dust emission. (**@ P 1210**)

e. Construction of paved roads within the premises of the Proposed Unit with automated sweeping machines. (**@ P 1210**)

f. Speed limit of trucks to be limited to 10 KM/Hour on Approach Road; and deployment of trucks with valid PUC's. (**@ P 1210**)

g. Development of Greenbelt covering an area of 33.98% along the boundary of the Proposed Unit. (**@ P 1210**)

52 The Project Proponent has also proposed to adopt the said state-of-the-art and environmental friendly German technology in the Proposed Unit, along with several facilities such as covered concrete silos', covered storage yards, closed loop systems, de-dusting bag filters and dust extraction systems to minimize and control any dust emission from other operations of the Proposed Unit. (**@ P 1212**). It may be noted that as per ICR review published in December 2020, closed storage yards and steel silos (which are also being employed by the Project Proponent) have been found to play a key role in containing and mitigating fugitive dust from bulk materials in cement plants and grinding units. The copy of ICR published in August & December 2020 is attached hereto as Annexure 4 (above).

53 It is further submitted that as per the International Cement Review (ICR) published in August 2020 (annexed above), the Vertical Roller Mill (VRM) being employed by the Project Proponent has been

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noted to have immense benefits relating to space and cost savings, and has also found to lead to substantial improvements to equipment efficiency and reliability in the manufacturing process.

CONCLUSION

54 A perusal of the above shows that the Project Proponent has carefully and meticulously planned and undertaken to adopt all possible mitigation measures to control air and noise pollution from transportation and also various other operational aspects involved in running of the Proposed Unit.

55 Without prejudice it is further submitted that the setting up of the Proposed Unit will lead to large scale socio-economic development. The Project Proponent plans to employ local resources only, and this will further generate large scale employment opportunities for the nearby villages and will benefit the local population immensely.

56 It is submitted that the Project Proponent has invested substantial sums of money into the planning and development of the Proposed Unit in an environmentally compliant manner, and the same is now being delayed due to no fault of the Project Proponent causing it huge losses. Accordingly, the Project Proponent prays for an expeditious consideration of the matter and remains available to answer any concerns that may arise.

57 It is further requested that in the interests of fairness and justice, the Project Proponent be granted an opportunity of personal hearing and presentation before the Ld. Committee in order to

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substantiate its submissions with respect to the issues referred to this Ld. Committee. The Project Proponent further reserves its rights to advance further submissions and material in respect of any other clarifications that the Ld. Committee may desire.

58 The instant Preliminary Submissions are being filed by the Project Proponent without prejudice to its rights, all which are reserved. It is reiterated that the Project Proponent further reserves its rights to advance such other submissions and file such further documents as may be required to substantiate its case before the Ld. Committee. It is humbly prayed that the Ld. Committee will give due consideration to the above submissions and will examine the same with a pragmatic view in the interest of Sustainable development.

We look forward to hearing from the Ld. Committee; and remain available to address any further clarifications.

Thanking you,

Yours faithfully,
For **Sanghi Industries Limited**

Gaurang Bhatt
Sr. Vice President

Encl: a.a.

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ANNEXURE-1

(1)

Item No. 02 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Appeal No. 36/2020
(Earlier Appeal No. 66/2019 (WZ))

Larsen & Toubro Limited Appellant

Versus

Sanghi Industries Limited & Ors. Respondent(s)

Date of hearing: 06.01.2021
Date of uploading of order: 22.01.2021

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

ORDER

1. This appeal has been preferred against order dated 23.08.2019 of the State Level Environment Impact Assessment Authority (SEIAA), Gujarat, granting Environmental Clearance (EC) to M/s. Sanghi Industries Limited for setting up of stand-alone Cement grinding unit at Survey No. 125/1 and 126/1+2+3, Village Shivratnpur, Ta: Choryasi, Distt.: Surat in category 3(b) of Schedule annexed with Environment Impact Assessment (EIA) Notification dated 14.09.2006.

2. The appellant is a company engaged in construction, manufacturing and other industrial/commercial activities. Its grievance is that the project in question will have hazardous impact on Hazira Manufacturing Complex where the appellant is manufacturing defence equipments. The said industrial area at Surat is 'polluted industrial area' classified as such based on data of air water and soil quality, called 'comprehensive

environment pollution index' (CEPI). The unit is of 'red' category in terms of categorisation of industries based on level of contribution to pollution under the Environment (Protection) Rules. EC has been granted without consideration of crucial aspects such as air emissions, water availability, wildlife etc.

3. The appeal was filed on 20.09.2019. Notice was issued on 26.09.2019. The appeal was allowed to be amended on 24.10.2019. IA No. 28/2020 has been filed by the interveners viz. the village Panchayat. IA No. 131/2019 has been filed by the appellant for production of documents relating to compliance status of main cement unit of the project proponent at Kutch in terms of environmental norms.

4. By way of amendment, the appellant has brought on record proceedings of public hearing dated 22.03.2019 wherein, among others, questions with regard to generation of dust from the plant, capacity of the road and source of water were raised. According to the appellant, such concerns relating to increased air and water pollution have not been addressed. The appellant has also pointed out discrepancies in the EIA report. It is submitted that neither the EIA report explains potential of compliance with the environmental norms nor State Environment Assessment Committee (SEAC) and SEIAA have given any reasons from which possibility of such compliance can be inferred. The proceedings do now show application of mind on the environmental consequences and the EC has been granted in a mechanical manner.

5. There are mangroves in the area but the project proponent concealed the said information in application Form 1. Similarly, there is reserve forest area which will be impacted which has not been mentioned. 2 Million Tonnes Per Annum (MTPA) cement is proposed to be grinded

which will require raw material including clinker, gypsum, fly ash, slag which has to be transported, involving movement of huge number of trucks. We made a reference to Table 4.17 in the EIA report showing the truck/tanker capacity and the frequency of trucks per day. The said table is reproduced in para 15 of this order. Though EC mentions that only 363 trucks will be permitted for transporting 278,000 liters water per day (as per specific condition no. 47), atleast 799 canters per day will be required. The land allotted is total 12 acres, out of which 33% is to be green area (as per specific condition no. 67 of the EC) Condition no. 67 of the specific conditions mentions that if land for green belt is not available, plantation can be in open land on road sides. The condition is as follows:

> *"67. The SIL shall develop green belt within the factory premises as per the CPCB guidelines,* ***consisting of at least three rows of trees of local species on periphery. However, if the adequate land is not available within the premises, the SIL shall take up adequate plantation at suitable open land on road sides and other open areas in nearby locality or schools in consultation with the Gram Panchayat/GPCB and submit an action plan of plantation for next three years to the GPCB."***

6. There is no provision in the EIA for space for parking for the trucks and other vehicles. Shifting of green belt outside the factory complex will defeat the object of mitigation of pollution. The industrial area in question is polluted industrial area which has no capacity for any further polluting activities as held in the order of this Tribunal dated 10.07.2019 in OA No. 1038/2018, *News item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels".*

7. The project proponent-Respondent No. 1 has filed reply by stating that it has state of art facilities to adhere to the environmental norms. The mangroves have been duly disclosed in the EIA report. The project is at a distance of 1.3 km from the mangroves. The Krishak Bharati Cooperative

Ltd. (KRIBHCO) has agreed to supply water through irrigation pipelines. The water requirement will be partly met by recycling.

8. Reply of the SEIAA, Gujarat is that EC has been granted based on EIA report furnished by the project proponent. Undertaking was given not to use lignite and pet coke which is not permissible fuel. The project was considered by the SEAC in the meeting held on 12.06.2019 in continuation of meeting held on 16.04.2019. The project proponent explained mitigation measures against the emissions on which the members of SEAC were satisfied and on their recommendation SEIAA granted EC on 16.7.2019. Relevant extract from the reply of SEIAA is:

> " xxx xxx
> 12. *I say that the answering respondent authority after receiving the recommendation considered the same alongwith the relevant material at its meeting held on 16.07.2019. A true copy of the minutes of the meeting of the respondent authority held on 16.07.2019 is annexed herewith and marked as Annexure R4. Being satisfied with the recommendation made by the Expert Appraisal Committee on the basis of the material and consideration of relevant aspects, the respondent authority decided to grant environment clearance for the proposed project. Accordingly, the clearance was issued on 23.08.2019."*

9. Relevant extracts from the minutes of the meetings of SEAC dated 16.04.2019 and 12.06.2019 are:

> ***"The 497th meeting of the State Level Expert Appraisal Committee (SEAC) was held on 16th April, 2019 at Gujarat Pollution Control Board, Sector 10-A, Gandhinagar.***
>
> xxx xxx xxx
>
> ***In view of the above, Committee unanimously decided to consider the proposal the proposal after submission of the following details:***
>
> xxx xxx xxx
>
> iii. ***Fugitive emission details with its mitigation measures.*** *Fugitive emission during raw material handling and feeding process and vehicle movements.*

Mitigation measures – High efficiency pulse air jet type bag filters will be considered to arrest the air borne dust at all the locations where transfer of material are takes place; The automatic bagging machine with bag filters will be installed for packing plant; unloading of coal trucks will be carried out with proper care avoiding dropping of the materials from height. Sprinklers will be installed in Raw Material/ Fuel Storage/Loading / Unloading areas. The sprinkling of water will be done along with internal roads in the plant in order to control the dust arising due to the movement of vehicular traffic; Proper maintenance of vehicles shall be carried out; All the workers inside the plant will be provided with disposable dust masks; thick greenbelt will be developed around the plant to arrest the fugitive emissions; and Periodic air quality monitoring shall be carried out as per CPCB/ SPCB norms etc.

xxx *xxx* *xxx*

After deliberation, SEAC unanimously decided to consider the proposal after submission of the following details:

1. to 4. *xxx* *xxx* *xxx*

5. *Sound APCM to control fugitive dust emission during raw material transportation, storage, handling, loading, unloading, transfer, fuel grinding etc."*

xxx *xxx* *xxx*

"Minutes of the 514th meeting of the State Level Expert Appraisal Committee held on 12/06/2019 at Committee Room, Gujarat Pollution Control Board, Sector 10-A, Gandhinagar.

xxx *xxx* *xxx*

15	*SIA/GJ/IND2/ 30448/2018*	*M/s. Sanghi Industries Limited Survey No. 125/1, 125/2 and 126/1+2+3, Vill.: Shivrampur, Tal.: Choryasi, Distt.: Surat*	*Appraisal – Recommendation*

xxx *xxx* *xxx*

iii, ***Fugitive emission details with its mitigation measures:***

xxx *xxx* *xxx*

On Road:

- *All internal roads used for transport of vehicles will be paved and maintained property and repaired immediately when required.*
- *For prevention of road dust emission, speed will be restricted to 10 km/hr for heavy vehicles within the project premises.*

- *All preventive measures i.e. covering of trucks, paving and maintenance of internal roads will be adopted.*
- *Regular vacuum sweeping and water spraying will be done on the internal roads.*
- *Proper maintenance of vehicles will be carried out."*

10. The minutes of the meeting of SEIAA dated 16.07.2019 are:

> ***"Minutes of the 253rd Meeting held on 16th July, 2019 at 09:00 A.M.***
>
> *The 253rd meeting of the State Level Environment Impact Assessment Authority (SEIAA) was held under the Chairmanship of Shri C.L. Meena at Gujarat Pollution Control Board, Gandhinagar. Prof. G.H. Ban, Member of SEIAA and Shri S.M. Saiyad, Member Secretary of the State Level Environment Impact Assessment Authority (SEIAA) attended the meeting.*
>
> *xxx xxx xxx*
>
> ***2) Sanghi Industries Limited, Dist. Surat***
>
> - ***After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC."***

11. The stand of the Ministry of Defence is that L&T facility is only a defence manufacturing facility and not a defence establishment. Thus, Works of Defence Act, 1903, prohibiting activities within a particular distance therefrom, does not apply.

12. We have heard Shri Raj Panjwani, learned Senior Counsel for the appellant, Shri Pinaki Mishra, learned Senior Counsel for Respondent No. 1 and Shri Maulik Nanavati, learned Counsel for SEIAA, Gujarat and perused the documents on record, with their assistance. We have also perused the written submissions filed by the parties in pursuance of order dated 06.01.2021 passed on conclusion of the hearing. In view of the fact that we are giving liberty to the parties to file written submissions before the CPCB for consideration of the Committee to which the matter is being referred, we do not find it necessary to make any comment on the said

submissions, beyond the comment on the rival contentions already raised before the Tribunal

13. Shri Panjwani has drawn our attention to Form I, the EIA and the minutes of the SEAC. He pointed out contradictions in the information in the EIA compared to the information furnished in Form-1, particularly with regard to the mangroves, forests and birds. From the EIA documents, it is pointed out that the project proponent is one of largest cement plants at Kutch while the present project is proposed as grinding unit at Hazira Industrial Zone, Village Shivrampur, Taluka-Choryasi, District-Surat, Gujarat. The land procured for the purpose is 4.856 hectare for use as per following break-up:

"Table 2.7 Land Breakup of Cement Grinding Unit

#	Particulars	Total Area (in Ha.)	Area
1.	Production Plant	0.712	14.66%
2.	Office & Lab Area	0.022	0.46%
3.	Raw Material Storage Area	0.632	13.01%
4.	Solid Waste Storage Area	0.005	0.10%
5.	Open Space	1.835	37.79%
6.	Green Belt	1.650	33.98%
	Total	**4.856**	**100.00%**

In the above break up, there is no provision for parking of large number of trucks to be used for about 800 trips per day for transporting material and other trucks for transporting water.

14. The main raw material i.e. clinker is to be transported from Kutch plant by sea/road as per statement in the EIA as follows:

> *"2.6.3 Transportation & Storage of Raw Material*
>
> *The clinker shall be transported from Sanghipuram (IU) to Surat GU mainly by sea. Clinker shall be extracted from the Clinker load out silos at IU, transported to the captive Jetty of SIL by trucks and loaded on to the barges by grab cranes. Barges shall transport the Clinker to*

the ship stationed at high seas. ***At Surat, the Clinker shall be unloaded from the ship at nearest port and transported to the Surat GU site by trucks. The clinker received through self-tipping trucks shall be unloaded by into a box feeder and transported to clinker storage silo through conveyor and elevator. The clinker storage has been envisaged in RCC silos of capacity 50,000 Ton, adequate for about 10 day requirement of the plant. Clinker shall be extracted from the bottom of the clinker silos and fed to the clinker hoppers in the cement grinding section through a belt conveyors and elevator."***

15. Under the heading 'air environment', the EIA mentions as follows:

"Table-4.17: Incoming & Outgoing Transportation

Incoming Raw Material Transportation							
S.No.	***Raw Material***		***Quantity TPA***	***Quantity TPD***	***Source***	***Mode of Transport***	***No. of vehicles (Truck/day)***
1.	*Clinker*		*2000000*	*6061*	*Captive*	*Sea*	*184*
2.	*Additives like Gypsum, Fly Ash, Slag*				*Purchase*	*Road*	
	Fuel		*60000*	*182*	*Purchase*	*Road*	
Total No. of Trucks deployed/day will be							***184***
Outgoing Product Transportation							
S. No.	***Product***	***Quality Million TPA***	***Quantity TPA***	***Quantity TPD***	***Source***	***Mode of Transport***	***No. of vehicles (Truck/day)***
1.	*Cement*	*2.0*	*2000000*	*6061*	*Captive*	*Road/Sea*	*179*
Total No. of Trucks deployed/day will be							***363***

Frequency of Vehicles:	
Total Capacity (Fuel, Clinker, Fly ash)	*40, 60,000 TPA*
No. of working days	*330*
Transportation of incoming and outgoing material	*12303 Tons/day*
Working hours per day	*24 hours (3 shifts)*
Truck/Tanker Capacity	*34 Tons*
Frequency of trucks/day (92 Nr. × 4 trips/day = 2 up/down)	*363 ×2*
Frequency of trucks deployed/hr	*16*
Increase in PCU/hr	*16 × 3 = 48*

16. The mode of transportation mentioned in para 5.3 of the EIA is as follows:

"5.3 ALTERNATIVE FOR TECHNOLOGY AND OTHER PARAMETERS

xxx *xxx* *xxx*

S. No.	***Site Particular***	***Alternative Option 1***	***Alternative Option 2***	***Remarks***
1 to 6	*xxx*	*xxx*	*Xxx*	*Xxx*
7.	*Road*	*Metallic Road*	*Kachcha Road*	*The road is well furnished. Most of*

				the raw material and fuel will be transported through ship (sea route)

17. Under the hearing mitigation measures, table 2.13 is as follows:

"Table 2.13: Aspects & Impacts Analysis

Activity	***Environmental Attribute***	***Cause***	***Impact Characteristics***			
			Nature	***Duration***	***Reversibility***	***Intensity and Significance***
Vehicles Movement and utilities operation	*Air quality*	*Exhaust Emissions i.e. NO_x, SO_2, Fugitive emission*	*Negative*	*Short Term*	*Reversible*	*Low, due to movement of vehicle only for loading and unloading of raw material. Provision of APC's.*
	Noise Levels	*Noise Generation*	*Negative*	*Short Term*	*Reversible*	*Low, due to limited activity*
	Risk & Hazards	*Accidents, collision of transport vehicles*	*Negative*	*Short Term*	*Reversible*	*Medium due to loss of property and injury to manpower.*

18. Conclusions in the EIA report are:

"11.5 Conclusion

Based on the EIA study conducted in Post Monsoon of 2018 (Oct. to Dec. 2018) and as per terms of reference given by SEAC, the following highlights emerge:

- *There will be minimal pollution potential on air, water and noise environment, which, with the implementation of the mitigation measures and EMP, can be reduced considerably.*
- *The proposed project activities will have positive beneficial effect on the local population, economic output and other related facilities viz. employment, development of business, transportation etc.*
- *Risk assessment including emergency response plan and DMP has been prepared to handle any sort of emergencies.*
- *Looking to the overall project justification, process, pollution potential and pollution prevention measures/ technologies installed by proponent, environmental management activities of proponent; the proposed project would be environmentally acceptable, in compliance with environmental legislation and standards.*

Hence, looking to the overall project justification, process, pollution potential and pollution prevention, measures/technologies installed by proponent, environmental management activities of proponent, ***it has been concluded that the proposed project would not have any considerable impacts on environment as well as socio-economic and ecological conditions of the project area. Hence proposed grinding unit at Shivrampur, Hastra is considered environmentally safe."***

19. Learned Counsel for the appellants has then referred to documents filed with IA No. 8/2020 and documents filed on 18.11.2020 by the intervener – Suvali Gram Panchayat. In para 15 of the reply filed by Suvali Gram Panchayat, it is mentioned that the project is in violation of Comprehensive General Development Control Regulations (CGDCR) notified by the State Government on 12.10.2017 under the Gujarat Town Planning and Urban Development Act, 1976. The CGDCR classify different zones for the permissible activities also specify negative list of activities. According to the said regulations, there is prohibition of Obnoxious & Hazardous industries in general industrial zone.

20. On being called upon, the learned Counsel for the project proponent as well as learned Counsel for the SEIAA were unable to show any discussion in the minutes of the SEAC or any material which may reflect application of mind to the assessment of impact of dust generation during the transportation and mitigation measures against the same. Beyond saying that provision has been made for covering the vehicles during transport and sprinkling of water, it has not shown as to how generation of dust and causing of noise pollution by movement of large number of heavy vehicles will be neutralized, given the carrying and load bearing capacity of the Panchayat road in question.

21. **In view of above, we find that the precautionary principle, for which EIA is conducted, remains to be addressed. As held in Hanuman Laxman**

Aroskar v. Union of India[1], the object of EIA is to ensure that all concerns affecting the environment are duly taken care of. Thus, the impugned EC cannot be sustained until the environmental concerns are duly addressed. We are informed that the project has not yet commenced. Even learned Counsel for the project proponent and the SEIAA fairly accepted this factual position.

22. Accordingly, we refer the issue of assessment of carrying and load bearing capacity of the Panchayat road in question and evaluation of EIA and EMP prepared by the project proponent to the EAC of the MoEF&CC dealing with the cement plants, alongwith the representatives of CPCB, NEERI and IIT Mumbai. The CPCB will be the nodal agency for coordination and compliance. Coordination with the EAC may be through the MoEF&CC. The Committee may assess how generation of dust and causing of noise pollution by movement of large number of heavy vehicles will be neutralized, given the carrying and load bearing capacity of the Panchayat road in question. The Expert Committee may furnish its report to this Tribunal within three months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF.

23. The appellant, the Suveli Gram Panchayat and the project proponent may file their respective written submissions to the CPCB within two weeks for consideration by the Committee.

A copy of this order be forwarded to the MoEF&CC, CPCB, NEERI and IIT Mumbai by e-mail for compliance.

[1] (2019) 15 SCC 401

(12)

List for further consideration on 14.07.2021.

Adarsh Kumar Goel, CP

S.K. Singh, JM

Dr. Nagin Nanda, EM

January 22, 2021
Appeal No. 36/2020
(Earlier Appeal No. 66/2019 (WZ))
DV

ANNEXURE-2

(13)

GRINDING UNIT DETAILS

Nos	State	Plants	District	Capacity MTPA 2019
1	Andra Pradesh	ACC - Vizag GU	Vizag	0.3
2		Andra - Vishaka GU	Vizag	0.54
3		My Home - Vizag GU	Vizag	2
4		NCL Ind - Kondapalli GU	Krishna	1
5		Ramco - Vizag GU	Vizag	0.95
6		Sagar - Bayyavaram GU	Vizag	1.5
7		Sri Chaka - Anna'pet GU	Vizianagaram	0.26
8	Assam	Calcom - Lanka GU	Noagoan	2.1
9		Star - Sonapur GU	Guwahati	2
10		Topcem - Gauripur GU	Kamrup	0.66
11	Bihar	Emami - Bhabua GU	Bhabhua	1.8
12		Kanodia Infra GU	Bhabhua	1.2
13		Shree - Bihar GU	Aurangabad	5.6
14		UltraTech - Pataliputra GU	Patna	1.6
15	Chhattisgarh	Bhilai Jaypee GU	Durg	2.2
16	Gujarat	Ambuja - Magdalla GU	Surat	1.56
17		JK Lakshmi - Kalol GU	Gandhinagar	0.9
18		JK Lakshmi - Surat GU	Surat	1.35
19		JK Super	Mahisagar	1
20		UltraTech - Magdalla GU	Surat	0.75
21		UltraTech - Wanakbori GU	Kheda	2.4
22		Vadraj - Mora GU	Surat	6
23	Hariyana	JK Cement - Jharli GU	Jhajjar	1.5
24		JK Lakshmi- Jhajjar GU	Jhajjar	1.31
25		Shree - Panipat GU	Panipat	1.5
26		UltraTech - Jhajjar GU	Jhajjar	1.6
27		UltraTech - Panipat GU	Panipat	1.3
28	Himachal Pradesh	Ambuja - Nalagarh GU	Solan	1.5
29		Asian CCpl GU	Solan	1.4
30		UltraTech - Bagheri GU	Solan	2
31	Kammu & Kasmir	J&K Cem- Samba GU	Jammu	0.1
32	Jharkhand	ACC - Sindri GU	Dhanbad	2.35
33		Dalmia - Bokaro GU	Bokaro	2.6
34		Nuvovo - Jojobera GU	Singhbhum	4.6
35	Karnataka	ACC - Kudithini GU	Bellary	1.1
36		ACC - Thondebhavi GU	Chikballapur	1.66
37		JSW - Vijaynagar GU	Bellary	3.2
38		UltraTech - Ginigera GU	Koppal	1.3
39	Kerala	Malabar - Cherthala GU	Alappuzha	0.2
40	Madhya Pradesh	Heidelberg - Imlai GU	Damoh	2
41		JPVL - Nigrie GU	Singrauli	2
42	Maharashtra	India Cem - Parli GU	Beed	1.1
43		JSW - Dolvi GU	Raigad	2.2

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44		Orent - Jalgaon GU	Jalgaon	2.2
45		Penna - Patas GU	Pune	1
46		RCCPL - Butibori GU	Nagpur	0.58
47		UltraTech - Hotgi GU	Solapur	4
48		UltraTech - Nagpur GU	Nagpur	2
49		UltraTech - Ratnagiri GU	Ratnagiri	0.48
50		Wonder - Dhule GU	Dhule	2
51		Zuari - Solapur GU	Solapur GU	1.2
52	Meghalaya	Megha Tech - J Hills GU	Jaintia Hills	0.7
53	Odisha	Dalmia - Kapilas GU	Cuttack	1.35
54		Emami - Kalinganagar GU	Jajpur	2
55		JK Lakshmi - Cuttack GU	Cuttack	0.6
56		JSW - Jajpur GU	Jajpur	1.2
57		Toshali - Chowdwar GU	Cuttack	0.38
58		UltraTech - Jharsuguda GU	Jharsuguda	2.6
59	Punjab	Ambuja - Bhatindra GU	Bhatinda	0.82
60		Ambuja - Ropar GU	Ropar	2.5
61		Asia FCPL GU	Patiala	1.5
62		UltraTech - Bhatinda GU	Bhatinda	2.6
63	Rajasthan	Shree - Jobner GU	Jaipur	1.5
64		Shree - Khushkhera GU	Alwar	3.5
65		Shree - Suratgarh GU	Sriganganagr	5.4
66		UNCL - Neem KT GU	Sikar	1.4
67	Tamil Nadu	India Cem - Vallur GU	Chennai	1.1
68		My Home - Tuticorin GU	Tuticorin	1.5
69		Ramco - Salem GU	Salem	1.6
70		UltraTech - Arakkonam GU	Vellore	1.1
71		Zuari - Chennai GU	Chennai	0.9
72	Uttar Pradesh	ACC - Tikaria GU	Sultanpur	3
73		Ambuja - Dadri GU	GB Nagar	2
74		Birla Corp - Raebareli GU	Raebareli	1.3
75		Heidelberg - Jhansi GU	Jhansi	2.7
76		JAL - Chunar GU	Mirzapur	2.5
77		JAL - Churk GU	Mirzapur	1
78		Kanodoa Cem GU	Bulandshahar	0.5
79		Mangalam - Aligarh GU	Aligarh	0.75
80		RCCPL - Kundanganj GU	Raebareli	2
81		Shree - Bulandshahr GU	Bulandshahr	2
82		UltraTech - Aligarh GU	Aligarh	1.3
83		UltraTech - Bara GU	Allahabad	4
84		UltraTech - Dadri GU	GB Nagar	1.3
85		UltraTech - Sik'bad GU	Bulanshahr	1
86		UltraTech - Tanda GU	Ambedkar N	1
87	Uttarakhand	Ambuja - Roorkee GU	Haridwar	1
88		Shree - Roorke GU	Haridwar	1.8
89		UltraTech - Roorkee GU	Haridwar	1.1
90	West Bangal	ACC - Damodar GU	Purulia	0.75
91		Ambuja - Farakka GU	Murshidabad	1.25

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92		Ambuja - Sankrali GU	Howrah	2.4
93		Birla Corp - Durgapur GU	Burdwan	2.3
94		Century - Sonar B GU	Murshidabad	2
95		Dalmia - Bengal GU	Midnapore	1.35
96		Emami - Panagarh GU	Burwan	2.5
97		JSW - Salboni GU	P Medinipur	2.4
98		Ma Chandi - Bamunara GU	Burwan	0.33
99		Nuvovo - Mejia GU	Bankura	1.5
100		Ramco - Kharagpur GU	P Medinipur	0.2
101		Ramco - Kolaghat GU	P Medinipur	0.95
102		Shristi - Mangalpur GU	Burwan	0.36
103		Swasata - Purulia GU	Purulia	1.5
104		UltraTech - Dankuni GU	Hooghly	1.6
105		UltraTech - WB GU	Burdwan	1.4
		Total		**174.94**

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GRINDING PLANTS DETAILS

SR. NO.	COUNTRY	GROUP NAME	CITY NAME	APPROX CAPACITY MILLION TONS	APPROX NO OF GRINDING UNIT	SUPPORTED BY INTEGRATED PLANT	INTEGRATED PLANT CAPACITY MILLION TONS
		Siam City Cement	Galle	2.3		Puttalam	1.04
1	Sri Lanka	Tokyo Cement Company	Trincomalee	2.8	2	-	
		TOTAL		5.10			1.04
		Star Cement Company LLC	Aden	1		-	-
2	Yemen	Al Ahlya Cement Company	-	1.62	2	-	-
		TOTAL		2.62			
3	Reunion	Holcim (Outre-Mer) S.A.S	Le Port	1.5	1	-	-
		TOTAL		1.50			
4	Madagascar	Madagascar Long Cimenterie (MALOCI)	Antananarivo	0.36	1	Antananariv	0.85
		TOTAL		0.36			0.85
		Groupe Amida	Abidjan	1			
		Cim Metal Group	Abidjan	3			
		LafargeHolcim Ltd	Abidjan	1			
		Groupe Amida	Abidjan	0.75			
5	Côte d'Ivoire, Ivory Coast	West African Cement (WACEM) SA	Anyama	5	8	-	-
		Ciments de L'Afrique (CIMAF) (Morocco)	Abidjan	0.5			
		Prestige Ciment Côte d'Ivoire (PCCI)	Abidjan	1.2			
		Limak Cimento San. ve Tic. Inc	Abidjan	1			
		TOTAL		13.45			
		Shah Cement Industries Ltd	Dhaka Plant	10			
			Chittagong	2.4			
		HeidelbergCement AG	Mukterpur	0.5			
		Siam City Cement, PLC (SCCC) Group	Narayanganj	0.5			
			Khulna	1.5			
6	Bangladesh	Shun Shing Group International Ltd	Dhaka Plant	3.5	10	-	-
			Chittagong	1.4			
		Cemex	Chittagong	0.52			
		Holcim Cement (Bangladesh) Ltd	Begerhat	1.3			
		Hadib Group Ltd	Chittagong	2			
		Premier Cement Mills Limited	Chatogram	1.6			
		S. Alam Group	Chittagong	0.44			
		Aramit Group	Chittagong	0.25			
		TOTAL		25.91			
		Lee Building Materials Ltd	Kilwa – Masoko	3		-	-
		Amsons Group	Dar Es Salaam	1		Dar Es Salaam	0.5
7	TANZANIA	Huaxin Cement Co, Ltd	Dar Es Salaam	1.6	5	-	-
		Benco India	Dar Es Salaam	0.5		Dar Es Salaam	-

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		Fortune Cement Ltd	Dar Es Salaam	1.4		-	
		TOTAL		7.41			0.50
8	KENYA		Athi River	1.4	8	Bondora	0.75
		David Group of Companies	Athi River	1.4		-	-
		Tororo Cement Limited	Athi River	1.8		Kilifi County	-
		Saruji	Nairobi	2.4		-	-
		LafargeHolcim Ltd	Athi River	3.2		Athi River / Mombasa	1.1
			Athi River	1.2		-	-
			Athi River			-	-
		Karsan Ramji & Sons Ltd.	Nakuru			-	-
		TOTAL		13.90			1.85
9	MOZAMBIQUE	HeidelbergCement AG	Dondo	0.35	9	Nacala	1.3
			Nacala	3.1			
		Ambrian plc	Beira	0.8			
		Limak Holding Inc.	Maputo	0.7			
		Adil Cimentos	Tchumene	2			
		S&S Cimentos	Matola	0.3		-	-
		CNC Trading DMCC	Maputo	0.4			
		Maputo Cement and Steel	Maputo	0.13			
		Fabrica de Cimentos de Cabo Delgado (Metuge Cement)	Metuge	0.25			
		TOTAL		8.03			1.30
10	UAE	UltraTech Cement	Abu Dhabi	3.34	14	-	-
			Dubai	6.25			
		Ghantoot Group	Abu Dhabi	2			
		Star Cement Company LLC	Ajman	2.5			
		Cemex	Dubai	2			
		Sharaf Group	Dubai	1			
		Bin Hamad Group	Al Ain	1.2			
		JK Cement LTD	Fujairah	0.6			
		Fujairah Cement Industries	Fujairah	2.4			
		Al Fahim Group	Abu Dhabi	1.2			
		Super Cement Manufacturing Company L.L.C	Abu Dhabi	0.7			
		Bin Hamad Group	Al Ain	1			
		K Cement International	Hamriyah	0.9			
		Umm Al-Qaiwain Cement Industries Co. P.S.C. (UCIC)	Umm Al Qaiwain	0.7			
		TOTAL		25.75			
11	Qatar	Al Jabor Holdings	Doha	0.9	2	-	-
		Qatar national Cement Co	Doha	5.0		-	-
		TOTAL		5.90			
		GRAND TOTAL IN MILLION TONS		109.92			

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EC Granted for setting up Cement Grinding Unit during last 5 years

State	Sr. No.	Name of Unit	Location	Capacity	Date of EC Granted
Gujarat	1	Sun Cement	Plot No. 701/6 Pallo 2, Village: Dabhoda, Tal: Kheralu, Dist. Mehsana	30 MT per day	01.06.2017
	2	SAL Steel Ltd.	S. No. 245/P, Vill: Bharapar, Tal.: Gandhidham, Dist: Kutch	4000 MT per month	01.06.2017
	3	New Jay Cement Industries	Survey No. 49/P-1, Plot No. 2, Village: Jamwadi, Ta: Gondal, Dist. Rajkot	45 MT per day	28.08.2018
	4	JK Cement Works	S. No. 1342/1327, 1336, 1328, 1333 & 1334, Village: Vadadala, Tal: Balasinor, Dist. Mahisagar	94500 MT per Month	25.03.2019
	5	JK Lakshmi Cement Ltd	Block no. 47 to 51, PO.: Dastan, Kadodara-Bardoli State Highway, Ta: Palsana, Dist: Surat	1.5 MMTPA	08-09-2014
	6	Adani Cementation Ltd.	Village: Tunda, Taluka: Mundra, Dist. Kutch	6000 MT per Month	25.03.2019
	7	Adani Cementation Ltd.	Village: Dahej, Dahej Industrial Estate	2 MMTPA	03.05.2019
	8	Shree Ganesh Cement	Plot No. 201/212, GIDC – Sanala Road, Morbi	1000 MT per month	16.05.2020
	9	Shri Ghantakaran Mahavir Cement Pvt. Ltd.	Plot No. 55, GIDC Ranasan, Mahuda-Vijapur Road, Tal: Vijapur, Dist Mehsana	1500 MT to 6000 MT per Month	07.01.2021
Andhra Pradesh	10	Penna Cement Industries Ltd.	Sy. No. 684, 687, 688, 689 & 690, Krishnapatnam Village, Muthukur Mandal, S.P.S.R. Nellore District	2 MTPA	18.03.2016
	11	Nandyala Cement Industries Ltd.	S. No. 429/1A, Panyam (V&M), Kurnool District	0.60 MTPA	28.01.2017
Bihar	12	M/s Rock Hill Hi-Tech Cement Pvt. Ltd.	Village:- Faluha Industrial Area, Tehsil- Faluha, District- Patna, State- Bihar	90,000 TPA	23.01.2021
	13	M/s Ultratech Cement Limited,	Village - shahjhanpur, Mutsuddpur & Huran, Tehsil:- Fatuha & Karai Parsurai, District:- Patna & Nalanda, State:- Bihar	2 MTPA to 4 MTPA	30.06.2017
	14	Himalayas-Height Cement Pvt. Ltd.	Kurari, Durgawati Kaimur, Dist: Bhabua	0.14 MTPA	28.10.2016
Chhattisgarh	15	M/s. Calcar Products Pvt. Ltd.	Village: Bhupdevpur, Tehsil – Kharsia, Dist: Raigarh	0.66 MTPA	03.12.2018
Haryana	16	WONDER CEMENT LIMITED	Village – Jhamsva, Tehsil – Matenhail, Dist. - Jhajjar	5.00 MTPA	05.07.2019
	17	AMBUJA CEMENT LIMITED	Village – Osara, Tehsil – Bhanpura, Dist. - Mandsaur	1.5 MTPA	07.08.2018
Jharkhand	18	DALMIA CEMENT BOKARO	Bokaro Industrial Area, Tehsil - Chas, Jharkhand		23.09.2019
	19	NUVOCO VISTAS CORPORATION LIMITED	Village: Jojobera, Rahargora, Jamsedpur, East Singhbhum	4.8 MTPA to 8.8 MTPA	08.05.2018
Karnataka	20	M/S S R S CEMENT INDUSTRIES	S. No. 47/2 and G P. 180, Village: Tanakankal, Tehsil Koppal, Dist. Koppal	60000 MTPA	27.02.2020
	21	M/S SREE SAI INDUSTRIES.	Sy. No. 36/C1 & 36/C2, Village: Haravanahalli, Hospet Taluka, Dist: Bellary	60000 MTPA	11.12.2019
	22	JR SUPER CEMENT	Survey No. 129/5A,129/5B and 129/5D, Village: Jeliber, Taluka-Mudhol, Dist-Bagalkot	200 TPD	14.02.2017
	23	AP CEMENT CONCRETE AND ALLIED PRODUCTS	Sy. No. 58/2 & 58/3, Bellahalli Village, Venagal Hobli, Kolar Taluk	100 TPD	28.04.2017
	24	MS SIDDAGANGA CEMENTS PVT LTD	S. No. 328, Village: Sadarahalli, Taluk Chikkanayakanahalli, Dist. Tumkur	30 TPD to 200 TPD	15.11.2016
	25	HEMAVATHI CEMENT INDUSTRIES	KIADB Industrial Growth Centre, Sy. No. 62-P, Plot No. 246 & 247, Vill. Nagathavalli, Kasaba Hobli, Taluka & District – Hassan	102 TPD	29.01.2016
	26	S.S.R. Cement Industries	Gavishree Nagar, 1st Cross, B/H District Court, Taluka & District – Koppal	60000 MTPA	19.12.2015

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ANNEXURE-3

Madhya Pradesh	27	M/s ACC Limited	Khasra No. 77, 83/1, 82, 81, 79, 78, Village: Amelha, Tehsil – Vijayraghavgarh, Dist.- Katnai	2 MTPA	16.09.2020
	28	DIAMOND CEMENTS	Village: Imlai, Dist: Damoh	2 MTPA to 2.5 MTPA	18.09.2019
Orissa	29	M/s. UltraTech Cement Ltd.	Village: Khamarnuagam & Kolhipanga, Tehsil – Athagad Dist. - Cuttack	3 MTPA	16.07.2018
	30	JSW Cement Ltd.	Kalinga Nagar Industrial Complex, Danagadi, Dist – Jajpur	1.2 MTPA	17.10.2017
	31	Jindal Steel & Power Ltd.	Village: Mukundpur & Bhubanpur, Tehsil – Chhendipada, District - Angul	1.1 MTPA	11.10.2017
Uttar Pradesh	32	Paragraph Power Generation Co.	Village-Jodh Khansemra, Tehsil – Bara, Allhabad	4 MTPA	28.11.2014
	33	M/S GANESH LAXMI CEMENTS PVT LTD	Plot No. B 61, Industrial Area, Salharia (SIDA), Jaunpur	3000 TPA	24.08.2020
	34	M/S VCC HI TECH CEMENT PRIVATE LIMITED	Plot No. 190, Village: Mal, Rampur, Tehsil – Mariyahun, Dist. Jaunpur	60000 TPA	01.09.2020
	35	Birla Corporation Limited	UPSIDC Industrial area, Phase-II, Amawan road, Raebareli tehsil, Raebareli district	0.90 MTPA to 1.25 MTPA	31.12.2020
	36	MAYFLEX CEMENT INDUSTRIES PRIVATE LIMITED	Khatoni No. 88, Gata No. 562, Village: Pheisanda, Tehsil – Ayodhya, Dist: Faizabad	500 TPD	20.03.2020
	37	UDDYAM CEMENT	Araji No. 460 MF & 470/1, Village: Dheulhan, Pargana-Saktesgarh, Tehsil – Chunar, Dist.- Mirzapur	600 Ton per day	24.02.2020
	38	MESSERS FIXEM CEMENT PVT LTD	Plot No. 1, 2, 3, Industrial Area, UPSIDC, Bijoli, Dist-Jhansi	60 Ton per day	07.01.2020
	39	DIAMOND CEMENT (Heidelberg)	Village: Madora, Post – Barataha Kalan, Tehsil & Dist – Jhansi	2.70 MTPA to 3.25 MTPA	04.11.2019
	40	MARCE CEMENT WORKS LTD	Area No. 683, 684/1-3, 684/1-5, 711/2, Village: Patana, Tehsil – Ramnagar, Dist- Chandauli	2,40,000 TPA	29.11.2018
West Bengal	41	STAR CEMENT LIMITED	Mohinagar Railway Crossing, JL No. 5 & 7, Mouza – Kharia & Palkata, Dist – Jalpaguri	1.6 MTPA to 2 MTPA	13.09.2019
	42	EMAMI CEMENT LTD.	Plot No. 85A, B 6 & B 8, Panagarh Industrial Park of WBIDC, Block – Aushgram – II, Dist – Burdwan	2 MTPA	18.11.2015
	43	OCL INDIA LTD	Village – Kulapachuria, PO – Godapiasal, P.S. Salbani, Dist - West Medinipur	1.35 MTPA to 4.0 MTPA	28.11.2017
Tamil Nadu	44	CHETTINAD CEMENT CORPORATION LIMITED	Village – Alambadi, Mallapuram and Kankkeli, Taluka – Vedasandur, Dist – Dindigul	1 MTPA to produce Slag Cement	22.02.2019
	45	CHETTINAD CEMENT CORPORATION LIMITED	Village – Puliyur, Taluka & Dist. - Karur	1 MTPA to produce Slag Cement	25.02.2019
Rajasthan	46	Jindal Shakti Cement	E-10, Bapi Industrial Area, Village – Bapi, Tehsile – Dausa, Dist – Dausa	50 MTPD	21.12.2017
	47	LC Cement Works LLP	Khasra No. 700 / 20, Village – Baklawas, Merta, Dist – Nagaur	70000 TPA	17.06.2019
			Total	**54.84 MTPA**	

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ANNEXURE-4

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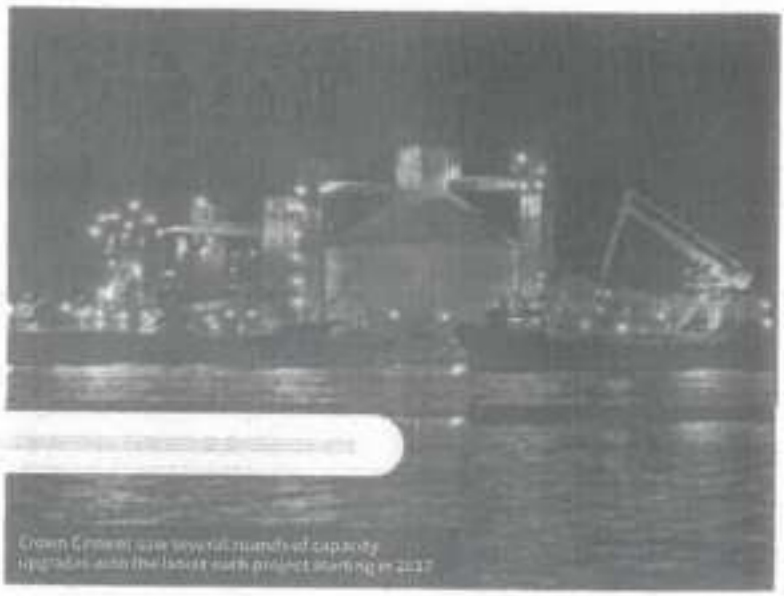
VRM to Crown operations

When Crown Cement identified the need to increase the cement capacity of its plant in Bangladesh it opted for vertical roller mill (VRM) technology from Loesche. With a range of VRM benefits, total grinding capacity has increased to 11,000tpd and has offered more product versatility with local operating conditions in mind.

■ by *Masud Khan*, Crown Cement Group, Bangladesh

Vertical roller mill (VRM) technology has gained in popularity over the years thanks to benefits relating to space and cost savings, as well as improvements to equipment efficiency and reliability. The basic structure of a VRM for cement grinding is the same as for raw material and coal grinding. Raw materials (such as clinker, slag, fly ash, gypsum, limestone or petcoke) are fed into the mill and ground by compression and shearing forces between the grinding table and two or four hydraulically-controlled rollers. Ground cement materials are sent by air to the separator, or classifier, like mine. Ground cement materials are sent by air to the separator installed in the upper section and classified into fine and coarse particles. Coarse particles are returned to the grinding table where they are ground again, while fine particles are sent to dust collectors such as a cyclone and/or bag filter.



Crown Cement has several rounds of capacity upgrades with the latest one project starting in 2017

Technology benefits

With these core highlights, a range of benefits from this technology, particularly when compared with ball mills. These include:

- considerably higher grinding capacity
- highly-efficient grinding with lower electrical power consumption
- improved particle size distribution
- higher blaine and lower residue at an economical cost
- much shorter residence time
- ability to economically grind hard materials such as slag
- large quantities of slag can be added, thereby reducing the clinker factor of cement and reducing costs
- space savings due to the footprint of a VRM being half that of a ball mill
- thanks to its design, a VRM for cement grinding produces little heat and therefore, is relatively trouble free when compared to ball mill grinding, which leads to extensive cement temperature rises and results in maintenance and reliability issues
- lower maintenance costs
- better system operational control response, making cement quality management easier.

Crown's continued expansion

Since the start of its journey in 1994, Crown Cement has continued to expand. Beginning with cement, the firm has diversified into upstream and downstream integrated companies, including operating ocean-going and light vessels, a fleet of more than 450 trucks, power stations, bagging plant and ready-mix operations.

Crown Cement's first foray into the cement market started with a small 600tpd cement grinding plant at Munshiganj, Bangladesh. Buoyed by its strong brand, sales and distribution network the company added a further three grinding units, increasing its capacity to 5800tpd in a short space of time. However, in 2017 when operating at full capacity it was decided that a further capacity expansion was needed. This would see the company opt for vertical roller mill technology.

Latest capacity expansion

When Crown Cement, part of MJ Cement Factory, carried out a technical feasibility study in 2017 to expand its grinding capacity, the company was faced with the choice of either continuing with its existing tube mill technology or opting for a VRM. After extensive studies and deliberations,

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Keeping dust at bay

Closed storage yards and steel silos are key in containing fugitive dust from bulk materials in the cement plant. They provide a more effective level of dust containment when compared with other dust control measures, such as wind nets and spray dust removal.

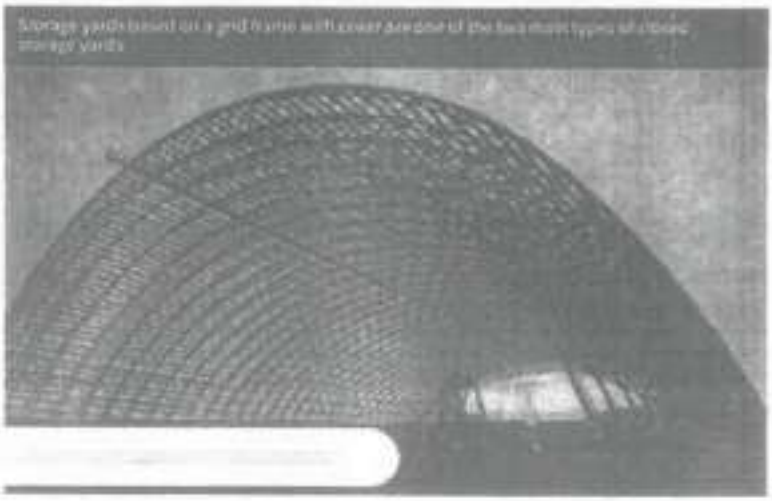
■ *by Sron Silo Engineering Co. China*

Due to the large amount of dust generated during storage, loading and unloading, and transportation of bulk materials in the open storage yard, cement plants around the world have been committed to controlling dust. They have adopted comprehensive dust removal measures based on open storage, including spray dust removal and chemical dust removal, coal car water injection, road water spraying, dust collection devices, coverage companion, wind nets and dust forest belts. These measures can suppress dust pollution to a certain extent, but they have not fundamentally solved the problem. To quickly prevent and control from the dust source and further raw material storage and transportation.

In China's modern terminals, there is a trend to build more closed storage yards and steel silos to reduce heavy dust emissions during the whole operation in open storage.

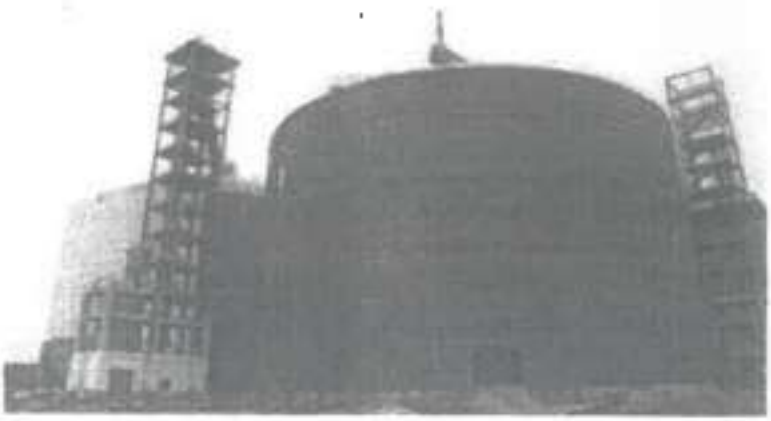
There are two main types of closed storage yards. The first is a grid frame and cover above the storage yard. The implementation of this depends on the yard's shape with strip or circular storage yard as options. The other solution is to use steel silos as a storage facility.

Applications include dry bulk materials to store cement, coal, metal ore, etc., and factories that store volatile or perishable bulk materials. Closed storage yards are also important in areas with active typhoons or heavy rainfall.



Storage yards based on a grid frame with cover are one of the two main types of closed storage yards

Steel silos are important in areas with active typhoons or heavy rainfall



Closed storage yard features

The closed strip silo

The closed strip silo is mainly composed of a cantilever bucket wheel stacker and reclaimer, a large span steel or grid enclosure and other related auxiliary facilities. The bar silo is generally equipped with a bucket wheel stacker and reclaimer, according to the operation of the bucket wheel. It can be arranged as a fold-back or through-type bucket wheel coal yard. Closed strip silos are the most widely used in China.

The operation of the closed strip silo is basically the same as those of the open strip storage yard, but environmental protection is greatly improved and the loss of bulk materials caused by wind and rain is avoided. However, due to the large unit area, the cost of the land required is relatively high, as is the storage loss of bulk materials.

ANNEXURE- 5

LOESCHE

INNOVATIVE ENGINEERING

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Reference List

Worldwide

Sorting by material and size

Updated in April 2019

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Referenzliste LOESCHE GmbH

Rohmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
69.6		1	2018	Sanghi Industries Limited	X	Sanghigwaon 2	IN
69.6		1	2018	Sinoma International Engineering (Tianjin) Co., Ltd. for Lucky Cement Ltd.	X	Pezu 2	PK
69.6		1	2018	Sinoma International Engineering Co.Ltd. for Dangote Cement PLC	X	Obajana Line 5	NG
69.6		1	2012	Sinoma International Engineering Co., LTD for Dangote Industries Limited	-	Mekaghsha	ET
69.6		2	2012	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Ibese 3+4	NG
69.6		1	2010	Cong Thanh Cement JSC Ltd	-	Tan Truong	VN
69.6		1	2008	ABG Cements Ltd	-	Thumb	IN
69.6		2	2008	Sinoma International Engineering Co., LTD for Dangote Industries Limited	-	Ibese 1+2	NG
69.6		1	2007	Holcim India for Gujarat Ambuja Cements Ltd.	-	Bhatapara 2	IN
69.6		2	2006	Grasim Industries Ltd	X	Aditya II	IN
69.6		1	2006	Grasim Industries Ltd.	X	Kotputli	IN
69.6		2	2006	Grasim Industries Ltd for Ultra Tech Cement Ltd.	-	Tadipatri (APCW II)	IN
69.6		1	2006	Star Cement Co. L.L.C.	-	Ichkin	AE
69.4		1	2012	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Obajana 4	NG
69.4		1	2009	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Obajana 3	NG
63.4		1	2018	Sinoma Equipment & Engineering Corp (Sinoma E&E) for LOMA NEGRA C.I.A.S.A	X	Lamali 2	AR
63.4		1	2002	Nuh Cimento Sanayi A.S	X	Kevele	TR
63.4		1	1998	Loma Negra C.I.A. S.A.	-	Olavarria	AR
63.4		1	1996	KHD for The Siam Cement Public Co Ltd.	X	Thung Song 6	TH
60.6		1	2019	CBMI Construction Co. Ltd. for Cement Company of Northern Nigeria PLC	-	Sokoto	NG
60.6		1	2010	Nanjing Cement Design & Research Institute for Thanh Thang Group Cement JSC	X	Thanh Thang 3	VN
60.6		1	2017	Chengdu Design & Research Institute of Building Materials Industry Co., Ltd. for Pioneer Cement Ltd.	X	Chenki	PK
60.6		1	2016	NCDRI (Sinoma Intern. Nanjing Cement Design & Research Institute) for Long Cement Company	-	Long Son 2	VN
60.6		1	2015	NCDRI (Sinoma Intern. Nanjing Cement Design & Research Institute) for Thanh Thang Group Cement JSC	-	Thach Thang	VN
60.6		2	2015	NCDRI (Sinoma Intern. Nanjing Cement Design & Research Institute) for Vissai Group Company Ltd.	-	Song Lam	VN
60.6		1	2011	Jaiprakash Associates Limited Cement Division - JRP	-	Shahabad	IN
60.6		1	2008	CBMI Construction Co. Ltd. for Lafarge Cement WAPCO Nigeria Pc	-	Ewekoro	NG
60.6		1	2008	CBMI Construction Co. Ltd. for OJSC Mikolaiv Cement	-	Mykolaiv	UA

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Rohrmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
60.6		1	2008	CBMI Construction Co. Ltd. for VASSILIKO CEMENT WORKS LTD.	X	Vassiliko	CY
60.6		1	2006	CTG-Italcementi Group	-	Martinsburg	WV
60.6		2	2006	Emirates Cement Factory	-	Al Ayn	AE
60.6		1	2005	Buzzi Unicem USA, Inc.	X	Festus	US
60.4		2	2016	CBMI Construction Co. Ltd. for SARL BISKRIA CIMENT	-	Biskra AMR	DZ
60.4		1	2014	Torbat-e-Jam Cement Company	-	Torbat-e-Jam	IR
60.4		1	2013	CBMI Construction Co., Ltd for United Cement Company of Nigeria (Ltd) - UniCem	-	Mfamosing	NG
60.4		1	2011	CSN - Companhia Siderúrgica Nacional	-	Arcos	BR
60.4		1	2011	CSN - Companhia Siderúrgica Nacional	-	Nordeste	BR
60.4		1	2011	CSN - Companhia Siderúrgica Nacional	-	Sul	BR
60.4		1	2009	KJS Cement Pvt. Ltd	-	Amalia	IN
60.4		1	2008	CTG-Italcementi Group for Devnya Cement AD - Italcementi Group	-	Devnya	BG
60.4		1	2006	Dalian Cement Group Co., Ltd.	-	Dalian	CN
60.4		2	2005	Sinoma / CBMEC for Union Cement Co. (P.S.C.)	X	Ras Al-Kaimah	AE
60.4		1	2002	Cemag Anlagenbau for Naien Cement Co	-	Naien	IR
60.4		1	2003	Sinoma / CBMI	-	Guangzhou	CN
60.4		1	1999	Lehigh Portland Cement Co	-	Union Bridge	US
60.4		3	1997	TCEC for Taiwan Cement Corporation	X	Hoping	TW
59.4		1	1997	PT Semen Bosowa Maros	-	Maros	ID
59.4		1	1996	Indo-Kodoko Cement Co.	-	Indonesia	ID
59.4		1	1995	P.T. Semen Gresik	X	Indonesia	ID
59.4		1	1994	P.T. Semen Nusantara	-	Indonesia	ID
59.4		1	1994	Sanghi Industries	-	Sanghipuram, Kutch (Gujarat)	IN
59.4		1	1991	P.T. Semen Gresik	X	Tuban	ID
56.6		2	2012	Medcem Madencilik ve Yapi Malzemeleri Sanayi ve Ticaret A.S.	-	Silifke	TR
56.4		1	2019	CDI (Chengdu Design & Research Institute) for Yutaian	X	Benchuan	CN
56.4		1	2019	Taiwan Cement Corporation	X	Shaoguan	CN
56.4		1	2018	Northern Cement Corporation NCC	-	Pangasinan Line A	PH
56.4		1	2018	Sinoma International Engineering Co.Ltd. for Kohat Cement Company Ltd.	X	Kohat 2	PK
56.4		1	2017	CDI (Chengdu Design & Research Institute) for Egyptian Steel Group	-	Soheg	EG
56.4		1	2017	Flying Cement Co. Ltd.	-	Khushab 2	PK
56.4		1	2017	Lubao Cement Co., Ltd	-	GX Beilu	CN
56.4		1	2017	SINOMA International Engineering Co. Ltd. for Besway Cement Ltd.	X	Mustekhem 2	PK
56.4		1	2017	Ultra Tech Cement Ltd.	X	Pearl_Dikar	IN
56.4		1	2016	CBMI Construction Co. Ltd. for Edo Cement	-	Ibeca	NG
56.4		6	2016	CDI (Chengdu Design & Research Institute) for MoD - Ministry of Defence	-	Beni Suef I-6	EG
56.4		1	2015	BATISÖKE Söke Cimento Sanayii A.S.	-	Söke	TR
56.4		1	2015	NCDRI (Sinoma Intern. Nanjing Cement Design & Reserch Institute) for Long Son Cement Company	-	Long Son	VN
56.4		2	2014	Chengdu Design & Research Institute of Building Materials Industry Co., Ltd. For El Arish Cement	-	El Arish 3&4	EG

Rohmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

Lfd-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
56.4		1	2013	China National Electronics Imp. & Exp Corp. for Southern Province Cement Co.	-	Bisha	SA
56.4		1	2013	High Pinnacle Construction Pte Ltd. for Panasia Group	-	Banyumas	ID
56.4		1	2013	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Mtwara	TZ
56.4		1	2013	Sinoma International Engineering (Tianjin) Co., Ltd. For United Cement Company	-	Jeddah	SA
56.4		2	2013	Tianjin Cement Industry Design & Research Institute Co., Ltd.for PT Indocement Tunggal Prakarsa	-	Cirebon	ID
56.4		1	2013	Tianjin Cement Industry Design & Research Institute for Qena	-	Taif	SA
56.4		1	2012	CBMI Construction Co. Ltd. For Holcim (Equador)	-	Guayaquil GU3	EC
56.4		1	2012	CBMI Construction Co. Ltd. for Nouvelle Cimenterie du Benin S.A. (NOCIBE)	-	Masse	BJ
56.4		2	2012	Shanxi Fuping Biological Cement Co., Ltd	-	Xue Zhen	CN
56.4		1	2012	Sinoma International for Southern Province Cement Co.	-	Tahamah 3	SA
56.4		1	2011	Guangdong Guangxin Qingzhou Cement Co., Ltd	-	Yunfu	CN
56.4		1	2011	Sephaku Cement	-	Isoseng	ZA
56.4		1	2010	Qingha, Yanhe Xinyu Cement Company	-	Yanhe	CN
56.4		1	2010	Sinoma for Southern Province Cement Co.	X	Tahamah 2	SA
56.4		1	2009	Holcim Hungary	-	Pilango	HU
56.4		1	2009	Hubei Yadong Cement Corporation Ltd.	X	Xin Zhou 2	CN
56.4		2	2009	Nanjing Cement Design & Research Institute for Yanbu Cement Co.	-	Yanbu	SA
56.4		1	2009	TCC Group - Taiwan Cement Corporation	-	Jurong	CN
56.4		1	2009	Tianjin Cement Industry Design and Research Institute (TCDRI)	-	El Nahda	EG
56.4		1	2008	Asia Cement (China) Holding Corporation for Jiangxi Ya Dong Cement Co. Ltd.	X	Ruichang 4	CN
56.4		1	2008	Asia Cement (China) Holding Corporation for Sichuan Ya Dong Cement Co., Ltd.	X	Pengzhou 3	CN
56.4		1	2008	Asia Cement Corporation for Huanggang Ya Dong Cement Co. Ltd.	X	Tianzhen	CN
56.4		1	2008	CBMI Construction Co. Ltd. for Al Badia Cement Co.	-	Al Badia	SY
56.4		1	2008	Cement Manufacturing Company Ltd. (CMCL)	-	Lumshnong	IN
56.4		1	2008	SINOTUANS HEBEI COMPANY for Gezhouba Cement Co. Ltd.	X	Laoheikou	CN
56.4		1	2007	Hubei Yadong Cement Corporation Ltd.	-	Xin Zhou 1	CN
56.4		1	2007	Raghuram Cement Ltd.	-	Nallalingayapalli	IN
56.4		1	2007	Raghuram Cement Ltd	X	Nallalingayapalli 2	IN
56.4		1	2007	Sichuan Yadong Cement Co., Ltd	-	Pengzhou	CN
56.4		1	2007	Sinotrans Hebei Company for Dongyang Gezhouba Cement Co. Ltd.	-	Dangyang	CN
56.4		1	2007	Sree Jayajothi Cements Ltd.	-	Banaiarpadu	IN
56.4		2	2007	Tianjin Cement Industry Design & Research Institute for El Arish Cement	-	El Arish	EG

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Rohmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
56.4		1	2007	Tianjin Cement Industry Design & Research Institute for Hevesberg Cement AG	-	Tula	RU
56.4		1	2007	Votorantim Cimentos Brasil S.A.	-	Salto de Pirapora	BR
56.4		1	2006	Bestway Cement Ltd.	-	Chakwal 2	PK
56.4		2	2006	CEMEX CENTRAL, S.A. de C.V.	X	Tepeaca	MX
56.4		1	2006	Ishikawajima-Harima Heavy Industries Co., Ltd.	-	Bim Son 2	VN
56.4		4	2006	NCDRI for Taiwan Cement Co.	-	Guigang	CN
56.4		4	2006	Sinoma / TCDRI for Saudi Cement Co.	-	Hofuf	SA
56.4		1	2005	Khuzestan Cement Co.	-	Khuzestan	IR
56.4		1	2005	Sinoma / TCDRI for Chanbwal Cement Ltd.	X	Chanbwal	PK
56.4		1	2005	Sinoma / TCDRI for Kohat Cement Company Ltd.	-	Kohat	PK
56.4		1	2005	Sinoma for Southern Province Cement Co.	-	Tabuna	SA
56.4		1	2004	FKYC Abyek Industrial Complex	-	Abyek	IR
56.4		1	2004	Sinoma / CBMC for Bestway Cement Ltd.	-	Chakwal	PK
56.4		1	2003	Zhejiang Jianleng Dencheng Cement Co. Ltd.	-	Luchu	CN
56.4		1	1995	FLS for The Siam Cement Public Co. Ltd.	X	Kaeng Khoi	TH
56.4		1	1995	GKW Ltd.	-	Bhavalia	IN
56.4		1	1994	Jaypee Bela Cement Ltd.	X	Bela	IN
56.4		1	1994	KHD for The Siam Cement Public Co. Ltd	-	Lampang	TH
56.4		1	1994	KHD for The Siam Cement Public Co Ltd.	X	Thung Song	TH
56.4		1	0	CDI (Chengdu Design & Research Institute) for Yunnan Hongta Dianxi Cement Co., Ltd.	-	Binchuan RM	CN
53.6		1	2010	Votorantim Cimentos Brasil S.A	-	Edealina	BR
53.6		1	2010	Votorantim Cimentos Brasil S.A.	-	Rio Branco do Sul	BR
50.4		1	1996	FLS for P. T. Semen Baturaja	-	Baturaja	ID
50.4		2	1994	FLS for Siam City Cement Public Co. Ltd.	-	Tabkwang Kiln 6	TH
50.4		1	1994	KHD for Arabian Cement Company	-	Rabigh	SA
50.4		1	1992	Gratsiin Industries Ltd.	X	Hirnernui	IN
50.4		1	1991	Ardebil Cement Co.	-	Ardebil	IR
50.4		1	1990	Bolu Cimento Sanayii A.S.	-	Caydurt	TR
50.4		2	1990	FLS for Siam City Cement Public Co. Ltd.	-	Tabkwang Kiln 5	TH
50.4		2	1990	The Siam Cement Public Co. Ltd	X	Khan Wong	TH
50.4		1	1990	The Tata Iron and Steel Co. Ltd.	-	Sonadih	IN
50.4		1	1989	Jaypee Rewa Cement Ltd.	-	Rewa	IN
50.4		1	1981	Onoda Cement Co. Ltd.	X	Kochi	JP
48.4		1	2017	Jiangxi Yonglun New Materials Tec.Co., Ltd.	-	Longnan	CN
48.4		1	2016	Cemento Chimborazo C.A. for Yura S.A.	-	Chimborazo	EC
48.4		1	2016	Sema Cimento Madencilik Beton San. ve Tic. A.s	-	Sema	TR
48.4		1	2015	Shahrekord Cement Industries Co.	X	Shahrekord 2	IR
48.4		1	2015	Sinoma Equipment & Engineering Corp (Sinoma E&E) for NOVA CIMANGOLA	-	Luanda	AO

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Rohrmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
48.4		1	2015	Sinoma International Engineering (Tianjin) Co., Ltd. for Votorantim Çimento Sanayi ve Ticaret A.S.	X	Sivas 2	TR
48.4		1	2014	AVIC International Beijing Co. Ltd for INVECEM Industria Venezolana del Cemento	-	Miranda	VE
48.4		1	2014	Domicem S.A. for Gitacem S.p.A.	-	Sabana Grande	DO
48.4		1	2014	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Gurgul	CG
48.4		1	2013	CBMI Construction Co. Ltd. for Cement Company of Northern Nigeria PLC	-	Sokoto	NG
48.4		1	2012	CBMI Construction Co. Ltd. for Devnya Cement - CTG-Italcementi Group	-	Devnya	BG
48.4		1	2012	CBMI Construction Co. Ltd. for Société des Ciments de Zahana (SCIZ)	-	Zahana	DZ
48.4		1	2012	Cementos Pacasmayo S.A.A.	-	Pacra	PE
48.4		1	2012	Krsec GmbH for Tehran Cement Co	-	Tehran 2	IR
48.4		1	2012	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Ndola	ZM
48.4		1	2011	ASKALE CIMENTO SANAYII T.A.S.	-	Gümüshane	TR
48.4		1	2011	Badran Consulting Engineers for Khorram Abad Cement Co.	-	Khoramabad	IR
48.4		1	2011	Tekfen-Ayhan Is Ortakligi for ASKALE CIMENTO SANAYII T.A.S.	-	Van	TR
48.4		1	2010	Sinoma International Engineering Co., LTD for Dangote Industries Limited	-	Pout	SN
48.4		1	2009	Hefei Cement Design & Research Institute for Messebo Building Materials Production P.L.C	-	Messebo	ET
48.4		1	2008	CBMI Construction Co, Ltd for OJSC "GARADAGH CEMENT"	-	Garadagh	AZ
48.4		1	2007	CBMI for Titan Cement Company S.A.	-	Antea	AL
48.4		1	2007	Cemex Central, S.A. de C.V.	-	Bayano	PA
48.4		1	2007	Sinoma Hebei Company for Jingmen Ziling Gechaoba	-	Jiayul	CN
48.4		1	2007	Sinoma Hebei Company for Jingmen Ziling Gechaoba	-	YiCheng	CN
48.4		1	2007	Sinoma Hebei Company for Jingmen Ziling Gechaoba Cement Co. Ltd.	-	Jingmen	CN
48.4		1	2006	Cemex Central S.A. de C.V.	-	Broceni	LV
48.4		1	2006	Cemex Central S.A. de C.V.	-	Merida	MX
48.4		1	2006	Cerro Azul Cement Consortium	-	Maturin	VE
48.4		1	2006	Mondedashy Cement Co.	-	Mondedashy	IR
48.4		2	2006	Sinoma for TCC Yingde Cement Co. Ltd.	X	Yingde 2	CN
48.4		1	2005	Zabol Cement Ind. Co.	-	Zabol	IR
48.4		1	2004	IKN GmbH for Sepahan Cement Co.	-	Esfahan	IR
48.4		1	2004	Nahavand Cement Co.	-	Nahavand	IR
48.4		1	2004	Delijan Aseptic Cement Co.	-	Delijan	IR
48.4		2	2004	Sinoma for TCC Yingde Cement Co. Ltd.	-	Yingde	CN
48.4		1	2003	AZAR AB Industries Co.	-	Shahrekord	IR
48.4		1	2003	Benue Cement Co.	X	Yandev	NG
48.4		1	2003	Ilam Cement Co.	-	Ilam	IR
48.4		1	2003	Jiangxi Wannianquan Cement Co., Ltd.	X	Wannian 3 (Ruijin)	CN
48.4		1	2002	Phuc Son Cement Corp.	X	Phuc Son	VN
48.4		2	2001	Continental Cement Corp.	X	Continental China	CN
48.4		1	2000	Titan Cement Company S.A.	-	Salonika	GR
48.4		1	1999	Cementos Avellaneda	-	Olavarria	AR
48.4		1	1996	Unimexportimport for Alson Cement	-	Bilgan	PH
48.4		1	1994	Davao Union	-	Philippinen	PH

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Rohmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
48.4		2	1994	ELS for Asia Cement Ltd.	-	Pukrang	TH
48.4		1	1993	Hyundai Cement Co. Ltd.	X	Korea	KR
48.4		1	1991	Hyundai Cement Co. Ltd.	-	Korea	KR
46.4		1	2018	The Ramco Cements Ltd.	X	Jayanthipuram 3	IN
46.4		1	2016	THE KCP Limited	-	Mukyala	IN
46.4		1	2015	Adana Cimento Sanayi ve Ticaret A.S.	-	Adana	TR
46.4		1	2011	IKN GmbH Ingenieur-Kohlerbau-Neustadt	-	Phu Son	VN
46.4		1	2008	CBMI Construction Co. Ltd. for HOLCIM (Maroc)	-	Fes	MA
46.4		1	2007	CNBM - China National Building Material Group Corporation for Ali Abdullah Alesayi Est	-	Ali Abdullah Alesayi (UOC)	YE
46.4		1	2007	Extension for Titan Cement Company S.A.	-	Beni Suef 2	EG
46.4		1	2007	Sibenikprojektcement for JSC Ikskilncement	-	Ikskilm	RU
46.4		1	2006	Cemag Anlagenbau GmbH	X	Zilnen 2	LV
46.4		1	2006	Cemex Central S.A. de C.V.	-	Yaqui	MX
46.4		1	2006	Cemex Central S.A. de C.V.	-	Balcones	US
46.4		1	2006	Madras Cements Ltd	-	Ariyalur	IN
46.4		1	2006	Madras Cements Ltd.	-	Jayanthipuram	IN
46.4		1	2006	OCL India Ltd.	-	Rajgangpur Line 2	IN
46.4		1	2005	Bagheran Cement Co.	-	Bagheran	IR
46.4		1	2005	Dehloran Cement Co.	X	Dehloran	IR
46.4		1	2005	Payvand Golestan Cement Co.	-	Golikesh	IR
46.4		1	2005	Sinoma / CBMI for Holcim (Maroc) S.A.	X	Settat	MA
46.4		1	2004	CBMI for CTG-Italcementi S.p.A.	X	Malaga	ES
46.4		1	2004	Mazandaran Cement Co.	X	Neka 2	IR
46.4		1	2004	Mazandaran Cement Co.	X	Neka 3	IR
46.4		1	2003	Dalmia Cements (Bharat) Ltd.	X	Dalmiapuram	IN
46.4		1	2000	Chettinad Cement Corp. Ltd.	X	Karikalli	IN
46.4		1	2000	IHI Co. Ltd Tokyo, Japan	-	Bim Son	VN
46.4		1	2000	Kobe Steel Ltd. for CTG-Italcementi	-	Calusco, Italy	IT
46.4		1	1999	Dyckerhoff Zement GmbH	-	Lengerich	DE
46.4		1	1997	Cemex, Inc.	-	Clinchfield	US
46.4		1	1995	Morning Star Ltd	-	Hon Chong	VN
46.4		1	1993	Himachal Ambuja	-	Ambuja	IN
46.4		1	1993	Nuh Cimento Sanayii A.S.	X	Hereke	TR
46.4		1	1992	Perak-Hanjoong Simen SDN BHD	X	Malaysia	MY
46.4		1	1990	P.T. Semen Cibinong	-	Narogong	ID
46.3		1	2015	Jiangxi Ya Dong Cement Co., Lt	X	Ruichang 7	CN
45.4		2	2014	Fives FCB for Entreprise des Ciments et Derives	-	Chelif	DZ
45.4		1	2014	VICAT Service Technique Ciment for BASTAS BASKENT CIMENTO SANAYII ve TICARET A.S.	X	Eregli	TR
45.4		1	2010	Votorantim Cimentos NNE S.A.	-	Itaucu	BR
45.4		1	2009	China National Machinery & Equipment Import & Export Corporation (CMEC) for Bajel Cement Factory	-	Bajel	YE
45.4		1	2008	VOTORANTIM Cimentos	-	Cuiaba	BR
45.4		1	2008	VOTORANTIM Cimentos	-	Primavera	BR
45.4		1	2007	Kawasaki Plant Systems, Ltd. For Lafarge Maroc	X	Tetouan	MA
45.4		1	2006	Continental Cement Co. L.L. C	-	Hannibal	US

Rohmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
45.4		1	2004	Votorantim Cimentos	-	Laranjeiras	BR
45.4		1	2001	Lafarge Maroc	-	Tetouan	MA
45.4		1	1996	Konya Cimento Sanayii A.S	X	Konya	TR
45.4		1	1995	BASTAS Baskent Cimento Sanayii A.S	-	Elmadag	TR
45.4		1	1995	CLE for Ciments de Sibline	-	Sibline	LB
45.4		1	1991	Ssangyong Cement Ind. Co. Ltd.	-	Korea	KR
45.4		1	1999	Colacem S.p.A.	-	Galazina	IT
45.4		2	1987	Halla Cement Co.	X	Kang-won-do	KR
45.4		1	1986	The Siam Cement Public Co. Ltd.	X	Kaeng Khoi	TH
45.4		1	1985	The Siam Cement Public Co. Ltd.	-	Kaeng Khoi	TH
43.4		1	1994	Jiangsan-Onoda Cement Co., Ltd.	-	China	CN
43.4		1	1994	Qinhuangdao Nihon Cement	-	China	CN
43.4		1	1994	Southern Province	-	Saudi Arabia	SA
43.4		1	1994	Taiwan Cement Corp	X	Hualien 3	TW
43.4		2	1992	Cementos Mexicanos S.A.	X	Tepeaca	MX
43.4		1	1992	Chihuahua	-	Mexico	MX
43.4		1	1988	Cementos Mexicanos S.A.	-	Hermosillo	MX
43.4		1	1988	Taiwan Cement Corp.	X	Suao	TW
43.4		1	1983	Hyundai Cement Co. Ltd	X	Tanyang	KR
43.4		1	1982	Cement Corp. of India Ltd.	-	Neemuch	IN
43.4		1	1982	Cement Corp. of India Ltd.	-	Tandur	IN
43.4		1	1980	General Cement Company S.A.	X	Milaki	GR
43.4		1	1978	UBE Industries Ltd.	X	Kanda	JP
43.4		1	1973	General Cement Company S.A.	-	Volos	GR
42.4		2	1995	Ili Cement Corporation	X	Norzagaray	PH
42.4		1	1990	Consolidada de Cementos C.A.	-	San Sebastian	VE
42.4		1	1990	Hong Song	-	Sam Chuk	KR
41.4		1	2013	Tianjin Cement Industry Design & Research Institute for Tanga Cement Company Limited	-	Tanga	TZ
41.4		1	2013	Northern Region Cement Co	-	Arar Cim	SA
41.4		1	2003	Jiangxi Wannianquan Cement Co., Ltd.	X	Wannian 4	CN
41.4		1	2003	Jiangxi Wannianquan Cement Co., Ltd.	X	Wannian II	CN
41.4		1	2001	Jiangxi Wannianqing Cement Co. Ltd.	-	Wannian	CN
41.4		1	2000	AZE Milhendislik ve Ticaret A.S for Askale Cimento	-	Askale, Erzurum	TR
41.4		1	2000	Liulihe Cement	-	Liulihe	CN
41.4		2	1996	P.T. Semen Padang	X	Indarung 5	ID
41.4		1	1994	Cia de Cimento Portland Rio Branco	-	Rio Branco	BR
41.4		1	1994	Jalaprathan Cement Co. Ltd.	-	Takli	TH
41.4		2	1992	FLS for P.T. Semen Tonasa	-	Tonasa	ID
41.4		1	1991	Märker Zementwerk GmbH	X	Harburg	DE
41.4		1	1991	Shargh Cement Co.	-	Mashad	IR
41.4		1	1991	Unicem	-	Megara	IT
41.4		1	1988	Denki Kagaku Kogyo K.K.	-	Ouna	JP
40.4		1	1996	Halla Engineering & Heavy Industries, Ltd	-	Malaysia	MY
40.4		2	1994	Ching Fong Hai Phong Cement	-	Chang Fong	VN
40.4		1	1994	UBE Industries Ltd.	X	Kanda	JP
40.4		1	1989	Asia Cement Co. Ltd.	-	Chechon	TW
40.4		1	1989	Ssangyong Cement Ind. Co. Ltd.	X	Kang-won-do	KR
40.4		1	1986	Ssangyong Cement Ind. Co. Ltd.	-	Kang-won-do	KR
40.4		1	1983	Rasi Cement Ltd.	-	Vishnuperam	IN

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Rohmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
38.3		1	2008	CBMI Construction Co. Ltd. for Nosra Cement Kft	-	Kiralyegyhaza	HU
38.4		1	2006	Lilama 69-3 Company	-	Song Thao	VN
38.4		1	2005	Humboldt Wedag / Eagle Products	-	La Salle	US
38.4		1	2004	SACCI S.p.A.	-	Testi	IT
38.4		1	2003	Cemag Anlagenbau for Shemal Cement Co	-	Shemal	IR
38.4		1	2001	Continental (Hunan) Cement Corp.	-	Hunan	CN
38.4		1	1998	Signal Mountain Cement Company, L.P.	-	Chattanooga	US
38.4		1	1995	Davao Union	X	Philippines	PH
38.4		1	1995	Hanil Cement Co.	X	Korea	KR
38.4		1	1994	Cemex Inc.	-	Caracollo	CO
38.4		1	1993	Hercules Cement Company	-	Stockertown	US
38.4		1	1992	Cimmco Limited for Malhar Cement	X	Malhar	IN
38.4		1	1992	Lakshmi Cement	-	Sirohi	IN
38.4		1	1991	Hanil Cement Co.	X	Chung-Buk	KR
38.4		1	1991	P.T. Semen Padang	-	Indarung	ID
38.4		1	1991	Portland Valderrivas S.A.	-	El Alto	ES
38.4		2	1990	Asia Cement Co. Ltd.	-	Phaburi	TH
38.4		1	1990	Goliath Cement Holdings Ltd.	-	Rallton	AU
38.4		1	1990	Jakaprakhan Cement Co. Ltd.	-	Cha-Am	TH
38.4		1	1990	Onoda Cement Co. Ltd. For	-	Dalian Huaneng	CN
38.4		1	1990	Solid Cement Corp.	-	Antipolo	PH
38.4		1	1990	The Siam Cement Public Co. Ltd.	X	Tabeang	TH
38.4		2	1989	The Siam Cement Public Co. Ltd.	X	Kaeng Khoi	TH
38.4		1	1988	Hanil Cement Co.	-	Tanyang	KR
38.4		1	1988	Nuh Cimento Sanayii A.S	X	Hereke	TR
38.4		1	1987	Cementos Apasco S.A.	-	Salitillo	MX
38.4		1	1985	Portland Valderrivas S.A.	-	El Alto	ES
38.4		1	1983	Perak-Hanjoong Simen SDN BHD	-	Pedang Rengas	MY
38.4		1	1977	Hornos Ibéricos S.A.	-	Almeria	ES
38.3		1	2001	Cimentarie di Cagnano SpA	-	Cagnano	IT
38.3		1	2000	Lagan Cement	-	Lanedown	IE
38.3		1	2000	Madras Cement Ltd.	X	Alathiyur II	IN
38.3		1	1995	Madras Cement Ltd.	-	Alathiyur	IN
38.3		1	1994	Industria Nacional de Cemento S.A.	-	Cartago	CR
36.4		1	1993	Continental Cement Corp.	-	Philippines	PH
36.4		1	1992	Yantai Mitsubishi Cement Corp.	-	China	CN
36.4		1	1991	Hira Cement Co.	-	India	IN
36.4		1	1987	Birla Jute Industries Ltd.	-	Sauna	IN
36.4		1	1985	Box Crow Cement Co.	-	Midlothian,Tx.	US
36.4		1	1985	Hindustan Sugar Mills Ltd.	-	Udaipur	IN
36.4		1	1984	Raymond Cement Works	-	Gopal	IN
36.4		1	1984	Shree Digvijay Cement Co. Ltd.	-	Bejawar	IN
36.4		1	1980	Marubeni Deutschland GmbH for Zliten	-	Zliten	LY
36.4		1	1980	Sri Lanka Cement Corp.	-	Kankesanthurai	LK
36.4		1	1978	Narmada Cement Co. Ltd.	-	Jafrabad	IN
36.4		1	1977	UBE Industries Ltd.	X	Ika	JP
36.4		1	1976	Marubeni Deutschland GmbH for ECDE	X	El Asnam	DZ
36.4		1	1976	UBE Industries Ltd.	X	Kanda	JP
36.4		1	1974	Aso Cement Co. Ltd.	-	Tagawa	JP
36.4		1	1974	Marubeni Deutschland GmbH for ECDE	-	El Asnam	DZ
36.4		2	1973	Sumitomo Cement Co. Ltd.	-	Akoh	JP
36.4		2	1973	UBE Industries Ltd.	X	Ika	JP

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Rohmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

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LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
36.4		1	2012	KHD Humboldt Wedag, Inc. for INVECEM Industria Venezolana del Cemento	-	San Sebastian	VE
35.4		1	2008	Cementos Fortaleza C.A.	-	Sogamoso	MX
35.4		1	2005	Ciment Quebec Inc.	-	St. Basile	CA
35.4		1	1998	Grasim Industries Ltd.	X	Reddipalayam	IN
35.4		1	1996	Jingzhou Hongfa Company	X	Gezhouba II	CN
35.4		1	1993	CNTIC	-	Gezhouba	CN
35.4		1	1990	Ash Grove West	-	Seattle, WA	US
35.4		1	1986	Cementerie Italiane del Sud S.p.A.	-	Vibo Valentia	IT
34.4		1	1990	Mitsui Mining Co. Ltd.	-	Tagawa	JP
34.4		1	1989	Adelaide Brighton Cement Ltd.	X	Adelaide	AU
34.4		1	1989	CBR Cement Corporation Lehighcpt	-	Montolita, Cal.	US
34.4		2	1989	Cementos Asland S.A.	-	Vallalpenga	ES
34.4		2	1981	Onoda Cement Co. Ltd.	X	Tsukusa	JP
34.4		1	1980	Tsuruga Cement Co. Ltd.	X	Tsuruga	JP
34.4		2	1979	Onoda Cement Co. Ltd.	-	Tsukumi	JP
34.4		1	1979	Tsuruga Cement Co. Ltd.	X	Tsuruga	JP
34.4		1	1976	Chia Hsin Cement Co. Ltd.	X	Kangshan	TW
34.4		1	1976	Progoresvest for Zahocie	-	Zahocie	SK
32.4		1	1995	CBMC, China for AWT	X	Nizampur 2	PK
32.4		1	1994	Lakshmi Cement	X	India	IN
32.4		1	1994	Wulian	-	China	CN
32.4		1	1993	CBMC, China for AWT	-	Nizampur	PK
32.4		1	1993	Chongqing	-	China	CN
32.4		1	1990	Bacnotan Consolidated Ind. Inc.	-	Bo Quirino	PH
32.4		1	1990	Shanxi	-	Shanxi	CN
32.4		1	1987	Canakkale Cimento Sanayii A.S.	X	Canakkale	TR
32.4		1	1987	FCB for Yun Foo Cement	-	Yun Fu	CN
32.4		1	1986	Canakkale Cimento Sanayi A.S.	X	Canakkale	TR
32.4		1	1985	Chettinad Cement Corp.	-	Pullyur	IN
32.4		1	1985	Qassim Cement Co.	-	Qassim	SA
32.4		1	1984	Gwalior Rayon Silk Mfg. Co. Ltd.	X	Vikram	IN
32.4		1	1984	State Cement Corporation of Pakistan	X	D.G.Khan	PK
32.4		1	1983	Gwalior Rayon Silk Mfg. Co. Ltd.	-	Vikram	IN
32.4		1	1982	State Cement Corporation of Pakistan	-	D.G.Khan	PK
32.4		2	1981	Madhgarh Cement Ltd.	-	Chandur	IN
32.4		1	1980	Martin Marietta Corp.	-	Leamington, Utah	US
32.4		1	1980	Saurashtra Cement Ltd.	X	Ranavav	IN
32.4		1	1975	Canakkale Cimento Sanayii A.S.	-	Canakkale	TR
32.4		1	1978	Gorgan & Mazandaran Cement Comp.	-	Neka I.	IR
32.4		1	1975	Louisville Cement Corp.	-	Speed, Ind.	US
32.4		1	1974	Cimenq Vicat	-	Ragland, Al.	US
32.4		1	1974	Gharb Cement Industries	-	Kermanshah	IR
32.4		2	1973	Lone Star Cement Corporation	-	Cloverdale, Va.	US
32.4		2	1973	Nihon Cement Co. Ltd.	-	Kawara	JP
32.4		1	1973	Onoda Cement Co. Ltd.	-	Otumo	JP
32.4		1	1973	Shin Nippon Steel Chemical Co. Ltd.	-	Kagaku	JP
32.4		1	1972	Tasek Cement Ltd.	-	Ipoh	MY
32.4		1	1973	Tsuruga Cement Co. Ltd.	-	Tsuruga	JP
32.4		1	1972	Buzzirac Zementwerke	-	Unterwat	CH
32.4		3	1972	Chichibu Cement Co. Ltd.	-	Kumagaya	JP
32.4		1	1972	Sumitomo Cement Co. Ltd.	-	Tochigi	JP
32.4		2	1972	UBE Industries Ltd.	X	Ina	JP

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Rohmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
32.4		1	1971	Nordcement AG	-	Höver	DE
31.3		1	2016	Sonapur Cement Pvt. Ltd.	-	Dang_Sonapur	NP
31.3		1	2003	Dragon Products Co. Inc.	-	Thomaston	US
31.3		1	1994	Cementizillo S.p.A.	-	Este	IT
31.3		1	1994	FLS für CIA. Uruguaya de Cement Portland S.A.	-	Verdun	UY
31.3		1	1990	Italcementi S.p.A.	X	Salerno	IT
31.3		1	1986	Italcementi S.p.A.	-	Sovfa	IT
31.3		1	1985	Dalmia Cement Ltd.	X	Dalmiapuram	IN
31.3		1	1985	Orissa Cement Ltd.	-	Rajagangpur	IN
31.2		1	1995	Pacific Cement Company, Inc.	X	Surigao	PH
31.2		1	1983	Cementeria di Morano S.p.A.	-	Morano Po	IT
30.4		1	1992	Asia Cement Co. Ltd.	-	South Korea	KR
30.4		1	1989	Hi Cement Corporation	-	Norzagaray	PH
30.4		1	1986	K.C. P. Ramakrishna Cements Ltd.	-	Macherla	IN
30.4		1	1984	Maihar Cement	-	Satna	IN
30.4		1	1977	Ciment Quebec Inc.	-	St. Basile	CA
30.4		2	1976	Gresik Cement Corporation	-	Gresik	ID
30.4		1	1974	Aslan ve Eskihisar S.A.	X	Bursa	TR
30.4		1	1974	Taiwan Cement Corp.	X	Kaohsiung	TW
30.4		1	1972	Cementfabrik Holderbank	-	Reklingen	CH
30.4		2	1971	Cementir	X	Maddaloni	IT
28.4		1	1993	Mitsubishi Mining Co. Ltd.	X	Tagawa	JP
28.4		1	1982	Hyundai Cement Co. Ltd.	X	Tanyang	KR
28.4		1	1982	Texas Cement Co.	-	Buda, Texas	US
28.4		1	1981	Onoda Cement Co. Ltd.	-	Onoda	JP
28.4	Lime	1	1979	Ryukyu Cement Co. Ltd	-	Yabu	JP
28.4		1	1978	Nihon Cement Co. Ltd.	X	Kawara	JP
28.4		1	1974	Adelaide Brighton Cement Ltd.	-	Adelaide	AU
28.4		1	1973	Hitachi Cement Co. Ltd.	-	Hitachi	JP
28.4		1	1973	Lehigh Portland Cement Co.	-	Leeds, Al.	US
28.4		1	1973	Nihon Cement Co. Ltd.	-	Tosa	JP
28/2240		2	1973	Ube Hsin Cement Co. Ltd.	-	Kangshan	TW
28/2240		1	1972	Southwestern Portland Cement	-	Fairborn, Ohio	US
28/2240		1	1972	Universal Atlas Cement	-	Buffington, Ind.	US
28/2240		2	1971	PZW Heidelberg AG	-	Scheidlingen	DE
28/2240		1	1971	Taiwan Cement Corp.	-	Chutung	TW
28/2240		1	1971	Taiwan Cement Corp.	X	Kaohsiung	TW
27.3		1	1991	Société CADEM	X	Meknès	MA
27.3		1	1989	Lone Star Industries Inc.	-	Oglesby, Illinois	US
27.3		1	1983	Société CADEM	-	Meknès	MA
27.3		1	1980	Chien Tai Cement Corp.	X	Pingtungshan	TW
27.3		1	1980	Wilsons Portland Cement Ltd	-	Whangarei	NZ
27.3		1	1978	Cementos Rezola S.A.	-	Añorga	ES
27.3		1	1977	Gebr. Laube PZW	X	Carnburg	AT
27.3		1	1976	State Cement Corporation of Pakistan	-	Muslehkam	PK
27/2120		1	1974	South Dakota State Cement	-	Rapid City, S.D.	US
27/2120		1	1973	Bamburi Portland Cement Co. Ltd.	-	Mombasa	KE
27/2120		1	1973	Fars & Khouzestan Cement Company	-	Shiraz	IR
27/2120		1	1972	Cia. Catalana de Cementos S.A.	X	Vallirana	ES
27/2120		1	1971	Cementwerk Lauffen	-	Lauffen	DE
27/2120		1	1971	Göller Bölgesi Cimento Sanayi ve Ticaret A.S.	-	Isparta	TR

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Rohmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
25.2		1	1972	Toyo Soda Mfg. Co. Ltd.	X	Shin-Nanyo	JP
25.2		1	1971	UBE Industries Ltd.	X	UBE	JP
25/2000		1	1983	Hyundai Cement Co. Ltd	X	Tanyang	KR
25/2000		1	1974	Hsin Tah Marble Co.	-	Taipei	TW
25/2000		1	1973	Cheng Tai Cement Corporation	-	Panpingshan	TW
25/2000		1	1972	Mitsubishi Cement Co. Ltd.	-	Higashidani	JP
25/2000		2	1971	Perlmooser Zementwerke	-	Rodaun	AT
25/2000		1	1971	PZW Rohrbach KG	-	Dotternhausen	DE
25/2000		1	1970	UBE Industries Ltd	X	UBE	JP
25/2000		1	1968	Märker Zementwerk GmbH	-	Harburg	DE
25/2000		3	1968	Toyo Soda Mfg. Co. Ltd.	X	Tokuo	JP
25/2000		3	1967	UBE Industries Ltd.	X	UBE	JP
25/2000		1	1966	Schlnhofer Portland Zementfabrik	X	Solnhofen	DE
25/2000		1	1966	UBE Industries Ltd.	X	UBE	JP
24.3		2	1983	Pezzo Cement Ltd.	-	Sangjang	PK
24.3		1	1982	Capitol Cement Co.	-	San Antonio, Tx.	US
24.3		1	1976	Texas Cemex Co	-	Buda, Tx.	US
24.2		2	2000	Southern Company Generation	-	Centersville	US
24.2		1	1997	Cimento Maua S.A.	-	Arcos	BR
23.2		1	1968	UBE Industries Ltd.	X	UBE	JP
23/1800		1	1989	Lafarge Holcim	X	Alcon (Madrid)	ES
23/1800		1	1973	Federcementi S.p.A.	-	Galatina	IT
23/1800		1	1972	Illinois Cement Co.	-	La Salle, Illinois	US
23/1800		1	1971	Cementi Pottorecatati S.p.A.	-	Castelmaramondo	IT
23/1800		2	1971	Wopfinger Stein- u. Kalkwerke	X	Wopfing	AT
23/1800		1	1970	Cementerie del Tirreno	X	Taranto	IT
23/1800		2	1969	Cementerie del Tirreno	X	Taranto	IT
23/1800		1	1969	Friulana Cementi S.A.	-	Travesio	IT
23/1800		1	1968	Skanska Cement AB	X	Slite	SE
23/1800		2	1967	Aslan ve Eskihisar S.A.	-	Darica	TR
23/1800		1	1964	Gebr. Leube PZW	X	Gartenau	AT
23/1800		2	1962	Cementerie del Tirreno	-	Neapel	IT
22/1700		1	1986	Cementos Portland	-	Zaragoza	ES
22/1700		1	1964	Cementir	-	Catalena	IT
22/1700		1	1963	Cementir	-	Maddaloni	IT
22/17		1	1960	Cosmos	-	Alcanar (Tarragona)	ES
21.2		1	1981	P.T. Semen Kupang	-	Kupang	ID
21.2		1	1975	Cementi Casale SpA.	-	Ozzano	IT
21/1600		1	1971	Cementi Barbetti	-	Gubbio	IT
20.2		1	1987	Mitsui Mining Co, Ltd.	X	Tagawa	JP
20/1500		1	1963	Italcementi S.p.A.	-	Guardaregia	IT
19.2		1	1979	Ciments d'Antsirabe	-	Ibity	MG
19.2		1	1979	Dalmia Cement Ltd.	-	Dalmiapuram	IN
18.2		1	1961	UBE Industries Ltd.	-	Mina	JP
18/1320		1	1960	Steirische Montanwerke Franz von Mayr-Melnhof KG	-	Peggau	AT
16.2		1	1966	UBE Industries Ltd.	X	UBE	JP
16.2		1	1961	Toyo Soda Mfg. Co. Ltd	-	Shin-Nanyo	JP
16.2		1	1959	UBE Industries Ltd.	-	Mine	JP
16/1180		1	1962	Cementos Turia S.A.	X	Valencia	ES

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Rohmehlmühlen

Vermahlung von Rohmaterialien für Zementwerke

M-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
16/1120		1	1981	S.A.C.C.I., S.A.	-	Testi	IT
15.2		1	1986	Himal Cement Company (P) Ltd.	X	Chobhar	NP
14/1060		1	1972	Industrias Barbalhense de Cimento S.A.	-	Barbalha, Ceará	BR
14/1060		1	1967	Himal Cement Company (P) Ltd.	-	Chobhar	NP
14/1060		1	1964	Gebr. Borsholdt	X	Golling	AT
14/1060		1	1961	Cimenti Biaschi	-	Rignano	IT
13/950		1	1974	Cimenterie de Zahana	-	Zahana	DZ
3.6		1	1981	C.E.R.I.L.H.	-	Paris	FR
3.6		1	1980	Blue Circle Industries Ltd.	-	Greenhithe	GB

Zement und Hüttensand

Vermahlung von Zementklinker und Hüttensand für die Zementindustrie

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
72.1+4 CS	Clinker/Slag	1	2018	Sinoma Equipment & Engineering Corp (Sinoma E&E) for LOMA NEGRA C.I.A.S.A.	-	Lamab 2	AR
72.4+4 CS	Clinker	1	2017	China National Heavy Machinery Corporation (CHMC) for Seven Circle (BD) Ltd	-	Gazipur	BD
72.4+4 CS	Clinker/Slag	1	2015	D. G. Khan Cement Co. Ltd	-	Kuh	PK
70.4+4 CS	Clinker	1	2014	CBMI Construction Co., Ltd for United Cement Company of Nigeria (Ltd) - UniCem	-	Mfamosing	NG
65.4+4 CS	Clinker	1	2019	Sanghi Industries Limited	X	Surat	IN
65.4+4 CS	Clinker/Slag	1	2019	Song Lam Cement JSC	X	Song Lam Line 4	VN
65.4+4 CS	Clinker	1	2018	Sanghi Industries Limited	-	Surat	IN
65.4+4 CS	Clinker	1	2017	CDI (Chengdu Design & Research Institute) for Egyptian Steel Group	-	Sohag	EG
65.4+4 CS	Clinker	6	2016	CDI (Chengdu Design & Research Institute) for MoD - Ministry of Defense	-	Beni Suef 1-6	EG
63.3+3 CS	Clinker	1	2016	Interceem Cement for Cem Meta Group	X	Abidjan	CI
63.3+3 CS	Clinker	1	2016	Tan Thang Cement JSC	X	Tan Thang	VN
63.3+3 CS	Clinker	2	2015	CNBM International Engineering Co., Ltd for Arabian Cement Co.	-	Rabegh 3	SA
63.3+3 CS	Clinker	2	2015	NCDRI (Sinoma Intern. Nanjing Cement Design & Research Institute) for Vissai Group Company ul.	-	Song Lam	VN
63.3+3 CS	Clinker/Slag	2	2014	Chengdu Design & Research Institute of Building Materials Industry Co., Ltd. For El Arish Cement	-	El Arish 3&4	EG
63.3+3 CS	Clinker	1	2013	Dangote Industries Limited	X	Ibese 7	NG
63.3+3 CS	Clinker	1	2013	Dangote Industries Limited	X	Obajana 5	NG
63.3+3 CS	Slag	1	2012	Nanjing Nangang K.Wah High Tech Materials Co., Ltd	-	Nanjing 3	CN
63.3+3 CS	Clinker	3	2012	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Ibese 3+4	NG
63.3+3 CS	Clinker	2	2012	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Obajana 4	NG
63.3+3 CS	Slag	1	2011	Taigang Group International Trade Co. Ltd for Shanxi Taigang Stainless Steel Co., Ltd.	-	Taiyuan 3	TW
63.3+3 CS	Clinker	1	2010	Cong Thanh Cement JSC Ltd.	-	Tan Truong	VN
63.3+3 CS	Clinker	1	2009	Benue Cement Company PLC (Dangote Group)	X	Benue	NG
63.3+3 CS	Clinker	1	2009	KJS Cement Pvt. Ltd.	-	Amalia	IN
63.3+3 CS	Clinker	2	2009	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Obajana 3	NG
63.3+3 CS	Clinker/Slag	1	2009	Tianjin Cement Industry Design and Research Institute (TCDRI)	-	El Nahda	EG
63.3+3 CS	Clinker	3	2008	ABG Cements Ltd	-	Thumb 3	IN
63.3+3 CS	Clinker	1	2008	Nirma Ltd.	-	Padhiarda	IN
63.3+3 CS	Clinker	3	2008	Sinoma International Engineering Co., LTD for Dangote Industries Limited	-	Ibese 1+2	NG
63.3+3 CS	Clinker	1	2007	Raghuram Cement Ltd.	-	Kallakurichi	IN
59.3+3 CS	Clinker	1	2018	CBMI Construction Co., Ltd. for LafargeHolcim Maroc	X	Souss	MA
59.3+3 CS	Clinker	1	2017	VICEM Hoang Thach Cement Company Limited	X	Hoang Thach CL	VN
59.3+3 CS	Clinker	3	2016	CBMI Construction Co. Ltd. for SARL BISKRIA CIMENT	-	Biskra AMR	DZ

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Zement und Hüttensand

Vermahlung von Zementklinker und Hüttensand für die Zementindustrie

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
50.3-3 CS	Clinker	2	2014	Pt Semen Gresik (Persero) Tbk. Gedung Utama Semen Gresik	-	Rembang	ID
56.3+3 CS	Clinker	2	2019	Birla Corporation Ltd.	X	Mukutban	IN
56.3+3 CS	Clinker	2	2018	Birla Corporation Ltd.	-	Mukutban	IN
56.3+3 CS	Clinker/Slag	2	2018	Lucky Cement Corp.	X	Pezu	PK
56.3+3 CS	Slag	1	2018	Shanxi Liheng Steel Works Co. Ltd.	X	Houma 2	CN
56.3+3 CS	Clinker	2	2018	Sinoma International Engineering (Tianjin) Co., Ltd. for Lucky Cement Ltd.	X	Pezu 2	PK
56.3+3 CS	Clinker	2	2017	Chengdu Design & Research Institute of Building Materials Industry Co., Ltd. for Pioneer Cement Ltd.	X	Chenki	PK
56.3+3 CS	Clinker/Slag	1	2017	NEL Cement Enterprises Ltd.	X	Rajanle 2	IL
56.3+3 CS	Slag	1	2017	Shouguang Longyuan New Building Materials Co., Ltd.	-	Houbazhen	CN
56.3+3 CS	Clinker/Slag	2	2017	Ultra Tech Cement Ltd.	X	Pearl_Dhar	IN
56.3+3 CS	Clinker/Slag	1	2016	Bim Son Cement Joint Stock Company	-	Bim Son	VN
56.3+3 CS	Clinker	1	2016	China National Heavy Machinery Corporation for Ansen Group for Ansen Group	X	Haria Line 2	BD
56.3+3 CS	Clinker	1	2015	Hefei Cement Research and Design Institute for Attock Cement Pakistan Ltd.	X	Hub Chowki 3	PK
56.3+3 CS	Clinker	1	2016	SCG Cement Co., Ltd.	X	Kaeng Khoi	TH
56.3+3 CS	Clinker	2	2016	Xuan Thanh Cement Joint Stock Company	-	Xuan Thanh Line 2	VN
56.3+3 CS	Clinker	1	2015	Bilecik Imsaat	-	Kostra	TR
56.3+3 CS	Clinker	1	2015	Insecom Cement for Cim Metal Group	-	Boho Dieoulasso	BF
56.3+3 CS	Clinker/Slag	1	2015	MI Cement Factory Ltd.	-	Munshiganj	BD
56.3+3 CS	Clinker	1	2014	China National Heavy Machinery Corporation for Ansen Group	-	Haria	BD
56.3+3 CS	Clinker	1	2014	SCG Cement Co., Ltd.	-	Ta Luang	TH
56.3+3 CS	Clinker	1	2014	Xuan Thanh Cement Company Ltd.	-	Ninh Binh	VN
56.3+3 CS	Slag	1	2013	ACC Ltd.	X	Sindri	IN
56.3+3 CS	Clinker	2	2013	China National Electronics Imp. & Exp. Corp. for Southern Province Cement Co.	-	Bisha	SA
56.3+3 CS	Clinker	1	2013	Gölas Cimento Sanayi T.A.S.	-	Isparta	TR
56.3+3 CS	Clinker	1	2013	KHD Humboldt Wedag India Pvt. Ltd.	-	Jamul	IN
56.3+3 CS	Clinker	1	2013	ThyssenKrupp Resource Technologies for PT Holcim Indonesia TBK	-	Tuban 2	ID
56.3+3 CS	Clinker	3	2013	Tianjin Cement Industry Design & Research Institute Co. Ltd for PT Indocement Tunggal Prakarsa	-	Cileureup	ID
56.3+3 CS	Clinker	1	2012	Askale Cimento Sanayii T.A.S.	-	Gümüshane	TR
56.3+3 CS	Clinker/Slag	1	2012	Cementos Pacasmayo S.A.A.	-	Piura	PE
56.3+3 CS	Clinker	3	2012	Medcem Madencilik ve Yapi Malzemeleri Sanayi ve Ticaret A.S	-	Silifke	TR
56.3+3 CS	Clinker	1	2012	Sinoma International Engineering Co., Ltd. for PT Semen Bosowa Banyuwangi (SBB)	-	Banyuwangi	ID
56.3+3 CS	Slag	2	2011	Happy Stee Steel Limited	-	Yingkou	CN
56.3+3 CS	Clinker	1	2011	Jaiprakash Associates Limited Cement Division - JRP	-	Shahabad	IN
56.3+3 CS	Clinker	1	2011	PT Holcim Indonesia TBK	-	Tuban	ID
56.3+3 CS	Clinker	1	2011	PT Jui Shin	-	Bekasi	ID
56.3+3 CS	Clinker	1	2011	PT Semen Bosowa Maros	-	Maros	ID
56.3+3 CS	Clinker	2	2011	Reliance Industries Limited	-	Malhar	IN
56.3+3 CS	Slag	1	2011	Shandong Guangfu Co., Ltd.	-	Qingyang	CN
56.3+3 CS	Slag	1	2010	China National Heavy Machinery Corporation (CHMC) for Bashundhara Industrial Complex Ltd	-	Dhaka	BD

Zement und Hüttensand

Vermahlung von Zementklinker und Hüttensand für die Zementindustrie

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LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
56.3+3 CS	Slag	1	2010	China National Heavy Machinery Corporation (CHMC) for Bashundhara Industrial Complex Ltd.	-	Mongla	BD
56.3+3 CS	Clinker	1	2010	Jaiprakash Associates Ltd.	-	Baga	IN
56.3+3 CS	Clinker	1	2009	Chettinad Cement Corp. Ltd.	-	Kovilkkal 2	IN
56.3+3 CS	Clinker	1	2009	Hubei Yadong Cement Corporation Ltd.	X	Xin Zhou 2	CN
56.3+3 CS	Slag	1	2009	Liaoyang Yongfeng Steel Company	-	Qihe	CN
56.3+3 CS	Clinker	2	2008	PT Semen GRESIK (Persero) Tbk.	-	Tuban	ID
56.3+3 CS	Clinker	2	2008	PT Semen Tonasa	-	Tonasa 5	ID
56.3+3 CS	Clinker	1	2008	Ambuja Cements Ltd.	-	Nalagarh	IN
56.3+3 CS	Clinker	1	2008	CBMI Construction Co. Ltd. for Al Badia Cement Co.	-	Al Badia	SY
56.3+3 CS	Clinker	1	2008	CTC-Italcementi Group for Devnya Cement AD - Italcementi Group	-	Devnya	BG
56.3+3 CS	Clinker	1	2008	Holcim (Ecuador) S.A.	-	Guayaquil	EC
56.3+3 CS	Clinker	2	2008	Holcim Group Support Ltd. for ACC Ltd.	-	Chanda	IN
56.3+3 CS	Slag	1	2008	Shanxi Taiyuan Dalong Ultrafine Powder Co., Ltd. for Taiyuan Iron & Steel (Group) Ltd Co. - TISCO	-	Taiyuan 2	CN
56.3+3 CS	Slag	1	2007	ACC Ltd.	-	Bellary	IN
56.3+3 CS	Clinker	1	2007	ACC Ltd.	X	Kolar	IN
56.3+3 CS	Clinker	1	2007	CBMI for Titan Cement Company S.A.	-	Antea	AL
56.3+3 CS	Clinker	1	2007	Chettinad Cement Corp. Ltd.	-	Ariyalur	IN
56.3+3 CS	Clinker	1	2007	Chettinad Cement Corporation Ltd.	-	CCCL Ariyalur II	IN
56.3+3 CS	Clinker	1	2007	Gujarat Ambuja Cements Ltd.	-	Dadri	IN
56.3+3 CS	Clinker	1	2007	Gujarat Ambuja Cements Ltd.	X	Sanand	IN
56.3+3 CS	Slag	2	2007	Rizhao Iron & Steel Corporation	X	Rizhao 2	CN
56.3+3 CS	Clinker	1	2007	SOBRAL S.A. for Empresa de Cimentos Liz S.A.	-	Vespasiano	BR
56.3+3 CS	Clinker	1	2007	Sree Jayajothi Cements Ltd.	-	Balaluppidi	IN
56.3+3 CS	Slag	1	2007	Zibo Jinbo Building New Material Co., Ltd. For Shandong Qilun Tendering Co., Ltd.	-	Zibo	CN
56.3+3 CS	Clinker/Slag	1	2006	Cemex Central S.A. de C.V.	-	Jebel Ali	AE
56.3+3 CS	Slag	1	2006	Cemex Central S.A. de C.V.	-	Chem	SE
56.3+3 CS	Clinker	1	2006	Cemex Central S.A. de C.V.	-	Yaqui	MX
56.3+3 CS	Clinker	1	2006	Cemex Central S.A. de C.V.	-	Balcones	US
56.3+3 CS	Clinker	3	2006	CEMEX CENTRAL, S.A. de C.V.	X	Tepeaca	MX
56.3+3 CS	Clinker	3	2006	Emirates Cement Factory	-	Al Ayn	AE
56.3+3 CS	Clinker	1	2006	IKN GmbH for Zeh-Alian-H.W. Sepahan Cement Co.	-	Esfahan Upgrade	IR
56.3+3 CS	Clinker	1	2006	Madras Cements Ltd.	-	Ariyalur	IN
56.3+3 CS	Clinker	1	2006	Mondedashty Cement Co.	-	Mondedashty	IR
56.3+3 CS	Clinker/Slag	1	2006	OCL India Ltd.	X	Kapilas	IN
56.3+3 CS	Slag	2	2006	Rizhao Iron & Steel Corporation	-	Rizhao	CN
56.3+3 CS	Slag	2	2006	Shandong Lubi Building Material Co., Ltd.	-	Laiwu	CN
56.3+3 CS	Clinker	1	2005	CBMI for Holcim (Maroc) S.A.	X	Settat	MA
56.3+3 CS	Clinker	1	2005	CIMSA Cimento Sanayii ve Ticaret A.S.	-	Kiziltepe	TR
56.3+3 CS	Clinker	1	2005	Dehlotan Cement Co.	-	Dehlotan	IR
56.3+3 CS	Slag	1	2005	Hebei Xuanhua Runxuan Hi-Tech Construction Materials Co., Ltd.	-	Xuanhua	CN
56.3+3 CS	Clinker/Slag	1	2005	Hubei Yadong Cement Corporation Ltd.	-	Xin Zhou I	CN
56.3+3 CS	Clinker	1	2005	National Cement Co.	-	Ragland	US
56.3+3 CS	Slag	1	2005	St. Lawrence Cement	-	St. Lawrence Slag	CA
56.3+3 CS	Clinker	2	2005	Union Cement Company (P.S.C.)	-	Ras Al-Khaimah	AE
56.3+3 CS	Clinker	1	2004	NIE Cement Enterprises Ltd.	-	Ramle	IL
56.3+3 CS	Clinker	1	2003	Dalmia Cement (Bharat) Ltd.	X	Dalmiapuram	IN

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Vermahlung von Zementklinker und/ Hüttensand für die Zementindustrie

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
56.3+3 CS	Clinker/Slag	1	2003	Orissa Cement Ltd.	X	Rajgangpur III	IN
56.2+2 CS	Clinker	1	2018	Lubao Cement Co., Ltd	-	G.X. Beilu	CN
56.2+2 CS	Clinker/Slag	1	2014	Shanxi Xingyuan Iron&Steel Co., Ltc.	X	Xiangfen	CN
56.2+2 CS	Clinker	1	2013	Shanxi Fuping Biological Cement Co., Ltd	-	Huangling	CN
56.2+2 CS	Clinker	1	2013	Yura S.A.	X	Arequipa 2	PE
56.2+2 CS	Clinker	2	2012	Shanxi Fuping Biological Cement Co., Ltd	-	Xue Zhen	CN
56.2+2 CS	Clinker	1	2007	Cementos Norte Pacasmayo S.A.	-	Pacasmayo 2	PE
56.2+2 CS	Slag	1	2006	Zhangjiagang Hengchang New Style Construction Material Co. Ltd.	-	Zhangjiagang 4	CN
56.2+2 CS	Slag	1	2006	Zhangjiagang Hengchang New Style Construction Material Co. Ltd.	X	Zhangjiagang 3	CN
56.2+2 CS	Slag	1	2004	Zhangjiagang Hengchang New Style Construction Material Co. Ltd.	X	Zhangjiagang 2	CN
56.2+2 CS	Slag	1	2003	Holcim, Vietnam	-	Thi Vai	VN
56.2+2 CS	Clinker	1	2003	Ilam Cement Co.	-	Ilam	IR
56.2+2 CS	Slag	1	2003	Sichuan Chong Long Co. Ltd.	-	Neijiang	CN
56.2+2 CS	Slag	1	2003	Zhangjiagang Hengchang New Style Construction Material Co. Ltd.	-	Zhangjiagang	CN
56.2+2 CS	Slag	1	2002	Shangxi Changzhi Iron & Steel Co.	-	Changzhi	CN
56.2+2 CS	Clinker/Slag	2	2001	Continental Cement Corp.	X	Penglai	CN
56.2+2 CS	Clinker/Slag	2	2001	Continental (Hunan) Cement Corp.	-	Hunan	CN
56.2+2 CS	Clinker/Slag	2	2001	Continental Cement Corp.	-	Changxing	CN
56.2+2 CS	Clinker	1	2000	Madras Cement Ltd.	X	Alathiyur II	IN
56.2+2 CS	Clinker	1	1999	Cementos Nacionales S.A.	-	Macoris (MC 3 Dominicana)	DO
56.2+2 CS	Clinker/Cement Mix	1	1999	Cementos Yura S.A.	X	Arequipa	PE
56.2+2 CS	Clinker/Slag	1	1998	Cementos Norte Pacasmayo S.A.	-	Pacasmayo	PE
53.3+3 CS	Clinker	2	2019	CBMI Construction Co. Ltd. for Cement Company of Northern Nigeria PLC	-	Sokoto	NG
53.3+3 CS	Clinker/Slag	2	2018	Sinoma International Engineering Co.,Ltd. for Kohat Cement Company Ltd.	X	Kohat 2	PK
53.3+3 CS	Clinker/Slag	1	2018	Star Cement Ltd.	-	Siliguri	IN
53.3+3 CS	Clinker	1	2017	China National Heavy Machinery Corporation (CHMC) for Shun Shing Cement Mills Ltd.	-	Shikalbaha	BD
53.3+3 CS	Clinker	1	2017	Sinoma International Engineering for Askari Cement Ltd.	X	Nizampur	PK
53.3+3 CS	Clinker	2	2016	CBMI Construction Co. Ltd. for Edo Cement	-	Ilara	NG
53.3+3 CS	Clinker	2	2016	NCDRI (Sinoma Intern. Nanjing Cement Design & Research Institute) for Long Cement Company	X	Long Son 2	VN
53.3+3 CS	Clinker	1	2016	The JCP Limited	-	Mukteria	IN
53.3+3 CS	Clinker	1	2015	BATISÖKE Söke Cimento Sanayii A.S.	-	Söke	TR
53.3+3 CS	Clinker	1	2015	Cementos Moctezuma S.A. de C.V.	-	Apazapan	MX
53.3+3 CS	Clinker	2	2015	NCDRI (Sinoma Intern. Nanjing Cement Design & Research Institute) for Thanh Thang Group Cement JSC	-	Thanh Thang	VN
53.3+3 CS	Slag	1	2015	PT Krakatau Semen Indonesia	-	Cigading	ID
53.3+3 CS	Clinker	2	2015	Tianjin Cement Industry Design & Research Institute Co. Ltd. for PT Semen Baturaja (Persero)	X	Baturaja 2	ID
53.3+3 CS	Clinker	1	2014	AVIC International Beijing Co. Ltd for INVECEM Industria Venezolana del Cemento	-	Money	VE

Zement und Hüttensand

Vermahlung von Zementklinker und Hüttensand für die Zementindustrie

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
53.3+3 CS	Clinker	1	2014	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Obajana	CG
53.3+3 CS	Clinker	2	2013	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Mtwara	TZ
53.3+3 CS	Slag	1	2012	Sampyo Elementary Materials Co. Ltd	X	Cheonan	KR
53.3+3 CS	Clinker	2	2012	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Mesagasha	ET
53.3+3 CS	Clinker	1	2012	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Douala	CM
53.3+3 CS	Clinker	1	2012	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Ndola	ZM
53.3+3 CS	Slag	1	2012	Western Diamond Cement Ltd	-	Takoradi	GH
53.3+3 CS	Clinker	3	2011	CSN - Companhia Siderúrgica Nacional	-	Arcos	BR
53.3+3 CS	Clinker	3	2011	CSN - Companhia Siderúrgica Nacional	-	Nordeste	BR
53.3+3 CS	Clinker	3	2011	CSN - Companhia Siderúrgica Nacional	-	Sul	BR
53.3+3 CS	Clinker	1	2011	Sephaku Cement	-	Delmas	ZA
53.3+3 CS	Clinker	1	2011	Sephaku Cement	-	Isposeng	ZA
53.3+3 CS	Slag	1	2011	Shanxi Liheng Steel Works Co. Ltd.	-	Houma	CN
53.3+3 CS	Slag	1	2010	Posco Plant Engineering Co., Ltd.	-	Kwangyang	KR
53.3+3 CS	Clinker	1	2010	Sinoma International Engineering Co., LTD for Dangote Industries Limited	-	Poui	SN
53.3+3 CS	Slag	1	2009	Hebei Jingye Group for Pingshan County Jingye Investment Co. Ltd	-	Nandian	CN
53.3+3 CS	Slag	1	2009	Sampyo Elementary Material Co. Limited	-	Pyeongtaek	KR
53.3+3 CS	Slag	1	2009	Shanxi Aneet Group Co. Ltd.	-	Yuan	CN
53.3+3 CS	Slag	1	2009	Guangxi-Rich International Trade and Economic Co., Ltd for Yinjiang Tanhe Cement Co., Ltd	-	Tianshan Slag	CN
53.3+3 CS	Clinker	1	2008	CIMI Construction Co. Ltd. For VASSILIKO CEMENT WORKS LTD:	X	Vassiliko 2	CY
53.3+3 CS	Clinker	1	2008	Cement Manufacturing Company Ltd (CMCL)	-	Guwahati	IN
53.3+3 CS	Clinker	2	2008	Dyckerhoff AG for BUZZI UNICEM S.P.A.	-	Altaling	RU
53.3+3 CS	Clinker	2	2008	Dyckerhoff AG for BUZZI UNICEM S.P.A.	-	Volyn	UA
53.3+3 CS	Slag	1	2008	HeidelbergCement India P. Ltd	-	Madora (ex Ammasamudram)	IN
53.3+3 CS	Clinker/Slag	1	2008	Lafarge Cement Division	-	Jojobera	IN
53.3+3 CS	Clinker	2	2008	Mechel Construction Materials Limited Company	-	Uchaliebrisk	RU
53.3+3 CS	Clinker	1	2007	Adana Cimento Sanayi ve Ticaret A.S	-	Iskenderun	TR
53.3+3 CS	Clinker	1	2007	Bolu Cimento Sanayii A.S.	-	Zonguldak	TR
53.3+3 CS	Clinker	1	2007	CTG-Italcementi Group	-	Ait-Baha	MA
53.3+3 CS	Clinker	1	2007	CTG-Italcementi Group	-	Ait-Baha 2	MA
53.3+3 CS	Clinker/Slag	2	2007	Fauji Cement Company Ltd.	-	Jhang Bahawar	PK
53.3+3 CS	Clinker	2	2007	Raghuram Cement Ltd.	X	Nallalingapalli 2	IN
53.3+3 CS	Clinker	1	2006	Cemex Central S.A. de C.V.	-	Brocení	LV
53.3+3 CS	Clinker	2	2006	CTG-Italcementi Group	-	Martinsburg	US
53.3+3 CS	Clinker	2	2006	Grasim Industries Ltd	-	Aditya II	IN
53.3+3 CS	Clinker	2	2006	Grasim Industries Ltd.	-	Kotputli	IN
53.3+3 CS	Clinker/Slag	2	2006	Grasim Industries Ltd. for Ultra Tech Cement Ltd.	-	Tadipatri (APCW II)	IN
53.3+3 CS	Clinker	2	2006	Grasim Industries Ltd. for Ultra Tech Cement Ltd.	X	Gotigere	IN
53.3+3 CS	Clinker	1	2006	Ha Tien 1 Cement Company	X	Binh Phuoc	VN
53.3+3 CS	Clinker	1	2006	Ha Tien 1 Cement Company	X	Phu Huu 1	VN
53.3+3 CS	Clinker	1	2006	Ha Tien 1 Cement Company	X	Phu Huu 2	VN
53.3+3 CS	Clinker	1	2006	Holcim (South Africa) (Pty.) Ltd.	-	Roodepoort	ZA

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Zement und Hüttensand

Vermahlung von Zementklinker und Hüttensand für die Zementindustrie

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
53.3+3 CS	Slag	1	2006	My Home Industries	-	Vizag	IN
53.3+3 CS	Clinker	1	2006	Vicat Service Technique Ciment	-	Montalieu	FR
53.3+3 CS	Clinker/Slag	1	2006	Buzzi Unicem S.p.A.	-	Fesnus	US
50C	Slag	2	1995	Hyundai Cement Co. Ltd	-	Korea	KR
48.2+2 CS	Slag	1	2017	China National Heavy Machinery Corporation (CHMC) for Shua Shing Group	-	Dubai	AE
48.2+2 CS	Clinker	2	2017	SINOMA International Engineering Co. Ltd. for BESTWAY Cement Limited	X	Mustekham 2	PK
48.2+2 CS	Clinker	2	2016	Sonia Cimento Modernizik Beton San. ve Tic. As	-	Sonia	TR
46.2+2 CS	Clinker	1	2019	Reliance Cement Company Private Limited (RCCPL)	X	Kundanganj 3	IN
46.2+2 CS	Slag	1	2018	Shandong Luxin New Building Materials Co., Ltd	X	Rizhao 10	CN
46.2+2 CS	Clinker	1	2017	CBMI Construction Co. Ltd. for Bamburi Cement Ltd.	-	Nairobi	KE
46.2+2 CS	Clinker	1	2017	CBMI Construction Co. Ltd. for CIMENCAM Les Cimenteries du Cameroun	-	Yaounde	CM
46.2+2 CS	Clinker	1	2017	CBMI Construction Co. Ltd. for Hima Cement Ltd.	-	Tororo	UG
46.2+2 CS	Slag	1	2017	CRH Ukraine Ltd.	-	Odessa	UA
46.2+2 CS	Clinker/Slag	1	2017	The Ramco Cements Ltd.,	-	Hariharapur	IN
46.2+2 CS	Clinker	1	2016	CYCNA Cementos y Concretos Nacionales for Cemento Cruz Azul, Hgo.	-	Tepezala	MX
46.2+2 CS	Clinker/Slag	1	2016	Ecocem France SAS	X	Dunkerque	FR
46.2+2 CS	Slag	1	2016	PT. Gunung Raja Paksi	-	Bekasi	ID
46.2+2 CS	Clinker	1	2016	SIE Cements Ivoire "CIMIVOIRE"	-	Angama	CI
46.2+2 CS	Slag	2	2014	Engro Corporation Limited	-	Jamshoro	CN
46.2+2 CS	Slag	1	2014	Zhejiang Yuefa Iron&Steel Co., Ltd	X	Daqiuzhuang 2	CN
46.2+2 CS	Slag	1	2013	Kungang K. Wah Cement Building Material Co.	-	Anning	CN
46.2+2 CS	Slag	1	2012	Engro Corporation Limited	X	Quanzhou	CN
46.2+2 CS	Slag	1	2012	Hebei Jin Tai Cheng Building Meterials Co., Ltd	-	Dawa	CN
46.2+2 CS	Slag	1	2012	Henan Dadi Cement Group	-	Raofang	CN
46.2+2 CS	Clinker	1	2012	Imtec GmbH for Tehran Cement Co.	-	Tehran 2	IR
46.2+2 CS	Clinker	1	2012	KHD Humboldt Wedag, Inc. for INVECEM Industria Venezolana del Cemento	-	San Sebastian	VE
46.2+2 CS	Clinker	1	2012	Kordestan Cement Co.	-	Bijar	IR
46.2+2 CS	Clinker	1	2012	PT Semen Padang (Persero)	-	Dumai	ID
46.2+2 CS	Clinker	2	2012	Reliance Industries Limited	-	Kundanganj	IN
46.2+2 CS	Slag	1	2012	Spenner Zement GmbH & Co. KG	-	Rheingold	DE
46.2+2 CS	Slag	3	2012	Wuhan Iron & Steel (Group) Ltd Co.	X	Wuhan 3	CN
46.2+2 CS	Slag	1	2012	Zhejiang Yuefa Iron&Steel Co., Ltd	-	Daqiuzhuang	CN
46.2+2 CS	Slag	1	2011	Anhui Technology Imp. & Exp. Co., Ltd. for Maanshan Zhongsun New type Building Materials Co., Ltd	-	Dangtu 1	CN
46.2+2 CS	Clinker	1	2011	Monolgones Transex Ltda	-	Puerto Aisi	CL
46.2+2 CS	Slag	1	2011	Laigang Yongfeng Steel Company	X	Qihe 2	CN
46.2+2 CS	Clinker	1	2011	PT. SEMEN BATURAJA (PERSERO)	-	Baturaja	ID
46.2+2 CS	Slag	1	2011	Shandong Beijin Group Co., Ltd	-	Beijin	CN
46.2+2 CS	Slag	1	2011	Shandong Luxin New Building Meterials CO., Ltd	-	Jinan 3	CN
46.2+2 CS	Slag	2	2011	Wuhan Iron & Steel (Group) Ltd Co.	X	Wuhan 2	CN

Zement und Hüttensand

Vermahlung von Zementklinker und Hüttensand für die Zementindustrie

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LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
46.2+2 CS	Clinker	1	2011	Zawar Cement Private Limited	-	Shahabad II	IN
46.2+2 CS	Slag	1	2010	Hyundai Cement Company Ltd.	-	Gyuseki	KR
46.2+2 CS	Slag	1	2009	Hebei Zenith International Trade Co. Ltd for Luquan Qiaotai Cement Co., Ltd	-	Qiaotai	CN
46.2+2 CS	Slag	1	2009	Ma Steel International Trade & Economic Corp.	X	Maanshan 2	CN
46.2+2 CS	Slag	1	2009	Maanshan Zhongjian New type Building Materials Co., Ltd	-	Dangtu	CN
46.2+2 CS	Clinker	2	2008	CIMM Construction Co. Ltd. for Nostra Cement Kft.	-	Kiralyegyhaza	HU
46.2+2 CS	Clinker	1	2008	Lafarge Canada Inc. for LaFarge North America	-	Ventanas	CL
46.2+2 CS	Slag	1	2007	Andrah Cements Ltd.	-	Shrinagar	IN
46.2+2 CS	Clinker	1	2007	Dyckerhoff AG for Cimsa S.A.	-	Esch Clinker	LU
46.2+2 CS	Slag	1	2007	Ecocem Materials Ltd	-	Fos sur Mer	NL
46.2+2 CS	Slag	1	2007	HeidelbergCement AG for Ceskomoravsky Cement	-	Mokra	CZ
46.2+2 CS	Clinker/Slag	1	2007	Hsing Ta Cement Co. Ltd.	-	Hsing Ta	TW
46.2+2 CS	Slag	1	2007	JSW Cement Limited	X	Raigarh	IN
46.2+2 CS	Clinker/Slag	1	2007	Lafarge Asland, S.A.	-	Tarragona	ES
46.2+2 CS	Clinker	1	2007	Pretoria Portland Cement Co.	-	Hercules	ZA
46.2+2 CS	Clinker/Slag	1	2007	Sree Jayajothe Cements Ltd.	-	Rajakurpalle	IN
46.2+2 CS	Clinker	1	2006	CariBbean Cement Co. Ltd.	-	Kingston	JM
46.2+2 CS	Clinker/Slag	1	2006	Cemex Central S.A. de C.V.	-	Tilbury	GB
46.2+2 CS	Clinker	2	2006	Cerro Azul Cement Consortium	-	Maturin	VE
46.2+2 CS	Slag	1	2006	Icheon Material Co., Ltd.	-	Mokpo	KR
46.2+2 CS	Clinker	1	2006	INACESA - Industria Nacional de Cemento S.A.	-	Curico	CL
46.2+2 CS	Slag	1	2006	JSW Cement Limited	-	Jindal	IN
46.2+2 CS	Clinker	1	2006	Lafarge CTEO	-	St Pierre La Cour	FR
46.2+2 CS	Clinker	1	2006	Lilama 69-3 Company	-	Song Than	VN
46.2+2 CS	Clinker	2	2005	Bagheran Cement Co.	X	Bagheran	IR
46.2+2 CS	Slag	1	2005	Cementos Lemona/Italcementi.	X	Bilbao	ES
46.2+2 CS	Slag	1	2005	Shandong Zendering Co. for Weifang Iron & Steel Group Company	-	Weifang	CN
46.2+2 CS	Clinker	1	2005	VINACONEX - Vietnam Construction & Import-Export Corp.	X	Cam Pha	VN
46.2+2 CS	Clinker	2	2005	Zabol Cement Ind. Co.	-	Zabol	IR
46.2+2 CS	Clinker/Slag	1	2004	Akij Group	-	Natanyangonj	BD
46.2+2 CS	Slag	1	2004	Anshan Jidong Cement	-	Anshan	CN
46.2+2 CS	Clinker	2	2004	Nahavand Cement Co.	-	Nahavand	IR
46.2+2 CS	Slag	1	2003	Anhui, Maanshan K. W.h New Building Material Co. Ltd.	-	Maanshan	CN
46.2+2 CS	Slag	1	2003	Yunnan Hwajun Ind. Corp	-	Anning	CN
46.2+2 CS	Clinker/Slag	1	2002	Holcim (España), S.A.	-	Carboneras	ES
46.2+2 CS	Slag	1	2002	Holcim France S.A	-	Dunkerque	FR
46.2+2 CS	Clinker	1	2002	Holcim Maroc S.A	X	Ras el Ma	MA
46.2+2 CS	Clinker	2	2002	Phuc Son Cement Corp.	-	Phuc Son	VN
46.2+2 CS	Slag	1	2002	Taiyuan Delong Super Powder Co. Ltd	-	Taiyuan	CN
46.2+2 CS	Clinker/Slag	1	2001	Orissa Cement Ltd.	X	Rajamppur II	IN
46.2+2 CS	Slag	1	2000	Civil and Marine Slag Cement Ltd.	-	Purfleet	GB
46.2+2 CS	Clinker/Slag	1	1999	Lucky One Realty Inc.	X	Batangas	PH
46.2+2 CS	Clinker/Slag	2	1998	Anhui Kingbridge Cement Ltd.	-	Wuhu	CN
46.2+2 CS	Clinker/Slag	1	1998	Madras Cements Ltd	-	Ariyanthipuram	IN
46.2+2 CS	Slag	1	1996	YTL Sdn. Bhd	-	Port Kilang	MY
46.2+2 CS	Slag	1	1996	YTL Sdn. Bhd.	X	Pasir Gudang	MY
46.2+2 CS	Slag	1	1995	CIMSA Cimento Sanayi Ve Ticaret A.S.	-	Mersin	TR

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Vermahlung von Zementklinker und Hüttensand für die Zementindustrie

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
46.2+2 CS	Clinker	1	1995	Dalmia Cement Ltd.	X	Dalmiapuram	IN
46.2+2 CS	Clinker	2	1995	Kobe Steel Ltd.	-	Hon Chong	VN
46.2+2 CS	Clinker/Slag	1	1995	Orissa Cement Ltd.	X	Rajgangpur	IN
46.2+2 CS	Clinker	1	1994	KHD for The Siam Cement Public Co. Ltd.	X	Thung Song	TH
46.2+2 CS	Clinker	1	1983	Lucky Cement Co	-	Pu-Shin	TW
46.2+2	Clinker	1	2006	Dewan Cement Ltd.	-	Dewan	PK
45S	Slag	1	1991	Ssangyong Cement Ind. Co. Ltd.	X	Korea	KR
45C	Slag	1	1990	Ssangyong Cement Ind. Co. Ltd.	-	Korea	KR
45C	Slag	1	1990	Ssangyong Cement Ind. Co. Ltd.	X	Korea	KR
41.2+2 CS	Clinker/Slag	1	2017	The Ramco Cements Ltd.	-	Gobburupalam	IN
41.2+2 CS	Clinker/Slag	1	2017	The Ramco Cements Ltd.,	-	Kolaghat	IN
41.2+2 CS	Slag	1	2015	Yoo Gyeong CM Co. Ltd.	-	Kyung Nam	KR
41.2+2 CS	Clinker	2	2012	Gizir Insaat ve Muhendislik A.S.	-	Al Raqqah	SY
38S	Slag	1	1994	Union Steel Cement Co., Ltd	X	Taiwan	TW
38S	Slag	1	1992	Union Steel Cement Co., Ltd.	-	Taiwan	TW
35.2+2 CS	Slag	2	2017	Super Cement Manufacturing Co. L.L.C	-	Doha	QA
35.2+2 CS	Clinker/Slag	1	2017	Tech Cem Consulting & Engg. Pvt. Ltd. for Balaji Cement Industries Pvt. Ltd.	-	Chandrauta	NP
35.2+2 CS	Slag	1	2016	Agni Cement Industries Pvt. Ltd.	-	Jaluke	IN
35.2+2 CS	Clinker	2	2016	Yojin Construction & Engineering	-	Thalawa CL Yojin	MM
35.2+2 CS	Slag	1	2015	Sri Balsha Chemicals Private Limited	-	Hindupur	IN
35.2+2 CS	Slag	1	2015	Sun Slag Cement Co., Ltd.	X	Mokpo 2	KR
35.2+2 CS	Clinker	1	2014	Cementos San Marcos S.A.	-	San Marcos	CO
35.2+2 CS	Clinker	1	2007	Inacesa - Industria Nacional de Cemento S.A.	-	San Antonio	CL
35.2+2 CS	Slag	1	2006	Dyckerhoff Zement GmbH	-	Lengerich	DE
35.2+2 CS	Slag	1	2005	CBMI Construction Co., Ltd.	-	Bordeaux	FR
35.2+2 CS	Clinker/Slag	1	2001	Deccan Cement	-	Bhavanipuram	IN
35.2+2 CS	Clinker/Slag	1	2001	Vassiliko Cement	-	Vassiliko	CY
35.2+2 CS	Slag	1	1998	Société Rouennaise de Transformation	-	Rouen	FR
35.2+2 CS	Slag	1	1997	Kartalmsa	-	Karabük	TR
35.2+2 CS	Slag	1	1993	Ciments Lafarge	-	Fos sur Mer	FR
35S	Slag	1	1992	Nagoya S-Ment Co., Ltd.	-	Nagoya	JP
35S	Slag	1	1987	Nippon Kokan K.K.	-	Fukuyama	JP
32S	Slag	1	1995	Chiba Riverdent Co.	-	Chiba	JP
30.30 CCG	Clinker	1	2017	Slam City Cement (Lanka) Ltd.	-	Galle	LK
30.20 CCG	Clinker/Slag	1	2018	Holcim (Argentina) S.A.	-	Malaguano	AR
30.20 CCG	Clinker/Slag	1	2018	Prime Cement Ltd.	-	Gisenyi	RW
30S	Slag	1	1990	Steel Cement Ind. Ltd	-	Australia	AU
30C	Slag	1	1992	UBE Industries Ltd.	-	Ube City	JP
28S	Slag	1	1980	Nihon Cement Co. Ltd.	X	Tosa	JP
24.20 CCG	Clinker	1	2017	Cemos Cimeni S.A.	-	Tanfaya	MA
24S	Slag	1	1987	Heartland Cement Co.	-	Independence/Ks.	US
22/1700	Slag	1	2006	Cemex Espana S.A.	-	Alcanar	US
20S	Slag	1	1991	Tos Ceramics Co., Ltd.	-	Korea	KR
16S	Slag	1	1994	UBE Industries Ltd.	X	Ube	JP

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Vermahlung von Zementklinker und Hüttensand für die Zementindustrie

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
14-11203	Slag	1	1976	Ibeda: Schlackenvermahlung	X	Groß Pösten	DE
940305	Slag	4	1940	Voest-Alpine AG	X	Linz	AT
8.2	Slag	1	1973	UBE Industries Ltd.	-	Ube	JP
3.6	Slag	1	1991	Ssangyong Cement Ind. Co. Ltd.	-	Korea	KR

Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
43.4 D	Coal	2	2018	Guoneng Group	X	Shenbei	CN
43.4 D		1	2018	Sanghi Industries Limited for Sanghi Industries Limited	X	Sanghipuram 2	IN
43.4 D	Coal	1	2017	Penna Cement Industries Limited	-	Boyareddipalli	IN
43.4 D		1	2015	KHD Humboldt Wedag India Pvt. Ltd. for Penna Cement Industries Limited	-	Penna	IN
43.4 D	Petcoke	1	2013	KHD Humboldt Wedag India Pvt. Ltd.	-	Jamul	IN
43.4 D		2	2012	Doosan Heavy Industries & Construction Co. Ltd. for Korea Western Power Co., Ltd (KOWEPO)	-	Taean	KR
43.4 D		1	2011	Siemens VAI for Sahaviriya Steel Industries UK Limited (SSI UK)	-	Redcar	GB
43.4 D		1	2010	Cong Thanh Cement JSC Ltd.	-	Tan Truong	VN
43.4 D		1	2008	ABC Cements Ltd.	-	Thumdi	IN
43.4 D		1	2007	ACC Ltd.	-	Wadi	IN
43.4 D		1	2007	Gujarat Ambuja Cements Ltd.	X	Darlaghat	IN
43.4 D		1	2007	Holcim India for Gujarat Ambuja Cements Ltd.	-	Bharapara 2	IN
43.4 D	Petcoke	1	2006	Grasim Industries Ltd.	-	Aditya II	IN
43.4 D	Petcoke	1	2006	Grasim Industries Ltd.	-	Kotpalli	IN
43.4 D	Petcoke	1	2006	Grasim Industries Ltd. for Ultra Tech Cement Ltd.	-	Tadipatri (APCW II)	IN
41.4 D	Petcoke	1	2017	Cemento Cruz Azul, Hgo	-	Hidalgo	MX
41.4 D	Petcoke	1	2017	Cemento Cruz Azul, Hgo.	-	Lagunas	MX
41.4 D		1	2012	Modern Madencilik ve Yapi Malzemeleri Sanayi ve Ticaret A.S.	-	Silifke	TR
35.3 D	Coal	6	2019	Beijing HTSC Power Technology Limited for Guangxi Huayi Energy& Chemical industry Co., Ltd.	-	Qinzhou	CN
35.3 D	Coal	1	2019	CDI (Chengdu Design & Research Institute) for Yunnan Hongta Dianxi Cement Co. Ltd.	-	Binchuan	CN
35.3 D	Coal	2	2018	Guangdong Taipai Group Jiaoling Sub-Company	X	Jiaoling 2	CN
35.3 D		1	2018	Northern Cement Corporation NCC	X	Pangasinan Line A	PH
35.3 D	Coal	1	2018	Sinoma International Engineering Co.Ltd. for Dangote Cement PLC	X	Obajana Line 5	NG
35.3 D		1	2017	Lubao Cement Co., Ltd	-	GX Beilio	CN
35.3 D		1	2017	Ultra Tech Cement Ltd.	X	Pearl_Dhar	IN
35.3 D		2	2016	Anhui Haoyuan Chemical Industry Group	-	Fuyang	CN
35.3 D		1	2016	Eagle Cement Co	-	Barrio Aldo Line 3	PH
35.3 D		1	2016	Guoneng Energy Source Co., Ltd	-	Luoyang	CN
35.3 D		2	2015	Guangdong Taipai Group Jiaoling Sub-Company	-	Jiaoling	CN
35.3 D		6	2015	Jianan Group	-	Beilin	CN
35.3 D		5	2015	Rafako-Mostostal Consortium for Tauron Wytwarzanie	-	Jaworzno IG	PL
35.3 D		4	2013	Wison Engineering Co.Ltd. for Lulai Mining Company	-	Changsha	CN
35.3 D		1	2012	LOMA NEGRA C.I.A.S.A for InterCement	-	Barker	AR
35.3 D	Petcoke	1	2011	CSN - Companhia Siderurgica Nacional	-	Arcos	BR
35.3 D		1	2011	CSN - Companhia Siderurgica Nacional	-	Nordeste	BR
35.3 D		1	2011	CSN - Companhia Siderurgica Nacional	-	Sul	BR
35.3 D		14	2010	Doosan Heavy Industries & Construction	-	Raipur 1+2	IN
35.3 D		2	2010	Paul Wurth S.A. for Evraz Holding	-	Novokuznetsk	RU
35.3 D		1	2010	Paul Wurth S.A. for Evraz Holding	-	Nizhniy Tagil	RU
35.3 D		1	2008	Vattenfall Europe Mining AG	-	Schwarze Pumpe 1	DE

Kohle

Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
35.3 D	Petcoke	1	2007	Heidelberg Technology Center for CJSC Donuzlavcement	-	Donuzlav	UA
35.3 D		1	2006	Ishikawajima-Harima Heavy Industries Co., Ltd.	-	Bim Son 2	VN
35.3 D		1	2006	Union Cement Company	-	Ras al Kaimah 4	AE
35.3 D		1	2004	Köhler for CST	X	Tuberao	BR
35.3 D	Anthracite	1	2003	CBMI Construction Co., Ltd.	-	Guangzhou	CN
35.3 D	Anthracite	1	1997	MHI for Nghi Son Cement Corporation	-	Nghi Son	VN
35.3 D		1	1994	Köhler for CST	-	Tuberao	BR
30.3 D		1	1996	Ishikawajimaharima Heavy Industries, Ltd.	-	Malaysia	MY
28.3 D		1	2017	Chengdu Design & Research Institute of Building Materials Industry Co., Ltd. for Pioneer Cement Ltd.	X	Chenki	PK
28.3 D		1	2015	BATISÖKE Söke Çimento Sanayii A.Ş.	-	Söke	TR
28.3 D		1	2015	Mitsui & Co. Plant Systems, Ltd. For JFE Steel Corporation	X	Fukuyama FI PCI	JP
28.3 D		2	2014	Dangote Industries Limited	X	Ibese 1+2	NG
28.3 D		2	2014	Dangote Industries Limited	X	Ibese 3+4	NG
28.3 D		2	2014	Dangote Industries Limited	X	Obajana L+2	NG
28.3 D		1	2014	Dangote Industries Limited	X	Obajana Line 4	NG
28.3 D		1	2014	Sinoma International Engineering Co., LTD for Dangote Industries Limited	-	Mtwara	TZ
28.3 D		18	2013	Doosan Heavy Industries & Construction for NTPC	-	Lara	IN
28.3 D		1	2013	Sibnilproject cement for Russil Achinsk	-	Achinsk	RU
28.3 D		2	2013	Tianjin Cement Industry Design & Research Institute Co. Ltd for PT Indocement Tunggal Prakarsa	-	Citeureup	ID
28.3 D		1	2012	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Mesagacha	ET
28.3 D		1	2011	RWE Power AG	X	Bernerath	DE
28.3 D		1	2009	KJS Cement Pvt. Ltd.	-	Andila	IN
28.3 D	Petcoke	1	2006	CBMI Construction Co. Ltd. for VASSILIKO CEMENT WORKS LTD.	X	Vassiliko	CY
28.3 D		1	2006	Claudius Peters Projects GmbH for ILVA S.p.A.	X	Taranto 2	IT
28.3 D		1	2006	Dandit Corus Technical Services BV	-	St. James Parish	US
28.3 D		6	2006	DOOSAN Heavy Industries & Constructions Co. Ltd.	-	CHECO One	TH
28.3 D		2	2007	Paul Wurth S.A. for NLMK	-	Lipetsk Steel 2	RU
28.3 D	Brown Coal/Peat	1	2007	RWE Power AG	-	Niederaußem	DE
28.3 D	Petcoke	1	2002	Nuh Cimento Sanayii A.S.	X	Hereke 5	TR
28.3 D		1	1998	Lehigh Portland Cement Co.	-	Union Bridge	US
28.3 D		1	1998	BMH Claudius Peters AG for Asominas	-	Ouro Branco	BR
28.3 D		1	1996	KHD for The Siam Cement Public Co. Ltd.	X	Thung Song 6	TH
28.3 D		1	1995	FLS for P.T. Semen Indo Kodeco Cement	X	Tarjun Lignite	ID
28.3 D		1	1994	KHD for The Siam Cement Public Co. Ltd.	-	Lampang	TH
28.3 D		1	1991	Kleimer Gmbh for US Steel	-	Kosice	SK
28.3 D		3	1990	Ilva S.p.A.	-	Taranto	IT
28.20 DC		16	2017	Doosan Power Systems India Pvt. Ltd	-	Jawaharpur	IN
28.20 DC		1	2016	The KCP Limited	-	Mokiyala	IN
28.2 D	Coal	1	2018	The Ramco Cements Ltd.	X	Jayanthipuram 3	IN
28.2 D		16	2017	Doosan Power Systems India Pvt. Ltd	-	Obra C	IN

Kohle

Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
28.2 D		1	2017	SINOMA International Engineering Co. Ltd for BESTWAY Cement Limited	X	Mustehkam 2	PK
28.2 D		12	2016	Power Machines, Russia for Beto Vietnam	-	Long Phu	VN
28.2 D		1	2015	D. G. Khan Cement Co. Ltd.	-	Hub	PK
28.2 D		2	2012	Kuttner GmbH & Co KG for OJSC "Enakievo Metallurgical Plant"	-	Enakievo	UA
28.2 D		1	2011	ASKALE CIMENTO SANAYII T.A.S.	-	Gümüshane	TR
28.2 D		2	2011	Hyundai Steel Company	-	Dangjin Steel - BF 3	KR
28.2 D		1	2011	Sephaku Cement	-	Jisoseng	ZA
28.2 D		1	2011	Terbay-Aybars Is Ortakligi for ASKALE CIMENTO SANAYII T.A.S.	-	Van	TR
28.2 D		1	2010	National Cement Co. p.s.c.	-	Dubai	AE
28.2 D		2	2009	Benue Cement Company PLC (Dangote Group)	X	Benue	NG
28.2 D		1	2009	Hubei Yadong Cement Corporation Ltd.	X	Xin Zhou 2	CN
28.2 D		1	2009	Nippon Steel Corporation	X	Tobata	JP
28.2 D		2	2009	Obajana Cement (Dangote Group)	X	Obajana 1+2	NG
28.2 D		1	2009	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Obajana 3	NG
28.2 D		1	2008	Asia Cement (China) Holding Corporation for Jiangxi Ya Dong Cement Co. Ltd	X	Ruichang 4	CN
28.2 D		1	2009	Asia Cement (China) Holding Corporation for Sichuan Ya Dong Cement Co., Ltd.	X	Pengzhou 3	CN
28.2 D		1	2009	Asia Cement Corporation for Huanggang Ya Dong Cement Co. Ltd.	X	Tianzhen	CN
28.2 D		15	2008	Burmeister & Wain Energy AS	-	Foco Tolle	TT
28.2 D		1	2008	CBMI Construction Co., Ltd. For OJSC "GARADAGH CEMENT"	-	Garadagh	AZ
28.2 D		1	2008	Cement Manufacturing Company Ltd. (CMCL)	-	Lumshnong	IN
28.2 D		2	2008	Sinoma International Engineering Co., LTD for Dangote Industries Limited	-	Ibese 1+2	NG
28.2 D	Petcoke	1	2007	CBMI for Tuan Cement Company S.A	-	Anwa	AL
28.2 D		1	2007	CNBM - China National Building Material Group Corporation	-	Derba	ET
28.2 D	Petcoke	1	2007	DTE Energy	X	Dofasco	CA
28.2 D		1	2007	Hubei Yadong Cement Corporation Ltd.	-	Xin Zhou 1	CN
28.2 D		2	2007	Hyundai Steel Company	-	Dangjin Steel - BF 1	KR
28.2 D		2	2007	Hyundai Steel Company	-	Dangjin Steel - BF 2	KR
28.2 D		2	2007	Kuttner GmbH for Zaporozhstal OJSC	-	Zaporozhje	UA
28.2 D		1	2007	Sichuan Yadong Cement Co., Ltd	X	Pengzhou	CN
28.2 D		1	2007	Sree Jayajothi Cements Ltd.	-	Basaiarpadu	IN
28.2 D		1	2006	Bestway Cement Ltd.	-	Chakwal 2	PK
28.2 D	Petcoke	1	2006	DTE Energy	-	Charleston	US
28.2 D		1	2006	Madras Cement Ltd.	-	Ariyalur	IN
28.2 D	Petcoke	1	2006	Madras Cement Ltd	X	Jayanthipuram	IN
28.2 D		1	2005	Sichuan Yadong Cement Co., Ltd	-	Sichuan	CN
28.2 D		1	2005	Sichuan Yadong Cement Co., Ltd	X	Pengzhou	CN
28.2 D		1	2004	CBMC for Bestway Cement Ltd.	-	Chakwal	PK
28.2 D	Petcoke	1	2004	DTE Energy Services	-	Vicksburg	US
28.2 D		1	2003	Dalmia Cement (Bharat) Ltd.	X	Dalmiapuram	IN
28.2 D		1	2003	Stahlwerke Bremen GmbH	-	Bremen	DE
28.2 D	Petcoke	1	2002	Beocinska Fabrika Cemenra	-	Beocin, Serbia	RS
28.2 D		2	2001	Continental Cement Corp	X	Continental	CN
28.2 D		1	2001	Lehigh Portland Cement Inland Group	-	Edmonton	CA

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Kohle

Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
28.2 D		1	2000	NKK Corporation	X	Fukuyama II	JP
28.2 D		10	2000	Taiwan Power Co.	-	Taichung	TW
28.2 D	Petcoke	1	2000	Titan Cement Company S.A.	-	Saloniki	GR
28.2 D		1	1999	Northern Cement Corporation	-	Pangasinan	PH
28.2 D	Brown Coal/Peat	2	1997	Laubag	-	Schwarze Pumpe	DE
27.3	Petcoke	1	1981	Voest-Alpine AG. for Barbados	-	Arawak	BB
27.2 D		1	2013	Enmet Ingenieria	-	Doniseribo	NC
27.2 D	Petcoke	1	2005	Office Cherifien des Phosphates OCP	X	Beni Idir	MA
27.2 D	Petcoke	1	2005	Office Cherifien des Phosphates OCP	X	Quad Zem	MA
27.2 D		1	1995	GKW Ltd.	-	Bhavalia	IN
27.2 D	Anthracite	1	1995	Morning Star Ltd.	-	Hon Chong	VN
27.2 D		2	1995	Nippon Steel for Iscor	-	VanderBijlpark	ZA
26.3 D	PCI	1	2019	Paul Wurth S.A. for Ternium Brasil Ltda. Siderúrgica do Atlântico	X	Sepetiba 2	BR
26.3 D	Coal	1	2018	Jinglan Cement Group	-	Jingshan	CN
26.3 D	Coal	1	2018	Sarawat International Engineering Co Ltd. for Kohat Cement Company Ltd.	X	Kohat 2	PK
26.3 D	Coal	1	2017	CDI (Changde Design & Research Institute) for Egyptian Steel Group	-	Sohag	EG
26.3 D		6	2016	CDI (Chengdu Design & Research Institute) for MoD - Ministry of Defence	-	Beni Suef 1-6	EG
26.3 D		1	2016	Sonia Cimento Madencilik Beton San. ve Tic. As	-	Sonia	TR
26.3 D		2	2012	Paul Wurth S.A. for PJSC Dneprovsky Iron & Steel Integrated Works named after F.Dzerzhinsky	X	Dniprodzerzhynsk	UA
26.3 D		1	2012	PT Semen Pacang (Persero)	-	Indarung 4 exp.	ID
26.3 D		1	2010	Nippon Steel Corporation	-	Oita	JP
26.3 D		1	2007	Raghuram Cement Ltd.	-	Nallalingayapalli	IN
26.3 D		1	2007	Raghuram Cement Ltd.	X	Nallalingayapalli 2	IN
26.3 D		2	2006	OCL India Ltd.	-	Rajgangpur Line 2	IN
26.3 D		2	2006	ThyssenKrupp CSA Companhia Siderurgica	-	Sepetiba	BR
26.3 D		2	1999	Kömmer GmbH & Co. KG for BHP Australien	-	Port Kembla	AU
26.3 D	Petcoke	1	1997	DEVNYA Cement	-	Devnya	BG
26.3 D		1	1997	PT Semen Bosowa Maros	-	Maros	ID
26.3 D		3	1997	TCEC for Taiwan Cement Corporation	X	Hoping	TW
26.3 D		2	1995	Nippon Steel for Cosipa	-	Cubatao	BR
26.3 D		1	1995	P.T. Semen Gresik	X	Indonesia	ID
26.3 D		1	1994	Eichleay Engineers Inc. for Stelco Inc.	-	Hamilton	CA
26.3 D		2	1994	FLS for Asia Cement Ltd.	-	Pulvarig	TH
26.3 D		3	1994	Jaypee Bela Cement Ltd.	X	Bela	IN
26.3 D		1	1994	P.T. Semen Nusamara	-	Indonesia	ID
26.3 D		2	1994	Sanghi Industries	-	Sanghipuram, Kutch (Gujarat)	IN
26.3 D		1	1993	Himachal Anubuja	-	Ambuja	IN
26.3 D		1	1993	Rajashree Cement	X	Malkhed	IN
26.3 D		1	1992	Cementos Limited for Maihar Cement	-	Maihar	IN
26.3 D		1	1992	FLS for P.T. Semen Tonasa	-	Tonasa	ID
26.3 D		1	1992	Grasim Industries Ltd.	X	Hirmi	IN
26.3 D	Brown Coal/Peat	1	1992	Milbag	-	Deuben	DE
26.3 D		1	1992	The Siam Cement Public Co. Ltd.	X	Kaeng Khoi	TH
26.3 D		1	1991	Batiolm Beli Anadolu Cimento Sanayii A.S.	-	Bornova	TR

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Kohle

Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
26.3 D		1	1991	P.T. Semen Gresik	X	Indonesia	ID
26.3 D		3	1990	Denkoler B.V.		Buggenum	NL
26.3 D		1	1989	Jaypee Rewa Cement Ltd.	-	Rewa	IN
26.3 D	Petcoke	1	1983	Soc. des Ciments Libanais	-	Chekka	LB
26.3		1	1991	Hanil Cement Co.	X	Tae Yang	KR
26.3		1	1990	The Tata Iron and Steel Co. Ltd.	-	Sonadih	IN
26.3		5	1982	N.E.I. / I.C.L., Derby, for	-	Jacui	BR
26.3		12	1980	L. & C. Steinmüller GmbH, for	-	Durba	ZA
25.2		1	1992	Kawasaki Steel Co. Ltd.	-	Mizushima	JP
25.2		3	1990	The Siam Cement Public Co. Ltd.	X	Thailand	TH
25/2000		1	1981	Ssangyong Cement Ind. Co. Ltd.	-	Korea	KR
25/2000		1	1980	UBE Industries Ltd.	X	Ise	JP
24.20 DC		1	2015	Sinoma Equipment & Engineering Corp (Sinoma E&E) for NOVA CIMANGOLA	-	Luanda	AO
24.2 D		1	1987	Canakkale Cimento Sanayii A.S.	X	Canakkale	TR
24.2 D		1	1967	Rajashree Cement	-	Malkhed	IN
24.2 D		1	1993	Rassi Cement Ltd.	X	Vishnupuram	IN
24.2 D		1	1990	Sri Lanka Cement Corp.	-	Kankesanthurai	LK
23.20		2	1996	Showa Denko Co., Ltd.	-	Kawasaki	JP
23.2 D	Coal	1	2018	CBMI Construction Co. Ltd. for Lafarge Africa PLC	X	Ewekoro	NG
23.2 D		2	2014	China National Building Material Group Corporation for Mugher Cement Enterprise	-	Mugher	ET
23.2 D		2	2014	Claudius Peters Projects GmbH for Rautaruukki Oyj	-	Raahe	FI
23.2 D		1	2013	Bhushan Power and Steel Ltd.	-	Bengali Bhushan	IN
23.2 D		1	2013	Dong Energy Thermal Power A/S	-	Avedorevaerket 2	DK
23.2 D		1	2012	Cementos Pacasmayo S.A.A.	-	Piura	PE
23.2 D		1	2012	Kardemir A.S.	-	Karabük	TR
23.2 D		1	2012	Paul Wurth S.A. for Trinecke Zelezarny	-	Trinecke	CZ
23.2 D	Petcoke	1	2008	Essroc Cement Co	-	Martinsburg	US
23.2 D		1	2008	Siemens VAI for Dragon Steel Corporation	X	Taichung 2	TW
23.2 D		1	2007	Arcelor Steel Belgium	X	Gent	BE
23.2 D		2	2007	Novolipezk Iron & Steel Corporation	-	Lipezk	RU
23.2 D		2	2007	VAI Industries UK Ltd.	-	Taichung	TW
23.2 D		1	2006	Klöckner GmbH for Sollac Méditerranée - Group Arcelor	-	Fos sur Mer	FR
23.2 D		1	2005	Jiangxi Ya-Dong Cement Co., Ltd.	X	Ruichang	CN
23.2 D		1	2001	Klöckner for CST	X	Tubarao	BR
23.2 D		3	2001	FLS Milyo	-	Avedorevaerket	DK
23.2 D	Petcoke	1	1999	Office Cherifien des Phosphates OCP	-	Beni Idir	MA
23.2 D		1	1997	Jiangxi Ya-Dong Cement Co., Ltd.	-	Jiangxi	CN
23.2 D		2	1997	NKK Corporation	-	Fukuyama	JP
23.2 D		2	1996	Baosteel	-	Baoshan	CN
23.2 D		1	1995	KHI for P.T. Indocement	X	Cirebon	ID
23.2 D		2	1994	BMK (Claudius Peters) for Ensidesa	-	Gijon	ES
23.2 D		1	1994	Jalaprathan Cement Co. Ltd.	-	Takli	TH
23.2 D		1	1994	KHD for The Siam Cement Public Co. Ltd.	X	Thung Song	TH
23.2 D		1	1991	P.T. Indocement	-	Cirebon	ID
23.2 D		1	1990	Asia Cement Co. Ltd	-	Hualien	TW
23.2 D	Petcoke	1	1990	Bolu Cimento Sanayii A.S.	-	Caydan	TR
23.2 D		1	1990	Mosman Co. Ltd. for	-	Sonyon	KR

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Kohle

Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
23.2 D		1	1988	Kawasaki Steel Co. Ltd.	-	Mizushima	JP
23.2 D		4	1987	Burmeister & Wain A.S., for	X	Odense	DK
23.2		1	1994	Chung Fong Hai Phong Cement	-	Chung Fong	VN
23.2		1	1994	Jingnan-Onoda Cement	•	China	CN
23.2		1	1994	Onoda Engineering Co., Ltd.	-	China	CN
23.2		1	1992	Korea Heavy Ind.& Const. Co. Ltd. (PHS)	-	Malaysia	MY
23.2		1	1990	Ssangyong Cement Ind. Co. Ltd.	X	Korea	KR
23/1800		1	1980	Chichibu Cement Co. Ltd.	X	Kumagaya	JP
23/1800		1	1980	UBE Industries Ltd.	X	Kanda	JP
23/1800		1	1979	UBE Industries Ltd.	X	Ube	JP
23/1800		1	1978	UBE Industries Ltd.	X	Kanda	JP
22.2 D		1	1982	N.E.L. / I.C.L., Derby, for	-	West Burton	GB
21.3 D		1	1994	P.T. Semen Nusantara	-	Indonesia	ID
21.2 D	Coal	1	2018	Henan Yishuiyuan Water Purifying Materials Tech. Com, Ltd.	-	Jiaozuo	CN
21.2 D		1	2014	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Dangul	CG
21.2 D		1	2012	Sinoma International Engineering Co., LTD for Dangote Industries Limited	X	Ndola	ZM
21.7 D		1	2010	Sinoma International Engineering Co., LTD for Dangote Industries Limited	-	Pout	SN
21.2 D		1	2008	Dillinger Hüttenwerke AG	X	Dillingen 2	DE
21.2 D	Petcoke	1	2007	Heidelberg Technology Center for OJSC Kryvyi Rih Cement	-	Kryvyi Rih	UA
21.2 D		1	2005	Cemento Chihuahua	-	Pueblo	US
21.2 D		1	2000	Chettinad Cement Corp. Ltd.	X	Kanikkali	IN
21.2 D		1	1998	Grasim Industries Ltd	X	Reddipalayam	IN
21.2 D	Petcoke	1	1997	Rondé S.A. Flavi	-	Flavi	BO
21.2 D		1	1996	Uzinexportimport for Alton Cement	-	Jilgan	PH
21.2 D		1	1995	Dharani Cement	•	Reddipalayam	IN
21.2 D		2	1995	Ha Cement Corporation	-	Paraguay	PH
21.2 D		1	1994	Davao Union	•	Philippines	PH
21.2 D		1	1991	Hira Cement Co.	•	India	IN
21.2 D		1	1991	P.T. Semen Padang	-	Indarung	ID
21.2 D		2	1990	Asia Cement Co. Ltd.	-	Saraburi	TH
21.2 D	Petcoke	1	1990	Cementos Asland S.A.	X	Villaluenga	ES
21.2 D		1	1990	Hong Song	-	Sam Chuk	KR
21.2 D		1	1990	P.T. Semen Cibinong	-	Naragong	ID
21.2 D		2	1987	Halla Cement Co.	X	Kang-won-do	KR
21.2 D		2	1986	Sidmar N.V.	•	Gent	BE
21.2 D		2	1985	ROGESA	•	Dillingen	DE
21.2 D	Petcoke	1	1984	Aslan Cimento A.S.	X	Bursa	TR
21.2 D	Petcoke	1	1984	Cimenteries CBR S.A.	-	Antoing	BE
21.2 D		1	1983	Nippon Steel Co. Ltd.	X	Tobata	JP
21.2 D		1	1982	Cement Corp. of India Ltd.	•	Neemuch	IN
21.2 D		1	1981	Manikgarh Cement Ltd.	-	Chandur	IN
21.2 D		1	1974	Cimenteries CBR S.A.	-	Lixhe	DE
21.2		1	1993	Hyundai Cement Co. Ltd.	X	Korea	KR
21.2		1	1991	Dailen Huaneng-Onoda Cement	•	China	CN
21.2		1	1990	Hyundai Cement Co. Ltd.	•	Korea	KR
21.2		1	1979	Osaka Cement Co. Ltd.	•	Osaka	JP
20.20 DC		4	2015	Doosan Heavy Industries & Construction Co. Ltd. for E.C.L.	•	Piere (Red Dragon)	CL
20.20 D		1	2017	KHD Humboldt Wedag India Pvt. Ltd. for CG Cement Industries Palpa P. Ltd.	•	Somada	IN

Kohle

Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
20.2 D		1	2006	Hunter Consultoria for HOLCIM (Brasil) S.A. Fazenda Vargem Alegre, gmr	-	Pedro Leopoldo	BR
20.2 D		8	2006	Ansaldo Caldaie S.p.A. for Centrale Thermique de Mohammedia	-	Mohammedia	MA
20.2 D		1	2006	Lilama 69-3 Company	-	Song Thao	VN
20.2 D		1	2006	Messebo Building Materials Production P.L.C.	-	Messebo	ET
20.2 D		1	2003	Cemag Anlagenbau for Asikari WAH Ltd.	-	Panji	PK
20.2 D		1	2003	Cemag Anlagenbau for Fauji Cement Co.	-	Asikari	PK
20.2 D	Petcoke	1	2002	Cementara Kosjeric	-	Kosjeric	CS
20.2 D		1	2002	China Steel Corp.	X	Kaohsiung IV	TW
20.2 D		2	2001	China Steel Corp.	X	Kaohsiung III	TW
20.2 D	Petcoke	1	2001	Nascocement d.d.	-	Nasice	HR
20.2 D		1	2000	Madras Cement Ltd.	X	Alathiyur II	IN
20.2 D		1	1996	Madras Cement Ltd.	-	Alathiyur	IN
20.2 D		1	1994	Nisshin Steel Co., Ltd.	-	Japan	JP
20.2 D		1	1994	Taiwan Cement Corp.	X	Hualien 3	TW
20.2 D		2	1991	China Steel Corp.	X	Kaohsiung II	TW
20.2 D		1	1991	Cemtco Limited for Kalyanpur Cement	-	Banjari	IN
20.2 D	Petcoke	1	1990	Cimsan T.A.S.	X	Lalapasa	TR
20.2 D		1	1989	Jalaprathan Cement Co. Ltd.	-	Cha-Am	TH
20.2 D		1	1989	Taiwan Cement Corp	X	Suao	TW
20.2 D	Petcoke	1	1987	Cimsan T.A.S.	-	Gaziantep	TR
20.2 D	Petcoke	1	1987	Cimsan T.A.S.	-	Kurtalan	TR
20.2 D	Petcoke	1	1987	Hindustan Sugar Mills Ltd.	-	Udaipur	IN
20.2 D	Petcoke	2	1987	NIL Cement Enterprises Ltd.	-	Rewle	IL
20.2 D		1	1987	The Siam Cement Public Co. Ltd.	X	Bangkok	TH
20.2 D		2	1985	C.M.I. S.A., for	X	Ruien	BE
20.2 D	Brown Coal/Peat	2	1984	Uppsala Kraftvärme AB	-	Uppsala	SE
20.2		1	1993	Yantai Mitsubishi Cement Corp.	-	China	CN
20.2		1	1991	Ibiden Fuka Kogyo Ltd.	-	Nami	JP
20.2		1	1991	Tsuruga Cement Co. Ltd	-	Tsuruga-Shi	JP
20.2		1	1990	Onoda Cement Co. Ltd. for	-	Dalian Huaneng	CN
20.2		1	1990	Ssangyong Cement Ind. Co. Ltd.	-	Korea	KR
20/1500		1	1984	Raymond Cement Works	X	Gopal	IN
20/1500		1	1983	Filipinas Cement Corp.	-	Teresa	PH
20/1500		1	1983	Hyundai Cement Co. Ltd.	X	Tanyang	KR
20/1500		1	1981	Denkikagaku Co. Ltd.	-	Omi	JP
20/1500		4	1981	Ssangyong Cement Ind. Co. Ltd	-	Korea	KR
20/1500		1	1981	Tohoku Kinzoku Co., Ltd.	-	Aomori	JP
20/1500		1	1980	Chichibu Cement Co. Ltd.	X	Chichibu	JP
20/1500		2	1980	Osaka Cement Co. Ltd.	-	Kobuchi	JP
19.20 D		1	2018	Cementos del Norte S.A.	-	Bijao	BR
19.20 D	Petcoke	1	2001	Cementarnica Usje	-	Usje	MK
19.20 D		1	2000	Holcim (Brasil)	-	Barreiro	BR
19.20 D		1	2000	Holcim (Romania)	-	Aleed	RO
19.20 D		1	2000	Holcim (Romania)	-	Campulung	RO
19.2 D	Petcoke	1	2016	Unión Cementera Nacional UCEM C.E.M	-	Guapan	EC
19.2 D		1	2013	Tianjin Cement Industry Design & Research Institute for Tanga Cement Company Limited	-	Tanga	TZ
19.2 D		1	2008	CEMI Construccion Co. Ltd. for Mosaro Cement Kft	-	Kisalyegyhaza	HU
19.2 D	Petcoke	1	2008	Cementos Fortaleza C.A.	-	Sagamoso	MX

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Kohle

Vermahlung von festen Brennstoffen verschiedene.
Herkunft für die Zementindustrie, Feuerungen,
Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
19.2 D		1	2006	Florida Rock Industries, Inc.	•	Newberry, FL	US
19.2 D		3	2005	Burmeister & Wain Engineering	V	Aarhus	DK
19.2 D		1	2004	CBMC for Nizampur Cement Plant	•	Nizampur	PK
19.2 D		1	2003	China Building Material Industrial Co.	X	Nizampur	PK
19.2 D	Petcoke	1	2002	The Monarch Cement Co.	-	Humboldt, KS	US
19.2 D	Petcoke	1	2000	INACESA - Industrin Nacional de Cemento S.A.	-	Curico	CL
19.2 D		1	1997	ABO Cement	-	Tuw-An	PH
19.2 D.		1	1909	Fuller Company, for	-	Mongolia, Cal.,	US
19.2 D	Petcoke	1	1997	Cimsan T.A.S.	-	Elazig	TR
19.2 D	Petcoke	1	1997	Cimsan T.A.S.	-	Nigde	TR
19.2 D	Petcoke	1	1997	Cimsan T.A.S.	-	Sivas	TR
19.2 D	Petcoke	1	1997	Cimsin T.A.S.	-	Trabzon	TR
19.2 D		1	1997	Nippon Steel Co. Ltd.	X	Kure	JP
19.2 D		8	1996	N.E.I. I.C.L., Derby, for	-	Kilroot	GB
19.2 D		1	1996	Svenska Stal AB	-	Oxelosund	SE
19.2 D		4	1995	EBES S.A.	X	Genk-Langerlo	BE
19.2 D		3	1994	Cor. Dominicana de Electricidad	-	Santo Domingo	DO
19.2 D		1	1994	Gwalior Rayon Silk Mfg. Co. Ltd	X	Vikram	IN
19.2 D		1	1994	Halla Cement Co.	-	Kang-won-do	KR
19.2 D		1	1994	Nippon Steel Co. Ltd.	-	Kure	JP
19.2 D		4	1993	EBES S.A.	•	Genk-Langerlo	BE
19.2 D		1	1993	Göller Bölgesi Cimento Sanayi ve Ticaret A.Ş.	-	Isparta	TR
19.2 D		1	1993	Gwalior Rayon Silk Mfg. Co. Ltd	-	Vikram	IN
19.2 D		2	1991	UBE Industries Ltd.	X	Ube	JP
19.2 D		1	1990	Taiwan Cement Corp.	X	Suao	TW
19.2 D		4	1979	Burmeister & Wain A.S., for	-	Skaerbaek	DK
19.2 D		4	1979	Société Intercom	•	Ruien	BE
19.2 D		6	1978	IFV Power Company	V	Asnaes	DK
19.2		1	1991	Asia Cement Co. Ltd.	-	Korea	KR
19.2		1	1990	Ube-Chosaku Group.	X	Ube	JP
18.25		1	1986	The Siam Cement Public Co. Ltd.	X	Bangkok	TH
18.25		1	1985	The Siam Cement Public Co. Ltd	X	Bangkok	TH
18.20		1	1975	Tokyo Gas Co. Ltd.	-	Tsurumi	JP
18.2 D		2	1994	China National Technical Import Corp.	X	China	CN
18.2 D		4	1994	Inner Mongolia Chemical Fertilize Plant	•	China	CN
18.2 D		3	1994	Nippon Steel Co. Ltd.	X	Japan	JP
18.2 D		4	1993	Babcock-Hitachi Co. Ltd.	-	Okinawa	JP
18.2 D		1	1993	China National Technical Import Corp.	X	China	CN
18.2 D		2	1993	Toyo Engineering Corp	-	China	CN
18.2 D		2	1993	China National Technical Import Corp	-	Beijing	CN
18.2 D		1	1991	Chien Tai Cement Corp.	X	Panpingshan	TW
18.2		1	1990	The Siam Cement Public Co. Ltd.	X	Thailand	TH
18.2		1	1989	Chemical Cement Co., Ltd.	-	China	CN
18.2		1	1988	Cheng Tai Cement Corporation	-	Kaohsiung	TW
18.2		1	1988	The Siam Cement Public Co. Ltd	X	Bangkok	TH
18/1340 D		18	1971	Intern. Comb. Africa Ltd., for	X	Arnot	ZA
18/1340 D		18	1968	Intern. Comb. Africa Ltd., for	•	Arnot	ZA
18/1340 D		4	1965	Burmeister & Wain A.S., for	X	Asnaes	DK
18/1320		1	1986	The Siam Cement Public Co. Ltd	X	Bangkok	TH
18/1320		2	1982	Asia Cement Co. Ltd.		Joechun	KR
18/1320		1	1982	Chien Tai Cement Corp.	X	Panpingshan	TW
18/1320		1	1982	The Siam Cement Public Co. Ltd	-	Bangkok	TH
18/1320		1	1981	Ube Chemical Co. Ltd.	X	Ube	JP

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Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
18/1320		1	1960	Aso Cement Co. Ltd.	X	Kanda	JP
18/1320		2	1960	Toyo Soda Manufacturing Co., Ltd.	-	Shin-Nanyo	JP
17.20 D	Petcoke	1	2002	Heracles General Cement Co	-	Milaia	GR
17.20 D	Petcoke	1	1998	Beloizvorsk Cement Ltd	-	Beli Izvor	BG
17.2 D		1	2005	Industria Nacional de Cementos S.A.	-	Antofagasta	CL
17.2 D		2	2004	Anadón Caldale S.p.A.	-	Le Colt (Reunion)	RE
17.2 D		1	2004	Tanga Cement	-	Tanga	TZ
17.2 D	Petcoke	1	2000	Salmon Anhovo	-	Deskle	SI
17.2 D	Petcoke	1	1998	Beloizvorsk Cement Ltd	-	Beli Izvor	BG
17.2 D		1	1998	Cimento Atol	-	Brasil	BR
17.2 D	Petcoke	1	1998	Cimento Goias	-	Cezarina	BR
17.2 D	Petcoke	1	1998	Companhia de Cimento Atol - CIMPOR	-	Atol	BR
17.2 D		4	1997	Burmeister & Wain Energy A S	-	Termopaipa	CO
17.2 D		1	1997	INCEHSA, S.A.	-	Honduras	HN
17.2 D		2	1994	Cheng Chen Machinery Co.	X	Tainan	TW
17.2 D		1	1990	Cheng Chen Machinery Co	-	Tainan	TW
17.2 D		1	1990	Goliath Cement Holdings Ltd.	-	Railton	AU
17.2 D	Petcoke	1	1989	CADEM	X	Meknes	MA
17.2 D		2	1988	China Steel Corp.	-	Kaohsiung	TW
17.2 D		1	1985	Chettinad Cement Corp.	-	Puliyur	IN
17.2 D		1	1985	Taiwan Cement Corp.	X	Suao	TW
17.2 D		2	1983	Cimenterie de l'Oriental	-	Oujda	MA
17.2 D		1	1981	blindiert Zementwerke	X	Untervaz	CH
17.2 D		1	1981	Taiwan Cement Corp	X	Chubung	TW
17.2 D		2	1979	Burmeister & Wain A.S., for	-	Herning	DK
17.2		1	1986	K.C.P. Ramakrishna Cement Ltd.	X	Macherla	IN
17.2		1	1983	Perak-Hanjoong Sirim SDN BHD	X	Pedang Rengas	MY
17.2		1	1978	Hamada Cement Co. Ltd.	-	Jafrabad	IN
16.20 D		8	2018	RAFAKO SA Boiler Engineering Company for PT PLN (Persero)	-	Lombok	ID
16.2 D		1	1993	Nuh Cimento Sanayi A.S.	X	Hereke	TR
16.2 D	Petcoke	1	1990	Industria Cementi F. Ruscone SpA	-	Caravate	IT
16.2 D		1	1990	Sharon	-	Shanxi	CN
16.2 D		1	1988	Cementi Ticino S.p.A.	-	Comabbio	IT
16.2 D		6	1988	Formosa Plastics Corp.	X	Jen Wu	TW
16.2 D		1	1988	Nuh Cimento Sanayii A.S.	X	Hereke	TR
16.2 D		2	1987	Nippon Steel Co. Ltd.	-	Hikari	JP
16.2 D		1	1984	Nuh Cimento Sanayi A.S.	X	Hereke	TR
16.2 D		2	1983	Nuh Cimento Sanayi A.S.	-	Hereke	TR
16.2 D		4	1982	Burmeister & Wain A.S., for	X	Vaesteras	SE
16.2 D		1	1980	Cementos Portland Monte de Jalón S.A.	-	Monte de Jalón	ES
16.2		1	1980	Hung-Ta Cement Co., Ltd.	-	Republic of China	CN
16/1220 D	Petcoke	2	2007	Cementeria Corzanmoyuly SRL	-	Barbe	IT
16/1220 D		1	1985	Shell Oil Company	-	Deer Park, Tx.	US
16/1220 D		3	1981	Götaverken Angteknik AB, for	-	Helsingborg	SE
16/1220 D		2	1979	L. & C. Steinmüller GmbH, for	X	Amager	DK
16/1220 D		1	1979	Exxon	X	Baytown, Tx.	US
16/1220 D		3	1976	N.E.C. / I.C.L., Derby, for	X	Naantali	FI
16/1220 D		16	1974	I.C.L. Africa Ltd., for	-	Hwange	ZW
16/1220 D		3	1973	N.E.C. / I.C.L., Derby, for	X	Naantali	FI
16/1220 D		3	1971	N.E.C. / I.C.L., Derby, for	-	Naantali	FI
16/1220 D		6	1968	L. & C. Steinmüller GmbH, for	-	Groenvlei	ZA
16/1180 D		2	1969	L. & C. Steinmüller GmbH, for	X	Amager	DK
16/1180 D		2	1967	L. & C. Steinmüller GmbH, for	-	Amager	DK

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Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
16/1180		2	1900	Osaka Cement Co. Ltd.	-	Ibuki	JP
16/180		8	1981	M.A.N. for	-	Durgapur	IN
16/1120		1	1978	P.T. Semen Baturaja	-	Baturaja	ID
16/1120		1	1974	UBE Industries Ltd.	X	Ube	JP
15.20		1	1988	Chuetsu Pulp Industry Co., Ltd.	X	Takaoka	JP
15.20		1	1984	Chuetsu Pulp Industry Co., Ltd.	-	Takaoka	JP
15.2 D		8	1909	Babcke-Dürr AG, for	-	Wedel	DE
15.2 D		1	1986	P.T. Semen Andalas Indonesia	-	LhoNga	ID
15.2 D		1	1986	The Siam Cement Public Co. Ltd	X	Bangkoo	TH
15.2 D		1	1985	Nippon Steel Chemical Co. Ltd.	X	Tobata	JP
15.2 D		3	1983	AkcanseTicaret A.S.	-	Bilyükçekmece	TR
15.2 D		1	1983	Federcementi S.p.A.	X	Galatina	IT
15.2 D		1	1982	Pan Malaysia Cement Co.	-	Rawang	MY
15.2		1	1990	Pacific Metal Co., Ltd.	-	Hachinohe	JP
15.2	Petcoke	1	1987	Chuetsu Pulp Industry Co., Ltd.	-	Takaoka	JP
15.2		1	1980	Swan Cement Ltd.	-	Rivervale	AU
15/1120		1	1985	The Siam Cement Public Co. Ltd.	-	Bangkok	TH
15/1120	Petcoke	1	1983	Chuetsu Pulp Industry Co., Ltd.	-	Tokyo	JP
15/1120		1	1981	Aso Cement Co. Ltd.	X	Tagawa	JP
15/1120		2	1981	Hyundai Cement Co. Ltd.	-	Korea	KR
15/1120		1	1981	Onoda Cement Co. Ltd.	X	Onoda	JP
15/1120		1	1981	Ryukyu Cement Co. Ltd.	-	Yaba	JP
15/1120		1	1980	Aso Cement Co. Ltd.	X	Tagawa	JP
15/1120		1	1980	Ube Chemical Co. Ltd.	X	Ube	JP
15/1120		1	1979	P.T. Semen Baturaja	-	Baturaja	ID
14.20 D		1	2002	Tvrtka Cemex	-	Pula	HR
14.2 D		1	2004	Leaf River Cellulose, LLC	-	New Augusta	US
14.2 D		1	2003	Georgia Pacific Co.	-	Zachary	US
14.2 D		2	1993	Oberösterreichische Kraftwerke AG	-	Riedersbach	AT
14.2 D		2	1989	Formosa Plastics Corp.	X	Lin Yuan	TW
14.2 D		1	1988	Cementos Rezola S.A.	-	Amigorringa	ES
14.2 D		3	1988	Formosa Plastics Corp.	X	Chia Yi	TW
14.2 D		1	1988	Sumitomo Metal Industries, Ltd.	-	Kokura	JP
14.2 D		6	1986	BEWAG	-	Oberhavel	DE
14.2 D		1	1986	China National Technical Import Corp.	-	Beijing	CN
14.2 D		1	1986	Daio Seishi Co. Ltd.	-	Mishima	JP
14.2 D		1	1986	Nikkatsu Steel Co. Ltd.	-	Osaka	JP
14.2 D		2	1985	Box Crow Cement Co.	-	Midlothian, Tx.	US
14.2 D		1	1985	Cementos Marroquies, C.M.A.	-	Tetouan	MA
14.2 D		1	1984	Soc. des Ciments de Marrakech	-	Mzoudia	MA
14.2 D		1	1983	Cementa AB	-	Skövde	SE
14.2 D		1	1983	Cementeria di Cassago S.p.A.	-	Cassago	IT
14.2 D		1	1983	Cementos Alfa S.A.	-	Maraponqueta	ES
14.2 D		2	1983	Hitachi Shipbuilding Co. Ltd.	-	Hitachi City	JP
14.2 D		2	1983	Tocay Industries Inc.	-	Ehime	JP
14.2 D		1	1982	Hetauda Cement	-	Hetauda	NP
14.2 D		2	1982	N.E.I. / I.C.L., Derby, for	-	Malmö	SE
14.2 D		1	1982	Ruhrkohle-Öl und Gas GmbH	-	Bottrop	DE
14.2 D		2	1982	Standard-Kessel GmbH, for	-	Stockstadt	DE
14.2 D		6	1981	Chugoku Electric Power Co., Ltd.	-	Ube	JP
14.2 D	Petcoke	1	1980	Cementos de Lemona	-	Lemona	ES
14.2 D		1	1980	Cia. Catalana de Cementos S.A.	X	Catalana	ES
14.2 D		6	1980	Goteverken Angpanjk. AB, for	-	Soederaelje	SE
14.2 D		1	1980	RZW Rotterbach KG	X	Duisenhausen	DE

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Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
14.2		1	1991	Mikuni Mining Co. Ltd.	-	Tagawa	JP
14.2		1	1990	SumiAmbutsan Co., Ltd.	-	Kakura	JP
14.2		1	1978	Maruberni Deutschland GmbH, for	-	Fat del Rio	CO
14/960		2	1961	M.A.N, for	-	Hengelo	NL
14/960		1	1960	PZW Heidelberg AG	-	Kiefersfelden	DE
14/1060		1	1986	Nakayama Steel Co. Ltd.	-	Osaka	JP
14/1060		1	1983	Kawasaki Steel Co. Ltd.	-	Chiba	JP
14/1060		1	1975	Goliath Portland Cement	-	Rerton	AU
14/1060		2	1975	Krupp-Koppers GmbH, for	-	Kafue	ZM
14/1060		1	1971	Taiwan Cement Corp	-	Chutung	TW
14/1060		1	1962	Phönix-Portlandzement- und Wasserkalkwerk	X	Beckum	DE
14/1060		4	1960	Burmeister & Wain A.S., for	-	Masnedsø	DK
14/1060		3	1960	Buntebister & Wain A.S., for	-	Aalborg	DK
13.850 D		1	1975	National Cement Corp	-	Ragland, Al.	US
13.20		1	1985	Showa Engineering Co., Ltd.	-	Kanazawa	JP
13.2 D	Coal	1	1990	Solvay Química	-	Torrelavega (Cantabria)	ES
13.2 D		1	1987	P.T. Semen Tonasa	-	Djakarta	ID
13.2 D		1	1987	Ssangyong Cement Ind. Co. Ltd.	X	Seoul	KR
13.2 D		6	1986	VKW AG, for		Frankfurt	DE
13.2 D		3	1985	Nordwestdeutsche Kraftwerke AG		Emden	DE
13.2 D		2	1985	RKW Rhein. Kalkwerke Westfalen	-	Messinghausen	DE
13.2 D		1	1985	RKW Rhein. Kalkwerke Westfalen	-	Rüdersdorf	DE
13.2 D		1	1985	Showa Engineering Co., Ltd	-	Ohita	JP
13.2 D		2	1982	Formosa Plastics Corp	-	Lin Yuan	TW
13.2 D		2	1982	Kanya Plastics Corp.	-	Linkou	TW
13.2 D		3	1981	Ferd. Lemjes AG for Farbwerke Hoechst	-	Hoechst	DE
13.2 D		2	1981	Ferd. Lemjes AG for Henkel	-	Düsseldorf-Holth.	DE
13.2 D		2	1981	Ferd. Lemjes AG for Pfeiffer & Lafgen	-	Elsdorf	DE
13.2 D		2	1981	Ube Ammonia Co., Ltd.	X	Ube	JP
13.2 D		2	1980	Ferd. Lemjes AG, for	X	Flensburg	DE
13.2 D		1	1980	Marin Marietta Corp.	-	Leamington, Utah	US
13.2 D		1	1980	Martin Marietta Corp.	-	Thomaston, Maine	US
13.2 D		6	1979	L. & C. Steinmüller GmbH, for	-	Beijing	CN
13.2		1	1992	Hyuga Smelting Co., Ltd.	-	Hyuga	JP
13.2		1	1990	Nippon Mesalight Co. Ltd.	-	Fonabashi	JP
13.2		1	1985	Koa Oil Co. Ltd.	-	Iwakuni	JP
13/950	Petcoke	1	1986	Komatsu Seiren Co. Ltd.	-	Kanazawa	JP
13/950	Petcoke	1	1984	Koa Oil Co. Ltd.	-	Iwakuni	JP
13/950		1	1983	CALDEM	X	Meknes	MA
13/950		1	1981	Nippon Soret Chemical Co. Ltd.	X	Tobata	JP
13/950		1	1981	Nitetsu Cement Co. Ltd.	X	Muroran	JP
13/950		1	1981	Taiheiyo Kiriushu Co. Ltd.	X	Hachuntbe	JP
13/950		1	1981	Tohoku Sekkai Kako Co.	-	Usuki	JP
13/950		1	1980	Asahi Kasei Kogyo Ltd.	-	Nobeoka	JP
13/950		2	1980	Nitetsu Cement Co. Ltd.	-	Muroran	JP
13/950		2	1980	UBE Industries Ltd.	X	Ube	JP
13/950		1	1977	Cementwerke Vigier AG	-	Reuchenette	CH
13/950		1	1975	Pacific Cement Company, Inc	-	Suigiao	PH
13/950		1	1973	Cheng Tai Cement Corporation	-	Pangingshan	TW
13/950		2	1973	Formosa Chemical & Fibre Corp.	X	Formosa	TW
13/950		2	1966	REWAG	X	Rudow	DE

Kohle

Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
13.20 D		12	2015	Doosan Heavy Industries & Construction - Power for Botswana Power Corporation	-	Moriputo	BW
12.20		1	1987	Sat Hwa Chemical Co., Ltd.	-	Korea	KR
12.20		1	1986	Nichigo Chemical Co., Ltd.	-	Ube	JP
12.20		1	1986	Showa Engineering Co., Ltd.	-	Kawasaki	JP
12.20		1	1985	Osaka Gas Co. Ltd	-	Torishima	JP
12.2 D		2	2005	Xstrata Plc	-	Steelport	ZA
12.2 D		1	1990	Solvay & Cie	-	Torrelavega	ES
12.2 D		1	1989	Krupp South Africa (PTY) Ltd.	-	Middelburg	ZA
12.2 D		3	1987	Fest. Lentjes AG for Farbwerke Hoechst	X	Hoechst	DE
12.2 D		1	1986	Daio Seishi Co. Ltd	-	Mishima	JP
12.2 D		1	1985	I/S Fynsværket	-	Odense	DK
12.2 D		1	1985	Söderjyllands Højspændingsværk A/S	-	Aabenraa	DK
12.2 D	Petcoke	1	1983	Tsurusaki Kyodo Doryoku Co. Ltd.	-	Oita	JP
12.2 D		1	1983	Tsurusaki Kyodo Doryoku Co. Ltd.	-	Oita	JP
12.2	Petcoke	1	1986	Industrias Quimicas del Nalón	-	La Nueva	ES
12.2	Petcoke	1	1986	Nichigo Chemical Co., Ltd.	-	Ube	JP
12.2	Petcoke	1	1986	Sanki-Kogyo Co. Ltd.	-	Seoul	KR
12.2	Petcoke	1	1986	Showa Denko Co., Ltd.	-	Kawasaki	JP
12/850	Petcoke	1	1986	Sanki-Kogyo Co. Ltd.	-	Korea	KR
12/850		1	1983	Sumitomo Metal Industries, Ltd	-	Uabasu	JP
12/850		1	1981	Godo Seitetu Co. Ltd.	-	Osaka	JP
12/850		1	1960	UBE Industries Ltd.	X	Ube	JP
12/850		1	1977	Aura-Cement-Tabriben	-	Wildegg	CH
12/850		2	1973	Fest. Lentjes A.G. for	-	Flensburg	DE
12/850		1	1966	Chia Hsin Cement Co. Ltd	-	Kangshan	TW
11.2 D		2	1990	Formosa Taffeta Co., Ltd.	X	Taiwan	TW
11.2 D		2	1986	Formosa Taffeta Co., Ltd.	-	Taipei	TW
11.2 D		2	1984	Toyobo Co. Ltd.	-	Iwakuni	JP
10.20		1	1987	Showa Engineering Co., Ltd.	-	Kawasaki	JP
10.20		1	1986	Okayamaken Kyodo Sekitai Co., Ltd.	-	Niimi	JP
10.2 D		2	1986	Toyobo Co. Ltd.	X	Tsuruga	JP
10.2	Petcoke	1	1987	Showa Denko Co., Ltd.	X	Kawasaki	JP
10.2	Petcoke	1	1986	Okayamaken Kyodo Sekitai Co., Ltd	-	Niimi	JP
10/750		1	1990	Cementos Bio-Bio S.A.	-	Talcahuano	CL
10/750		1	1990	Cementos Bio-Bio S.A.	X	Coplapo	CL
10/750		2	1987	Cementos Bio Bio S.A.	-	Inacesa	CL
10/750		1	1987	Soprocal S.A.	X	Melhipilla	CL
10/750		1	1983	Kajin Co. Ltd.	-	Yatsushiro	JP
10/750	Petcoke	1	1982	Cementos Asland S.A.	-	Villaluenga	ES
10/750	Petcoke	1	1982	Cementos El Leon S.A.	-	Mariltas	ES
10/750	Coke	1	1982	Lafarge Malrim	-	Sagunto (Valencia)	ES
10/750	Coke	1	1981	Cementos	-	Chilches (Castellon)	ES
10/750		1	1981	Cementos Turia S.A.	X	Valencia	ES
10/750		1	1981	Nippon Mesalight Co. Ltd.	-	Fumabashi	JP
10/750		1	1981	Sumitomo Metal Mining Co. Ltd	-	Kanagawa	JP
10/750		1	1980	Fiji Industries Pacific Cement Ltd.	-	Suva	FJ
10/750		1	1979	Faxe Kalk Produkt A/S	-	Randers	DK
10/750		2	1966	BEWAG	X	Rudow	DE
10/750		2	1965	Formosa Chemical & Fibre Corp	-	Formosa	TW
10/750		4	1961	BEWAG	X	Rudow	DE
10/750		6	1960	AB Svenska Maskinverken, Ek	-	Beijing	CN
10/750		1	1960	Soc. Cementifera Italiana	-	Casale-Monferrato	IT

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Vermahlung von festen Brennstoffen verschiedener Herkunft für die Zementindustrie, Feuerungen, Kraftwerke und Kohlevergasung

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
9.20 D		1	1985	Hitachi Zosen Co., Ltd.	-	Toyosa	JP
9.20		1	1996	Mitsui Mining Co. Ltd	-	Kita-Kyushu	JP
9/630		2	1977	Cementa AB	-	Degerhamn	SE
9		1	2001	Grinaker Lta. Process Engineering Ltd.	-	Rustenberg	ZA
8.20		1	1984	Chichibu Sekkai Kgyo Ltd	-	Chichibu	JP
8.20		1	1984	Manual Lime, Ltd	-	Ogaki	JP
8.20	Pecoke	2	1984	Nakayama Sekkai Kogyo, Ltd	-	Kitabo	JP
8.20		1	1984	Nakayama Sekkai Kogyo, Ltd.	X	Kitabo	JP
8.20		1	1984	Tohoku Toso Chemical Co., Ltd.	-	Ishinomaki	JP
8.20		1	1983	Nakayama Sekkai Kogyo, Ltd.	X	Kurabo	JP
8.20		1	1964	Osaka Gas Co. Ltd.	-	Toneshima	JP
8.20		1	1963	Osaka Gas Co. Ltd.	-	Seimi	JP
8.2	Pecoke	1	1984	Chichibu Sekkai Kgyo Ltd.	-	Chichibu	JP
8.2	Pecoke	1	1984	Manual Sekkai Kogyo, Ltd	-	Ohgaki	JP
8.2		1	1983	Hitachi Zosen Co., Ltd	X	Maitsuru	JP
8.2		1	1983	Sumitomo Metal Industries, Ltd.	-	Wakayama	JP
8/560		1	1981	Nippon Sekkai Kogyo, Ltd.	-	Chiba	JP
8/560		1	1981	Nippon Steel Co. Ltd.	-	Oita	JP
8/560		1	1980	Ashidachi Sekkai Kogyo, Ltd.	-	Niimi	JP
8/560		1	1980	Taiheiyo Kinzoku Co. Ltd.	X	Hachinohe	JP
8/560		1	1980	Ube Chemical Co. Ltd.	X	Ube	JP
8/560		1	1979	Taiheiyo Kinzoku Co. Ltd.	-	Hachinohe	JP
7/530		1	1989	FLS for	X	Kotkamaki	FI
7/530		1	1981	A/S Norsk Leca	-	Bunge	NO
7/530		1	1977	A/S Norsk Leca	-	Ratlingen	NO
7/530		1	1975	L. & C. Steinmuller GmbH, for	-	Kamen	DE
7/530		1	1973	AB Svensk Leca	-	Linkoping	SE
7/530		1	1973	Oy Rettund AB	X	Helsinki	FI
7/530		1	1972	Kopex	-	Mikolow	PL
7/530		1	1971	Dano	X	Kopenhagen	DK
7/530		1	1968	Dano	-	Lidkoping	SE
7/500		1	1966	Dano	-	Finnland	FI
7/500		3	1965	Dano	X	Kopenhagen	DK
7/500		1	1965	Jydsk Leca Werk	-	Hinge	DK
7/500		2	1965	Jydsk Leca Werk	X	Hinge	DK
7		1	1991	Leca Portugal Exp. Lda.	-	Avelar	PT
6.2		1	1985	Sumitomo Metal Industries, Ltd.	X	Wakayama	JP
3.6		1	1999	Eskom	-	Johannesburg	ZA
3.6		1	1987	Daiichi Giken Co., Ltd.	-	Chiba	JP
3.6		1	1983	Osaka Gas Co. Ltd.	-	Tonshima	JP
3.6		2	1980	Chiyoda Engineering Co. Ltd.	-	Yokohama	JP
3.6		1	1980	Hitachi Zosen Co., Ltd	-	Maitsuru	JP
3.6		1	1980	Nippon Mesalight Kogyo, Ltd.	-	Tokyo	JP
3.6		1	1980	Nippon Steel Co. Ltd.	-	Tahata	JP
3.6		2	1979	Denpatsu Fly Ash Co. Ltd.	-	Isogo	JP

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Verschiedene Mahlgüter

Vermahlung von Koks und Elektrodenmassen,
Bentonit, Graphit, TiO2 Farbpigmente, Ton für Blähton,
Gips, Dolomit u.a. für ..... Industrien

LM-Type	Mahlgut	Anzahl	Jahr	Käufer	Nachbestellung	Ort/Land	
19.20 D	Biomass	4	2015	Doosan Heavy Industries & Construction Co. Ltd for Korean Electric Power Corporation	-	Yeongdong	KR
16/160	Coke	1	1975	Osaka Gas Co. Ltd.	X	Torishima	JP
16/160	Coke	1	1969	Osaka Gas Co. Ltd.	X	Torishima	JP
15.20	Miscellaneous	1	1985	Toyo Soda Manufacturing Co., Ltd.	-	Hyuga	JP
15.2	Electrode Rods	2	2011	SGL Carbon Sdn Bhd	-	Bintulu	MY
15.2	Miscellaneous	1	1989	Industrimeroder AB	-	Hällefors	SE
13/950	Coke	1	1970	Toho Gas Co. Ltd.	X	Toho	JP
13/950	Coke	1	1970	Tokyo Gas Co. Ltd.	-	Tsurumi	JP
13/950	Coke	1	1968	Toho Gas Co. Ltd.	-	Toho	JP
12.20	Miscellaneous	1	1988	Mino Yogyo Co. Ltd.	-	Turkey	TR
12/850	Electrode Rods	1	2006	SGL Carbon GmbH & Co.	-	Steeg	AT
12/850	Electrode Rods	1	1972	Sigri	X	Frankfurt	DE
12/850	Electrode Rods	1	1971	Ringsdorff-Werke GmbH	-	Bonn	DE
12/850	Electrode Rods	1	1971	Sigri	-	Frankfurt	DE
10.20	Miscellaneous	1	1971	Mino Yogyo Co. Ltd.	-	Kawasaki	JP
10.20	Miscellaneous	1	1970	Mino Yogyo Co. Ltd.	X	Minamoto	JP
10.20	Miscellaneous	1	1966	Mino Yogyo Co. Ltd.	-	Minamoto	JP
10.20	Miscellaneous	1	1963	Mino Yogyo Co. Ltd.	-	Kawasaki	JP
10/750	Coke	1	1958	Shin Nippon Carbon Co. Ltd.	-	Shin	JP
10/750	Graphite	1	1962	Graphitbergbau Kaisersberg	X	Leoben	AT
9/760	Electrode Rods	1	1979	Elektrodenwerk Steeg GmbH	X	Steeg	AT
9	High Alumina Cement	1	1990	Alumeni	X	Bronkhorstspruit	ZA
8.2	Coke	1	1985	Mitsui Mining Co. Ltd.	-	Ohmuta	JP
3.6	Miscellaneous	1	1974	UBE Industries Ltd.	X	Ube	JP

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Erze, Mineralien und Schlacken

Vermahlung von Erzen für Aufbereitungsanlagen, Vermahlung von Mineralien für Aufbereitungsanlagen oder auf Endfeinheit, Vermahlung von pyrometallurgischen Zwischenprodukten und Schlacken für weitere pyrometallurgische Aufbereitung oder Metallrückgewinnung

56.4	Gold Ore	1	2017	Gürs Insaat ve Mühendislik A.S. Turkey	-	Tac	TR
50.4	Raw Phosphate	1	1998	FOSKOR Ltd.	-	Phalaborwa	ZA
31.3	Copper Matte	1	2017	Changsha Nonferrous Metallurgy Design Institute Co. for China Aluminia South-East Copper Ind. Co Ltd.	-	Ningde	CN
31.3	Copper Matte	1	2013	China National Jinyu Gold Materials & Equipment Corp. for Henan Zhongyuan Gold Smelter Co., Ltd.	-	Sanmenxia	CN
31.3	Copper Matte	1	2011	Gejiang XI Jin Chuan Non-ferrous Metals Co. Ltd	-	Fangcheng	CN
31.3	Copper Matte	1	2010	Tongling Nonferrous Group Co., Ltd.	-	Tongling	CN
31.3	Copper Matte	1	2009	Yanggu Xiangguang Copper Co., Ltd.	-	Yanggu	CN
31.2	Copper Matte	1	1995	Kennecott Utah Copper Co.	-	Magna	US
24.2 M	Phosphorite	1	2013	OAO Eurochem	-	Zhanatas	KZ
24.2	Pozzolane	1	1985	Colacem S.p.A.	-	Sesto Campano	IT
23/1800	Limestone	1	1975	Nittetsu Mining Co. Ltd.	-	Tsukumi	JP
23/1800	Limestone	1	1971	Kalkwerk Hehlen	X	Hehlen	DE
21.2	Limestone	1	2017	Idwala Carbonates	-	Idwala	ZA
21.2	Limestone	1	2003	Lasselsberger Hungaria Kft	-	Tatabanya	HU
21.2	Limestone	1	1986	Rheinische Kalksteinwerke GmbH	-	Wülfrath	DE
21.2	Quick Lime	1	1980	Baustoffwerke Dünenthau	-	Elfringen-Kirchem	DE
21.2	Limestone	1	1980	Hydro Agri Sluiskil B.V.	X	Sluiskil	NL
21.2	Raw Phosphate	1	1982	Babcock-BSH, for	X	Kazachstan	KZ
21/1600	Raw Phosphate	1	1971	Davy Powergas GmbH, for	X	Samsun	TR
20.20	Limestone	1	1991	Baholou Funka Kogyo Ltd.	-	Nami	JP
20.2	Limestone	1	1987	Baholou Funka Kogyo Ltd.	X	Fukushima	JP
20.2	Limestone	1	1987	Formosa Plastics Corp.	X	Linyuan	TW
20/1500	Limestone	1	1972	Polimex-Cekop, for	-	Wloclawek	PL
20/1500	Quick Lime	1	1968	Calci e Cementi di Segni	-	Colleferro	IT
19.2 D	Limestone	1	2010	Karl-Kraft Steinwerke	-	Heloenheim	DE
19.2 D	Colemanite	1	2005	Etibank	X	Bigadic	TR
18.20	Limestone	1	1975	Nihon Lime Co., Ltd.	-	Ichihara	JP
18.20	Limestone	1	1972	Nihon Lime Co., Ltd.	-	Ofine	JP
18.20	Limestone	1	1961	UBE Industries Ltd.	-	Mine	JP
18/1400	Raw Phosphate	3	1975	Börner-Schilde-Elsas AG, for	-	Homs	SY
18/1400	Raw Phosphate	3	1971	Ipran/Industrialimport	-	Bukarest	RO
18/1400	Raw Phosphate	1	1969	Davy Powergas GmbH, for	X	Samsun	TR
18/1350	Raw Phosphate	3	1965	Knapsack AG	X	Hürth	DE
18/1320	Limestone	2	1974	Sakata Kyodo Power Co.	-	Sakata	JP
18/1320	Limestone	1	1968	Märker Zementwerk GmbH	X	Harburg	DE
18/1320	Quick Lime	1	1964	Andre Baechl, Kalk- und PZW	X	Regensburg	DE
17.20 D	Limestone	1	2003	Ecuec Barcelona S.L.	-	Cassazza	IT
17.20 D	Limestone	1	1995	Andreas Sceber GmbH & Co.Kg.	-	Baunach	DE
17.2	Strontium Sulfate	1	1997	Quimica del estroncio	-	Cartagena (Murcia)	ES
17.2	Limestone	1	1997	Soprocal S.A.	X	Melipilla	CL
17.2	Quick Lime	1	1996	Kalkwerk Saal GmbH & Co.	X	Saal 3	DE
17.2	Anhydrite	1	1991	Knauf GmbH	-	Hünenboom	DE
17.2	Manganese Ore	1	1990	Manganese Metal Co. (Pty) Ltd.	-	Hotspruit	ZA
17.2	Quick Lime	1	1975	Cementa AB	-	Köping	SE

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Erze, Mineralien und Schlacken

Vermahlung von Erzen für Aufbereitungsanlagen, Vermahlung von Mineralien für Aufbereitungsanlagen oder auf Endfeinheit, Vermahlung von pyrometallurgischen Zwischenprodukten und Schlacken für weitere pyrometallurgische Aufbereitung oder Metallrückgewinnung

17.2	Quick Lime	2	1974	S.A. des Carrieres & Fours à Chaux d'Aisemont		Aisemont	BE
16.20	Limestone	1	1969	GBE Industries Ltd.	-	Mew	JP
16/1220 D	Bentonite	1	2006	Neco Oil Field Supplies Co.	-	Alexandria	EG
16/1220 D	Barite	1	2006	Neco Oil Field Supplies Co.	X	Alexandria	EG
16/1120	Raw Phosphate	1	1979	Metallurgimport	X	Moskau	RU
16/1140	Raw Phosphate	1	1976	Hinode Chemicals Mfg. Co. Ltd.	-	Maizuru	JP
16/1180	Limestone	1	1967	Cie. Neerlandaise de l'Azote	X	Sluiskil	NL
16/1180	Limestone	1	1966	Cie. Neerlandaise de l'Azote	-	Sluiskil	NL
16/1190	Raw Phosphate	5	1965	DELO (Engineers), for	X	Moskau	RU
16/1180	Raw Phosphate	2	1965	Maschinenport	X	Turnu Magurele	RO
16/1180	Raw Phosphate	2	1963	Uhde GmbH, for	-	Moskau	RU
16/1190	Raw Phosphate	1	1961	Maschinenport	-	Navodari	RO
16/1180	Raw Phosphate	1	1961	Technokomplekt	-	Dimitrovgrad	BG
16/1180	Anhydrite	1	1960	ANIC	-	Ravenna	IT
15.200	Bentonite	1	2017	Imerys Metallcasting Germany GmbH	-	Marl	DE
15.200	Raw Phosphate	1	2016	Intesa Industrial	-	Jan Solahne	ES
15.200	Steel Slag	1	2012	Recoval Belgium	-	Chatelet	BE
15.200	Limestone	1	2009	Ribwaghua Chemical Co. Ltd	-	Lame	GB
15.200	Limestone	1	2007	Nordkalk sp. z.o.o	-	Wolin	PL
15.200	Limestone	1	2006	Achema	-	Jonava	LT
15.200	Quick Lime	1	2006	FMW Förderanlagen GMBH & Co.	-	Alchevsk	UA
15.200	Limestone	1	2005	Nordkalk sp. z.o.o	-	Slawno	PL
15.200	Quick Lime	1	2005	Sebmet L.C.	-	Zhimov	RU
15.20	Quick Lime	1	2008	Hütten Maschinenbau GmbH for	-	Browary	UA
15.20	Dolomite	1	2008	Ternopolsky Karyer	-	Ternopol	UA
15.2 5	Metal Slag	1	2004	Minsur S.A.	-	Pisco	PE
15.2	Barite	1	2011	JSC Zhairemsky GOK	-	Zhairem	KZ
15.2	Limestone	1	2011	Omya International AG	-	Safi	MA
15.2	Limestone	1	1998	Parsek Nordkalk Oy AB	-	Kokkola	FI
15.2	Clay	1	1990	Vitro Building Products (Pty) Ltd.	-	Vereeniging	ZA
15.2	Benonite	1	1985	Jowle	-	Benghazi	LY
15.2	Barite	1	1985	Jowle	X	Benghazi	LY
14.21	Limestone	1	1974	Ueda Mining Co. Ltd.	-	Ogaki	JP
14.20 D	Limestone	1	2005	VAC - Vimiano Adriano Costruz.	-	Rio Maior	PT
14.20 D	Limestone	1	2004	FMW Förderanlagen GmbH & Co.	-	Magnitogorsk	RU
14.20 D	Limestone	1	2003	Gemag Anlagenbau GmbH	-	Bandung	ID
14.20	Limestone	1	2007	Mexco Power	-	Georgia Pacific	US
14.20	Limestone	1	1978	Chang Ja Industrial Co.	-	Korea	KR
14.2 D	Limestone	2	2005	Kvaerner Power Inc./Georgia Pacific Group	-	Bon Hudson	US
14.2	Limestone	1	1986	Ashidachi Sekiei Kogyo, Ltd	-	Nami	JP
14/960	Dolomite	1	1973	Ueda Mining Co. Ltd.	-	Ueda	JP
14/990	Limestone	1	1965	Stein- u. Schotterwerk Geiger	-	Pfraundorf	DE
14/1120	Barite	2	1976	Ceco Heemsede B.V.	-	Ijmuiden	NL
14/1120	Raw Phosphate	1	1969	Deny Powergas GmbH, for	-	Samsun	TR
14/1060	Limestone	1	1977	Industrogradnja	-	Licko Lesce	CS
14/1060	Quick Lime	1	1976	Mou Jeung Industrial Co.	-	Seoul	KR
14/1060	Clay	1	1973	Südd. Bläson Werke	-	Tunengen	DE
14/1060	Bentonite	1	1973	Sydvaranger	-	Kirkenes	NO
14/1060	Titanium Dioxide	1	1973	Thann et Mulhouse	X	Le Havre	FR
14/1060	Limestone	1	1972	Barjuan Kalkwerk	-	Medenbach	DE
14/1060	Limestone	1	1971	Steinwerke AG	-	Rorschach	CH

Erze, Mineralien und Schlacken

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14·1060	Quick Lime	1	1971	Stadt. Kalksandsteinwerke AG	X	Saal	DE
14·1000	Limestone	1	1969	Surabaya A.B.		Salt	SE
14·1060	Quick Lime	1	1966	Stadt. Kalksandsteinwerke AG	-	Saal	DE
13.20	Titanium Slag	1	2007	China Vanpea Metallurgical Group	-	Kunming	CN
13·20	Manganese Dioxide	1	2001	Cegasa Portable Energy	X	Guipuzcoa	ES
13.2 SP	Titanium Slag	1	2001	Ticor SA	-	Empangeni	ZA
13·2 SP	Titanium Slag	1	1993	Anglo American Research Institute		Vredenburg	ZA
13.2	Colemanite	1	1997	Etibank	-	Bigadic	TR
13.2	Dolomite	1	1997	Zakłady Azotowe Kedzierzyn	X	Kedzierzyn	PL
13.2	Limestone	1	1991	Sappi Saiccor	-	Umkomaas	ZA
13.2	Limestone	1	1988	Kalkwerke Vilshofen GmbH	-	Vilshofen	DE
13.2	Feldspar	1	1987	Bikita Minerals (PVT.) Ltd	-	Bikita	ZW
13.2	Dolomite	1	1982	Petrimex-Cekop, for	-	Kedzierzyn	PL
13.1	Quick Lime	1	1982	Schirkat Ajoure Masseshkie	-	Pelidjkhar	IR
13.2	Talc	1	1979	Talkumwerke Naintsch GmbH	-	Oberfeistritz	AT
13.2	Quick Lime	1	1979	Voest-Alpine AG, for	-	Warri	NG
13.2	Limestone	1	1978	AECI	-	Modderfontein	ZA
13/950	Limestone	1	1966	Vinci S.p.A.	X	San Martino	IT
13/950	Dolomite	1	1975	Vinci S.p.A.	-	San Martino	IT
13/950	Limestone	1	1973	Ashidachi Limestone Co. Ltd.	-	Ashidachi	JP
13/950	Limestone	2	1973	Petrimex-Cekop, for	-	Trzuskawica	PL
13/950	Talc	1	1973	SOMI	-	Nuoro	IT
13/950	Limestone	1	1966	Gebr. Wandelsieben GmbH	-	Sarstedt	DE
13/950	Quick Lime	1	1961	Wopfinger Stein- und Kalkwerke Wien	X	Wopfing	AT
12.200	Quick Lime	1	2017	Carboprogetti Lime Technologies for Super Cement Manufacturing Co. L.L.C	-	Abu Dhabi	AE
12.20	Limestone	1	1989	Sobeckay Co., Ltd.	-	Suzuka	JP
12.20	Raw Phosphate	1	1964	Kyushu Chemical Co., Ltd.	-	Tobata	JP
12.20	Raw Phosphate	1	1963	Mitsui Toatsu Chemical Co., Ltd.	-	Yokkaichi	JP
12.20	Raw Phosphate	1	1961	UBE Industries Ltd.	-	Ube	JP
12.2	Quick Lime	1	2015	Alamin GmbH	-	Magnitogorsk	RU
12.2	Limestone	1	1988	Nakayama Sekkai Kogyo, Ltd.	-	Kuabo	JP
12/850	Limestone	1	1988	Kalkfabrik Neutal AG	-	Neutal	CH
12/850	Bentonite	1	1975	Bong Mining Co.	X	Monrovia	LR
12/850	Quick Lime	1	1975	Ets. Victor Warnquier S.A.	-	Elouges	BE
12/850	Bentonite	1	1975	Voest-Alpine AG, for	-	Chowgule	IN
12/850	Bentonite	1	1974	Hasenag KG, for	-	Iligan	PH
12/850	Bentonite	1	1974	Hasenag KG, for	-	Manila	PH
12/850	Titanium Dioxide	2	1973	Cinkarna	-	Celje	SI
12/850	Shale	1	1971	Lonza Werke AG	X	Visp	CH
12/850	Bentonite	1	1969	Bong Mining Co.	-	Monrovia	LR
12/850	Quick Lime	1	1969	Skanska Cement AB	-	Limhamn	SE
12/850	Limestone	1	1968	Reynerholms Gamla Industri AB	-	Helsingborg	SE
12/850	Titanium Dioxide	1	1966	Thann et Mulhouse	-	Le Havre	FR
12/850	Limestone	1	1957	Ilseder Schlackenverwertung	-	Peiner	DE
12/850	Magnesite	1	1967	Mino Yogyo Co. Ltd.	X	Mitsuwashi	JP
12/850	Raw Phosphate	1	1967	UBE Industries Ltd.	X	Ube	JP
12/850	Raw Phosphate	1	1965	Toyo Gas Chemicals Inc.	-	Tokyo	JP
12/850	Bentonite	1	1962	Tolsa S.A.	-	Toledo	ES
12/800	Limestone	2	1971	S.I.M.A.	-	Valmeara	IT
12/800	Limestone	2	1965	Hibernia-Chemie	X	Herne	DE

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Erze, Mineralien und Schlacken

Vermahlung von Erzen fur Aufbereitungsanlagen. Vermahlung von Mineralien für Aufbereinungsanlagen oder auf Endfeinheit, Vermahlung von pyrometallurgischen Zwischenprodukten und Schlacken für weitere pyrometallurgische Aufbereiung oder Metallrückgewinnung

11.2	Limestone	1	1987	Bihoku Funka Kogyo Ltd.	-	Neimi	JP
10.3	Limestone	1	1987	Fuji Talc Kogyo, Ltd.	-	Sakai	JP
10.20	Raw Phosphate	1	1964	Mitsui Toatsu Chemical Co., Ltd.	-	Sumakawa	JP
10.2	Limestone	1	1986	Sobueclay Co., Ltd.	-	Syzuka	JP
10/750	Limestone	1	1977	Agregados Calcareos S.A.	-	Lima	PE
10750	Raw Phosphate	2	1963	Taiwan Fertilizer Co.	X	Kaohsiung	TW
9.2	Limestone	1	1988	Yamashi Kogyo, Ltd.	-	Nilmi	JP
9/760	Manganese Dioxide	1	1979	Mitsubishi International GmbH, for	X	Thessaloniki	GR
9/780	Manganese Dioxide	1	1973	Mitsubishi International GmbH, for	-	Thessaloniki	GR
9/750	Colemanite	1	1969	Minerallunion	X	Neuss/Rhein	DE
9/760	Talc	1	1969	Minetalia Valtellinese	X	Sondrio	IT
9/670	Limestone	1	1975	Turkiye Sise ve Cam	-	Istanbul	TR
9/630	Limestone	1	1972	Aymar	-	San Celoni	ES
9/630	Magnesite	1	1971	Minerallunion	X	Neuss/Rhein	DE
9/630	Raw Phosphate	1	1961	Compania Navarra Abonos Quimicos S.A.	X	Pamplona	ES
9	Calcined Managnese Ore	1	2000	Delta EMD	X	Hotazel	ZA
9	Electrolytic Manganese Dioxide	1	1996	Delta EMD	X	Nelspruit	ZA
9	Manganese Dioxide	1	1990	Delta (E.M.D.) (Pty) Ltd.	-	Nelspruit	ZA
7/530	Manganese Dioxide	1	1989	Cegasa Portable Energy	-	Guipuzcoa	ES
7	Electrolytic Manganese Dioxide	1	2001	Delta EMD	X	Nelspruit	ZA
3.6	Manganese Ore	1	2002	Manganese Metal Company	-	Nelspruit	ZA
3.6	Ore Various	1	1999	Anglo American Research Institute	X	Johannesburg	ZA
3.6	Electrolytic Manganese Dioxide	1	1999	Delta EMD	X	Nelspruit	ZA
3.6	Pariumferrite	1	1972	Robert Bosch GmbH	X	Stuttgart	DE
Small Mill	Ore	1	2018	TU Bergakademie Freiberg	-	Freiberg	DE
CCP	Bentonite	1	2015	Cimsa (Turkiye) Boya Kimyevi	-	Balikesir	TR

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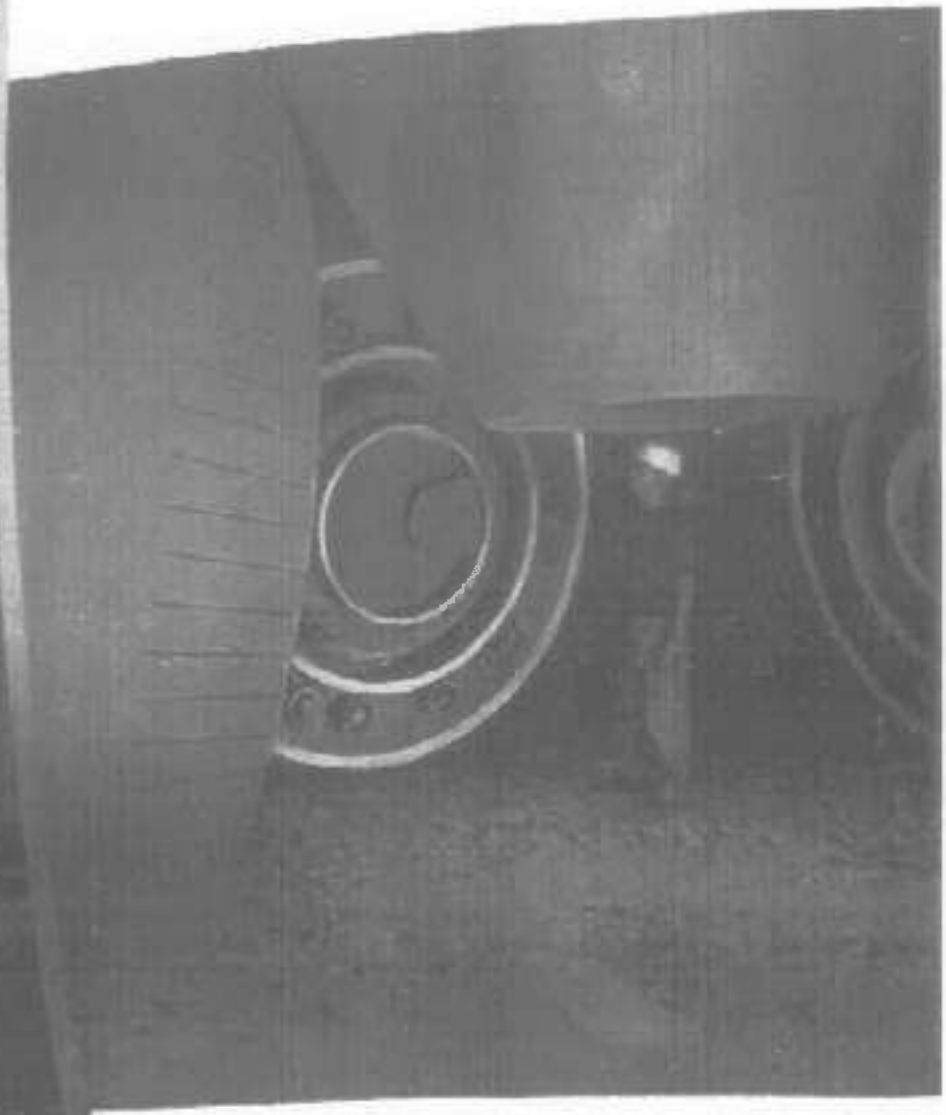
FOR CEMENT RAW MATERIAL



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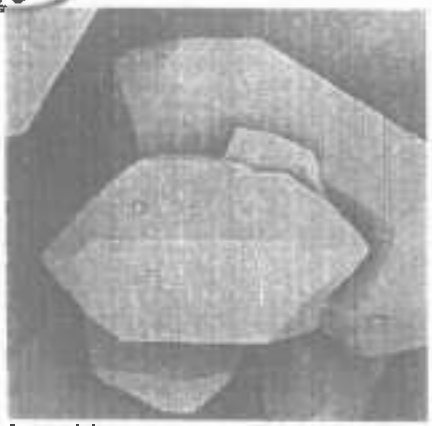
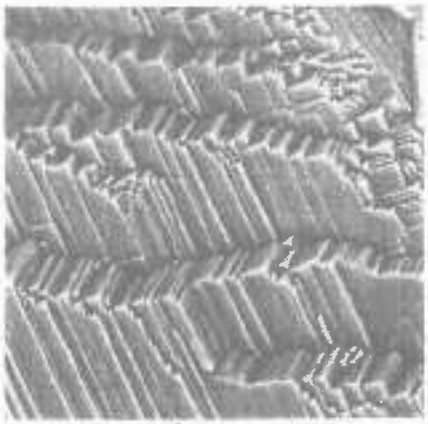
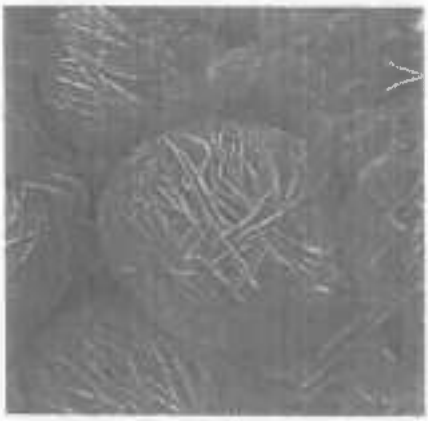


Quartz (SiO_2) 50µm

Calcite ($CaCO_3$) 20µm

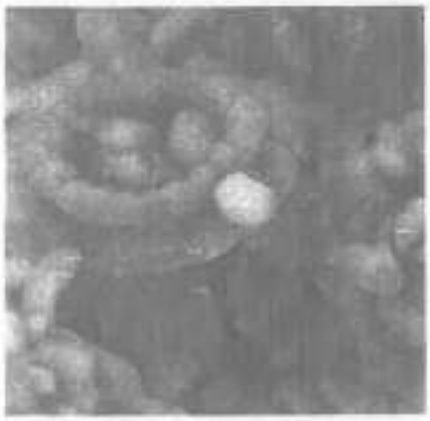


Aluminum oxide (Al_2O_3) 5µm

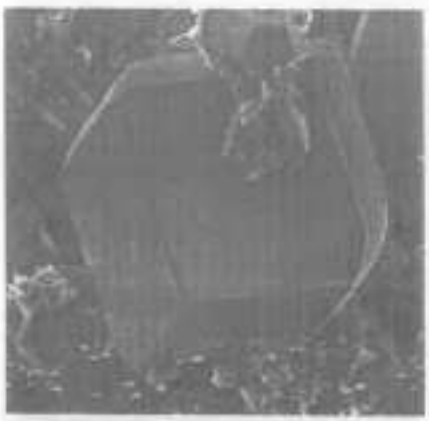


Iron oxide (Fe_2O_3) 20µm

Dolomite ($CaCO_3$ + $MgCO_3$) 20µm

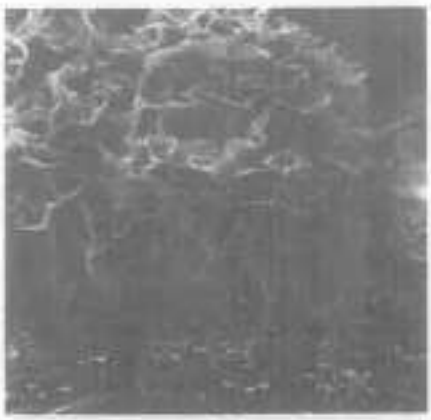


Chalk ($CaCO_3$) 2µm



Hydromagnesite + Calcite 5µm

Hydromagnesite + Calcite 2µm



Clay 30µm

Air-cooled blast furnace slag 1µm

Iron oxide, Titanium oxide and Orthoclase 30µm

Air-cooled blast furnace slag 5µm

Pollutes originated at the electron microscope laboratory of Bauhaus-University Weimar

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REVIEW

Detailed information about the Loesche products outlined in brief here can be obtained from the product-specific brochures available at www.loesche.com

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Loesche – worldwide presence

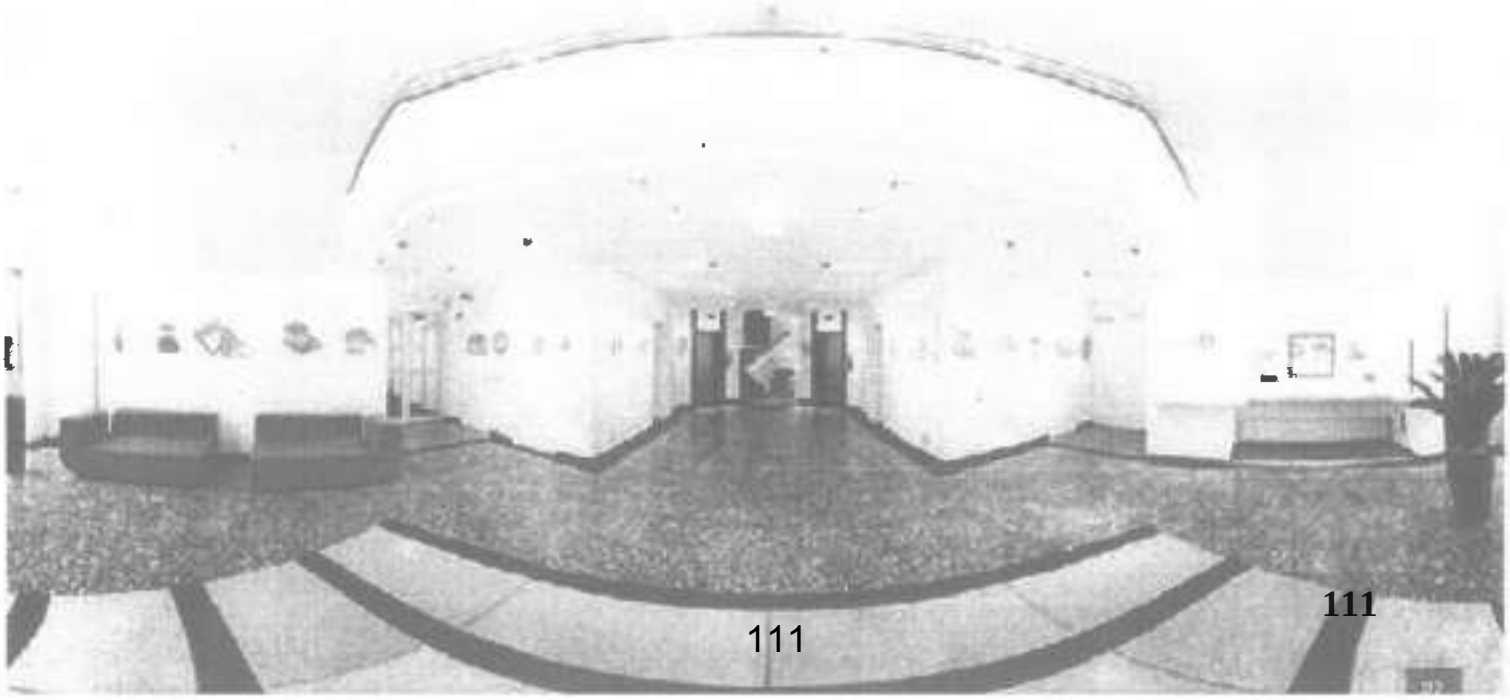
Loesche is an export-oriented company run by the owner, which was established in 1906 in Berlin. Today the company is internationally active with subsidiaries, representatives and agencies worldwide.

Our engineers are constantly developing new ideas and individual concepts for grinding technologies and preparation processes for the benefit of our customers. Their competence is mainly due to our worldwide information management.

This ensures that current knowledge and developments can also be used immediately for our own projects.

The services of our subsidiaries and agencies are of key importance for analysis, processing and solving specific project problems for our customers.

Please visit our homepage at **www.loesche.com**
for up-to-date information on our overseas companies.



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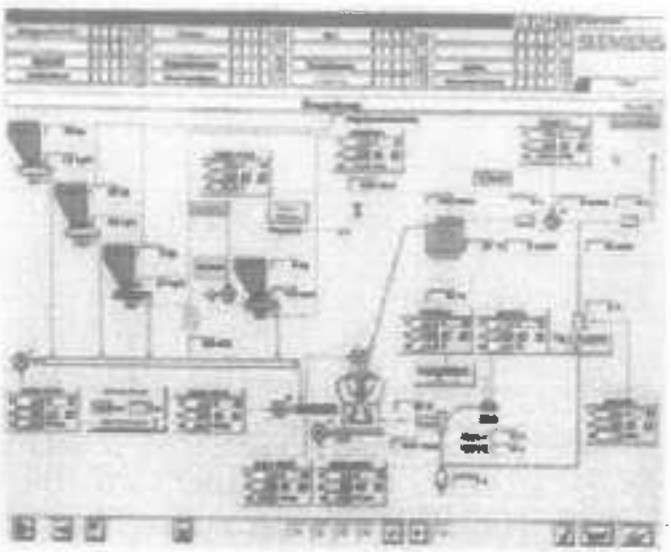
The Loesche test facility for raw materials testing, Research and Development

Calibrated standard grinding tests for mill sizing

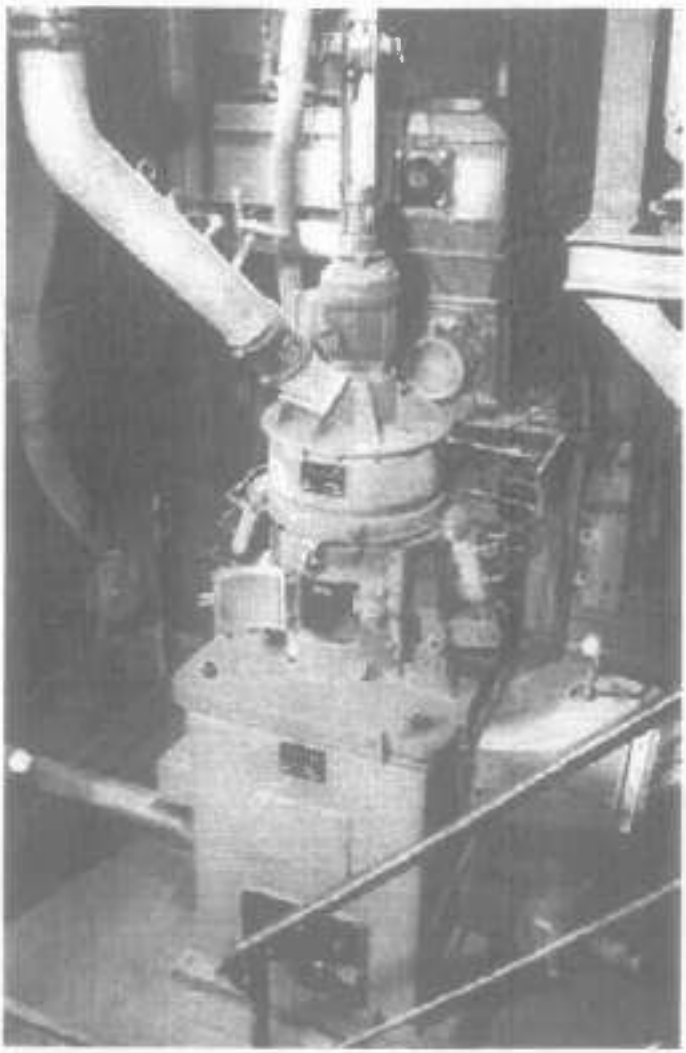
Loesche has many years of experience in designing grinding mills. The most important prerequisite for correctly designed grinding mills is an exact knowledge of the physical properties of the materials to be ground.

The most important characteristic values of a material to be ground are the Loesche grindability factor and the specific power demand in relation to a defined fineness. Depending on the geological formation of the material to be ground, materials with highly different properties are found in nature, even with materials which appear visually to be similar.

Three well equipped laboratory LM 3.6 grinding mills are available in the Loesche test plant for performing standard grinding tests.



Fully-automatic operation with PLC



LM 3.6 laboratory mill

Technological development through practical laboratory grinding tests

One of the first steps in introducing new technologies is the practical laboratory test.

Within the framework of our research and development projects the following actions are carried out:

- New materials for grinding of future market requirements are examined
- Optimised mill settings for special products are determined
- Plant components and process configurations are optimised
- New wear materials and concepts are tested

Our test plant is constructed in such a way that various modes of operation and plant process configurations can be simulated in the tests.

Analysis possibilities

- Pure density determination with gas pycnometer
- Determination of mass-related surface according to Blaine
- Grain size analysis with Cilas laser granulometer
- Sieve analyses with Alpine air-jet screening method
- Sieve analyses with Retsch vibrating sieves
- Grindability according to Hardgrove
- Grindability according to Zeisel
- Microscopy with Zeiss Stemi SV11
- Drying ovens for moisture determination
- Coal testing (Cfix, volatile matter, ash content)

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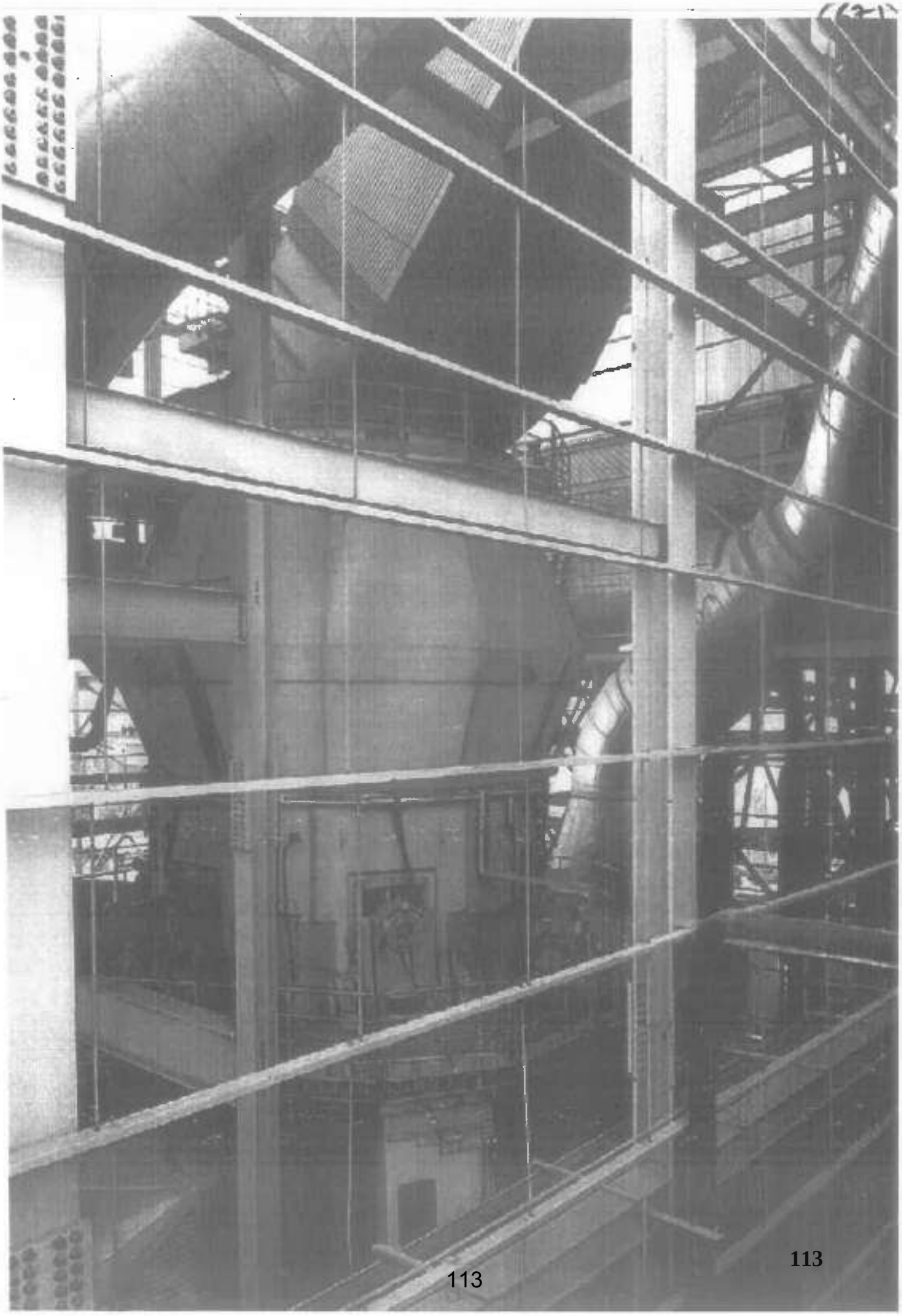

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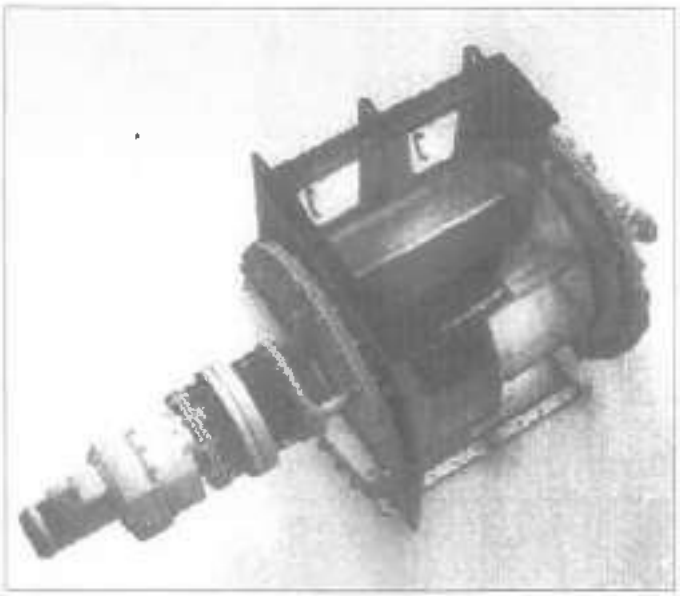
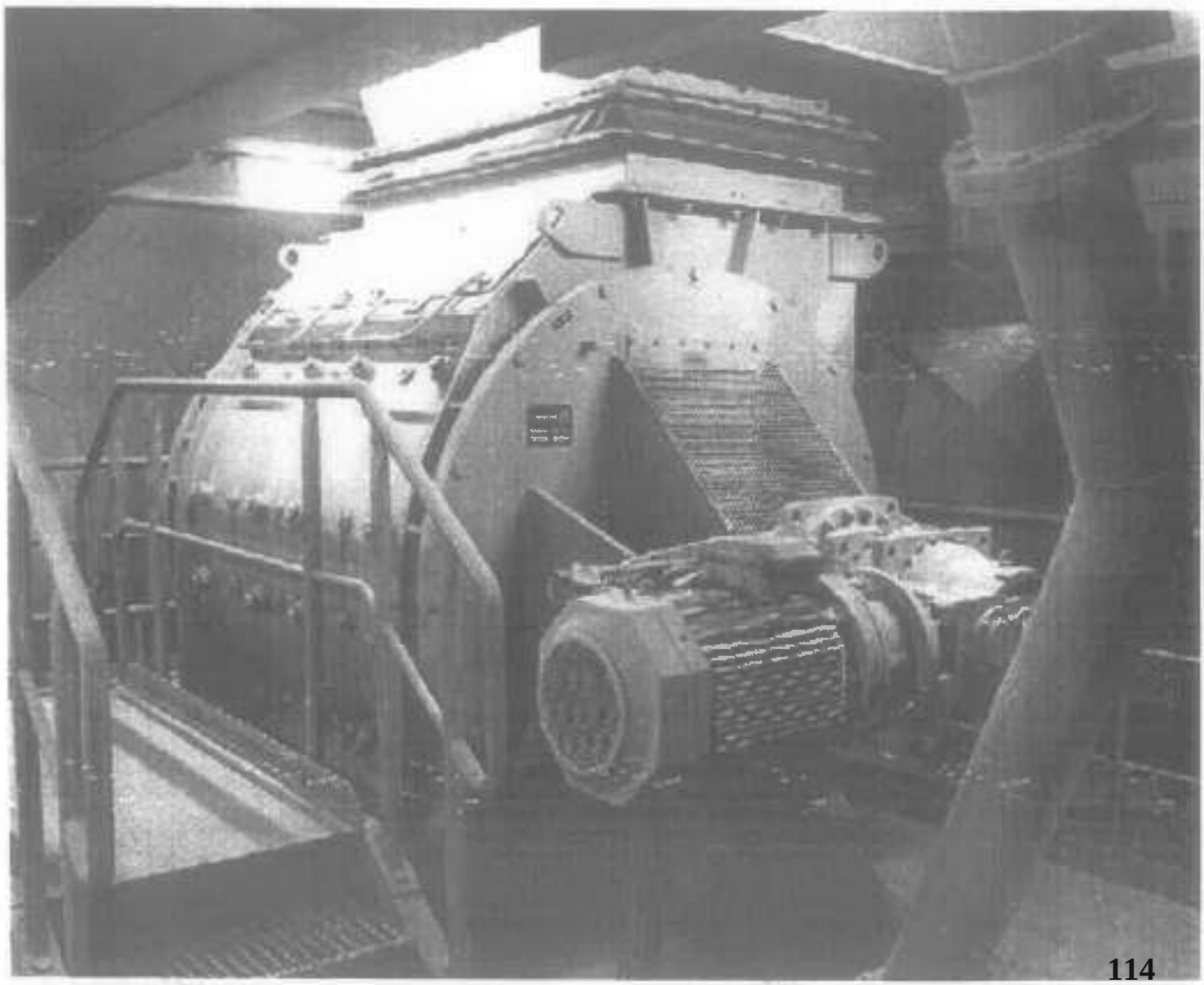
Loesche rotary vane feeder

Feeding of Loesche mills is carried out via a rotary vane feeder in order to prevent infiltration air ingress into the mill interior.

Material is fed continuously from above via the inlet hopper into every vane pocket of the slowly rotating vane feeder. In order to reduce wear from the abrasive feed stock the peripheral speed is low and the filling level limited to 40%. Adjustable sealing strips on the rotor prevent any large gaps between the wearing plate of the housing and the rotor. The material is discharged downwards into the feed chute of the mill.

Hot gas can be passed through the inside of the rotary feeder to prevent material caking. It is easy to dismantle for maintenance purposes.





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Loesche hot gas generator

The perforated jacket combustion system developed by Loesche in the mid 1960's consists of a combustion chamber of heat resistant steel with burner muffle, and is well known in the market under the name LOMA Hot Gas Generator. The LOMA Hot Gas Generator has been used worldwide for decades in many different types of thermal processes for optimization.

Design and operation

- The combustion chamber consists of heat resistant steels – no refractory brickwork is necessary.
- When starting up the hot gas generator heat losses are minimised since it is not necessary to heat up refractory brickwork. A start at full load is therefore possible.
- Very good thermal shock resistance and rapid load changes with only a short delay
- High cooling rate of the combustion chamber prevents thermal overloading of following units. An EMERGENCY chimney stack is not necessary in EMERGENCY-OFF SITUATIONS and when starting and stopping.
- Accessible within a short time for inspection
- Low wear
- Short installation times, low weight, small space requirement. Can be installed in existing plants. Complete preassembly is carried out – also for larger LOMA combustion units.

Loesche hot gas generators are used where hot gases are required for direct drying, e.g. in the cement, steel, industrial minerals, ore, wood, cattle food, agri-food and chemical industries.

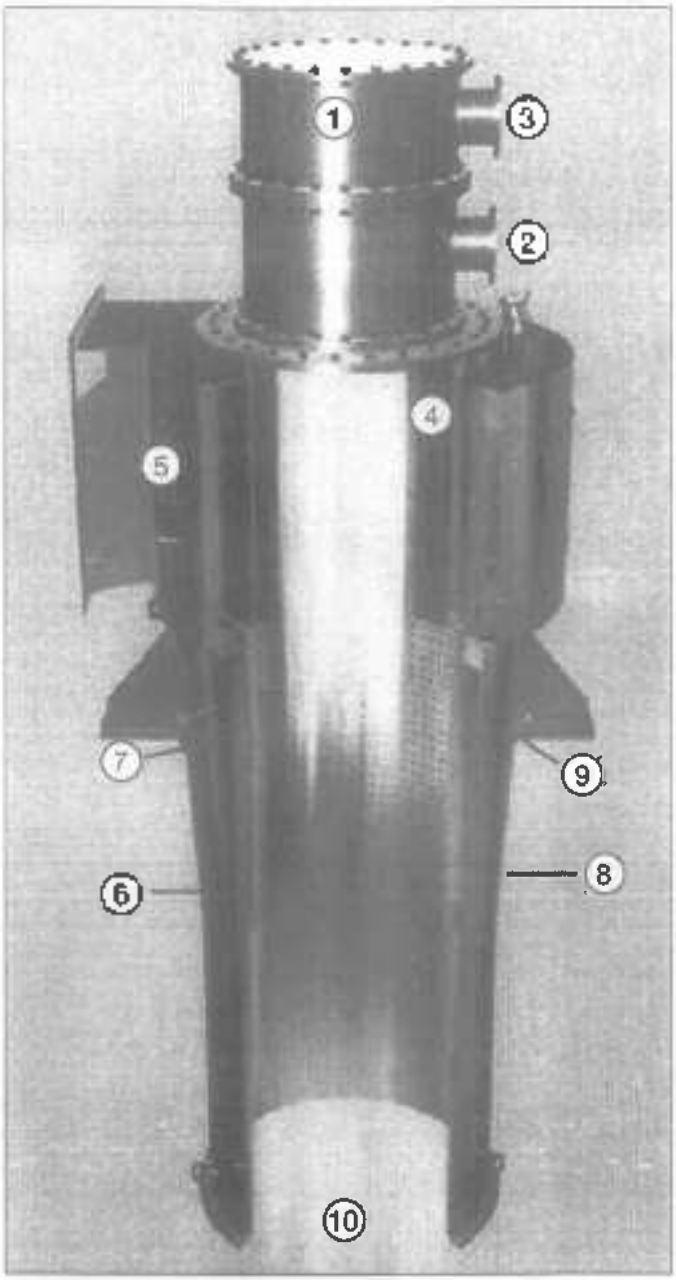
Mode of operation

The process gas stream which enters the spiral housing ⑤ cools both the protective jacket housing ⑧ and the perforated jacket ⑥, as a result of the flow pattern. The process gas enters the interior of the combustion chamber through the annular gap ⑦ and holes in the perforated jacket, and mixes there with the hot flue gases from combustion. At the same time the flame and hot flue gases are kept away from the perforated jacket.

Heating media

- Natural gas, bio gas, coke gas, blast furnace gas and other low calorific value gases
- Light and heavy oils, wood and lignite dust

LOMA Hot Gas Generator units are constantly being developed and conform to current technical standards. More than 600 hot gas generators of this type have been commissioned for a heat flow of between 100 kW and 64,000 kW.



Construction

① Burner
② Fuel
③ Combustion air
④ Burner muffle
⑤ Spiral housing
⑥ Perforated jacket
⑦ Annular gap
⑧ Protective casing
⑨ Temperature control
⑩ Hot gas outlet

LOMA combustion unit type LF 65 with a natural gas burner, 2005

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Dynamic Loesche classifier LSKS

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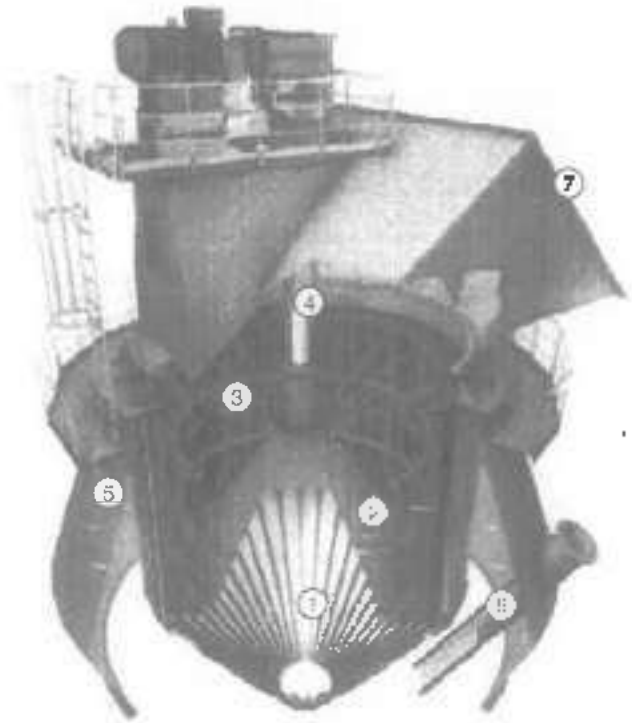

Structure:

- ⓒ Grit return
- ① Guide vane
- ③ Rotor with classifier blades
- ④ Rotor shaft
- ⑤ Housing
- ⑥ Material feed chute
- ⑦ Product discharge

The classifier can separate particle sizes of up to 1 µm (and generate products with residues of 1% R 10 µm). The mechanical components of the classifier in combination with process influencing parameters can produce various particle size distributions.

The LSKS classifier is able to operate both at high selection efficiency for a narrow particle size distribution, as well as with a wide particle size distribution.
The gas / particle stream from the mill is passed to the classifier chamber via a static guide vane device ⑤. The gas-solids mixture flows through the adjustable guide vane ② and is presented to the radially bladed, concentrically placed, classifier rotor ③.

The rotor accelerates the gas-solids mixture tangentially. The centrifugal force produced rejects the oversize material.

Through selection of the rotor speed, in combination with the gas stream and its direction of flow, the required separation grain size can be adjusted within a wide range.

A special feature of this classifier type is the continuous re-classification of the particle stream rejected by the rotor. When the particles are thrown outwards by centrifugal force into the annular gap between static guide vane and rotor they are again subjected to the upwards/inwards directed gas stream. In this way agglomerated particles can be more easily separated, so that they follow the product stream as single grains and do not fall back onto the grinding table with oversize material as apparent oversize.

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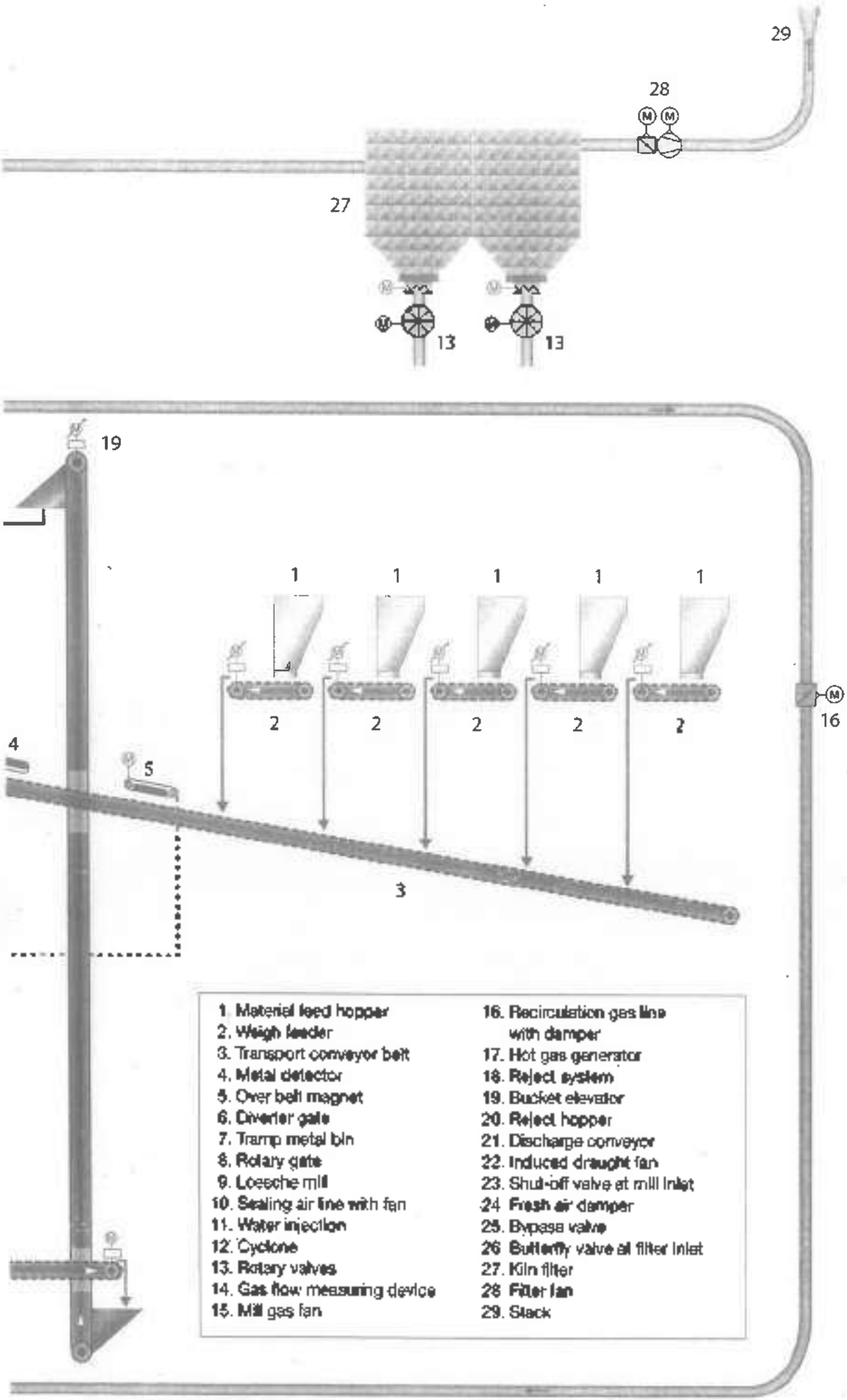
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1. Material feed hopper
2. Weigh feeder
3. Transport conveyor belt
4. Metal detector
5. Over belt magnet
6. Diverter gate
7. Tramp metal bin
8. Rotary gate
9. Loesche mill
10. Sealing air line with fan
11. Water injection
12. Cyclone
13. Rotary valves
14. Gas flow measuring device
15. Mill gas fan
16. Recirculation gas line with damper
17. Hot gas generator
18. Reject system
19. Bucket elevator
20. Reject hopper
21. Discharge conveyor
22. Induced draught fan
23. Shut-off valve at mill inlet
24. Fresh air damper
25. Bypass valve
26. Butterfly valve at filter inlet
27. Kiln filter
28. Filter fan
29. Stack

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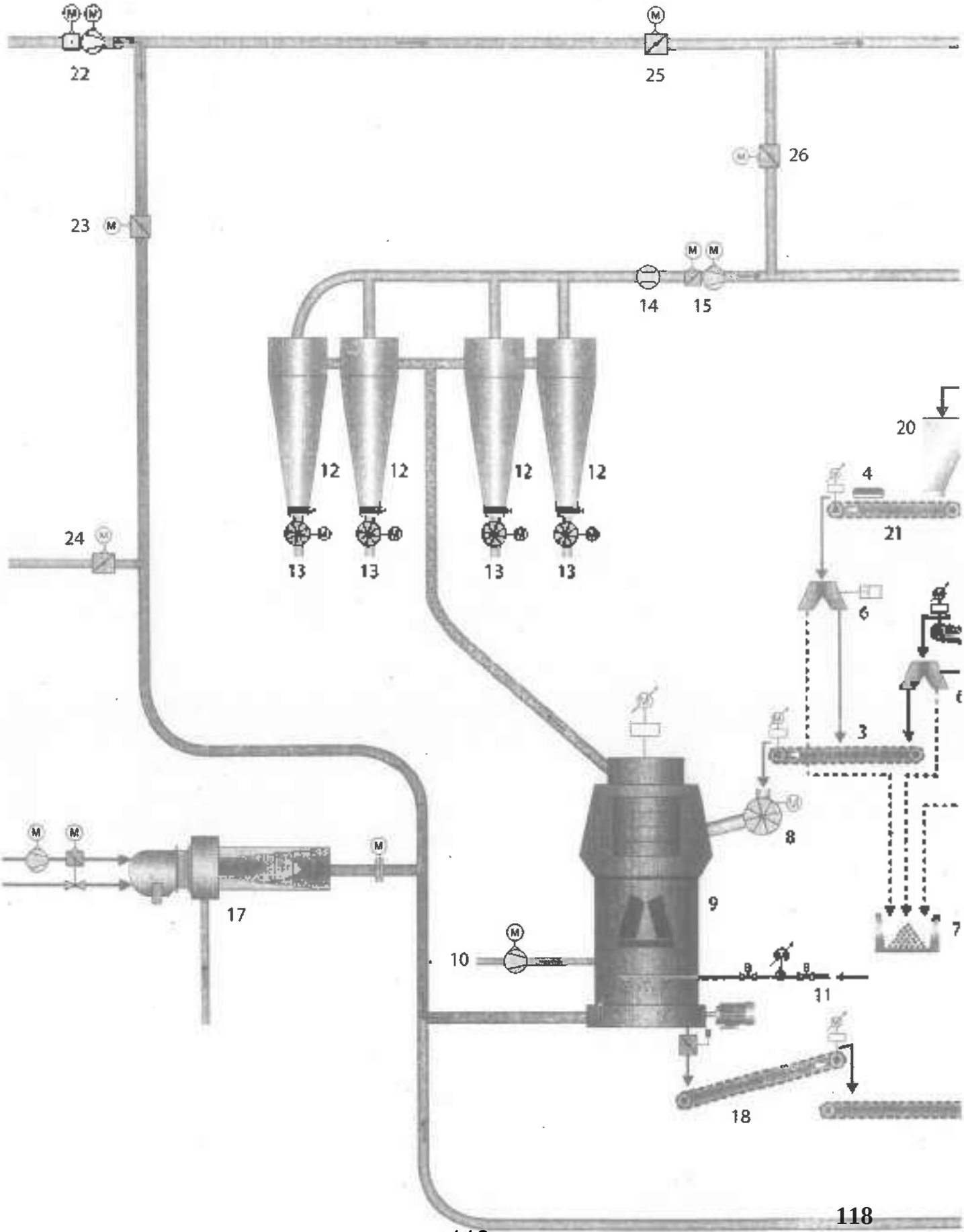

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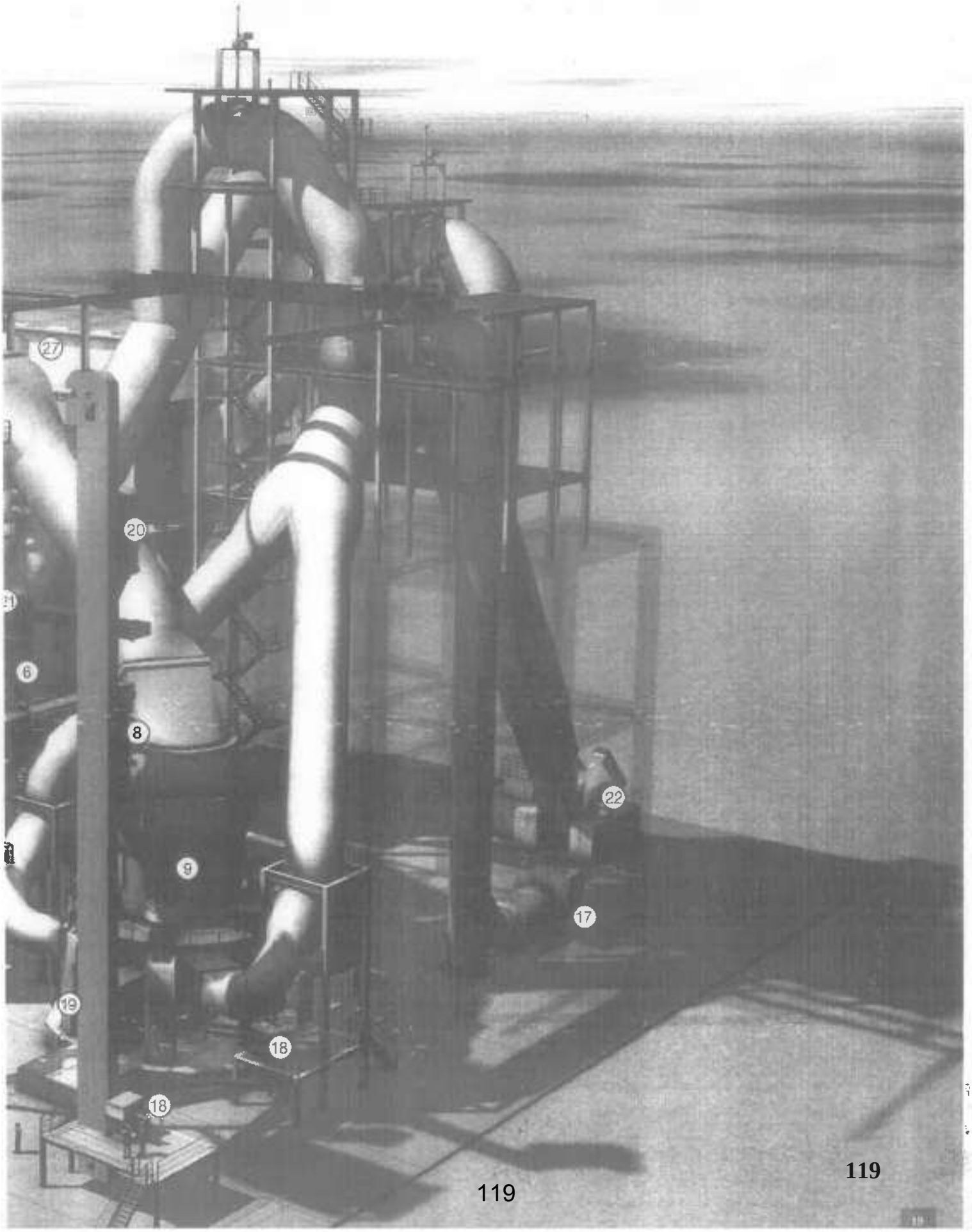

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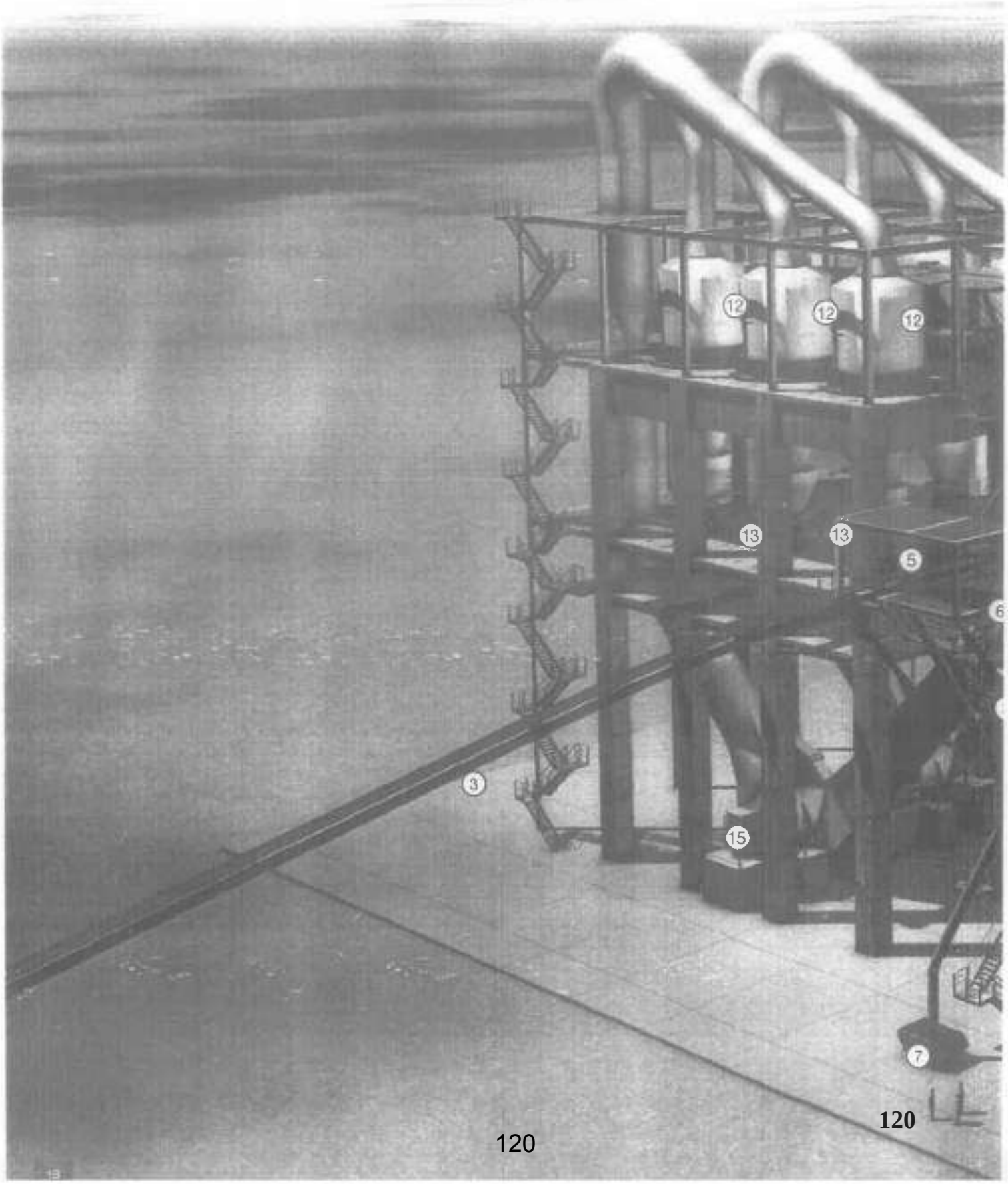

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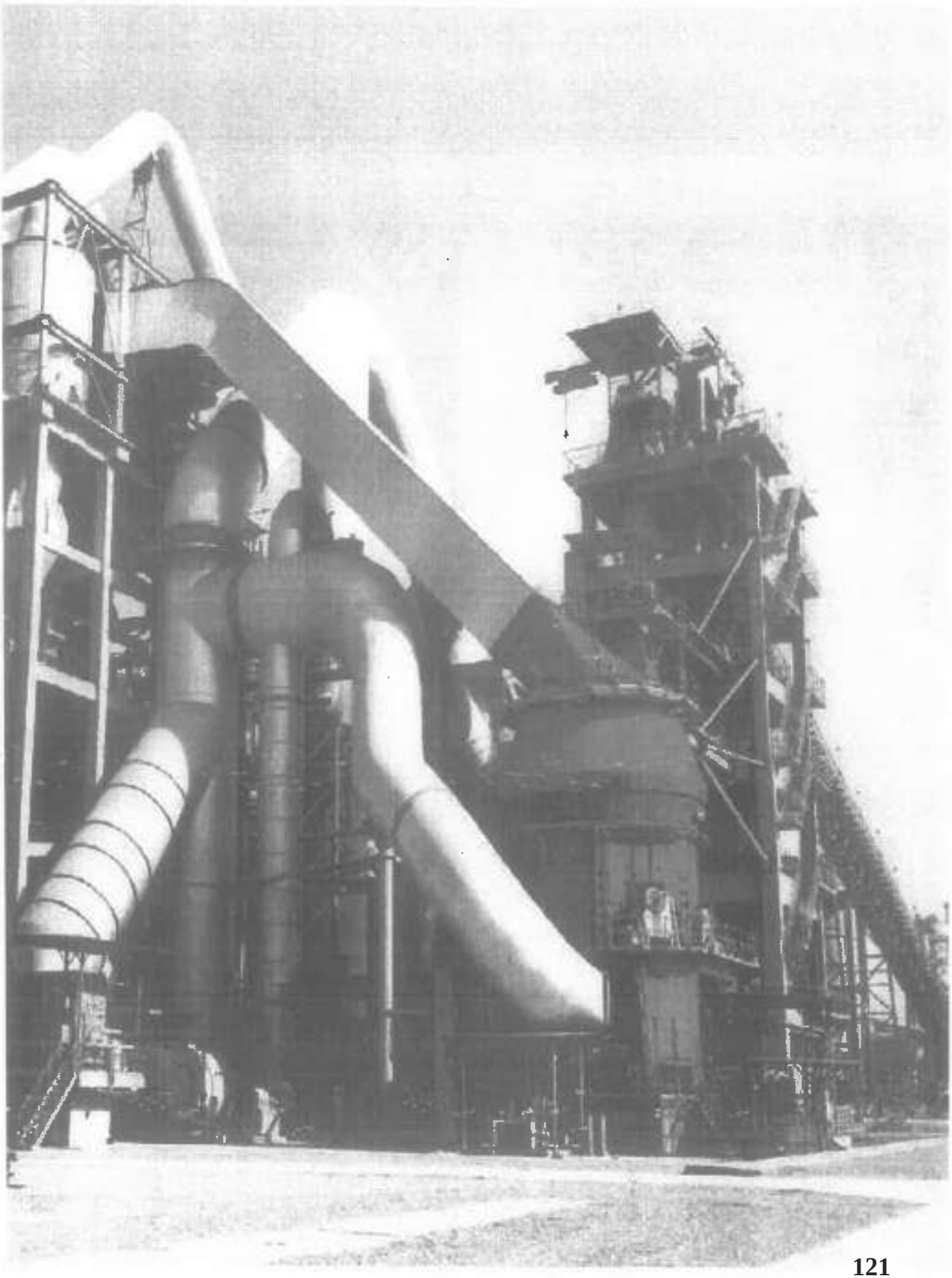

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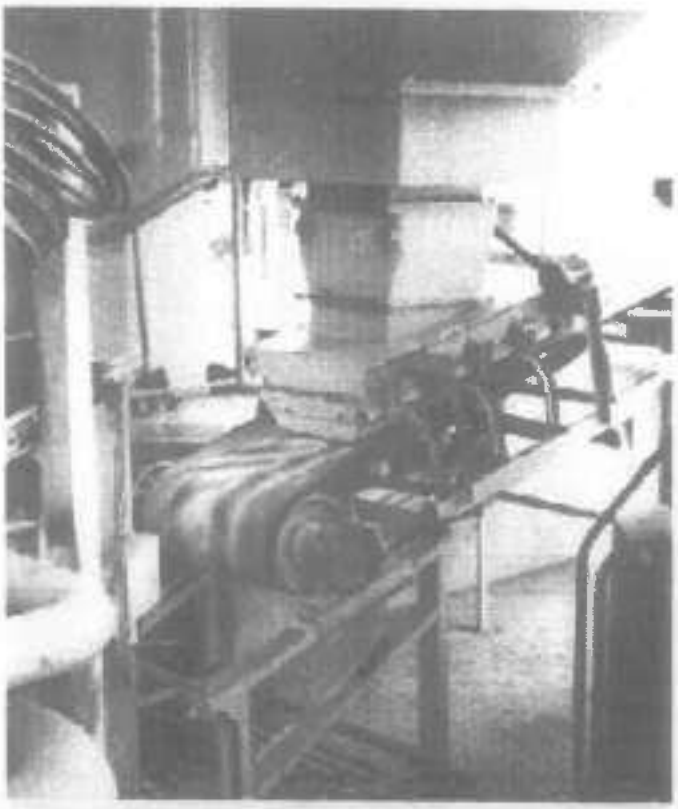
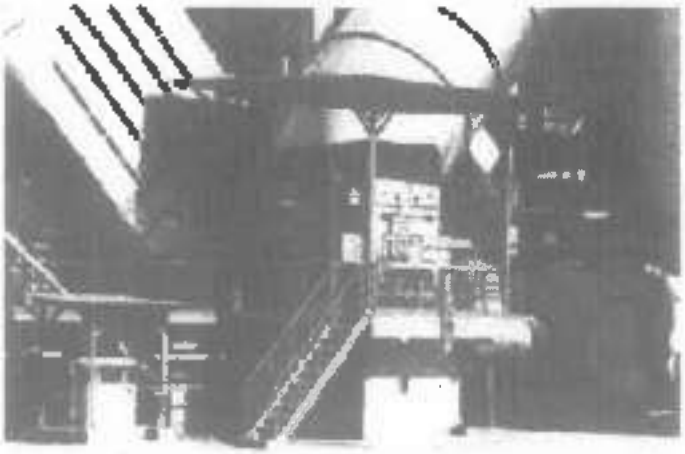
Reject treatment

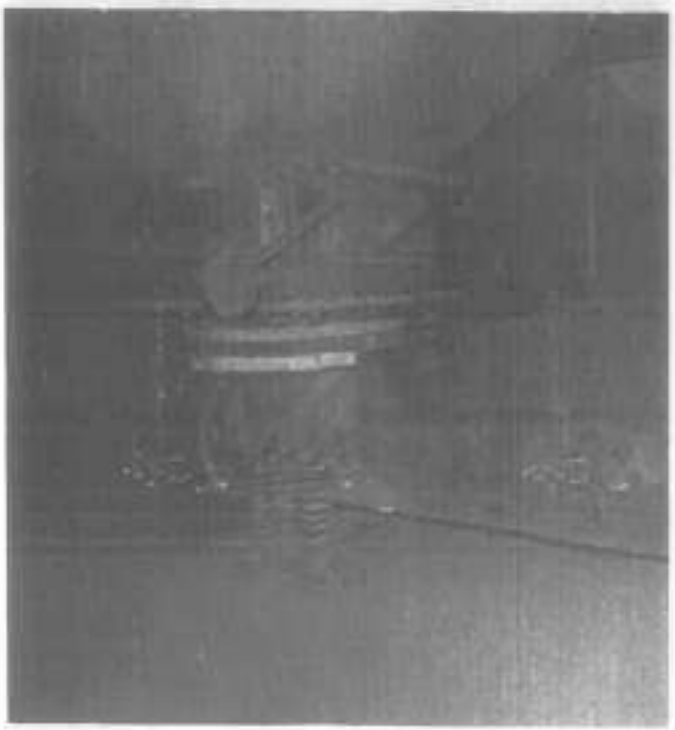
The reject material passing through the louvre ring is automatically cleaned out and transported off via an airtight encapsulated conveyor and bucket elevator. The flow of feed material to the mill, which is the sum of the fresh material and reject material, is maintained at a constant level by the proportioning system.

Mill fan

The mill fan requires no wear protection due to the high efficiency of the dust separator. It is generally equipped with an inlet vane control and / or a variable speed drive.







Process and measuring and control equipment

The heat required to dry the material to be ground is controlled by the process control system such that that gas temperature at the mill outlet remains constant. The preferred source of the heat energy required is provided by the exhaust gas flow of the rotary kiln. If this is insufficient, heat must be provided from other sources. A separate hot gas generator (LOMA combustion chamber) as well as gases from other processes such as preheated waste gases, clinker cooler exhaust gases and exhaust gases from diesel generators etc. are suitable for this.

Part of the process gas is recirculated upstream of the dust separator in order to utilise its heat content. The remaining part is exhausted via a stack. A fresh air flap is located in the recirculation gas duct to the mill. Where exhaust gas temperatures reach over 100°C at the mill outlet cold fresh air can be sucked in from the atmosphere; this fresh air reduces the temperature of the mill exhaust gas to the desired temperature. The upper temperature limit is determined by the thermal resistance of the filter (bag material), the lower temperature limit by the dew point of the stream of dust gas. Levels must under no circumstances fall below this lower limit in order to prevent condensation.

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Complete grinding plants with components

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Until the end of the 1950s Loesche mills were deployed in the power station industry as coal direct firing mills for steam furnaces in model sizes up to LM 16. In the limestone and fertiliser area mill sizes of up to LM 18 with product throughputs of up to 40 t/h were common. Relatively few vertical mills are still being used for grinding cement raw material in cement works. Most can be found in cement works with shaft kilns. The biggest mill in 1960 was an LM 20 with approx. 50 t/h product throughput and drive power of 400 kW.

The need for Loesche mills for grinding cement raw material skyrockets at the start of the 1960s. The reason for this trend is the technological development in the cement manufacturing process which moves away from the energy-intensive wet procedure to the semi-dry process and ultimately to the dry process with precalcination. As a result the kiln throughput increased dramatically with simultaneous significant reduction in specific energy consumption.

From the beginning Loesche develops mill sizes that are adapted to the throughput of the cement rotary kiln.

The mills launched onto the market satisfy the following requirements:

- Mill capacities adapted to the raw meal requirements of the rotary kilns and which permit parallel operation of the kiln and mill.
- Mill sizes that permit the parallel operation of a kiln with a mill, a concept that is specifically up to 30% more cost effective than the parallel operation of a rotary kiln with 2 roller mills! This Loesche philosophy has been proven to be correct and is today generally accepted by customers.
- Mills which make ideal use of the exhaust gases of the rotary kiln for dry grinding and for transportation of the grinding materials with low specific energy consumption [kWh/t].
- Grinding, drying, classifying in one machine unit through to the ground product with the required grain distribution and residual moisture.
- Grinding plants which can be quickly adjusted in line with the operational requirements of the firing process.

Feed of the materials to be ground

The cement raw material is crushed up in the traditional manner and stored in raw material hoppers according to components. From there it is proportioned and added to the mill feed belt. The speed of the conveyor belt can be regulated.

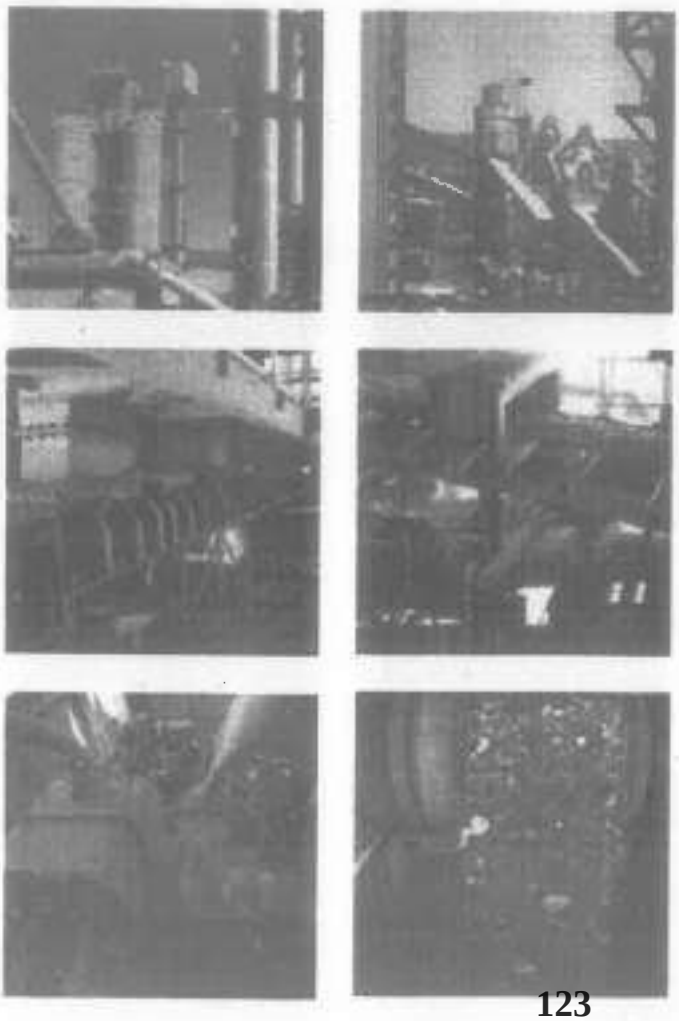
A belt magnet and a metal detector for separating larger metallic parts of foreign matter are situated in the path of the material to the mill.

The material then passes into the mill hermetically sealed through a rotary feeder or a gate feeder. The rotary feeders are specially adapted to the properties of the feed material. Thus oversized pieces, so-called "fish" or tree roots are used as reference for the maximum filling level of the cells. The calculated filling level of the chambers is less than 40 % of the pocket volume in order to prevent the rotor clogging. Both types of gate can be heated using process gas in the case of moist feed material.

Rotary and gate feeders are equipped with wear protection.

Grinding and classifying

The raw material is ground and dried in the mill. Mills with 2 rollers have one hot gas entry channel, while those with three and four rollers have two and mills with six rolls have four. The process gas is distributed from there uniformly by means of guide vanes into the grinding bed chamber. When it leaves the grinding table the ground material together with the process gas, which has since been cooled by water evaporation to below 100°C, is led to the classifier on the mill. The powdered ground product leaves the classifier and is separated in a downstream filter or a combination of cyclone battery with (smaller) filter. Separated grit falls back onto the grinding track along with fresh material.



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The homogeneity and fineness of the cement raw meal also plays an important role in the downstream sintering process in addition to the correct chemical composition of the raw meal mixture.

There are high demands with respect to the permitted residual moisture in the ground product.

The residual moisture (max. 0.5 M %) must be just as homogeneous as the distributed chemical components.

This also means that where water content varies, for example in the case of limestone and clays, the residual moisture content of each component of the finished material must be approximately the same. The process control system of the Loesche mill guarantees this.

CEMENT RAW MATERIAL

Tests on materials to be ground

The characteristics of the cement raw material must be known in order to determine the size of the mill and classifier. The material properties are examined in the Loesche test plant. Ideally the customer supplies the test plant with a representative sample of the cement raw material compound as used in this factory. If a quarry has not yet been opened in the case of new construction projects, specified quantities of individual components are supplied and chemically analysed. Their moisture is measured and under some circumstances adjusted. A quantity of feed material amounting to at least 1,5 t is prepared from the supplied or manufactured raw material compound. If the supplied grain size is too coarse for the Loesche laboratory mill, the required feed material grain size is generated in the Loesche laboratory crusher in an intermediate stage before grinding. The raw material is then completely ground, dried and classified in the Loesche test plant mill in continuous operation.

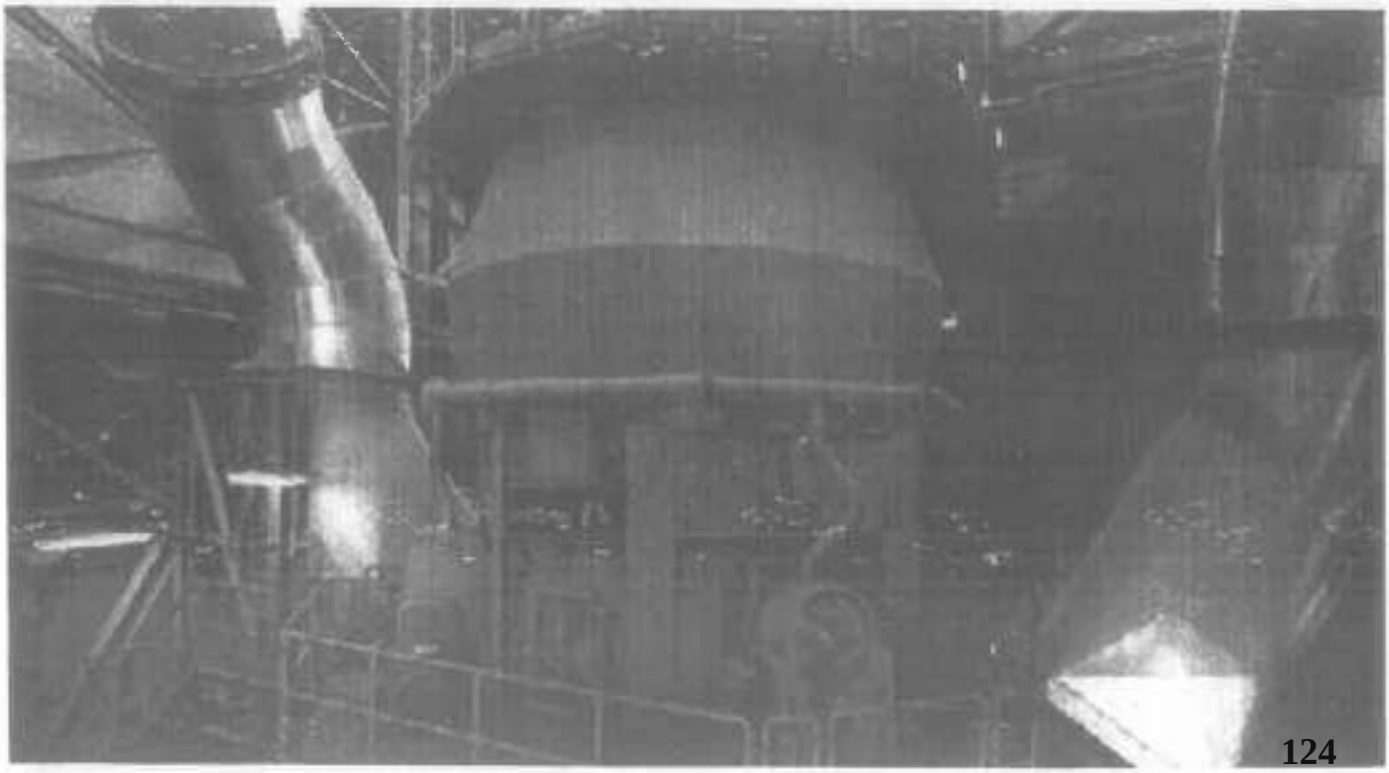
The test grinding delivers the following representative results:

- Loesche grindability factor "MF";
- Loesche fineness factor "FF";
- Moisture factor "WF" with water content of > 8 %;
- Specific energy consumption "e" [kWh / t];
- Wear factor "V_p".

The appropriate Loesche mill is determined using these parameters and standard charts.

Notwithstanding these standardised methods, other decisive variables flow into the dimensioning of the mill, the classifier and also the mill fan, such as extremely high grinding material moisture or very high differences in the case of grindability factors of individual raw material components.

Loesche mill Type LM 38.4, Biasi, Italy, 2004



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According to Labahn & Kohlhaas the following terms are common for the raw materials used arranged with diminishing $CaCO_3$ content:

- Pure limestone > 95 M. – % $CaCO_3$
- Marly limestone 85 – 95 M. – % $CaCO_3$
- Lime marl 70 – 85 M. – % $CaCO_3$
- Marl 30 – 70 M. – % $CaCO_3$
- Argillaceous marl 15 – 30 M. – % $CaCO_3$
- Marly clay 5 – 15 M. – % $CaCO_3$
- Clay < 5 M. – % $CaCO_3$

Cement raw materials require a $CaCO_3$ content of between 74 and 79 M %. The desired raw material composition is rarely found in a natural raw material.

For this reason materials containing SiO_2 and ferric oxide as well as fluorites must be used as correcting materials to precisely adjust the required raw material compounds and to improve sintering.

Some of these grinding materials additives are highly abrasive and lead to the disproportionate wear of grinding parts, areas of machines and in ducts through high speeds of gas-solid mixtures. Loesche takes suitable protective measures against wear when materials of this nature are used.

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Raw materials for grinding

Cement raw material; deposits

Cement raw material is principally a compound made of limestone and argillaceous rock, which undergoes mechanical and thermal treatment to create cement clinker. The geological formation, material composition and water content influence the grinding dryness and energy requirements.

The raw materials are classified according to their origin into

- **natural mineral raw materials** and
- **synthetic mineral materials**

that are by-products or waste products from other branches of industry deploying raw materials.

The suitability of natural and synthetic mineral raw materials for manufacturing binding agents is primarily determined by their chemical composition.

The following fields are chiefly used for the provision of the most important components:

- **Carbonate fields,**
  consisting for example of shell limestone, white Jura, chalk etc.
- **Silicate aluminate deposits,**
  consisting for example of sandstone and argillaceous rock, magmatic and metamorphic rocks etc.

For a good and fast reaction during the firing process it is more favourable to use those materials whose composition is by nature closer to the desired chemical compound.

The compositions of raw material compounds used in practice can be most easily represented using the table from LABAHN & KOHLHAAS (1982).

Chemical composition of cement raw material; ignition loss-free.
[LABAHN & KOHLHAAS, 1982]

MINERAL	OXIDE	min. and max. mass[%]
LIMESTONE	CaO	60 – 69
SILICATE	SiO_2	18 – 24
CLAY	Al_2O_3	4 – 8
FERRIC OXIDE	Fe_2O_3	1 – 8
MAGNESIUM OXIDE	MgO	< 5.0
POTASSIUM OXIDE/SODIUM OXIDE	K_2O; Na_2O	< 2.0
SULPHUR TRIOXIDE	SO_3	< 3.0

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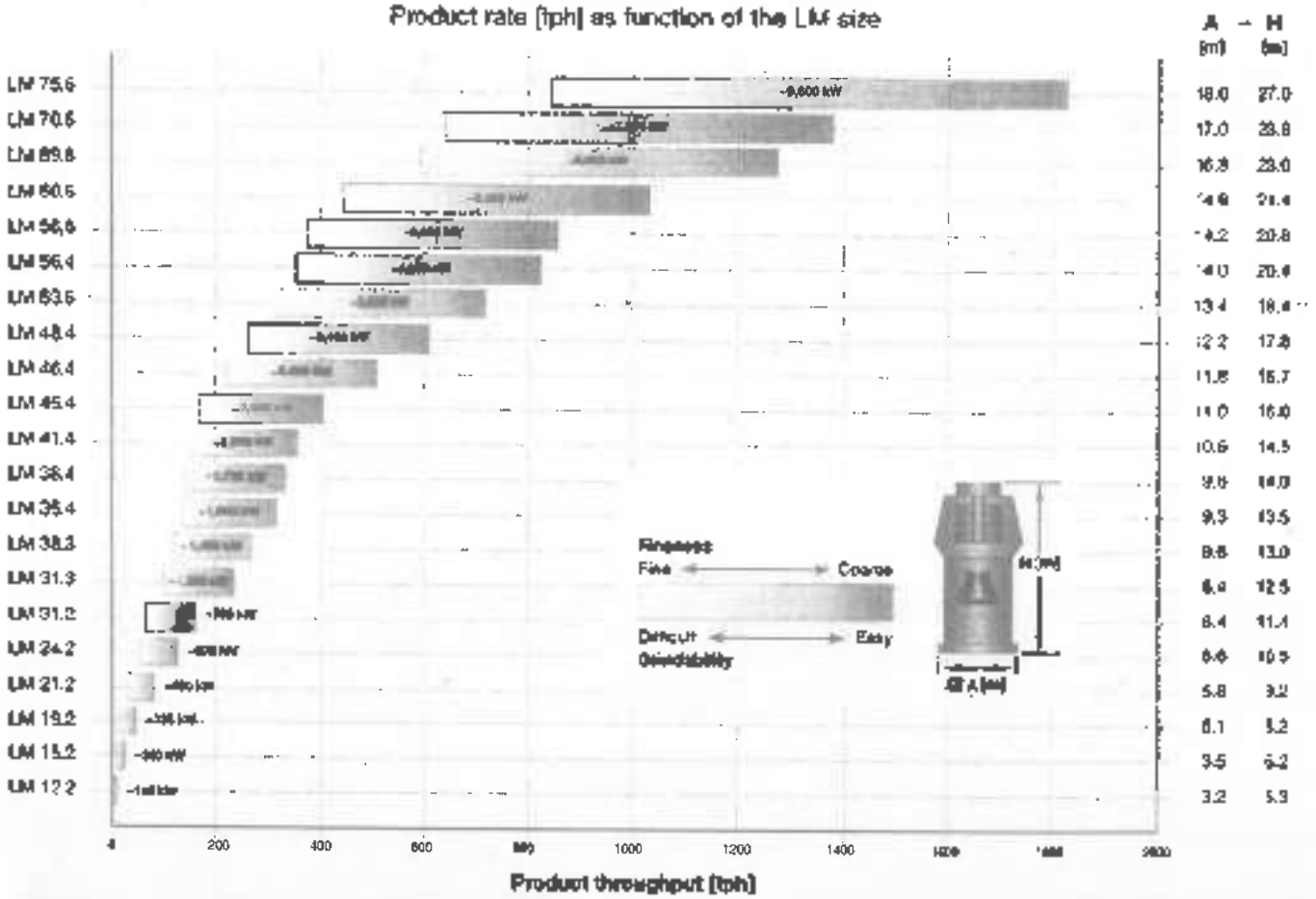
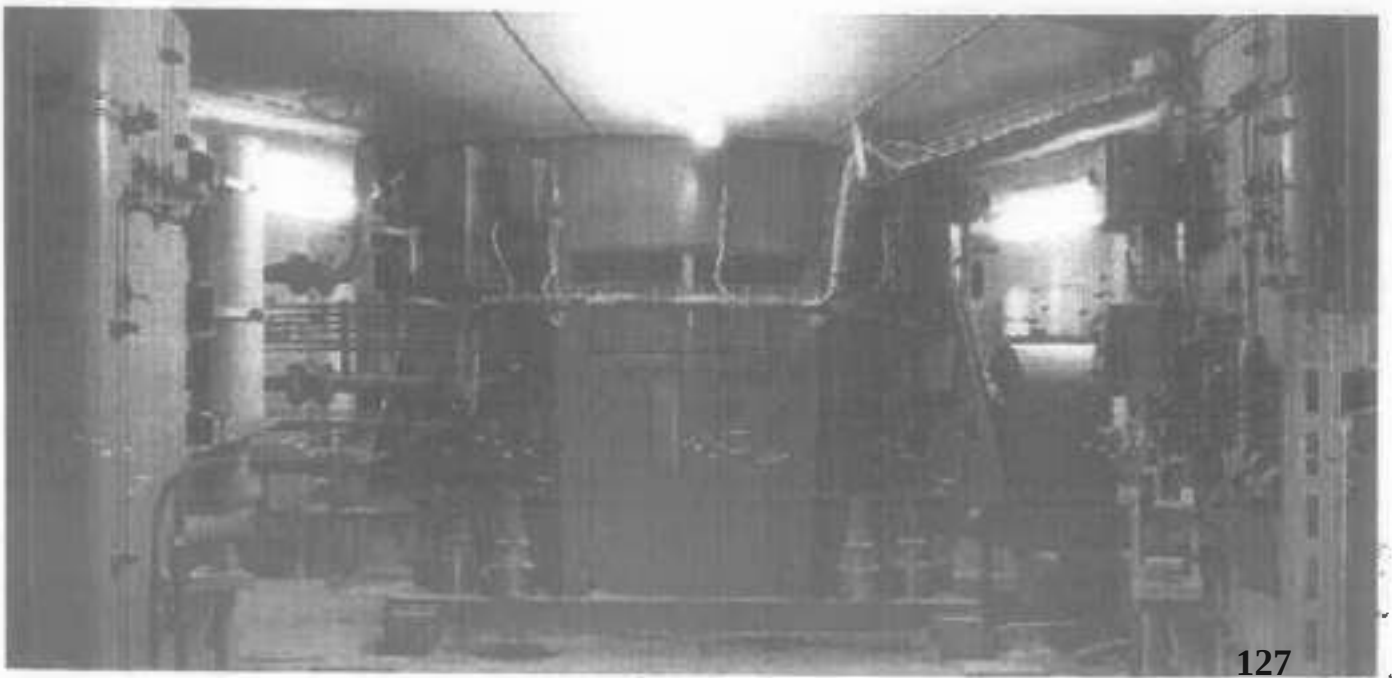
LM for Raw Material and Minerals

Product rate [tph] as function of the LM size





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Mill selection sizing – models – dimensions – drives

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Dimensioning parameters
The following standard parameters are decisive for dimensioning Loesche cement raw material mills:

- GRINDING PRESSURE
  This lies between the minimum value for solid fuels and the maximum value for cement clinker/granulated blast furnace slag.

- MATERIAL MOISTURE
  The Loesche mill can process material with moisture of up to 25%.

- PRODUCT FINENESS
  The fineness of the final product is between 6% and 30% R 0.09 mm, depending on the composition of the raw material.

- DRIVE PERFORMANCE
  The specific energy consumption in the grinding test is decisive for gearbox and motor sizing.

Models
- Mill sizes are identified according to the outer effective diameter of the grinding track in decimetres [dm].

- The identification is followed by a digit, separated by a full stop. This specifies the number of rollers operated in the mill.

- The number and size of rollers is geared to the required product throughput in conjunction with the "Loesche performance factor" as well as the product which is influenced by factors of grindability, moisture and fineness. The required gas stream is decisive for the housing dimensioning of mill and classifier.

- The Loesche cement and raw meal mills are constructed in a modular fashion. Modules are understood as units comprising rollers, rocker arms and roller-related spring components with their pedestal. This is arranged from between 2 and 6 times around a grinding table as required.

Dimensions
- The coordinates of the grinding table diameter and number of rollers can be read off from the following table. The x-coordinate indicates which product throughputs can be generated using the respective mills. The width of the fields is a measurement of the output factor (see above).

- The dimensions H, A and D in turn describe the height of mills with classifier, the footprint diameters and the overall space required, taking a service area (for replacing grinding parts) into consideration.

Drives
An electric motor serves as the drive. It drives a planetary gearbox using a torsionally flexible coupling. The drive shaft lies horizontally, the vertically mounted flanged output shaft rotates in a horizontal plane. The gearbox contains a segmental thrust bearing that accommodates the grinding force at the top of the housing. Loesche mill gearboxes are developed in cooperation between Loesche GmbH and reputable gearbox manufacturers. The dynamic safety factors are suitably chosen for the application. Decades of experience operating Loesche mills determine the design of the (mill) gearbox and their peripherical equipment, bearing in mind all climatic conditions.

Modern gearboxes today are constructed in a modular manner in the same way as Loesche mills. Torque split ensures a reduction in the rotating masses and simultaneous multiple use of machine construction elements in gearboxes with different sizes and performance.

A lubrication unit ensures that adequate oil is supplied to the gear teeth, the shaft bearings and the segmental thrust bearing. Filters and cooling equipment condition the oil. Electrical and hydraulic instruments that are monitored in the customer's PLC guarantee safe operation.

The modular construction principle of gearboxes permits further increases in performance in line with the current state of the art without the need to develop a new construction concept.

The Loesche mill does not require a motor with increased starting torque. Since the rollers are raised hydraulically, the breakaway torque for the filled mill only comprises 40% of the full load torque. This starting torque can be achieved by a "standard motor" without a problem.

The installed motor power is sized according to the energy requirements of the mill. This is established in the test plant using a grinding test. The next suitable commercially available motor is selected and recommended to the customer.

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Mill function

The cement raw material is fed via a rotary feeder ① and falls via the chute ② onto the centre of the grinding bed ③. Free ferrous foreign objects are separated out from the feed material magnetically before reaching the rotary feeder ① and removed via a diverter gate. A metal detector operates in a similar way and ensures the separation of non-magnetic metal parts. The material to be ground moves on the grinding track towards the edge of the grinding table under the effect of centrifugal force and in this way passes under the hydro-pneumatically spring-loaded grinding rollers ④. The material that has been drawn in is ground in the material bed in the gap between the rollers and grinding track. The rollers ④ are displaced upwards as they roll over the material bed ⑤. As a result the functional unit consisting of rocker arm ⑥, spring rod and pistons from the hydraulic cylinder ⑦ is moved. The piston displaces the hydraulic oil from the cylinder into the gas-filled bladder accumulator unit. Nitrogen-filled rubber bladders in the accumulator units are compressed and act as gas springs. The gas springs can be set to be harder or softer by selecting the gas pressure in relation to the hydraulic operating pressure, depending on the fracture behaviour of the material to be ground.

The ground material is subjected to centrifugal force and rotates outwards and over the edge of the grinding table. In the area of the louvre/dam ring ⑧ which surrounds the grinding table ③ the stream of hot gas ⑨ directed upwards captures the mixture of ground material and material as yet not completely ground and conveys this to the classifier ⑩.

Depending on settings of the classifier ⑩ it rejects coarse materials. This falls into the internal grit return cone ⑪ and then onto the grinding table ③ for re-grinding. The ground material passes from the classifier and is conveyed from the Loesche mill with the gas stream ⑫.

Foreign matter and small amounts of coarse material fall through the louvre ring ⑧ into the ring channel ⑬ as reject material.

Scrapers ⑰ connected to the grinding table transport foreign matter into the reject hopper ⑱.

Cement raw material usually has differing degrees of moisture content when extracted from the quarry. As soon as the ground material leaves the grinding table in the area above the louvre ring ⑧, the water contained in the working material evaporates spontaneously upon intimate contact with the hot gas stream. Therefore the required mill outlet temperature of the dust/gas mix of approx. 80 ° to 110 °C is already achieved in the grinding chamber.

The mill is driven by an electric motor ⑬ via a flexible coupling ⑭ and the mill gearbox via an output flange ⑮. A segmental thrust bearing in the top of the gearbox absorbs the grinding forces.

The grinding rollers ④ are hydraulically lifted from the grinding track before the mill motor is started. The mill can then not only be started empty but also partially filled with a low starting torque. Metallic contact of grinding parts on an empty or loaded mill is prevented by automatic lifting of rollers via a grinding bed depth control.

A so-called "auxiliary drive" for starting up a filled mill at low revolutions is not required!

Servicing

Worn grinding parts, roller tyres and grinding track segments can be simply and quickly replaced. The rollers are retracted from the grinding chamber into a vertical position using a retracting cylinder. Complete rollers, roller tyres and grinding plates are then made accessible to hoisting devices.

When grinding cement raw material the metallic particles usually cause uniform wear throughout their entire service life so that the mill throughput only declines when mill parts are completely worn. Partial wear may occur if, for reasons of cement chemistry, free quartz sand needs to be used as concrete aggregate. This can be offset by targeted hard facing in the mill.

Loesche has the required know-how for in-situ welding using appropriate welding equipment.

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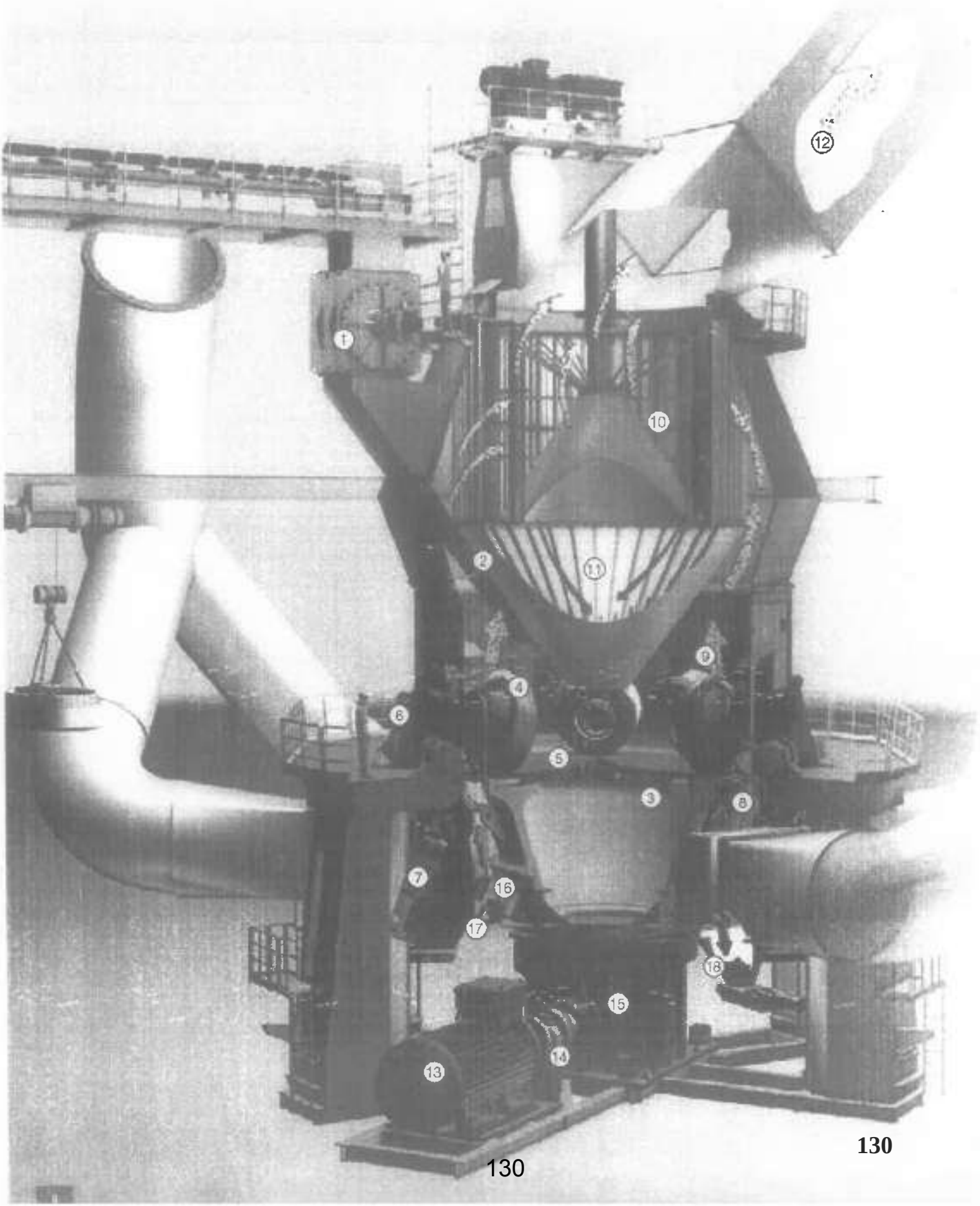

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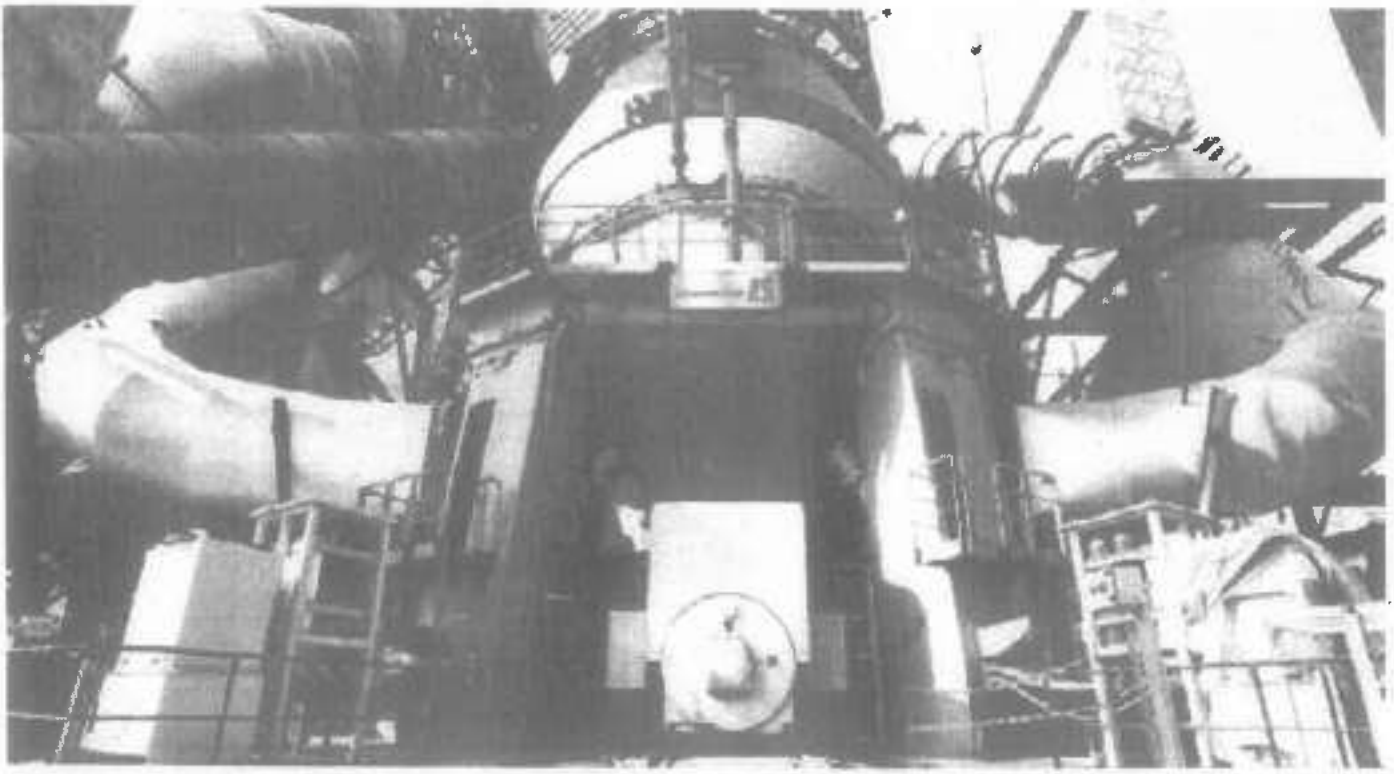
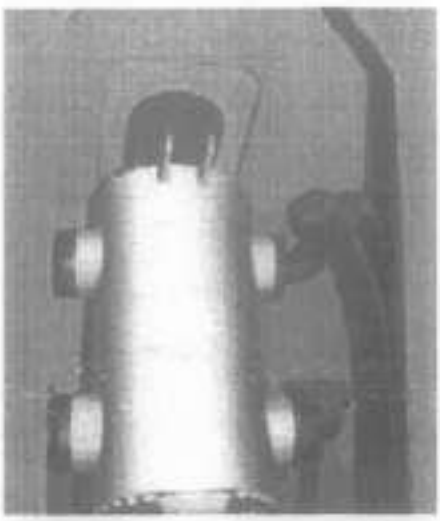


Loesche Mill Type LM 56.4, Idfert, United Arab Emirates, 2008

Gas spring system

Rocker arm in working position



Hydraulic cylinder

View of the grinding chamber of an LM 56.4

Rollers of an LM 46.4

Mill gearbox

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Working principle, construction and function of Loesche mills

Working principle

The material to be ground is crushed between the rotating grinding track and the individually guided grinding rollers.

Grinding is carried out primarily through the application of compressive force. A small amount of shear force supports the displacement of crystalline layers in the raw material. This effect occurs through conical rollers whose axes are inclined at 15° compared to the horizontal grinding track. As already demonstrated through comparative studies in the 1930s, this permits ideal fine grinding and at the same time ensures minimum wear.

A higher specific grinding pressure is applied compared to coal grinding and a lower specific grinding pressure is applied compared to the fine grinding of clinker and granulated blast furnace slag.

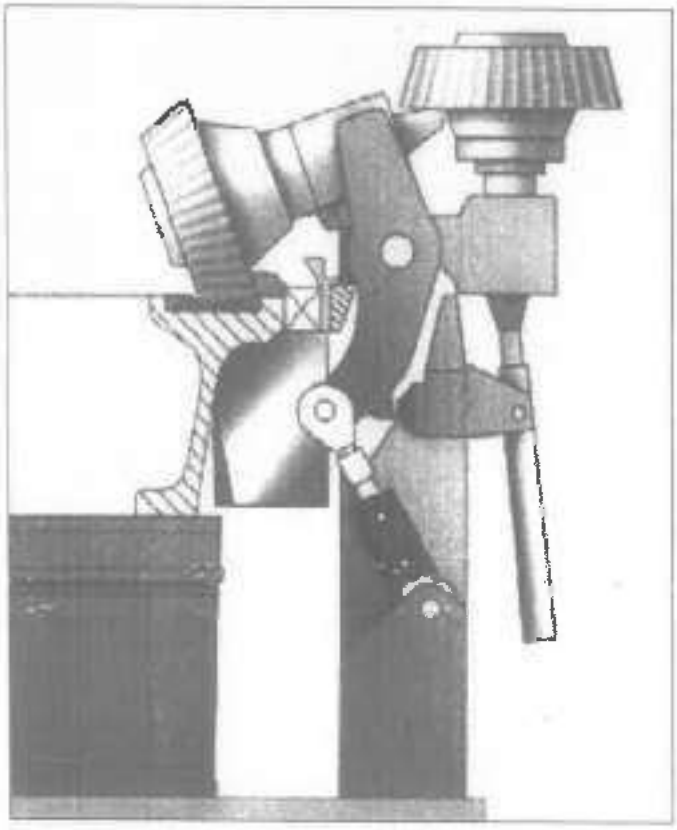
Hot gases are added in the dry-grinding process to evaporate material moisture. Use is predominantly made of the exhaust gases from the rotary kilns, the heat exchanger or the cement clinker cooler. If none of these sources are available or the heat content of these exhaust gases is insufficient, Loesche's own hot gas generators are deployed. In the classifier above the grinding chamber the ground product is separated from the grit which then falls back onto the grinding track for renewed grinding.

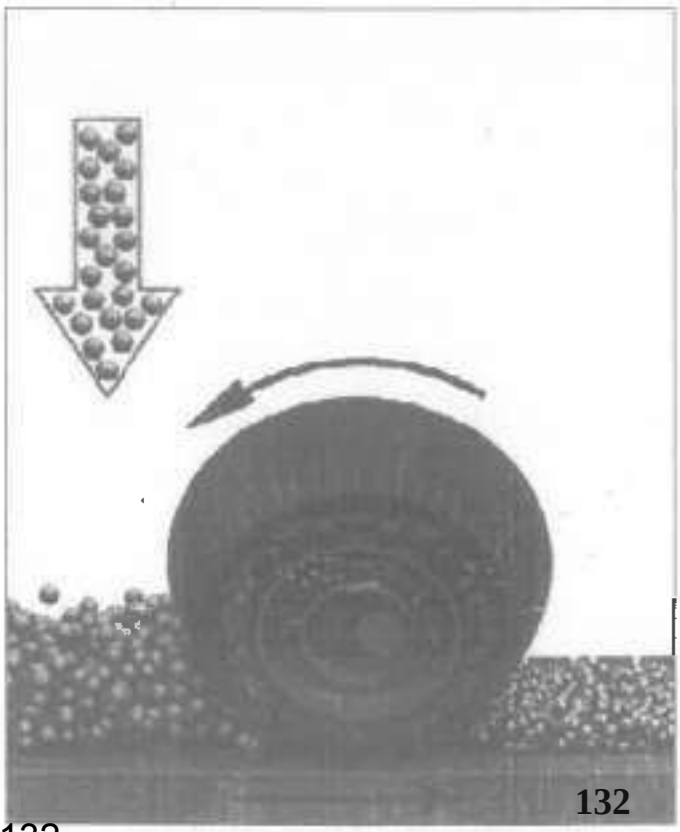
Construction

The familiar basic principle of the modular system patented in 1970 is applied to Loesche mills with two, three, four and six rollers. The rollers together with their lever systems, hydropneumatic springs and hydraulic control systems make up a functional unit. Large or small modules with a different number of rollers (between two and six) can be deployed in the same mill sizes (grinding table diameter). This makes it possible to customise the product to meet specific customer requirements.

The following features characterise Loesche technology:

- The support and precise guiding of the rocker arm roller system with its roller bearings takes place in a pedestal with integrated spring system.
- Hydropneumatic spring loading of the roller rocker arm unit with integrated mechanism to lift the rollers serves as an aid for the mills when starting up with a filled grinding track.
- The rollers are connected in pairs to a common hydraulic unit (except in the case of 3-roller mills).
- An almost parallel grinding gap is maintained between the grinding rollers and the grinding plates during the entire service life of the grinding parts.





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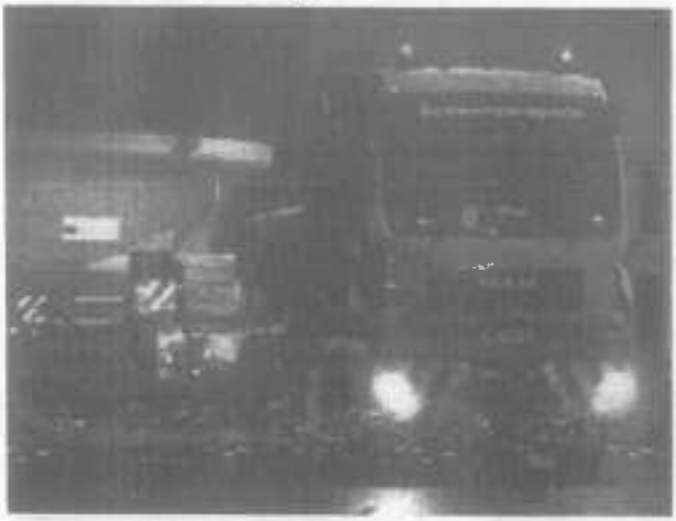
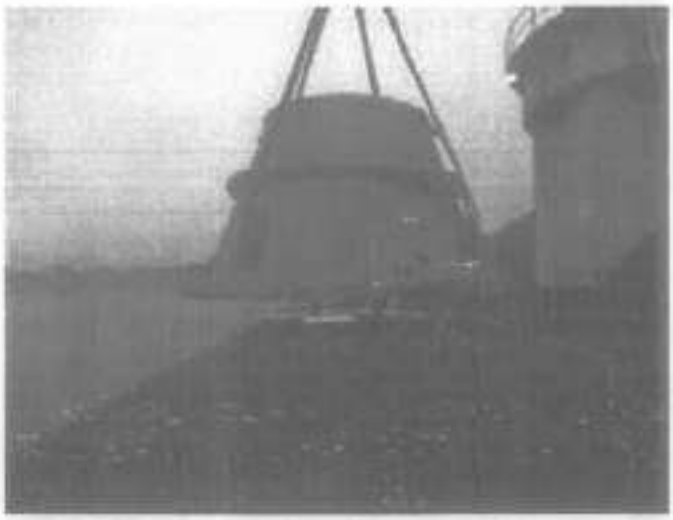
Grinding table at the LMW in the foundry



Transport to the port



Shipment for further processing

Assembly of the lower part of the mill

Assembly of the grinding table

Mill unit complete upon construction

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Benefits to customers and customer satisfaction

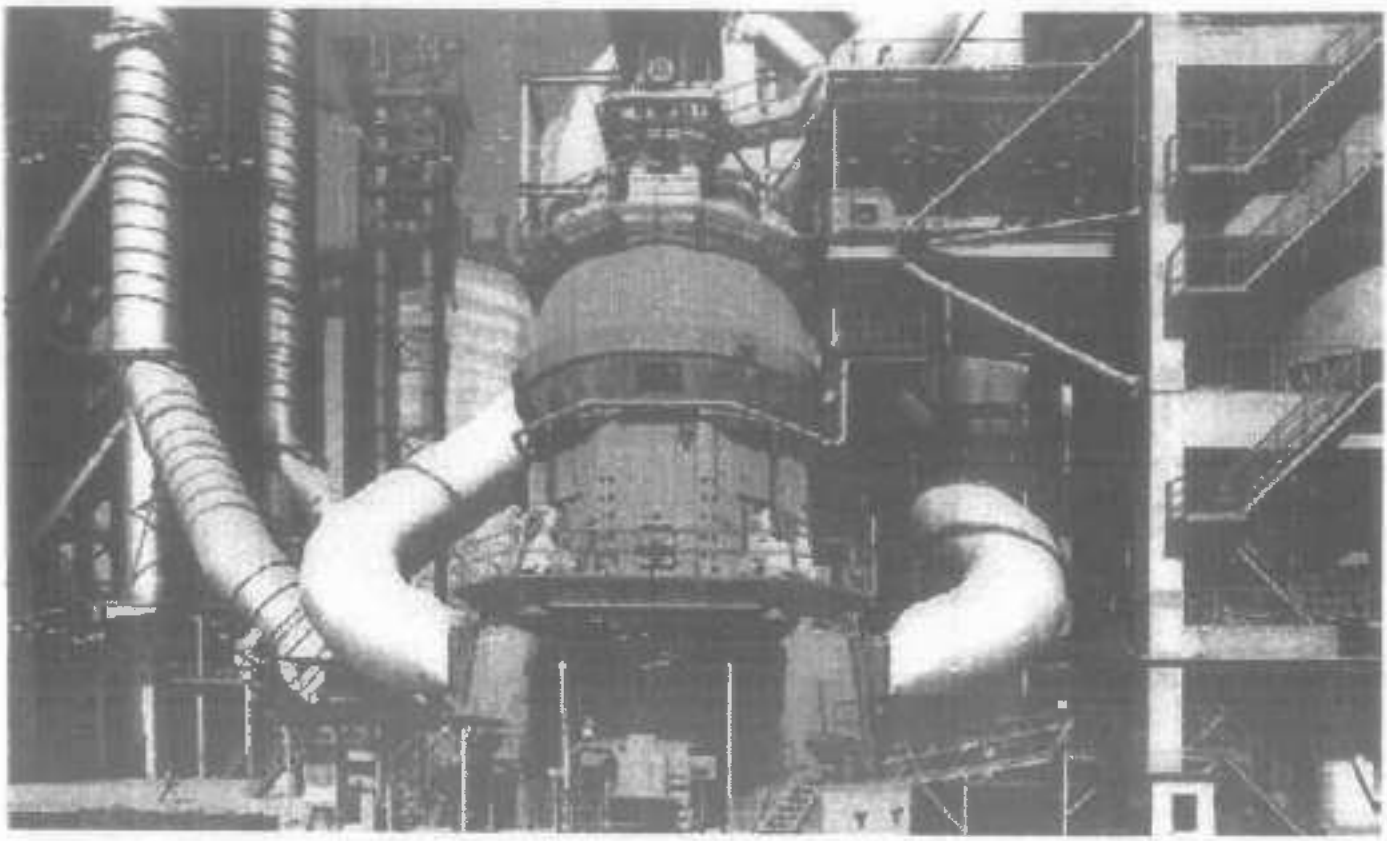
Quality and reliability right from the start are the globally recognised benefits to be derived from Loesche grinding plants. As early as 1928, when the first Loesche mill came onto the market, the grinding principle of the vertical roller grinding mill, with a driven grinding track and spring-loaded rollers was shown to be particularly energy-efficient and reduced the use of natural resources. These advantages of Loesche mills will become ever more important in the light of increasing plant size and the obligation to make more careful use of primary energy.

Moreover, the high product throughputs of Loesche mills (up to 1,300 t/h for cement raw material and already 350 t/h for cement clinker and granulated blast furnace slag) result in considerably reduced investment costs compared to two smaller grinding plants.

Loesche is a competent partner for its customers from the initial sale to customer service and from punctual project planning to the handing over of the plant. Our maxim is "Every Loesche grinding mill must be a reference mill!"

Our competence is founded on the following key features:

- Tailor-made plant concepts from planning to commissioning, based on our own experience combined with customer wishes
- Individual problem solutions through optimised process technology
- Rational solutions with simultaneous planning of cement clinker/granulated blast furnace slag mills and raw meal mills through the use of exchangeable components for all models of mill, extending to the use of identical gear drives
- Close cooperation with suppliers of rotary kilns in line with customer wishes
- Customer service: plant optimisation and advice in the case of further technical developments
- Long-term delivery capability when supplying spare parts
- Certification in accordance with EN ISO 9001: 2008.



Loesche mill Type LM 65.4, Ras Al-Khaimah, United Arab Emirates, 2005

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1971 Introduction of a modular system in mill construction: creation of replacement groups of components such as rollers, rocker arm and hydropneumatic spring for constructing mills with 2, 3 and optionally 4 rollers of the same size. The first LM 30.4 and LM 32.4 4-roller mills are sold and have product throughputs of 178 t/h and 215 t/h.

1973 Sale of LM 36.4 and LM 43.4 mills with product throughputs of 260 t/h and 425 t/h.

1989 Sale of the first LM 50.4 with a throughput of 490 t/h.

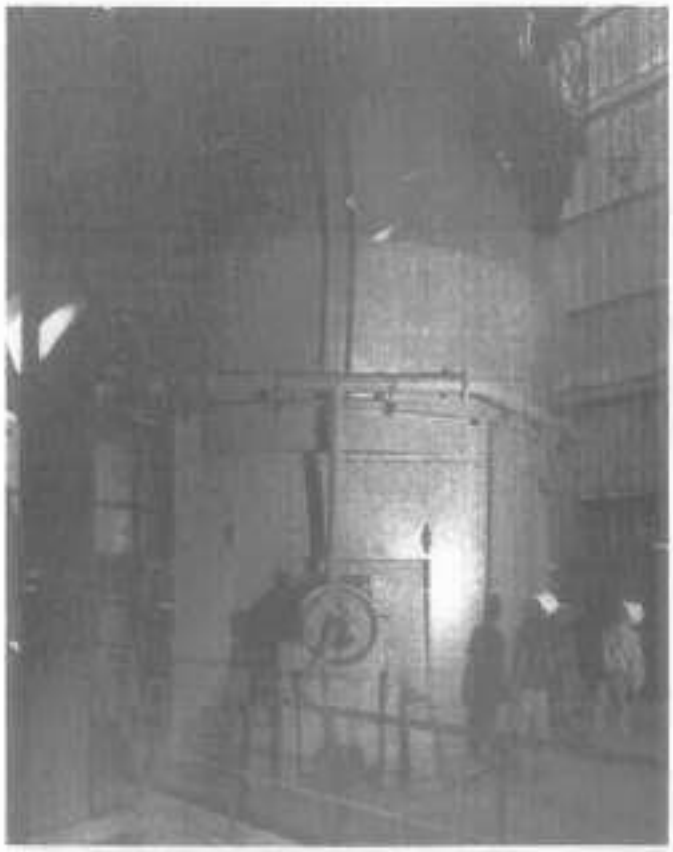
1996 Sale of the first LM 63.4 with a throughput of 800 t/h.

2005 Sale of the first 6-roller Loesche mills LM 60.6 with a throughput of 740 t/h

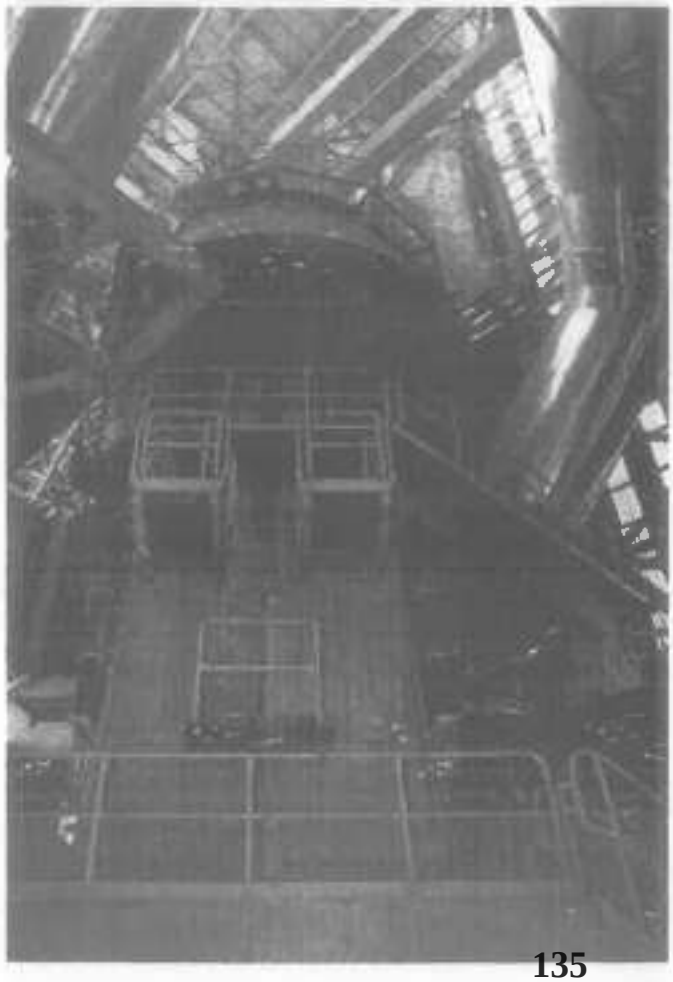
2006 – 2008 14 mills Type LM 69.4 and LM 69.6 with product throughputs of up to 1200 t/h are sold.

In the 1930s Loesche mills are used to grind cement raw material for the first time. The major breakthrough came at the start of the 1960s when rotary kilns with heat exchangers (dry process) are introduced. The following Loesche technological features make the deployment of these mills so successful in the cement industry:

- Low specific energy consumption
- Low pressure loss through large cross-sectional flow areas in Loesche mills
- Minimal sound emissions so that no sound insulation measures are required
- Rapid reaction to fluctuating raw material qualities
- Rapid readjustment to different product qualities
- Use of the kiln exhaust gases for dry grinding and as a transport medium for the final product to dust separators



Loesche mill Type LM 45.4 roller mill, Elmadag, Turkey, 1998



Loesche mill Type LM 63.4, Manisa, Turkey, 2002

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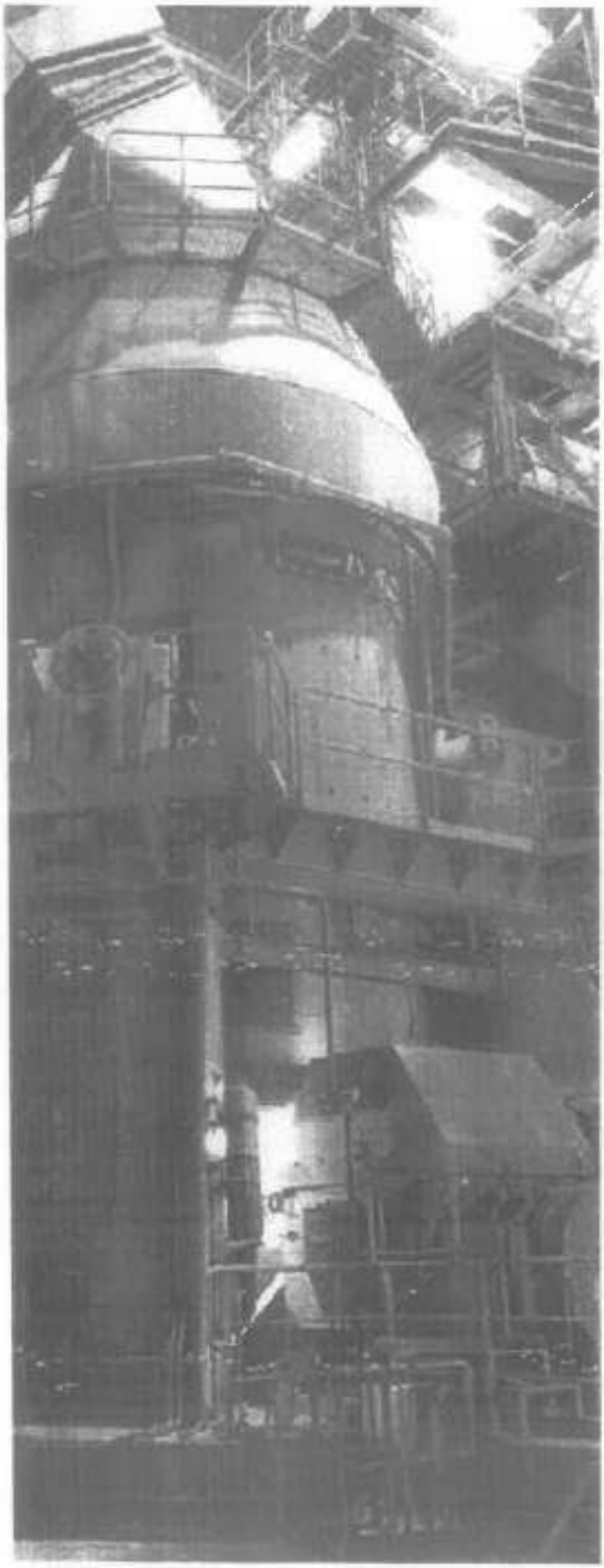
Loesche technology – always a step ahead



Loesche mill Type LM 66.4, Lengerich, Germany, 2003

Cement raw material has been almost exclusively ground in roller mills (vertical air-swept grinding mills) since the second half of the 20th century. Loesche was and is the pioneer of this technology. Hundreds of Loesche mills have been used in the cement industry across the world to the present day. They operate with two, three, four and six rollers.

1926 The first spring-loaded air-swept grinding mill in the world, constructed by the original company Curt v. Grueber Maschinenbau-Anstalt, Teltow near Berlin, is launched onto the market under the name Loesche mill and has 2 grinding rollers. It already has all the essential features of modern air-swept vertical grinding mills built today. Even the first Loesche mills had an integrated dynamic classifier. Several examples of this are deployed in Klingenberg, Europe's first coal dust-fired large-scale power plant in Berlin for coal grinding with a raw coal rate of approx. 12 t/h.

1934 Loesche mills are increasingly also used worldwide for limestone and cement raw material.

1937 400 Loesche mills have already been sold for coal, phosphate and cement raw material.

1939 The largest Loesche mill at this time is an LM 16 with two steel spring-loaded rollers, a grinding track diameter of 1,600 mm and product throughput of 22 t/h.

1948 The company in Teltow is nationalised; the company is newly established under the name Loesche KG in Düsseldorf (West Germany).

1949 – 1960 Loesche mills supplied in the sizes LM 16 to LM 20 in modern welded construction with two steel spring-loaded rollers and product throughputs up to approx. 55 t/h.

1961 – 1970 Development of 2-roller Loesche mills in the sizes LM 22 to LM 28 with the world novelty of a hydropneumatic spring assembly system for product throughputs up to 140 t/h.

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OVER VIEW

LOESCHE
INNOVATIVE ENGINEERING

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Loesche Technology – a Success Story

In 1927 Ernst Curt Loesche patented the world's first spring-loaded air-swept mill developed by him in Tetow near Berlin. And so began the unprecedented career of the Loesche roller grinding mill.

It all started with the grinding of coal at the Klingenberg power station in Berlin, the first coal-dust-fired power station in Europe.

The technological and energy benefits of this new type of mill were so outstanding that the technology was very quickly carried over into other fields of application.

Today in the cement industry conventional grinding technology for raw meal, coal, cement and granulated blast furnace slag can be substituted entirely by vertical air-swept mills – thanks to Loesche.

Loesche also introduced this technology in the ore industry and for grinding of steel slag.

A defined product particle size distribution cannot be achieved without classification. Loesche developed highly efficient classifiers in tandem with grinding technology.

For optimum combined drying and grinding results Loesche's very own patented hot gas generators have been around for decades. These generators have steel combustion chambers, no refractory material, are energy-saving and ahead of their time. They are known throughout the world as LOMA® heaters.

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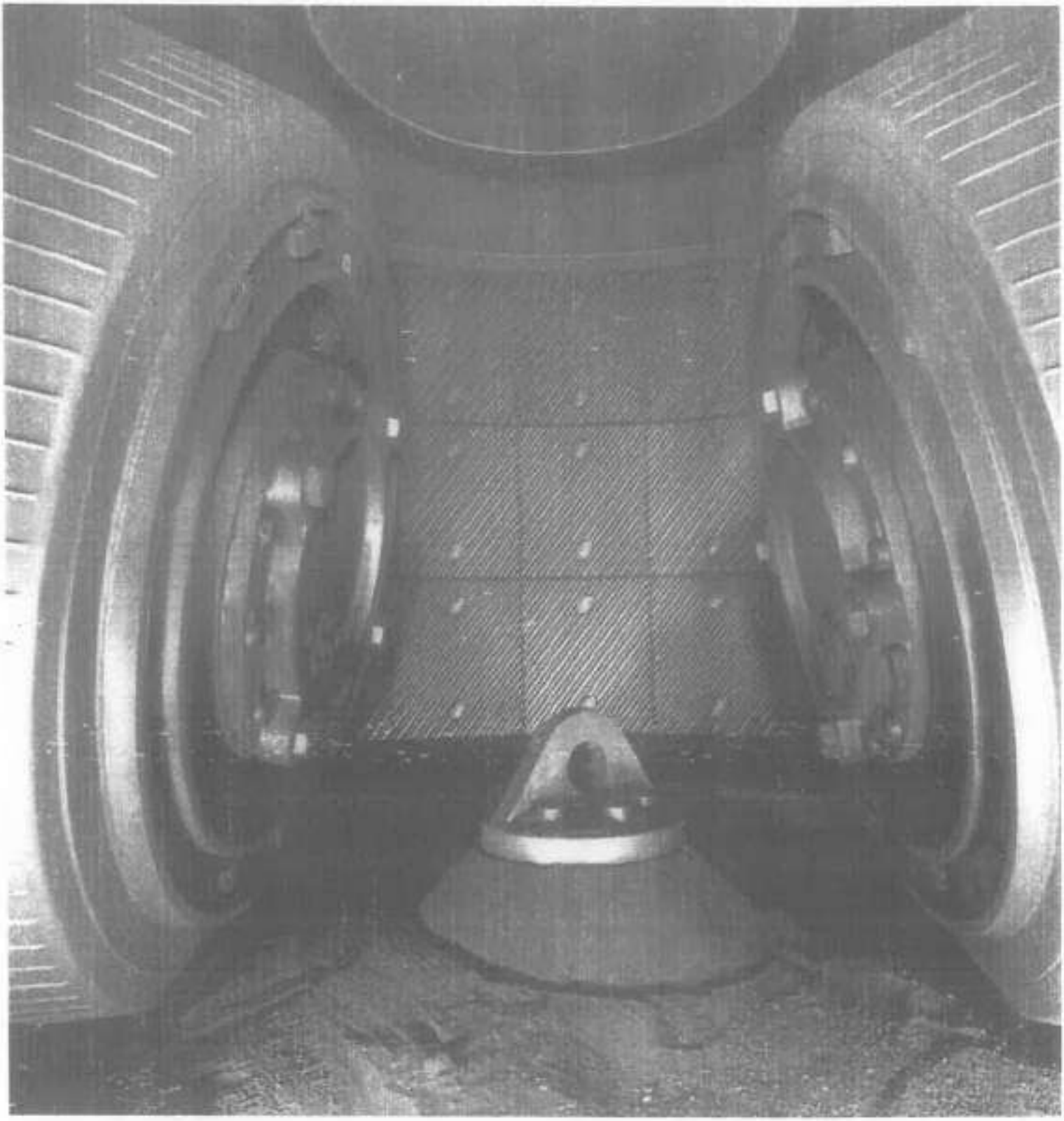

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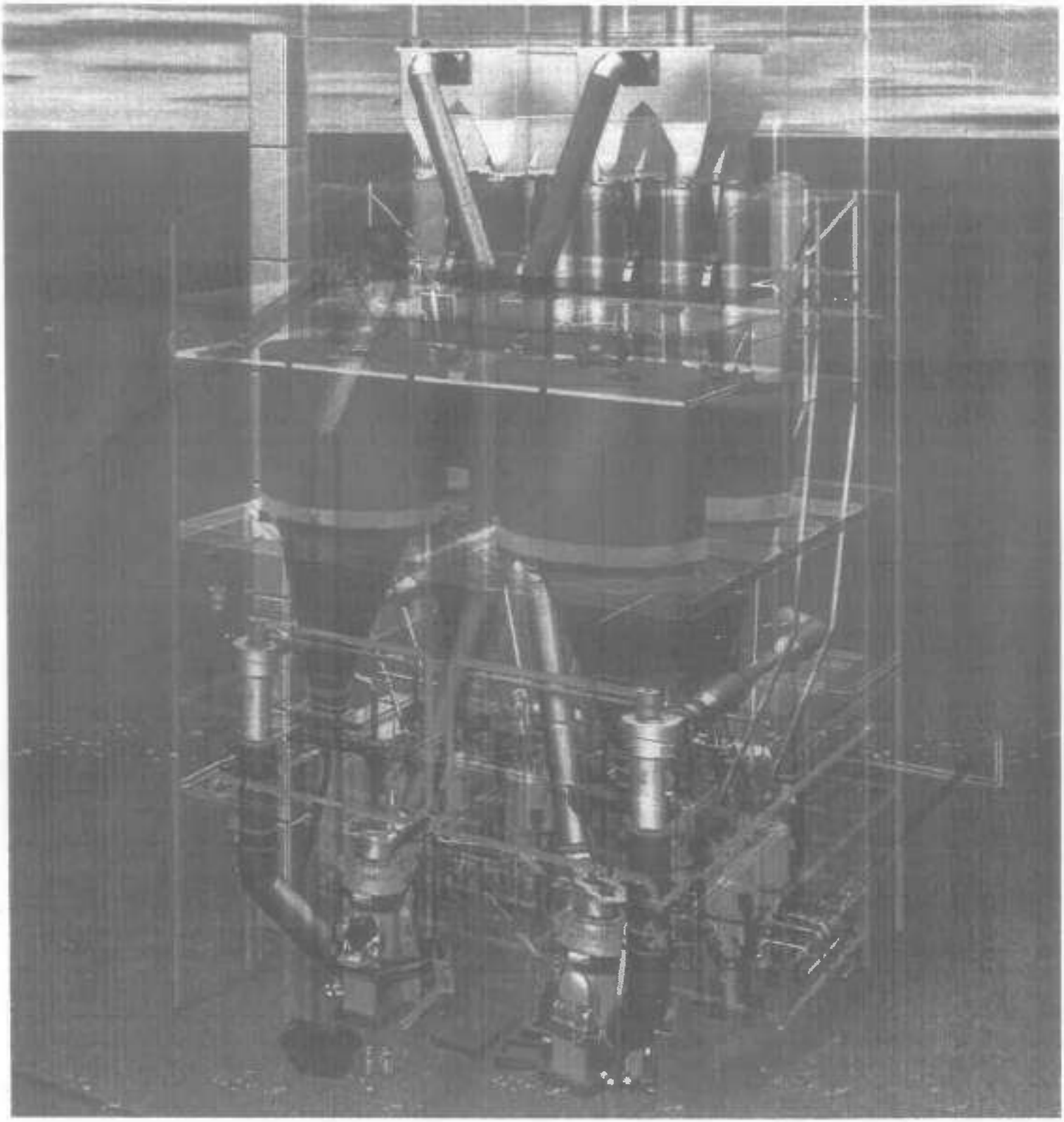

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Loesche Product Line

– the right mill size for every throughput

Product rates for cement raw material of 1400 t/h and mill drive ratings exceeding 10000 kW are managed as flawlessly as 2 t/h at 110 kW.

Naturally we also supply suitable associated machines for units of all mill sizes, for example classifiers for finenesses > 7000 Blaine or d_{90} < 5µm, and hot-gas generators ranging from 300 kW to 60 MW.

Loesche mills are supplied today for a multitude of applications. They are adapted to the comminution requirements of the respective material involved.

We supply:
- Mills for cement raw meal
- Mills for cement and granulated blast furnace slag
- Mills for solid fuels
- Mills for industrial minerals
- Mills for ores and steel slag
- Mobile grinding plants for solid fuels
- Mobile grinding plants for ores and slag

Loesche is the only mill supplier to have developed in-house hot-gas generator technology for burning:
- solid fuels
- low calorific value gases
- conventional liquid and gaseous fuels

a significant advantage for an optimum combined drying and grinding process.

The delivery of turn-key grinding plants is as much a part of our programme as the technological advice we offer in respect of energy-efficiency and environmental protection.

Loesche automation technology completes our product line.

We build complete grinding plants.

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Mills for Cement Raw Meal

– from pure limestone to superfine clay

Loesche has always been consistently geared towards the needs of the cement industry. The increase in the throughputs of cement plants in connection with the introduction of new energy-saving technologies – from the wet process, through the semi-dry process down to the dry process – necessitated an increase in the capacities of the mills.

The basic model of the Loesche mill was further developed with a high degree of inventiveness. This is made apparent in the mill sizes, the throughputs and the accompanying technological innovations, such as

- a new hydropneumatic spring assembly
- the introduction of a modular construction
- the availability of exchangable assemblies for building 2-, 3-, 4- and 6-roller mills

The use of large mills reduces investment costs.

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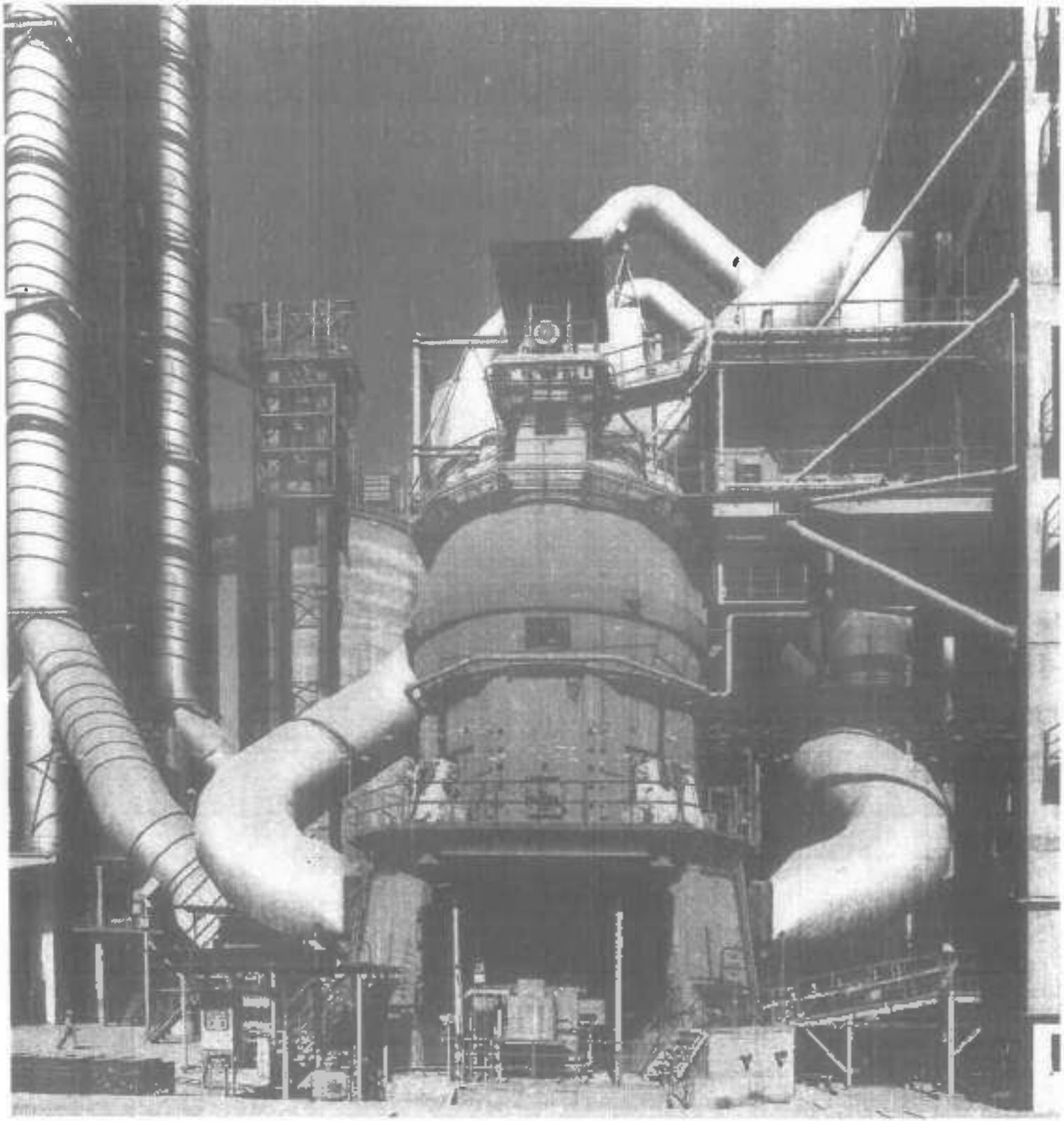

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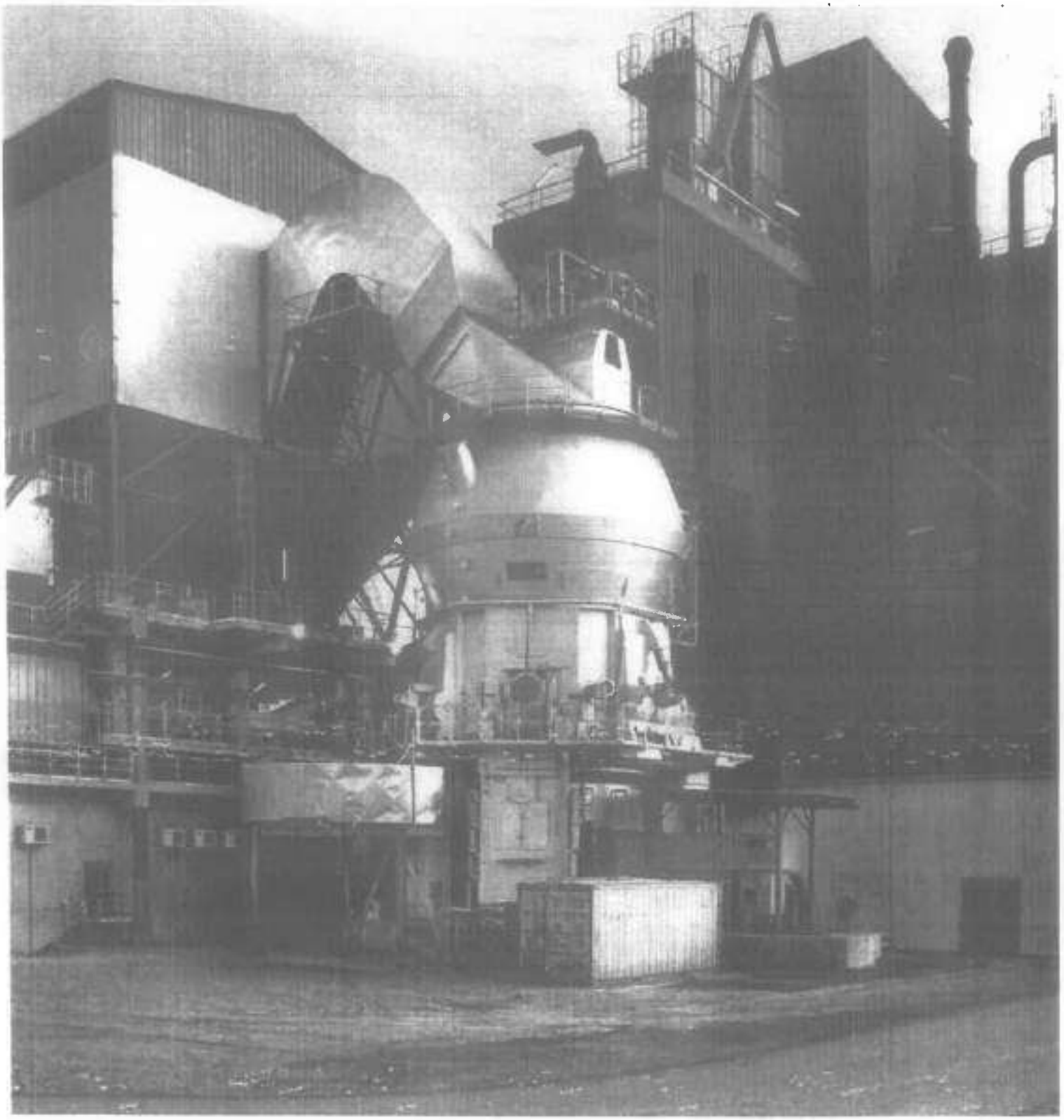

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Mills for Cement and Granulated Blast Furnace Slag

– new roller concept, highest fineness

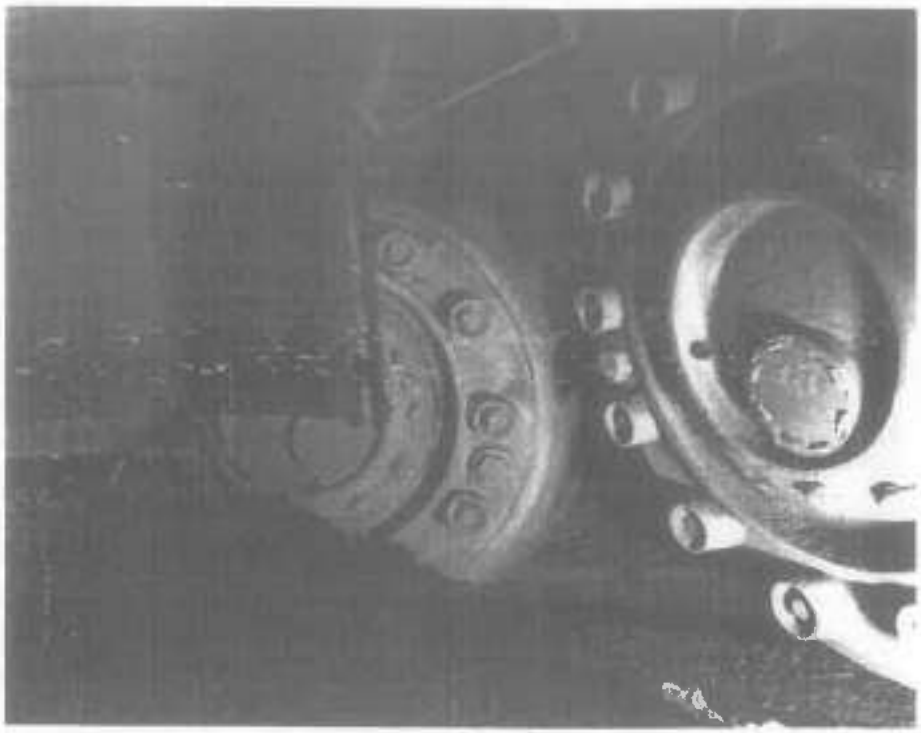
In 1935 Loesche supplied a first cement mill to Brasil. Then, the time was not yet ripe to establish the grinding of cement in vertical mills. It was to be almost another 30 years before the cement industry introduced this modern grinding technology. The fineresses required for cements place the highest demands on the new grinding technology.

Innovative engineers from Loesche came up with a solution for grinding very fine materials and from it created a new grinding roller concept – the 2+2 or 3+3 technology, i.e. half the rollers, also called the master rollers, are used for grinding. The other rollers, called the support rollers, prepare the grinding bed in order to control the specific properties of the very fine material.

This new roller concept was accompanied by further innovations:

- significantly higher grinding pressure
- variable grinding pressure during grinding, depending on the specific surface area to be achieved (Blaine)
- very low differential speed between roller and grinding track
- low specific wear during superfine grinding
- hardfacing with mobile welding equipment possible.

All cement factory mills are now "vertical" and can be supplied by Loesche.



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Mills for Solid Fuels

– it all began with coal

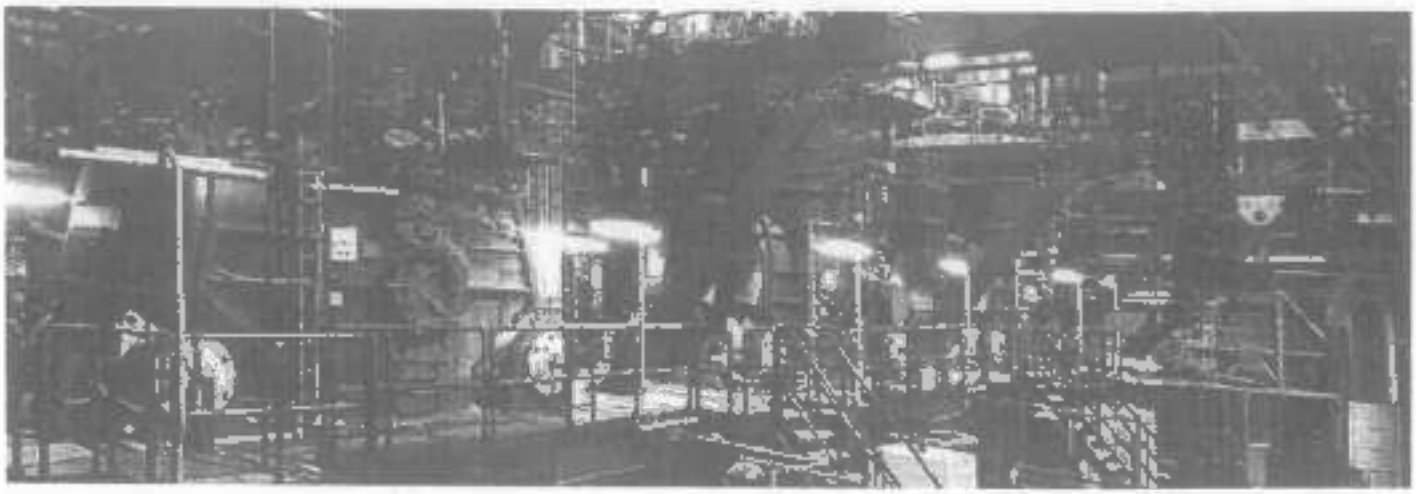
The world's first spring-loaded air-swept mill patented by Loesche in 1927, already demonstrated all the essential features of modern vertical air-swept mills. This first mill incorporated an integrated dynamic classifier. The first shock-resistant pressure mill came onto the market in 1965, in response to tightened safety requirements. In 1980 Loesche patented the modular mill construction, enabling identical components to be used in different mills. In 2008 the 800th mill was sold. With the world's first self-inert coal grinding plant in a German steelworks, Loesche played a significant role in the introduction of PCI technology (Pulverised Coal Injection) – so this day we are the market leader in this field.

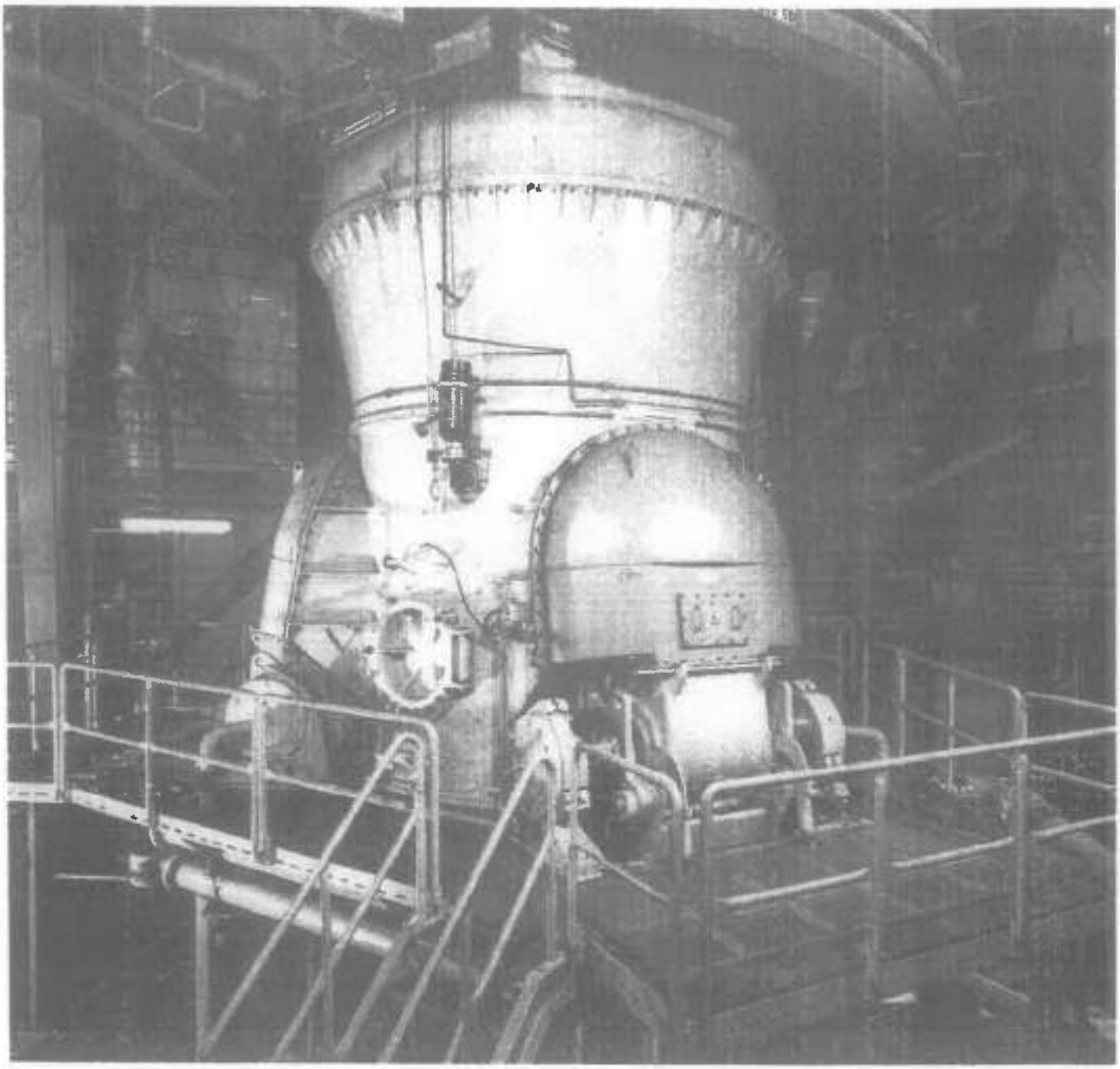
Keep it solid and simple – Loesche builds safe and reliable roller grinding mills and coal grinding plants in accordance with this motto.

Important features here are:

- no metallic contact between the grinding parts, even when the mill is empty; thus no sparking
- individual guidance of the grinding rollers ensures low-vibration mill operation even in the partial-load range down to 20 %
- the hydropneumatic counter pressure system makes it possible to grind a multitude of different fuels – both hard and soft
- mill design with 2, 3, 4 or 6 rollers for fuel throughputs up to 350 t/h

Loesche's development of self-inerting grinding plants in the mid-1970s provided the crucial foundations for the safety concepts associated with the grinding of solid fuels.





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Mills for Industrial Minerals

- complete or partly complete delivery to the construction site

When it comes to mineral raw materials the industry demands throughputs of between 5 t/h and 80 t/h. The main throughput range is 5 t/h to 25 t/h. The required finenesses range between 1 % R 25 µm and 1 % R 300 µm.

Loesche has developed a special mill series to meet these needs.

Our top-selling mill sizes in this market segment are the LM 12.2D0 and the LM 15.2D0, which fall within the main throughput range.

These new Loesche mills with complete or partly complete delivery to the construction site offer our customers significant advantages such as:

- short delivery times
- completed planning documentation for all mills
- significant shortening of site assembly, thanks to complete preassembly or preassembled components
- ease of maintenance thanks to good accessibility

In our company history stretching back over more than 100 years we have supplied many industries of industry with plants for grinding limestone, dolomite, marble, barite, chalk, quick lime, bentonite, colemanite, phosphate rock, anhydrite, talc, manganese dioxide, magnesite, and other materials.

Small but fine (milled).

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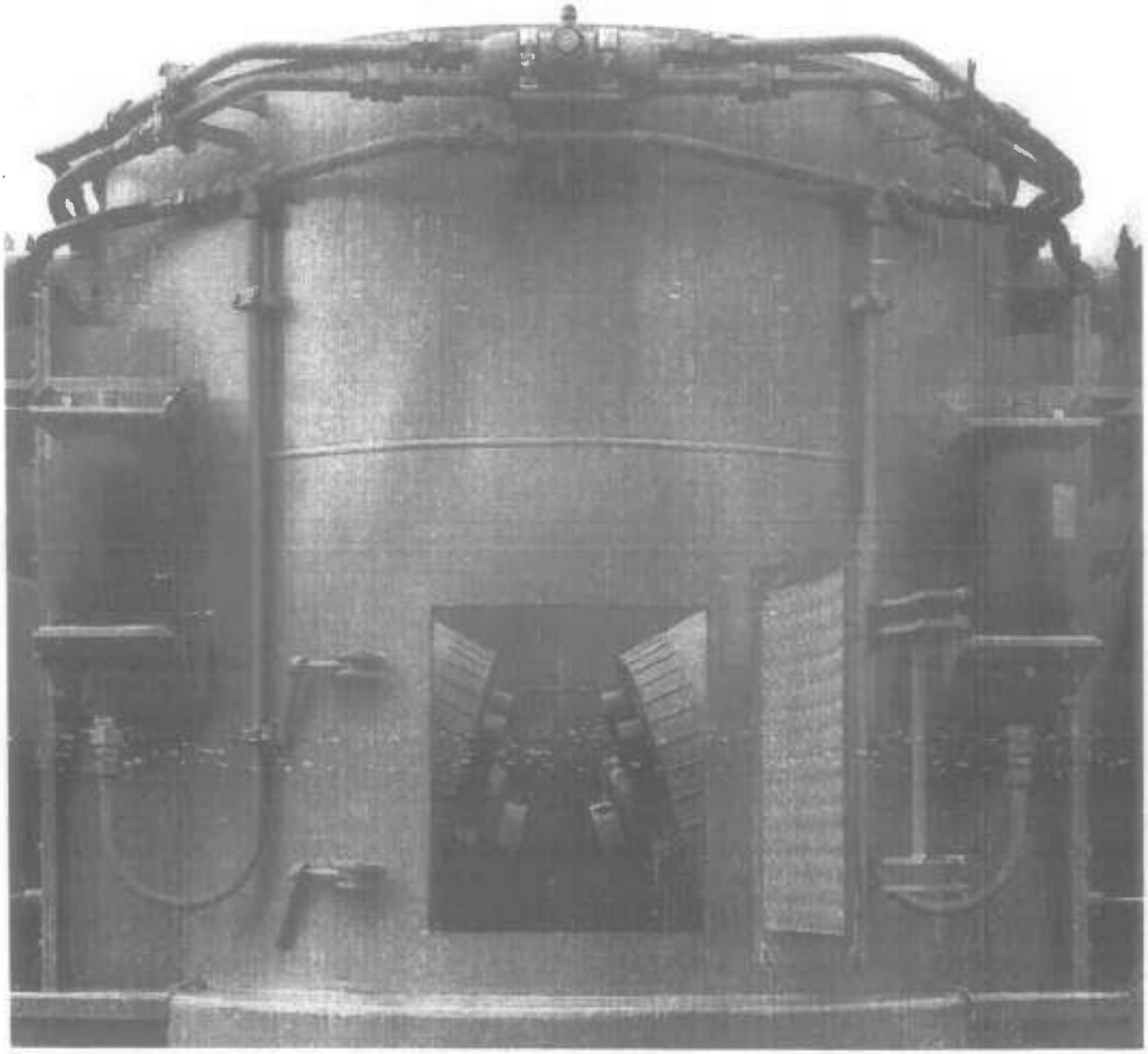

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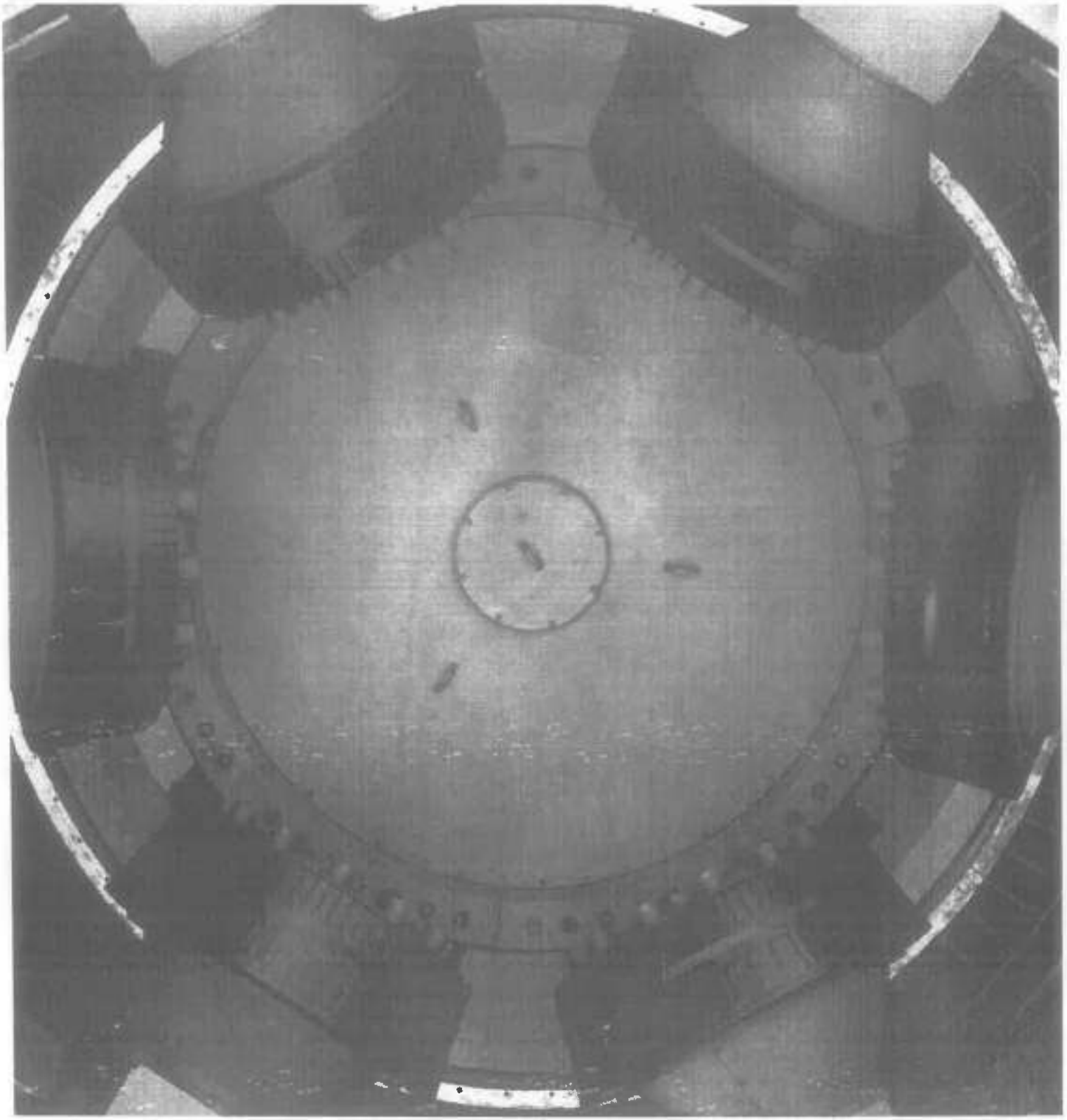

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Mills for Ores and Steel Slags

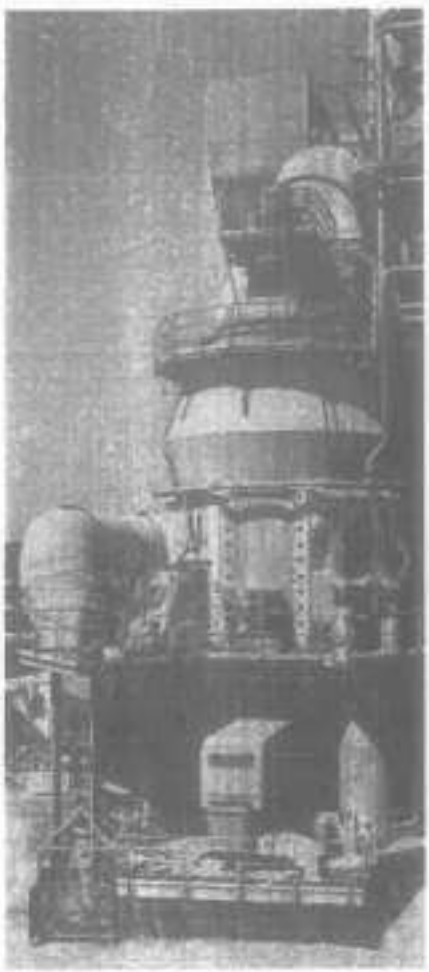
– the variety of ores requires high technical variability

Conservation of resources was an important motivating force for Loesche and resulted in the introduction of vertical air-swept mills for grinding ores. Dry-grinding avoids the use of water, which is particularly important in arid climates.

Loesche grinding technology demonstrates further significant advantages over conventional grinding systems.

- Energy savings of between 30 % and 40 % thanks to low specific energy consumption
- Steep product particle size distribution
- Reduced product overgrinding
  Inter-particle comminution in a material bed
  Selective comminution
  Higher degree of liberation of the valuable minerals
- Combining of the process steps of crushing, grinding, sorting, drying and classifying
- Rapid response to changes in the material composition and characteristics
- Dry grinding product has a positive effect on the downstream processes
- Compact construction
- Mill throughputs up to 1440 t/h

We are not "ore"-conservative – that is why we use vertical mills for this.



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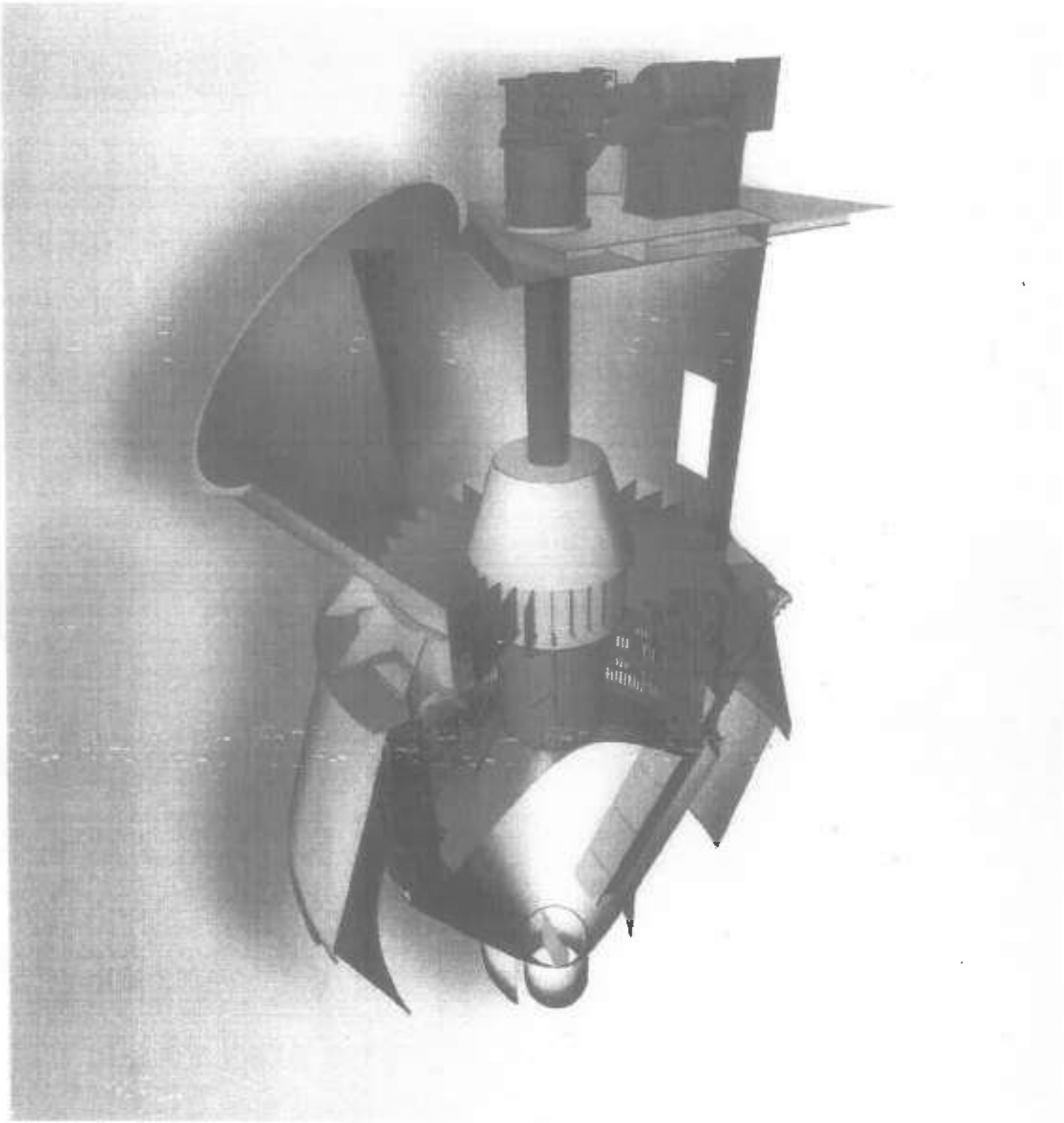

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Classifier, integrated in the Mill

- efficiency of separation, fineness, particle size distribution

The Loesche vertical mill is characterised by the fact that several processes – comminution, drying and classifying – can be implemented in a single machine. Since the birth of the Loesche mill back in 1927 we have devoted ourselves just as much to classifying as we have to the grinding process. This is because only highly efficient classifying delivers the desired product quality.

In addition to the operating parameters of the classifier itself – such as separation efficiency or pressure loss – the materials to be classified also play a role.

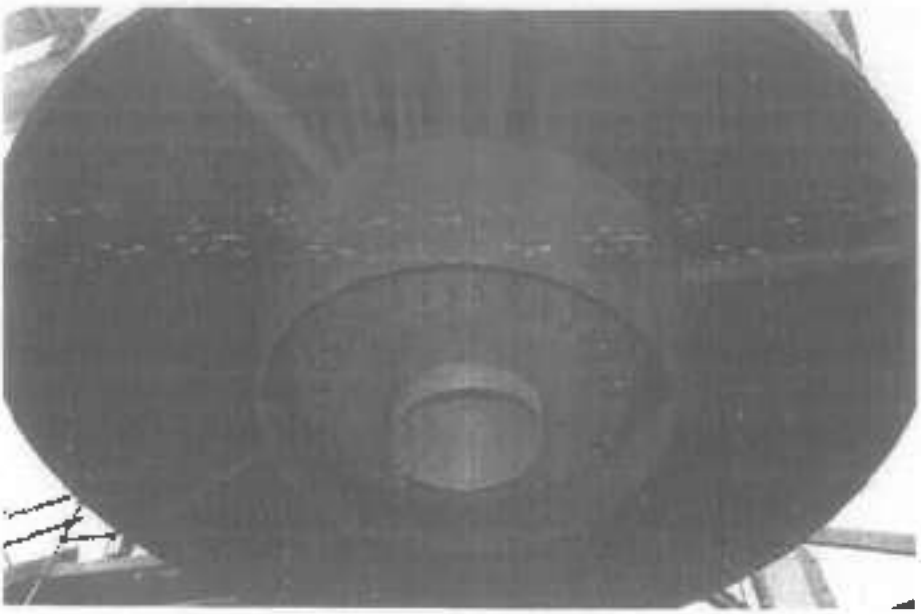
The lamellar classifier developed in 1928 was followed by pressure-shock-resistant classifiers for coal mills, rotary classifiers for very moist materials and louvre classifiers for example for creating fine and coarse products. Rotary and louvre classifiers were later combined. The LSKS, which is tailored to processing the often very moist granulated slags, has been available since the beginning of the 1990s. Today this type of classifier is standard for all materials.

Thanks to intensive research and analysis of the system parameters in CFD simulations and model tests it has been possible to optimise the gas/dust flow patterns. The guide vane assembly and the rotor offer a lower resistance to flow than before and provide an improved classification efficiency. This leads to higher energy efficiency and less wear.

The new LDC Series (Loesche-Dynamic-Classifier) is optimally matched to the Loesche mills. Upper housings with a rectangular horizontal outlet and a round sloping outlet are available.

Using the patented swirl rectifier brings about a more homogeneous dust and gas distribution in the filter.

Here it's all about fineness.



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Mobile Grinding Plants

- perfectly natural to us

In the technological field we cannot dispense completely with the use of fossil fuels. We must, however, depending on resources, turn to coal in order not to destroy the declining supplies of purer energy sources such as oil and gas.

In response to this finding Loesche developed a mobile coal grinding plant (CGP Coal Grinding Plant) which produces 2–4 t/h coal dust for a thermal output of approximately 5–20 MW. The newly developed container-construction plant provides for the local supply of thermal processes and can be used at any site.

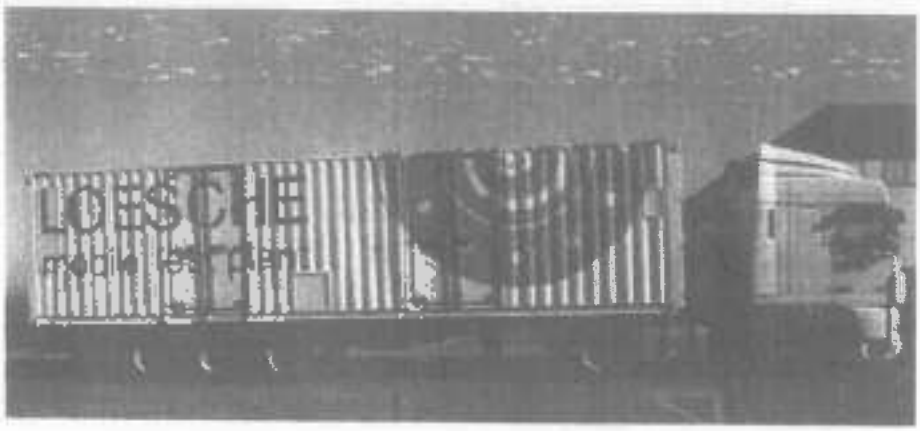
This plant type fills the gap in the supply of coal dust in that it eliminates long transportation routes in special vehicles. The use of coal instead of gas and oil that is made possible by this plant reduces operating costs dramatically.

To introduce new processing technologies in the ore industry – in this case a dry processing method – Loesche also developed a transportable, fully-equipped container based grinding plant (OGP Ore Grinding Plant). This plant is designed in such a way that it can be transported to practically any geographical and climatic region in the world where mining operations are conducted.

Loesche's purpose with this plant is to enable ores to be immediately ground directly on site in an ore processing plant without intermediate transportation so as to prevent potential changes to the grinding stock. The material behaviour in the downstream processes can be analysed immediately.

The customer is able to evaluate process variants realistically and to determine economically in the short term the influences on the production of valuable substances in his plant.

The mill for the in between.



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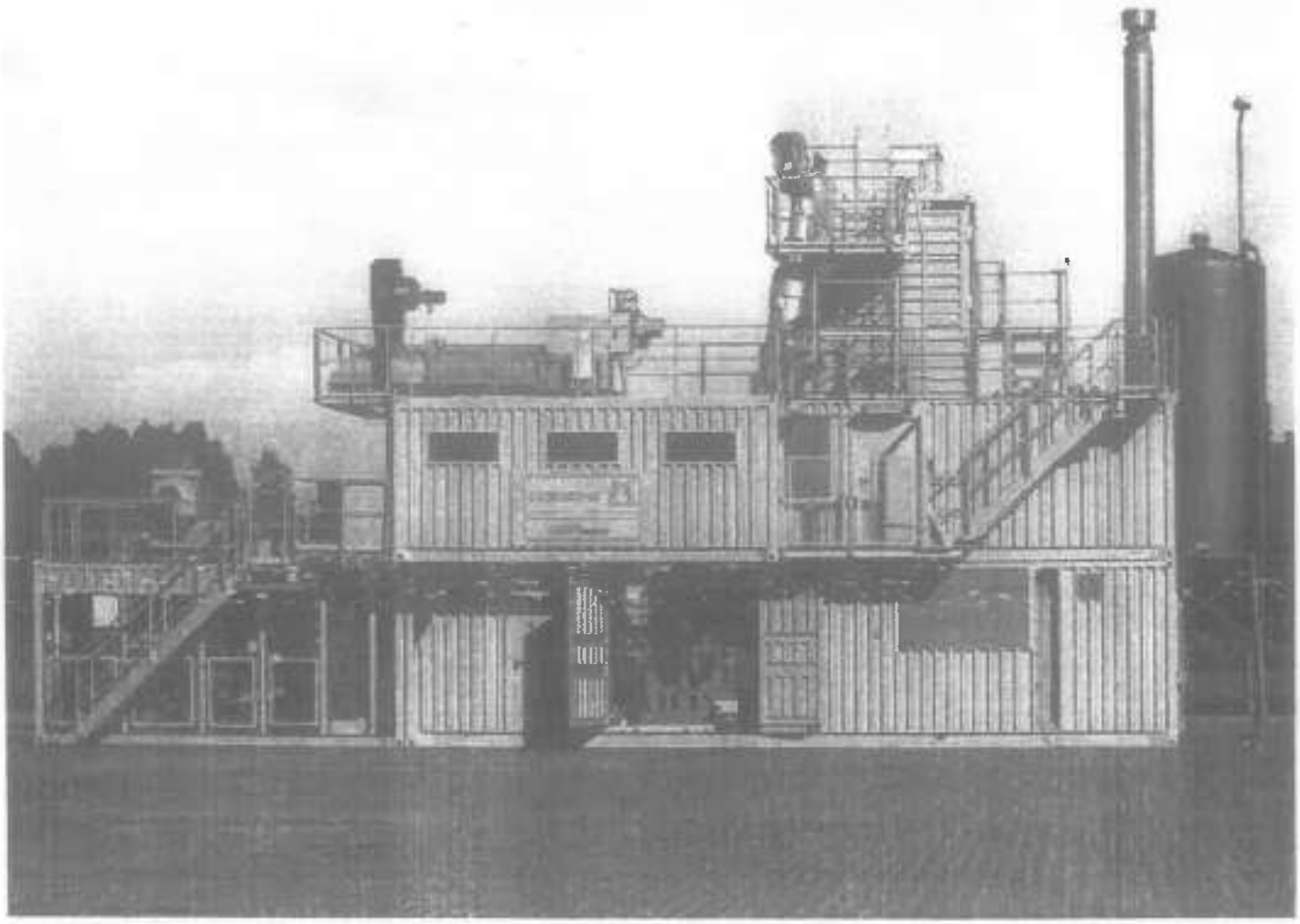

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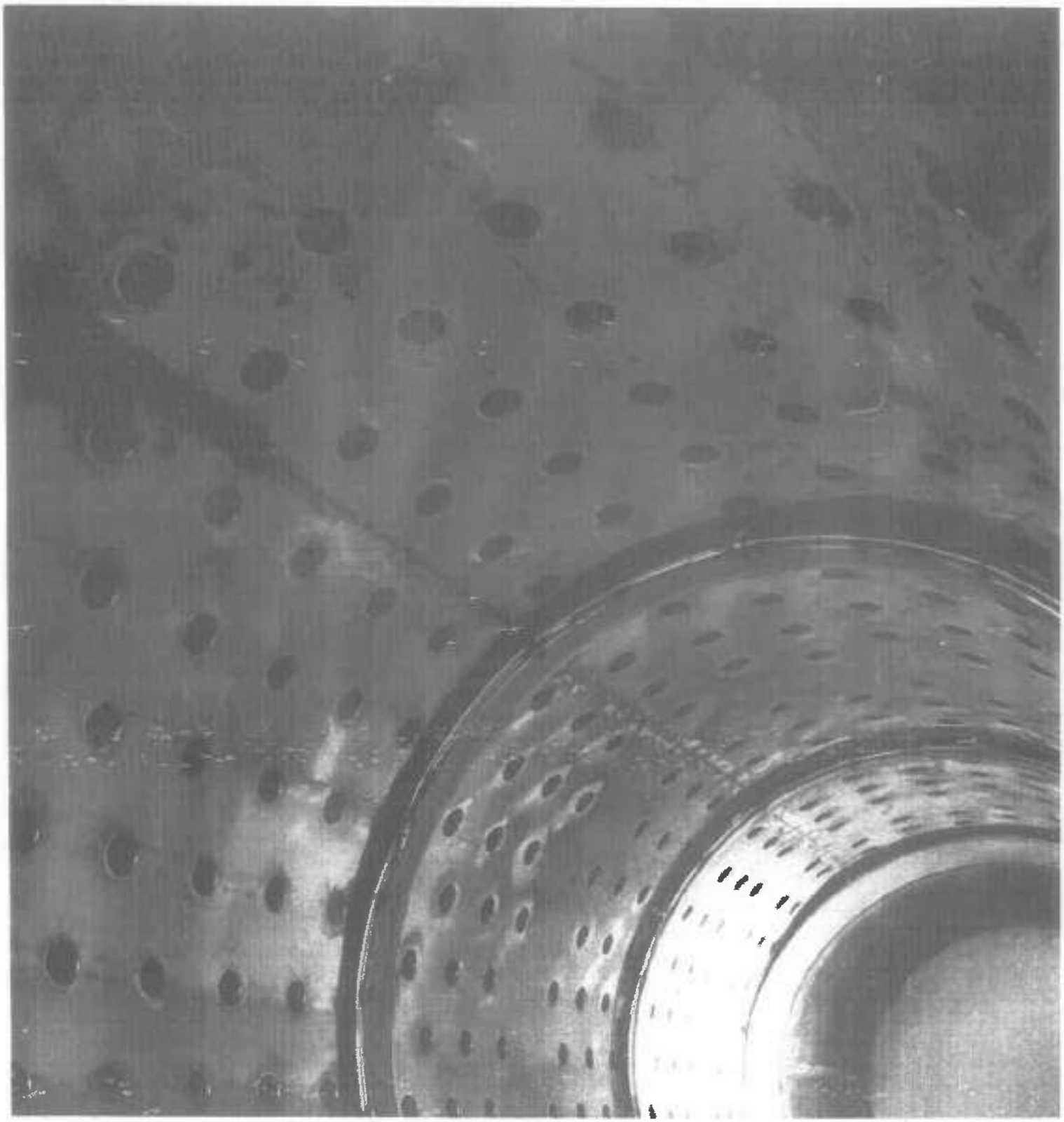

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Hot-gas Generator with Steel Combustion Chamber

- a milestone

For the combined drying and grinding process a heat source is required to dry the grinding stock – this is usually a hot-gas generator. At the beginning of the 1960s Loesche built the first combustion chamber with no refractory lining. This signalled the start of a success story.

Loesche was and is the only mill manufacturer that can supply all the equipment in-house, i.e. the mill with its own hot-gas generator.

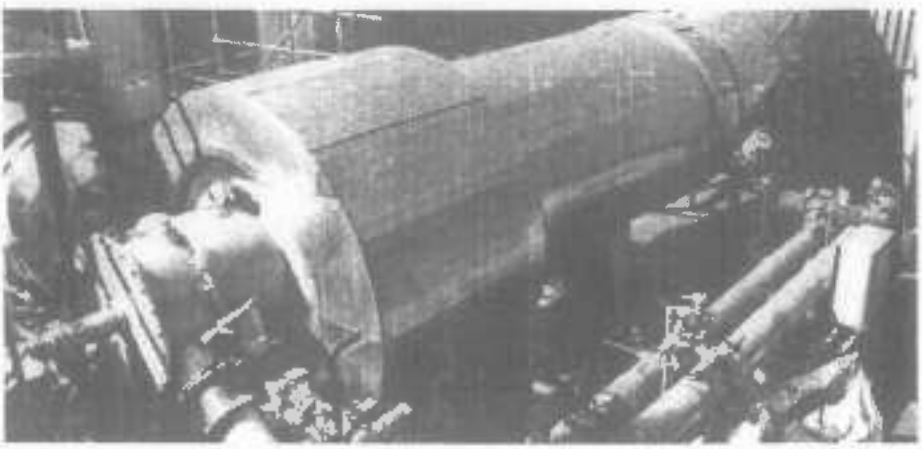
The Loesche combustion chamber, known around the world by the name LOMA heater (LOchMAntel = German for perforated jacket), initiated the age of steel combustion chambers with no refractory linings and is the prototype of all these combustion chambers which are used today worldwide for all kinds of thermal processes.

The first decades in the story of the LOMA® heater were marked by the use of conventional gases and liquid fuels.

Increased energy awareness and the scarcity of pure energy sources gave rise to a high demand for energy-efficient processes and the call for the use of alternative fuels.

The basis for the development of new hot-gas generator systems by Loesche was on the one hand gaseous industrial by-products such as blast furnace gas, coke gas, synthesis gas, etc. and on the other hand the increased use of all manner of solid fuels – from wood dust, through to pulverised lignite and pulverised hard coal, as well as petroleum coke.

We recognise the signs of the times – energy efficiency and ecological awareness.



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Our burner systems

– ready for all fuels for outputs from 0.1 MW to 60 MW

Loesche burners are used in a variety of industries for drying, heating, temperature control, power and steam generation.

Output ranges from 0.1 to 60 MW are reached through a large number of applications and optimised fuel burners. Loesche engineers advise clients on a project-specific basis on whether gaseous, solid, liquid or powdered fuel offer optimum energy efficiency and fuel costs. More than 600 reference plants have been erected worldwide in the cement, power generation, steel, minerals, ore, timber, animal feed and chemical industry already.

At the beginning of the 1990s Loesche engineers succeeded in combining the Loesche steel combustion chamber with a new type of burner to create a new hot-gas generator system. This marked the birth of the multiple lance burner, or MLB for short. This burner enables lean gases with heating values down to a minimum of 2800 kJ/m³ (STP) to be burned with great efficiency without the need for combustion assistance.

Within just a few years the MLB was in use all around the world, primarily in the steelworks industry for the thermal utilisation of blast furnace gas.

For coal gasification processes a modified MLB is used to burn synthesis gas. This burner has been successfully used since the construction of the first industrial coal-to-gas plant in the Netherlands in 1990.

The process of coal grinding requires high control ranges of 1:10, which can be achieved with the Loesche hot-gas generator systems.

This burner system represents the state of the art in engineering since the beginning of the 1990s.

Even in the early days the advantages of the Loesche steel combustion chamber were already being exploited in the burning of solid fuels. In the 1980s the wood industry played a pioneering role in the utilisation of industrial solid fuels. Thanks to continuous further development pulverised lignite and pulverised hard coal can also be efficiently burned today.

In order to conduct combustion testing of solid fuels from all kinds of sources Loesche built a 1 MW hot-gas test plant which is connected online to a Loesche coal mill.

The plant enables Loesche to determine the combustion parameters for any solid fuel under real conditions.

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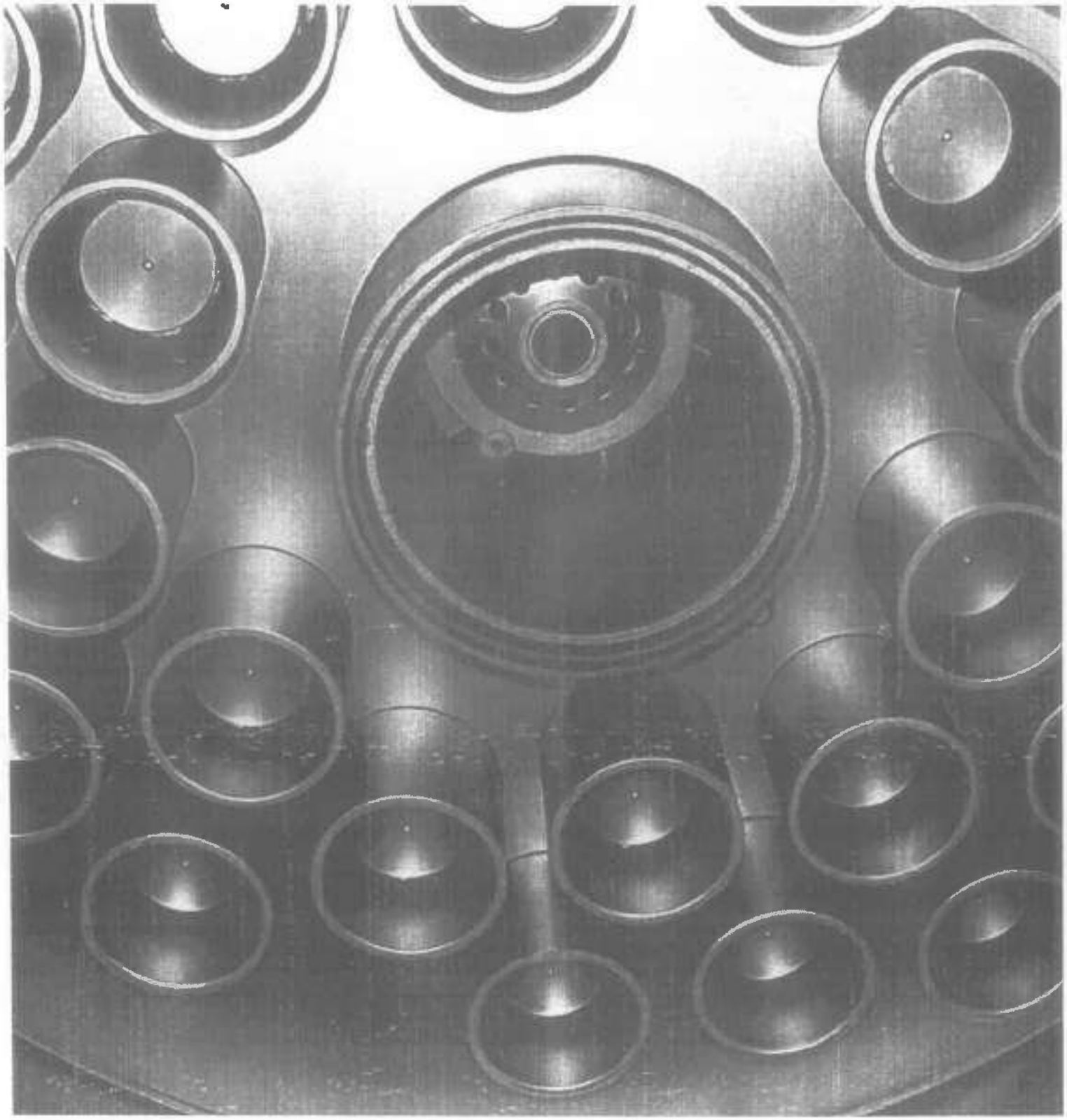

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Automation Technology

– regulates and controls the heart of the machine

Loesche automation technology integrates cutting-edge machine technology and intelligent process control for optimum and efficient plant operation.

We offer our customers customised engineering services for process, hardware and software development.

These services cover all disciplines ranging from open-loop and closed-loop control engineering, through to the full on-site supply of electrical equipment down to service, maintenance and customer training.

On the back of decades of experience Loesche develops intelligent control engineering solutions specifically for individual customers even for complex process engineering requirements.

Loesche automation completes our scope of services. This enables us to offer and supply customers with turnkey grinding plants from a single source and to maintain these plants in our capacity as a lifetime partner.

We can monitor and control.

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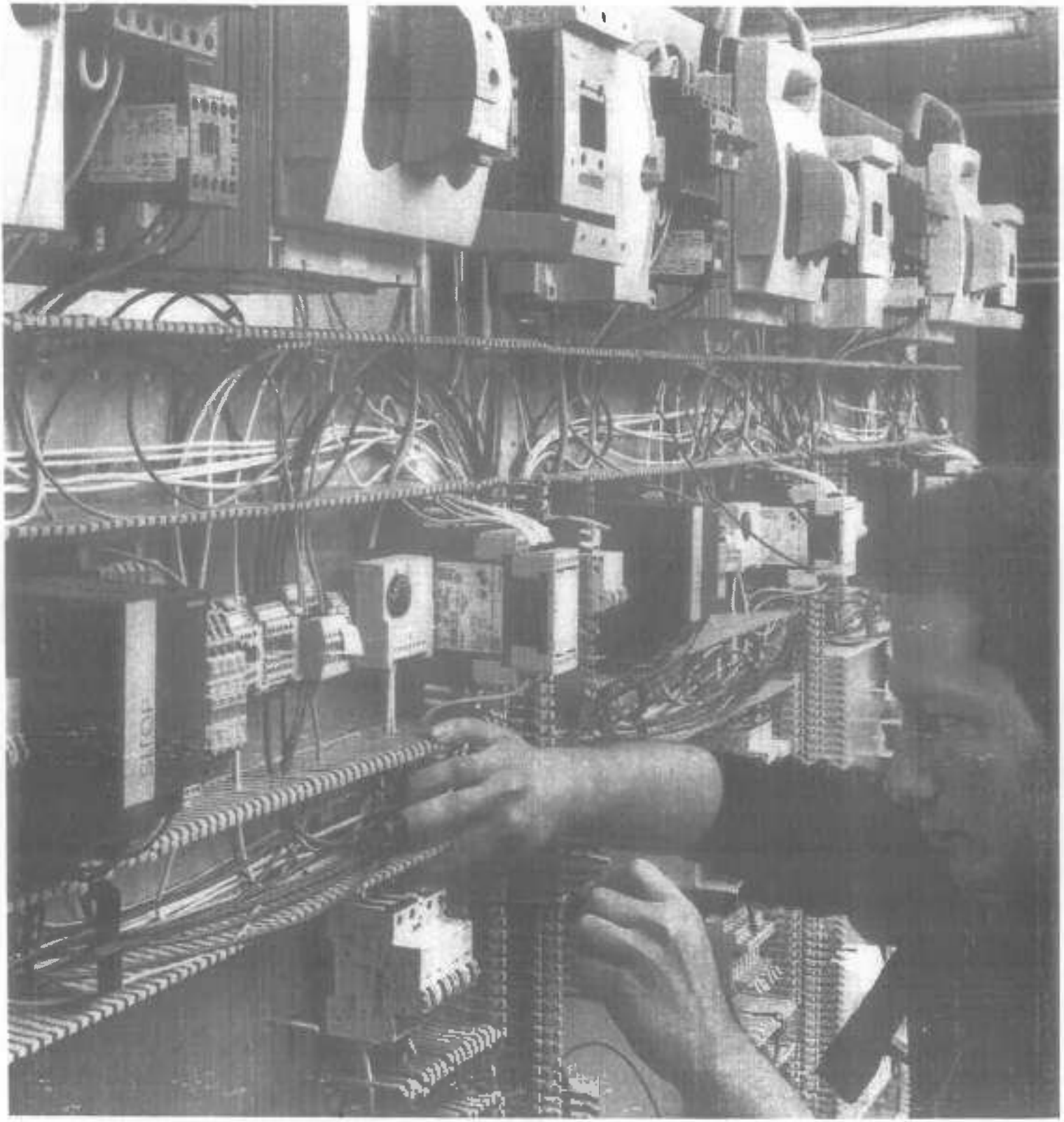

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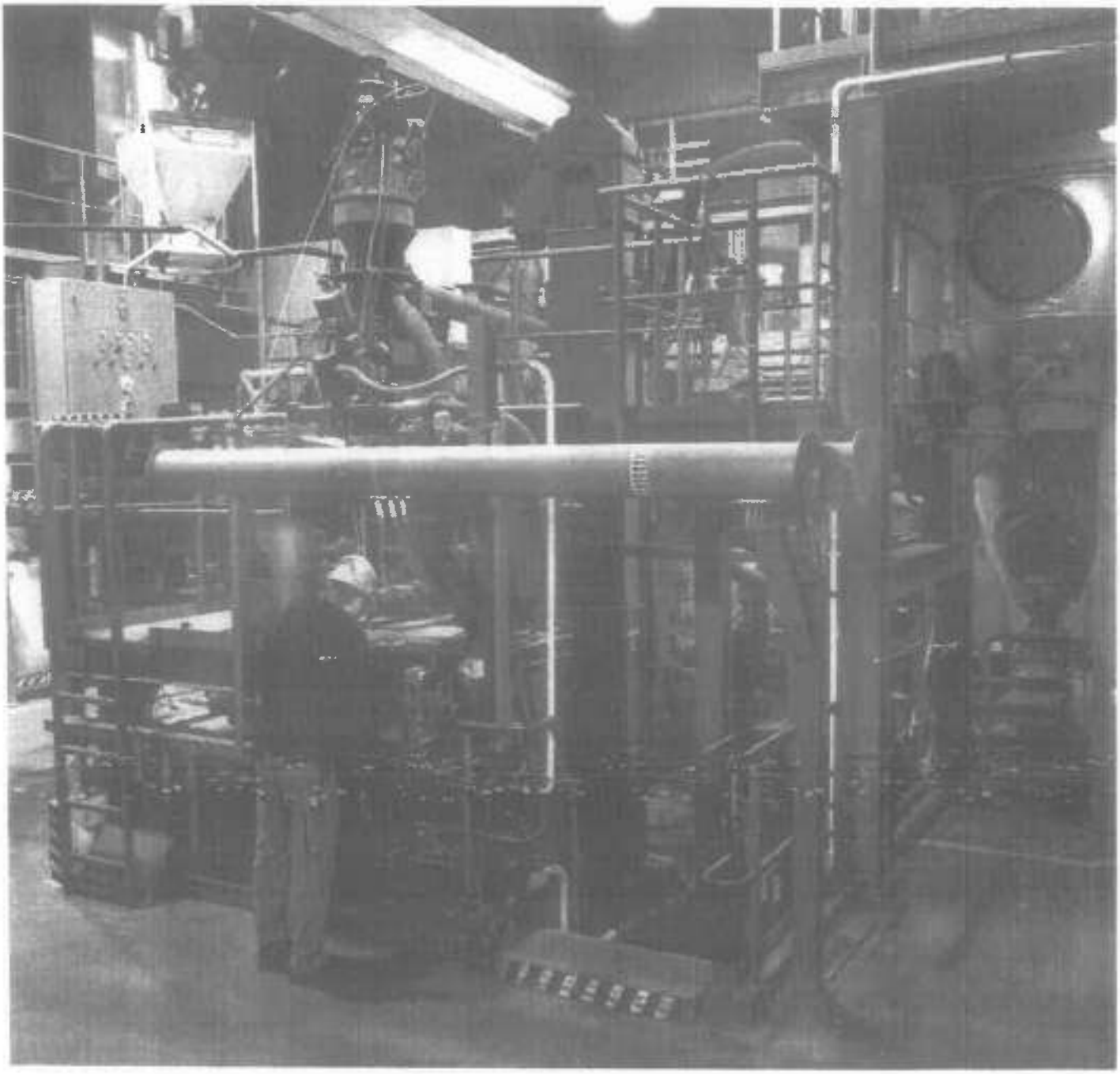

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Research and Development

– the basis for innovative engineering

One of the first steps in developing and launching new technologies involves practical testing at the technical center.

For our research and development projects we have four test grinding plants for a variety of purposes:

- Trials of new grinding technologies and classifiers
- Testing of plant specific raw materials
- Analysis of grinding stock for future market segments
- Optimization of plant components and circuits
- Testing of new grinding stock for future market segments
- Analysis and testing of new wear materials and concepts
- Development of hot gas generator plants for burning solid fuels and lean gases

For grinding tests within the framework of projects or for special customer requests we operate at the Loesche test center LM 3.6 type grinding plants for all kinds of applications and tasks.

The most important key figures for a grinding stock are the Loesche grindability and the specific power demand, as related to a defined product fineness.

Depending on the geological origin of the grinding stock in nature one finds highly differing properties even in evidently similar materials.

In industrial produce differences in material are common and depend on the respective process situation.

Analysis possibilities

- Particle size analysis with Cilas laser granulometer
- Determination of mass-related surface area according to Blaine
- Determination of true density with gas pycnometer
- Sieve analyses with Alpine airjet sieve and Retsch vibratory sieve
- Grindability according to Hardgrove
- Grindability according to Zeisel
- Macroscopy with Zeiss Stemi SV 11
- Drying chambers for determining moisture
- Coal analysis (CHN, volatile constituents, ash content).

Materials

- Coal
- Cement, granulated slag
- Cement raw meal
- Ores and slag
- Industrial minerals
- Biomass.

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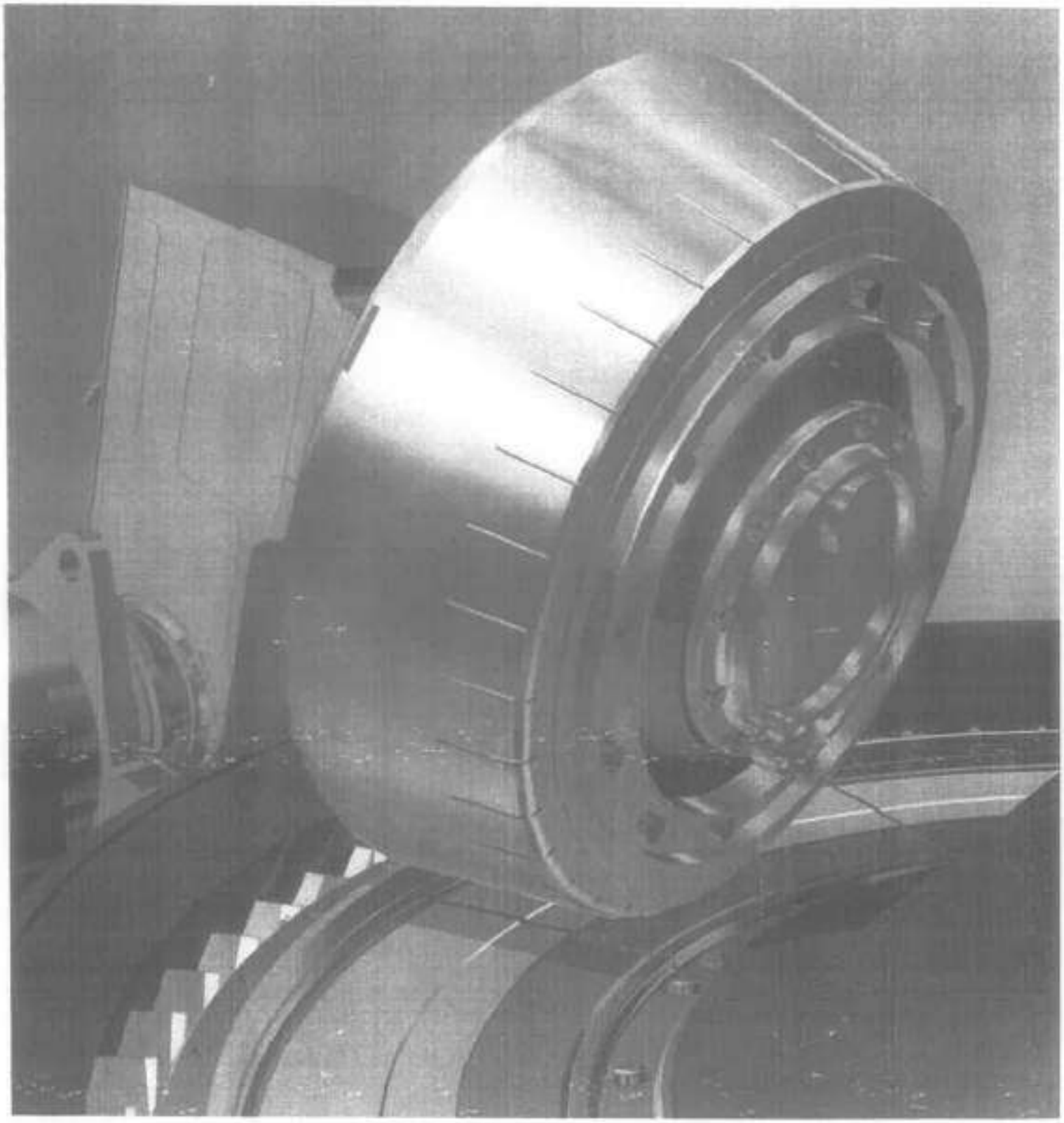

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Technology – Innovations

– we never rest on our laurels

Reducing grinding part wear

Wear is encountered in all comminution processes. The primary type of wear in the grinding roller/grinding plate system is abrasion, i.e.

- Hard particles penetrate into the grinding wear components
- The depth of penetration is dependent on the hardness of the grinding component

Multiphase materials (chilled casting - embedded carbide) are subject to local score grooving processes, resulting in a selective erosion.

Loesche offers the right material to suit every application. In practice three different groups of materials have proven successful for grinding elements:

- Cast iron with high chromium content
- Hardfaced steel casting
- Composite materials

Heat recovery from process waste gases

In combined drying and grinding some of the process gas after leaving the dust separator is fed back into the grinding circuit. The rest is lost through the stack. A new process sequence allows some of the heat loss flow dissipated at the stack to be made available again for the grinding process. The process gas is routed through an air-to-air heat exchanger and preheats the required fresh air in the system.

The advantages:

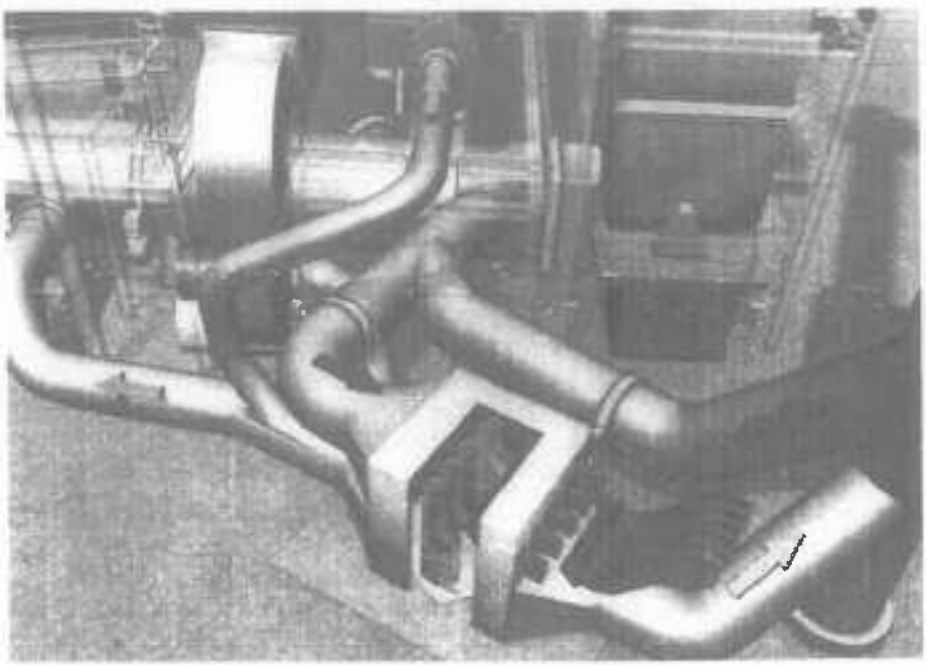
- Annual fuel cost savings of between 10% and 15%
- The additional investment in the upgraded heat recovery/heat utilisation system has a pay-back of 1 and 2 years

Improved roller seal

In order to increase the efficiency of grinding plants Loesche now offers a rocker arm seal which reduces energy costs and provides for a complete seal.

The new Loesche seal prevents false air from entering between the rocker arm and the mill body and seals off this area completely.

Always committed to progress and benefit of our customers.



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Recovering metals and producing filler from steelworks slag

The scarcity of resources is increasingly forcing engineers to tap industrial by-products as "sources of raw materials". By developing new processes Loesche addresses both the challenges of environmental technology and the economic constraints of conserving resources in the form of its "recovery philosophy".

The dry reduction process developed by Loesche for recovering metals from slag combines all the advantages of conventional processes.

- Efficient and cost-effective metal recovery in the coarse range
- Virtually 100% metal yield down to the finest grain range by means of optimised dry grinding, classification and finest grain sorting technology
- Production of a high-quality mineral filler product with precisely definable grain distribution.

The process is particularly suitable for
- slag from the production of stainless steels
- LD slag, and
- metallurgically modified slag

Recycling of oil-contaminated scale

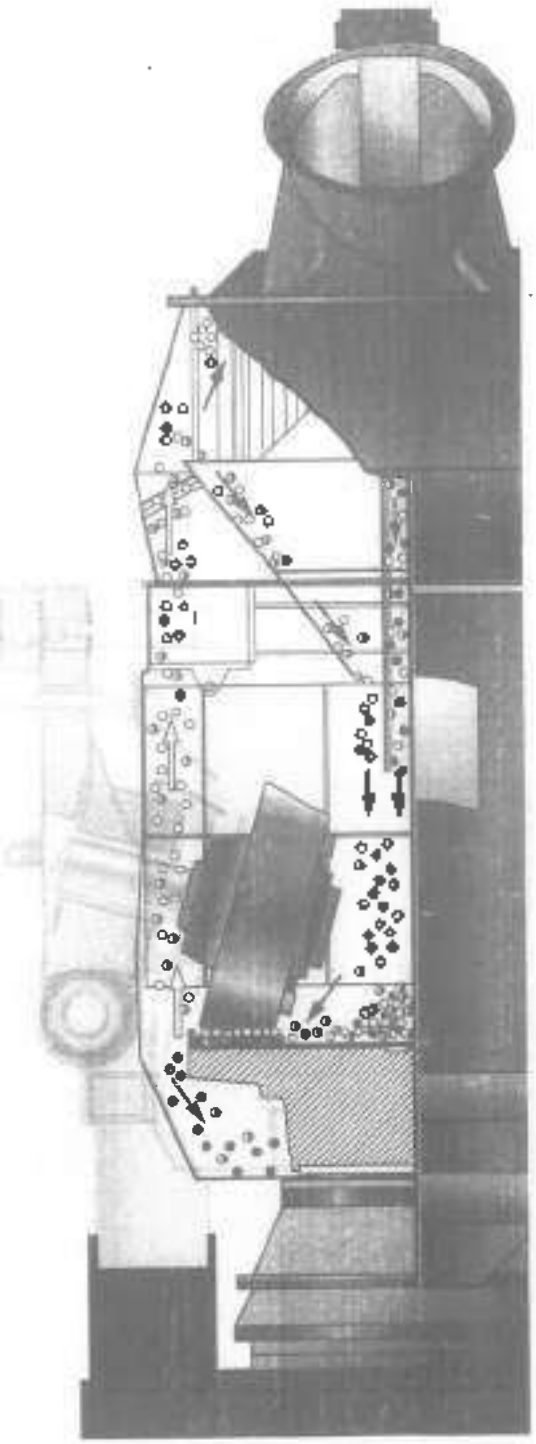
Oil-contaminated scale is one of the most difficult materials to recycle and is created during the hot forming of steel. The iron content of the dewatered scale lies between 65% and 70%.

The patented process developed by Loesche exhibits the following features:

- The oil-contaminated scale is added in a specific relationship to the raw coal at its storage point.
- The coal and scale mixture is transported to the bunker
- The drying and grinding process creates an optimal homogenising and comminution of both components.
- The pulverised coal and scale mixture is fed via the dosing unit and the injectors into the blast furnace

This process of drying and grinding the coal-scale mixture can be planned into the erection of new PCI plants as well as being retrospectively fitted to existing plants. This process requires no extra, expensive equipment.

The process has been successfully integrated into the production lines of three coal mills at the Dillinger Hütte steelworks in Germany. It ensures that the oil-contaminated scale is effectively reintroduced to the smelting process



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ANNEXURE 6

123

IN THE HIGH COURT OF GUJARAT AT AHMEDABAD

SPECIAL CIVIL APPLICATION No. 10850 of 2009

==========

SUKHABHAI BHIKHABHAI AAHIR & 29 - Petitioner(s)
Versus
PRINCIPAL SECRETARY & 3 - Respondent(s)

==========

Appearance :
MR KK TRIVEDI for the Petitioners.
Ms. Trusha K Patel, Assistant GOVERNMENT PLEADER for Respondent nos.1
1.2.1, 1.2.2, 1.2.3, 1.2.4 and 3.
MR VD PARGHI for Respondent no.2.
Mr. S.I.Nanavati, Senior Advocate with MRS VD NANAVATI for Respondent no.4.

==========

CORAM : HONOURABLE THE CHIEF JUSTICE MR. S.J. MUKHOPADHAYA

and

HONOURABLE MR.JUSTICE ANANT S. DAVE

सत्यमेव जयते
THE HIGH COURT OF GUJARAT

Date : 23/02/2010

ORAL ORDER

(Per : HONOURABLE THE CHIEF JUSTICE MR. S.J. MUKHOPADHAYA)

The writ petition in public interest has been filed by villagers of Junagam village (old name Sunvali), Ta: Choryasi, Dist: Surat. They have a grievance with regard to raising of boundary around land allotted in favour of the 4th respondent Larsen and Toubro Ltd. (hereinafter referred to as "the Company"). A prayer has been made to direct the 4th respondent to provide 9 meter space surrounding th periphery of the block bearing Revenue Survey Nos. 445 to 497. Further prayer has been made to set aside

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the order dated 24th October, 2008 and the order dated 23rd October, 2008 whereby the lands were allotted by the respondent State to the 4th respondent Company with a further prayer to constitute a High Level Committee to determine the market value of the land allotted in favour of the 4th respondent Company.

2. When the matter was taken up, learned counsel for the 4th respondent submits that there is no public interest involved in this case and there being adjoining road to the village in question, the Company is not liable to provide any road or space for the villagers.

Learned counsel appearing on behalf of the petitioners though alleged that the land has been transferred for a lesser amount, but could not lay hand on any document to show that the value of the land is higher than the rate in which it has been allotted in favour of the 4th respondent.

3. After detailed argument, learned counsel for the petitioners submitted that the petitioners are more concerned with the access to their village land and drainage of storm water. It was contended that the land allotted to the 4th respondent surrounds the total village except road from one side. Apart from the fact that there will not be approach road for the villagers, the 4th respondent raises the level of the adjoining land, the village will sub-merge in absence of outlet for storm water.

4. On behalf of the 4th respondent, originally time was sought for and after instructions, learned counsel for the 4th respondent submitted that the 4th respondent company being a reputed company, is agreeable to construct a road for access to the land of villagers. It is also agreeable to construct the storm water drainage to ensure the drainage of water from the village.

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Three affidavits have been filed wherein a statement in this regard has been made. In the affidavit dated 19th February, 2010, the following statement has been made.

> "para: 3: I say that as stated in the earlier affidavit, Respondent no. 4 intends to provide 10 feet wide road alongwith the periphery of the land bearing Revenue Survey Nos. 445 to 497 of the petitioners and other villagers. Alongside the proposed periphery road, Respondent no. 4 also intends to provide open storm water drains having the width of 2.5 feet. A sketch showing the proposed periphery road and the storm water drains between the private lands and the land allotted to Respondent No. 4 is annexed hereto and marked as Annexure-"I". A further sketch showing the cross-section of the private land, Respondent no. 4's land and the periphery road with the storm water drain is annexed hereto and marked as Annexure-"II".

In the affidavit dated 19th February, 2010, following statement has been made.

> "3. I say that as stated in earlier affidavit, respondent no. 4 intends to provide 10 feet wide road along the periphery of the land bearing Revenue Survey Nos. 445 to 497 of the petitioners and other villagers. Alongside the proposed periphery road, respondent no. 4 also intends to provide open storm water drains having the width of 2.5 feet. A sketch showing the proposed periphery road and the storm water drains between the private lands and the land allotted to respondent no. 4 is annexed hereto and marked as Annexure 'I". A further sketch showing the cross-section of the private land, respondent no. 4's land and the periphery road with the storm water drain is annexed hereto and marked as Annexure "II".

In the affidavit dated 19th February, 2010, the following statement has been made.

> "3. I say that respondent no. 4 intends to provide about six culverts at suitable places underneath the proposed periphery road indicated by blue circles in

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the sketch annexed hereto and marked at Annexure-"I". One end of these culverts will be connected to storm water drains proposed in respondent no. 4's land. The other end of the culverts will be at the boundary of private land."

Alongwith the copy of the affidavit, relevant maps have also been enclosed by the 4th respondent.

5. Learned Assistant Government Pleader appearing on behalf of the State submitted that direction should be issued on the 4th respondent to complete the construction of the approach road and the storm water drainage within a reasonable period, preferably before starting of monsoon. In reply, it was contended by learned counsel for the 4th respondent that the total work will be completed by December, 2010.

6. We have heard learned counsel for the parties and perused the record.

7. In the present case, as we find no case made out to interfere with the valuation of the land fixed by the State, we are not inclined to grant the relief so sought for in the writ petition.

So far as the prayer for providing space surrounding the periphery of the block of Revenue Survey Nos. 445 to 497 is concerned, taking into consideration the stand taken by the 4th respondent, we direct the 4th respondent to construct the proposed road stated in its affidavit and shown in the enclosure annexed to the affidavit, at an early date, preferably within six months. In the meantime, if the 4th respondent raises level of its land before construction of road and drainage, it must ensure that some space is left for drainage of storm water of the land of Revenue Survey Nos. 445 to 497. To ensure that road and drainage are properly constructed, we are imposing the map of the proposed road and

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proposed drainage plan as submitted by the 4th respondent as part of this judgment at Annexures "A" and "B".

8. It will be open to the 4th respondent to make some variation with regard to storm water drainage inlet and the culvert as shown in the map in rounds at six places.

9. The writ petition stands disposed of with the aforesaid observations and directions. There should be no order as to costs.

(S.J.Mukhopadhaya,C.J.)

(Anant S.Dave,J)

***vcdarji

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THE HIGH COURT
OF GUJARAT
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IN THE HIGH COURT OF GUJARAT AT AHMEDABAD

R/SPECIAL CIVIL APPLICATION NO. 12912 of 2019
With
CIVIL APPLICATION (DIRECTION) NO. 1 of 2020
In
R/SPECIAL CIVIL APPLICATION NO. 12912 of 2019

SEABIRD MARINE SERVICES PVT. LTD
Versus
STATE OF GUJARAT

Appearance:
MR. AADIT R SANJANWALA(9918) for the Petitioner Nos. 1, 2
MR. K.M. ANTANI, AGP for the Respondent No. 1
MR ANAL S SHAH(3988) for the Respondent No. 4
MR CJ VIN(976) for the Respondent No. 3
MR HS MUNSHAW(495) for the Respondent No. 2

CORAM: HONOURABLE MR. JUSTICE BHARGAV D. KARIA

Date : 25/02/2021

COMMON ORAL ORDER

Heard learned Senior Advocate Mr. R.S. Sanjanwala assisted by learned advocate Mr. Aadit Sanjanwala for the petitioner – applicant, learned Senior Counsel Mr. Mihir Joshi assisted by learned advocate Mr. Anal Shah, learned advocate Mr. H.S. Munshaw and learned advocate Mr. C.J. Vin for the respective respondents and learned AGP Mr. K.M. Antani for the respondent – State through video conference.

Learned Senior Advocate Mr. Sanjanwala assisted by learned advocate Mr. Aadit Sanjanwala for the petitioner without going into the merits of the case, under instructions seeks permission to withdraw this petition in view of the draft Development Plan 2035

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of the Surat Urban Development Authority and to make submissions before the appropriate authority in the proceedings of variation of the Draft Development Plan 2035, which are under consideration by raising all the contentions, which are raised in this petition and which may be raised in future. Mr. Sanjanwala also prays that the respondent authority may consider the request of the petitioner to make an alternative road pliable.

In view of the aforesaid statement of learned Senior Advocate Mr. Sanjanwala, the petition is permitted to be withdrawn and the appropriate authority may consider the objections, which may be raised by the petitioner in the proceedings of variation of the Draft Development Plan 2035 and also consider the request of the petitioner to make an alternative road pliable. The petition is accordingly disposed of as withdrawn. ***Notice is discharged.***

In view of the withdrawal of the Special Civil Application, no order is required to be passed in Civil Application for direction. Civil Application stands disposed of accordingly.

THE HIGH COURT OF GUJARAT
WEB COPY

(BHARGAV D. KARIA, J.)

AMAR RATHOD...

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ANNEXURE-7

(131)

- not addressed.
- Hazardous waste matrix is not properly addressed in accordance with the HWM Rules, 2016.
- Details of EMP-CER with break-up is not submitted.
- Project specific safety details are not addressed.
- Chemical reaction and relevant details not covered in EIA report.
- Composition of waste generated from the different sources and its management as per prevailing laws/rules &regulations is not addressed properly.

ring SEAC meeting, Committee noted that most of the ToR pertaining to the above mentioned points s not addressed properly in EIA report as well as in presentation. Committee concluded that PP is not ll prepared and compliance of TOR is not satisfactory.

view of the above, Committee unanimously decided to consider the proposal after submission the following details:

1. Redress ToR no. 8, 10, 16,17,19,23,26,27, 28,37, 40,41,44,46,50 and incorporate it in EIA.
2. Compliance of MoEF&CC's OM dated 01/05/2018 regarding "Corporate Environment Responsibility" (CER). Fund allocation for Corporate Environment Responsibility (CER) shall be made as per MoEF&CC's O.M. No. 22-65/2017-IA.III dated 01/05/2018 for various activities therein. The details of fund allocation and activities for CER shall be incorporated in EIA/EMP report.
3. Justification of quantity of ETP sludge against treatment of industrial effluent.
4. Sources of process gas emission, process stack and its APCM.
5. Sound management of bleed liquor (exhausted scrubbing media) as per the HWM Rules, 2016.

	SIA/GJ/IND2/30448/2018	M/s. Sanghi Industries Limited Survey No. 125/1, 125/2 and 126/1+2+3, Vill.: Shivrampur, Tal.: Choryasi, Dist.: Surat.	Appraisal

Category of the unit: 3(b)

Project status: New

- Project proponent (PP) submitted online application vide no. SIA/GJ/IND2/30448/2018dated 12/03/19 for obtaining Environmental Clearance.
- SEIAA issued TOR to PP vide their letter dated 20/01/2019.
- Project proponent has submitted EIA Report prepared by Eco Chem Sales & Services based on the TOR issued by SEIAA.
- Public Hearing for the project was held on 22/03/2019.
- This is new unit proposes for stand alone cement grinding as tabulated below:

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Sr. No.	Name of the Products	Quantity MMT/Annum	End-use of products
1	Cement (OPC / PPC / PSC)	2.0	Customer

- The project falls underCategory B of project activity 3(b) asper the schedule of EIA Notification 2006.
- PP was called for presentation in the SEAC meeting dated 16/04/2019.
- Salient Features of the project including Water, Air and Hazardous waste management:

Sr. no.	Particulars	Details
A	Total cost of Proposed Project (Rs. in Crores):	282.28
	Brief details of EMP	

S. No.	Particulars	Capital Cost (Lakhs)	Recuring Cost (Lakhs/annum)
1.	Air Pollution Control Devices	752.15	65.00
2.	Water Pollution & Reclamation	35.00	5.60
3.	Occupational Health and Safety	49.65	18.30
4.	Environmental Monitoring	54.00	27.81
5.	Green Belt Development	20.00	12.00
	Total	911.00	149.71

Brief details of CER

Approximately Rs. 424.00 Lakhs (~1.5%) is bean allocated for following CER activities for next five years.

S.No.	CER Activities	Cost (Lakhs)
1.	Drinking water facility in nearby village	75.00
2.	Up-gradation and hygiene facilities in nearby village	149.00
3.	Plantation in community areas	55.00
4.	Training and Awareness Program	75.00
5.	Education & Farming related activities	70.00
	Total	424.00

B	Total Plot area (sq. meter)	48,560 m^2
	Green belt area /Tree Plantation area (sq. meter)	1650 m^2
C	Employment generation	780 Nos. (Construction + Operation)
D	Water	
i	Source of Water Supply(GIDC Bore well, Surface water, Tanker supply etc..)	The water requirement shall be met from irrigation department/Private Tanker.
	Status of permission from the concern authority.	Application has been made to Irrigation Department which is under process
ii	Water consumption (KLD)	

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S. No.	Particulars	Water Consumption, (KLD)
A.	Domestic	15.0
B.	Industrial	
1.	Processing/Cooling	150
2.	Dust suppression & Fire Fighting	10 KLD Fresh Water + 58 KLD from Blow down = 68 KLD
	Total Industrial	160.0
C.	Gardening	25 KLD Fresh water + 20 KLD recycled= Total 45
	Total Fresh water Requirement	200.0
	Total water Requirement	278.0

1) Total water requirement for the project: 278 KLD
2) Quantity to be recycle: 78 KLD
3) Total fresh water requirement: 200 KLD

iii **Waste water generation (KLD)**

Type / Source	Quantity of Waste Water Generated (Kilo Litre per Day)	Treatment Capacity (Kilo Litre per Day)	Treatment Method	Mode of Disposal	Quantity of Treated Water Used in Recycling / Reuse (Kilo Litre per Day)	Quantity of Discharged Water (Kilo Litre per Day)
Domestic	10.0	15	STP	-	8	None
Industrial	70.0	150	Cooling Tower	-	70	None

iv **Treatment facility within premises with capacity [For existing and Proposed]**

[In-house ETP (Primary, Secondary, Tertiary), MEE, Stripper, Spray Dryer, STP etc.

STP – 15 KLD

v **Mode of Disposal & Final meeting point**

Domestic:	Recycle through STP and use for green belt
Industrial:	Recycle through close circuit Cooling Tower

vi In case of Common facility (CF) like CETP, Common Spray dryer, Common MEE, CHWIF etc.

Name of Common facility

Not Applicable

Membership of Common facility (CF)

Not Applicable

vii **Reuse/Recycle details (KLD)**

78 KL

E **Air**

i Flue gas emission details

No. of Boilers/TFH/Furnaces/DG sets etc. with capacities viz. TPH, Kcal/hr, MT/hr, KVA etc. Proposed

S.No.	Location	Types of Emission	Qty.	Air Pollution Control Measures (APCM)	Stack Details

	1	Cement Mill (VRM)	PM SOx NOx	01	Bag House Capacity - 11,00,000 m^3/hr	Height – 55 m Dia – 3.2 m APC: Bag filters *Air emission:* PM 30 mg/Nm^3 SOx 100 ppm NOx 100 ppm

ii Process gas i.e. Type of pollutant gases (SO_2, HCl, NH_3, Cl_2, NO_x etc.)
Proposed

-

Sr. no.	Source of emission	Type of emission	Stack/Vent Height (meter)	Air Pollution Control Measures (APCM)
1	Not Applicable			

-

iii Fugitive emission details with its mitigation measures.

Fugitive emission during raw material handling and feeding process and vehicle movements. Mitigation measures – High efficiency pulse air jet type bag filters will be considered to arrest the air borne dust at all the locations where transfer of material are takes place; The automatic bagging machine with bag filters will be installed for packing plant; Unloading of coal trucks will be carried out with proper care avoiding dropping of the materials from height. Sprinklers will be installed in Raw Material / Fuel storage/ Loading / unloading areas. The sprinkling of water will be done along the internal roads in the plant in order to control the dust arising due to the movement of vehicular traffic; Proper maintenance of vehicles shall be carried out; All the workers inside the plant will be provided with disposable dust masks; Thick greenbelt will be developed around the plant to arrest the fugitive emissions; and Periodic air quality monitoring shall be carried out as per CPCB / SPCB norms etc.

F Hazardous waste
(as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016.
Proposed

i Solid/ Hazardous waste will be collected, stored, transported and disposed as per the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2016. Dust collected from air pollution control equipment will be 100% recycled in system. Generated used oil from plant machinery will be utilized as alternative fuel to burn in existing cement plant at Sanghipuram.

ii	Membership details of TSDF, CHWIF etc.	Not Applicable
iii	Details of Non-Hazardous waste & its disposal (MSW and others)	-

G Solvent management, VOC emissions etc.
Not Applicable

i Types of solvents, Details of Solvent recovery, % recovery, reuse of recovered Solvents

- Not Applicable

ii VOC emission sources and its mitigation measures

- Not Applicable

- During the meeting dated 16/04/2019, technical presentation made by the Project proponent.

- During the meeting, the project was appraised based on the information furnished in the EIA Report, various issues raised during the public hearing and details presented during the meeting.
- The baseline environmental quality has been assessed for various components of the environment viz. air, noise, water, biological and socioeconomic aspect for the study area of 10 km radial distance from project site for the period 01/10/2018 to 31/12/2018. Ambient Air Quality monitoring was carried out for $PM_{2.5}$, PM10, SO2, NOx, CO and VOC at Nine locations, including the project site. Values conform to the prescribed standards for Ambient Air Quality. The Incremental Ground Level Concentration (GLC) has been computed using ISCST 3.
- The resultant concentrations are within the NAAQS. The modeling study proved that the air emissions from the proposed plant would not affect the ambient air quality of the region in any significant manner. The ambient air quality around the proposed project site will remain within the National Ambient Air Quality Standards (NAAQS).
- Risk assessment including prediction of the worst-case scenario and maximum credible accident scenarios has been carried out. The detail proposed safeguard measures including On-Site / Off-Site Emergency Plan has been covered in the RA report.
- Committee noted that this proposal is for new project of 2.0 MMTPA Standalone Cement Grinding at Survey No. 125/1, 125/2 and 126/1+2+3, Village: Shivrampur, Taluka: Choryasi, District: Surat .
- Cooling bleed off will be utilized for dust suppression within premises. There will no process effluent generation. Sewage will be treated in STP and treated sewage will be utilize on land for gardening/plantation within premises.
- PP has proposed to use Lignite or Coal or Petcoke 12 TPH as fuel in HAG. Committee noted that use of Petcoke in HAG is not allowed in Gujarat as per approved fuel notification. PP has not proposed APCM for SOx control incase of use of lignite. Committee found that details of stacks attached to APCS are not addressed. While deliberation on fuel, PP informed that they will not use lignite &Petcoke as a fuel.
- This office has received representation from M/s. L&T Limited, Hazira against this project regarding anticipated air pollution due to proposed Cement grinding unit through email dated 12.04.2019. M/s. L&T Ltd. represented that they are manufacturing super critical turbine generator, nuclear equipments, war weapons (gun, tanks etc.) and fugitive dust emission of proposed project will adversely affect quality and performance of the product which being used in national security. The same issue was also raised by M/s. L&T Limited during public hearing on dated 22/03/2019.The copy of representation of M/s. L&T Limited, Hazira was given to PP for compliance of the issues raised by them.
- PP has addressed hazardous waste management.

- Committee deliberated CER, EMP and baseline data. PP has not furnished status of all the applicable Rules, Acts, Regulation, Clearances in a tabular form as per given ToR no. 6.

After deliberation, SEAC unanimously decided to consider the proposal after submission of the following details:

1. Readdress ToR no. 5, 40
2. Point wise action plan regarding representation of L&T Ltd. Hazira.
3. Submit raw material & product transportation route, its impact on surrounding area and mitigation measures.
4. Undertaking regarding no use of Lignite &Petcoke as fuel.
5. Sound APCM to control fugitive dust emission during raw material transportation, storage, handling, loading, unloading, transfer; fuel grinding etc.
6. Details of vents/stacks with specific source &Air Pollution Control System.
7. Compliance of Coal & Ash handling guidelines & its commitment.

6	SIA/GJ/IND2/31394/2018	M/s. Gujarat Dyestuff Industries Plot No. Z/25,26,27,28, Dahej SEZ, Vill.: Dahej, Tal. : Vagra,Dist.: Bharuch	EC Amendment

Category of the unit: 6(f)

Project status: EC Amendment

- This unit has been granted EC vide letter no. SEIAA/GUJ/EC/5(f)/43/2018 dated January 31, 2018.
- Now this unit has applied for EC amendment vide proposal no. SIA/GJ/IND2/31394/2018 dated 28.03.2019.
- During the meeting dated 16/04/2019, technical presentation made by the Project Proponent (PP).
- Unit has applied for EC amendment to total water consumption from 34.5 KLD to 166 KLD. The additional water consumption will be utilized in cooling purpose only.
- Industrial effluent will be treated in ETP and reused in cooling make up. Complete ZLD will be maintained.
- PP explained that the acetic anhydride plant requires huge amount of cooling and the conventional cooling system is through cooling water (upto 40 degree) followed by chill water (upto 10 degree) and finally through brine (upto -10 degree). When the EC application was done they had envisage that the chill water and brine requirement would be met through using VAM (Vapour absorption Machine) waste heat from gas based power plant (Proposed) and flue gas from furnace. Based on above the water consumption in the cooling tower which was envisaged in the plant was 28.5 KLPD. Thereafter, when the detailed engineering was conducted after the approval of the EC it was

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ANNEXURE- 8

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Minutes of the 49th meeting of the State Level Expert Appraisal Committee held on 19/04/2019 at Committee Room, Gujarat Pollution Control Board, Sector – 10 A, Gandhinagar to review concerns raised by M/s. L & T Ltd., Hazira against standalone Cement grinding project proposed by M/s. Sanghi Industries Limited, Hazira Surat.

- Earlier, SEAC has received representation through e-mail dated 12/04/2019 from M/s. L&T Limited, Hazira, Surat against the standalone Cement grinding project proposed by M/s. Sanghi Industries Limited located at Survey No. 125/1, 125/2 and 128/1+2+3, Vill.: Shivaanpar, Tal.: Choryasi, Dist.: Surat.
- Copy of representation (e-mail) received from M/s. L&T Limited, Hazira was conveyed to M/s. Sanghi Industries Limited for compliance of the issues raised.
- During SEAC meeting dated 16/04/2019, Committee decided to call M/s. L & T Ltd. to make their representation more understandable before SEAC. The same was conveyed to representative of M/s. L & T Ltd. through e-mail on 16/04/2019.
- Representatives from M/s. L & T Ltd. were remained present during the SEAC meeting dated 16/04/2019. They represented their issues regarding anticipated air pollution due to proposed Cement grinding unit.
- While discussing about the issues, representatives from M/s. L & T Ltd. informed that in addition to earlier e-mail dated 12/04/2019 they want to submit their concerns & expected solutions from M/s. Sanghi Industries Limited.
- Representatives from M/s. L & T Ltd. have submitted their concerns through email vide dated 22/04/2019 which was forwarded to M/s. Sanghi Industries Limited for their views and compliance.
- At the end of discussion on the concerns raised during discussion, M/s. L& T agreed to have agreeable solutions of their concerns.
- Committee decided to consider the proposal of M/s. Sanghi Industries Limited only after receiving of reply to the issues raised by M/s. L & T Ltd.

Minutes approved by:

Sr	Name & designation	Sign
1.	Dr. Dinesh Misra, Chairman, SEAC	
2.	Shri S. C. Srivastav, Vice Chairman, SEAC	
3.	Shri V. N. Patel, Member, SEAC	
4.	Shri R. J. Shah, Member, SEAC.	
5.	Dr. V. K. Jain, Member, SEAC.	

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ANNEXURE - 9

Sanghi Industries Limited
Grinding Unit - Surat
Survey No.: 125/1, 125/2, 126/1+2+3
Opp. LAT Piping Center, Gate No. 8,
Hazira, Surat - 394510, Gujarat.

STATE LEVEL EXPERT APPRAISAL COMMITTEE GUJARAT
RECEIVED ON
23 MAY 2019
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May 23, 2019

To,
The State Level Expert Appraisal Committee (SEAC)
Gujarat Pollution Control Board,
Gujarat Pollution Control Board,
4th Floor, Sector – 10 A,
Gandhinagar - 382010.

Sub: Submission of Additional Information sought by the committee during the appraisal of EC on 16th April 2019 for our proposed project of 2 Million TPA Standalone Grinding Unit with Bulk & Bag Packing Plant at Hazira Industrial Zone, Survey No. 125 / 1, 125 / 2, 126 / 1+2+3; Village: Shivrampur, Tal. Choryasi, District - Surat

Ref: (1) Proposal No. SIA/GJ/IND2/30448/2018
(2) 497th meeting of SEAC – Gujarat dated 16.04.2019

Dear Sir,

Sanghi Industries Limited is the Cement Manufacturing Company having total captive infrastructure of Power, Port located at Sanghipuram, Kutch with State-of-art technology from FL Smidth, USA operating at 4 MTPA Capacity with an investment of Rs.3000 crores. The company has also set up two Cement Terminals (1) Navlakhi – Gujarat State (2) Dharangdhar – Maharashtra State wherein through coastal route, company brings loose cement at the cement terminal and caters the local market. The company has also established Ready Mix Concrete Plant (RMC) at Ahmedabad as well as Rajkot in Gujarat State. The turnover of the company in the year 2018-19 is Rs.1088 crores.

The Company produces superior quality cement of OPC, PPC and PSC having marketing presence in the State of Gujarat, Rajasthan, Maharashtra, Madhya Parades, Cochin.

The company is presently expanding cement capacity from 4 MTPA to 8.6 MTPA with an investment of Rs.1500 crores, which is under advance stage of implementation and expected to commission by March 2020. Thus, total investment would be Rs.5000 crores having 8.6 MTPA capacity at single location.

As per the Company Policy, we believe in State-of-Art Technology to be adopted for the projects to be executed and also has a focus on sustainable development with vigilant eye on ensuring zero pollution with thrust on green environment. Due to our continuous efforts for energy efficiency, sustainable development, Best Industry Practices, company has earned many awards and

Sanghi Industries Limited
Grinding Unit - Surat
Survey No. : 125/1, 125/2, 126/1+2+3
Opp. L&T Piping Center, Gate No. 8,
Hazira, Surat - 394510, Gujarat.

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recolonization from National and International reputed institution and even from Government.

The company has always given thrust on sustainable development and has taken various actions for the same. The major actions are:-

- Promotion of alternative fuel and raw materials & waste management
- Reduction of CO2 emission: - Received 38434 energy saving certificate under PAT Cycle – 1.
- Water Management:- Rainwater harvesting in Mines Pit, which helps to meet our demand of water as well as local villagers and also maintains the groundwater table in surrounding area.
- Gujarat Mineral Research and Development Society, an Agency of Government of Gujarat under the aegis of Commissioner of Geology and Mines, Gandhinagar, Gujarat has published a book titled "Working with Elements" and in the said book the water conservation methods and the free distribution of water by the company in the local villages has been highlighted.
- Promoting Bio-diversity:- The first major step was constructing 3 check dams towards the transformation of this barren landscape to impound the rain water harvesting.
- Landmark contribution as 1st in Indian Cement sector
  - ✓ Utilization of pond Ash in raw mix
  - ✓ Co processing of Coal Tar – waste from ceramic industries

The company also taken noteworthy actions in the environment aspects for which following awards has been received by the company:-

1. For Eco-friendly Industrial Development, the company has been awarded Green Rating Project Awards – 3 LEAVES by **Sunita Narain** of Center for Science and Environment, New Delhi.
2. In recognition for outstanding achievement in Environment Management, company received the prestigious "Greentech Environment Excellence Gold Award" in Cement Sector three times i.e. In the year 2008, 2013 & 2014.
3. In recognition of outstanding achievement in Environment Management, company received "Greentech Platinum Award-2018" in Cement sector.

Sanghi Industries Limited
Grinding Unit - Surat
Survey No. : 125/1, 125/2, 126/1+2+3
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4. For Excellence in Waste Management Initiatives, we have received Kutch Business Excellence Award – 2013 from Federation of Kutch Industries Association.

5. For the last few consecutive years, company has been awarded First Prize for its captive mines and operations mines for Mines Environment and Mineral Conservation under the aegis of Indian Bureau of Mines, IBM, GOI for;

- Afforestation/Plantation
- Systematic & Scientific Development
- Air Pollution Control Measures
- Water Pollution Control Measures
- Noise vibration control & Aesthetic Beauty
- Overall Performance
- Community Development
- Mineral Conservation

The company due to its marketing strategies, product quality acceptance etc., has won following awards from various reputed organizations:-

1. India's Most Trusted (Cement Manufacturing) Company Award (2017) International Brand Consulting Corporation, USA.

2. India's Top Challengers 2016-17 Trophy (2016-2017) Construction World Magazine & Media.

3. Most preferred brand by real estate sector (Nov. 2017) Real Estate & Infrastructure Round Table & Awards

4. Gujarat Brand Leadership Award – 2018 (Corporate CSR) by ABP News.

5. Cashless Township (2017) Recognized by Hon'ble Prime Minister Shri Narendra Modiji.

6. Two Star Export House (Certificate of Registration) from the office of the Joint Director General of Foreign Trade, Government of India.

7. Emerging Brand of the Year Award – 2018 Cement & Concrete By Realty Plus.

8. Social Media Campaign of the Year – 2019 by Realty Plus.

Sanghi Industries Limited
Grinding Unit - Surat
Survey No. : 125/1, 125/2, 129/1+2+3
Opp. L&T Piping Center, Gate No. 8,
Hazira, Surat - 394510, Gujarat.

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For manufacturing of Cement & Clinker company has received International Accreditation:-

- ISO 9001:2015 (Quality Management System Standard)
- ISO 14001:2015 (Environmental Management System Standard)
- OHSAS 1800:2007 (Occupational Hazard and Safety)
- SA 8000:2015 (Social Accountability)
- ISO/ IEC 17025:2005 (NABL accreditation for Chemical and Mechanical Testing

Sanghi Industries Limited had been described by CRISIL, a global leading Rating Agency, in its report of November 2009, as the "Most efficient in Operating Cost Parameters" in the mid segment of cement industry and second most efficient in the industry as a whole.

It is submitted that we are well reputed and well established Cement Manufacturing Company in the Cement Sector.

With reference to the captioned subject, our EC proposal was discussed in the 497th meeting of SEAC. After detailed deliberation, the Committee sought additional details. We are submitting the point-wise reply as under:-

Sr. No.	Details sought by the Committee	Our reply
1.	Readdress ToR No. 5, 40	Attached as **Annexure - 1**
2.	Point wise action plan regarding representation of L&T Ltd., Hazira	Attached as **Annexure - 2**
3.	Submit raw material and product transportation route, its impact on surrounding area and mitigation measures	Attached as **Annexure - 3**
4.	Undertaking regarding no use of Lignite & Petcoke as fuel	Attached as **Annexure - 4**
5.	Sound APCM to control fugitive dust emission during raw material transportation, storage, handling, loading, unloading, transfer, fuel grinding etc.	Attached as **Annexure - 5**
6.	Details of vent / stacks with specific source & Air Pollution Control System	Attached as **Annexure - 6**
7.	Compliance of Coal & Ash handling guidelines and its commitment	Attached as **Annexure - 7**

Sanghi Industries Limited
Grinding Unit - Surat
Survey No.: 126/1, 125/2, 126/1+2+3
Opp. L&T Piping Center, Gate No. 9,
Hazira, Surat - 394510, Gujarat.

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In view of the above, we sincerely urge Hon'ble Committee to take pragmatic view in the overall interest for development of the area.

Thanking you,

Yours faithfully,
for **Sanghi Industries Limited**

Authorized Signatory

End: As above

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Annexure – 1

Point No. 1 :- Readdress ToR No. 5 & 40

TOR No. 5:
PP shall furnish status of all the applicable Rules, Acts, Regulation, Clearance in the Tabular Form;

Compliance:

Sr. No.	Applicable Rules, Acts, Regulation, Clearances	Status
1.	The Environment (Protection) Act, 1986 and Rules, 1986 as amended to date	Shall be complied as per conditions of Environment Clearance / CTE / CTO
	Environment Clearance under EIA Notification 2006	Application for EC made on 21.12.2018, which is under process.
	Consent to Establish as per Air and Water Act	Applied and payment towards processing fee of Rs. 300,000/- has been deposited on 30.01.2019.
	Consent to Operate as per Air and Water Act	Will apply at the time of commencement of production.
	E-waste (management and Handling) Rules, 2011 as amended to date	CTE/CTO shall be obtained and condition therein will be complied.
	Hazardous and Other Wastes (Management and Trans-boundary Movement) Amendment Rules 2016.	
	The Air (Prevention and Control of Pollution) Act, 1981 and Rules 1982, as mentioned to date.	
	The Noise Pollution (Regulation and Control) Rules, 2000 as amended to date	
	The Water (Prevention and Control of Pollution) Act, 1974 and Rules, 1975 as mentioned to date	
2.	Factory Act 1948 and amendment thereafter	Will be complied during the stage of erection and commission.
3.	Factory Licence	Will apply at the time of commencement of production.

SANGHI INDUSTRIES LIMITED AHMEDABAD

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4.	Workmen Compensation Act, 1923 as amended thereafter	Will be complied during the stage of erection and commission.
5.	Contract Labour Regulation and Abolition Act, 1970 as amended thereafter	Will be complied during the stage of erection and commission.
6.	The Bureau of Indian Standards Act, 1986	Will apply at the time of commencement of production.
7.	The Motor Vehicle Act, 1988 and The Central Motor Vehicle Rules, 1989	Will be complied during the stage of erection and commission.
8.	Indian Electricity Act, 2003	We will obtain power from DGVCL and will be applied at the time of erection and commissioning.
9.	Water Permission	Application submitted to Irrigation department on 23.01.2019 and our application is under active consideration as per their letter dated 03.04.2019. Additionally MoU has been signed with Tankers Suppliers to Supply water
10.	Standards of Weights & Measurement Act 1976 and Rules made thereunder	Will apply at the time of commencement of production.

TOR No. 40:
PP shall ensure participation of people during Public Hearing with equality in gender so as to encourage woman participation in Public hearing & at the same time their issues shall also be given weightage.

Compliance:
The public hearing was conducted on dated: 22/03/2019 at the Project Location Site as per the Environment Notification 2006 and as per the directions received and in consultation the GPCB Officials.

Accordingly, we have met the Sarpanch of all villages located within 10 kms of Project Site and apprised them about our proposed project and circulated them the Executive Summary in Gujarati Language. We have requested them to ensure more participation of local people including women participation in Public Hearing. Total 118 Nos. of peoples had participated in Public Hearing on 23.03.219 who have signed. Moreover there are many other people who have also participated in the meeting. Total women participation was approximately 13 Nos.

SANGHI INDUSTRIES LIMITED AHMEDABAD

Sanghi Industries Limited
Grinding Unit - Surat
Survey No. : 125/1, 125/2, 126/1+2+3
Opp. L&T Piping Center, Gate No. 9,
Hazira, Surat - 394510, Gujarat.

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Annexure - 2

May 23, 2019

To,
The State Level Environment Impact Assessment Authority (SEIAA)
Gujarat Pollution Control Board
Paryavaran Bhavan, Opp. Bij Nigam
CHH Road, Sector 10 A
Gandhinagar – 382010

Sub: Clarifications and Actions required by Larsen & Toubro Limited from Sanghi Industries Limited for proposed project of 2 Million TPA Standalone Grinding Unit with Bulk & Bag Packing Plant at Hazira Industrial Zone, Survey No. 125/1, 125/2, 126/1+2+3; Village: Shivrampur, Tal. Choryasi, District - Surat

Ref: (1) L&T Letter dated 05.04.2019 submitted to SEIAA
(2) L&T Letter No. HZCS/E-30/2019-20/SIL dated 22.04.2019 submitted to SEIAA

Dear Sir,

With reference to the subject matter, this is to inform your good-self that the representatives of the L&T remained present during the Public Hearing held on 22.03.2019 and L&T representative also has accepted that the APCM has been well planned by the project proponent. Further certain clarification were sought from the project proponent which were clarified to the satisfaction of L&T representative, which is also recorded in the PH proceedings. However, we are submitting here under the point-wise reply of the concerns raised by L&T in their letters under Reference (1) & (2).

Concerns raised in the Letter dated 05.04.2019 & our reply:-

S N	L&T Point	Reply
1	L&T is in business of manufacturing Ultra Critical equipment i.e. Super Critical Turbine Generators, Nuclear equipment and K9 Vajra Self-propelled Howitzer guns at Hazira Manufacturing Complex. Above mentioned production facilities are within 1 km radius of the proposed project of Sanghi Industries Limited. Cement and Coal dust will adversely impact the quality & on field performance of such Critical products of National Security / Safety importance, which could impact to our Business, as well as Nation and Community at Large.	Our proposed location of Grinding Unit is located at Hazira Industrial Area. Hajira is known as the "gateway port" to serve the hinterlands of North, West and Central India as it is situated in the midst of one of the most industrialized area in the country. The existing industrial portfolio of Hajira includes mega industrial projects such as petrochemicals, fertilizers, heavy engineering, steel, Cement, energy, edible oil, LNG Terminal and port related activities having investment of more than 1.8 lakhs crores. More than 20 large and medium companies are located in Hajira, including Bharat Petroleum Corporation, Cairn Energy, Essar Power, Essar Steel, Hindustan Petroleum and Larsen & Toubro, Reliance, NTPC, GSECL, Vadraj Cement, Adani Wilmer among others. Shell has established an LNG Terminal at Hajira in 2004.

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The major industrial units operating in nearby area in the Hazira Industrial Area are shown on the Google Map attached at Annexure – A.

The L&T Defence Unit of the L&T is near Gate No. 20, which is at a distance of Approx 1.25 km away from our proposed project. Site. The Defence Unit of L&T is surrounded by Red Category Industries of its own units viz. L&T MHPS Turbine, MHPS Boilers, Special Steels & Heavy Forgings, Heavy Engineering, Piping Centre etc.

SIL has taken utmost care to control the fugitive emission through the operation of the proposed grinding unit. With High Efficiency APC Devices and implementation of Stringent mitigation measures, the fugitive emission through the plant operation will be negligible.

As per the baseline study conducted during October – December 2018, in crosswind direction maximum GLC value is PM_{10}- 0.77 µg/m³, So_x- 0.53 µg/m³ and No_x-0.61 µg/m³. After Addition of Incremental value in baseline data Resultant concentration will be PM_{10}- 87.17 µg/m³, So_x-14.83 µg/m³ and No_x- 21.01 µg/m³. This shows that even after implementation of Grinding Unit of SIL there will not be any significant increase in levels of PM_{10}, So_x and No_x.

Predominant wind direction is study region is NE to SW and in downwind direction there is no village. Nearest village form the project site is Suvali which is 1.2 km in WSW direction. Maximum incremental concentration of PM_{10}- 0.77 µg/m³ at Suvali. L&T defense project is appx. 1.25 km away from project site and in NNW direction. The location of Defence Unit of L&T is in crosswind direction. Hence there will be no impact of dust emission at L&T defense site due to proposed project.

Moreover SIL has Proposed a Thick Green belt to the tune of 33% surrounding the project boundary. The plantation shall comprise of large canopy thick foliage and high stomatal Index. This will help in dust absorption and ensure that fugitive dust will not go outside the project premises.

Looking to this, there will be no impact on Air emission

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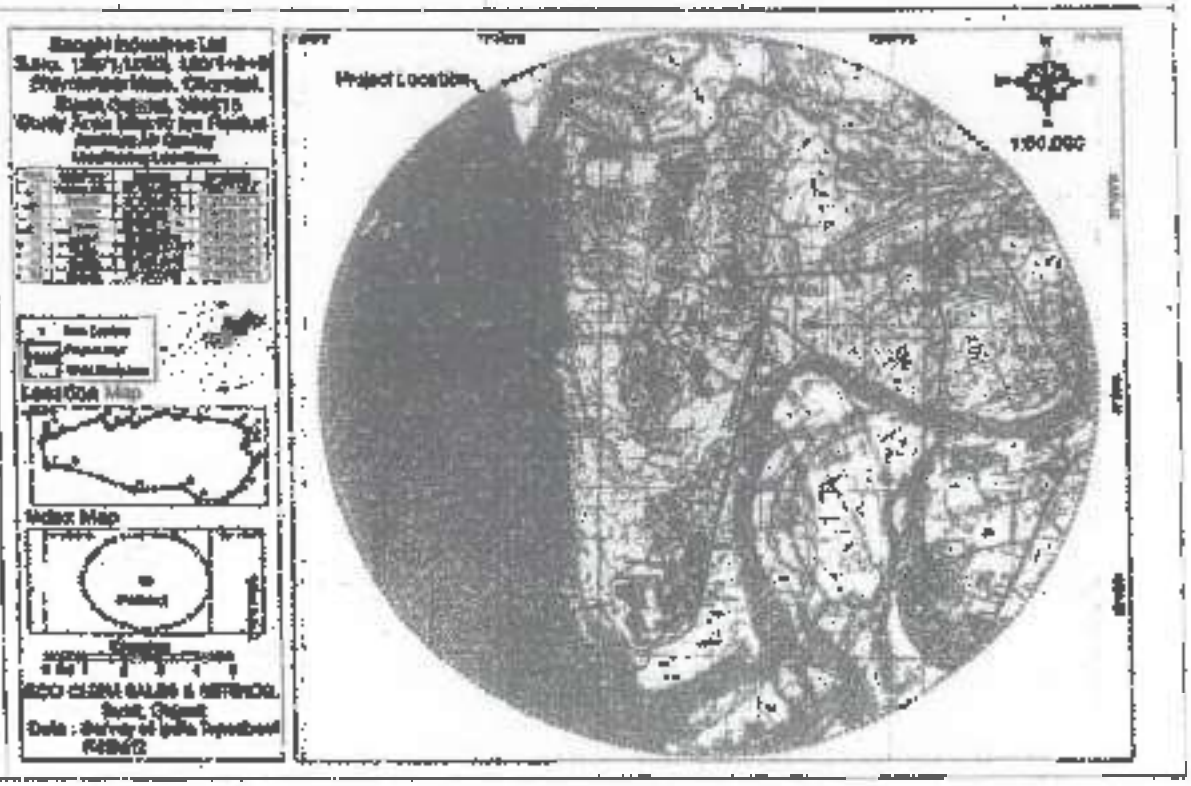
		parameter, which will not adversely impact the quality and on field performance of such critical products of National Security / Safety importance.
2	Transportation, loading, storage, Transfer Operation & Unloading of Coal, Fly Ash, Clinker & Slag will lead to substantial increase in Process / Non-process related Fugitive Emission. This may lead to irreversible damage to us including surrounding Environment.	A list of sources of Air Pollution and mitigation measures taken by SIL to control the process / non-process related Fugitive Emission is attached at Annexure – B. SIL will strictly implement the mitigation measures and regular monitoring will be carried out to ensure that ambient air quality parameter will always meet the norms of GPCB/GPCB.
3.	Increased PM2.5 & PM10 exposure may lead to serious health hazards specifically Respiratory and Lung diseases (cancer) to people operating in close vicinity.	In Crosswind direction maximum GLC value is PM_{10}- 0.77 µg/m³, So_x- 0.53 µg/m³ and No_x-0.61 µg/m³. After Addition of incremental value in baseline data Resultant concentration will be PM_{10}- 87.17 µg/m³, So_x-14.83 µg/m³ and No_x- 21.01 µg/m³.This shows that even after implementation of Grinding Unit of SIL there will not be any significant increase in levels of PM_{10}, SO_x and NO_x.



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Code	Location	Distance/Direction from the Project site	Selection Criteria
A1	Project Site	-	-
A2	Suvali	1.2 km/WSW	Crosswind
A3	Mora	2.9 km/NNE	U wind
A4	Dumka	5.0 km/N	Crosswind
A5	Rajgari	3.8 km/NNW	Crosswind
A6	Kavas	7.4 km/NE	U wind
A7	Hazira	5.7 km/S	Crosswind
A8	Dumas	7.9 km/SE	Crosswind

Predominant wind direction is study region is NE to SW and in downwind direction there is no village. Nearest village form the project site is Suvali which is 1.2 km in WSW direction. Maximum incremental concentration of PM_{10}- 0.77 $\mu g/m^3$ at Suvali. L&T defense project is appx. 1.25 km away from project site and in NNW direction. The location of Defence Unit of L&T is in crosswind direction. Hence there will be no impact of dust emission at L&T defense site due to proposed project.

Clarification sought in the Letter dated 22..04.2019 & our reply:-

S.N.	Particular	Concerns / Impacts	Reply
1	Air Pollution	1) Cement dust deposition on water bodies will degraded the potable water quality	The reply is as per the reply given for point no. 1 to 3 of the letter dated 05.04.2019.
		2) Health Hazard – SPM is known to poise health hazards in person working in nearby areas. PM2.5 itself may lead to respiratory diseases like lung fibrosis, mesothelioma of lung, tuberculosis and skin problem	SIL has taken utmost care to control the fugitive emission through the operation of the proposed grinding unit. With APCM and mitigation measures, the fugitive emission through the plant operation will be negligible. Hence there will not be degraded the potable water quality, no adverse impact on the health and quality of Defence products.
		3) Quality of Products: a) Super Critical Turbine Generators Cement Dust exposure will affect the High Voltage endurance capacity, Tan Delta, thereby limiting the life of the winding insulation after assembly which makes the Rotor & Stator Coil assembly not acceptable as per ICE 60034.	SIL will ensure best in class Air Pollution Control Measures. SIL will ensure that there will be no further increase in SPM, SOx and NOx level due to operation of the proposed Grinding Unit. Hence, there will not be any impact on L&T manufacturing

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		(b) & (C) Critical equipment of this project shall be manufactured and maintained in Dust free environment. Dust exposure may affect the reliability & functionality of Defence Product.	facilities and other industries located in the area. The Defence Unit of L&T is surrounded by Red Category Industries of its own units viz. L&T MHPS Turbine, MHPS Boilers, Special Steels & Heavy Forgings, Heavy Engineering, Piping Centre etc. Continuous Ambient Air quality monitoring station will be installed and report of the same will be submitted to GPCB as per the direction. Third Party monitoring will be carried out on monthly basis through GPCB approved Third Party and report will be submitted to GPCB.
2	Use of PetCoke / Lignite as Fuel	Use of low quality grade Lignite & Pet coke will lead to high emission of SOx, NOx and PM.	There will not be use of lignite and petcoke. Undertaking for no use of Lignite and petcoke submitted to the SEAC.
3	Green Belt Damage	Our developed Green belt will be directly exposed to the Cement dust deposition and other process & non-process related fugitive emission. Besides, green belt development proposed by you will take 5 years to grow, which is very much longer time.	With adoption of the mitigation measures, there will be no fugitive emission due to operations of the plant, which will not affect the developed green belt of L&T as envisaged. SIL will develop 33% Green Belt. However, belt on the periphery of the plant will be developed before commencement of the operations and green belt within the plant are will be developed in shortest possible time. On the periphery, green belt width would be approximately in the range of 6 mtr to 8 mtr based on selection of species and location in the plant area. Greenbelt within the plant are will be developed with width ranging from 20 – 30 mtrs. Equal distance between the layers will be maintained. Our green-belt will help to control fugitive emission. Moreover, the green-belt developed at the premises of the L&T will also control fugitive emission.

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			There shall be no impact on developed greenbelt by L&T in their premises.
4	Ground Level Concentration of Pollutants	What will be the level of GLC of SPM, SOx and NOx considering the downwind directions? Moreover, we feel that the proposed project site is within 500 meters of Forest Area. (Ref. GPCB Guidelines for Coal Handling Units)	The reply is as per the reply given for point no. 3 of the letter dated 05.04.2019. Our proposal is for standalone cement grinding unit. As such as location criteria defined by GPCB Guideline is not applicable to us. However, we will ensure all compliance of the coal and ash handling guidelines applicable to cement plant.
5	Total Nos. of Road Trips (Raw Material + Finished Good) Per Day	Capacity of proposed project is 2.0 Million TPA, which means approx. 550 nos. of Trucks movement in a day. This will create frequent traffic issue and non-process related fugitive emission. What is your Traffic Management Plan including Parking facilities.	Daily 363 Nos. of Trips (In & Out) will be required for transport of cement and raw material during the operations of the Grinding Unit. The proposed route of the trucks movement is attached at Annexure – C. The Traffic Management Plan with Parking facilities is attached at Annexure – D.
6	Exact mode and route of Transportation for Raw Materials and Finished Goods.	The proposed project site is in the middle of various L&T Manufacturing. Trucks transportation through internal roads and trucks loaded with clinker, coal, Slag and Fly Ash & Cement will create heavy traffic and non process related fugitive emission.	The google map of the proposed site alongwith the distance of the each unit of the L&T is attached at Annexure – E. The proposed location is in industrial zone. The L&T Units are on the N.H on which daily movement of Heavy Vehicle Traffic are already in existence. Our proposed site is connected to major National High Way which is utilized by all the industries of Hazira. Daily average basis 1421 PCU / Hour passing through Highway presently. There will be increase of 48 PCU / Hour due to our proposed project, which is very nominal @ 3.38%. Hence, the additional load on the carrying capacity of the concern road is not likely to have any significant effect.

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			SIL will ensue best in class Air Pollution Control Measures. Hence, there will be no any non-process related fugitive emission during transportation. After survey of the various sites, SIL has already invested for procuring land in the industrial zone and therefore it is not possible to explore alternate location for the proposed project. Moreover, there is a concern of disposal of fly ash and slag generated in Hazira by Power Plant and Steel Industry. Government is also encourage disposal of fly ash and slag in safe and scientific manner under AFR. Our proposed plant will be one of the solution for disposal of slag and fly ash generated in the area.
7	Responsibility & Liability	If any damage will occur to our Green Belt, Water, Health of Employees, Product Quality and Business due to your operation, who will be responsible for the same?	Our proposed project having sophisticated machinery and control systems and approximate 300 nos. of persons will work in our site. Our prime responsibility is to ensure Health and Safety of our people, plant and neighbors. The Cement is not carcinogenic material, it is hazard less material, which can not have any impact. However, we will take adequate measures not for just L&T but also our own people, plant, neighboring industries. We assure that with implementation of the mitigation plan and regular monitoring, there will not be any degradation of environment, which adversely affect the Green Belt, Water, Health of Employees, Product Quality and business of L&T and other neighboring units.
8	Project Expansion in Future	As Cement Industry falls under 17 Categories of High Polluting Industries declared by GPCB, we will be the direct suffers if at all there is any chance of setting up integrated / full fledged cement plant.	The Defence Unit of L&T is surrounded by Red Category Industries of its own units. The proposed project is only a standalone Grinding Unit. There is no chance of setting up an Integrated / fledged cement

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			plant as there is no limestone in the vicinity. SIL has already invested for procuring land in the industrial zone and therefore it is not possible to explore alternate location for the proposed project.
9	Location of proposed Project	Proposed Project site is surrounded by various L&T Manufacturing Units. Hence, there will be having direct impact due to our operation.	With the implementation of the mitigation measures, there will not be any chance of degradation of Environment, which will direct impact on L&T Manufacturing Unit. Alternate site study has been done and most suitable site has been selected for the proposed project based on the siting criteria guidelines. SIL has already invested for procuring the land in the industrial zone, it is not feasible to shift the project site to any other location. Moreover, there is a concern of disposal of fly ash and slag generated in Hazira by Power Plant and Steel Industry. Government also encourages disposal of fly ash and slag in safe and scientific manner under APR. Our proposed plant will be one of the solution for disposal of slag and fly ash generated in the area.

We humbly submit to the State Level Expert Appraisal Committee (SEAC) that the concerns / issues raised by L&T with respect to the fugitive emission due to our proposed project (process / non-process area operation) and effect of the same on their developed green-belt / water body / manufacturing facilities and products are absolutely unwarranted, far from the truth and only imaginary. As explained above, we submit that the Standalone Grinding Unit is not at all a polluting industry as projected by the L&T. Moreover, we have taken abundant precaution in selecting the technology for Grinding Unit, Air Pollution Control Pollution Equipment, Development of Green Belt on periphery and in and around Grinding Unit. Further, we would like to categorically state that there will be no impact of our operations to the nearby located industries.

It is further submitted that the existing manufacturing facilities of L&T must be complying with conditions of the approvals /, clearances / permission issued to them by various authorities. Moreover, L&T must have also taken into consideration the existing large scale industries in Hazira Industrial Area as well as future development before setting up their facilities. We feel that

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the L&T must have taken necessary safeguards to ensure that their manufacturing facilities are not affected due to existing as well as future industrial development of the area.

All the points raised by L&T has already been adequately covered while preparing Environment Impact Assessment Report (EIA) and we once again inform that during Public Hearing held on 22.03.2019, L&T representatives has accepted that APCM has well planned by us and points raised during PH were clarified to their best satisfaction. We feel that L&T is interested in shifting our present location on frivolous ground. It is hereby submitted that it is absolutely not possible at this juncture to shift the location to alternate location as we have already made huge investment in the land and project planning has been done including placing of orders for major Plant & Machinery.

We once again reiterate that we have taken abundant precautions for our standalone grinding unit with respect to the pollution parameters (Process / non-process area) as is evident from submitted EIA. It will have no impact to L&T or other industries located nearby.

In view of the above, we request the Hon'ble Committee to kindly take a suitable decision in the interest of the overall development in the region.

Thanking you,

Yours faithfully,
for Sanghi Industries Limited

Authorized Signatory

Encl: As above

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ANNEXURE – A

Nearest Industries	Distance from Proposed Unit of SIL in km
Reliance	3.25 km, NNE
NTPC	4.70 km, NNE
KRIBHCO	6.40 km, NE
GAIL	6.00 km, NE
ONGC	8.70 km, E
CAIRN INDIA	1.80 km, NNW
ADANI WILMAR	1.30 km, NNW
L&T DEFENCE	1.25 km, NNW
L&T HEAVY ENGINEERING	1.81 km, NNE
L&T MHPS	0.90 km, E
L&T SPECIAL STEEL AND HEAVY FORGINGS	1.01 km, N
L&T PIPING	0.33 km, W
ESSAR STEEL	5.07 km, S
ADANI PORT	7.20 km, SSW
HAZIRA LNG & PORT	6.56 km, SSW

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Sound APCM / EMP against sources of air pollution

(A) Fugitive Emissions:

Process & non-process related fugitive emissions sources and mitigation measures are given below:

(I) Process related Fugitive Emission Sources & its mitigation measures / EMP

SN	Types of operation	Activity	Mode	Materials handled	No. of emission source	Mitigation Measures (APCM) / EMP
1	Raw Material Handling & Transfer	Unloading Operation	Feeder	Clinker	1	➢ Fully enclosed unloading station will be provided. ➢ Adequate water sprinkling system will be provided. ➢ Dust extraction (suction apparatus) system with dust collector of capacity 11000 M3/hr will be installed.
			Feeder	Additive - Gypsum, Slag & Coal	1	➢ Fully enclosed unloading station will be provided. ➢ Adequate water sprinkling system shall be provided. ➢ Dust extraction (suction apparatus) system with dust collector of capacity 11000 M3/hr will be installed.
			Pneumatic from closed tankers	Fly ash	0	➢ Fly ash will be pumped directly from the closed tankers to silo by fully automated pneumatic system in closed loop so that fugitive emissions do not occur. ➢ Fly Ash Handling Guidelines will be complied.
			Stacker	Gypsum, Slag & coal	3	➢ Raw materials will be stored in covered yard. ➢ Single entry point with flexible curtain will be provided. ➢ Concrete flooring will be provided in the covered yard. ➢ Closed belt conveyor will be provided from unloading station to piles. ➢ Dust suppression system will be provided at stock piles.
2	Raw Material Handling & Transfer	Loading Operation	Belt conveyor	Clinker	1	➢ An automated closed loop silo extraction system with closed belt conveyor will be provided for clinker loading and transportation from silo to mill. ➢ De-dusting bag filter of 25000 M3/hr capacity will be installed at silo top.
			Reclaimer	Gypsum, Slag and Coal	2	➢ Raw materials will be stored in covered yards. ➢ Single entry point with flexible curtain will be provided. ➢ Reclaimer system will be provided to mechanize loading operation. ➢ Closed belt conveyor will be provided from loading point to mill. ➢ Dust suppression system will be provided at stock pi ➢ Coal Handling Guideline will be complied.

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S N	Types of operation	Activity	Mode	Materials handled	No. of emission source	Mitigation Measures (APCM) / EMP
3	Raw Material Handling & Transfer	Transfer Operation (Transfer Points)	Belt conveyor	Clinker	1	➢ Transfer point will be fully enclosed ➢ De-dusting bag filter of 3000 M3/hr capacity will be installed. ➢ Capture dust from the bag filter will be directly fed into the system in closed loop.
				Gypsum / Slag / Coal	2	➢ Transfer points will be fully enclosed. ➢ Two nos. of de-dusting bag filter with capacity of 3000 M3/hr each will be installed. ➢ Capture dust from the bag filter will be directly fed into the system in closed loop.
4	Finish Product Handling & Transfer	Mill to Silo	Air slide	Cement	0	➢ The closed looped system of air slides will be provided for finished product transportation from mill to silo.
		Silo to Packing Plant	Belt conveyor	Cement	1	➢ Covered belt conveyor will be installed for material handling. ➢ De-dusting bag filter with capacity of 45000 M3/hr will be installed.
		Silo to bulk loading system	Belt conveyor	Cement	1	➢ Covered belt conveyor will be installed for material handling. ➢ An automated closed bulk loading system will be installed. ➢ De-dusting bag filter with capacity of 5000 M3/hr will be installed.
		Silo Vent	--	--	3	➢ Three nos. of de-dusting bag filter with capacity of 3000 M3/hr each will be installed.
5	Packing plant	Cement Packing	Automatic Packer machine / Bulk loading	Cement	03	➢ The packing operation will be performed automatic electronic packers under negative pressure by the centrally installed de dusting bag filters of 45000 M3/hr capacity. ➢ Engineering controls like guiding plate, scrapper brush and self bag cleaning system will be installed. ➢ An automated closed loop system will be provided for bulk cement loading. ➢ The spilled cement on the floor will be swept by vacuum sweeping machine periodically and sent for recycling. ➢ The vibratory screen with dust extraction arrangement will be provided for recycling of cement. ➢ Closed air slides and bucket elevators will be installed for finish product transportation in the plant.

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(2) Non-process related Fugitive Emission Sources & its mitigation measures / EMP

S N	Types of operation	Activity	Materials handled	Mitigation Measures / EMP
1	Vehicle Traffic at site	Movement of raw materials & finished product by trucks / dumpers Movement of other vehicles - personnel four / two wheelers	Clinker, Gypsum, Fly ash, Slag, Coal and Cement	➢ Raw materials / finished product will be transported in covered trucks / trippers. Fly ash will be transported in bouser. ➢ Paved roads and concrete flooring will be provided in activity area. ➢ Speed of vehicles will be limit up to 10 KMPH. ➢ Sweeping machine will be provided for road and floor cleaning as abundant precaution. ➢ Greenbelt in three layers will be developed along with plant boundary. ➢ Water sprinkling will be done in non-process area. ➢ Valid PUC trucks will be deployed for transportation.
2	Raw Material & finished product Storage	Storage of materials	Gypsum, Slag, Coal, Fly ash, Clinker and Cement	➢ All raw materials will be stored in covered yard. ➢ Single entry point with flexible curtain will be provided. ➢ Concrete flooring will be provided in the covered yard. ➢ Clinker & Fly ash will be stored in silo. ➢ Dust suppression system will be provided at stock piles. ➢ Stacker & reclaimer will be provided to mechanize loading and unloading operation in the yard. ➢ Greenbelt in three layers will be developed around the storage yard. ➢ Clinker, Fly ash and cement will be stored in closed Silo

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(B) Process / Flue Gas Emissions:

SN	Types of operation	Activity	Materials handled	Mitigation Measures / EMP
1	Grinding	Cement grinding in Vertical Roller Mill (VRM)	Clinker, Gypsum & additives - Fly ash and Slag	➢ Latest technology based intensive Jet Bag house of capacity 11,00,000 m3/hr will be installed. ➢ 55 meter high x 3.2 meter Dia. Stack will be provided for dispersion. ➢ SPM <30 mg/Nm3, SOx & NOx < 100 ppm (Norms as per CPCB Guidelines).

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An Environment Management Cell (EMC)

- An Environment Management Cell will be developed by an effective mixing of a group of technical experts from various departments of the project to look after the all obligatory requirements and shall be responsible for the effective implementation of all environmental pollution control measures.
- The head of EMC will be directly report to top management
- The "dust control officer" will be employed under EMC wings
- Regular training will be provided to the personnel operating and maintaining fugitive emission control system
- Regular maintenance of APCD will be carried out as per OEM recommendations
- Sufficient EHS budget will be allocated to implement and ensure effective implementation of planned mitigation including R&D programs for innovative technologies for better environment management
- Regular environmental monitoring will be conducted by SPCB approved 3rd party and reports will be submitted to regulatory authority as per guideline

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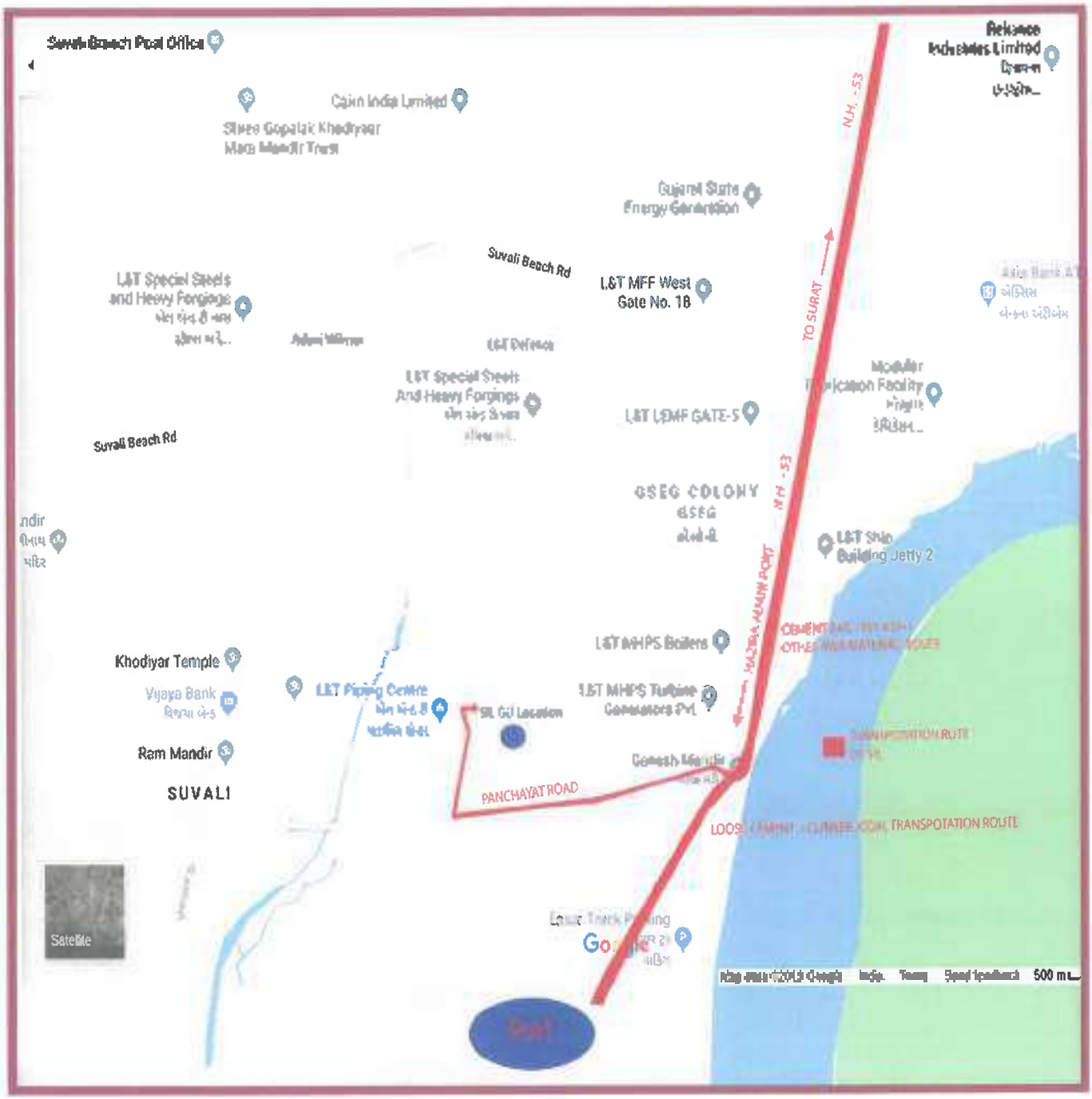
Annexure – C

Raw Material and Product Transportation Route:



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ANNEXURE – D

Traffic Planning and Management Plan

1. Baseline Traffic Scenario:-

Traffic study measurements were performed at National Highway 6 and State Highway 166. Proposed project will attract to commercial vehicles as a result traffic load will also increase on highways. Traffic load play a major role in polluting the air. To assess the traffic load, 4 no. of surveyors were appointed to survey for National Highway 6 & National Highway 186.

Traffic data collected continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined. Traffic study is conducted on National Highway 6 & National Highway 186 from 26th and 27th Dec 2018

Traffic Study Report

S.No.	Vehicles Distribution	No. of Vehicles/ Day		Passenger Car Unit (PCU)	Total No. of Vehicle in PCU		Total No. of Vehicle (PCU)/Hour	
		National Highway 6	State Highway 166		National Highway 6	State Highway 166	National Highway 6	State Highway 166
1.	Cars	20538	9087	1.0	20538	9087	856	379
2.	Buses	1080	754	3.0	3240	2262	135	94
3.	Trucks	2036	1256	3.0	6108	3768	255	157
4.	Two wheelers	5612	3845	0.5	2806	1923	117	80
5.	Three wheelers	1863	1066	0.75	1397	792	58	33
Total		31129	16909		34089	17832	1421	743

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
National Highway 6	1421	3000	0.47	C
State Highway 166	743	1250	0.59	C

Existing Traffic Scenario with respect to LOS

0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/Average/Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

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Interpretation of Traffic Study:-

LOS values have been calculated based on traffic data on National Highway 6 & State Highway 168 and it has been found 0.47 and 0.59 respectively. LOS value indicates that the performances of NH-6 & SH-168 are good.

2. Incremental Traffic:-

The Incremental Traffic due to proposed project is described as below.

Incoming & Outgoing Transportation

S.No	Product		Quantity TPA	Quantity TPD	Source	Mode of Transport	No. of Vehicles (Truck/day)
1.	Clinker		2000000	6061	Captive	Sea	184
2.	Additives like Gypsum, Fly Ash, Slag				Purchase	Road	
	Fuel		60000	182	Purchase	Road	
Total No. of Trucks deployed / day will be							184

Outgoing Product Transportation

S.No	Product	Quantity Million TPA	Quantity TPA	Quantity TPD	Source	Mode of Transport	No. of Vehicles (Truck/day)
1.	Cement	2.0	2000000	6061	Captive	Road/Sea	179
Total No. of Trucks deployed / day will be							363

Frequency of Vehicles:

Total Capacity (Fuel, Clinker, Fly ash)	40, 60,000 TPA
No. of working days	330
Transportation of incoming and outgoing material	12303 Tons/day
Working hours per day	24 hour (3 shifts)
Truck/Tanker Capacity	34 Tons
Frequency of trucks/day (91 Nos x 4 trips/day x 2 (up/down)	363 x 2
Frequency of trucks deployed/hr	16
Increase in PCU/hr	16 x 3= 48

Modified Traffic Scenario and LOS

S.No	Road	Increased PCUs	Modified PCUs	Capacity	V/C Ratio	LOS
1.	National Highway 6	48*60%= 29	1421+29= 1450	3000	0.48	C
2.	State Highway 168	48*40%= 19	743+19= 762	1250	0.61	D

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Minimum impact on local transport as only 91 Nos. [4 trips/day x 2 (up/down)] Trucks will be required for transport of cement and raw material. The LOS value from the proposed project will be the almost same as before i.e. **"C" "Good"** for the National highways falling in the study area. So, the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse effect. The company has planned Coastal Shipping of Cement, accordingly cement terminals have been developed at various locations. This will reduce the load on railroad network / transportation.

3. PURPOSE:-

The purpose of this Traffic Management Plan is to outline the manner in which vehicular, plant and pedestrian movements will be managed on the SIL Project during construction and operation phase, as well as the control measures in place to manage risks associated with Project-related traffic.

SIL acknowledges that the effective management of Project traffic and safety of operators and pedestrianis paramount to the delivery of successful day-to-day activities on site and SIL's overall Zero Harm objectives and targets for the Project. Primary objectives of this sub-plan include:

- Maximizing operator and pedestrian safety;
- Minimizing wherever possible adverse interfaces between Project vehicles and the general public as a result of traffic and activities;
- Minimizing impact on the local road network;
- Minimizing disruption, delays and congestion to local road users;
- Mitigating risks associated with deliveries to the Project;
- Providing clearly defined instruction and parameters cohesive with site traffic protocols to enable compliance to this sub-plan by all Project stakeholders(including visitors);
- Providing a safe Project environment free of hazardous interactions besween vehicles, plant, people and infrastructure; and Complying with legislative and contractual requirements.

4. RESPONSIBILITIES:-

The requirements of this plan, SIL shall:
Provide adequate information, instruction and training to enable all Project personnel and other stakeholders to enter, operate across and leave the Project site in a safe manner (including clear installation of signage and training in the requirements of this plan);

- Establish designated pedestrian paths delineated from mobile plant routes wherever possible;
- Ensure all on-site roads established traffic is free of hazards to vehicles and plant requiring access;
- Establish a process to authorize vehicles for operation on site
- Ensure that Project traffic does not cause undue disruption or delays to surrounding public roads through planning, risk assessment and scheduling; and
- Review and update this sub-plan as necessary, in consultation with relevant stakeholders.

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5. GENERAL REQUIREMENTS:-

Traffic movement in and around the Project site presents a number of risks to personnel, as well as the potential for property damage to vehicles, plant and infrastructure. As such, the following parameters will be applied to ensure the safe movement of people, vehicles and plant during construction and operation phase.

- There will be designated areas for pedestrians and vehicles.
- Signage will be placed to direct safe passage around the site.
- Vehicle speed restrictions.

5.1. Site Security:-

The Project site will be secured with a boundary. There will be one main entry and exit point. Security measures will be taken to ensure the safety of the site on a twenty four hour basis.

5.2. Site Access:-

The main entry into the SIL site will be via NH-53 to Internal Gram Panchayat Road The site entry will be designed to accommodate entry and exit of all anticipated vehicles requiring site access.

5.3. Entry Requirements:-

As a minimum, to enter the SIL GU it is expected that all personnel meet the following requirements:

- Completion of Induction
- Completion of Site Delivery Drivers Induction (Transport Contractors Only)

Delivery drivers and visitors can enter SIL GU area without the above requirements if they are escorted by a person who is authorized to operate on the Site.

Note: All persons shall wear the site specific PPE at all times (e.g. helmets, safety boots and high visibility clothing, gloves, safety glasses etc.) including delivery drivers. Any delivery driver failing to adhere to this will be refused access to the Site.

5.4. Noise:-

It is SIL's responsibility to comply with planning requirements, permits and any applicable regulations in relation to noise levels produced during construction / operation activities.

Noise generation from plant activities shall be minimized as far as reasonably practicable.

Vehicles / Trucks are queued or temporarily parked up whether it be on Site or off Site will be turned off to reduce noise and greenhouse gas emissions. Blowing of Horns will be restricted at site to avoid noise pollution.

Compression braking shall be avoided near residential areas and sensitive receptors. Noise monitoring shall be conducted on regular intervals.

5.5 Dust Control:-

All operators / Transporters must use vehicles and plant in a manner that minimizes dust generation on the site including using designated roads and observing speed restrictions at all times. All the raw material required for the proposed project will be

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in solid form except fly ash. The fly ash will be transported in the bouser only. The clinker and coal will be transported in the trucks covered with the Tarpaulin. Strict instructions will be given to the transporter transporting the clinker and coal and special condition in the transport contract will be included to cover the Tarpaulin. SIL will not give entry of the trucks carrying clinker / coal in the premises without tarpaulin cover. The bags cement will be transported in the trucks and loose cement will be transported in the bousers only. Paved roads and concrete flooring will be provided in activity area. Speed of vehicles will be limit upto 10 km/hr within plant premises. Swiping Machine will be provided for road and floor cleaning within the premises. Thick green belt will be developed on the periphery of the plant. The Responsibility of Strict Implementation of Mitigation Measures and compliance of EMP shall be handled by EHS in-charge of Environment Management Cell.

5.6 Flora, Fauna and Wildlife:-
All transporters, operators, vehicle drivers should be aware of local wildlife within and outside the Plant area. Drivers having valid licence shall only be allowed to drive vehicle to avoid sediment issues and harm to flora, fauna and wildlife. Any damage, injury or death of wildlife will be reported to the SIL Site Management Team. This will be communicated via Site based inductions, driver packs and toolbox talks.

6. TRAFFIC MANAGEMENT INTERNAL:-

6.1 Access:-
All access to the site will be through the main entry via NH-53 to Gram Panchayat road. The site office and lay down area will be located within the site boundary and will be clearly signposted.

6.2 Pedestrian Delineation:-
Delineation between pedestrian and plant access route will be established using separation methods. Signage will otherwise be implemented to advise of unrestricted pedestrian areas and exclusion zone.

Signage for exclusion zones and restricted access areas will be identify the area supervisor to be contacted in the case of persons requiring entry into the area.

6.3 Right of Way:-
Emergency vehicle entering the project site will have right of way at all times.

6.4 Speed Restrictions:-
10 km/h speed restrictions apply across the project site. Personnel found to be in breach of the site speed limits will be subject to disciplinary actions, which may include removal of access to site.

6.5 Signage:
All appropriate signage will be installed for direction of traffic and the safety of pedestrians. Temporary and permanent signage on site should be positioned for maximum visibility to inform operators of speed restrictions, warning and other critical traffic information for the area. Signage no longer applicable will be promptly removed.

6.6 Reversing:-
SIL will implement on-way system around the site and in loading and unloading area and provide designated turning area. Instruction to the drivers will be given not to reverse, unless absolutely necessary to reduce the reversing operations.

SANGHI INDUSTRIES LIMITED

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6.7 **Proposed Heavy Vehicle Movement:-**

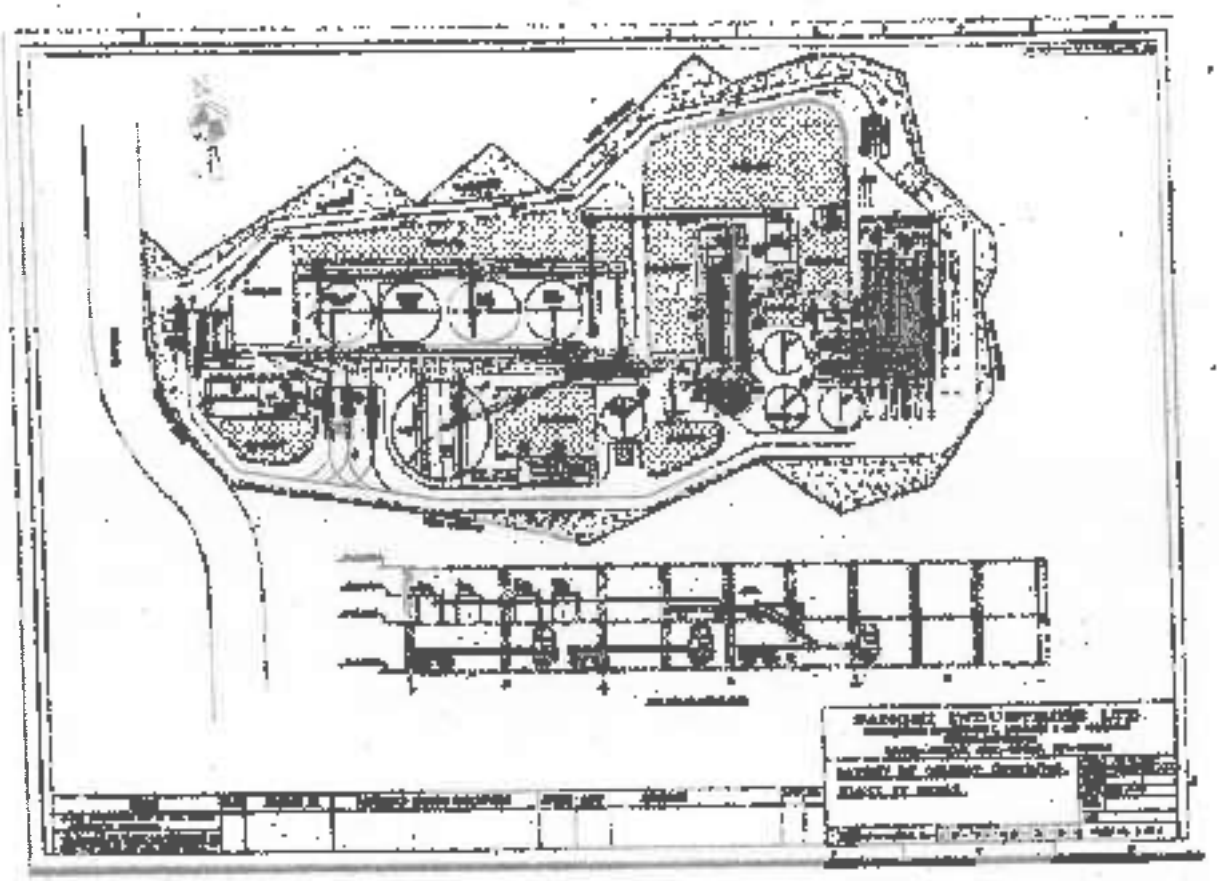
The clinker shall be transported from Sanghipuram (IU) to Surat (GU) mainly by sea route. At Surat, the Clinker shall be unloaded from the ship at nearest port and transported to the Surat GU site by trucks. The additives and fuel requirement of the plant will be transported through trucks. The finished goods will be dispatched through trucks / bousers.

6.8 **Parking:**

Looking to the in & out flow materials from the plant, SIL has made provision for parking of 40 trucks within the plant boundary below and near the Packing Plant.

Separate arrangement for car parking of the visitors / employees are made near the Administrative Office. A layout showing the Parking Area designated by SIL is Shown here-under. All parking locations will be marked on the site Vehicle Movement Plan (VMP) (posted on notice boards at the main office facilities).

Parking Arrangement within Plant Premises



SANGHI INDUSTRIES LIMITED AHMEDABAD

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7. Traffic Monitoring and Management:-

Internal RCC road network and separate entry/exit gate will be provided for smooth functioning of the traffic. Along with the road network, adequate parking space will also be provided at the project site.

The traffic management for Proposed Project of SIL is presented in the following table:

Traffic Management Plan

Controlled vehicular movement (preferably with clearly demarcated entry/exit) with adequate supervision	Within and immediately outside the site - Construction and operation phase	Contractor/ Project Manager during construction phase. Security and concerned departments during operation phase.	Security-in charge and security team
Demarcation of separate vehicular lanes and pedestrian routes/footpaths	Within the site - Construction and operation phase	Contractor/ Project Manager during construction phase. Security and concerned departments during operation phase.	Security team
Vehicle entry and exit scheduling so that traffic congestion is not created on the external road leading to the site and within the port premises	Within and immediately outside the side - Construction and operation phase	Contractor/ Project Manager during construction phase. Security and concerned head of department during operation phase.	Security-in charge and security team

SHAKTI INDUSTRIES LIMITED AHMEDABAD

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Larsen & Toubro Limited (East Campus)
Larsen & Toubro Limited
Larsen & Toubro, Heavy Engineering
1200 MTR
ADANI WILMER
650 MTR
L&T Special Steels and Heavy Forgings
L&T LEMF GATE-5
L&T LEMF GATE-5
GSEG Colony
CEMENT BAG /FLY ASH/OTHER RAW MA
480 MTR
L&T MHPS Boilers
L&T MHPS Boilers
212
SIL SITE
40 MTR
Larsen & Toubro
360 MTR
L&T MHPS Turbine Generators Pvt Ltd
NH-53
PANCHAYAT ROAD
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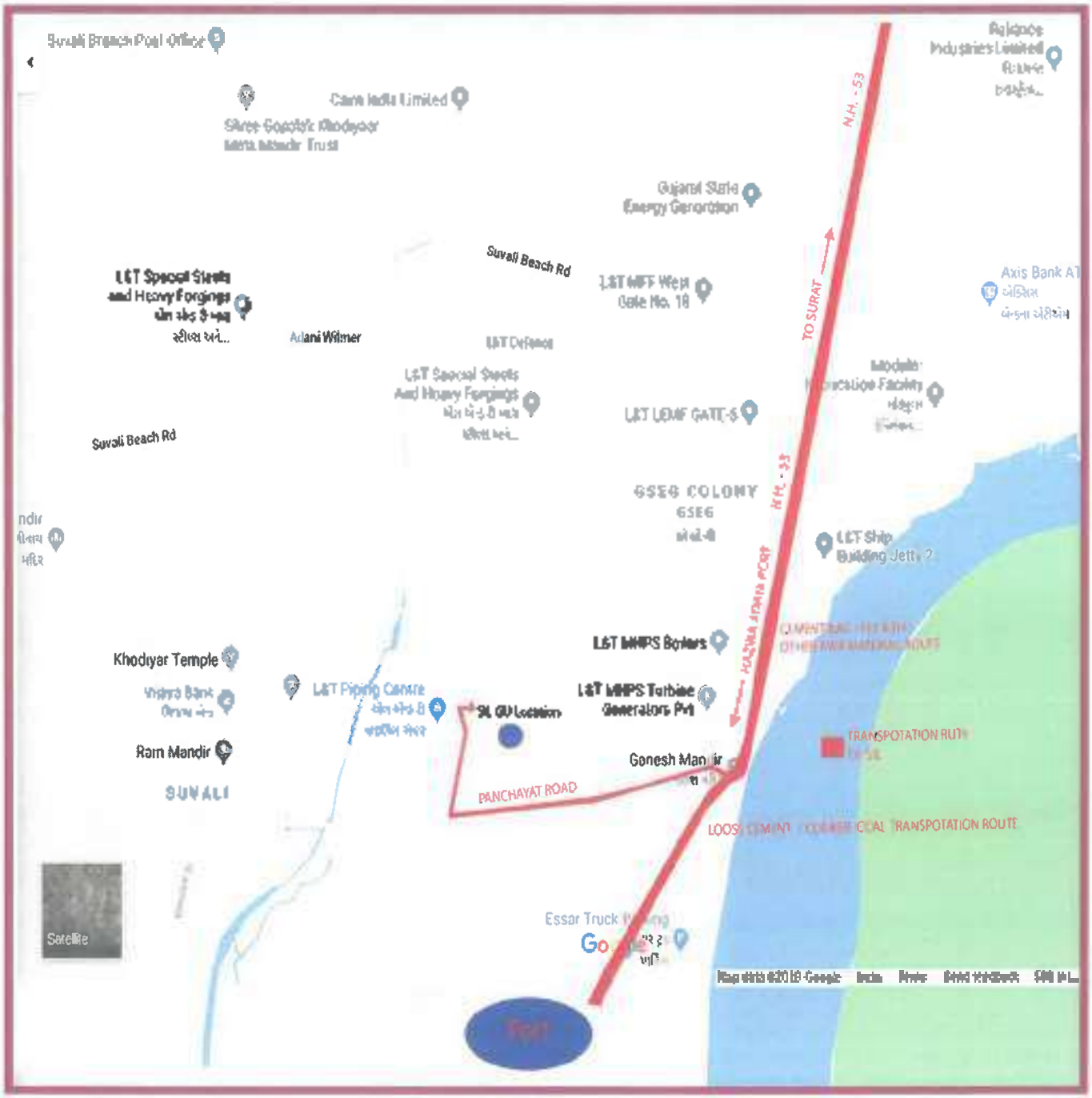
LOOSE CEMENT / CLINKER / COAL TRANSPORTATION ROUTE

Annexure – 3

Raw Material and Product Transportation Route:



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Impact on Surrounding Area and Mitigation Measures

1. Baseline Traffic Scenario:-

Traffic study measurements were performed at National Highway 6 and State Highway 168. Proposed project will attract to commercial vehicles as a result traffic load will also increase on highways. Traffic load play a major role in polluting the air. To assess the traffic load, 4 no. of surveyors were appointed to survey for National Highway 6 & National Highway 186.

Traffic data collected continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined. Traffic study is conducted on National Highway 6 & National Highway 186 from 26th and 27th Dec 2018.

Traffic Study Report

S.No.	Vehicles Distribution	No. of Vehicles/ Day		Passenger Car Unit (PCU)	Total No. of Vehicle in PCU		Total No. of Vehicle (PCU)/Hour	
		National Highway 6	State Highway 168		National Highway 6	State Highway 168	National Highway 6	State Highway 168
1.	Cars	20538	9087	1.0	20538	9087	856	379
2.	Buses	1080	754	3.0	3240	2262	135	94
3.	Trucks	2036	1256	3.0	6108	3768	255	157
4.	Two wheelers	5612	3845	0.5	2806	1923	117	80
5.	Three wheelers	1863	1056	0.75	1397	792	58	33
Total		31129	15998		34089	17832	1421	743

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
National Highway 6	1421	3000	0.47	C
State Highway 186	743	1250	0.59	C

Existing Traffic Scenario with respect to LOS

0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/Average/Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

Interpretation of Traffic Study:-

LOS values have been calculated based on traffic data on National Highway 6 & State Highway 168 and it has been found 0.47 and 0.59 respectively. LOS value indicates that the performances of NH-6 & SH-168 are good.

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2. Incremental Traffic:-

The Incremental Traffic due to proposed project is described as below.

Incoming & Outgoing Transportation

S.No	Raw Material	Quantity Million TPA	Quantity TPA	Quantity TPD	Source	Mode of Transport	No. of Vehicles (Truck/day)
1.	Clinker	2000000	6061	Captive	Sea	Road	184
2.	Additives like Gypsum, Fly Ash, Slag			Purchase			
	Fuel	60000	182	Purchase	Road		
Total No. of Trucks deployed / day will be							184

Outgoing Product Transportation

S.No	Product	Quantity Million TPA	Quantity TPA	Quantity TPD	Source	Mode of Transport	No. of Vehicles (Truck/day)
1.	Cement	2.0	2000000	6061	Captive	Road/Sea	179
Total No. of Trucks deployed / day will be							363

Frequency of Vehicles:

Total Capacity (Fuel, Clinker, Fly ash)	40, 60,000 TPA
No. of working days	330
Transportation of incoming and outgoing material	12303 Tons/day
Working hours per day	24 hour (3 shifts)
Truck/Tanker Capacity	34 Tons
Frequency of trucks/day (91 No.x 4 trips/day x 2 (up/down)	363 x 2
Frequency of trucks deployed/hr	16
Increase in PCU/hr	16 x 3= 48

Modified Traffic Scenario and LOS

S.No	Name of Roads	Increased PCUs	Modified PCU	Capacity	Volume Capacity Ratio	LOS
1.	National Highway 6	48*60%= 29	1421+29= 1450	3000	0.48	C
2.	State Highway 186	48*40%= 19	743+19= 762	1250	0.61	D

Minimum impact on local transport as only 91 Nos. [4 trips/day x 2 (up/down)] Trucks will be required for transport of cement and raw material. The LOS value from the proposed project will be the almost same as before i.e. "C" "Good" for the National highways falling in the study area. So, the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse effect. The company has planned Coastal Shipping of Cement, accordingly cement terminals have been developed at [illegible] locations. This will reduce the load on rail/road network / transportation.

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IMPACT OF TRAFFIC MOVEMENT ON SURROUNDING AREA & MITIGATION MEASURES

- Release of flue gas emission like PM, SO_2 and NOx from diesel operated vehicles.
- Generation of fugitive dust due to vehicle movement for transportation and handling of raw material and finished goods.
- Release of fugitive emission may cause health impacts.

MITIGATION MEASURES DURING TRANSPORTATION

SN	Activity	Materials handled	Mitigation Measures / EMP
1	Movement of raw materials & finished product by trucks / dumpers Movement of other vehicles - personnel four / two wheeler	Clinker Gypsum Fly ash Slag Coal Cement	• All operators / Transporters must use vehicles and plant in a manner that minimizes dust generation on the site including using designated roads and observing speed restrictions at all times. • All the raw material required for the proposed project will be in solid form except fly ash. The fly ash will be transported in the bouser only. The clinker and coal will be transported in the trucks covered with the Tarpaulin. • Strict instructions will be given to the transporter transporting the clinker and coal and special condition in the transport contract will be included to cover the Tarpaulin. SIL will not give entry of the trucks carrying clinker / coal in the premises without tarpaulin cover. • The bags cement will be transported in the trucks and loose cement will be transported in the bousers only. • Paved roads and concrete flooring will be provided in activity area. • Speed of vehicles will be limit upto 10 km/hr within plant premises. • Swiping Machine will be provided for road and floor cleaning within the premises. • Thick green belt will be developed on the periphery of the plant. • The Responsibility of Strict implementation of Mitigation Measures and compliance of EMP shall be handled by EHS in-charge of Environment Management Cell. • Valid PUC trucks will be deployed for transportation.

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Sanghi Industries Limited
Grinding Unit - Surat
Survey No. : 125/1, 125/2, 126/1+2+3
Opp. L&T Piping Center, Gate No. 8,
Hazira, Surat - 394510, Gujarat.

SANGHI CEMENT
Turning Dreams into Concrete Reality

Annexure - 4

UNDERTAKING

We, Sanghi Industries Limited solemnly affirm an undertaking that we shall use Imported Coal as a fuel and will not use Petcoke and Lignite in our proposed Cement Grinding Unit located at Survey No. 125/1, 125/2 and 126/1+2+3 of Village: Shivrampur, Taluka: Chorasi, District: Surat.

For , Sanghi Industries Ltd.

Authorised Signatory

Date: 23.05.2019
Place: Ahmedabad

CIN No. : L1620[illegible]PLC003581
Registered Office : P.O. Sanghinagar, Hayatnagar Mandal, R.R.District, Telangana - 501511
Tel. : 08415 - 242240 E-mail : companysecretary@sanghicement.com

Sound APCM / EMP against sources of air pollution

(A) Fugitive Emissions:

Process & non-process related fugitive emissions sources and mitigation measures are given below:

(1) Process related Fugitive Emission Sources & its mitigation measures / EMP

SN	Types of operation	Activity	Mode	Materials handled	No. of emission source	Mitigation Measures (APCM) / EMP
1	Raw Material Handling & Transfer	Unloading Operation	Feeder	Clinker	1	➢ Fully enclosed unloading station will be provided. ➢ Adequate water sprinkling system will be provided. ➢ Dust extraction (suction apparatus) system with dust collector of capacity 11000 M3/hr will be installed.
			Feeder	Additive - Gypsum, Slag & Coal	1	➢ Fully enclosed unloading station will be provided. ➢ Adequate water sprinkling system shall be provided. ➢ Dust extraction (suction apparatus) system with dust collector of capacity 11000 M3/hr will be installed.
			Pneumatic from closed tankers	Fly ash	0	➢ Fly ash will be pumped directly from the closed tankers to silo by fully automated pneumatic system in closed loop so that fugitive emissions do not occur. ➢ Fly Ash Handling Guidelines will be complied.
			Stacker	Gypsum, Slag & coal	3	➢ Raw materials will be stored in covered yard. ➢ Single entry point with flexible curtain will be provided. ➢ Concrete flooring will be provided in the covered yard. ➢ Closed belt conveyor will be provided from unloading station to piles. ➢ Dust suppression system will be provided at stock piles.
2	Raw Material Handling & Transfer	Loading Operation	Belt conveyor	Clinker	1	➢ An automated closed loop silo extraction system with closed belt conveyor will be provided for clinker loading and transportation from silo to mill. ➢ De-dusting bag filter of 25000 M3/hr capacity will be installed at silo top.
			Reclaimer	Gypsum, Slag and Coal	2	➢ Raw materials will be stored in covered yards. ➢ Single entry point with flexible curtain will be provided. ➢ Reclaimer system will be provided to mechanize loading operation. ➢ Closed belt conveyor will be provided from loading point to mill. ➢ Dust suppression system will be provided at stock piles. ➢ Coal Handling Guideline will be complied.

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SN	Types of operation	Activity	Mode	Materials handled	No. of emission source	Mitigation Measures (APCM) / EMP
3	Raw Material Handling & Transfer	Transfer Operation (Transfer Points)	Belt conveyor	Clinker	1	➢ Transfer point will be fully enclosed ➢ De-dusting bag filter of 3000 M3/hr capacity will be installed. ➢ Capture dust from the bag filter will be directly fed into the system in closed loop.
				Gypsum / Slag / Coal	2	➢ Transfer points will be fully enclosed. ➢ Two nos. of de-dusting bag filter with capacity of 3000 M3/hr each will be installed. ➢ Capture dust from the bag filter will be directly fed into the system in closed loop.
4	Finish Product Handling & Transfer	Mill to Silo	Air slide	Cement	0	➢ The closed looped system of air-slides will be provided for finished product transportation from mill to silo.
		Silo to Packing Plant	Belt conveyor	Cement	1	➢ Covered belt conveyor will be installed for material handling. ➢ De-dusting bag filter with capacity of 45000 M3/hr will be installed.
		Silo to bulk loading system	Belt conveyor	Cement	1	➢ Covered belt conveyor will be installed for material handling. ➢ An automated closed bulk loading system will be installed. ➢ De-dusting bag filter with capacity of 5000 M3/hr will be installed.
		Silo Vent	–	–	3	➢ Three nos. of de-dusting bag filter with capacity of 3000 M3/hr each will be installed.
5	Packing plant	Cement Packing	Automatic Packer machine / Bulk loading	Cement	03	➢ The packing operation will be performed automatic electronic packers under negative pressure by the centrally installed de dusting bag filters of 45000 M3/hr capacity. ➢ Engineering controls like guiding plate, scrapper brush and self bag cleaning system will be installed. ➢ An automated closed loop system will be provided for bulk cement loading ➢ The spilled cement on the floor will be swept by vacuum sweeping machine periodically and sent for recycling. ➢ The vibratory screen with dust extraction arrangement will be provided for recycling of cement. ➢ Closed air slides and bucket elevators will be installed for finish product transportation in the plant.

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(2) Non-process related Fugitive Emission Sources & its mitigation measures / EMP

SN	Types of operation	Activity	Materials handled	Mitigation Measures / EMP
1	Vehicle Traffic at site	Movement of raw materials & finished product by trucks / dumpers Movement of other vehicles - personnel four / two wheelers	Clinker, Gypsum, Fly ash, Slag, Coal and Cement	➢ Raw materials / finished product will be transported in covered trucks / trippers. Fly ash will be transported in bouser. ➢ Paved roads and concrete flooring will be provided in activity area. ➢ Speed of vehicles will be limit up to 10 KMPH. ➢ Sweeping machine will be provided for road and floor cleaning as abundant precaution. ➢ Greenbelt in three layers will be developed along with plant boundary. ➢ Water sprinkling will be done in non-process area. ➢ Valid PUC trucks will be deployed for transportation.
2	Raw Material & finished product Storage	Storage of materials	Gypsum, Slag, Coal, Fly ash, Clinker and Cement	➢ All raw materials will be stored in covered yard. ➢ Single entry point with flexible curtain will be provided. ➢ Concrete flooring will be provided in the covered yard. ➢ Clinker & Fly ash will be stored in silo. ➢ Dust suppression system will be provided at stock piles. ➢ Stacker & reclaimer will be provided to mechanize loading and unloading operation in the yard. ➢ Greenbelt in three layers will be developed around the storage yard. ➢ Clinker, Fly ash and cement will be stored in closed Silo.

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(B) Process / Flue Gas Emissions:

SN	Types of operation	Activity	Materials handled	Mitigation Measures / EMP
1	Grinding	Cement grinding in Vertical Roller Mill (VRM)	Clinker, Gypsum & additives - Fly ash and Slag	➢ Latest technology based Intensive Jet Bag house of capacity 11,00,000 m3/hr will be installed. ➢ 55 meter high x 3.2 meter Dia. Stack will be provided for dispersion. ➢ SPM <30 mg/Nm3, SOx & NOx < 100 ppm (Norms as per CPCB Guidelines).

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An Environment Management Cell (EMC)

- An Environment Management Cell will be developed by an effective mixing of a group of technical experts from various departments of the project to look after the all obligatory requirements and shall be responsible for the effective implementation of all environmental pollution control measures.
- The head of EMC will be directly report to top management
- The "dust control officer" will be employed under EMC wings
- Regular training will be provided to the personnel operating and maintaining fugitive emission control system
- Regular maintenance of APCD will be carried out as per OEM recommendations
- Sufficient EHS budget will be allocated to implement and ensure effective implementation of planned mitigation including R&D programs for innovative technologies for better environment management
- Regular environmental monitoring will be conducted by SPCB approved 3rd party and reports will be submitted to regulatory authority as per guideline

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Details of vents/stack with specific source & Air Pollution Control System

S N	Technical Details	Unit	Source / Location								
			Cement Mill (VRM)	Unloading Stations	Transfer Points	BAG	Clinker Silo	Cement Silos	Fly ash Silo	Packing Plant	Bulk Loading Station
1	APCS	Type	Bag house	Bag filter	Bag filter	Bag filter	Bag filter	Bag filter	Bag filter	Bag filter	Bag filter
2	Technology	–	Intensive jet Bag house	Pulse jet Bag filter	Intensive jet Bag house	Pulse jet Bag filter	Pulse jet Bag filter	Pulse jet Bag filter	Pulse jet Bag filter	Pulse jet Bag filter	Pulse jet Bag filter
3	Quantity	Nos.	01	02	03	01	01	03	01	01	01
4	Capacity	M3/hr	11,00,000	11,000 each	3,000 each	5,000	25,000	3,000 each	3,000	45,000	5,000
5	Compartment	Nos.	10	1	1	1	1	1	1	1	1
6	Bag Size	Meter	8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
7	Bag Quantity	Nos.	4420	110	34	67	256	34	34	460	56
8	Bags quality	Type	100 % Homo polymer poly acrylonitrile	Polyester Needle Felt	Polyester Needle Felt	100 % Homo polymer poly acrylonitrile	Polyester Needle Felt	Polyester Needle Felt	Polyester Needle Felt	Polyester Needle Felt	Polyester Needle Felt
9	Air to cloth ratio	m3/min/m2	1	1.2	1.2	1	1.2	1.2	1.2	1.2	1.2
10	Effective area	M2	18218	148	46	90	345	46	46	621	75
11	Inlet dust load	g/m3	299-371	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100
12	Outlet dust load	mg/m3	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30
13	Efficiency	%	99.96	99.95	99.95	99.95	99.95	99.95	99.95	99.95	99.95
14	Stack Diameter	Meter	3.2	NA	NA	NA	NA	NA	NA	NA	NA
15	Stack Height	Meter	55	Vent	Vent	Vent	Vent	Vent	Vent	Vent	Vent

* Detail may very during detailed engineering at the time of execution.

SANGHI INDUSTRIES LIMITED AHMEDABAD

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Sanghi Industries Limited
Grinding Unit - Surat
Survey No. : 125/1, 125/2, 126/1+2+3
Opp. L&T Piping Center, Gala No. 9,
Hazira, Surat - 394510, Gujarat.

SANGHI CEMENT
Turning Dreams into Concrete Reality

Annexure - 7

UNDERTAKING

We, Sanghi Industries Limited solemnly affirm an undertaking that we shall adhere all the guidelines prescribed by the authority for handling of coal & fly ash in our proposed Cement Grinding Unit located at Survey No. 125/1, 125/2 and 126/1+2+3 of Village: Shivrampur, Taluka: Chorasi, District: Surat.

For , **Sanghi Industries Ltd.**

Authorised Signatory

Date: 23.05.2019
Place: Ahmedabad

COMPLIANCE OF COAL HANDLING GUIDELINES OF GUJARAT POLLUTION CONTROL BOARD

S. No.	Guidelines /Conditions	Compliance Status
(A) Location Criteria		
1	Coal handling unit/agency shall not use any agriculture land and shall be located at a minimum distance of 250 meters away from the surrounding agriculture land	Our proposal is for standalone cement grinding unit. As such as location criteria defined by GPCB Guideline is not applicable to us. However, we will ensure all compliance of the coal and ash handling guidelines applicable to cement plant.
2	Government waste land not suitable for any agriculture purpose meeting with the requisite sitting/distance criteria shall be preferred for establishing coal handling units	
3	Coal handling unit/agency shall be minimum 500 meters away from the residential area, School/colleges, Historical Monuments, Religious Places, Ecological sensitive area as well as forest area.	
4	Coal handling unit/Agency shall be located 500 meters away from the Railway line, Express ways, National Highways, state ways and District Roads and from water bodies like River, Nala, Canal , Pond etc	
5	In case of coal handling activities at the ports and jetties or extension thereof, the distance and land use criteria may be relaxed and compensated by advanced /sophisticated pollution control measures and mechanization & thick plantation, however all such ports and jetties, where coal handling is carried out, shall provide closed conveyor belt and mechanization for handling of coal.	
(B) Storage Criteria		
6	Coal handling unit/Agency shall store cover in such a way that coal heap should not be higher than 5 meter and clear distance between two adjoining heaps at G.L. should be 5 meters, so that in case of fire, approach is available.	Covered coal storage area will be provided and > 5 meter distance between will be maintained between two adjoining coal piles.
7	There should be mechanized loading/unloading system from the loading / unloading area to the stacking yards and in to the vehicle	Fully mechanized system i.e. truck tippler, Stacker & Reclaimer system will be provided for loading / unloading
8	Coal handling unit/ Agency shall take all corrective steps to resolve the issue of air pollution at permitted coal storage /handling area where coal is being stored.	Best in class possible all corrective measures i.e. covered storage shed, dust suppression system, stacker & reclaimer with covered belt conveyor, adequate bag filters on transfer points etc will be provided

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(C) Transport Criteria		
9	Coal handling unit/Agency shall ensure that all trucks before leaving the storage yard shall be showered with water with adequate system, shall be covered with tarpaulin or any other effective measure/device completely and also that trucks are not over loaded as well as there is no spillage during transportation	Tarpaulin covered trucks will be used for coal handling. It will ensure that trucks are not over loaded as well as there is no spillage during transportation
10	The vehicles carrying the coal should not be overloaded by raising the height of carriage. Weigh scale shall be provided within the loading area only and port / coal park authority shall ensure that no overloading is done.	The vehicles carrying the coal will not be overloaded by raising the height of carriage.
11	The top of the vehicle should be covered with fixed cover instead of tarpaulin cover to avoid spillage or dusting of coal.	The top of the vehicle should be covered with tarpaulin to avoid spillage or dusting of coal.
12	Coal handling /Agency shall obtain transport permission from the local administration under the relevant rules.	Transport permission will be obtained from the local administration under the relevant rules before commissioning of the project.
(D) Pollution Prevention Criteria		
13	Coal handling unit/Agency shall provide paved approach with adequate traffic carrying capacity.	Paved approach will be provided with adequate traffic carrying capacity.
14	Coal handling /Agency shall construct compound wall all along periphery of the premises with minimum 9 meters height.	Not applicable as coal will be stored in covered storage shed.
15	Continuous water sprinkling shall be carried out on the top of the heap at regular intervals to prevent dusting, fire & smoke. To prevent fugitive emission during loading/ unloading, fixed pipe network with sufficient water storage and pump shall be installed. Water sprinkling shall be carried out at each and every stage of handling to avoid generation of coal dust or other dust within premises.	Continuous water sprinkling will be carried out on the top of the heap at regular intervals to prevent dusting, fire & smoke. Water sprinkling will be carried out at each and every stage of handling to avoid generation of coal dust or other dust within premises.
16	Coal handling unit/Agency shall ensure regular sweeping of coal dust from internal and main road and also ensure that there is adequate space for free movement of vehicles.	Regular sweeping of coal dust from internal and main road will be carried out and also ensured that there is adequate space for free movement of vehicles.
17	The following adequate Air Pollution Control Measures shall be installed and to be operated efficiently. a) Dust containment cum suppression system for the coal stack, loading and unloading.	Dust suppression system will be installed for the coal stack, loading and unloading.

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	b) Construction of effective wind breaking wall suitable to local condition to prevent the suspension of particles from the heaps.	Coal will be stored in covered storage shed.
	c) Construction of metal road & RCC Pucca flooring in the plot area/godown etc.	Construction of metal road & RCC Pucca flooring in the plant area will be provided.
	d) System for regular cleaning and wetting of the floor area within the premises.	Regular cleaning and wetting of the floor area within the premises will be implemented.
	e) Entire coal storage area/ godown should be covered with permanent weather shed roofing and side walls i.e. , in closed shed, in case of crushing /sieving/grading activity is carried out (i.e. G.I. Sheet) along with adequate additional APCM should be installed.	Coal storage area will be covered with permanent weather shed roofing and side walls along with dust suppression system will be installed.
18	Coal handling/Agency shall carrying out three row plantation with tall growing trees all along the periphery of the coal handling premises, inside & outside of the premises along with road.	Three row plantation with tall growing trees all along the periphery of the coal handling premises, inside & outside of the premises along with road will be carried out as per EMP.
19	Proper drainage system shall be provided in all coal storage area so that water drained from sprinkling & runoff is collected at a common tank and can be reused after screening through the coal slit or any other effective treatment system.	Proper drainage system will be provided in all coal storage area so that water drained from sprinkling & runoff.
20	All the engineering control measures and state of art technology including covered conveyors belts, mechanized loading and unloading, provision of silo etc. shall be provided in addition to the measures recommended in the environmental guidelines for curbing the pollution.	Covered conveyors belts, mechanized loading and unloading, provision of silo etc. Will be provided for dust emission control.
(E) Safety Requirements		
21	Coal handling unit/Agency shall provide adequate fire fighting measure to avoid any fire or related hazards including adequate water storage facility, and the premises shall be exclusively used for storage of the coal.	Adequate fire fighting system will be provided with adequate water storage facility in coal storage shed.
22	An onsite emergency plan shall be prepared and implemented by coal handling unit.	An onsite emergency plan will be prepared and implemented accordingly.
(F) Legal Criteria		

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23	Necessary permission from all the applicable regulatory authorities and adequate steps under the provisions of applicable environmental acts/rules shall be taken.	Necessary permission from all the applicable regulatory / authorities will be obtained and adequate steps under the provisions of applicable environmental acts/rules will be taken accordingly.
24	Coal handling unit/Agency shall prepare EMP (Environment Management Plan) and implement the same in true spirit and thus maintain overall environment of that area.	EMP (Environment Management Plan) will be prepared and implemented in true spirit and thus maintain overall environment of that area.
25	Coal handling unit/Agency shall not carry out the operation of loading/unloading of coal/coal dust at any place, till adequate air pollution control equipment for dust control/ suppression are installed and efficiently operated and the consent under the provisions of Air (Prevention & Control of Pollution) Act, 1981 is obtained by coal yard owners/Coal handling unit/Agency /Coal importer.	Point Noted.
26	Coal handling unit /Agency shall operate continuous Ambient Air Quality Monitoring Stations as per CPCB guidelines. The results of parameter like SPM, RSPM and SO_2 and NOx shall be submitted to the SPCB every month.	Continuous Ambient Air Quality Monitoring Stations will be installed as per CPCB guidelines. The results of perameter like SPM, RSPM and SO_2 and NOx will be submitted to the GPCB every month.
27	In case of port which provides the facility to individual developers an agreement/ MoU shall be made between port authority and developer for curtailment of pollution. Port authority shall be responsible for supervising and controlling the pollution control related activities and implementation of the environmental guidelines.	For our grinding unit, we will be procuring coal from the local sources, hence, not applicable.
28	The concentration of the following parameters in the ambient air within the premises and a distance of 10 meters from the source (other than the stack/vent shall not exceed the following levels.	Ambient air quality parameters will be compiled as per CPCB / GPCB.

PARAMETERS	PERMISSIBLE LIMIT	
	Annual	24 Hrs Average
Particulate Matter – 10 (PM_{10})	60 Microgram/M^3	100 Microgram/M^3
Particulate Matter – 10 ($PM_{2.5}$)	40 Microgram/M^3	60 Microgram/M^3
SO_2	50 Microgram/M^3	80 Microgram/M^3
NO_x	40 Microgram/M^3	80 Microgram/M^3

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Compliance of CPCB Guidelines for loading, unloading, storage, transportation of fly ash
Thermal Power Plant

There is no any specific guidelines available for ash handling generated by Hot Air Generator (HAG), hence compliance of CPCB Guidelines for ash handling – Thermal Power Plant is given below:

S.No	Description/ Condition	Compliance/ Status
7.1 Dry collection of fly ash and bottom ash		
a	Coarse fly ash from first field of ESP Hoppers needs to be collected and stored separately into the coarse fly ash silo.	Not applicable as ash will be collected through bag filter. The closed loop system will be provided for ash transportation from bag filter hopper to fly ash silo.
b	Fine fly ash from second field onwards of ESP Hoppers should be collected separately. For some specific usage, fine fly ash may be passed through Classifier for further separation of fine fly ash and stored in separate silo.	Not applicable as ash will be collected through bag filter. The closed loop system will be provided for ash transportation from bag filter hopper to fly ash silo.
c	Bottom ash which is not utilised presently could also be collected in dry form and converted into a valuable resource if processed to match the end use specification. The dry bottom ash removal and its transportation is certainly more environment friendly, compared to that of wet ash removal and transport system. Wet collection & disposal of bottom ash should be minimised as far as possible.	The closed loop system will be provided for ash transportation from HAG to fly ash silo.
7.2 Loading, Unloading and Storage Installation of Bag Filters with dry fly ash collection and storage in Silos at loading and unloading points are standard practices at both locations i.e. loading at power plant site as well as at the unloading point at user's site. Suggestions for further improvement in existing practices are as under:		
a	Current practice of loading of fly ash in Bulkers / Tankers requires improvement at the stage of loading of fly ash in Tankers. The opening telescopic chutes should be closed and confined to avoid fugitive dust emission.	Not applicable as closed loop system will be provided for fly ash / bottom ash up to storage silo.
b	The Pollution Control Equipment / Cascade Filters, attached with fly ash loading Chute should be periodically cleaned along with regular scheduled maintenance of Bag Filter to avoid choking and malfunctioning of Bag Filter. It would mitigate the dust emission during loading of fly ash	Not applicable as no tanker loading operation involve in the project as only unloading of bulker will be required which will be handled through closed automated pneumatic system.

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c	Malfunctioning of level sensor scan be avoided, with regular maintenance, to prevent over filling of fly ash in Tankers.	Not applicable as no tanker loading operation involve in the project as only unloading of bulker will be required which will be handled through closed automated pneumatic system.
d	The Weigh Bridge to be installed under fly ash loading chute to fill just the required quantity of fly ash in Tankers so that rejection and emptying out of fly ash in open area is avoided which otherwise results in heavy fugitive emission all around.	Not applicable as no tanker loading operation involve in the project as only unloading of bulker will be required which will be handled through closed automated pneumatic system.
e	Opening of Tankers need to be closed and properly locked during transportation of fly ash. Automatic opening / close system need to be installed without fail.	Not applicable as no tanker loading operation involve in the project as only unloading of bulker will be required which will be handled through closed automated pneumatic system.
f	Current practice of unloading of fly ash from Tanker to Storage Hopper through pneumatic system is certainly good. But it has, however, been observed that the leakage of fly ash occur at bends and joints of transportation pipe line. The fly ash being abrasive in nature causes damage at bends and joint locations. Fly ash should, therefore be transported through PVC coated MS pipes to avoid the abrasion otherwise it may lead to leakage of fly ash. The mechanical unloading system should be envisaged to avoid high pressure, more power consumption and dust leakage from unloading pipe lines. As far as possible, number of bends should be minimised.	Closed automated pneumatic system will be provided for fly ash handling from bulkers to silo. Fly ash will be transported through PVC coated MS pipes to avoid the abrasion to avoid leakage of fly ash. The system will be designed in such a way that there will be minimum bends.
g	The fly ash storage silo should to be made up of anti-abrasive or anti corrosive material. It is preferred to provide concrete silo/hopper to avoid leakages.	Concrete silo will be provided for fly ash storage.
h	The bottom ash discharged from boiler bed, may be transported pneumatically in dry form / in slurry form to the ash pond.	Not applicable as no boiler will be installed in the project.
i	Proper functioning of all the level sensor of Storage Hopper has to be ensured to avoid any possible spillage from Hopper opening.	Proper functioning of all the level sensor of Storage Hopper will be ensured to avoid any possible spillage from Hopper opening.
j	The Bag Filter made of anti-abrasive material/cloth be provided with telescopic chute.	Advance technology based pulse jet bag filter will be installed. Telescopic chute will be not applicable as no loading operation required

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k	Dumping of ash in Ash pond should be loaded mechanically in moist condition so that the ash does not get air borne and pose fugitive dust problem.	Not applicable as no pond ash will be required in the project.

7.3 Transportation

Fly ash transportation has many challenges like distance to be transported, form of ash i.e. dry or wet ash, user's requirement, economic feasibility, requirement of surrounding vicinity and many more site specific issues. Over and above, in any case control of dust emission during transportation is prime concern and more challenging being a non-point source of pollution and larger area coverage due to movement from one place to other passing through various receptors. As fly ash is used by different users for different purpose such as cement manufacturing, brick manufacturing, mine back filling, road construction and filling of low lying area, the handling and transportation have to accordingly suggest. Following modes of transportation and precautions, to avoid fugitive dust emission are, therefore, suggested for different end users of fly ash or bottom ash as the case may be:

a	**Cement/ Asbestos manufacturing**	
i	Specially designed Road Tankers/ Bulkers or mechanically designed covered Truck sand provided with automatic loading and unloading through compressor / vacuum pumps mounted on the tankers need only to be used	Specially designed Bulkers will be utilized with automatic unloading through vacuum pumps system.
ii	Special designed railway wagons similar to Bulkers/Tankers need to be used for transportation	Not applicable as fly ash will be transported through bulkers through nearby power plants.
iii	Dedicated boats and bargers should only carry fly ash containers for transportation of fly ash. Specially designed jetty with automatic loading and unloading system for transportation of fly ash from silo to container should be developed.	Not applicable as fly ash will be transported through bulkers through nearby power plants.
b	**Flyash based Brick, Tiles, Blocks etc. manufacturing:**	Not applicable as the proposed project is standalone cement grinding unit.
i	Tankers/ Bulkers or mechanically designed covered Trucks need to be used	Not applicable as the proposed project is standalone cement grinding unit.

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II	Tractor trolleys with box type cover on top with hydraulic unloading system need only to be deployed for transportation of dry or wet fly ash, while traversing through habilitated areas otherwise, Tractor trolleys suitably covered with good quality of tarpaulin (made of HDPE)could be allowed to transport flyash for shorter distance say upto a distance of about 10 Kms.	Not applicable as the proposed project is standalone cement grinding unit.
C	**Mine/ abandoned quarry back filling**	Not applicable as the proposed project is standalone cement grinding unit.
I	Tankers/ Bulkers or mechanically designed covered Trucks need to be used	Not applicable as the proposed project is standalone cement grinding unit.
II	Pipe conveyors, wherever feasible, based on the topography of the area should be used.	Not applicable as the proposed project is standalone cement grinding unit.
III	Thermal Power Plants using wet ash disposal, if permitted can transport ash slurry directly to abandoned mine through ash slurry pipe line.	Not applicable as the proposed project is standalone cement grinding unit.
d	**Road construction and filling of low lying area**	Not applicable as the proposed project is standalone cement grinding unit.
I	Tankers/ Bulkers or mechanically designed covered Trucks need to be used.	Not applicable as the proposed project is standalone cement grinding unit.
e	**Other miscellaneous purposes**	Not applicable as the proposed project is standalone cement grinding unit.
I	Tankers/ Bulkers or mechanically designed covered Trucks need only to be used	Not applicable as the proposed project is standalone cement grinding unit.
7.3.1	The user agency shall obtain prior approval of design of Road Tankers/ Bulkers or mechanically covered Trucks, as the case may be, from the concerned State Pollution Control Board. In no case, flyash or bottom ash shall be allowed to be transported by open trucks / trollies irrespective of distance or end use.	Not applicable as the proposed project is standalone cement grinding unit.
7.4	**Code of Practices for general maintenance of roads, vehicles and conditioning of fly ash**	
a	Thermal power plants and use agency collectively transported in environmentally sound manner prescribed by CPCB	Fly ash will be transported in environmentally sound manner prescribed by CPCB

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b	Roads inside power plant and that of flyash user agency should be paved and plantation of adequate width should be done at both sides. Mechanised Road Sweepers should be deployed. In addition, adequate arrangements for water sprinkling should be made to suppress fugitive dust emission, if any generated.	Paved inter road with plantation of adequate width will be done at both sides. Mechanised Road Sweepers will be deployed. In addition, adequate arrangements for water sprinkling will be made to suppress fugitive dust emission.
c	Pond ash to be transported should be conditioned with water to maintain minimum 15% moisture at the disposal point so that ash does not get air borne and cause fugitive emission.	Not applicable as no pond ash will be required in the project.
d	Adequate free board in trucks should be kept to avoid overflow/spillage during transportation.	Not applicable as fly ash will be transported through bulkers through nearby power plants.
e	In case of any spillage enroute during transportation of fly ash, the agency shall ensure that spilled ash is collected and transported to the disposal/usage site immediately	Not applicable as fly ash will be transported through bulkers through nearby power plants.
f	All the Bulkers and trucks responsible for carrying fly ash should have valid Pollution Under Control certificates.	All the Bulkers utilize for carrying fly ash will have valid Pollution Under Control certificates.
g	The speed limit of vehicles carrying flyash should be strictly enforced and in no case same shall exceed 40 km per hour.	The speed limit of vehicles carrying fly ash will be strictly enforced and in no case same shall exceed 40 km per hour.
h	State Pollution Control Boards shall indicate clearly mode of transportation and method of loading and unloading while granting the consent.	Point Noted
i	Transportation of fly ash through thickly through thickly populated areas populated areas should be avoided as for as possible.	Not applicable as proposed project is located in Hazira industrial zone and transportation of fly ash will be carried out through national highway / state road.
j	General awareness/ training programmes be organised regularly for tanker operating staff like drivers and cleaners on the impact of hazards of fly ash.	General awareness/ training programmes will be organised regularly for tanker operating staff like drivers and cleaners on the impact of hazards of fly ash.

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$PM_{2.5}$, PM10, SO2, NOx, CO and VOC at eight locations, including the project site. Values conform to the prescribed standards for Ambient Air Quality. The incremental Ground Level Concentration (GLC) has been computed using ISCST 3.

- The resultant concentrations are within the NAAQS. The modeling study proved that the air emissions from the proposed plant would not affect the ambient air quality of the region in any significant manner. The ambient air quality around the proposed project site will remain within the National Ambient Air Quality Standards (NAAQS).
- Risk assessment including prediction of the worst-case scenario and maximum credible accident scenarios has been carried out. The detail proposed safeguard measures including On-Site / Off-Site Emergency Plan has been covered in the RA report.
- Committee noted that this proposal is for new project of 2.0 MMTPA Standalone Cement Grinding at Survey No. 125/1, 125/2 and 128/1+2+3, Village: Shivrampur, Taluka: Choryasi, District: Surat.
- Cooling bleed off will be utilized for dust suppression within premises. There will no process effluent generation. Sewage will be treated in STP and treated sewage will be utilized on land for gardening/plantation within premises.
- PP has proposed to use Lignite or Coal or Petcoke 12 TPH as fuel in HAG. Committee noted that use of Petcoke in HAG is not allowed in Gujarat as per approved fuel notification. PP has not proposed APCM for SOx control inspite of use of lignite. Committee found that details of stacks attached to APCS are not addressed. While deliberation on fuel, PP informed that they will not use lignite &Petcoke as a fuel.
- This office has received representation from M/s. L&T Limited, Hazira against this project regarding anticipated air pollution due to proposed Cement grinding unit through email dated 18.09.2019. M/s. L&T Ltd. represented that they are manufacturing super critical turbine generator, nuclear equipments, war weapons (gun, tanks etc.) and fugitive dust emission of proposed project will adversely affect quality and performance of the product which being used in national security. The same issue was also raised by M/s. L&T Limited during public hearing on dated 22/09/2019.The copy of representation of M/s. L&T Limited, Hazira was given to PP for compliance of the issues raised by them.
- PP has addressed hazardous waste management.
- Committee deliberated CER, EMP and baseline data. PP has not furnished status of all the applicable Rules, Acts, Regulation, Clearances in a tabular form as per given ToR no. 6.
- After deliberation, SEAC unanimously decided to consider the proposal after submission of the following details:

1. Readdress ToR no. 6, 40.
2. Point wise action plan regarding representation of L&T Ltd. Hazira.
3. Submit raw material & product transportation route, its impact on surrounding area and mitigation measures.
4. Undertaking regarding no use of Lignite &Petcoke as fuel.

5. Sound APCM to control fugitive dust emission during raw material transportation, storage, handling, loading, unloading, transfer, fuel grinding etc.
6. Details of vents/stacks with specific source &Air Pollution Control System.
7. Compliance of Coal & Ash handling guidelines & its commitment.

- PP has submitted detailed reply on 23/05/2019 submitting the additional details sought with point-wise reply with respect to the representation of L&T Ltd., Hazira dated 05/04/2019 and 22/04/2019.
- PP was called for Presentation based on the reply on 12/06/2019.
- During the meeting, the project was appraised based on details furnished on 23/05/2019 by the project proponent against the additional details sought.
- PP along with its expert consultant made technical presentation and explained in detail all the points which were raised on 18/04/2019.
- Committee noted that PP has readdressed ToR no-5 and 40 with details regarding applicable rules/Acts/Regulation to unit in tabular form and compliance of issues of woman and more participation of woman in public hearing.
-
- Committee asked regarding action plan on representation of L& T Ltd, Hazira made vide letter dated 05/04/2019 & 22/04/2019 and reviewed all the points raised by L&T in their representations, PP informed that points raised by L & T Ltd. Hazira are already addressed in the EIA Report. PP also agreed regarding green belt development in periphery of the unit and closed transportation system for loading/unloading and bulk cement in closed cement tanker.
- Committee asked for fugitive emission from proposed project may affect production activity of Defence Unit of M/s L & T Ltd, Hazira and serious health hazards to people operating in closed vicinity, PP informed that Defence Unit of M/s L & T Ltd is approximately one kilometre aerial distance from proposed project in cross-wind direction and least chances for dusting spread over to M/s L & T Ltd. Moreover company adopted latest technology of covered and closed system in loading/unloading and transportation of raw material and finished products. Also PP informed that 33% green belt developed in and around periphery of proposed project. PP agreed with committee suggestions regarding adequate height boundary wall for control of dusting spread in nearby area and installation of advance sprinkling system for raw material like fly ash, gypsum and coal handling system.
-
- PP submitted detailed reply with clarification regarding L&T representation dated 05/04/2019 & 22/04/2019 and said that there is no chances for dusting with implementation of EMP and no adverse impact on potable water due to cement dusting from proposed project. CAAQMS will be installed in proposed project and its report will be submitted to GPCB regularly.
- PP submitted undertaking regarding not to use lignite and Petcoke as fuel.
- PP agreed with complying coal and fly ash guidelines of GPCB for proposed project. PP submitted

assurance that there will not be any degradation of environment which adversely affects the green belt, Water, Health of employees, production quality and business of L & T and other neighbouring units.

- PP submitted adequate proposal for raw material and product transportation route and impact of traffic movement on surrounding area and mitigation measures/EMP for proposed project like Dust extraction system with capacity of 11000 m3/Hr and fully enclosed system for unloading station.
- PP addressed and clarified details of sound APCM to control fugitive dust emission during raw-material transportation, storage, handling, loading, unloading, transfer, fuel grinding etc. along with details of vents / stacks with specific source and air pollution control system.
- Committee found that PP has addressed all the points raised in the ADS on 16/04/2019 satisfactorily and also assured to take all necessary mitigation measures to control air pollution at source.
- After detailed discussion SEAC unanimously decided to recommend the project to SEIAA Gujarat for grant of Environmental Clearance.

18.	SIA/GJ/IND2/30845/2013	M/s. Tatva Chintan Pharma Chem Pvt. ltd Plot No. Z/103/F/1, SEZ Dahej, Part-II, Ta: Vagra Dist. Bharuch	EC Amendment- Refer back case

Category of the unit:5(f)

Status of the project: New

M/s: Tatva Chintan Pharma Chem Pvt. ltd, applied for amendment in Environmental clearance and the SEAC recommended the project for grant of environmental clearance vide this office letter no. EIA-10-2018/IND2/1177 dated 01/04/2019 for amendment in EC for change mode of disposal of effluent from multi effect evaporator to single stage evaporator as mentioned therein:

The case was referred back by the SEIAA, Gujarat vide SEIAA minutes of 209th meeting dated 02/04/2019 with the following point:

1. **To verify the details of characteristic of effluent and its treatability study.**

Project proponent submitted reply vide their letter dated 20/04/2019 showing Characteristic of effluent for the above mentioned points.

PP has submitted as under:

1. **PP has submitted characteristic of untreated effluent, primary treated effluent, after solvent stripper and after single stage evaporator characteristic.PP also mentioned about details of primary treatment of and evaporator with solvent stripper for effluent.**

The case was reconsidered in the SEAC meeting dated 12/06/2019.

During the SEAC meeting dated 12/06/2019, the said reply was considered by the Committee. Committee asked clarification regarding drastic reduction in TDS, COD and BOD value in solvent stripper and single stage evaporator. Also committee asked about drastic reduction in Ammonical Nitrogen in solvent stripper.

ANNEXURE-II

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Minutes of the 259th Meeting held on 16th July 2013 at 09.00 A.M.

The 253rd meeting of the State Level Environment Impact Assessment Authority (SEIAA) was held under the Chairmanship of Shri C. L. Meena at Gujarat Pollution Control Board, Gandhinagar. Prof. G.H. Ban, Member of SEIAA and Shri S. M. Saiyed, Member Secretary of the State Level Environment Impact Assessment Authority (SEIAA) attended the meeting.

The following cases were taken up during the meeting:-

1	Macson Products Plot No. 2424/2426, Sachin GIDC, Surat	Synthetic Organic Chemical Industry – 5(f)	Surat
2	Sanghi Industries Limited Survey No. 125/1, 125/2 and 126/1+2+3, Vill. Shivrampur, Ta. Choryasi, Surat	Cement Industry – 3(b)	Surat
3	K. Patel Chemo Pharma Pvt. Ltd. (Unit No. -2) Plot No. 408/6 to 408/23 (except plot no. 408/10 & 408/11), Notified GIDC Industrial Estate, Panoli, Ta. Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
4	Amita Chemical Industries Plot No. 4784, GIDC Estate, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
5	Galaxy Chemi Science Plot No. 10008/2, GIDC Estate, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
6	Maitri Pharma Plot No. 25/10, GIDC Jhagadia, Nr. Pepsico India Pvt. Ltd., Industrial Estate, Jhagadia, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
7	Mahek Life Science Plot No. 2329, GIDC Industrial Estate, Panoli, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
8	Chevon Pharma Chem Industries Survey No. 183, Hardevan, Mehsana	Synthetic Organic Chemical Industry – 5(f)	Mehsana
9	Akmi Chemicals Plot No. 4774-4775, GIDC Estate, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
10	Dutt Chemicals Plot No. 308/3/2, 308/1, 308/2, GIDC Phase-II, GIDC Vatva, Ahmedabad	Synthetic Organic Chemical Industry – 5(f)	Ahmedabad

Having carefully considered the relevant aspects, the following decisions were taken:-

1) Macson Products, Dist. Surat

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

2) Sanghi Industries Limited, Dist. Surat

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

3) K. Patel Chemo Pharma Pvt. Ltd. (Unit No. -2), Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

SEIAA State Level Environment Impact Assessment Authority Gujarat

8) Amita Chem. Ind Industries, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

9) Galaxy Chem. Science, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

10) Mahi Pharma, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

11) Mahek Life Science, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

12) Chiron Pharma Chem Industries, Dist. Ahmedabad

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

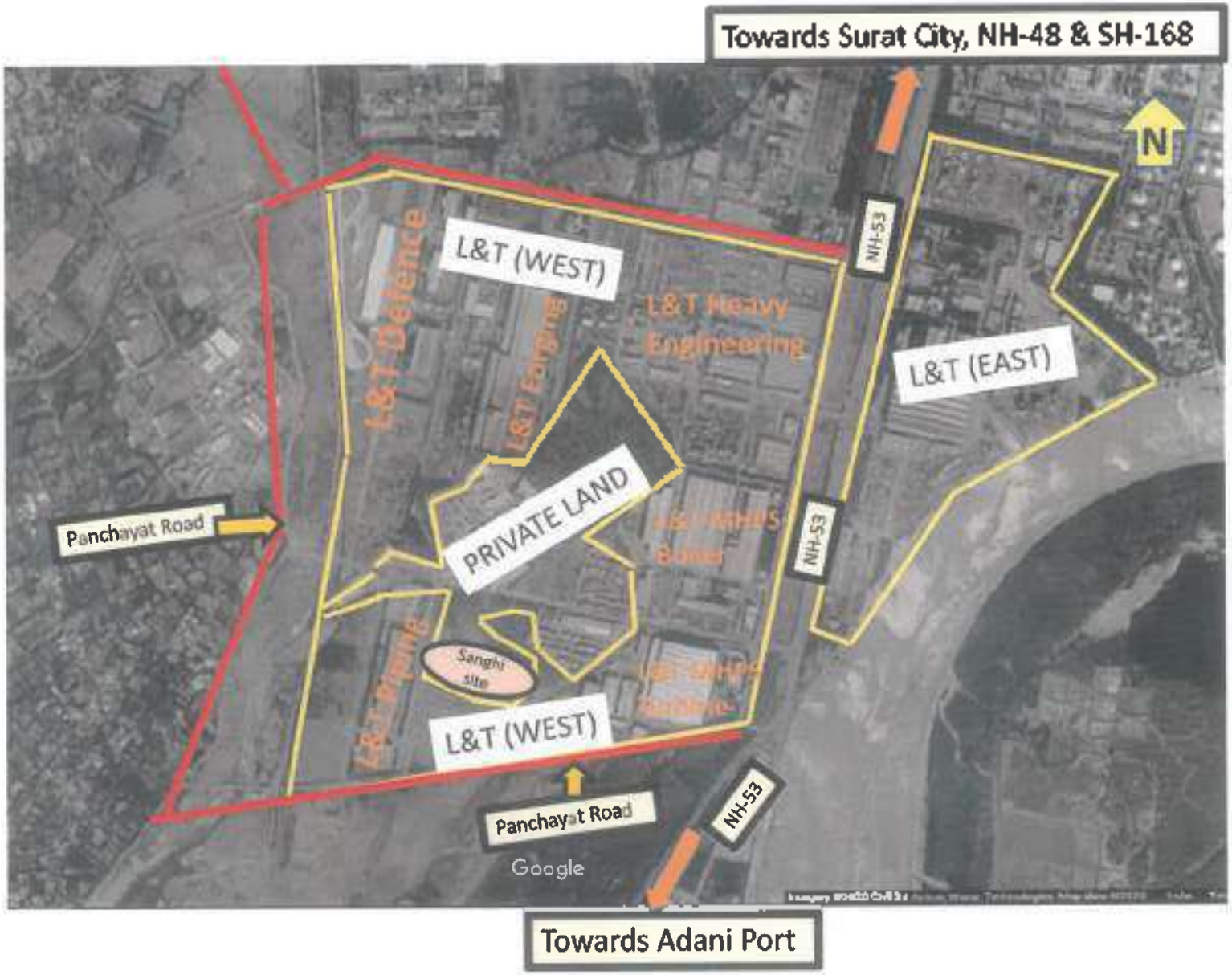
13) Abad Chemicals, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

14) Dutt Chemicals, Dist. Ahmedabad

- After detailed discussion, it was decided to grant Terms of Reference as recommended by the SEAC.

Sr. No.	NAME	DESIGNATION	SIGNATURE
1.	Shri C. L. Meena	Chairman	
2.	Prof. G. N. Rao	Member	
3.	Shri S. M. Sayed	Member Secretary	



LEGEND

L&T Boundary

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ANNEXURE-12

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ANNEXURE-13

ANNEXURE-14

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TRAFFIC STUDY REPORT

For

CEMENT GRINDING UNIT

of

M/s Sanghi Industries Limited (SIL)

Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village,

Tal. Choryasi, Dist.- Surat, Gujarat, India

Prepared By

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NABET Accredited Consultant
M/s GRC INDIA (P) LTD.

Service Report No. AKONE/2020/SER-072

(195)

DESIGN CERTIFICATE

Document - Service report no. AKONE/2020/SER/-072 has been issued dated 16th day of January 2021 for the purpose of traffic assessment of approach road/panchayat road near proposed cement grinding unit at Hazira.

We hereby certify that -

a) The traffic scenario for baseline data generation has been collected on 12-13th January 2021, may have different traffic scenario on different dates.
b) No Objection Certificate/Work order has been issued by client M/s Sanghi Industries Ltd. for the said work as per the requirement.
c) All necessary and required norms has been considered for calculation of Traffic projection and future sicario as per IRC and ITE.
d) The report is fit for purpose and application it is meant for.

Signed by Authorized Representative on Sixteenth Day of January, Two Thousand Twenty-One.

For, Akone Services

Date: 16th January, 2021

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1.1 DESCRIPTION OF PROJECT

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal- Choryasi, Dist.- Surat, Gujarat. The company has well defined vision, mission and values that the company follows on its path to success. It has a vision to be the business leader, delivering superior value to all our stakeholders with a mission to achieve profitable growth and customer delight through innovation, operational excellence, leadership and teamwork to add value for all stakeholders and society.

Salient Features of Grinding Unit

Category of the Project	Project/Activity 3 (b) – Category B (Standalone Grinding unit)
Plant Capacity	2.0 Million TPA
Technology	Standalone Cement grinding process will be based on Vertical Roller Mill (VRM) technology with automatic packer and truck loading facilities
Land Area	4.856 Ha. or 12.0 Acres or 48,563 m²
Green Belt Area	1.650 Ha. or 16500 m²
Parking Area	4716 m²
Capital Investment	Rs. 28228 Lakhs or 282.28 Crores

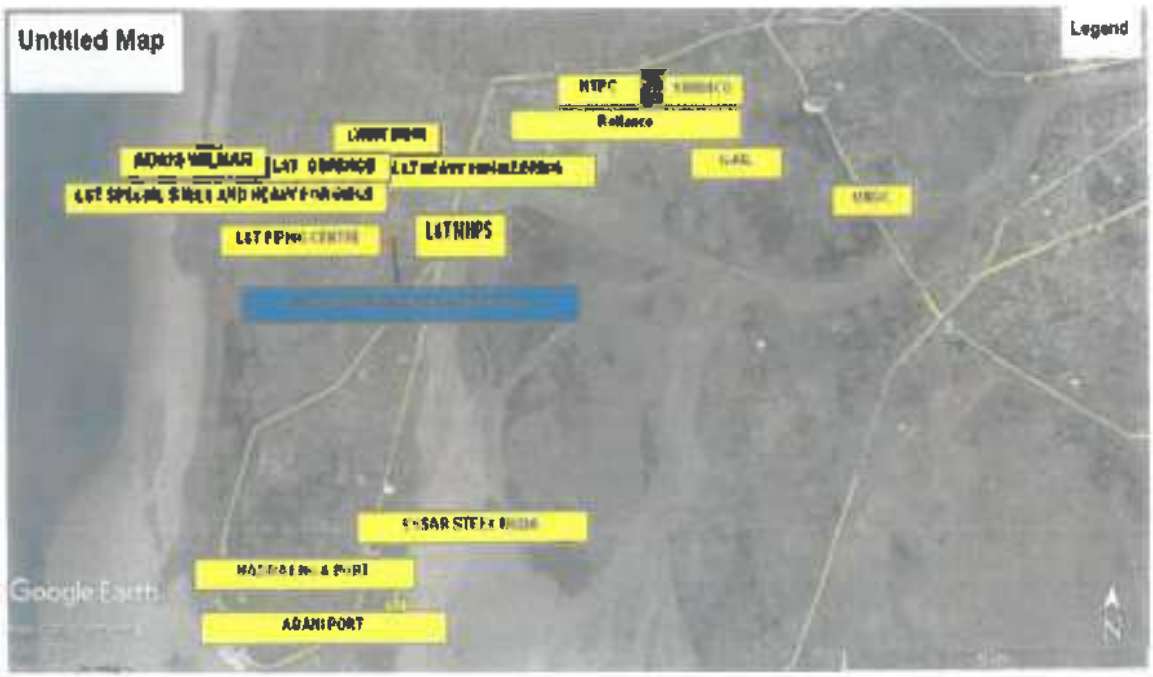

Figure 1. Google Image of nearby Industries wrt proposed project site

1.2 CONNECTIVITY

The proposed site is well connected with road, rail and air network. The following table 1 gives brief regarding connectivity of the proposed site.

Table 1. Connectivity of Project Site

Component	Description
Road	NH-6 at approx. 1 km East
Rail	Surat Railway Station is approx. 20 km towards NE direction from the project
Air	Surat airport at 10 km towards SE direction from project site

1.3 LOCATION OF PROJECT

Survey No. 125/1, 125/2,126/1+2+3, Shiverampur Village, Tal. Choryasi Dist.- Surat, Gujarat. The geographical co-ordinates of site are 21° 8'57.92"N and 72°39'7.07"E. Site location on google earth imagery and location map of project are presented in Figure 2 and 3 respectively.

Table 2. Coordinates of Project Site

Points	Latitude	Longitude
A	21° 9'0.08"N	72°39'0.68"E
B	21° 8'59.46"N	72°39'1.09"E
C	21° 9'0.78"N	72°39'3.62"E
D	21° 9'0.12"N	72°39'4.09"E
E	21° 9'0.81"N	72°39'5.20"E
F	21° 9'0.29"N	72°39'5.47"E
G	21° 9'1.18"N	72°39'6.90"E
H	21° 9'0.93"N	72°39'7.90"E
I	21° 9'0.86"N	72°39'9.24"E
J	21° 9'0.46"N	72°39'11.28"E
K	21° 8'59.84"N	72°39'11.93"E
L	21° 8'58.72"N	72°39'11.71"E
M	21° 8'57.60"N	72°39'12.32"E
N	21° 8'55.54"N	72°39'11.61"E
O	21° 8'54.57"N	72°39'10.56"E
P	21° 8'54.59"N	72°39'9.07"E
Q	21° 8'55.54"N	72°39'8.23"E
R	21° 8'55.22"N	72°39'5.49"E
S	21° 8'56.94"N	72°39'1.80"E
T	21° 8'57.07"N	72°39'0.75"E
U	21° 8'58.75"N	72°39'0.36"E

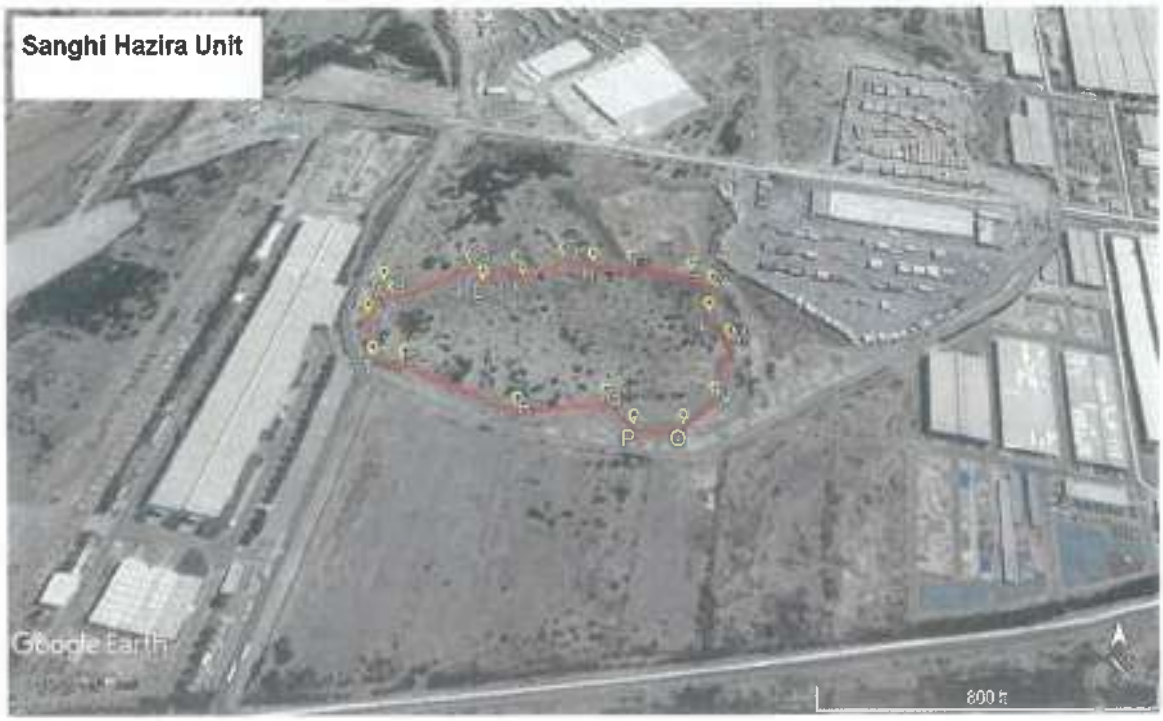

Figure 2a. Google Satellite imagery of project site

Figure 2b. Map showing Major Road Network from proposed Unit and Industries in nearby area

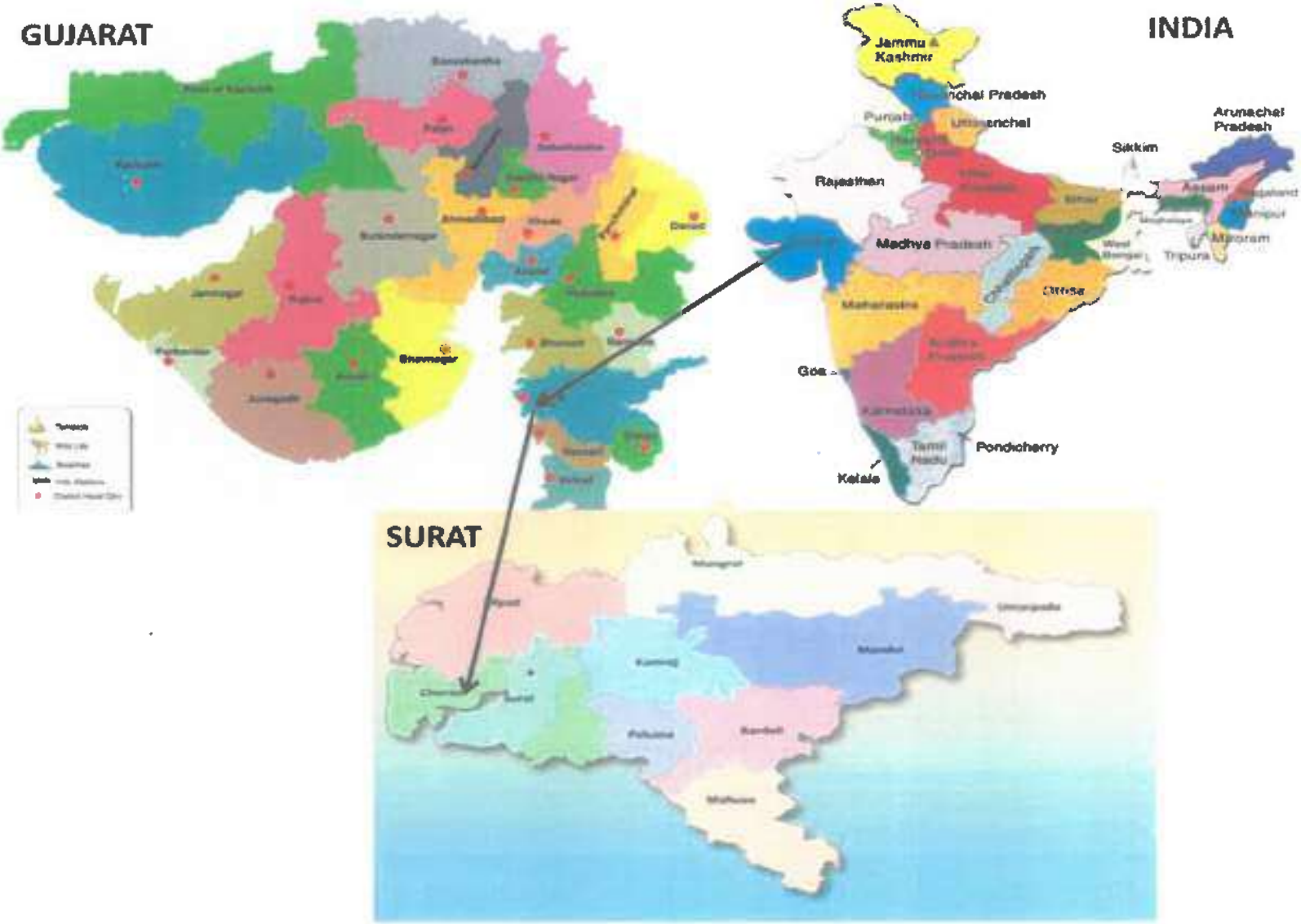

Figure 3. Location of Project

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1.4 LAND USE OF PROJECT

Sanghi Industries Ltd. has procured 48,563.00 m² land to develop the standalone grinding unit. Proposed project will be set at, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Chorvasi Dist.- Surat, Gujarat. Out of 48,560 m² area approx. 32,063 m² will be utilized for proposed project and remaining 16,500 m² area will be kept for greenbelt development. Construction of admin building, plant building, Raw material storage area, finished products storage area, utility area, treatment facility, parking, fire hydrant and other ancillary amenities shall be undertaken within the plot area. Proposed project will be developed in accordance with local development plan and used for industrial purpose. Bifurcation of plot area is mentioned in table below.

Table 3. Land Breakup of Cement Grinding Unit

#	Particulars	Total Area (in Ha.)	Area
1.	Production Plant	0.712	14.66%
2.	Office & Lab Area	0.022	0.46%
3.	Raw Materials Storage Area	0.632	13.01%
4.	Solid Waste Storage Area	0.005	0.10%
5.	Open Space	1.835	37.79%
6.	Green Belt	1.650	33.98%
	Total	4.856	100.00%

1.4.1 Raw Materials/Fuel and its Source

The major raw material is clinker, fly ash, gypsum and slag for the production of cement. The imported coal will be used as fuel. The details of raw material, its quantity, the source and mode of transportation are provided in Table below:

Table 4: Raw Material Requirement

S.No.	Material	Requirement per Annum - Million Ton/Annum				Source	Mode of Transportation
		100% OPC	100% PPC	100% PSC	Max per Annum		
1.	Clinker – OPC	1.90	--	--	1.90	In house from Sanghipuram plant	Sea/Road
	Clinker – PPC	--	1.20	--			Road
	Clinker - PSC	--	--	1.10			Road
2.	Gypsum	0.10	0.10	0.10	0.10	Open Market	Road
3.	Fly Ash	--	0.70	--	0.70	Nearby Power Plant & Open market	Road
4.	Slag	--	--	0.80	0.80	Nearby Steel plants & Open Market	

5.	Imported coal	0.06	0.06	Open Market	Road

The clinker which is the major raw material will be brought from SIL's IU at Sanghipuram through coastal sea route to Port at Hazira, which is at a distance of approx. 13 km from the proposed grinding unit location. The clinker will be unloaded at port and transported to GU project by trucks.

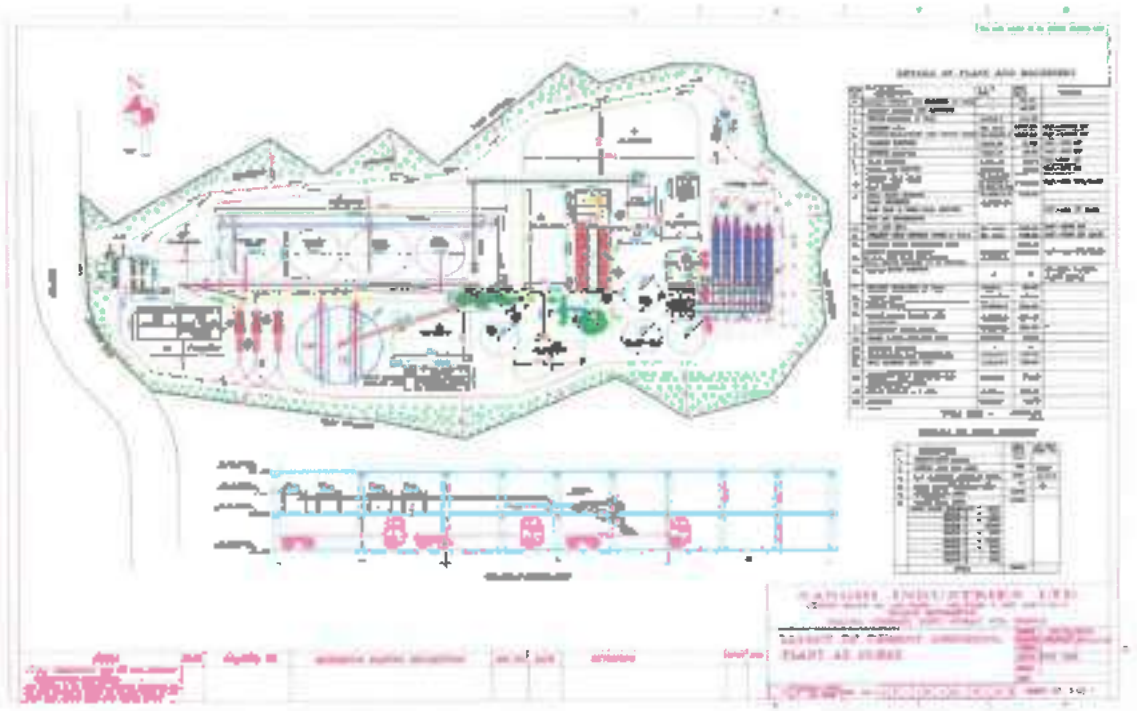

Figure 4. Layout of Cement Grinding Unit

2.1 TRAFFIC STUDY OF MAJOR ROADS

Proposed cement grinding project connect with NH-6; previously it was NH-53 (major transportation route in the study area) and will attract to commercial vehicles as a result traffic load will also increase on highways. Traffic load play a major role in polluting the air. Traffic study measurements were performed at National Highway 6 (Old NH-53); State Highway 186 and approach road leading to project site .

Traffic data collected for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined. The data collected was analyzed to obtain the travel characteristics of the road users. The desire patterns of the road users have been established on the basis of the origin and destination patterns of sample traffic interviewed.

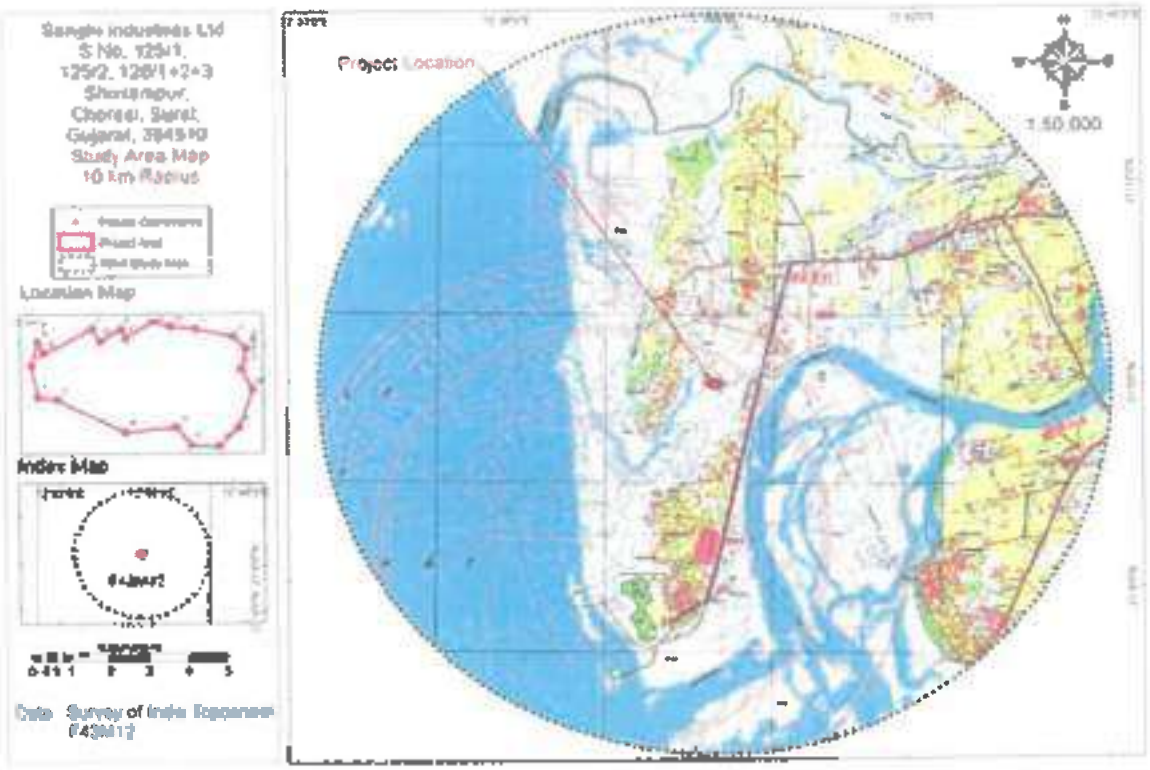

Figure 5. Major Roads in the Study Area on Toposheet

Table 5. Road Network for Traffic Study

Name of Major Roads	Direction		Remarks
	Up	Down	
NH-6 (Old NH-53)	Hazira	Kolkata	Economic Corridor (EC1) runs 1,949 km from Surat to Kolkata

SH-168	Magdalla	Savan	Gujarat State Highway
Approach Road /Panchayat Road	Proposed Unit to NH-6 (Old NH-53)	Connecting NH-6 (Old NH-53)	Link/Approach Road from Proposed Unit to NH 6 (Old NH-53)

Figure 6a. Approach Road from proposed Unit link to NH-6 (Old NH-53) on Google Earth Image (This road will be utilized for Transporation of finished goods and raw material; total Length is 1.62 km shown as ____taken from Proposed gate)

- The vehicle plying on road in both the directions were counted continuously for 24 hours.
- The vehicles were counted every hour and stipulated by Indian Road Congress (IRC).
- The vehicle counting has been done at two places considering up and down.
- Traffic study measurements were performed at two locations at approach road of cement grinding unit link to NH-6 (Old NH-53) dtd. 12-13 January, 2021 to assess impact on local transport infrastructure due to this project.
- Passenger and Goods trip end matrices have been prepared and mode wise break-up of passenger and goods trips, thereafter have been derived.
- High level (over 60%) of interaction between Hazira to Surat alone has been observed.

Figure 6b. Showing Proposed Site and its Road Network on Google Earth Imagery 2021

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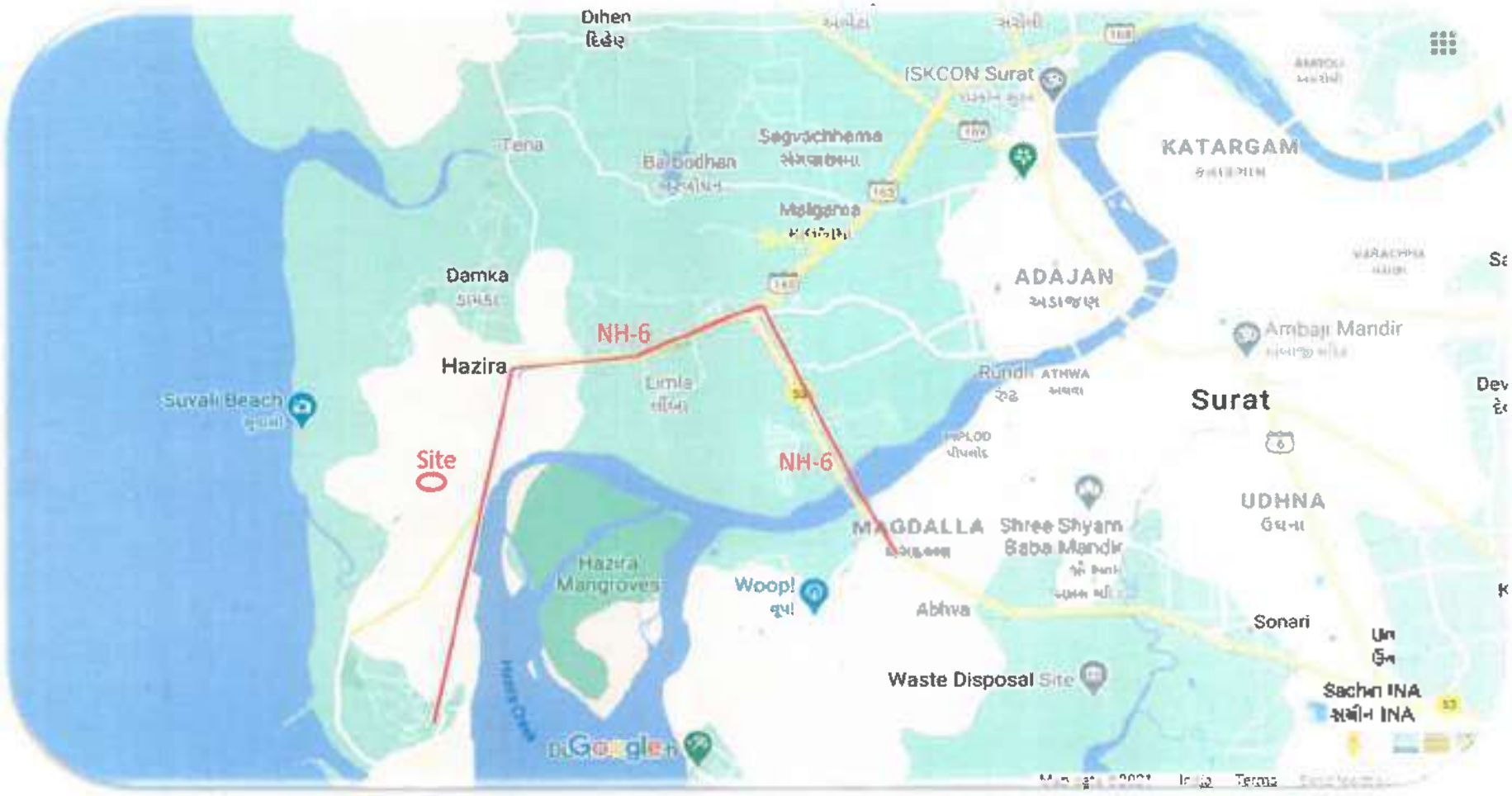

Figure 6c. Showing Proposed Site and its Road Network on Google Map 2021

Figure 6d. Road Network (SH 168) Characteristics

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Representation of NH-6 (Old NH-53) Network on Map of India starts from Hazira

Figure 7. Road Network of NH-6 (old NH-53) on Map of India showing start to end

Figure 8. Width Measurement at Approach Road near Proposed Unit

Figure 9. Photographs of Approach Road and its Measurement

2.2 CARRYING CAPACITY OF APPROACH ROAD

The width measurement of Approach /Panchayat road has been done manually at 11 points. The total length of approach /panchayat road is 1.62 km from NH-6 (earlier NH-53) to proposed cement grinding unit. The measurement points has been depicted in figure and table below-

Table 6: Width of Approach Road /Panchayat Road

S.No.	Point	Latitude	Longitude	Width (m)	Width (ft)
1	A	21° 8'59.62"N	72°38'59.80"E	12	38
2	B	21° 8'57.11"N	72°39'0.28"E	12.2	40
3	C	21° 8'56.35"N	72°39'0.54"E	21.45	70.39
4	D	21° 8'51.66"N	72°38'59.47"E	20.05	65.77
5	E	21° 8'47.21"N	72°38'58.41"E	15	49.26
6	F	21° 8'46.73"N	72°38'59.06"E	15.57	51
7	G	21° 8'46.65"N	72°38'56.89"E	9.20	30
8	H	21° 8'47.84"N	72°39'10.75"E	15	49.30
9	I	21° 8'48.59"N	72°39'19.18"E	16	53
10	J	21° 8'52.40"N	72°39'36.18"E	17.38	57
11	K	21° 8'51.47"N	72°39'38.53"E	34.5	113

The carrying capacity of Panchayat road as per width of the road is 1250 PCU. However, as per IRC, 1990; the carrying capacity of Panchayat road notified by Collector of District & having 2-Lane (Two way) for roads with free frontage access, packed vehicle & heavy crossed traffic is 900 PCU. There is a possibility of additional PCU on this road. The panchayat road is pucca road (metalled road) and as per SUDA vide letter no.252927 dtd 08/01/2021, the proposed site falls under industrial zone with 22 m wide road for industrail traffic.

Figure 10. Measurement of Panchayat Road (1.62 km)

Figure 11. Tri-Point at L&T Piping Centre near proposed Site

Figure 12. Road around the Proposed Site

Figure 13. Approach Road Near L&T Piping centre

Figure 14. View of Porposed Site and nearby Industries

Figure 15. Tri-Point on Approach Road towards linking to NH-6 (Old NH-53)

Figure 16. Current Scenario of Approach Road linking to NH-6 (Old NH-53)-- will be utilized for Material Transportation

Figure 17. Current Scenario of Panchayat Road Linking to Suvali Village

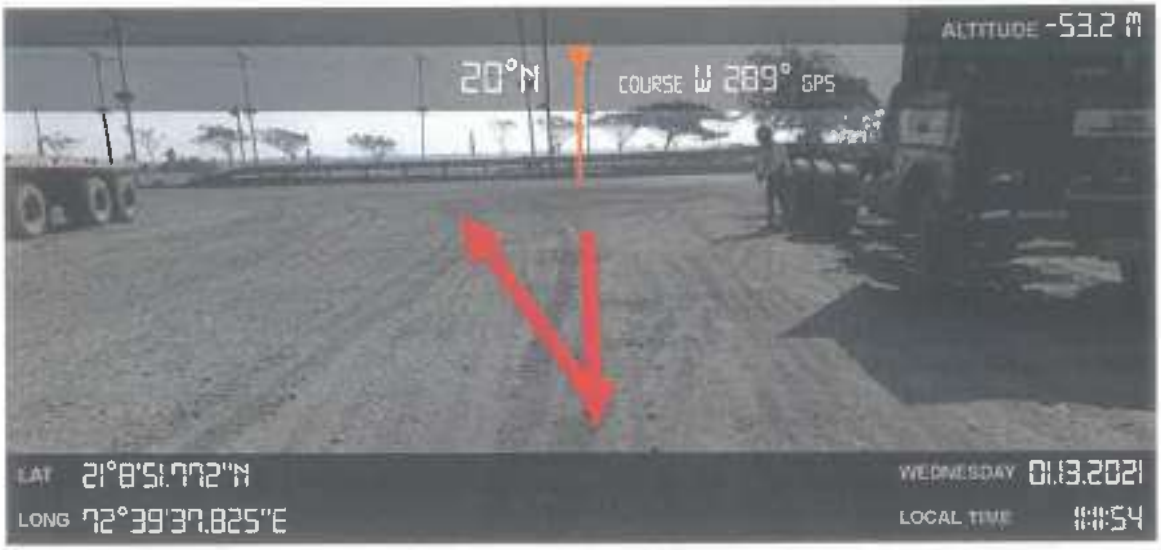


Figure 18. Showing Approach Road linking to NH - 6

Figure 19. Magdalla Bridge : NH-6

Figure 20. NH-6 (Old NH-53) Near Essar Township, Hazira

ALTITUDE -57.0 M
88°E
COURSE SW 214° GPS
LAT 21°8'52.747"N
LONG 72°39'39.792"E
WEDNESDAY 01.13.2021
LOCAL TIME 09:32:52

Figure 21. Photo showing Traffic of Nearby Industries over NH-6 (Old NH-53)

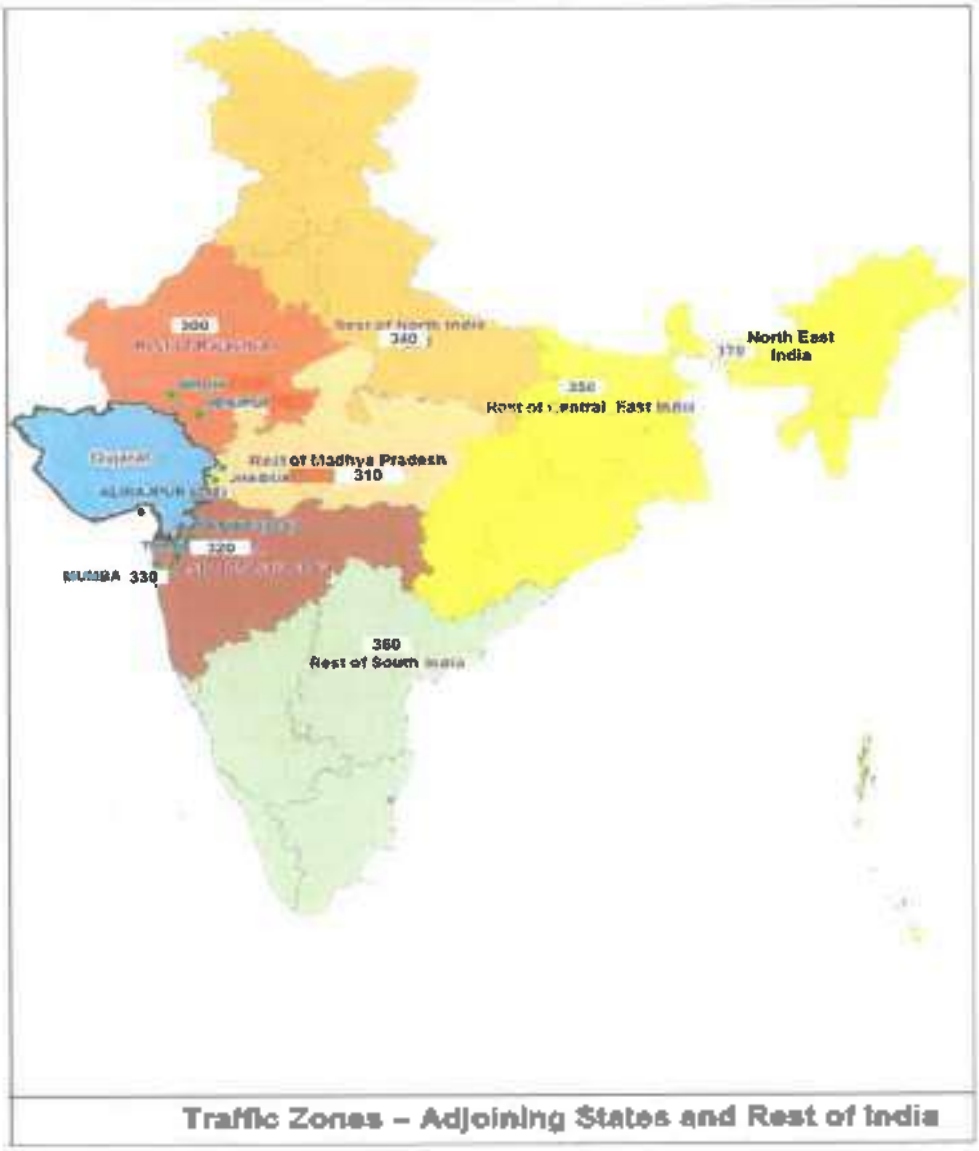


Figure 22. Traffic Zone in Gujarat & India

2.3 TRAFFIC COMPOSITION

Traffic data was collected for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads were high, two persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined. Traffic study was conducted for NH-6 (Old NH-53) and SH-168 dtd. 26 to 27th Dec. 2018. The Traffic Study for Approach road (connecting to proposed project site) has been carried out on 12-13 Jan. 2021.

Table 7. Types of Vehicles

S. No.	Type of Vehicle	Remarks
1.	Two Wheelers	Moped, Bike, etc.
2.	Three Wheelers	Auto rickshaw, Three-wheeled motor scooters
3.	Four Wheelers	Cars

4.	Trucks	Trucks/Tailor/Tractor
5.	Bus	Large bus, Mini bus, Micro Bus, Auto-Tempo, Laguna/Maxi
6.	Others	Cycle, Animal drawn etc.

Table 8. Traffic Composition of Major Roads

S. No.	Name of Road	No. of Vehicles per Day					Total No. of vehicles per Day
		Cars	Bus	Trucks	2 Wheeler	3 Wheeler	All
1.	NH-6 (Old NH-53)	20538	1080	2036	5612	1863	31129
2	SH-168	9087	754	1256	3845	1056	15998
3	Approach Road/Panchayat Road	260	6	1290	780	6	2342

- About 88% of the vehicles have one of the trip ends on this Highway NH-6 (Old NH-53).
- 7.5% of the trips have both trip ends within Gujarat but not on the corridor NH-6 (Old NH-53).
- 3% of the trips have both trip ends on the corridor SH-168.
- 1% of the vehicles have one trip end within Gujarat and the other out side Gujarat.
- It has been observed that 80% of trips are performed for work and business purposes, followed by social and recreation. For work purposes, cars and two-wheelers are the most preferred mode. For material transport – trucks and trailers were main vehicle on NH-6 (Old NH-53).

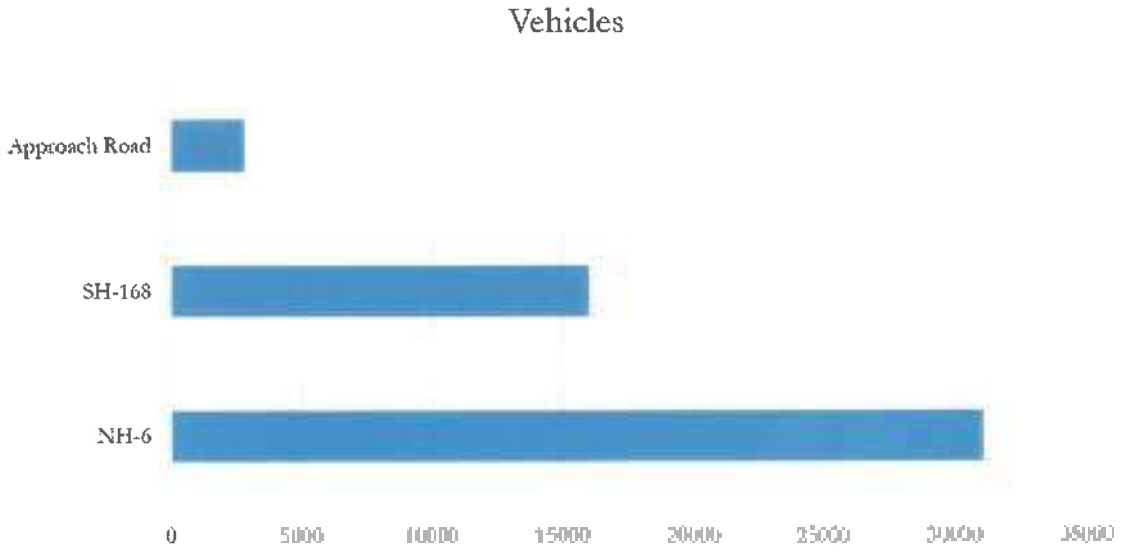


Figure 23. Traffic Variation on Road Network in Study Area

2.3 DATA ANALYSIS

The baseline data generated from traffic survey is presented in table below with calculation in PCU:

Table 9. Traffic Study Report of NH-6 (Old NH-53)

S. No.	Vehicle Distribution	No. of Vehicles/Day	Passenger Car Unit (PCU)	Total No. of Vehicle in PCU	Total No. of Vehicle (PCU)/Hour
		NH-6		NH-6	
1.	Cars	20538	1.0	20538	856
2.	Buses	1080	3.0	3240	135
3.	Trucks	2036	3.0	6108	255
4.	Two Wheelers	5612	0.5	2806	117
5.	Three Wheelers	1863	0.75	1397	58
Total		**31129**	-	**34089**	**1421**

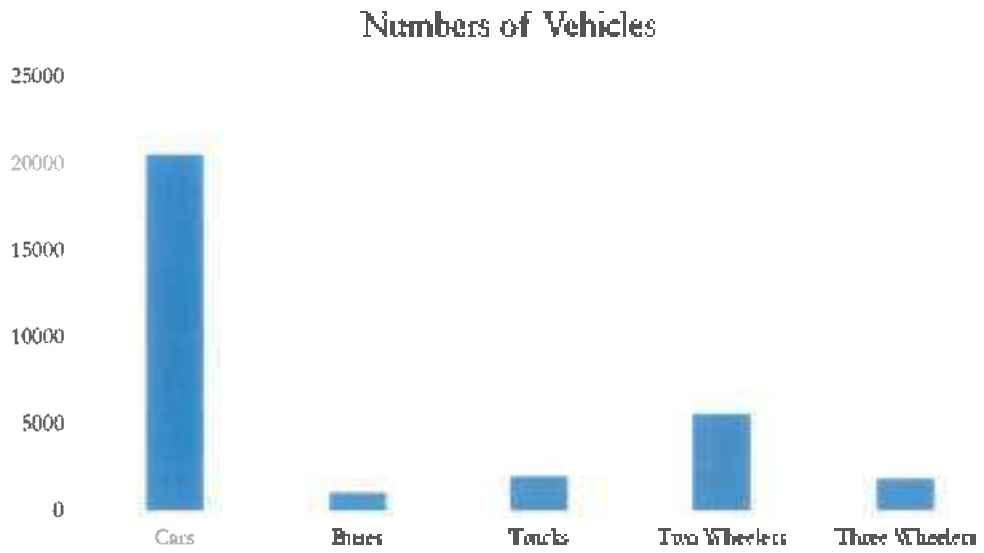


Figure 24. Traffic composion on NH-6 (Old NH-53) in Baseline

Table 10. Traffic Study Report of SH-168

S. No.	Vehicle Distribution	No. of Vehicles/Day	Passenger Car Unit (PCU)	Total No. of Vehicle in PCU	Total No. of Vehicle (PCU)/Hour
		SH-168		SH-168	
1.	Cars	9087	1.0	9087	379
2.	Buses	754	3.0	2262	94
3.	Trucks	1256	3.0	3768	157
4.	Two Wheelers	3845	0.5	1923	80
5.	Three Wheelers	1056	0.75	792	33
Total		**15998**	-	**17832**	**743**

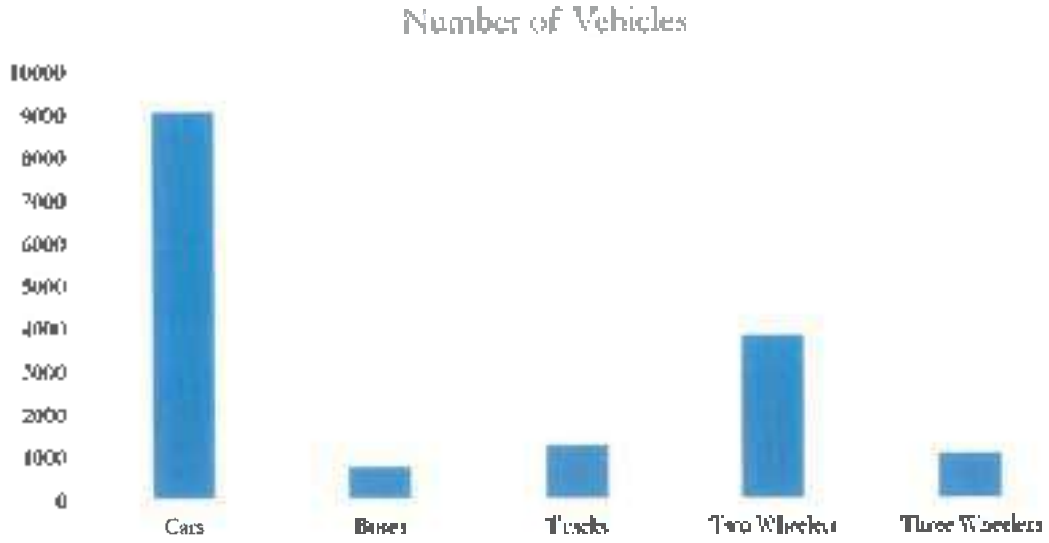


Figure 25. Traffic Study for SH-168

Table 11. Traffic Study Report of Approach Road / Panchayat Road

S. No.	Vehicle Distribution	No. of Vehicles/Day	Passenger Car Unit (PCU)	Total No. of Vehicle in PCU	Total No. of Vehicle (PCU)/Hour
		Approach Road		Approach Road	
1.	Cars	260	1.0	260	11
2.	Buses	6	3.0	18	0.75
3.	Trucks	1290	3.0	3870	161.25
4.	Two Wheelers	780	0.5	390	16.25
5.	Three Wheelers	6	0.75	4.5	0.19
Total			-	4542.5	189.44 say 190

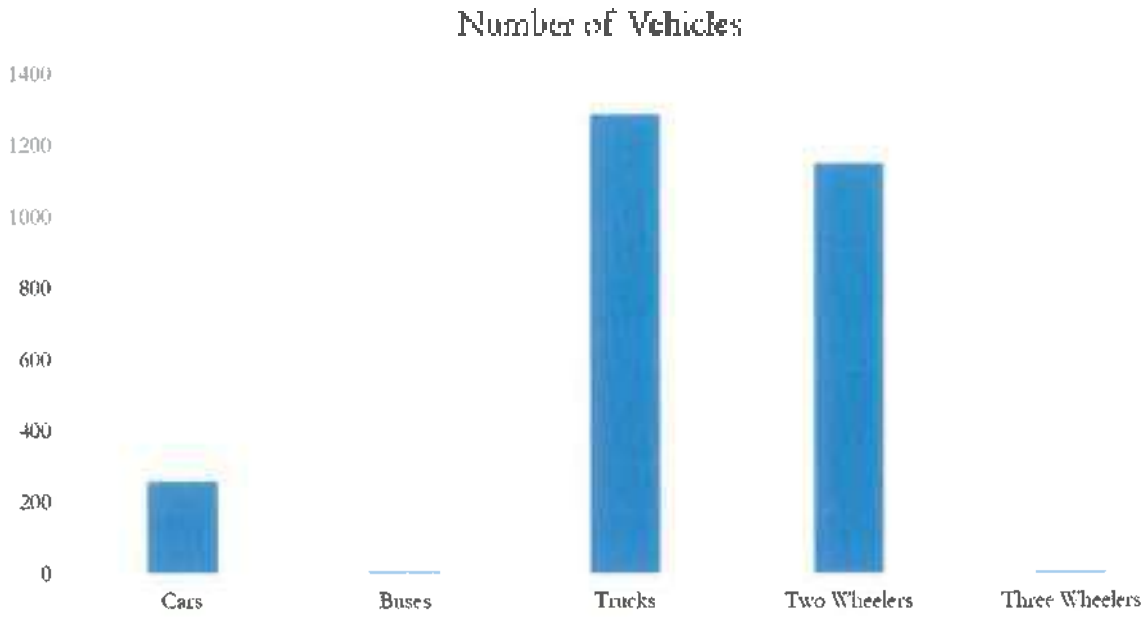


Figure 26. Traffic Study for Approach Road/Panchayat Road

Table 12. Existing Traffic Scenario with respect to Level of Service (LOS)

S. No.	Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C	LOS
1.	NH-6 (Old NH-53)	1421	3000	0.47	C
2	SH- 168	743	1250	0.59	C
3a.	Approach Road /Panchayat Road	190	1250*	0.15	A
3b.			900**	0.21	B

*As per actual width ** as per IRC

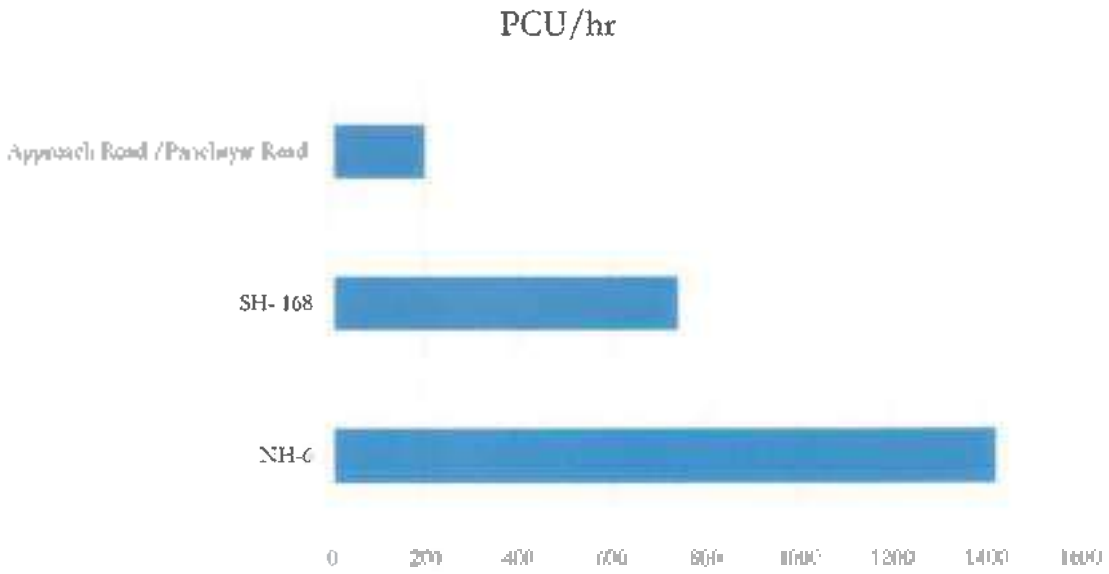


Figure 27. PCU/hr on Three Road Network within Study area

Table 13. Criteria of LOS

V/C	LOS	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/Average/Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very poor

LOS values have been calculated based on traffic data on National Highway 6 & State Highway 168 and it has been found 0.47 and 0.59 respectively. LOS value indicates that the performances of NH-6 (Old NH-53) & SH-168 are good. **Ratio of volume to carrying capacity of Approach road is 0.15 which represent the excellent LOS of approach road considering actual width of road and 0.21 as per IRC which indicate B (very good).**

3 ANALYSIS OF TRIP GENERATION FROM PROJECT SITE

There are two ways to define a trip: in terms of linked trip and unlinked trip. The former is an entire trip of a person to terminate a single purpose, while the latter is a part of the former segregated by transport mode. In other words, a linked trip is a chain of unlinked trips by different individual transport modes.

To provide an uninterrupted flow of traffic on highway, it is felt important to cater to the road-side parking demand. To understand the extent of demand, parking studies have been carried out for proposed project and also for highway. The detail of parking for proposed project is given below. For highway, at most of the locations, besides predominance of goods vehicles, there were considerable number of passenger vehicles including autos, jeeps and two-wheelers. Vehicle-wise, parking demand within proposed site at different locations has been estimated for 12 hours duration and then peak parking demand. First preferred mode of transpostation is car and second, truck was the predominant mode.

Adequate provision will be made for car/vehicle parking at the project site. Parking details are provided below:

3.1 PARKING

Table 14: Incoming & Outgoing Transportation

Incoming Raw Material Transportation						
S.No	Raw Material	Quantity TPA	Quantity TPD	Source	Mode of Transport	No. of Vehicles (Truck/day)
1.	Clinker	20,00,000	6061	Captive	Sea	184
2.	Additives like Gypsum, Fly Ash, Slag			Purchase	Road	
3.	Fuel	60,000	182	Purchase	Road	
Total No. of Trucks deployed / day will be						184
Outgoing Product Transportation						
S.No	Product	Quantity Million TPA	Quantity TPA	Quantity TPD	Source	Mode of Transport	No. of Vehicles (Truck/day)
1.	Cement	2.0	20,00,000	6061	Captive	Road/Sea	179
PCU per Day							363

Frequency of Vehicles:

Total Capacity (Fuel, Limestone, Fly ash)	40, 60,000 TPA
No. of working days	330
Transportation of incoming and outgoing material	12,303 Tons/day
Working hours per day	24 hour (3 shifts)
Truck/Tanker Capacity	34 Tons
Frequency of trucks/day	362 x 2 (Actual)

(91 No. Trucks x 4 trips/day x 2 (up/down)	364 x 2 (Calculated)
Frequency of trucks deployed/hr	16 (Actual) 15.125 (Calculated)
Increase in PCU/hr	16 x 3= 48

Total 91 trucks are required in any day. Total 16 trucks per hour is required to transport the material (finished goods and raw material), hence, total 48 PCU per hr (16 x 3 = 48) will increase in existing traffic scenario.

Recommendations on Traffic Capacity as per IRC 2010

S.No.	Category of Road	Maximum PCU/hr	Dispatch Ratio (%)
1.	National Highway 6 (Old NH-53)	3000	60
2.	State Highway 168	1250	40

Source: *IRC:SP:37-2010*

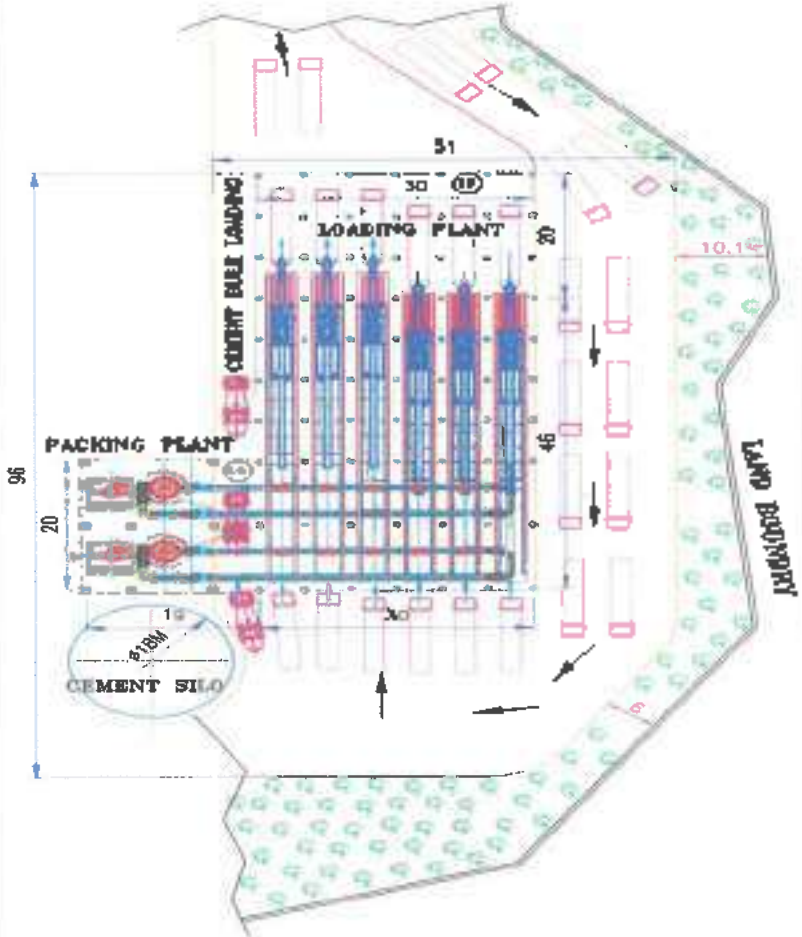
Table 15: Modified Traffic Scenario and LOS

S.No	Road	Increased PCUs	Modified V	C	Modified V/C Ratio	Modified V/C Ratio
1.	National Highway 6	48*60%= 29	1421+29= 1450	3000	0.48	C
2.	State Highway 168	48*40%= 19	743+19= 762	1250	0.61	D
3a.	Approach Road/Panchayat Road*	48	190+48= 238	1250	0.19	A
3b.				900	0.26	B

*All the traffic will be diverted from approach road to NH-6 (Old NH-53) and SH-168, hence total PCU considered for calculation of LOS. After commencement of cement grinding unit, LOS of approach/panchayat road will not be changed (V/C – 0.15 to 0.19) in any manner either considering actual width of road and as per IRC (considering 900 PCU).

Trip generation and Trip Distribution

Trip generation is the process of estimating the amount of traffic a proposed development will have once it is built and operating. Trip distribution is the process by which we take the raw projected traffic for a development (trip generation) and add it to the existing volumes on the transportation network. The traffic calculation for trucks requirement as per raw material and finished products has been done and it is estimated that total 91 Nos. of trucks are required for transportation of raw material and finished products.



TOTAL AREA FOR PARKING

NO.	DESCRIPTION	AREA SQ.M
1.	AREA UNDER CEMENT LOADING PLANT 60M Long x 30M Width	1980
2.	BALANCE AREA NEAR CEMENT PACKING & LOADING PLANT	2736
	TOTAL AREA OF TRUCK PARKING (96M Long x 51M Width=4896 SQ M Less 180 SQ.M BOTTOM TRIANGULAR AREA)	4716
	ONE TRUCK (34 MT CAP.) AREA SIZE - 15M Long x 3M Width	45
	TOTAL AREA REQUIRED FOR 40 TRUCK PARKING (45 SQ.M x 40 Nos)	1800

PART VIEW OF OUR DRG No-AP-16-G-2-02

Figure 28. Parking Layout Plan

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Table 16. Dispatch Ratio (PCU per day)

S.No.	Major Road	Dispatch/Modal Ratio	Increased PCUs	Remarks
1.	NH – 6 (Old NH-53)	60%	48*60%= 29	Finished product will be distributed majorly on NH-6 (Old NH-53) and marginal on SH-168. There is approach road and also another alternate route under Panchayat Road (MDR) is available which can be utilized for transportation by proposed unit in future.
2.	SH-168	40%	48*40%= 19	
3.	Approach Road	100% originates from Project	48	
Total		100%	100%	

Table 17. Modified Traffic Scenario and LOS

Major Roads	Increased PCUPs on Road	V	C	Modified V/C Ratio	LOS
NH-6 (Old NH-53)	29	1450	3000	0.48	C
SH-168	19	762	1250	0.61	D
Panchayat Road (MDR)	48	238	1250	0.19	A
			900	0.26	B

Due to projected traffic from this project, the level of service will not change. The project is expected to complete in next 3 years. The expected traffic projection on NH-6 (Old NH-53) is presented in next sections.

The major national highway within study area is NH-6 (Old NH-53). The combination of base traffic, generated traffic from project site and developmental traffic from adjacent land use is called cumulative traffic. The consultant has also estimated the developmental traffic due to proposed land used around the project site, and added it to the base traffic and generated traffic. The generated traffic from project site will remain constant in each of the horizon year. Traffic is derived demand. Traffic flows on road system are resultant of several externalities. Based on study of several documents on Gujarat economy, a macro assessment of likely growth scenario is made by regions and sectors of economy of Gujarat.

Region	Districts
North Gujarat	Mehsana, Patan, Banaskantha, Sabarkantha
South Gujarat	Surat, Valsad, Dangs, Navsari, Bharuch, Narmada
Saurashtra	Jamnagar, Porbandar, Rajkot, Junagadh, Amreli, Bhavnagar, Surendranagar
Central Gujarat	Ahmedabad, Gandhinagar, Anand, Kheda, Panchmahal, Dahod, Vadodara
Kutchh	Kutchh Districts

The forecast of likely traffic levels by each of the homogeneous links falling along the project corridor have been done by using the following three methods for NH-6 (Old NH-53):

- Trend Based Method;
- Econometric Method;
- CAM Method

Table 18 - Projected Traffic using Trend Method for NH-6 (old NH-53)

	2025	2030	2035	2040
Traffic in vehicles				
Passenger	15539	18980	22936	27314
Goods	13882	18179	23836	31289
Total	29725	37495	47138	59004
Traffic in PCU	58714	75331	96687	124157

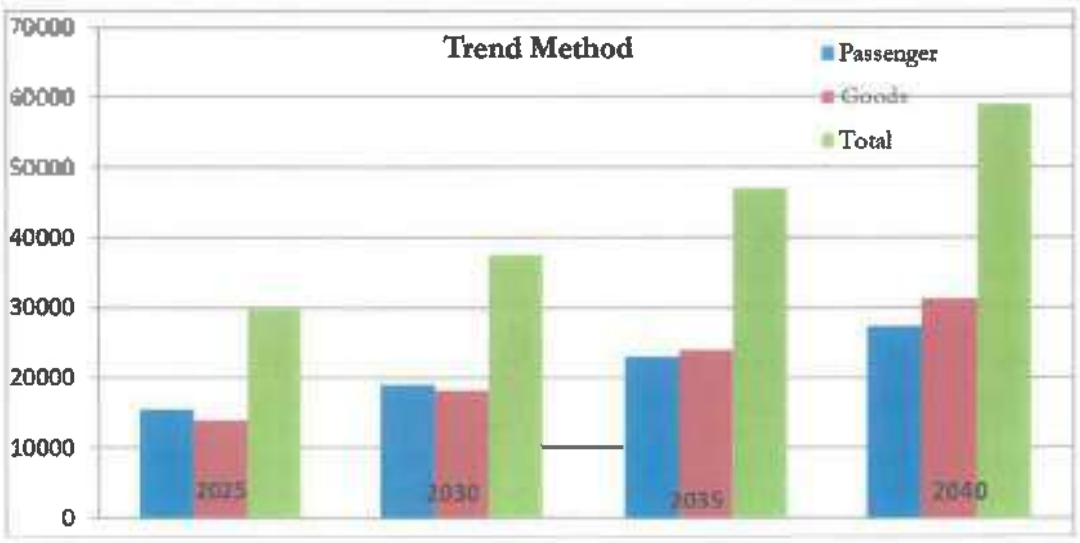

Figure 29 – Projected Traffic using Trend method

Table 19 - Projected Traffic using Econometric Method (NH-6 – earlier NH-53)

	2025	2030	2035	2040
Traffic in vehicles				
Passenger	17732	21229	25168	29853
Goods	16481	21464	27858	36242
Total	34542	43048	53408	66505
Traffic in PCU	69357	88598	113006	144740

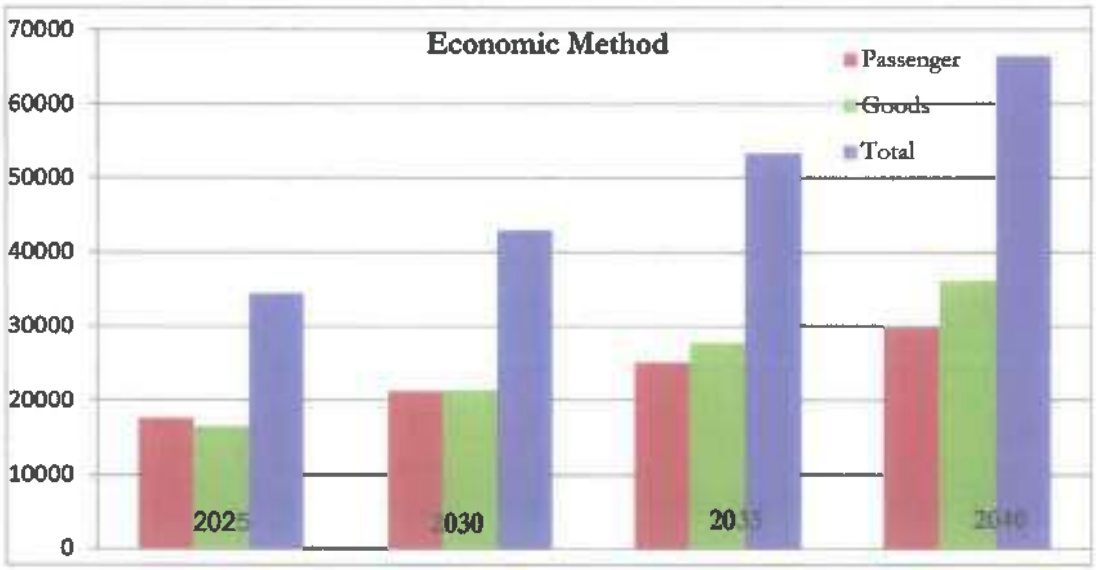

Figure 30 – Projected Traffic using Economic method

Table 20 - Projected Traffic using Cam Method (NH-6- earlier NH-53)

	2025	2030	2035	2040
Traffic in Vehicles				
Passenger	20554	27079	35308	45460
Goods	9912	11949	14449	17530
Total	30758	39350	50112	63382
Traffic in PCU	54709	68735	86258	107966

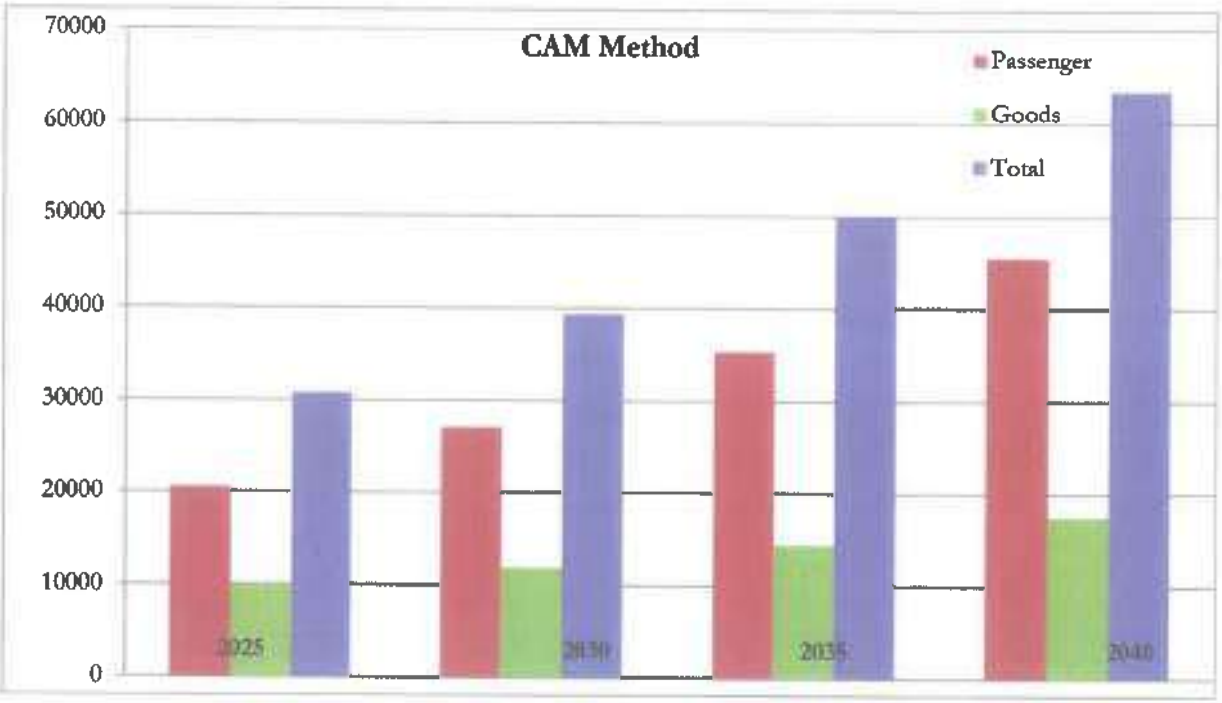

Figure 31 – Projected Traffic using Cam method

Table 21 - Comparison and Adoption of Predicted Traffic Volume (NH-6- earlier NH-53)

Methods	2025	2030	2035	2040
Trend	58714	75331	96687	124157
Econometric	69357	88598	113006	144740
CAM	54709	68735	86258	107966

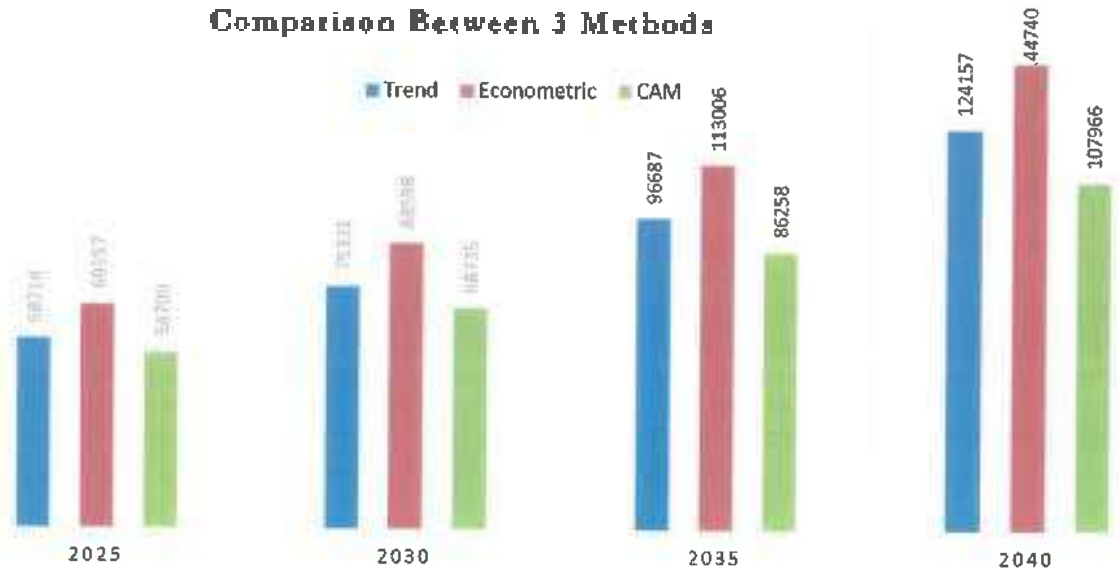

Figure 32 – Comparison between different methods

It has been observed that the consumption and mobility based traffic forecast results in the least traffic growth rates and hence the least traffic levels. Given the levels of uncertainty in economic growth and several other dependencies, and also more importantly since this project is likely to be taken up under the Industrial format, it has been felt appropriate to use the highest traffic levels for further consideration and analysis. Also, since the approach puts an emphasis on the consumption and mobility patterns of the individuals, it is felt that it will reflect a realistic future traffic.

- The combination of base traffic, generated traffic from project site and developmental traffic from adjacent land use is called cumulative traffic. We have also estimated the developmental traffic due to proposed land used around the project site is added to the base traffic and generated traffic. We have already presented projected base traffic and generated traffic from project site. The potential generated traffic from developing area immediate to the project site has been assumed and added to the base and generated traffic. It is considered that more than 60% of the existing traffic will be added by year 2025 and beyond. The capacity analysis of cumulative traffic with the combination of Base projected Traffic, Generated traffic from project site and Developmental traffic from adjacent land.
- The generated traffic from project site is significantly high during peak hour and it may create marginal impact on the immediate network. Due to good road network connectivity of project site, the generated traffic will be dispersed on adjacent immediate road network, and the impact of generated traffic from project site will be minimized.

Table 22. Base Year Traffic (NH-6-earler NH-53) and Generated Traffic Projections and Capacity Analysis

Traffic Volume (V) →	2025	2030	2035	2040
Trend	58714	75331	96687	124157
Volume per hour	2446	3139	4029	5173
V/C	0.8	1.0	1.3	1.7
Econometeic	69357	88598	113006	144740
Volume per hour	2890	3691	4708	6030
V/C	1.0	1.23	1.57	2.01
CAM	54709	68735	86258	107966
Volume per hour	2278	2864	3594	4499
V/C	0.76	0.95	1.2	1.5
LOS	E	E	E*	E*

Capacity of NH-6 (C)= 3000

*There is an urgent need to new highway in 2035 onwards.

5.1 IMPACTS

- No. of 363 PCU in a day (48 PCU per hour) will increase due to proposed cement grinding unit in existing traffic scenario.
- Only 48 PCU will increase in the existing traffic due to this cement grinding unit project, which represents that no Level of Service (LOS) of NH-6 (Old NH-53), and Panchayat Road will change.
- Vehicle collation may occur unwanted sound.
- Accidents may be occurring due to fast movement of vehicles.

5.2 MITIGATION

- The green belt in three layer to be developed as per requirement (33%) by planting local species with consultation of Forest department with some fruit bearing and medicinal trees, along periphery within the premises to prevent the impact of vehicular emission in the nearby areas.
- Raw material /finished product will be transported in covered trucks/tippers.
- Fly ash will be transported in bouser.
- Paved roads and concrete flooring will be provided in activity area
- Speed of vehicle will be limited to 10 kmph.
- Sweeping machine will be provided for road and floor cleaning as abundant precaution.
- Water sprinkling will be done in non-process area.
- Valid PUC trucks will be deployed for trasportation.
- To avoid accidents, the speed of vehicles will be minimum in nearby areas.
- Speed breakers are recomonded near the proposed project on both way (up & down).

5.3 TRAFFIC MANAGEMENT PLAN

The traffic impacts of the Proposed cement grinding unit project could be minimized by adopting the good traffic management plan.

- The right turn traffic will move through U-turn near any crossing.
- The slip road must be free from encroachments such as hawkers, moving vendors, unauthorized rickshaw stand/ bus stand etc.
- Separate entry and exit will be provided. Internal road with adequate turning around has been provided.
- Watchmen will be provided at every corner for parking movement.
- Barricading will be provided with sign board for entry and exit.
- At every entry/exit of must be provided no stopping no standing to prevent blockage, queues and conflict.
- Facility for differently able persons (Divyangs) must be provided such as parking, tactile paving on footpath to guide them etc.
- Outside the premises, parking must be prohibited. Parking must only be allowed on designated parking/stand.
- The signage scheme around the cement grinding unit must be provide adequate information in time and every time in a simple sign language which is appropriate for road users so that they can take safe measures.
- At the entry/ exit gates of project site parking must be strictly avoided to facilitate easy entry and exit as well maintain site distance for entering and leaving traffic.

- Within the project site, the users must be directed through signs and marshals to parking area. It is suggested that the guests and physically challenged users must be allow to park at surface level and signs must be posted to make these parking slots clearly visible.
- Pedestrian movement outside and inside the project site must be guided through signs and protected through footpath about 150 mm above the road surface.
- Wherever the pedestrians cross the road, a ramp of suitable gradients (1 in 12) must be provided to interchange between levels.
- Zebra crossings must be provided to guide the crossing pedestrians smoother.

On the above facts and baseline study, the proposed cement grinding unit which will add only 48 PCU is recommended for the commencement with proper mitigation measure as suggested above. From the baseline study and various discussion on probable impacts of all the operational activity, it has been concluded that this project will create more positive impact and will generate the revenue and employment (280 Nos.) in the surrounding area. There is no change in Level of Service (LOS) on approach road /Panchayat road due to traffic projection of cement grinding unit.

Fwd: Additional details as discussed - EAC meeting dated 13.04.21 (NGT Matter)

From : Sundar Ramanathan <r.sundar@nic.in> Thu, Apr 15, 2021 06:01 PM
Subject : Fwd: Additional details as discussed - EAC meeting dated 13.04.21 (NGT Matter) 3 attachments
To : ssmishtha <ssmishtha@gmail.com>

From: gjbhatt@sanghicement.com
To: "Sundar Ramanathan" <r.sundar@nic.in>
Sent: Thursday, April 15, 2021 5:40:39 PM
Subject: Additional details as discussed - EAC meeting dated 13.04.21 (NGT Matter)

To,

The Member Secretary

EAC Committee – Industry – I

Ministry of Environment Forests & Climate Change

Indira Paryavaran Bhawan

New Delhi

Sub: First meeting of the Expert Committee in pursuance of the Order dated 21.01.2021 of Hon'ble National Green Tribunal in Appeal No. 36/2020 Larsen & Toubro Limited V/s Sanghi Industries Limited & Ors.

Ref: EAC Committee meeting held on 13.04.2021

Dear Sir,

This has reference to the representation made to the Central Pollution Control Board vide our letter dated 12.03.2021 and presentation based on the said representation circulated to Hon'ble Committee Members and furtherance to the personal hearing before the Hon'ble Committee Members on 13.04.2021, we are submitting herewith the following additional information, as discussed during meeting:-

1. Copy of online application made before the Surat Urban Development Authority (SUDA) on 07.09.2019 and payment receipt for the application are attached herewith. The process of plan approval is online.

2. We have approached Roads & Building Department (Panchayat) of State of Gujarat, Surat and requested for technical details of the existing Metal Tar Pacca Road including the load bearing

capacity etc. of the Panchayat Road which we propose to use for transportation for our Grinding Unit.

We understand that Road was made much earlier so the desired details are not available. However, they have provided a map duly signed by the Executive Engineer, R&B showing the road network of Taluka Choryasi, District: Surat, which is attached herewith.

3. Note on Traffic Impact and Mitigation Measures for the truck movement is attached herewith.

We sincerely urge Hon'ble Committee to take pragmatic view in the overall interest of the sustainable development.

Yours sincerely,

for Sanghi Industries Limited

Gaurang Bhatt

Sr. Vice President

Encl: As above

Note_Traffic Impact and Mitigation Measures.pdf
51 KB

Map_Road network.pdf
362 KB

SUDA Application.pdf
163 KB

From : gjbhatt@sanghicement.com Thu, Apr 15, 2021 05:50 PM

Subject : Additional details as discussed - EAC meeting dated 13.04.21 (NGT Matter) 3 attachments

To : Sundar Ramanathan <r.sundar@nic.in>

To,

The Member Secretary

EAC Committee – Industry – I

Ministry of Environment Forests & Climate Change

Indira Paryavaran Bhawan

New Delhi

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Sr. Vice President

Encl: As above

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163 KB

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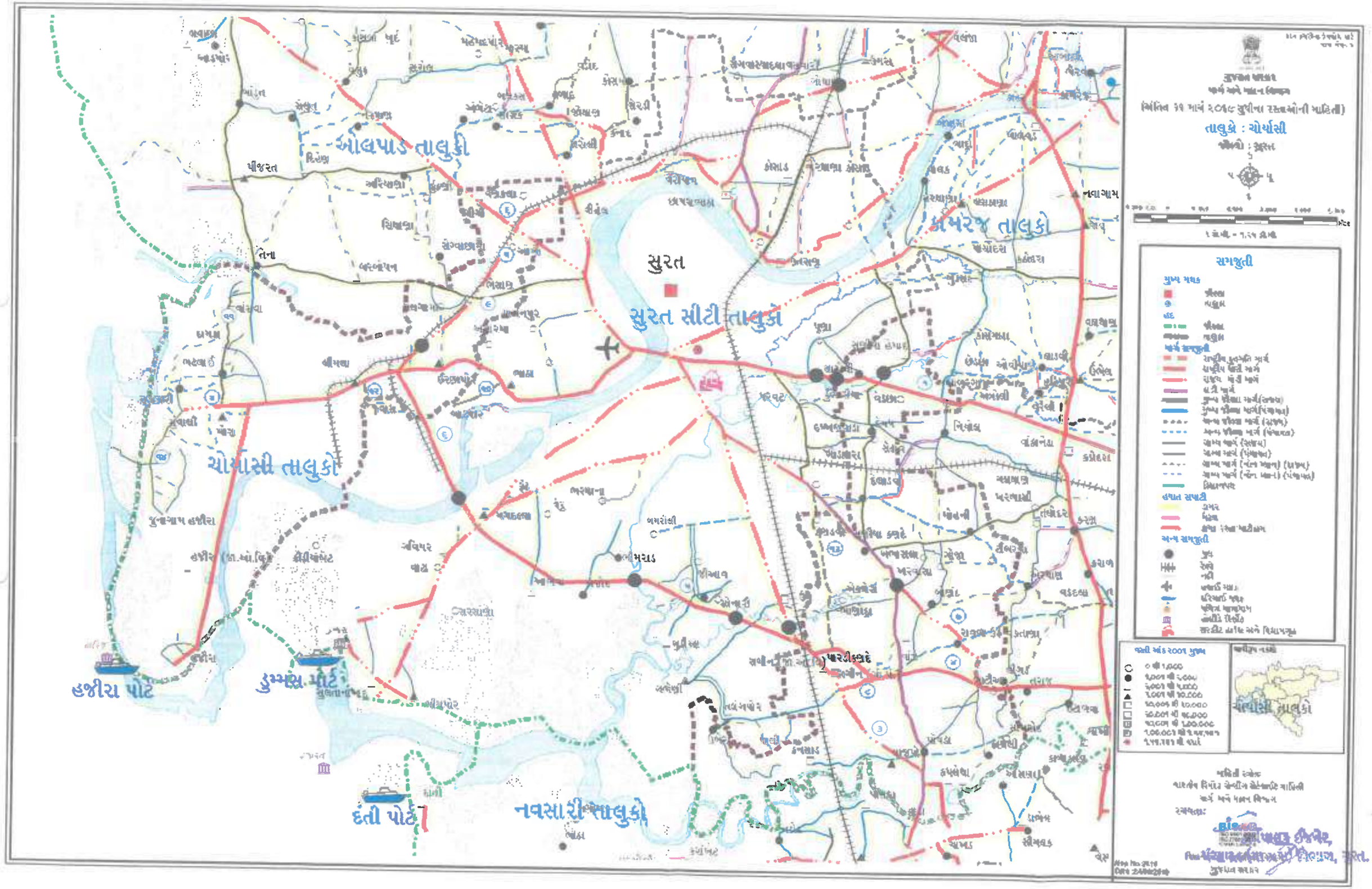
ઓલપાડ તાલુકો
સુરત
સુરત સીટી તાલુકો
અમરોલી તાલુકો
ચોર્યાસી તાલુકો
હજીરા પોર્ટ
દમણ પોર્ટ
દંતી પોર્ટ
નવસારી તાલુકો
તાલુકો : ચોર્યાસી
સમજુતી

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Traffic Impact and Mitigation Measures

The material and finished product quantity along with number of trucks required as below –

S.No.	Raw Material & Product	Quantity Million TPA	Quantity TPA	Quantity TPD	Source	Mode of Transport	No. of Vehicles (Truck/day)
1.	Clinker	2.0	20,00,000	6061	Captive	Sea	184
2.	Additives like Gypsum, Fly Ash, Slag				Purchase	Road	
3.	Fuel	0.06	60,000	182	Purchase	Road	
4.	Cement	2.0	20,00,000	6061	Captive	Road/ Sea	179
Total No. of Trucks Required							**363**

The clinker/material will come from sea route and from the seaport it will be transported using truck of 34-ton capacity with 4 axles. As per S.O. 3447(E) dtd 16th July 2018 of MoEF&CC (https://morth.nic.in/sites/default/files/Advisory_regarding_revision_of_safe_axle_1.pdf) for Maximum safe Axle weight of Truck/trailers, weight carrying upto 36 tons, safe axles in rigid truck required is 4.

The equivalent PCU factor of truck or bus (fast moving) is 2.2 PCU in 5% composition of vehicle type in traffic stream and 3.7 PCU in 10% composition of vehicle type in traffic stream as per IRC guideline 106-1990 (https://thelibraryofcivilengineer.files.wordpress.com/2015/09/irc-106-1990-guidelines-for-capacity-of-urban-roads-in-plain-areas.pdf).

We have taken average of two values (2.95 say 3) as the traffic composition of approach road is between 6% to 7%. Hence the Total PCU will be 363 x 3 = 1089 per day or 45 PCU per day. In worst case scenario, we have taken traffic of 48 PCU per hr to be added on existing roads. Considering the same value, we have prepared the Traffic Impact assessment (TIA) report additionally for approach road (Panchayat Road) for the assessing the traffic scenario and impact with proper mitigation measures.

Modified Traffic Scenario in case of 48 PCU and LOS

S.No	Road	Increased PCUs	Modified V	C	Modified V/C Ratio	Modified V/C Ratio
1.	**National Highway 6**	48*60%= 29	1421+29 = 1450	3000	0.48	C
2.	**State Highway 168**	48*40%= 19	743+19= 762	1250	0.61	D
3a.	**Approach Road/ Panchayat Road***	48	190+48= 238	1250	0.19	A
3b.				900	0.26	B

However, as per new recommendations of IRC (https://thelibraryofcivilengineer.files.wordpress.com/2015/09/irc-sp-41.pdf), the equivalent PCU factor for 4-6 Axle Truck/Trailer (fast moving) vehicle is 4.5. The modified equivalent PCU for proposed project will be as follows:

No. of trucks required per day = 363

Equivalent PCU factor for 4-6 Axle = 4.5

PCU per day for 363 Trucks = 363 x 4.5 = 1633.5 per day or 68.06 say 68 PCU per hr. The modified traffic scenario considering 68 PCU per hr presented in table below:

Modified Traffic Scenario in case of 68 PUC and LOS

S.No	Road	Increased PCUs	Modified V	C	Modified V/C Ratio	Modified V/C Ratio
1.	**National Highway 6**	68*60%= 41	1421+41 = 1462	3000	0.48	C
2.	**State Highway 168**	68*40%= 27	743+27= 786	1250	0.62	D
3a.	**Approach Road/ Panchayat Road***	68	190+68= 258	1250	0.21	B
3b.				900	0.28	B

For considering modified PCU factory of 4.5, the LOS value of Approach road / Panchayat Road (Sr. No. 3.a) will change from A to B i.e. Excellent to Very Good.

In this scenario, as mitigation measure the impact can be further reduced by reutilizing the trucks of clinker for cement disptach to the sea route. As per the present market condition, about 118 trips can be reutilized (same truck will be used for clinker in up and cement in down) which will negate approx. 20 PCU per hr (actual 22). Thus only 68-20 = 48 PCU per hr will be the net impact as per the previous scenario of traffic.

Mitigation Measures of Dust Pollution:

- More than 33% green belt in three tiers as per MoEF requirement will be developed by planting local species with consultation of Forest department with some fruit bearing and medicinal trees, along periphery within the premises to prevent the impact of vehicular emission in the nearby areas.
- Raw material /finished product will be transported in covered trucks/trippers.
- Fly ash will be transported in bouser.
- Paved roads and concrete flooring will be provided in activity area.
- Speed of vehicle will be limited to 10 kmph.
- Sweeping machine will be provided for road and floor cleaning as abundant precaution.
- Water sprinkling will be done in non-process area.
- Valid PUC trucks will be deployed for transportation.

- To avoid accidents, the speed of vehicles will be minimum in nearby areas.
- Speed breakers are recommended near the proposed project on both way (up & down).

Mitigation Measures of Noise Pollution

- Periodic vehicle inspection
- The trucks will shortly go into regular revenue service, to uncover and correct any operating or maintenance problems which might arise from the techniques applied.
- Regular vehicle overhauling and maintenance
- Training to drivers for awareness about consequences of noise pollution.
- Contra-noise – installing speakers in engine compartment to cancel out engine noise or electronic mufflers for exhaust noise.
- Open–graded asphalt pavement material for tire noise reduction
- Speed limit reduction in certain neighbourhoods
- Banning truck operation at certain urban streets.
- Enforcing sufficient right-of-way distances.
- Establishing 3 tier greenbelt within premises and avenue plantation along the approach road to reduce noise levels at receptor locations.
- Changes in vertical or horizontal alignment, so that the transportation facility avoids noise sensitive areas.

Project Application Form

Date: 07/09/2019 02:39:15 PM

Project Id: 10001128386

Applicant Details

Applicant First Name:	SANGHI INDUSTRIES LIMITED A COMPANY THROUGH ITS SENIOR VICE PRESIDENT	Applicant Middle Name:	-
Applicant Last Name:	SHRI GAURANGBHAI JAYANTIBHAI B	Applicant Designation:	OWNER
Applicant Phone Number:	-	Applicant Fax No:	-
Applicant Mobile Number:	9979866079	Applicant Email ID:	jignasujain123@gmail.com
Applicant Address Line 1:	10nt floor,Katariya Arcade,makarba,ahmedabad.	Applicant Address Line 2:	-
Applicant Country:	INDIA	Applicant City:	
Applicant State / UT:	Gujarat	Applicant District:	Ahmedabad
Applicant Taluka:	Ahmedabad City	Applicant Village:	Makarba
Applicant PIN Code:	380051		

Company Details

Name of Enterprise:	SANGHI INDUSTRIES LIMITED A COMPANY THROUGH ITS SENIOR VICE PRESIDENT SHRI GAURANGBHAI JAYANTIBHAI B	Registered Company Address Line 1:	10nt floor,Katariya Arcade,makarba,ahmedabad.
Registered Company Address Line 2:	-	Registered Company Country:	INDIA
Registered Company City:		Registered Company State / UT:	Gujarat
Registered Company District:	Ahmedabad	Registered Company Taluka:	Ahmedabad City
Registered Company Village:	Makarba	Registered Company PIN Code:	380051
Date of Incorporation:	2019-09-07 00:00:00.0	Organization Type:	Proprietorship
Type:	-	In case of partnership firm, whether the deed of partnership is registered?	No
Registration No :	-	Registration No in case of Co.operative Society:	-
No. given by the register of Companies in case of private/public limited companies:	-	Company PAN Number:	ADWPJ4520F
Website:	-	Is your project situated in:	Urban Local body

Project Details

Name of Project:	PROPOSED INDUSTRIAL LAYOUT	Whether proposed work is for:	New

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Project Address Line 1:	BLOCK-125/P1,125/P2,126/1+2+3,MOJE-SHIVRAMPUR,TALUKA-CHORYASI,DIS-SURAT.	Project Address Line 2:	-
Project Country:	INDIA	Project City:	
Project State / UT:	Gujarat	Project District:	Surat
Project Taluka:	Choryasi	Project Village:	Sunvall
Project PIN Code:	394510	Survey Number:	BLOCK-125/P1,125/P2,126/1+2+3
Plot / Sub Plot / Shed No.:	-	Ward No/Nearest Landmark:	-
Type of Industry:	Manufacturing	NIC Code:	410 - Construction of buildings
Does your industry unit fall under the category of white industries exempted from obtaining Consent to Establish under GPCB ?	Yes	GPCB District Name:	-
GPCB SIDC Name:	-	GPCB Taluka Name:	-
GPCB Village Name:	-	Project Phone Number:	-
Project Fax No:	-	Project Mobile Number:	9979866079
Project Email ID:	jignasujain123@gmail.com	Relevant Urban Local Body:	Surat Urban Development Authority
Expected Date of Commencement:	2019-12-10 00:00:00.0	GPCB Code:	-

Investment Details

Investment in Land (INR):	5000000	Investment in Plant and Machinery(P & M) (INR):	1000000
Investment in equipment:	1000000	UAN/EMN/SSI/IEM Number:	ADWPJ4520F
Type of Unit:	Micro		

Correspondence Address

First Name:	-	Middle Name:	-
Last Name:	-	Phone Number:	-
Fax:	-	Mobile Number:	9979866079
Email ID:	jignasujain123@gmail.com	Address Line 1:	BLOCK-125/P1,125/P2,126/1+2+3,MOJE-SHIVRAMPUR,TALUKA-CHORYASI,DIS-SURAT.
Address Line 2:	-	Country Name:	INDIA
City Name:		State Name:	Gujarat
District Name:	Surat	Taluka Name:	Choryasi
PIN Code:	394510		

Other Details

Power Required (KVA):	Yes	Do you need electrical plan approval?	No
Type of power connection required:	New LT Connection	Power Category:	DGVCL

290

Do you require a water connection?	Yes	water connection category:	Water Application (GWSSB/GWIL/SSNNL/ Water Resource Department)
Will your enterprise have steam boilers?	No	Do you intend / employ 10 or more contract labourers?	Yes as a Contractor
Will you be felling trees on your premises?	Yes	Do you need Building Plan Approval?	Yes, from ULB

291

Investor Facilitation Portal

Payment Receipt

Applicant Name: SANGHI INDUSTRIES LIMITED A COMPANY THROUGH ITS SENIOR VICE PRESIDENT SHRI GAURANGBHAI JAYANTIBHAI B

Project Name: PROPOSED INDUSTRIAL LAYOUT

Address of Applicant: 10nt floor,Kataniya Arcade,makarba,ahmedabad. - 380051

Receipt No: 1284023

Receipt Date and Time: 11/09/2019 03:41:58 PM

Financial Year: 2019-2020

Sr No	IFP Application No	Service Name/Application Name	Department Name	Office Name	Amount
1	1298066	UDD - Building Permission Application	Urban Development & Urban Housing Department	Surat Urban Development Authority	190100
				Total	190100

Amount in Words: Rupees One Lac Ninety Thousand One Hundred Only.

Note : This Receipt is Generated from Investor Facilitation Portal and Not Required Signature.

THANK YOU FOR PAYMENT

Print

Email **Sundar Ramanathan**

Re: Expert Committee meeting held on 13/04/2021 and 17/05/2021 in pusuance to the Hon'ble NGT Order in Appeal 36 of 2020

From : gjbhatt@sanghicement.com Thu, Jul 01, 2021 06:57 PM

Subject : Re: Expert Committee meeting held on 13/04/2021 and 17/05/2021 in pusuance to the Hon'ble NGT Order in Appeal 36 of 2020

2 attachments

To : Sundar Ramanathan <r.sundar@nic.in>

Cc : cnpandey@iitgn.ac.in, jkishwan@gmail.com, sv godavarthi <sv.godavarthi@gmail.com>, munish chandel <munish.chandel@gmail.com>, M Suresh Kumar <ms_kumar@neeri.res.in>, Ankur Tiwary <ankur.cpcb@nic.in>, rpsh3@hotmail.com, kamyotra@yahoo.co.in, ahupadhy@rediffmail.com, avasaralajagan@gmail.com, sksinghdce@gmail.com, mkg cppri <mkg_cppri@rediffmail.com>, siddhartha singh74 <siddhartha.singh74@gmail.com>, tejaswini acf <tejaswini.acf@gmail.com>, MAHENDRA PHULWARIA <m.phulwaria@gov.in>, ssmishtha@gmail.com

Dear Sir,

We submit our reply in response to your email dated 06.06.2021 as attached herewith.

Regards

Gaurang Bhatt
Sr. Vice President - Corporate Affairs & Legal

Sanghi Industries Limited
10th Floor, Kataria Arcade, Off.S.G. Road,
Makarba, Ahmedabad-380051, Gujarat,
INDIA.
www.sanghicement.com

Tel.: +91 79 2683 8000
Mo.:+91 99798 56023
E-mail :
gjbhatt@sanghicement.com

Sanghi Industries Limited
Corporate Office : 10th Floor, Kataria Arcade,
Off S. G. Highway, Post : Makarba, Dist : Ahmedabad - 380051.
Tel. : 079 - 25838000 Fax : 079 - 26833111
E-mail : sanghicmo@sanghicement.com

SANGHI CEMENT
Turning Dreams into Concrete Reality

July 1, 2021

To,
The Hon'ble Expert Committee
Ministry of Environment, Forest & CC
Industry - 1
New Delhi

Sub: Expert Committee Meeting held on 13th April 21 and 17th May 2021 pursuant to Order dated 20.01.2021 passed by the Hon'ble National Green Tribunal, Principal Bench in Appeal No 36/2020

Dear Sir,

1. This in reference to your email dated 06.06.2021 and our subsequent e-mails dated 08.06.2021 and 16.06.2021, whereby we have been advised to respond to your email dated 06.06.2021 on the load bearing capacity of the Panchayat Road proposed to be utilized by us for our Cement Grinding Unit in Hazira Industrial Area, in accordance with IRC 1997 Guidelines.
2. Pursuant to your directions, we engaged of Multi-Media Consultants Pvt. Ltd., a renowned consultant empanelled with the Roads & Building Department of the Govt. of Gujarat, various Municipal Corporations as well as major Urban Development Authorities within the State, to assess the load bearing capacity of the Panchayat Road in question. They have prepared a report dated 01.07.2021 which is attached herewith for your kind consideration as response to your email dated 06.06.2021.
3. In addition to, and without prejudice to the above, we deem it appropriate to bring to your attention the following points in relation to the said Panchayat Road:
    a. The Panchayat Road, for which the load bearing capacity was impugned by the L&T, was constructed by L&T Ltd. itself pursuant to directions of the Hon'ble High Court of Gujarat in Special Civil Appeal No 10850/2009 titled as *"Sukhabhai Bhikhabhai Aahir & 29 others. Vs. Principal Secretary & 3 others"*.
    b. In this Special Civil Application, which was filed by residents of village Sunvati against L&T, the Hon'ble High Court, vide an Order dated 23.02.2010 directed as follows:

        "We direct the L&T (Respondent No. 4) to construct the proposed road stated in its affidavit and shown in the enclosure annexed to the affidavit, at an early date, preferably within six months. In the meantime, if the 4th Respondent raises level of its land before construction of road and drainage, it must ensure that some space is left for drainage of storm water of the land or Revenue Survey No. 445 to 497. To ensure that road and drainage are properly constructed, we

Sanghi Industries Limited
Corporate Office : 10th Floor, Kataria Arcade,
Off S. G. Highway, Post : Makarba, Dist : Ahmedabad - 380051.
Tel. : 079 - 26836000 Fax : 079 - 26836111
E-mail : sanghicorp@sanghicement.com

SANGHI CEMENT
Turning Dreams into Concrete Reality

are imposing the map of the proposed road and proposed drainage plan as submitted by the 4th respondent as part of this judgment at Annexure "A" and "B".

c. As will be evident from the above, the Panchayat Road was caused to be constructed by L&T Ltd. in terms of the directions passed by the Hon'ble High Court; and in accordance with condition imposed by the Collector, Surat in its Land Allotment Order dated 23.08.2010. In terms thereof, L&T was required to construct the Panchayat Road in compliance of applicable regulations and standards applicable in industrial areas, and after obtaining approvals from Ex-Engineering (R&B Department, Circle 1, Surat) and execute agreement also.

d. Furthermore, the Panchayat Road has been disclosed and sanctioned to be a 22 Meter long road under the sanctioned SUDA Development Plan.

4. As such, this will make it evident that the Panchayat Road has been constructed pursuant to judicial directions and in accordance with applicable regulations and standards, is a 'Pacca' road and is in fact being used for movement of commercial vehicles such as the 34 tonner trucks proposed to be used by the SIL.
5. You may further appreciate that the Panchayat Road currently belongs to Roads & Building Department, Government of Gujarat, who is in charge of its maintenance and upkeep. Upon inquiries, we have been given to understand that the R&B Department (Panchayat), Surat Office has already proposed to the government for improvement of the road and on approval they will take further action.
6. In the meanwhile, the surrounding industries are also making efforts to maintain the Panchayat Roads for smooth vehicluar movement.

We hope above submisson meet the requirements and request Honorable committee to humbly give due consideration to the above submission and will examine the same with a pragmatic view in the interest of sustainable development.

Thanking you,

Yours faithfully,

For Sanghi Industries Limited

Gaurang Bhatt
Sr. Vice President

Encl: as above

MMCPL/07-21/806
July 1, 2021

To
Sanghi Industries Limited
10th Floor, Kataria Arcade,
Off S G Highway
P.O. Makarba
Ahmedabad- 380051

Dear Sir

Pursuant to our appointment as consultants to carry out
stretch of approach Road to R.S no. 125
Observations on the same are as follows:

1. We have studied the geotechnical i
   report provided by you. As per this
   average value of 3.5%, and the avera
2. We have also examined the traffic a
   an observed movement of 1290 com **CVPD**"),
3. It may be noted that the following
   potentially relevant in determining th
   a. IRC:81-1997
   b. IRC:SP:72-2015
4. As per the codal provisions and look
   in our opinion, possesses the load be
5. We have further been informed that
   generate a movement of 363 CVPD
   years design life, vehicle damage fa
   be (assuming *ceteris paribus*) arour
   traffic. In fact, even this too will ha
   roughly 2 years for construction and
6. It is our opinion that assuming the ac
   of commercial operation
   evaluation of the road
   Decision of overlay / rec

We remain available to discuss t
Yours truly

For,
Multi Media Consultants Pvt Ltd

Email **Sundar Ramanathan**

Sanghi Cement - NGT

From : gjbhatt@sanghicement.com Mon, Jul 05, 2021 01:21 PM
Subject : Sanghi Cement - NGT
To : Sundar Ramanathan <r.sundar@nic.in>

Sir,

Total thickness of pavement varies from 300mm to 535mm with average of 420mm.

Thickness of Granular sub-base varies from 100mm to 300mm with average of 200mm .

Thickness of Granular base is 150mm throughout the alignment.

Regards,

Gaurang Bhatt
Sr. Vice President - Corporate Affairs & Legal

Sanghi Industries Limited
10th Floor, Kataria Arcade, Off.S.G. Road,
Makarba, Ahmedabad-380051, Gujarat,
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gjbhatt@sanghicement.com

This message is confidential. It may also be privileged or otherwise protected by work product immunity or other legal rules. If you have received it by mistake, please let us know by e-mail reply and delete it from your system; you may not copy this message or disclose its contents to anyone. The integrity and security of this message cannot be guaranteed on the Internet.

On 02/07/21 1:35 pm, Sundar Ramanathan wrote:

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Sir,
May please see the trialing email below and provide the requisite information at the earliest.
With regards,
Sundar

From: ahupadhy@rediffmail.com

BEFORE THE CENTRAL POLLUTION CONTROL BOARD,

NEW DELHI

IN FURTHERANCE OF THE ORDER DATED 21.01.2021

PASSED IN THE MATTER *LARSEN & TOUBRO VS SANGHI INDUSTRIES LTD. & ORS. (APPEAL NO. 36 OF 2020 – ERSTWHILE APPEAL NO. 66 OF 2019)* BY THE HON'BLE NATIONAL GREEN TRIBUNAL (PRINCIPAL BENCH)

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Through:

Place: New Delhi

Date: 22.02.2021

Ayush Puri
D/4010/2017
Third Floor
Taj Ambassador
Delhi-110003
+91 9811439334
ayush.puri.91@gmail.com

BEFORE THE CENTRAL POLLUTION CONTROL BOARD,

NEW DELHI

IN FURTHERANCE OF THE ORDER DATED 21.01.2021

PASSED IN THE MATTER *LARSEN & TOUBRO VS SANGHI INDUSTRIES LTD. & ORS. (APPEAL NO. 36 OF 2020 – ERSTWHILE APPEAL NO. 66 OF 2019)* BY THE HON'BLE NATIONAL GREEN TRIBUNAL (PRINCIPAL BENCH)

SUBMISSIONS ON BEHALF OF SUVALI GRAM PANCHAYAT

I. APPEAL NO. 36 OF 2020 (ERSTWHILE APPEAL NO. 66 OF 2019) AND ORDER OF HON'BLE NGT DATED 21.01.2021

1.1. The above captioned appeal was filed by Larsen and Toubro seeking to challenge the Environmental Clearance bearing no. SEIAA/GUJ/EC/3(b)O/1155/2018 dated August 23, 2019 ("**Impugned EC**") granted to Sanghi Industries Ltd. ("**Sanghi**") for its proposed project of 2.0 Million Metric Tonne Per Annum (TPA) Standalone Grinding Unit with bulk and bag packing plant at Hazira Industrial Zone, Survey 125/1, 125/2, 126/1+2+3, Village Shivrampur, Tal Choryasi, District-Surat, Gujarat ("**Project**"). The impugned Environmental Clearance is annexed herewith as **Annexure 1**.

1.2. That vide Order dated 21.01.2021, after recording observations w.r.t. various irregularities in the Environmental Impact Assessment (EIA) Report, the Hon'ble NGT referred the issue of assessment and evaluation of the Environment Impact Assessment (EIA) report prepared by the project proponent and directed the parties *inter alia* Larsen and Toubro, Suvali Gram

Panchayat and the Project Proponent to file written submissions before CPCB. The said Order is annexed herewith as **Annexure 2**.

II. STATUS OF SUVALI GRAM PANCHAYAT AND VILLAGERS AS INTERVENORS BEFORE HON'BLE NGT

2.1. That an intervention application was filed by Suvali Gram Panchayat before the Hon'ble NGT to intervene in the above captioned appeal filed by Larsen & Toubro**.**

2.2. That during the course of the hearing on 15.09.2020, the Hon'ble Tribunal vide an oral order / observation permitted the Intervenor and all the other interested parties to file their respective Replies. Accordingly, Suvali Gram Panchayat was impleaded as an intervenor in the above captioned appeal.

III. SUBMISSIONS OF SUVALI GRAM PANCHAYAT

3.1. MISREPRESENTATION BY PROJECT PROPONENT WHILE OBTAINING IMPUGNED ENVIRONMENTAL CLEARANCE

3.1.1. Sanghi Industries Ltd., which is the Project Proponent in this case, misrepresented various facts in the Pre-Feasibility Report, Form-I, and the Environmental Impact Assessment Report submitted to the relevant authorities. The Project Proponent, using its influence, expedited the Environmental Clearance process and concealed various material facts during the course of obtaining the same.

3.1.2. The Impugned EC granted to the Project Proponent suffers from gross irregularities and inconsistencies. The information submitted for seeking Environmental Clearance was misleading, false and incorrect and the State

Authorities did not care to verify or cross-check the same and issued the Impugned EC in blatant violation of the prescribed rules and regulations.

3.1.3. That Surat was declared as a polluted area by the Hon'ble NGT vide its Order dated 10.07.2019. Further, the sites of GIDC Pandesara and GIDC Sachin located in Surat were declared as severely polluted areas by an office order dated 11.11.2019 issued by the Gujarat Pollution Control Board.

3.1.4. Further, the abovementioned office order also specifies certain additional conditions applicable to some CPA/SPAs which include Sachin & Pandesara GIDC Estate. Such additional conditions include stringent air pollutants standards and conditions under various other legislations including the Water (Prevention and Control of Pollution) Act, 1974 and Hazardous Waste Management Rules, 2016. A copy of the said office order is annexed herewith as **Annexure 3.**

3.1.5. Project Proponent has declared that the project site is located at considerable distance of 14 km after buffer zone of 5 km from these sites. Aerial distance between boundary of Surat city and Project Proponent site is approx.8 Km. Maps showing the entire layout have been annexed herewith as **Annexure 4.**

3.1.6. Project Proponent, in its EIA Report, has stated that there is no vulnerable group near the plant site, despite being aware of a school situated at a distance of less than 1.5kms. In addition to this, from 30.03.2016, the Land Survey no. 498-1, Village Suvali, admeasuring 20 Acres i.e., approx. 80,000 sq. m., has been allotted to Marine Sector Commander, Hazira (Superintendence of Police) under Home Ministry of Gujarat for the purpose of residential cum office complex of Marine Task Force, Hazira.

3.1.7. At present, the residential complex is under construction. The aerial distance from project site to this residential complex is approx. 1.6 km in Suvali

village. The master layout of the residential cum office complex is annexed herewith as **Annexure 5.**

3.1.8. Moreover, there is inconsistency between the EIA Report and other reports, presentations made by Project Proponent before various authorities. For instance, there is a mismatch between the information submitted by the Project Proponent regarding coal to be used in the project. The EIA Report dated March 2019 shows coal required to be 12TPH*21HR=252TPD. The EIA Report has been annexed herewith as **Annexure 6**.

3.1.9. On the contrary, the Project Proponent, as a response to the additional information sought by the appraisal committee, in its letter dated 23.05.2019, does not show any calculation of this kind or how it is going to use imported coal instead of Lignite and Pet Coke. This letter has also been referred in the impugned Environmental Clearance. The said letter has been annexed herewith as **Annexure 7.**

3.1.10. Further, changing its position, on 12.06.2019, the Project Proponent presented before SEAC that it will use imported coal hence it requires less coal and showed it at a less quantity i.e. 6.9 TPH. The slack height was also showed to be reduced in lieu of using imported coal. However, it did not show any calculation from the 12 TPH as shown in EIA Report to 6.9 TPH. Coal required as per slide 72 of presentation made by Project Proponent to SEIAC on 16.06.2019 is 6.9 TPH. The slide has been annexed herewith as **Annexure 8.**

3.1.11. Further, Project Proponent has not shown hourly peak hour traffic of NHAI and location from where they have taken two days traffic. It has failed to factor in that the approach road is a Village Panchayat Road, which does not have a carrying capacity of 34 ton truck. The land status of panchayat road is forest land. For any change on this road such as widening, the permission is

to be taken from forest department. However, no such arrangements have been made by the Project Proponent in this case.

3.1.12. Further, in draft EIA, Project Proponent had calculated 20 Ton truck capacity. In final EIA, Project Proponent has shown 34 Ton truck capacity. Furthermore, the EIA Report avoids mention to facilities like disposal of discarded containers, allocation to finished storage area, loading and unloading area, parking area for used trucks, canteen area, etc.

3.1.13. In addition to this, Project Proponent, in order to conceal the relevant information and to secure the Environmental Clearance in dubious manner, knowingly concealed multiple regulations and their impact and measures to address the same. The same were left out not just in its EIA but also in its presentation made to SEAC on 12.06.2019. The said regulations are as provided hereinbelow:

i. *Construction and Demolition Waste Management Rules, 2016*
ii. *The Energy Conservation Act, 2001.*
iii. *The Batteries (Management and Handling) Rules, 2001.*
iv. *Chemical Accidents (Emergency Planning, Preparedness and*
IV. *Response) Rules, 1996*
v. *The Gas Cylinder Rules, 2004*
vi. *The Static and Mobile Pressure Vessels (unfired) Rules, 1981*
vii. *Plastic waste Management Rules, 2016.*
viii. *Bio-Medical waste Management Rules, 2016.*

3.2. CONCERNS OF SUVALI GRAM PANCHAYAT WERE NOT TAKEN INTO CONSIDERATION, NEITHER BY THE PROJECT PROPONENT NOR BY CONCERNED AUTHORITIES

3.2.1. It is pertinent to note that the objections raised by the Intervenor i.e. Suvali Gram Panchayat have not been presented for the first time before the Hon'ble NGT. The said concerns and objections of the villagers were brought into the notice of the Project Proponent many times before the impugned EC was granted.

3.2.2. That on 22.03.2019, a public hearing was held for the proposed project at the project site, headed by Dr. Dhaval Patel, Collector and District Magistrate, Surat. Many villagers from adjoining villages raised several detailed queries during the public meeting, *inter alia* comprising the methods and means which would be undertaken by Project Proponent to prevent environmental degradation around the project site.

3.2.3. It is pertinent to note here that as is reflected from the Minutes of the Public Hearing, Project Proponent evaded half of the questions and gave incorrect assurances for the other half. Unclear/ vague/ dubious replies were given by the Project Proponent to different questions of various stakeholders.

3.2.4. It is further submitted that consequent to the puzzling and unclear answers of the representatives of Project Proponent in the public hearing, Suvali Gram Panchayat held extensive discussions with its members and residents of the village. Eventually, on 30.07.2019, the Panchayat held an official meeting and passed a resolution to approach the higher authorities in order to voice their concerns of the imminent threat faced by them in the form of pollution which will be caused by the proposed cement grinding plant. A copy of the said resolution has been annexed herewith as **Annexure 9.**

3.2.5. That in the said meeting, Resolution No. 5 was adopted which discussed the following impacts of the proposed unit on the local residents and villagers:

a. Coal will be utilised as a raw material by the company and because of that there will be increase in proportion of air pollution. Damage will be caused to the health of village people.
b. When the company will undertake process of production of cement, the minute particles emanating from it will get mixed in the air, and the fertility (quality) of agricultural land of the village would be degraded. The villagers will have to bear the loss.
c. Along with air, the particulates emanating from the facility will also contaminate the water resources of Suvali village. As a result, it will severely pollute the quality of water, which would cause severe effect on life of the villagers and children.
d. Dust which will be produced by the Company will get mixed with air, resulting in air pollution. It will have severe effect on human life and other animal beings.
e. The work of transportation of cement and the work of bringing of raw materials ordinarily will be done day and night. It will cause disturbance to the peace of village life and cause damage to health of people.

3.2.6. Pursuant to this, after taking into consideration the views expressed by its members and in consensus of all the local villagers, Suvali Gram Panchayat wrote to the Environment Department and the District Collector, Surat on 11.09.2019 to seek resolution of their grievance. The said letter has been annexed herewith as **Annexure 10**. However, possibly in light of the influence of Project Proponent and its financial strength, the objections of the Suvali Gram were submerged and not addressed.

3.3. THE PROPOSED UNIT IS BOUND TO CONTRIBUTE TO AIR, WATER, AND NOISE POLLUTION AND ULTIMATELY ENVIRONMENTAL DEGRADATION OF THE SURROUNDING AREA

3.3.1. The EIA Report has failed to address the environmental norms relating to air, water and land that would be severely impacted by the establishment of the cement manufacturing unit. It is also to be noted that the relevant material and factors were not placed before the SEAC, Gujarat and the SEIAA along with Form-1, for meticulous environmental evaluation and audit. Further, both the SEAC, Gujarat and SEIAA did not apply their mind on the environmental consequences and apparently recommended the grant of EC in a mechanical manner.

3.3.2. It is pertinent to note that Coal will be utilized as raw material by the company. This would inevitably lead to increased pollution in the area and lead to growth of respiratory diseases. The current emission rates of Hazira are hazardous. Carbon Monoxide is a gas which is lethal to humans if inhaled in excess. If the current rate of emission is severe, a new industrial unit like a cement plant which utilises coal burning as fuel (leads CO emissions) would only add to the already severe air condition of the area.

3.3.3. Further, it is pertinent to note that the proposed unit is being set up near a school with a strength of around 1200 children. Navchetan Vidhyalaya D.L.S.S. (District Level Sports School) with cooperation of "Sports Authority of Gujarat" has entered into MoU with the Government. According to the said MoU, facility of lodging and boarding for 250 students from all over Gujarat has to be provided. This brings the total number of students to be 1450. Inhaling such toxic fumes and air pollution and living off resources polluted by a cement grinding unit is bound to jeopardise the future of many generations.

3.3.4. Emissions to air is the main environmental challenge faced by the cement industry. Main pollutions of cement productions include; cement dust, air pollution, water pollution, solid waste pollution noise pollution, ground vibration and resources depletion due to raw material extraction. The

requirement of heat is obtained by the combustion of fuel, with a chemical reaction in which carbon, hydrogen, sulfur and nitrogen in the fuel mixes with Oxygen in the air. Dust emission is a significant source of environmental pollution during cement production.

3.3.5. That in order to further substantiate the concern of the Village Panchayat, the case of ACC cement plant at Barmana in Bilaspur district may be noted. The Tribune India (newspaper) reported on 1.01.2019 how the said cement plant become a major source of air pollution in nearby Salappar, Kangu and Dehar panchayats. The Hon'ble Tribunal has also recognised the fact that industrial pollution leads to pollution which cause various diseases. The plant was established back in 1984. The people of Salapar district claim there that they have been having terminal diseases like cancer due to effects of the facility. Salapar district was left out of compensation and rehabilitation plan. It took about four decades for the ill-effects of such a plant to come to surface.

3.3.6. It is pertinent to note that the villagers are already suffering from many diseases including Cancer, Tuberculosis (TB), and various skin diseases owing to the large industries in the area. A letter evidencing the same by the Medical Officer of the Primary Health Centre of Suvali village has been annexed herewith as **Annexure 11** with its translation. That said, it is further to be noted that the project site is not located on an urban land. Crops are grown on the adjoining land during both Kharif and Rabi season. Particulates emanating from the facility will get mixed in the air and the fertility (quality) of agricultural land of the village would be degraded.

3.3.7. Dust which will be produced by the Company will get mixed with air, resulting in air pollution. It will have severe effect on human life and other animal beings. The villagers will have to bear the loss. Along with air, the particulates emanating from the facility will also contaminate the water

resources of Suvali village. As a result, it will severely pollute the quality of water, which would cause severe effect on life of the villagers and children.

3.3.8. Economic development at the cost of lives of people and without preservation of the right to life and a living under Article 21 is not development in its true sense. It is important for the CPCB to weigh the considerations presented above.

3.3.9. Thus, it is humbly prayed that the impugned environmental clearance is arbitrary and should be cancelled.

Through:

Place: New Delhi

Date: 22.02.2021

Ayush Puri
D/4010/2017
Third Floor
Taj Ambassador
Delhi-110003
+91 9811439334
ayush.puri.91@gmail.com

S. M. SAIYAD, IFS
MEMBER SECRETARY
SEIAA (GUJARAT)

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY GUJARAT

Government of Gujarat

No. SEIAA/GUJ/EC/3(b)/1155/2018 Date: 23 AUG 2019 By R P A D

Time Limit

Sub: Environment Clearance to M/s. Sanghi Industries Limited for setting up of stand-alone Cement grinding unit at Survey No. 125/1, 125/2 and 126/1+2+3, Vill.: Shivrampur, Ta.: Choryasi, Dist.: Surat. In Category 3(b) of Schedule annexed with EIA Notification dated 14/09/2006.

Ref: Your Proposal No. SIA/GJ/INO/30448/2018.

Dear Sir,

This has reference to your application along with Form-I dated 03/04/2019 submitted to SEIAA seeking Environmental Clearance under Environment Impact Assessment Notification, 2006 and additional information / documents submitted vide letter dated 23/05/2019 to the SEAC.

The proposal is for Environmental Clearance to M/s. Sanghi Industries Limited for setting up of stand-alone Cement grinding unit at Survey No. 125/1, 125/2 and 126/1+2+3, Vill.: Shivrampur, Ta.: Choryasi, Dist.: Surat. In Category 5(f) of Schedule annexed with EIA Notification dated 14/09/2006. It is a proposed unit for manufacturing following products, which falls in the category - 3(b) of the schedule of the EIA Notification-2006:

Sr. No.	Name of the Products	Quantity, MMT/Annum
1	Cement (OPC / PPC / PSC)	2.0

The project activity is covered in 5(f) and is of 'B' Category. Public hearing was conducted on 22/03/2019.

The SEAC, Gujarat vide their letter dated 16/07/2019 has recommended to the SEIAA, Gujarat, to grant the Environment Clearance for the above-mentioned project based on its meeting held on 12/06/2019. The proposal was considered by SEIAA, Gujarat in its meeting held on 16/07/2019 at Gandhinagar. After careful consideration, the SEIAA hereby accords Environmental Clearance to above project under the provisions of EIA Notification dated 14th September, 2006 subject to the compliance of the following conditions.

A. CONDITIONS

CONSTRUCTION PHASE

a) Water demand during construction phase shall be reduced by use of curing agents, super plasticizers and other best construction practices.

b) Project proponent shall ensure that surrounding environment shall not be affected due to construction activity. Construction materials shall be covered during transportation and regular water sprinkling shall be done in vulnerable areas for controlling fugitive emission.

c) All required sanitary and hygienic measures shall be provided before starting the construction activities and to be maintained throughout the construction phase.

d) First Aid Box shall be made readily available in adequate quantity at all the times.

e) SIL (Sanghi Industries Ltd.) shall strictly comply with the Building and other Construction Workers' (Regulation of Employment & Conditions of Service) Act 1996 and Gujarat rules made there under and their subsequent amendments. Local bye-laws of concern authority shall be complied in letter and spirit.

f) Ambient noise levels shall conform to residential standards both during day and night. Incremental pollution load on the ambient air and noise quality shall be closely monitored during construction phase.

g) Use of Diesel Generator (DG) sets during construction phase shall be strictly equipped with acoustic enclosure and shall conform to the EPA Rules for air and noise emission standards.

h) Safe disposal of waste water and municipal solid wastes generated during the construction phase shall be ensured.

i) All topsoil excavated during construction activity shall be used in horticultural / landscape development within the project site.

j) Excavated earth to be generated during the construction phase shall be utilized within the premises to the maximum extent possible and balance quantity of excavated earth shall be disposed off with the approval of the competent authority after taking the necessary precautions for general safety and health aspects. Disposal of the excavated earth during construction phase shall not create adverse effect on neighbouring communities.

k) Project proponent shall ensure use of eco-friendly building materials including fly ash bricks, fly ash paver blocks.

Ready Mix Concrete [RMC] and lead free paints in the project

i) Fly ash shall be used in construction wherever applicable as per provisions of Fly Ash Notification under the E.P. Act, 1986 and its subsequent amendments from time to time.

OPERATION PHASE:

A. 1 SPECIFIC CONDITION :

1. Project proponent (Sanghi Industries Ltd.- SIL) shall procure raw materials like clinker for the proposed project from the authorized units having Environmental Clearance as per the EIA Notification 2006, CTE & CC&A from the concern authorities.
2. SIL shall abide by all the commitments and recommendations made in the EIA / EMP report prepared by Eco Chem Sales & Services, Surat and that during their presentation to the SEAC/SEIAA. The commitments made by S.I. to the issue raised during public hearing shall be implemented by the proponent. Implementation of the mitigation plan and regular monitoring shall be carried out to ensure no any degradation of the environment, which adversely affect the Green belt, water, Health of Employees, product quality and business of neighboring units.
3. Complete Zero Liquid Discharge (ZLD) status shall be maintained all the time and there shall be no drainage connection from the premises.
4. SIL shall allocate the separate fund of Rs. 4.24 Crores i.e. 1.5 % of the capital investment for activities mentioned in EIA report under Corporate Environment Responsibility (CER) in accordance to the MoEFCC's Office Memorandum No. F.No.22-65/2017-IA.III dated 01/05/2018. The entire activities proposed under CER shall be monitored and the monitoring report shall be submitted to the regional office of MoEF&CC as a part of half-yearly compliance report and to district collector. The monitoring report shall be posted on the website of the project proponent.
5. SIL shall commission continuous ambient air quality monitoring station (CAAQMS) at appropriate location and an arrangement shall also be done for reflecting the online monitoring results on the company's server, which can be accessable by the GPCB on real time basis.
6. SIL shall develop minimum 33% green belt with native tree species in and around periphery of proposed project as per the prevailing guidelines of CPCB/MoEF&CC, New Delhi
7. SIL shall provide boundary wall with adequate height for control of dusting and fugitive emission.
8. SIL shall install advance sprinkling system for raw material like fly ash, gypsum and coal handling system and finished product like cement handling system.
9. SIL shall strictly adhere with assurance that there shall not be any degradation of environment which adversely affects the green belt, Water, Health of employees, production quality and business of neighboring units.
10. SIL shall commission Dust extraction system with capacity of 11000 m3/H and fully enclosed system for unloading station within plant premises.
11. SIL shall adopt closed transportation system for loading/unloading and bulk cement in closed cement tanker and latest advance closed conveying system shall be installed for raw material and finished product transportation within production plant and loading/unloading station.
12. SIL shall strictly comply prevailing guidelines for coal and fly ash handling.
13. SIL shall not use lignite and Petcock as fuel.
14. SIL shall comply all the applicable standard conditions prescribed in Office Memorandum (OM) published by MoEF&CC vide no. F. No. 22-34/2018-IA.III dated 08/08/2018 for Stand-alone Cement grinding units whose Captive Power Plant as mentioned at Sr. no. xii).
15. SIL shall install 24x7 Continuous Emission Monitoring System (CEMS) at process stacks to monitor stack emission with respect to standards prescribed in Environment (Protection) Rules 1986 vide G.S.R. No. 612 (E) dated 28th August, 2014 (Cement) and subsequent amendment dated 9th May, 2016 (Cement) and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories.
16. SIL must strictly adhere to the stipulations made by the Gujarat Pollution Control Board, State Government and/or any other statutory authority.
17. The National Ambient Air Quality Emission Standards issued by the Ministry vide G. S. R. No. 826 (E) dated 16th November, 2009 shall be complied with.
18. SIL shall monitor fugitive emissions in the plant premises at least once in every quarter through labs recognized under Environment (Protection) Act, 1986.
19. Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.
20. Appropriate and adequate Air Pollution Control (APC) system shall be provided for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed stack/vent emission and fugitive emission standards.
21. PP shall ensure covered transportation and conveying of raw material to prevent spillage and dust generation. Use

closed bunkers for carrying fly ash

22. Pollution control system in the cement plant shall be provided as per the CREP Guidelines of CPCB.
23. Third party monitoring shall be carried out for dust pollution on monthly basis through GPCB approved Third party and report shall be submitted to GPCB.
24. All the issues raised in the public hearing shall be considered/addressed / complied with in a time bound manner
25. The National Ambient Air Quality Emission Standards issued by the Ministry vide G. S. R. No. 826 (E) dated 16th November, 2009 shall be complied with.
26. SIL shall obtain CGWA permission for withdrawal of ground water as per the public notice of CGWA vide no. 26-NCGWA/PN/2018 dated 14/11/2018.
27. A dedicated environmental cell with qualified personnel shall be established. The head of the environment cell shall report directly to the head of the Organization.

A. 2 WATER:

28. Total water requirement for the project shall not exceed 278 KL/Day. SIL shall reuse 78 KL/Day of treated effluent for dust suppression and cooling tower within premises and hence, fresh water requirement shall not exceed 200 KL/Day and it shall be met through Irrigation department/Private tankers. Necessary permission from concern Authority in this regards shall be obtained.
29. The industrial effluent generation from the project shall not exceed 70 KL/day.
30. Total industrial effluent 70 KL/Day of cooling reject shall be used for dust suppression and in closed circuit cooling tower. No effluent shall be discharged outside premises by any means.
31. Domestic wastewater generation shall be 10 KL/Day and it shall be treated through adequate capacity STP and treated sewage shall be reused for garden rejplantation within premises.
32. During monsoon season when treated sewage effluent may not be required for the plantation / Gardening / Green belt purpose, it shall be stored within premises. There shall be no discharge of waste water outside the premises in any case.
33. SIL shall provide buffer water storage tank of adequate capacity for storage of treated waste water during rainy days.
34. The company shall harvest rainwater from the rooftop of the building to recharge the ground water and to use the same water for the various activities of the project to conserve fresh water. Before recharging the surface run off, pre-treatment must be done to remove suspended matter.

A. 3 AIR:

35. SIL shall not exceed fuel consumption for Cement Mill (VRM) as mentioned below:

Sr. no.	Source of emission With Capacity	Stack Height (meter)	Type of Fuel	Quantity of Fuel MT/Day	Type of emissions i.e. Air Pollutants	Air Pollution Control Measures (APCM)
1	Cement Mill (VRM)	40	Imported Coal	182	PM SOx Nox	Bag House

36. SIL shall provide adequate APCM with flue gas generation sources as mentioned above.
37. SIL shall provide adequate APCM with process gas generation sources as mentioned below:

Sr. no.	Source of emission	Type of emission	Stack/Vent Height (meter)	Air Pollution Control Measures (APCM)
1	Clinker unloading Station	Fugitive	Vent Fan	De-dusting Bag Filter
2	Additive Unloading Station	Fugitive	Vent Fan	De-dusting Bag Filter
3	Clinker Silo Top	Fugitive	Vent Fan	De-dusting Bag Filter
4	Cement Silo Top	Fugitive	Vent Fan	De-dusting Bag Filter
5	Cement Extraction	Fugitive	Vent Fan	De-dusting Bag Filter
6	Packing Plant	Fugitive	Vent Fan	De-dusting Bag Filter
7	Bulk Cement Loading	Fugitive	Vent Fan	De-dusting Bag Filter
8	Fly Ash Silo Top	Fugitive	Vent Fan	De-dusting Bag Filter
9	HAG Feed Hopper	Fugitive	Vent Fan	De-ducting Bag Filter

38. The above-mentioned measures are indicative and the unit may explore the possibilities of other latest devices also to achieve the better results & better compliance of the air pollution control norms prescribed by the Gujarat Pollution Control Board (GPCB).
39. The Reverse Pulse Jet Type Bag Filters shall be provided with proper metallic casing, adequate stack height and stack monitoring requirement facility.
40. The design of the air pollution control equipments (APCE) shall be validated by the reputed institutes and APCEs shall be fabricated, erected and commissioned under guidance and supervision of the said institute.
41. The APCM shall be operated efficiently and effectively to achieve the norms prescribed by the GPCB at stack outlet.
42. SIL shall provide leakage detection and mechanized bag cleaning facilities for better maintenance of bags.
43. SIL shall provide sufficient number of mobile or stationery vacuum cleaners to clean plan roads, shop floors, roads

regularly.

44. SIL shall use leak proof trucks/dumpers for carrying coal and other raw materials and shall cover them with tarpaulin. SIL shall use closed bulkers for carrying fly ash.
45. SIL shall provide adequate wind shelter fence to avoid any escaping of dust from the premises.
46. SIL shall have separate truck/bulkers parking area. The traffic management plan with parking facilities submitted before SEAC shall be implemented in letter and spirit.
47. Numbers of trips (In & Out) shall not exceed 353 nos per day for transport of cement and raw material during the operations of the grinding unit.
48. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution and shall conform to the EPA Rules for air and noise emission standards.
49. Stack/Vents of adequate height shall be provided as per the prevailing norms for flue gas emission/Process gas emission.
50. Interlocking facility of the pollution control equipment and the equipment(s) to which it is attached should be provided in such a manner that in the event of pollution control equipment(s) not working, the respective unit(s) is shut down automatically.
51. Regular periodic preventive maintenance of the air pollution control systems shall be carried out during the operation phase.
52. The applicant shall carry out yearly performance evaluation of the air pollution control equipments through any reputed institute and furnish the report in this regard to the Gujarat Pollution Control Board every year.
53. The fugitive emission in the work zone environment and ambient air quality shall be monitored. The emission shall confirm to the standards prescribed by the concerned authorities including Director of Industrial Health and Safety as well as Gujarat Pollution Control Board from time to time. Following indicative guidelines shall be followed to reduce the fugitive emission.
    a) Enclosure shall be provided at all loading and unloading operations.
    b) Water shall be sprayed on all raw materials stock pile periodically to retain some moisture in top layer except wet gypsum to reduce the fugitive emission.
    c) All transfer points shall be fully enclosed.
    d) Accumulated dust on the ground and other surfaces shall be removed / swept regularly and water the area after sweeping.
    e) Internal roads shall be either asphalted or paved properly to reduce the fugitive emission during vehicular movement.
    f) The company shall install adequate dust collection and extraction system to control fugitive dust emission from various material handling areas. (eg. raw material loading, unloading, conveying, transporting, stacking, bagging and packing etc.) Guidelines / Code of Practice issued by the CPCB for prevention and control of the fugitive emission shall be followed.
54. Regular monitoring of ground level concentration of PM10, PM2.5, SO2 & NOx shall be carried out in the impact zone and its records shall be maintained. Ambient air quality levels shall not exceed the standards stipulated by the GPCB. If at any stage these levels are found to exceed the prescribed limits, necessary additional control measures shall be taken immediately. The location of the stations and frequency of monitoring shall be decided in consultation with the GPCB.

A. SOLID/HAZARDOUS WASTE:

55. All the hazardous waste management shall be taken care as mentioned below:

S. N	Type of Waste	Source	Category as per Haz. Waste Rules, 2016	Quantity, MT/ Annum	Management of HW
1	Used Oil	Utilities & Operation	5.1	50 MT/Annum	Collection, Storage, Transportation and Disposed off in own cement plant at Sanghipuram

B. SAFETY:

56. Proper ventilation shall be provided in the work area.
57. Personal Protective Equipments shall be provided to workers and its usage shall be ensured and supervised.
58. First Aid Box shall be made readily available in adequate quantity in the unit.
59. Regular periodic work zone ambient air monitoring shall be carried out for measuring concentrations of cement dust silica dust etc. through qualified industrial hygienist and its records shall be maintained.
60. Occupational health surveillance of the workers shall be done and its records shall be maintained. Pre-employment and periodical medical examination for all the workers shall be undertaken on regular basis as per Factories Act & Rules.
61. All necessary safety measures shall be taken to avoid any kind of accident.
62. Training shall be imparted to all the workers on safety and health aspects.

5. 6 NOISE:

63. The overall noise level in and around the plant area shall be kept well within the prescribed standards by providing noise control measures including acoustic insulation, hoods, silencers, enclosures vibration dampers etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under the Environment (Protection) Act and Rules. Workplace noise levels for workers shall be as per the Factories Act and Rules

6. 7 CLEANER PRODUCTION AND WASTE MINIMISATION

64. The SIL shall undertake the Cleaner Production Assessment study through a reputed institute / organization and shall form a CP team in the company. The recommendations thereof along with the compliance shall be furnished to the GPCB.

65. Efforts shall be made to use more fly ash in cement manufacturing without compromising the quality of the cement

A. 8 GREEN BELT AND OTHER PLANTATION

66. Green belt shall be developed in an area equal to 33% of the plant area with a native tree species in accordance with CPCB guidelines. The greenbelt shall inter alia cover the entire periphery of the plant.

67. The SIL shall develop green belt within the factory premises as per the CPCB guidelines, consisting of at least three rows of trees of local species on periphery. However, if the adequate land is not available within the premises, the SIL shall take up adequate plantation at suitable open land on road sides and other open areas in nearby locality or schools in consultation with the Gram Panchayat / GPCB and submit an action plan of plantation for next three years to the GPCB.

B. OTHER CONDITION

68. Unit shall comply all the applicable standard conditions prescribed in Office Memorandum (OM) published by MoEF&CC vide no. F. No 22-34/2018-IA.III dated 09/08/2018.

69. In case of use of spray dryer, the unit shall provide the adequate & efficient APCMs with spray dryer so that there should not be any adverse impact on human health & environment. Unit shall carry out third party monitoring of the proposed Spray dryer & its APCM through the credible institutes and study report for impacts on Environment and Human Health shall be submitted to GPCB every year along with half yearly compliance report.

The project proponent shall allocate the separate fund for Corporate Environment Responsibility (CER) in accordance to the MoEF&CC's Office Memorandum No. F.No.22-65/2017-IA.III dated 01/05/2018 to carry out the activities under CER in affected area around the project. The entire activities proposed under CER shall be monitored and the monitoring report shall be submitted to the regional office of MoEF&CC as a part of half-yearly compliance report and to district collector. The monitoring report shall be posted on the website of the project proponent

71. In the event of failure of any pollution control system adopted by the unit, the SIL shall be safely closed down and shall not be restarted until the desired efficiency of the control equipment has been achieved.

72. All the recommendations of the Corporate Responsibility of Environment Protection (CREP) shall be strictly followed.

73. All the environmental protection measures and safeguards recommended in the EIA / EMP report of the project submitted by SIL shall be implemented effectively and shall be complied in letter and spirit.

74. SIL shall also comply with any additional condition that may be imposed by the SEAC or the SEIAA or any other competent authority for the purpose of the environmental protection and management.

75. No further expansion or modifications in the plant likely to cause environmental impacts shall be carried out without obtaining prior Environment Clearance from the concerned authority.

76. The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act,1974 the Air (Prevention & Control of Pollution) Act 1981, the Environment (Protection) Act, 1986 and the Hazardous Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

77. The granting of Environment Clearance to the project by the SEIAA does not restrain or dilute any legal action to be initiated against SIL by any authority including the GPCB, for commencing the construction work and production without obtaining prior Environment Clearance.

78. The project proponent shall comply all the conditions mentioned in "The Companies (Corporate Social Responsibility Policy) Rules, 2014" and its amendments from time to time in a letter and spirit.

79. The project management shall ensure that Unit complies with all the environment protection measures, risk mitigation measures and safeguards recommended in the EMP report and Risk Assessment study report as well as proposed by project proponent.

80. The project authorities shall earmark adequate funds to implement the conditions stipulated by SEIAA as well as GPCB along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose.

81. The applicant shall inform the public that the project has been accorded environmental clearance by the SEIAA and that the copies of the clearance letter are available with the GPCB and may also be seen at the Website of SEIAA/ SEAC/

GPCB. This shall be advertised within seven days from the date of the clearance letter, in at least two local newspapers that are widely circulated in the region, one of which shall be in the Gujarati language and the other in English. A copy each of the same shall be forwarded to the concerned Regional Office of the Ministry.

82. The project proponent shall also comply with any additional condition that may be imposed by the SEAC or the SEIAA or any other competent authority for the purpose of the environmental protection and management.
83. It shall be mandatory for the project management to submit half-yearly compliance report in respect of the stipulated prior environmental clearance terms and conditions in soft copies to the regulatory authority concerned, on 1st June and 1st December of each calendar year.
84. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
85. The project authorities shall also adhere to the stipulations made by the Gujarat Pollution Control Board.
86. The SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not found satisfactory.
87. The company in a time bound manner shall implement these conditions. The SEIAA reserves the right to stipulate additional conditions, if the same is found necessary.
88. The project authorities shall inform the GPCB, Regional Office of MoEF and SEIAA about the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.
89. This environmental clearance is valid for seven years from the date of issue.
90. Any appeal against this environmental clearance shall lie with the National Green Tribunal if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.
91. Submission of any false or misleading information or data which is material to screening or scoping or appraisal or decision on the application makes this environment clearance cancelled.

With regards,
Yours sincerely,

(S. M. SAIYAD)
Member Secretary

Issued to:
M/s. Sanghi Industries Limited
19th Floor, Kataria Arcade, Off S G Highway
PO: Makarba, Ahmedabad- 380051

SEIAA

Minutes of the 253rd Meeting held on 16th July 2019 at 09.00 A.M.

The 253rd meeting of the State Level Environment Impact Assessment Authority (SEIAA) was held under the Chairmanship of Shri C. L. Meena at Gujarat Pollution Control Board, Gandhinagar. Prof. G.H. Ban, Member of SEIAA and Shri S. M. Saiyad, Member Secretary of the State Level Environment Impact Assessment Authority (SEIAA) attended the meeting.

The following cases were taken up during the meeting:-

1	**Macson Products** Plot No. 2424/2426, Sachin GIDC, Surat	Synthetic Organic Chemical Industry – 5(f)	Surat
2	**Sanghi Industries Limited** Survey No 125/1, 125/2 and 126/1+2+3, Vil. Shivrampur, Ta. Choryasi, Surat	Cement Industry – 3(b)	Surat
3	**K. Patel Chemo Pharma Pvt. Ltd. (Unit No. -2)** Plot No. 408/6 to 408/23 (except plot no. 408/10 & 408/11), Notified GIDC Industrial Estate, Panoli, Ta. Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
4	**Amita Chemical Industries** Plot No. 4784, GIDC Estate, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
5	**Galaxy Chemi Science** Plot No. 10008/2, GIDC Estate, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
6	**Maitri Pharma** Plot No. 25/10, GIDC Jhagadia, Nr. Pepsico India Pvt. Ltd., Industrial Estate, Jhagadia, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
7	**Mahek Life Science** Plot No. 2329, GIDC Industrial Estate, Panoli, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
8	**Charon Pharma Chem Industries** Survey No. 183, Hardesan, Mehsana	Synthetic Organic Chemical Industry – 5(f)	Mehsana
9	**Abad Chemicals** Plot No. 4774-4775, GIDC Estate, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
10	**Dutt Chemicals** Plot No. 308/3/2, 308/1, 308/2, GIDC Phase-II, GIDC Vatva, Ahmedabad	Synthetic Organic Chemical Industry – 5(f)	Ahmedabad

Having carefully considered the relevant aspects, the following decisions were taken:-

1) Macson Products, Dist. Surat

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

2) Sanghi Industries Limited, Dist. Surat

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

3) K. Patel Chemo Pharma Pvt. Ltd. (Unit No. -2), Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

SEIAA State Level Environment Impact Assessment Authority Gujarat

4) Amita Chemical Industries, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

5) Galaxy Chemi Science, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

6) Mektr Pharma, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

7) Mahek Life Science, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

8) Charon Pharma Chem Industries, Dist. Vahsana

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

9) Abse Chemicals, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

10) Dutt Chemicals, Dist. Ahmedabad

- After detailed discussion, it was decided to grant Terms of Reference as recommended by the SEAC.

Sr. No.	NAME	DESIGNATION	SIGNATURE
1.	Shri C. L. Meena	Chairman	
2.	Prof. G. H. Ban	Member	
3.	Shri S. M. Saiyad	Member Secretary	

Item No. 02 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Appeal No. 36/2020
(Earlier Appeal No. 66/2019 (WZ))

Larsen & Toubro Limited Appellant

Versus

Sanghi Industries Limited & Ors. Respondent(s)

Date of hearing: 06.01.2021
Date of uploading of order: 22.01.2021

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

ORDER

1. This appeal has been preferred against order dated 23.08.2019 of the State Level Environment Impact Assessment Authority (SEIAA), Gujarat, granting Environmental Clearance (EC) to M/s. Sanghi Industries Limited for setting up of stand-alone Cement grinding unit at Survey No. 125/1 and 126/1+2+3, Village Shivrampur, Ta: Choryasi, Distt.: Surat in category 3(b) of Schedule annexed with Environment Impact Assessment (EIA) Notification dated 14.09.2006.

2. The appellant is a company engaged in construction, manufacturing and other industrial/commercial activities. Its grievance is that the project in question will have hazardous impact on Hazira Manufacturing Complex where the appellant is manufacturing defence equipments. The said industrial area at Surat is 'polluted industrial area' classified as such based on data of air water and soil quality, called 'comprehensive

environment pollution index' (CEPI). The unit is of 'red' category in terms of categorisation of industries based on level of contribution to pollution under the Environment (Protection) Rules. EC has been granted without consideration of crucial aspects such as air emissions, water availability, wildlife etc.

3. The appeal was filed on 20.09.2019. Notice was issued on 26.09.2019. The appeal was allowed to be amended on 24.10.2019. IA No. 28/2020 has been filed by the interveners viz. the village Panchayat. IA No. 131/2019 has been filed by the appellant for production of documents relating to compliance status of main cement unit of the project proponent at Kutch in terms of environmental norms.

4. By way of amendment, the appellant has brought on record proceedings of public hearing dated 22.03.2019 wherein, among others, questions with regard to generation of dust from the plant, capacity of the road and source of water were raised. According to the appellant, such concerns relating to increased air and water pollution have not been addressed. The appellant has also pointed out discrepancies in the EIA report. It is submitted that neither the EIA report explains potential of compliance with the environmental norms nor State Environment Assessment Committee (SEAC) and SEIAA have given any reasons from which possibility of such compliance can be inferred. The proceedings do now show application of mind on the environmental consequences and the EC has been granted in a mechanical manner.

5. There are mangroves in the area but the project proponent concealed the said information in application Form I. Similarly, there is reserve forest area which will be impacted which has not been mentioned. 2 Million Tonnes Per Annum (MTPA) cement is proposed to be grinded

which will require raw material including clinker, gypsum, fly ash, slag which has to be transported, involving movement of huge number of trucks. We made a reference to Table 4.17 in the EIA report showing the truck/tanker capacity and the frequency of trucks per day. The said table is reproduced in para 15 of this order. Though EC mentions that only 363 trucks will be permitted for transporting 278,000 liters water per day (as per specific condition no. 47), atleast 799 canters per day will be required. The land allotted is total 12 acres, out of which 33% is to be green area (as per specific condition no. 67 of the EC) Condition no. 67 of the specific conditions mentions that if land for green belt is not available, plantation can be in open land on road sides. The condition is as follows:

> *"67. The SIL shall develop green belt within the factory premises as per the CPCB guidelines,* ***consisting of at least three rows of trees of local species on periphery. However, if the adequate land is not available within the premises, the SIL shall take up adequate plantation at suitable open land on road sides and other open areas in nearby locality or schools in consultation with the Gram Panchayat/GPCB and submit an action plan of plantation for next three years to the GPCB."***

6. There is no provision in the EIA for space for parking for the trucks and other vehicles. Shifting of green belt outside the factory complex will defeat the object of mitigation of pollution. The industrial area in question is polluted industrial area which has no capacity for any further polluting activities as held in the order of this Tribunal dated 10.07.2019 in OA No. 1038/2018, *News item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels".*

7. The project proponent-Respondent No. 1 has filed reply by stating that it has state of art facilities to adhere to the environmental norms. The mangroves have been duly disclosed in the EIA report. The project is at a distance of 1.3 km from the mangroves. The Krishak Bharati Cooperative

Ltd. (KRIBHCO) has agreed to supply water through irrigation pipelines. The water requirement will be partly met by recycling.

8. Reply of the SEIAA, Gujarat is that EC has been granted based on EIA report furnished by the project proponent. Undertaking was given not to use lignite and pet coke which is not permissible fuel. The project was considered by the SEAC in the meeting held on 12.06.2019 in continuation of meeting held on 16.04.2019. The project proponent explained mitigation measures against the emissions on which the members of SEAC were satisfied and on their recommendation SEIAA granted EC on 16.7.2019. Relevant extract from the reply of SEIAA is:

> *" xxx xxx*
> *12. I say that the answering respondent authority after receiving the recommendation considered the same alongwith the relevant material at its meeting held on 16.07.2019. A true copy of the minutes of the meeting of the respondent authority held on 16.07.2019 is annexed herewith and marked as Annexure R4. Being satisfied with the recommendation made by the Expert Appraisal Committee on the basis of the material and consideration of relevant aspects, the respondent authority decided to grant environment clearance for the proposed project. Accordingly, the clearance was issued on 23.08.2019."*

9. Relevant extracts from the minutes of the meetings of SEAC dated 16.04.2019 and 12.06.2019 are:

> ***"The 497th meeting of the State Level Expert Appraisal Committee (SEAC) was held on 16th April, 2019 at Gujarat Pollution Control Board, Sector 10-A, Gandhinagar.***
>
> *xxx xxx xxx*
>
> ***In view of the above, Committee unanimously decided to consider the proposal the proposal after submission of the following details:***
>
> *xxx xxx xxx*
>
> *iii.* ***Fugitive emission details with its mitigation measures****.*
> *Fugitive emission during raw material handling and feeding process and vehicle movements.*

Mitigation measures – High efficiency pulse air jet type bag filters will be considered to arrest the air borne dust at all the locations where transfer of material are takes place; The automatic bagging machine with bag filters will be installed for packing plant; unloading of coal trucks will be carried out with proper care avoiding dropping of the materials from height. Sprinklers will be installed in Raw Material/ Fuel Storage/Loading / Unloading areas. The sprinkling of water will be done along with internal roads in the plant in order to control the dust arising due to the movement of vehicular traffic; Proper maintenance of vehicles shall be carried out; All the workers inside the plant will be provided with disposable dust masks; thick greenbelt will be developed around the plant to arrest the fugitive emissions; and Periodic air quality monitoring shall be carried out as per CPCB/ SPCB norms etc.

xxx xxx xxx

***After deliberation, SEAC unanimously decided to consider the proposal after submission of the following details**:*

1. to 4. xxx xxx xxx

5. Sound APCM to control fugitive dust emission during raw material transportation, storage, handling, loading, unloading, transfer, fuel grinding etc."

xxx xxx xxx

"Minutes of the 514th meeting of the State Level Expert Appraisal Committee held on 12/06/2019 at Committee Room, Gujarat Pollution Control Board, Sector 10-A, Gandhinagar.

xxx xxx xxx

15	*SIA/GJ/IND2/ 30448/2018*	*M/s. Sanghi Industries Limited Survey No. 125/1, 125/2 and 126/1+2+3, Vill.: Shivrampur, Tal.: Choryasi, Distt.: Surat*	*Appraisal – Recommendation*

xxx xxx xxx

iii, ***Fugitive emission details with its mitigation measures:***

xxx xxx xxx

***On Road**:*

- *All internal roads used for transport of vehicles will be paved and maintained properly and repaired immediately when required.*
- *For prevention of road dust emission, speed will be restricted to 10 km/hr for heavy vehicles within the project premises.*

- *All preventive measures i.e. covering of trucks, paving and maintenance of internal roads will be adopted.*
- *Regular vacuum sweeping and water spraying will be done on the internal roads.*
- *Proper maintenance of vehicles will be carried out."*

10. The minutes of the meeting of SEIAA dated 16.07.2019 are:

> ***"Minutes of the 253rd Meeting held on 16th July, 2019 at 09:00 A.M.***
>
> *The 253rd meeting of the State Level Environment Impact Assessment Authority (SEIAA) was held under the Chairmanship of Shri C.L. Meena at Gujarat Pollution Control Board, Gandhinagar. Prof. G.H. Ban, Member of SEIAA and Shri S.M. Saiyad, Member Secretary of the State Level Environment Impact Assessment Authority (SEIAA) attended the meeting.*
>
> *xxx* *xxx* *xxx*
>
> ***2) Sanghi Industries Limited, Dist. Surat***
>
> - ***After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC."***

11. The stand of the Ministry of Defence is that L&T facility is only a defence manufacturing facility and not a defence establishment. Thus, Works of Defence Act, 1903, prohibiting activities within a particular distance therefrom, does not apply.

12. We have heard Shri Raj Panjwani, learned Senior Counsel for the appellant, Shri Pinaki Mishra, learned Senior Counsel for Respondent No. 1 and Shri Maulik Nanavati, learned Counsel for SEIAA, Gujarat and perused the documents on record, with their assistance. We have also perused the written submissions filed by the parties in pursuance of order dated 06.01.2021 passed on conclusion of the hearing. In view of the fact that we are giving liberty to the parties to file written submissions before the CPCB for consideration of the Committee to which the matter is being referred, we do not find it necessary to make any comment on the said

submissions, beyond the comment on the rival contentions already raised before the Tribunal.

13. Shri Panjwani has drawn our attention to Form I, the EIA and the minutes of the SEAC. He pointed out contradictions in the information in the EIA compared to the information furnished in Form-1, particularly with regard to the mangroves, forests and birds. From the EIA documents, it is pointed out that the project proponent is one of largest cement plants at Kutch while the present project is proposed as grinding unit at Hazira Industrial Zone, Village Shivrampur, Taluka-Choryasi, District-Surat, Gujarat. The land procured for the purpose is 4.856 hectare for use as per following break-up:

"Table 2.7 Land Breakup of Cement Grinding Unit

#	*Particulars*	*Total Area (in Ha.)*	*Area*
1.	*Production Plant*	*0.712*	*14.66%*
2.	*Office & Lab Area*	*0.022*	*0.46%*
3.	*Raw Material Storage Area*	*0.632*	*13.01%*
4.	*Solid Waste Storage Area*	*0.005*	*0.10%*
5.	*Open Space*	*1.835*	*37.79%*
6.	*Green Belt*	*1.650*	*33.98%*
	Total	***4.856***	***100.00%***

"

In the above break up, there is no provision for parking of large number of trucks to be used for about 800 trips per day for transporting material and other trucks for transporting water.

14. The main raw material i.e. clinker is to be transported from Kutch plant by sea/road as per statement in the EIA as follows:

> ***"2.6.3 Transportation & Storage of Raw Material***
>
> *The clinker shall be transported from Sanghipuram (IU) to Surat GU mainly by sea. Clinker shall be extracted from the Clinker load out silos at IU, transported to the captive Jetty of SIL by trucks and loaded on to the barges by grab cranes. Barges shall transport the Clinker to*

the ship stationed at high seas. ***At Surat, the Clinker shall be unloaded from the ship at nearest port and transported to the Surat GU site by trucks. The clinker received through self-tipping trucks shall be unloaded by into a box feeder and transported to clinker storage silo through conveyor and elevator. The clinker storage has been envisaged in RCC silos of capacity 50,000 Ton, adequate for about 10 day requirement of the plant. Clinker shall be extracted from the bottom of the clinker silos and fed to the clinker hoppers in the cement grinding section through a belt conveyors and elevator****."*

15. Under the heading 'air environment', the EIA mentions as follows:

"Table-4.17: Incoming & Outgoing Transportation

Incoming Raw Material Transportation							
S.No.	***Raw Material***		***Quantity TPA***	***Quantity TPD***	***Source***	***Mode of Transport***	***No. of vehicles (Truck/day)***
1.	*Clinker*		*2000000*	*6061*	*Captive*	*Sea*	*184*
2.	*Additives like Gypsum, Fly Ash, Slag*				*Purchase*	*Road*	
	Fuel		*60000*	*182*	*Purchase*	*Road*	
Total No. of Trucks deployed/day will be							***184***
Outgoing Product Transportation							
S. No.	***Product***	***Quality Million TPA***	***Quantity TPA***	***Quantity TPD***	***Source***	***Mode of Transport***	***No. of vehicles (Truck/day)***
1.	*Cement*	*2.0*	*2000000*	*6061*	*Captive*	*Road/Sea*	*179*
Total No. of Trucks deployed/day will be							***363***

Frequency of Vehicles:

Total Capacity (Fuel, Clinker, Fly ash)	*40, 60,000 TPA*
No. of working days	*330*
Transportation of incoming and outgoing material	*12303 Tons/day*
Working hours per day	*24 hours (3 shifts)*
Truck/Tanker Capacity	*34 Tons*
Frequency of trucks/day (92 No. × 4 trips/day × 2 (up/down)	*363 ×2*
Frequency of trucks deployed/hr	*16*
Increase in PCU/hr	*16× 3 = 48*

"

16. The mode of transportation mentioned in para 5.3 of the EIA is as follows:

"5.3 ALTERNATIVE FOR TECHNOLOGY AND OTHER PARAMETERS

xxx *xxx* *xxx*

S. No.	***Site Particular***	***Alternative Option 1***	***Alternative Option 2***	***Remarks***
1 to 6	*xxx*	*xxx*	*Xxx*	*Xxx*
7.	*Road*	*Metallic Road*	*Kachcha Road*	*The road is well furnished. Most of*

				the raw material and fuel will be transported through ship (sea route)

17. Under the hearing mitigation measures, table 2.13 is as follows:

"Table 2.13: Aspects & Impacts Analysis

Activity	***Environmental Attribute***	***Cause***	***Impact Characteristics***			
			Nature	***Duration***	***Reversibility***	***Intensity and Significance***
Vehicles Movement and utilities operation	*Air quality*	*Exhaust Emissions i.e. NO_X, SO_2, Fugitive emission*	*Negative*	*Short Term*	*Reversible*	*Low, due to movement of vehicle only for loading and unloading of raw material. Provision of APC's.*
	Noise Levels	*Noise Generation*	*Negative*	*Short Term*	*Reversible*	*Low, due to limited activity*
	Risk & Hazards	*Accidents, collision of transport vehicles*	*Negative*	*Short Term*	*Reversible*	*Medium due to loss of property and injury to manpower.*

"

18. Conclusions in the EIA report are:

"11.5 Conclusion

Based on the EIA study conducted in Post Monsoon of 2018 (Oct. to Dec. 2018) and as per terms of reference given by SEAC, the following highlights emerge:

- *There will be minimal pollution potential on air, water and noise environment, which, with the implementation of the mitigation measures and EMP, can be reduced considerably.*
- *The proposed project activities will have positive beneficial effect on the local population, economic output and other related facilities viz. employment, development of business, transportation etc.*
- *Risk assessment including emergency response plan and DMP has been prepared to handle any sort of emergencies.*
- *Looking to the overall project justification, process, pollution potential and pollution prevention measures/technologies installed by proponent, environmental management activities of proponent; the proposed project would be environmentally acceptable, in compliance with environmental legislation and standards.*

> *Hence, looking to the overall project justification, process, pollution potential and pollution prevention, measures/technologies installed by proponent, environmental management activities of proponent,* ***it has been concluded that the proposed project would not have any considerable impacts on environment as well as socio-economic and ecological conditions of the project area. Hence proposed grinding unit at Shivrampur, Hazira is considered environmentally safe."***

19. Learned Counsel for the appellants has then referred to documents filed with IA No. 8/2020 and documents filed on 18.11.2020 by the intervener – Suvali Gram Panchayat. In para 15 of the reply filed by Suvali Gram Panchayat, it is mentioned that the project is in violation of Comprehensive General Development Control Regulations (CGDCR) notified by the State Government on 12.10.2017 under the Gujarat Town Planning and Urban Development Act, 1976. The CGDCR classify different zones for the permissible activities also specify negative list of activities. According to the said regulations, there is prohibition of Obnoxious & Hazardous industries in general industrial zone.

20. On being called upon, the learned Counsel for the project proponent as well as learned Counsel for the SEIAA were unable to show any discussion in the minutes of the SEAC or any material which may reflect application of mind to the assessment of impact of dust generation during the transportation and mitigation measures against the same. Beyond saying that provision has been made for covering the vehicles during transport and sprinkling of water, it has not shown as to how generation of dust and causing of noise pollution by movement of large number of heavy vehicles will be neutralized, given the carrying and load bearing capacity of the Panchayat road in question.

21. In view of above, we find that the precautionary principle, for which EIA is conducted, remains to be addressed. As held in Hanuman Laxman

Aroskar v. Union of India[1], the object of EIA is to ensure that all concerns affecting the environment are duly taken care of. Thus, the impugned EC cannot be sustained until the environmental concerns are duly addressed. We are informed that the project has not yet commenced. Even learned Counsel for the project proponent and the SEIAA fairly accepted this factual position.

22. Accordingly, we refer the issue of assessment of carrying and load bearing capacity of the Panchayat road in question and evaluation of EIA and EMP prepared by the project proponent to the EAC of the MoEF&CC dealing with the cement plants, alongwith the representatives of CPCB, NEERI and IIT Mumbai. The CPCB will be the nodal agency for coordination and compliance. Coordination with the EAC may be through the MoEF&CC. The Committee may assess how generation of dust and causing of noise pollution by movement of large number of heavy vehicles will be neutralized, given the carrying and load bearing capacity of the Panchayat road in question. The Expert Committee may furnish its report to this Tribunal within three months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF.

23. The appellant, the Suveli Gram Panchayat and the project proponent may file their respective written submissions to the CPCB within two weeks for consideration by the Committee.

A copy of this order be forwarded to the MoEF&CC, CPCB, NEERI and IIT Mumbai by e-mail for compliance.

[1] (2019) 15 SCC 401

List for further consideration on 14.07.2021.

Adarsh Kumar Goel, CP

S.K. Singh, JM

Dr. Nagin Nanda, EM

January 22, 2021
Appeal No. 36/2020
(Earlier Appeal No. 66/2019 (WZ))
DV

ANNEXURE 3

Gujarat Pollution Control Board
Paryavaran Bhavan, Sector-10-A
Gandhinagar

Office Order

Sub: **Mechanism for environmental management of critically and severally Polluted Area and considerations of activities/Projects in such areas in compliance to Hon'ble NGT order dated 23/08/2019 in the matter of O.A. No. 1038/2018-reg.**

With reference to CPCB letter no. CPCB/IPC-VII/CEPI/NGT/2019 dated 25/10/2019 mechanism prepared by MoEF&CC for grant Consent to Establishment/Consent to Operate to those projects / activities of Red / Orange categories located in CPAs/ SPAs which are not covered under the provisions of the EIA notification,2006 are delineated.

Accordingly, it is required to prescribe the additional conditions deemed fit in the CTE / CTO of the projects / activities of Red/ Orange categories in the CPAs / SPAs of Gujarat.

After detailed discussion with industries associations of the CPA / SPAs of Gujarat and consultation with other stakeholders, it is decided to prescribe following additional conditions (deemed fit on case to case basis) considering the framework given in the letter of CPCB dated 25/10/2019.

These additional conditions will be applicable to the following CPAs/ SPAs of the Gujarat. Considering the mechanism, the 5 km from the boundary of each CPA/ SPA should be considered as the area of influence and the additional conditions stipulated for the new / expansion project will be made applicable to all such projects in this area. Map of the respective areas obtained from BISAG is enclosed herewith as Annexure-1.

1. Vapi GIDC Estate
2. Sachin & Pandesara GIDC Estate (Considering monitoring carried out by CPCB in these areas)
3. Ankleshwar Cluster (Ankleshwar and Panoli GIDC estate)
4. Nandesari GIDC & PCC Area (Considering monitoring carried out by CPCB in these areas)
5. Vatva- Narol

6. Aji GIDC estate (Rajkot)

7. Chitra GIDC estate (Bhavnagar)

Specific Conditions stipulated in Critically Polluted Areas (CPA) / Severely Polluted Areas (SPA).

Additional conditions under Air Act:

a) Unit shall adhere to stringent air pollutants standards i.e. 80 % of existing flue gas and process emission standards in the CPA.

b) Unit shall adhere to stringent air pollutants standards i.e. 90 % of existing flue gas and process emission standards in the SPA.

c) Following air pollution control measures shall be provided for the flue gas emission sources like Boiler, Thermic Fluid Heaters etc. (As Applicable)

Stipulated APCM in Red / Orange category industrial units of CPA/ SPA	
Steam generation capacity (in TPH)	**Type of APCM**
Less than 1	Multi Cyclone
1 to <3	Multi Cyclone + Water Scrubber
3 to <6	Bag filter + Water Scrubber
≥ 6	ESP+ Water Scrubber

d) Unit shall provide at least two stage scrubbing system of appropriate media for the control of the process gas emission.

e) Unit shall install and commission Continuous Emission Monitoring System- CEMS (as per CPCB guidelines for relevant parameters) which shall be connected with GPCB/CPCB server (in case of large and medium red category industries)

f) All common facilities shall install CEMS (as per CPCB guidelines for relevant parameters) which shall be connected with GPCB/CPCB server to the Stacks provided with Common Multiple Effect Evaporator (CMEE), Common Spray Dryer, Common incinerator etc.

g) The unit shall adhere to Sector specific guidelines/ SOP published by GPCB / CPCB from time to time for effective fugitive emission control. (like guidelines for: Stone crushing units, Coal handling units, spent solvent handling and management, spent acid management, Decontamination of drums, containers etc.)

h) Unit shall take adequate measures to control odour nuisance from the industrial activities which may include measures like- use of masking agent with atomizer system (water curtain), closed / automatic material handling system, containment of the odour vulnerable areas etc.
i) Unit shall not use Pet-coke, furnace oil, LSHS as a fuel.
j) Unit shall adopt sectoral Best Available Technology-BAT (Like Use of Induction Furnace, Electric Arc Furnace instead of Cupola furnace in foundry industry, Caustic Recovery System in Cotton Textile units etc.)
k) Unit shall provide green belt of 40% of the plot area, using concept of the social forestry and development of green belt outside project premises in adjacent areas.
l) Unit shall provide Wall to Wall carpeting in vehicle movement areas within premises to avoid dusting.

Additional conditions under the Water Act:

1. Unit shall only use treated effluent for preparation of lime and other slurry in ETP. No fresh water shall be utilized in ETP.

2. In the case, if the Industry is not a member of CETP and domestic waste water generation is more than 10 KLPD, industry shall install STP of adequate capacity and treated sewage shall be reused / recycled to the maximum extent.

3. In case of Large and Medium Red Category industry, the unit shall install system for continuous monitoring of effluent quality / quantity as per CPCB guidelines for relevant parameters (like pH, Flow, Temperature, TOC/COD, NH_3-N etc.) and shall be connected to GPCB server. In case, if the industry is a member of CETP, unit shall install flow meter.

4. If the water consumption of the unit is more than 50 KLPD, Unit shall submit detailed water harvesting plan (off site).

5. The unit shall explore Techno-Economic feasibility of Zero Liquid Discharge (ZLD) and if feasible, ZLD should be adopted.

Additional conditions under the Hazardous Waste Management Rules:

1. Unit shall strictly carry out handling, storage and disposal of fly-ash, slag, red-mud, de-inking sludge etc. (High Volume- Low Effect Wastes) as per prevailing guidelines and its disposal at designated locations approved by the Board.

2. Industry shall dispose its hazardous wastes through co-processing, pre-processing to the extent possible prior its disposal to incineration/ landfill as per provisions of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

3. Industry shall strictly comply with all the measures specified in guidelines for spent solvent management, spent acid management, and other guidelines/directions published from time to time by GPCB and/or CPCB, etc.

4. Unit shall carry out transportation of hazardous wastes through GPS mounted vehicles only.

Other General Conditions:

1. Unit shall submit report of compliance of the conditions of EC every year to the Board prepared by third party.

2. Unit shall enhance CER fund allocation to at least 1.5 times the slabs given in the OM dated 01.05.2018 for SPA and 2 times for CPA in case of Environmental Clearance.

You are required to prescribe relevant additional conditions as above henceforth while granting CTE / CTO of Red / Orange categories located in CPAs/ SPAs.

(N.M.Tabhani)
Member Secretary

No. GPCB/P-1/CEPI-12/ 572652

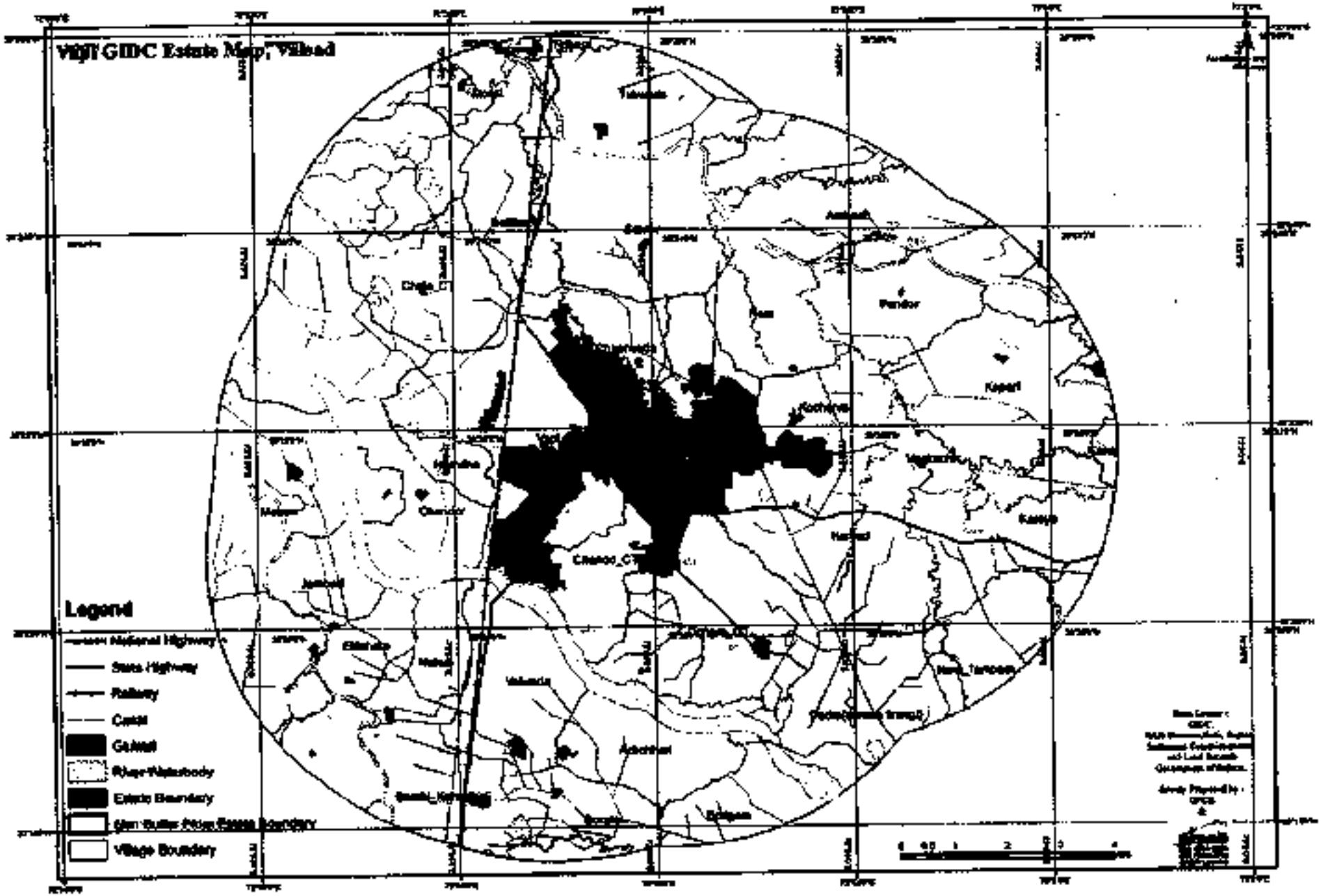
Date: 11.11.2019

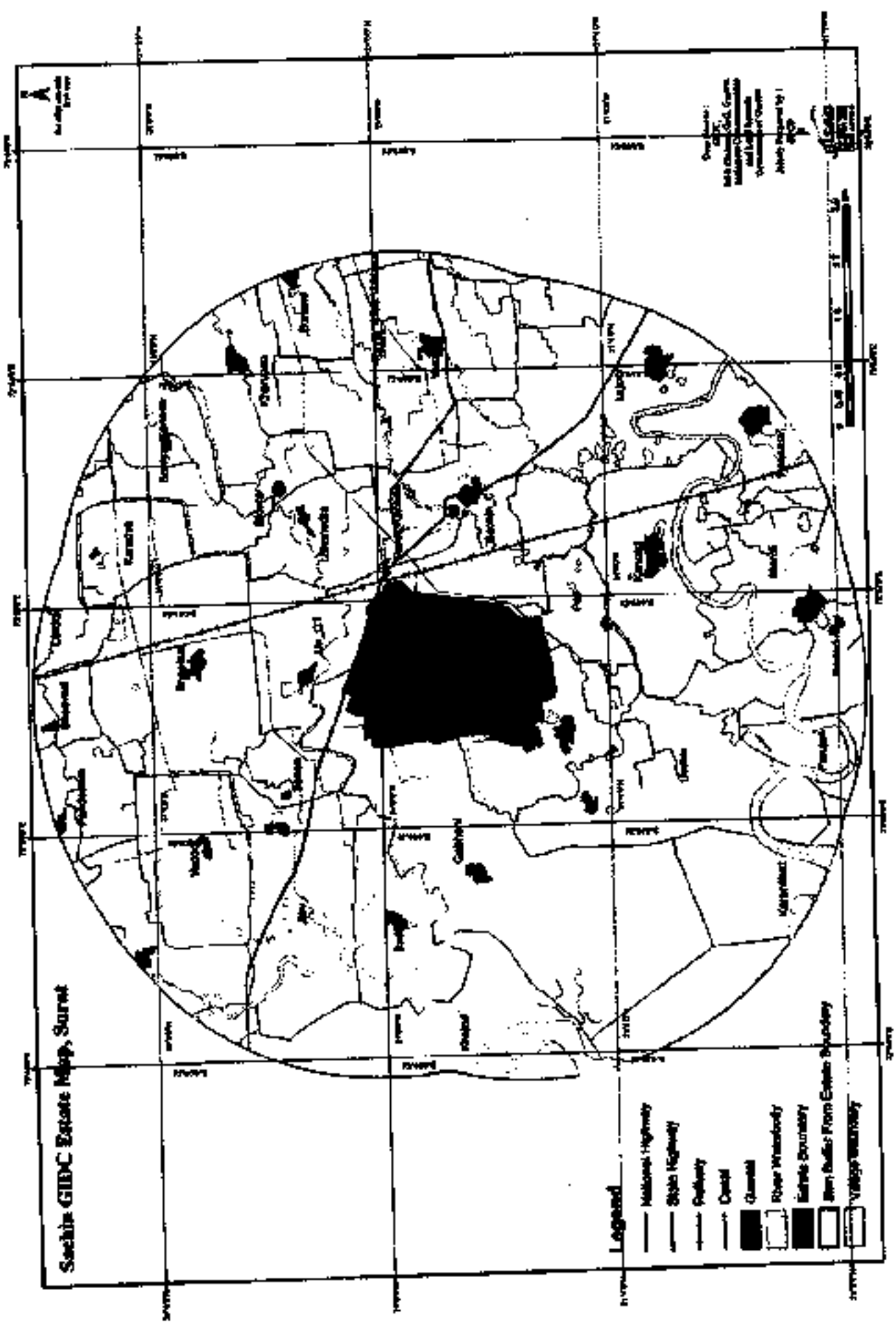
To,

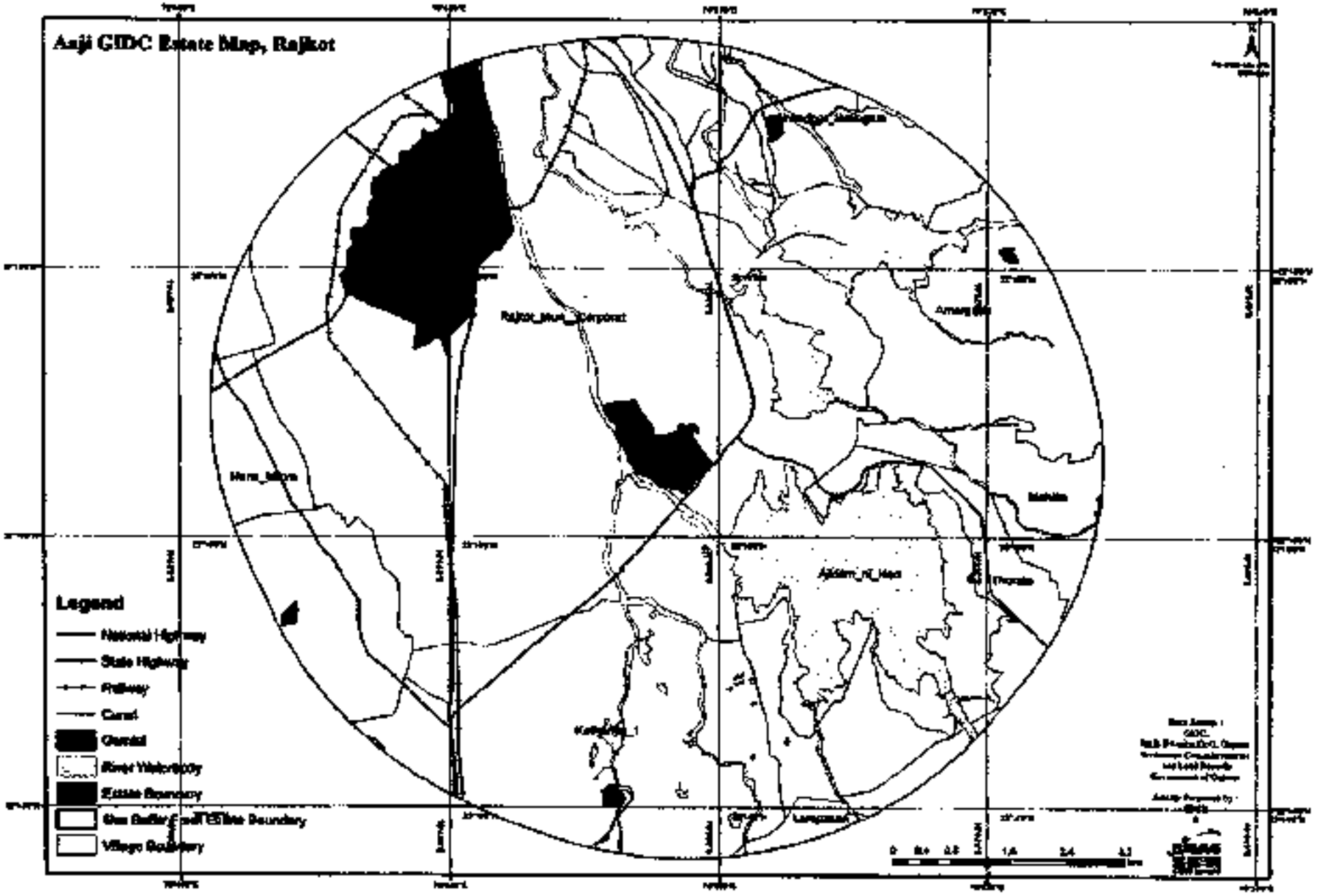
1. All Unit Heads
2. All Regional Officers...For necessary action please.

Copy to:

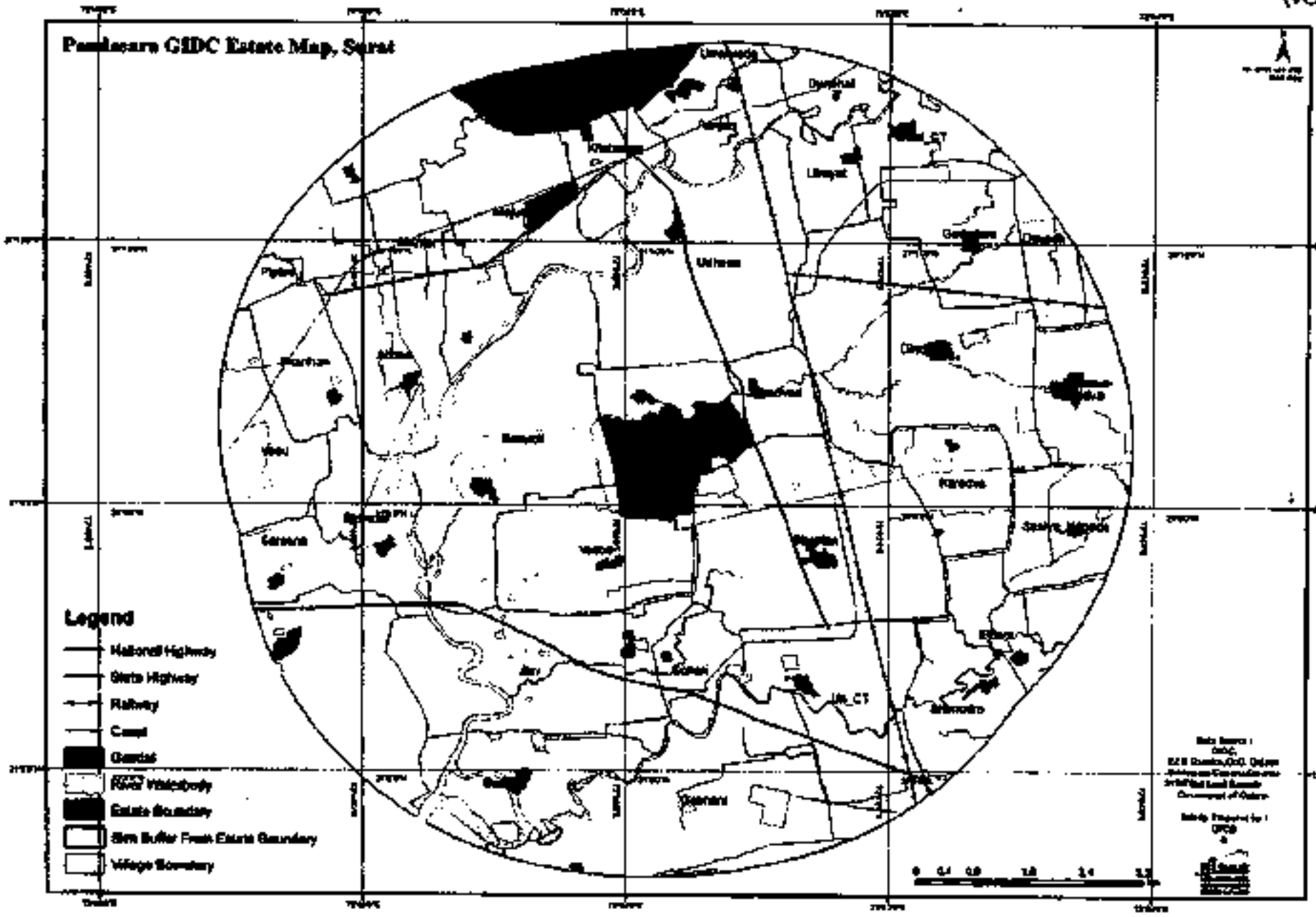
1. Chairman Office
2. Member Secretary Office
3. All Vigilance Officers... for necessary action
4. Respective File
5. IT Cell-for display on Board Website.


Vapi GIDC Estate Map, Vilsad
Legend
National Highway
State Highway
Railway
Canal
GIDC
River/Waterbody
Estate Boundary
Village Boundary


Sachin GIDC Estate Map, Surat
Legend
National Highway
State Highway
Railway
Canal
River/Waterbody
Estate Boundary
Non Notified Area Estate Boundary
Village Boundary


Aaji GIDC Estate Map, Rajkot
Legend
Village Boundary

Chitra GIDC Estate Map, Bhavnagar
Legend
Bhavnagar_Dist_Code


Pandesara GIDC Estate Map, Surat
Legend
National Highway
State Highway
Railway
Canal
Gandat
River/ Waterbody
Estate Boundary
Site Buffer From Estate Boundary
Village Boundary

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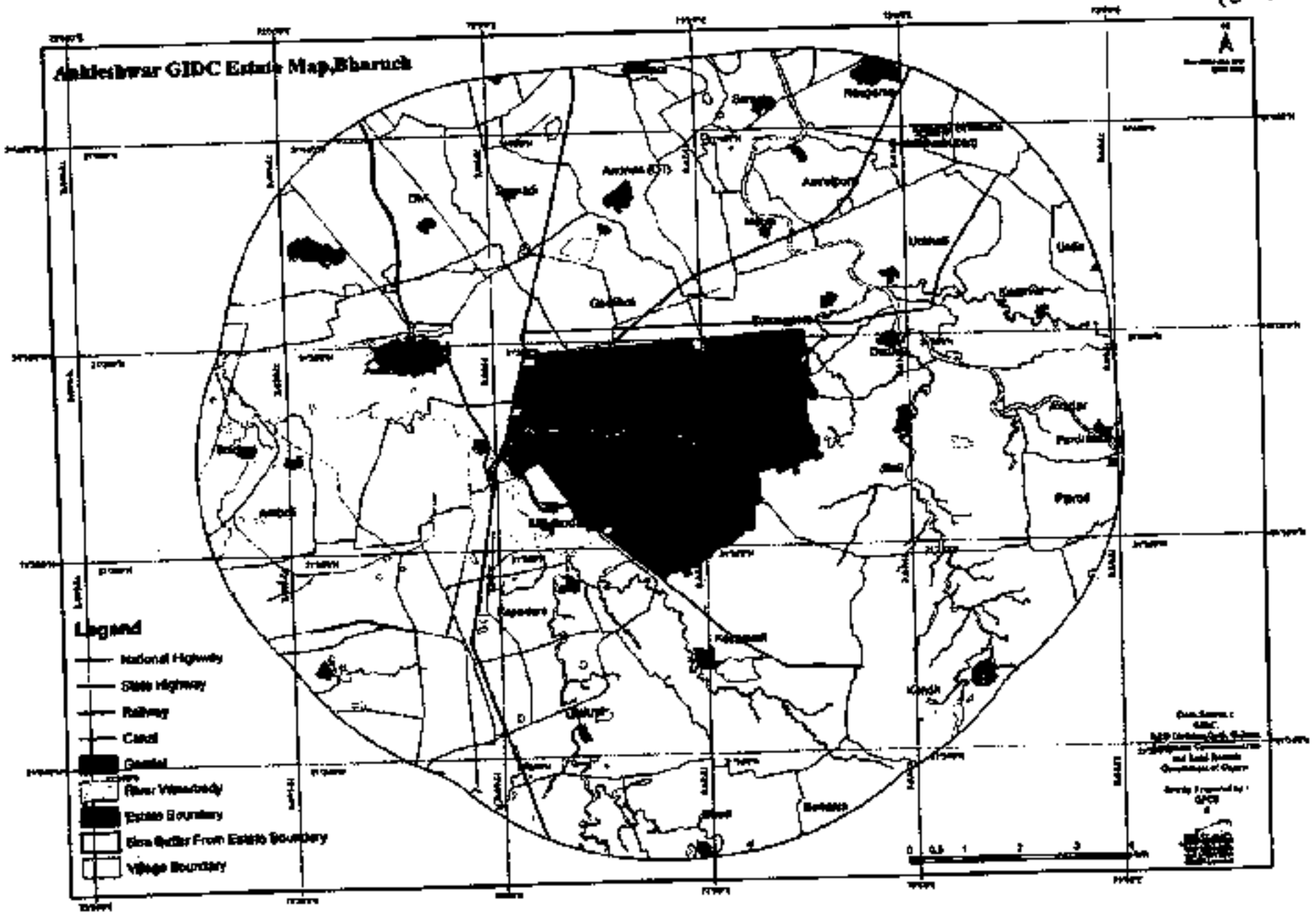
Ankleshwar GIDC Estate Map,Bharuch
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National Highway
State Highway
Railway
Canal
Coastal
River Waterbody
Estate Boundary
Buffer From Estate Boundary
Village Boundary

132/c

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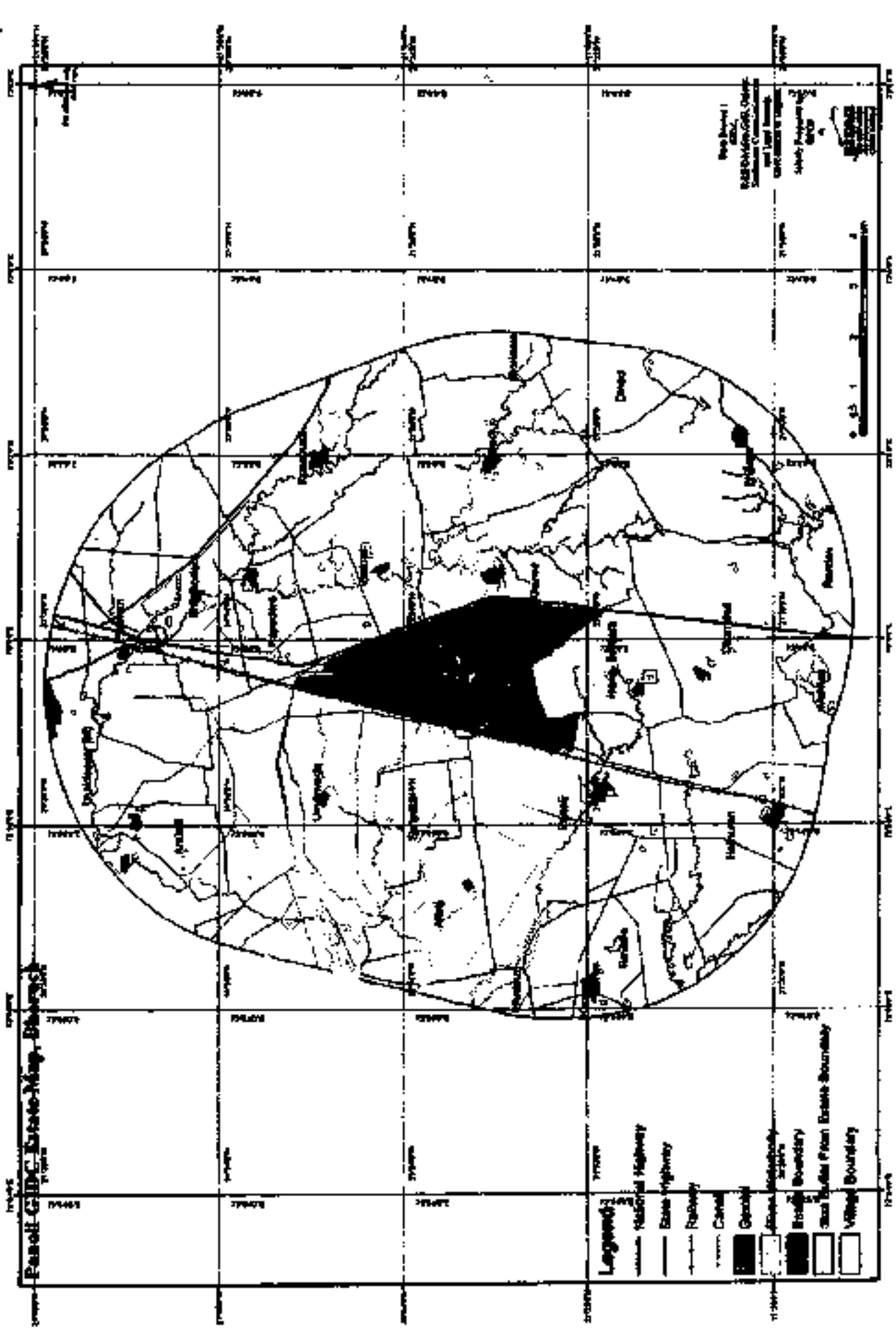
Panoli GIDC Taluka Map, Bharuch
Legend
National Highway
State Highway
Railway
Canal
Gauchi
Area Under Industries
Taluka Boundary
Sea Buffer From State Boundary
Village Boundary

Legend
Village Boundary
Taluka Boundary
Dist. Boundary
Canal
Railway
State Highway
National Highway
Vadodara
Padra
Karjan
Savli
Dabhoi
Chhotaudepur
Jambusar
Bharuch
Ankleshwar
Jhagadia
Vagra
Amod
Sanjeli
Narmada
Dediapada
Tilakwada
Nandod
Rajpipla
Sagbara
Valia
Jhagadia
Ankleshwar
Bharuch
Jambusar
Vagra
Chhotaudepur
Kavant
Sankheda
Dabhoi
Savli
Padra
Vadodara
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Dediapada
Sagbara
Valia
Amod
Sanjeli
Narmada

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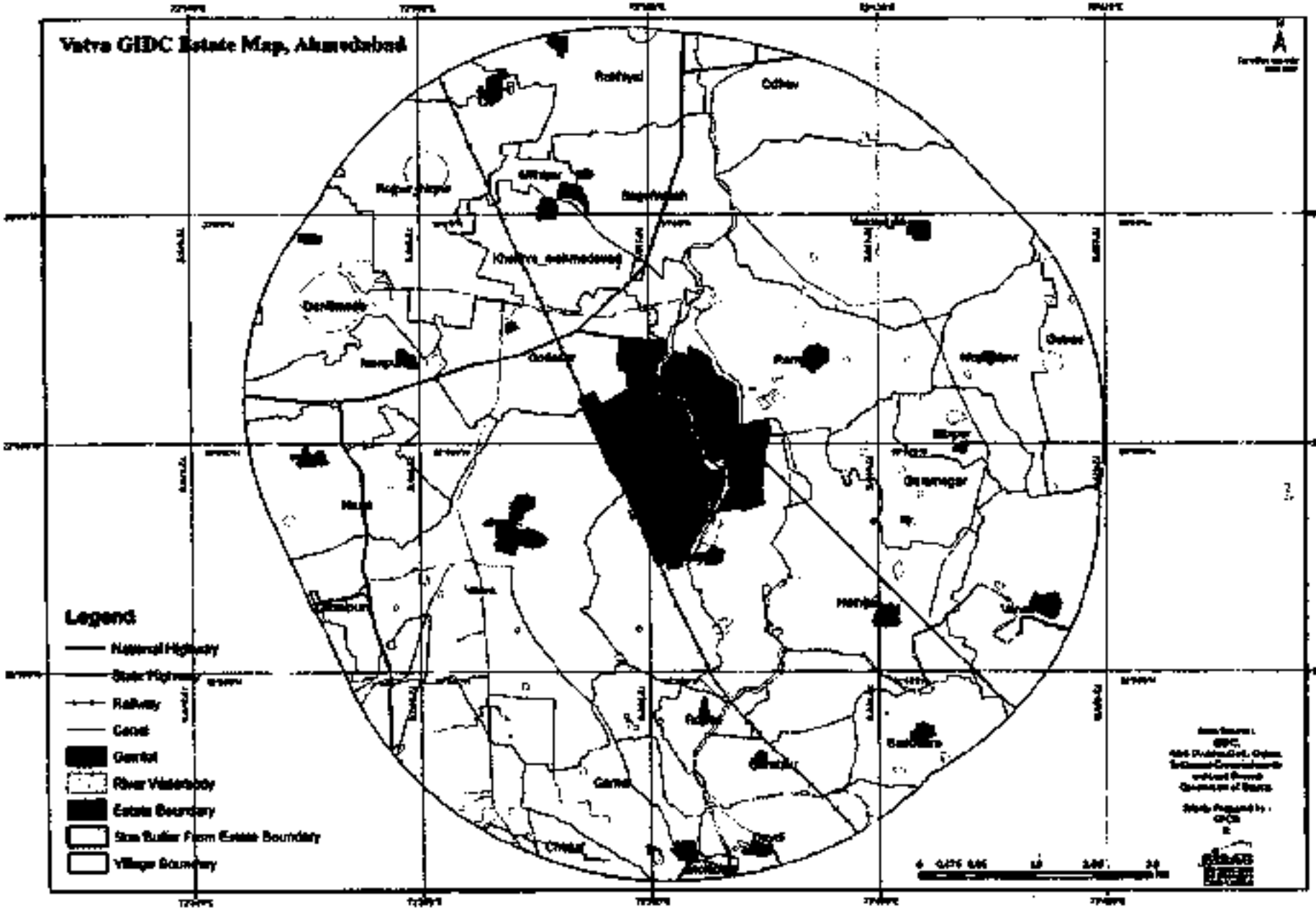
151/C


Vatva GIDC Estate Map, Ahmedabad
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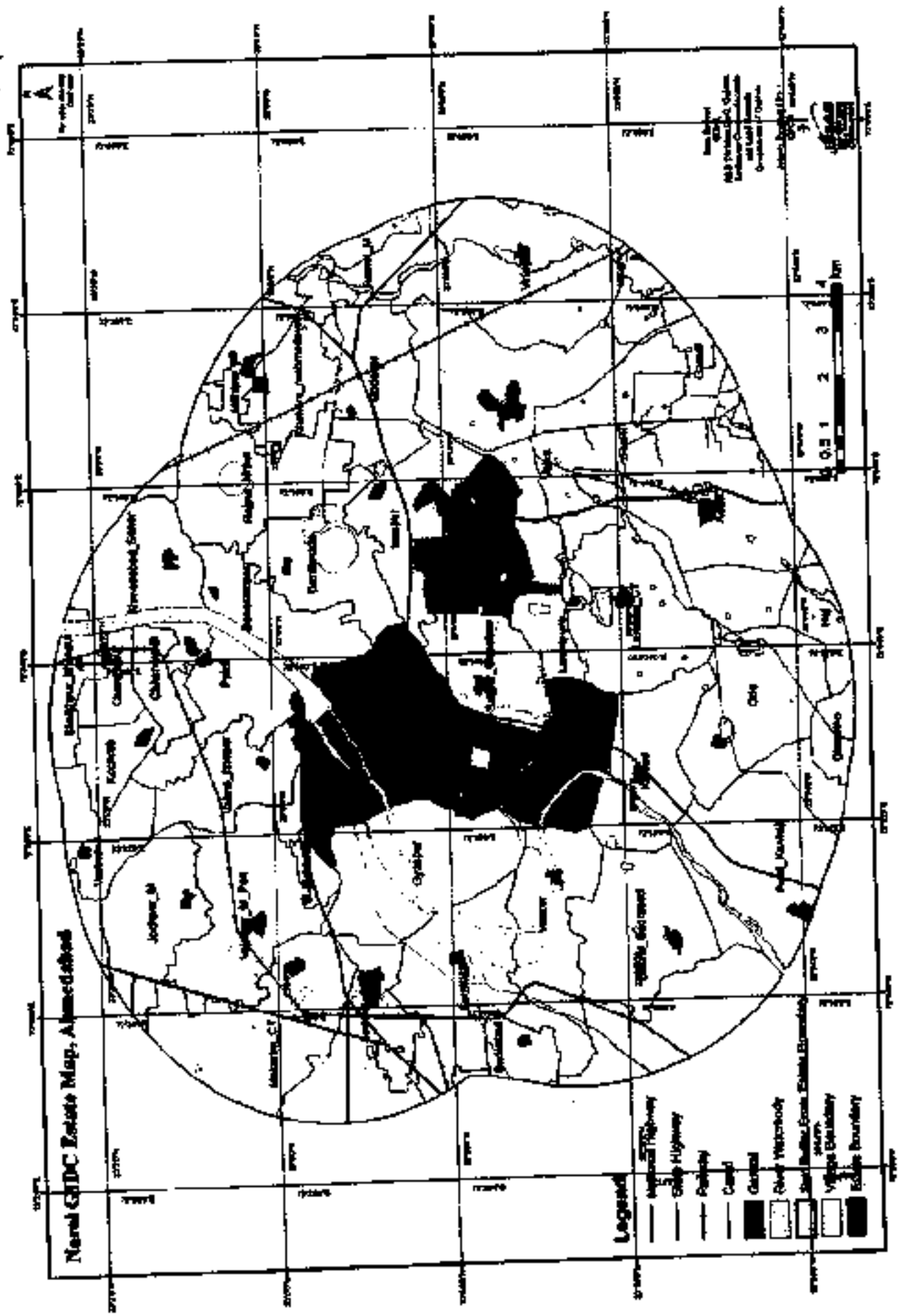
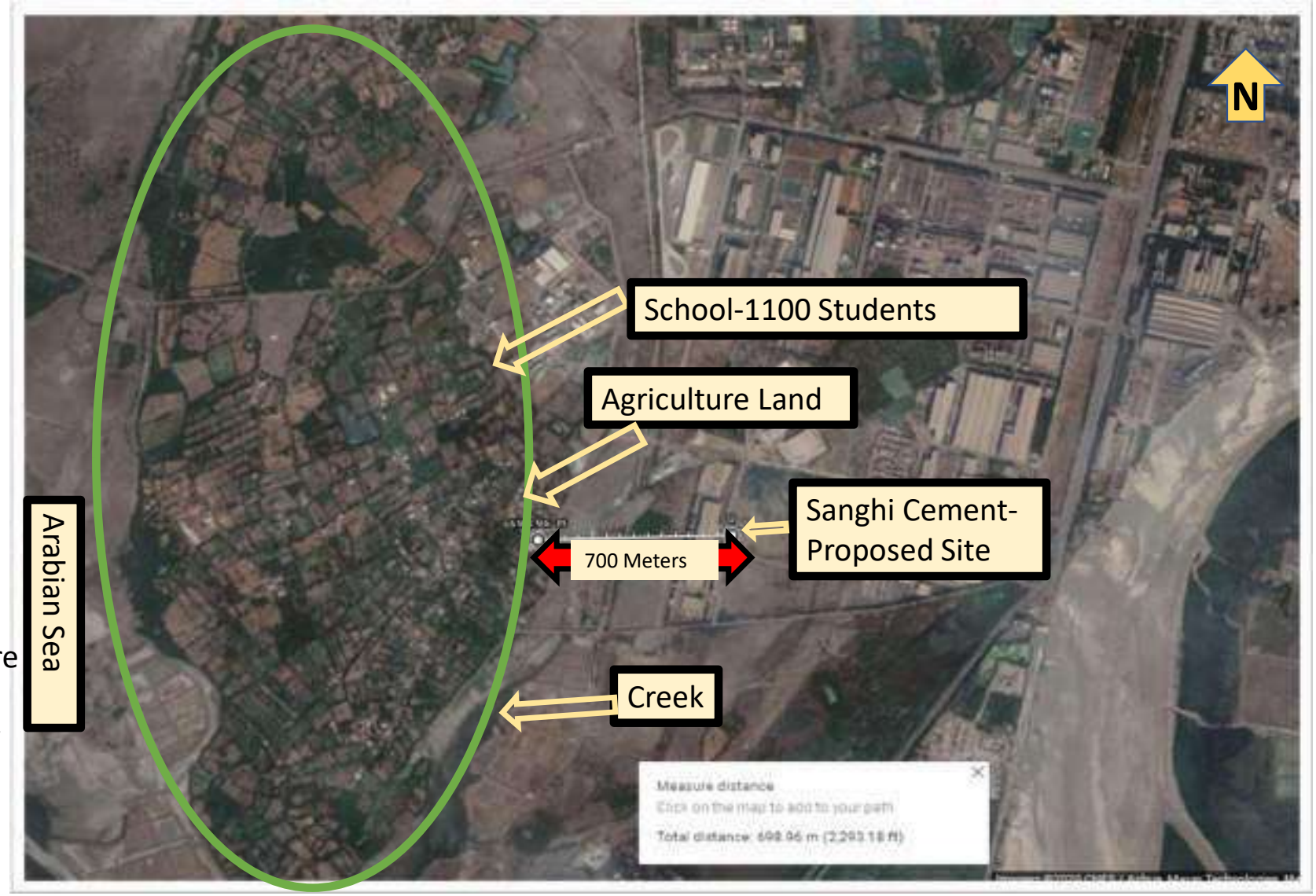
National Highway
State Highway
Railway
Canal
Ganlol
River/Waterbody
Estate Boundary
Village Boundary

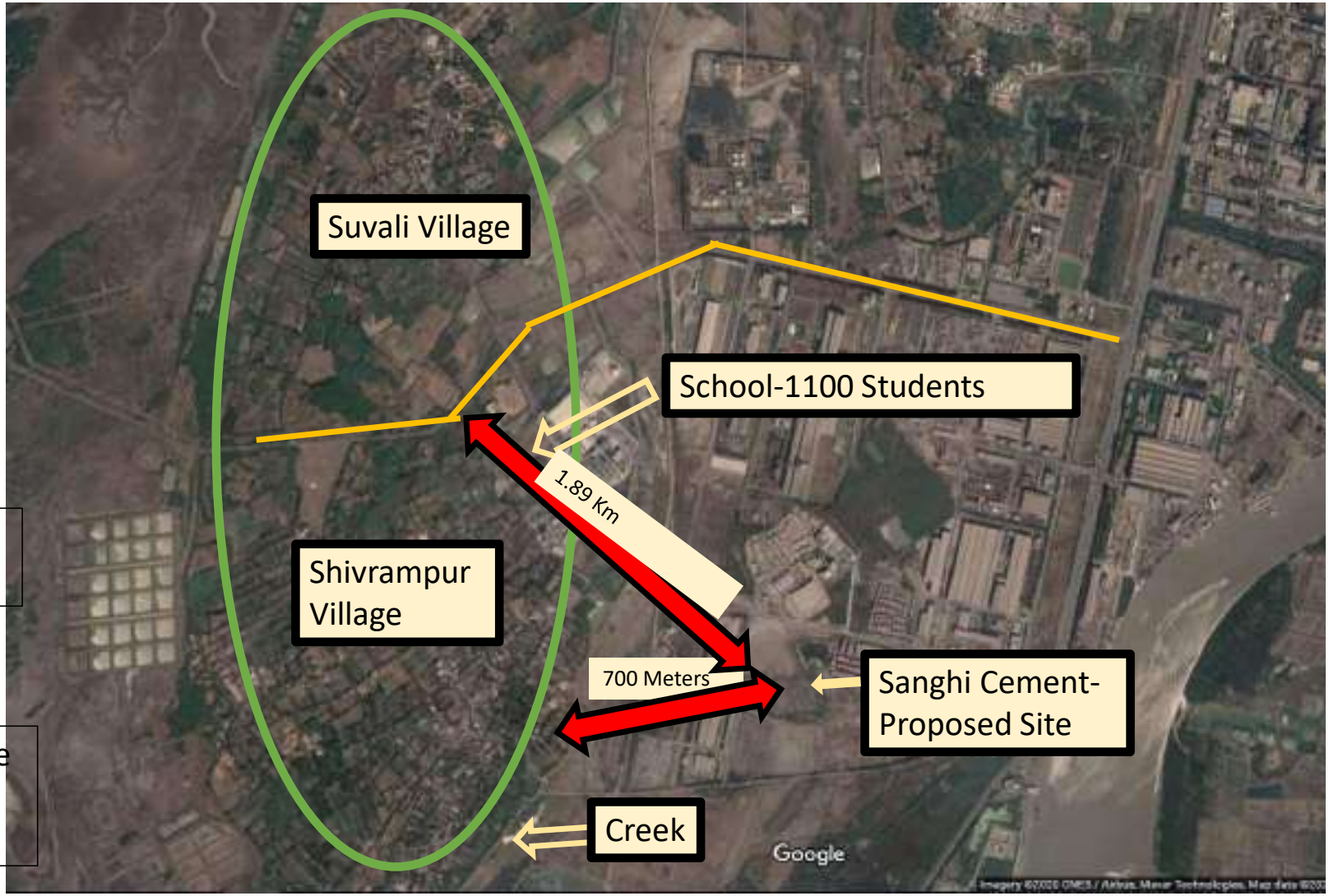
343

44


Navi GIDC Estate Map, Ahmedabad
Legend
National Highway
State Highway
Railway
Canal
Control
River Waterbody
Village Boundary
Estate Boundary
Ghodasar
Vatva
Odhav
Narol
Jodhpur
Sarkhej
Chandlodia
Ranip
Gota
Vasna
Bhadaj
Kathwada
Vinzol
Rakhial
Asarwa
Saijpur
Bopal
Ghuma
Thaltej
Sola
Ognaj
Vastral
Isanpur
Nikol
Naroda
Maninagar
Memnagar
Ellisbridge
Navrangpura
Vejalpur
Jodhpur
Satellite
Bodakdev
Ambawadi
Vasna
Chandkheda
Motera
Sabarmati
Ranip
Gota
Vasna
Bhadaj
Kathwada
Vinzol
Rakhial
Asarwa
Saijpur
Bopal
Ghuma
Thaltej
Sola
Ognaj
Vastral
Isanpur
Nikol
Naroda
Maninagar
Memnagar
Ellisbridge
Navrangpura
Vejalpur
Jodhpur
Satellite
Bodakdev
Ambawadi
Vasna
Chandkheda
Motera
Sabarmati
0 0.5 1 2 3 4 km

Distance of Agriculture land from Proposed Sanghi Cement Plant

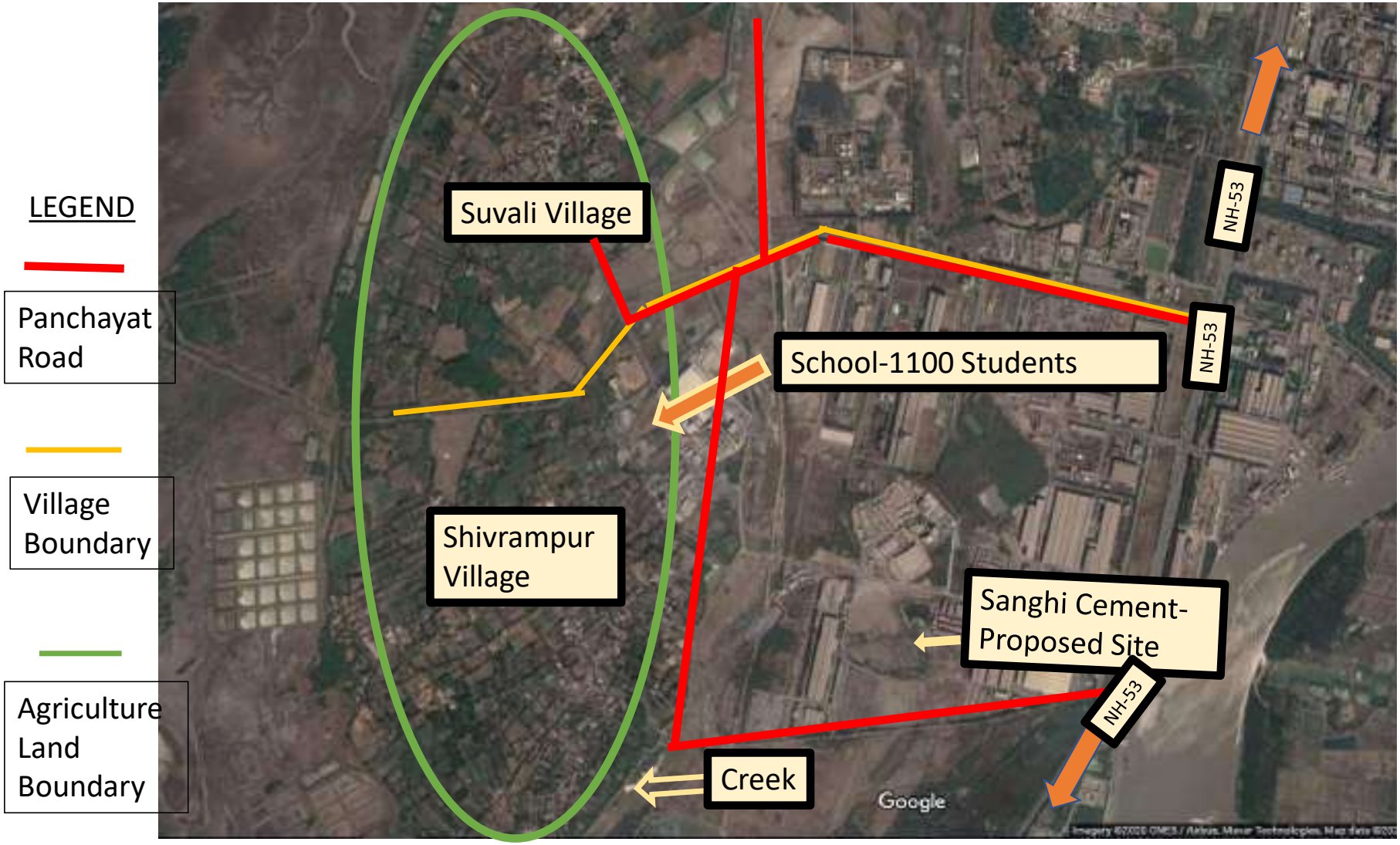




LEGEND

Village Boundary

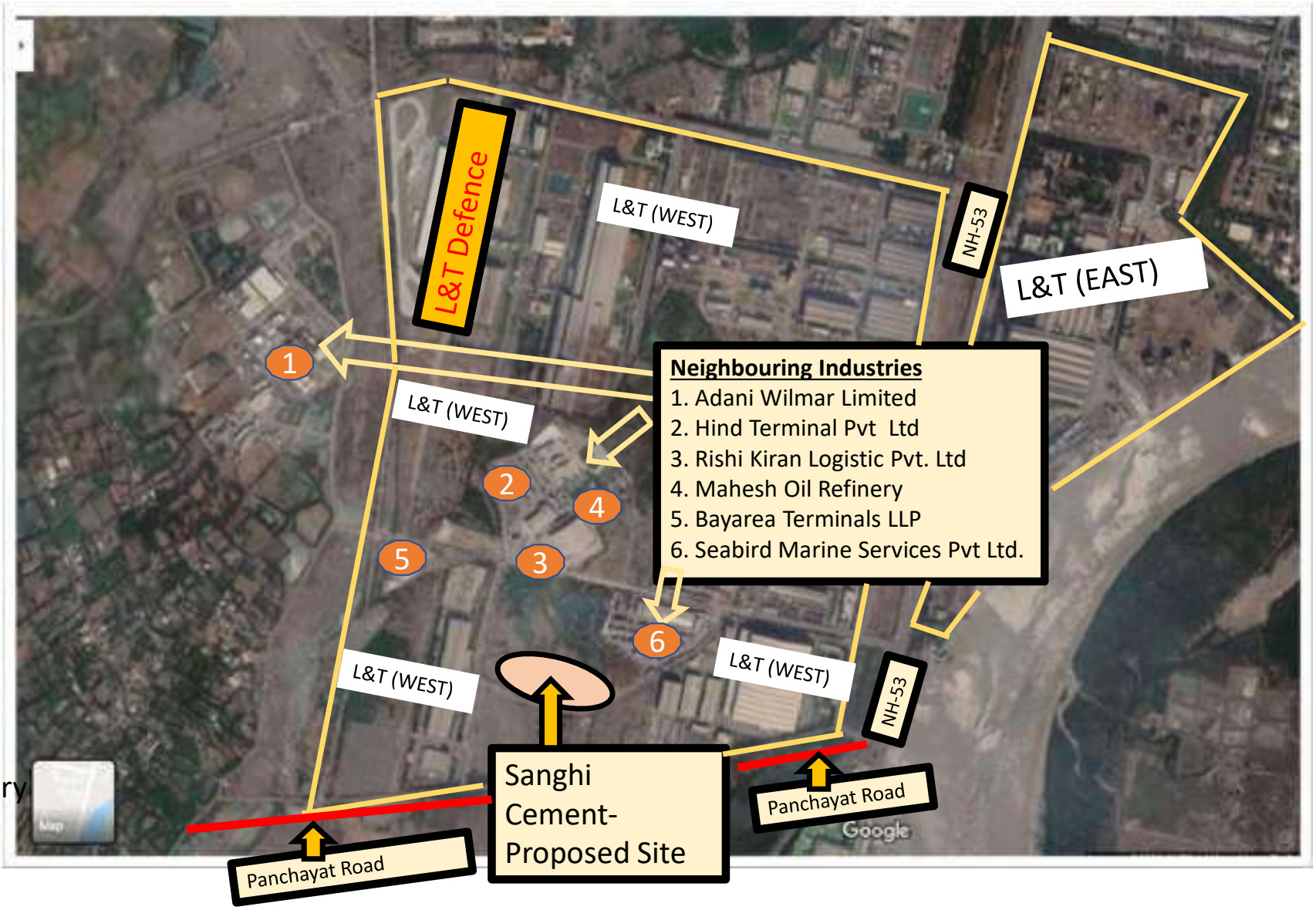
Agriculture Land Boundary


LEGEND
Panchayat Road
Village Boundary
Agriculture Land Boundary
Suvali Village
Shivrampur Village
School-1100 Students
Sanghi Cement-Proposed Site
Creek
NH-53
NH-53
NH-53
Google

LEGEND

L&T Boundary

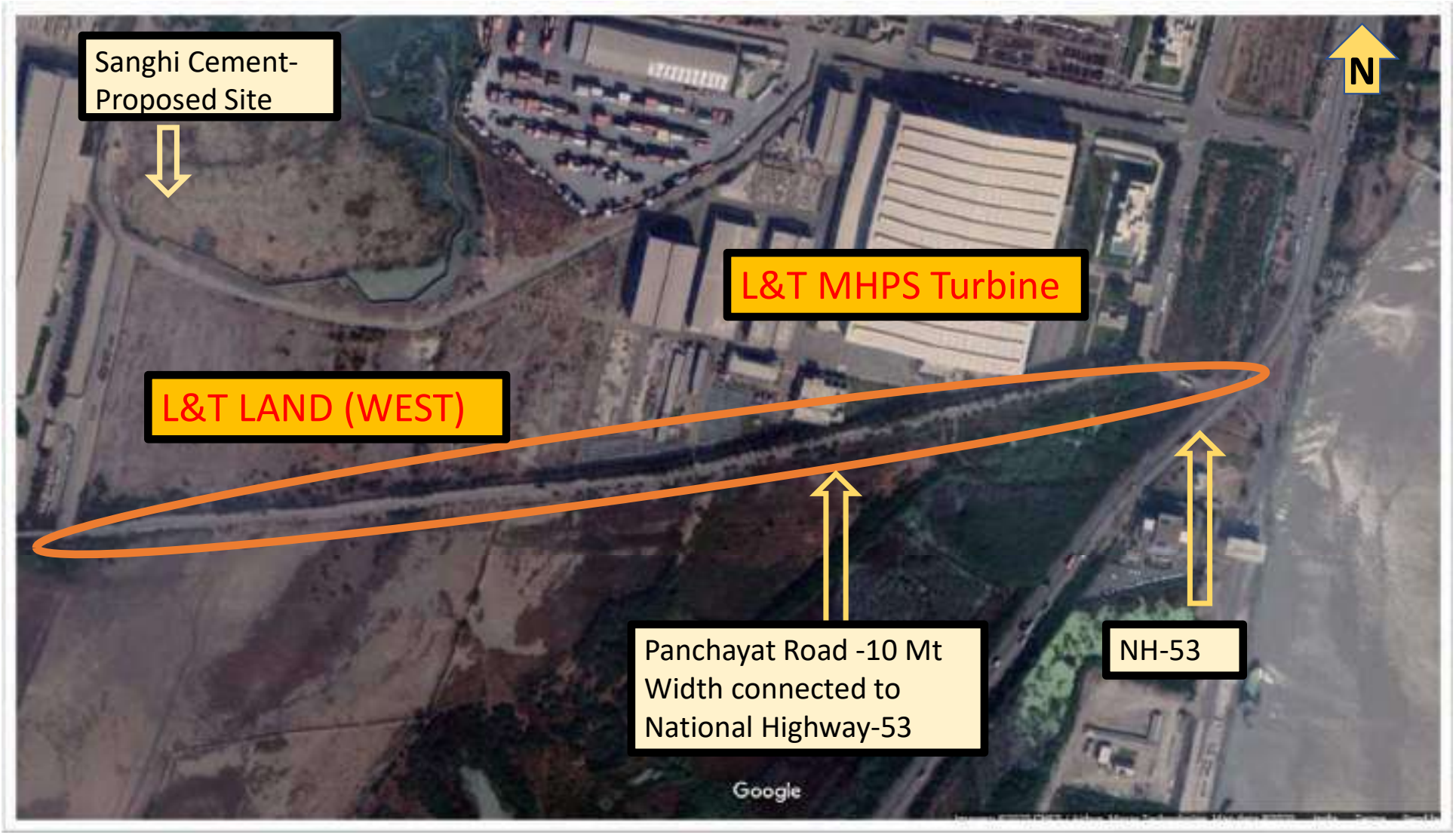
Neighbouring Industries in midst of L&T Hazira Manufacturing Complex



LEGEND

L&T Boundary

10 Mt Width Panchayat Road shown by Proposed Sanghi Cement Plant as Approach Road

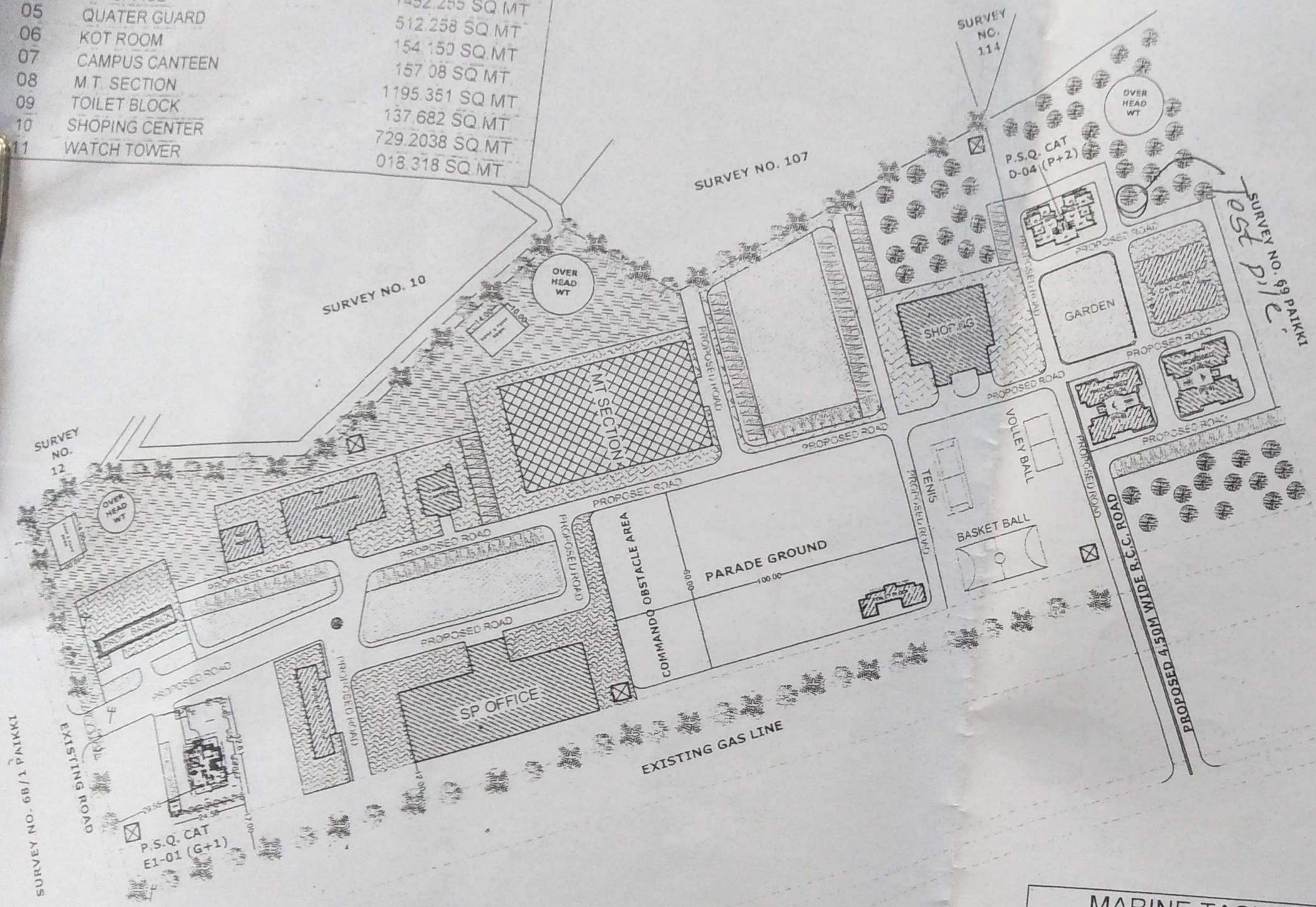


Bank Of Baroda
Bank Of Baroda
Axis Bank
ONGC Char Rasta Flyover Bridge
Union Bank of India
State Bank of India
Bank Of Baroda
Hazira
Hazira Police Station
Vijaya Bank
Magdalla Bridge
MAGDALLA

ANNEXURE 5

LEGEND A [N.R.B.]

SR. NO	BULDING NAME	
01	MAIN GATE SEQURITY ROOM	038.380 SQ.MT
02	BARRACK [40 PERSON]	390.775 SQ.MT
03	CLUB HOUSE	245.454 SQ.MT
04	SP OFFICE	1452.255 SQ.MT
05	QUATER GUARD	512.258 SQ.MT
06	KOT ROOM	154.150 SQ.MT
07	CAMPUS CANTEEN	157.08 SQ.MT
08	M.T. SECTION	1195.351 SQ.MT
09	TOILET BLOCK	137.682 SQ.MT
10	SHOPING CENTER	729.2038 SQ.MT
11	WATCH TOWER	018.318 SQ.MT



APPR BY

APPROVED BY
MANAGING DIRECTOR
G.S.P.H.C. LTD.
GANDHINAGAR
Dt.....

REV. NO.	DATE	PARTICULARS

REVISIONS

NOTES :-
- ALL DIMENSIONS ARE IN METRES.
-IF ANY AMBIGUITY FOUND SHALL BE BROUGHT TO NOTICE TO ARCHITECT.

PROJECT

DIV:- SURAT
AT:- MARNE TASK FORSE HAJIRA

DRG. TITLE

SITE LAYOUT -
MARNE TASK FORSE HAJIRA

SCALE : N.T.S	DWG.NO.	REV.NO	FILE NO
DATE : 31-07-2020			
DEALT : BHARGAV	A / 1.1	00	2706
CHECK : J.M.B			

ARCHITECT'S BRANCH

J. M. BHALANI
ARCHITECT
CA/98/
Gujarat State Police
Housing Corporation Ltd.
Gandhinagar

ARCHITECT

GUJARAT STATE POLICE HO
CORPORATION LTD.

MARINE TASK FORCE HAJIRA
RESIDENT QUARTER BUILT UP AREA

BUILD. TYPE	NO. OF BLOCK	BUILT UP AREA/BLOCK	NO OF BLOCK
	RESI. CAT. - B - 24 [P+06] TOTAL - 24 UNIT 01 TO 02 BLOCK	2782.304	02
PROPOSED CAT.C-04 (P+2)	RESI. CAT. - C - 08 [P+02] TOTAL - 08 UNIT 01 BLOCK	551.817	01
	RESI. CAT. - D - 04 [P+02] TOTAL - 04 UNIT 01 BLOCK		01
	RESI. CAT. - E1 - 01 [G+1] BUILDING TYPE		01

EIA REPORT

For

GREENFIELD PROJECT OF 2.0 MTPA STANDALONE GRINDING UNIT WITH BULK AND BAG PACKING PLANT

At

Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3,
Shivrampur Village, Tal. Choryasi Dist.- Surat.

Land Area: 4.856 Ha. / 12.0 Acres / 48,563 m^2

Production Capacity: 2.0 Million TPA

[ToR letter No.: SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan. 2019]

[Public hearing Date/Time/Venue: 22/03/2019 at 11:00 hrs. at Project Site]

[Study Period: 1st Oct 2018 to 31st Dec 2018]

Schedule: 3 (b) Category – B as per EIA Notification 2006

APPLICANT	ENVIRONMENTAL CONSULTANT
SANGHI INDUSTRIES LIMITED. 10th Floor, Kataria Arcade, Opposite SG Highway Post Makarba, District- Ahmedabad–380054 Email: gjbhatt@sanghicement.com Phone: **07926838020**	**ECO CHEM SALES & SERVICES** Office Floor, Ashoka Pavilion, New Civil Road Surat (QCI/NABET ACCREDITED NO. NABET/EIA/1720/ RA 051) E-mail: eco@ecoshripad.com Contact No.: 0261-2231630

NABET CERTIFICATE

Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

Eco Chem Sales & Services (ECSS)
Office Floor, Ashoka Pavillion - A, Opp. Kapadia Health Club,
New Civil Road, Surat -395 001, Gujarat

are accredited as Category - A organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA/EMP reports in the following sectors:

Sl.No.	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals(Opencast only)	1	1 (a) (i)	A
2	Offshore and onshore oil and gas exploration, development & production	2	1 (b)	A
3	Thermal power plants	4	1 (d)	A
4	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
5	Cement plants	9	3 (b)	B
6	Chlor-alkali industry	13	4 (d)	A
7	Chemical fertilizers	16	5 (a)	A
8	Pesticides industry and pesticide specific intermediates	17	5 (b)	A
9	Manmade fibres manufacturing	19	5 (d)	A
10	Synthetic organic chemicals industry	21	5 (f)	A
11	Distilleries	22	5(g)	A
12	Integrated paint industry	23	5 (h)	A
13	Pulp & paper industry excluding manufacturing of paper	24	5 (i)	A
14	Oil & gas transportation pipeline	27	6 (a)	A
15	Isolated storage & handling of Hazardous chemicals	28	6 (b)	B
16	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	32	7 (f)	A
17	Ports, harbours, break waters and dredging	33	7 (a)	A
18	Highways	34	7 (f)	A
19	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
20	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
21	Building and construction projects	38	8 (a)	B
22	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RA AC minutes dated May 12, 2017 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/17/0334 dated 01 June 2017. The accreditation needs to be renewed before the expiry date by Eco Chem Sales & Services (ECSS), Surat following due process of assessment.

C.E.O	Certificate No.	Issue date	Expiry Date
NABET	NABET/ EIA/1720/ RA 051	Jun. 12, 2017	Feb. 03, 2020

For the updated list of Accredited Consultants with approved sectors please refer QCI-NABET website.

DECLARATION OF CONSULTANT

Declaration by Experts contributing to the EIA/EMP report for Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat by Sanghi Industries Limited (SIL). Schedule 3(b) Category–"B" as per EIA Notification 2006 and its amendment thereof.

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

Consultant	:	**Eco Chem Sales & Services, Surat**
EIA co-ordinator	:	**Dr. Ashok K. Rathoure**
Signature	:	
Date	:	**29/03/2019**
Period of Involvement	:	**Sept. 2018 to Apr. 2019**

Functional Area Experts

S.No.	Functional area/s	Name of Expert	Involvement (Period and Task)	Signature
1.	AP	Mrs. Rekha Shah	**Sept. 2018 to March 2019** Site visit followed by selection of monitoring locations, Supervision of air quality monitoring, Identification of probable impacts of different air emission from the plants/facilities proposed, suggesting most suitable control device and contribution to EIA documentation.	
2.	WP	Mrs. Rekha Shah	**Sept. 2018 to March 2019** Site visit; supervision & selection of sampling locations for surface water & Ground water samples & their analysis results and developing scheme for reuse of water, identification of impacts, finalization of mitigation measures.	
3.	SHW	Mrs. Rekha Shah	**Sept. 2018 to March 2019** Identification of waste generated from the site, confirming adequacy of mitigation measures for management of hazardous waste and contribution to EIA documentation.	
4.	SE	Mr. Ghanshayam Patel	**Sept. 2018 to Jan. 2019** Conducting baseline socio-economic surveys through interviews/questionnaire from the surrounding area/villages of the proposed project, impact identification and mitigation measures for incorporating to EIA documentation.	
5.	EB	Dr. Ashok K. Rathoure	**Sept. 2018 to March 2019** Site visit and conduct of ecological survey and preparation of status report for rare endangered and threatned species of animals and plants and also species protected under national laws, assessment of the impacts of proposed	

S.No.	Functional area/s	Name of Expert	Involvement (Period and Task)	Signature
			project activities on the biological environment and contribution to EIA documentation.	
6.	HG	Mr. Dhaval Shah	**Sept. 2018 to Jan. 2019** Understanding and representing groundwater conditions, supervision of groundwater sampling locations, finalization of survey findings, identification of impacts, suggestion of mitigation measures.	
7.	AQ	Priyanka Verma	**Sept. 2018 to Jan. 2019** AAQM for various parameters; Drawing isolplth and Calculation ground level concention.	
8.	NV	Mr. Dhaval Shah	**Sept. 2018 to Jan. 2019** Checking of noise sampling results, analysis of data, identification of impacts and mitigation measures.	
9.	LU	Mr. Joshua Anand	**March 2018 to May 2018** Generation and analysis of data related to landuse pattern. Development of landuse maps of study area using ArcGIS / related tools, site visit for ground truth survey, finalization of landuse maps.	
10.	RH	Mr. Vinay Patil	**Sept. 2018 to Jan. 2019** Identification of hazards and hazardous substances Preparation of impacts diagrams & mitigation measures, preparation of disaster management plan.	
11.	GEO	Mr. Ravikant Sharma	Not involved rationalized as per QCI Scheme for Accreditation Verson 3.	-
12.	SC	Dr. B.K. Patel		

Declaration by the Head of the Accredited Consultant Organization/ authorized person

I, **Rekha S. Shah**, hereby, confirm that our experts prepared the EIA report of Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.-Surat, Gujarat by Sanghi Industries Limited (SIL). I also confirm that I shall be fully accountable for any mis-leading information mentioned in this statement. It is certified that no unethical practice like 'copy and paste', and used external data/text without proper acknowledgement, while preparing this EIA report.

Signature :

Name : **Rekha S. Shah**
Designation : CEO
Name of the EIA Consultant Organization : **ECO CHEM SALES & SERVICES**
Office Floor, Ashoka Pavillion – A,
Opp. Kapadia Health Club, Surat 395001 (GJ)
NABET Certificate No. & Issue Date : **NABET/EIA/1720/ RA 051,**
Valid upto February 03, 2020

UNDERTAKING BY APPLICANT

Sanghi Industries Limited
Corporate Office : 10th Floor, Kataria Arcade,
Off. S. G. Highway, Post : Makarba, Dist : Ahmedabad - 380051
Tel. : 079-26838000 **Fax** : 079 - 26838111
E-mail : sanghicmo@sanghicement.com

UNDERTAKING LETTER FOR OWNING FINAL EIA & EMP REPORT

To,
The Member Secretary,
State Level Expert Appraisal Committee (SEAC)
Gujarat Pollution Control Board,
4th Floor, Sector – 10 A,
Paryavaran Bhavan, Gandhinagar.

Date:30/03/2019

Subject: Undertaking letter for ownership of Environmental Impact Assessment (EIA/EMP) report for Environmental Clearance as per EIA notification 2006.

Ref: 1) Terms of Reference awarded by SEIAA Gujarat vide letter no. SEIAA/GUJ/TOR /3(b)/ 223/2019 dated 29.01.2019
2) OM dated 05/10/2011 & 04/08/2009 issued by MoEF&CC

Sir,

We hereby give you an undertaking for owning the contents and information provided in EIA/EMP report submitted to SEAC Gandhinagar for Environmental Clearance of the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat.

Thanking you,
Yours Sincerely,

For, SANGHI INDUSTRIES LIMITED.

SANGHI INDUSTRIES LTD. AHMEDABAD

(AUTHORIZED SIGNATORY)

CIN No. : L18209TG1985PLC005581
Registered Office : P.O. Sanghinagar, Hayatnagar Mandal, R R District, Telangana - 501511
Tel. : 08415 - 242240 **E-mail** : companysecretary@sanghicement.com
Website : www.sanghicement.com

UNDERTAKING BY CONSULTANT

ECOCHEM
SALES & SERVICES
POLLUTION CONTROL CONSULTANT, ENGINEERS & CONTRACTORS

To,

Dated: 30/03/2019

The Member Secretary,
State Level Expert Appraisal Committee (SEAC)
Gujarat Pollution Control Board,
4th Floor, Sector – 10 A,
Paryavaran Bhavan, Gandhinagar

Subject: Undertaking on the compliance of Terms of Reference issued by the SEIAA Gujarat for Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat by Sanghi Industries Limited (SIL).

Reference: 1) Terms of Reference awarded by SEIAA Gujarat vide letter no SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan. 2019
2) OM dated 05/10/2011 & 04/08/2009 issued by MoEF&CC

Sir,

We, **Eco Chem Sales & Services** are NABET accredited consultants and hereby give you an undertaking that we have prepared the EIA report based on the Terms of Reference (ToRs) issued by SEIAA Gujarat. All the studies have been undertaken with reference to the ToR points and we ensure that all the ToR points have been addressed in the EIA/EMP report for the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat by Sanghi Industries Limited (SIL).

Thanking You
Yours Sincerely,

ECO CHEM SALES & SERVICES

Place: Surat

Office Floor, Ashoka Pavillion-A, Opp. Kapadia Health Club, New Civil Road, SURAT-395 001.
Telefax : 91 - 0261 - 2231630 - 2236223 - 2233075 - 6545050
e-mail : eco@ecoshripad.com Website : www.ecosystemindia.com

LIST OF ABBREVIATIONS

1.	APC	Air Pollution Control
2.	CRZ	Coastal Regulation zone
3.	CEMS	Continuous emission monitoring system
4.	CPCB	Central pollution control board.
5.	CER	Corporate Environmental responsibility
6.	CREP	Corporate responsibility for environment protection
7.	CPP	Captive power plant
8.	ETP	Effluent Treatment Plant
9.	EC	Environmental Clearance
10.	EMP	Environmental Management Plan
11.	EMS	Environmental Management System
12.	EIA	Environmental Impact Assessment
13.	EMC	Environmental management cell
14.	GMDC	Gujarat Mineral Development Corporation Limited
15.	HSD	High Speed Diesel
16.	KLD	Kilo Liter per day
17.	MW	Mega watt
18.	MTPM	Metric ton per Month
19.	MoEF&CC	Ministry of Environment, Forest and Climate Change
20.	PH	Public Hearing
21.	PM	Particulate Matter
22.	PPE	Personal Protective Equipment
23.	RO	Reverse Osmosis
24.	STP	Sewage Treatment Plant
25.	SEIAA	State Environmental impact assessment authority.
26.	SIL	Sanghi Industries Ltd.
27.	SH	Super Heaters
28.	TPA	Ton per annum
29.	ToR	Terms of Reference
30.	VECs	Valued Environmental Components

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1 INTRODUCTION

1.1 PRELUDE

EIA studies help to the decision maker for approving the project about the impact on local and remote Environment, societal benefits and losses if any of the development in particular region. Cement Industries are important for the nation. The need to avoid adverse impacts and to ensure long term benefits has led to the concept of sustainability. This has become accepted as an essential feature of development, if the aim of increased well-being and greater equity in fulfilling basic needs is to be met for this and future generations. Mankind, as it is developed today, cannot live without taking up developmental activities for the food, security and other needs. Consequently, there is a need to harmonize developmental activities with the environmental concerns. Environmental Impact Assessment (EIA) is one of the tools available with the planners to achieve the above mentioned goals. An Environmental Impact Assessment (EIA) may be defined as:

EIA is an assessment of the possible impact—positive or negative—that a proposed or expansion project may have on the environment, together consisting of the natural, social and economic aspects. The purpose of the assessment is to ensure that decision makers to consider the environmental impacts along with mitigation measures when deciding whether to proceed with a project or not. EIA has three main functions:

- To predict problems (Impact Assessment),
- To find ways to avoid them (Mitigation Measures),
- To enhance positive impacts (Environmental Management Plan).

It is required that every project proponent must take Environmental Clearance from Ministry of Environment, Forest and Climate Change (MoEF&CC), New Delhi/SEIAA before starting up any project as per EIA legislation. The environmental clearance is also mandatory for the expansion, modernization; this is applicable as per the MoEF&CC guidelines and EIA notifications 2006 and amended from time to time.

1.2 PURPOSE OF THE REPORT

As per the Environment Impact Assessment (EIA) Notification dated 14th September 2006 and its amendment thereafter, the greenfield project of Standalone grinding unit with bulk and bag packing plant - falls in ‗Category B' under project activity 3(b). Application for prior Environmental Clearance for the proposal was submitted to the State Environmental Impact Assessment Authority, Gujarat vide Proposal No. SIA/GJ/IND/30448/2018 dated 22nd December, 2018 for approval of Terms of Reference (TOR) for the preparation of EIA/EMP Report for which the baseline data is collected during October to December 2018 as per OM 29th Aug. 2017. The present EIA Report has been prepared on the basis of EIA Notification, with special reference to the TOR conditions received from State Environment Impact Assessment Authority, Gujarat, vide letter SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan., 2019 the Greenfield project of grinding unit with bulk and bag packing plant. Copy of the said TOR letter is enclosed as **Annexure-I.**

1.3 IDENTIFICATION OF THE PROJECT AND PROJECT PROPONENT

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant. This project is based on state of art technology at Village Shivrampur, Survey No. 125/1, 125/2,126/1+2+3; Tal. Choryasi Dist.- Surat, Gujarat. The salient features in and around area is given in Table 1.1.

Table 1.1 Environmental Settings (Valued Environmental Components)

S.No.	Particulars	Description	Aerial Distance and Direction
1.	Latitude and Longitude of the site		

Points	Latitude	Longitude
A	21° 9'0.08"N	72°39'0.68"E
B	21° 8'59.46"N	72°39'1.09"E
C	21° 9'0.78"N	72°39'3.62"E
D	21° 9'0.12"N	72°39'4.09"E

	E	21° 9'0.81"N	72°39'5.20"E
	F	21° 9'0.29"N	72°39'5.47"E
	G	21° 9'1.18"N	72°39'6.90"E
	H	21° 9'0.93"N	72°39'7.90"E
	I	21° 9'0.86"N	72°39'9.24"E
	J	21° 9'0.46"N	72°39'11.28"E
	K	21° 8'59.84"N	72°39'11.93"E
	L	21° 8'58.72"N	72°39'11.71"E
	M	21° 8'57.60"N	72°39'12.32"E
	N	21° 8'55.54"N	72°39'11.61"E
	O	21° 8'54.57"N	72°39'10.56"E
	P	21° 8'54.59"N	72°39'9.07"E
	Q	21° 8'55.54"N	72°39'8.23"E
	R	21° 8'55.22"N	72°39'5.49"E
	S	21° 8'56.94"N	72°39'1.80"E
	T	21° 8'57.07"N	72°39'0.75"E
	U	21° 8'58.75"N	72°39'0.36"E
2.	Toposheet No. (SOI)	F43 M/12	
3.	Nearest Village (Human Settlement)	Shivrampur	@1.5 Km in SW direction
4.	Nearest Town/City	Surat	@ 16.0 Km in ESE
6.	Nearest National Highway	NH-6	@ 0.9 km in East
7.	Nearest State Highway	SH-168	@ 8.5 km in NE
8.	Nearest Railway station	Surat Railway Station	@ 17.0 km in NE
9.	Nearest Airport	Surat Airport	@ 10.1 km in SE
10.	State, National Boundaries	None within 10 Km of study area	-
11.	Nearest Water Body	Tapi River	@ 0.89 km in East
12.	Sea	Arabian Sea/Coastal Zone	@ 3.5 km in West
13.	Archaeological site	None	--
14	National Park/ Marine sanctuary, etc.	No National Park and Marine sanctuary are falls within 10 km radius of study area	--
16.	Mangrove	None within 10 Km radius of study area	--
17.	Nearest Industry	L&T, Reliance, Essar, etc.	Within 3 km radius

1.3.1 Project Background

Sanghi Industries Limited is the flagship company of The Ravi Sanghi Group dealing in the production and distribution of Cement under the Brand Name "Sanghi Cement". Sanghi Cement was commissioned in 2002 with one of the world's largest single stream Cement Plant located at Sanghipuram in the Abdasa Taluka of Kutch District of Gujarat State. This plant is fully automatic with state-of-the-art technology from Fuller International, USA and having present capacity of 4.0 MTPA. The company produces superior quality 53 Grade OPC, PPC and PSC Cement and have revolutionized the way cement is produced and sold in India. The company has obtained environment clearance from MoEF&CC, New Delhi for capacity expansion of existing plant located at Sanghipuram on 1st May 2018. Now, SIL intend to setup standalone cement grinding unit with packing plant in Surat. The project has been conceived on the basis of following considerations:

- Better customer satisfaction by reducing lead time for meeting the cement requirement of South Gujarat and some part of Maharashtra.
- Reduction in logistics cost and utilization of sea route transportation.
- Regular, sustainable and reliable availability of additives like slag, fly ash and gypsum.

1.3.2 Present Proposal

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat. The detailed feature of proposed plant is given in **Table 1.2.**

Table 1.2 Salient Features of Grinding Unit

Category of the Project	**:**	Project/Activity: 3 (b) – Category B (Standalone Grinding unit)
Plant Capacity		2.0 Million TPA
Technology	**:**	Standalone Cement grinding process will be based on Vertical Roller Mill (VRM) technology with automatic packer and truck loading facilities
Land Area	**:**	4.856 Ha. or 12.0 Acres or 48,563 m^2
Water Requirement	**:**	278 m^3/day **Source**: Local Body / Irrigation Department Surat
Products		Cement (PPC, OPC, PSC)
Power Requirement	**:**	13.5 MW from State Grid (Power will be willing from CPP at Kutch) No. of DG set during Power Failures:1 No. of 2.0 MW
Man Power Requirement	**:**	Direct + Indirect - Construction: 500 Persons, Operation: 280 Persons
Capital Investment	**:**	Rs. 28228 Lakhs or 282.28 Crores

Location: Survey No. 125/1, 125/2,126/1+2+3, Village – Shivrampur, Taluka- Choryasi - 394510, District-Surat, Gujarat India.

Corporate Addres s: 10th Floor, Kataria Arcade, Opposite SG Highway Post Makarba, District-Ahmedabad–380054 (Gujarat).

Project Proponent

Sanghi Industries Limited is the flagship company of –The Ravi Sanghi Group" dealing in the production and distribution of Cement under the Brand Name "Sanghi Cement". Sanghi Cement was commissioned in 2002 with one of the world's largest single stream Cement Plant located at Sanghipuram, Kutch, Gujarat. This plant is fully automatic with state-of-the-art technology from FL Smidth, USA and having present capacity of 4.0 MTPA. SIL are expanding cement plant capacity from 4 MTPA to 8.6 MTPA for which Environment Clearance has been obtained from the MOEF&CC, GOI in May 2018. Now, SIL intend to setup standalone cement grinding unit with packing plant in Surat. The company has several firsts to its credit:

- First plant in India to install cross belt analyzer for micro-analysis of limestone to ensure consistent superior quality of cement.

- First plant in the country to have 100% automatic control systems to ensure consistently superior strength and quality of operations.
- Only Indian Cement Company to achieve Export House status in the first 8 months of commencement of operations.
- Cement grade high quality captive limestone mines with mining through latest eco-friendly and state-of-the-art surface miners.
- First company in India to have full-fledged infrastructure, from day one, such as 100% captive power plant, own jetty to cater the needs of sea route transportation, desalination plant and road network.
- The only FIVE STAR certified organization in Indian Cement Industry conforming to-

➢ Quality Management System (ISO: 9001:2015),
➢ Environmental Management System (ISO: 14001:2015),
➢ Health & Safety Management System (OHSAS: 18001:2007),
➢ Testing & Calibration Management System (ISO: 17025:2005),
➢ Social Accountability Management System (SA: 8000:2014).

Promoter's Background

Sanghi Industries Limited is managed by professional. The key promoters are as below:

a) **Mr. Ravi Sanghi - Chairman and Managing Director:** Mr. Ravi Sanghi, is a first generation entrepreneur and the visionary behind the establishment of one of the world's largest cement plant - Sanghi Cement Plant in Kutch since its conception to completion of the commissioning and successful operations of the plant till date. He has vast experience in conceptualizing and directing projects of diverse industries and magnitudes.

b) **Mr. Aditya Sanghi - Whole Time Director:** Mr. Aditya Sanghi holds a Master Degree in Industrial Engineering from Rochester Institute, USA and has worked with leading American companies. He has rich experience in management of the clinker and cement operations, and the establishment and operation of thermal power plant. He has successfully implemented many best manufacturing practices and executed diverse projects for the company. He expertly guides the production, project and corporate strategy.

c) **Mr. Alok Sanghi - Whole Time Director:** Mr. Alok Sanghi, studied in Finance and Management from Kelley School of Business, Indiana University, Bloomington, USA, has worked with leading financial services companies. He has been instrumental in successfully launching the company's products in domestic and international markets. He possesses acumen in corporate, commercial, shipping and marketing strategies and corporate affairs of the company.

1.4 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION OF THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY, REGION

S. No.	Details	Description
1.	Nature	Standalone Grinding unit with Bulk and Bag Packing plant Category-B, under section 3(b)
2.	Size	2.0 Million TPA
3.	Location	Shivrampur Village, Tal- Choryasi, Surat – Gujarat
4.	Cost of the project	Rs.282.28 Crores

Importance to the Country and Region

Cement is an essential ingredient for the modern building construction. The new generation cement plant in India now employs the latest technology for better efficiency, energy conservation, pollution control and economics of large capacity production. The improved market conditions witnessed recently, after a grip of recession over a long period, are expected to continue due to high priority being given by the Government to Housing and Infrastructure. The housing sector is the biggest demand driver for the Cement Industry, accounting for about 67% of the total consumption in India. The other major consumers of cement include infrastructure at 13%, commercial construction at 11% and industrial construction at 9%. India's cement demand is expected to grow rapidly keeping in view the Government's thrust on infrastructure development and affordable housing.

India is expected to spend INR 22,407 Crores on ‗Housing for All', over INR 70,000 Crores in additional spending on infrastructure and INR 20,000 Crores on the ‗National Investment and Infrastructure Fund'. Apart from these, the Ministry of Urban Development is also planning big spends on future-proofing India's cities and smart cities especially Surat. In view of the massive investment proposed in by the government in Housing and infrastructure, industry and rural sectors, there is an urgent need to increase the production capacity in the country in spite of severe resource constraints. This project shall plan to supply cement to coastal locations through coastal shipping. Hence, the proposal of Grinding unit by Sanghi Industries Limited will cater the increased demand of cement in the country and region.

1.5 SCOPE OF THE STUDY

1.5.1 Regulatory framework

- Environmental Clearance under EIA Notification 2006.
- Consent to Establish and Consent to Operate as per Air and Water Act.
- E-waste (Management and Handling) Rules, 2011 as amended to date.
- Factory License
- Hazardous and Other Wastes (Management and Transboundary Movement) Amendment Rules, 2016
- Public Liability Insurance Act, 1991 and Rules, 1991 as amended to date.
- The Air (Prevention and Control of Pollution) Act, 1981 and Rules, 1982, as amended to date.
- The Bureau of Indian Standards Act, 1986
- The Custom Act, 1962
- The Environment (Protection) Act, 1986 and Rules, 1986, as amended to date
- The Factories Act, 1948
- The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, as amended to date.
- The Motor Vehicles Act, 1988 & The Central Motor Vehicle rules, 1989
- The Noise Pollution (Regulation and Control) Rules, 2000 as amended to date.
- The Petroleum Act, 1934 & Rules, 2002
- The Water (Prevention and Control of Pollution) Act, 1974 and Rules, 1975, as amended to date.

1.5.2 Scope of the Study

The EIA/EMP report has been prepared in line with approved ToR issued by SEAC, Gujarat, vide letter SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan. 2019 and as per generic structure given in EIA Notification – 2006 (Appendix III & IIIA). The EIA/EMP report includes collection of baseline data with respect to major environmental components, *viz.* Air, Noise, Water, Soil, Geology, Hydrology, Land use, Ecology & Biodiversity and Socio-economic components for one season (post Monsoon) *i.e*. from October to December 2018. The study area map covering 10 km radius of project site is given in Chapter – 3. The Compliance to the ToR condition has been provided under section 1.14

1.6 APPLICABILITY OF EIA NOTIFICATION, 200 6/ FOREST (CONSERVATION) ACT/WILDLIFE (PROTECTION) ACT, 1972/ CRZ NOTIFICATION 2011/2016

The proposed Greenfield Standalone Grinding Unit falls in Category-B, under section 3(b) as per the prevailing EIA Notification, dated 14th September 2006 and its amendments thereafter. The Forest (Conservation) Act/Wildlife (Protection) Act / CRZ Notification are not application to this project.

1.7 APPLICABILITY OF GC CONDITIONS A S PER EIA NOTIFICATION 2006 AND ITS AMENDMENT THEREAFTER

General condition are not applicable for Greenfield Standalone Grinding Unit with Bulk and Bag packing Plant as this project does not located in whole or in part within 5 km from the boundary of Protected Areas notified under the Wild Life (Protection) Act, 1972, Critically Polluted areas as notified by the Central Pollution Control Board, Notified Eco-sensitive areas and inter-State boundaries and international boundaries.

1.8 STATUS OF LITIGATIONS/COURT ORDERS

No litigation pending/court Case pending from SIL for this project.

1.9 EXISTING EC AND STATUS OF EC COMPLIANCE

Not Applicable as Proposed project is Greenfield project.

1.10 VALIDITY OF AIR/WATER CONSENT ORDERS AND HWA FOR EXISTING PROJECT

Not Applicable as Proposed project is Greenfield project.

1.11 COMPLIANCE ST ATUS TO STA NDARDS AND SPE CIFIC CONDTIONS ISS UED B Y SPCC/CPCB (CREP), ETC.

The Proposed project is Greenfield project. SIL will complied all statutory and regulatory requirement after getting EC from SEAC, Gujarat and consent to establish from GPCB, Gandhinagar

1.12 NOTICE ISSUED BY SPCB UNDER AIR/WATER/EP ACT (LAST YEAR)

None

1.13 STRUCTURE OF EIA REPORT

The entire EIA report is prepared based on the generic structure of EIA document given at appendix - III of the Notification No. S.O. 1533 dated 14th September, 2006 at MoEFCC, New Delhi.

1.14 COMPLIANCE WITH REFERENCE TO THE TOR IDENTIFIED BY PP AND ADDITIONAL TOR STIPULATED BY THE AUTHORITY

ToR Letter No. SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan. 2019 under Schedule 3(b) Category "B" for 2.0 Million TPA Standalone Grinding Unit with Bulk and Bag Packing Plant at Village Shivrampur, Choryasi Dist- Surat, Gujarat.

S.No	ToR Points	Reply	Citation
1.	Alternative site analysis and justification for selection of the present site based on the pros & cons of various alternatives with technical reasons including the likely impacts of the air pollution (both flue gas emission and fugitive emissions) vis-à-vis wind direction, noise impacts due to the proposed activities, etc. for the proposed project.	The two sites have been chosen for alternative site analysis and option 2 (Located at Shivrampur village) has been selected for the proposed project set up.	Page 110, Chapter 5
2.	Project site specific details and site suitability with respect to siting criteria / guidelines. The site specific details should include distance of the project site from the nearest (1) Village (2) Water Body: River / Creek / Nallah / Reservoir / Pond / Canal (3) National Highway (4) State Highway (5) Railway line(6) Heritage site (7) National Park / Wild Life Sanctuary / Biosphere Reserve / Conservation Reserve (8) Reserve Forest / Protected Forest (9) Any other eco-sensitive areas like wetland, mangroves, coral reefs, migratory route of wild animals, turtle nesting ground etc.	The project site specific details and site suitability with respect to siting criteria / guidelines have been mentioned in chapter 5 and the distance from project site covering all area as mentioned in the ToR is listed in chapter 2.	Page 2 and page 110, Chapter 2 & 5.

3.	Land possession documents and NA order.	The private land located in Industrial Zone at Shivrampur village, Tal-Choryasi is under possession will be utilized for cement grinding unit.	Page 27, Chapter 2
4.	Need for the proposed project along with justification for selecting the proposed product and unit size.	The need for the cement is basically for infrastructure which is increasing day by day.	Page 15, Chapter 2
5.	PP shall furnish status of all the applicable Rules, Acts, Regulation, Clearances in a tabular form.	The regulatory framework has been mentioned in chapter 2.	Page 5, Chapter 2
6.	Land requirement for the project including its break up for various purposes, its availability and optimization.	Total 48,563 m^2 area is required to set up the grinding unit. The bifurcation is presented as suggested in ToR.	Page 27, Chapter 2
7.	Layout plan clearly demarcating various units (plants / utilities), green belt and open path around the periphery / plants for easy movement of emergency vehicles.	Layout plan has been prepared clearly demarcating various units (plants / utilities), green belt and open path around the periphery / plants for easy movement of emergency vehicles.	Page 34, Chapter 2
8.	Demarcation of proposed facilities for expansion in lay out of the existing premises.	Not applicable	-
9.	Details of exact production capacity per month in terms of each kind of cement *i.e*. Ordinary Portland Cement [OPC] / Pozzolona Portland Cement [PPC] etc.	Details of exact production capacity (1,66,667 TPM or 2.0 Million TPA) of cement grinding unit is provided in chapter 2.	Page 18, Chapter 2
10.	Detailed manufacturing operations along with mass balance, process flow diagram describing each unit, its processes / operations etc.	The manufacturing operations along with mass balance, process flow diagram provided in chapter 2.	Page 23, Chapter 2
11.	Strategy for the implementation of the Cleaner Production activities along with a write up on possibility of using high calorific hazardous wastes in kiln and commitment regarding use of hazardous waste in the process.	The Cleaner Production activities are provided in chapter 10.	Page 157, Chapter 10
12.	Explore possibilities of reuse / recycle and other cleaner production options for reduction of wastes & emissions along with commitment of the management on futuristic development / implementation for the same.	We have proposed to recycle the water from cooling tower and STP. The detail is provided in chapter 2 &10.	Page 36, Chapter 2
13.	Water requirement, its source and permission obtained from the concerned authority for supply of requisite quantity of water to the project. In case of ground water	Water requirement, its source and permission from concerned authority is provided in chapter 2. No ground water will be utilized; hence CGWA	Page 28, Chapter 2 Annexure IV

	abstraction, status of permission from the CGWA along with study report on geo-hydrology of the area and impacts of ground water abstraction.	permission is not required.	
14.	Explore the possibilities of getting surface water supply instead of depending on the ground water source for the proposed project.	Yes, we have proposed to use surface water from Irrigation department Surat.	Page 28, Chapter 2. Annexure IV.
15.	Detailed report for storm water drainage, management & disposal, measures proposed to avoid contamination of the storm water as well as restricting and isolating the contaminated storm water not allowing it to flow out of the premises.	The rain water harvesting has been proposed in chapter 10. No contaminated storm water will be flow out from the premises.	Page 150, Chapter 10.
16.	Water balance diagram (including reuse-recycle, if any). Efforts for water conservation.	Water balance diagram has provided in chapter 2. We will recycle 78 KLD water within premises.	Page 29, Chapter 2
17.	Details on raw materials, source, storage and handling within the premises. Mode of transportation of raw materials and products as well as measures proposed for preventing fugitive emission during transportation.	The detail of raw material with quantity has been provided in chapter 2.	Page 18, Chapter 2
18.	Type, quantity and quality of fuels required. A confirmed fuel linkage / copy of MoU for supply of fuel.	Type, quantity and quality of fuels required for cement grinding unit has been mentioned in chapter 2.	Page 32, Chapter 2 Annexure V
19.	List the sources of air pollution including process emissions as well as fugitive emissions along with the mitigation measures. Air pollution control measures (APCM) along with its design details, efficiency, inlet and outlet pollutant concentrations, etc. and stack height. The APCM shall be designed to achieve particulate matter emission below 50 mg/Nm3 at the stack outlet and its design should be got approved by the reputed institute.	All the sources of air pollution including process emissions as well as fugitive emissions have been identified and the mitigation measures have been suggested.	Page 35, 91 and 105, Chapter 2 and chapter 4.
20.	An action plan to control and monitor secondary fugitive emissions from all the sources.	Regular water sprinkling is proposed to control the fugitive emission.	Page 152, Chapter 10
21.	Provision of the online monitoring system on stacks for monitoring of pollutants, with an arrangement to reflect monitored data on company‘s server that can be	CEMS will be installed as per direction of CPCB with an arrangement to reflect monitored data on company‘s server that can be accessed by the GPCB	Page 117, Chapter 6

	accessed by the GPCB on real time basis.	on real time basis.	
22.	In case, hazardous waste is proposed to be charged in kilns, details on type of waste, its characteristics and monitoring of emissions of gases, heavy metals, VOCs, dioxins and furans.	Not applicable	-
23.	Details of solid / hazardous wastes generation, its composition, handling, storage, utilization, disposal etc.	Details of solid/hazardous wastes generation, etc. is listed in chapter 2.	Page 36, Chapter 2
24.	Details of all possible sources of noise pollution, its magnitude and mitigation measures including engineering and other controls proposed to control it.	The all possible sources of noise pollution, its magnitude and mitigation measures including engineering and other controls has been identified and presented in EIA report.	Page 36 & 141, Chapter 2 & chapter 10
25.	Details of heat emission sources from the proposed project and proposed mitigation measures.	All the emission sources have been identified and presented.	Page 47, Chapter 3
26.	One season site-specific meteorological data including temperature, relative humidity, hourly wind speed and direction and rainfall shall be provided.	One season site-specific meteorological data including temperature, relative humidity, hourly wind speed and direction and rainfall has been provided.	Page 44, Chapter 3
27.	One season (except monsoon) ambient air quality monitoring at minimum 6 locations within the study area along with dates of monitoring. Parameters to be considered shall be in accordance with the revised national ambient air quality standards notified in November, 2009 and other project specific parameters. The monitoring stations shall take into account the predominant wind direction, population zone and sensitive receptors including reserved forests. There should be at least one monitoring station in the upwind direction and one monitoring station at / near the location where maximum ground level concentration is likely to occur.	Baseline monitoring for post monsoon season (1st Oct. 2018 to 31st Dec. 2018) has been utilized for the preparation of EIA. The 8 locations were selected considering predominant wind direction, population zone and sensitive receptors including reserved forests, etc. The sampling location map along with coordinates of site has been mentioned in chapter 3.	Page 48, Chapter 3
28.	Prediction of ground level concentration of pollutants by air quality modeling based on site specific meteorological features. Details of the model used and the input parameters used for	GLC has been predicted on the basis of AAQ modeling and presented in chapter 4. The wind roses map shown on GLC map.	Page 100, Chapter 4

	modeling shall be provided. The air quality contours shall be plotted on a location map showing location of project site, habitation, sensitive receptors, etc. The wind roses should also be shown on this map.		
29.	Location of the project site and nearest habitats with distances from the project site to be demarcated on a toposheet (1: 50000 scale).	Location of the project site and nearest habitats with distances from the project site has been mentioned in chapter 2 and Toposheet map on 1:50000 scale has been provided.	Page 16 & 39, Chapter 2 & 3
30.	Land use pattern of the study area based on satellite imagery / field investigation including location specific sensitivities such as national parks / wildlife sanctuary, villages, industries, prime agricultural land etc., for the study area. If any incompatible land use attributes fall within the study area, proponent shall describe the sensitivity (distance, area and significance).	The land use Patten of the study area has been presented.	Page 56, Chapter 3
31.	The baseline data shall also be collected for other components of environment viz. noise, water, land, and biology and socio-economic.	The baseline data has been collected for other components of environment viz. noise, water, land and socio-economic.	Page 52,65,55 and 81, Chapter 3
32.	Ecological status (terrestrial and aquatic) of the study area such as habitat type and quality, species, diversity, rarity, fragmentation, ecological linkage, age, abundance, etc. In case of scheduled fauna, conservation measures should be proposed.	Ecology and biodiversity of the area has been studies by EB expert covering all aspects.	Page 77, Chapter 3
33.	A detailed study to assess the wildlife habitats, their migration route, etc. and measures to mitigate impacts of the proposed activities.	Ecology and biodiversity of the area has been studies by EB expert and mitigation measures suggested accordingly.	Page 77, 94 and 108, Chapter 3 & chapter 4
34.	While identifying the likely impacts, also include following for analysis of significance and required mitigation measures: (i) Impacts due to transportation of raw materials and end products on road network (ii) Impacts on surface water, soil and groundwater (iii) Impact on drainage of the area and the surroundings (iv) Impacts due to air pollution (v) Major sources of noise and its impacts (vi) Impacts due to	The anticipated impact has been identified and mitigation measures have been presented.	Page 97, Chapter 4

	fugitive emissions (viii) Impact on health of workers due to proposed project activities.		
35.	Proposal to construct approach road from the main road to the company premises and to maintain it in good condition for reducing fugitive emission due to transportation of vehicles.	The asphalt road is already available connecting from National Highway to site. Regular water sprinkling will be done.	-
36.	Details regarding infrastructure facilities such as sanitation, fuel storage, restroom, etc., to the workers during construction and operation phase.	The amenities at site have been mentioned in chapter 2.	Page 32, Chapter 2
37.	Environmental Monitoring Program for operational phase of project including (i) Monitoring programme for pollution control at source, (ii) Monitoring pollutants at receiving environment for the relevant parameters – air quality, groundwater, surface water, etc. to assess impact during operational phase of the project, (iii) Specific programme for medical surveillance and monitoring of working environment (especially for cement / silica dust) as per Gujarat Factories Rules (iv) Details of in-house monitoring capabilities and details of outsourcing to other agencies if proposed for conducting monitoring.	Environmental Monitoring Program for operational phase has been included in chapter 6 for all the relevant parameters as suggested.	Page 113 and 164, Chapter 6 & Chapter 10
38.	Environmental Management Plan including (i) Measures to mitigate adverse impacts along with item-wise cost of its implementation (capital and recurring costs), (ii) Administrative and technical organizational structure for implementation of mitigation measures and proposed post-project Environmental Monitoring Program, (iii) Allocation of resources and responsibilities for plan implementation.	Environmental Management Plan including mitigation measures has been included in chapter 4 and budget mentioned in chapter 10.	Page 89 and 165, Chapter 4 & Chapter 10
39.	A tabular chart for the issues raised in public hearing/consultation and commitment of the project proponent to the same. An action plan addressing the issues raised and the necessary allocation of funds for the same.	The detail will be added after PH conducted.	-

40.	PP shall ensure participation of people during Public Hearing with equality in gender so as to encourage woman participation in Public hearing & at the same time their issues shall also be given weightage.	The public hearing will be done after submission of draft EIA to GPCB and participation of women will be ensured.	-
41.	Action plan for the greenbelt development in accordance to CPCB published guidelines. The details should include types &number of species, width of plantations, area under green belt development [with map], planning schedule, budgetary outlay, etc.	The action plan of green belt (16500 m^2) has been prepared and presented in the EIA.	Page 159, Chapter 10
42.	Risk assessment including prediction of the worst-case scenario and maximum credible accident scenario along with risk contours plotted on the plant layout clearly showing the activities that would be affected in case of an accident taking place.	Risk assessment including prediction of all the hazard anticipated has been included.	Page 129, Chapter 7
43.	Details on the proposed safeguard measures, fire control plan, and on-site and off-site emergency management plans.	The safeguard measures, fire control plan, and on-site and off-site emergency management plans, etc. has been presented in chapter 7.	Page 131, Chapter 7
44.	Proposal for CSR activities most useful in the area along with time bound action plan and cost.	CSR is not applicable for the new project. However, CER is covered under ToR 45.	-
45.	Compliance of MoEFCC"s OM dated 01/05/2018 regarding —Corporate Environment Responsibility" (CER). Fund allocation for Corporate Environment Responsibility (CER) shall be made as per MoEFCC's O.M. No. 22-65/2017-IA.III dated 01/05/2018 for various activities therein. The details of fund allocation and activities for CER shall be incorporated in EIA/EMP report.	The activities under CER has been listed as per need base assessment and as suggested in MoEFCC"s OM dated 01/05/2018 regarding —Corporate Environment Responsibility" (CER).	Page 163, Chapter 10
46.	Explore the use of renewable energy to the maximum extent possible. Details of provisions to make the project energy-efficient through energy efficient devices and adoption of modes of alternative eco-friendly sources of energy like solar water heater, solar lighting etc. Measures proposed for energy conservation.	We have planned to use energy efficient devise and solar panel to save the energy and electricity. The measures proposed for energy conservation has been provided in chapter 10.	Page 149, Chapter 10

47.	Detailed scheme for surface / roof top rain water harvesting and ground water recharge shall be incorporated. In case of ground water abstraction, annual abstraction quantity should be compensated by equal amount of ground water recharge. The details should include scientific calculations based on rainfall, catchment area, runoff / recharge coefficients, percolation rate, duration of recharge etc. Before recharging the surface run off, pre-treatment must be done to remove suspended matter / oil & grease. Location of recharge percolation wells should be demarcated on layout plan.	No ground water will be used, however, the rain water harvesting has been proposed.	Page 150, Chapter 10
48.	Plan for compliance to the CREP guidelines.	Complied	Page 166, Chapter 10
49. a	Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.	Yes	Annexure VI
50. b	Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.	Yes	Annexure VI
51.	What is the hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions? Details of this system may be given.	The organogram has been presented in chapter 10.	Page 164, Chapter 10
52.	Does the company have a system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA Report.	Yes	Page 164, Chapter 10
53.	Certificate of accreditation issued by the NABET, QCI to the environmental consultant should be incorporated in the EIA Report.	Certificate of accreditation issued by the NABET is enclosed with this EIA report in on second page.	ii

54.	PP shall explore using gypsum as ARF (Alternative Raw Material/ Fuel) produced by chemical industries from process/ETP.	Yes, we have the proposal of using gypsum (ARF) by chemical industries from process.	-
55.	A tabular chart with index for point-wise compliance of above TORs.	Complied	-

1.15 SUMMARY

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant. This project is based on state of art technology Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat. The proposed Greenfield Standalone Grinding Unit falls in Category-B, under section 3(b) as per the prevailing EIA Notification, dated 14th September 2006 and its amendments thereafter. Capital cost of this project is 282.28 Crores. There is no litigation pending against the project and/or land on which the project will proposed to be set up. EIA study has been conducted prior to commissioning Standalone grinding unit with bulk and bag packing plant and in accordance with letter SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan. 2019 issued by SEIAA Gujarat.

2 PROJECT DESCRIPTION

2.1 GENERAL

The aim of this chapter is to discuss about type, need, location, size or magnitude of project, operational activities, technology to be used and other related activities. It also provides a condensed description of the aspects which are likely to cause environmental damages to the surrounding environment.

2.2 TYPE OF PROJECT AND CAPACITY

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat. This activity falls in Category- B under Project/Activity 3(b) schedule as per EIA Notification dated 14th September, 2006, as subsequent amendments. The company has well defined vision, mission and values that the company follows on its path to success. It has a vision to be the business leader, delivering superior value to all our stakeholders with a mission to achieve profitable growth and customer delight through innovation, operational excellence, leadership and teamwork to add value for all stakeholders and society.

2.3 NEED OF THE PROJECT

Industrialization is the better way for growth and employment. Also it is a strategic location connecting Indian markets. Cement is major component in infrastructure growth. Total cement production in the area and nearby state does not match the demand growth and hence new capacities have to come up concurrently. The proposed plant will ensure that the supply situation in Gujarat is comfortable in the coming times, as growth is expected to propel demand. SIL is known for its environment friendly initiatives across sectors it operates in and strong reputation for sustainable growth. Disposal of fly ash is an environmental concern which is faced all coal based thermal power generating plants. Cement grinding can consume up to thirty five percent of fly ash produced in the power plants and thus reduce environmental concern. The cement projects planned by SIL would also generate immense employment opportunities and significant contribution to the Govt. exchequer, improvement of socio economics of the area. The company is committed to the development of the country and will put all efforts for comprehensive development of this area also as being practiced.

2.4 LOCATION (M APS SHOWING GENERAL LOCATION, SP ECIFIC LOCATION, PROJECT BOUNDARY & PROJECT SITE LAYOUT, LONGITUDE AND LATITUDE)

Proposed project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant located at Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat, India. Location map and long/short view of Google Earth is depicted as **Figure 2.1 to 2.3** respectively. Land document is enclosed as **Annexure–II**. Project boundary marked on Google Earth having following co-ordinate:

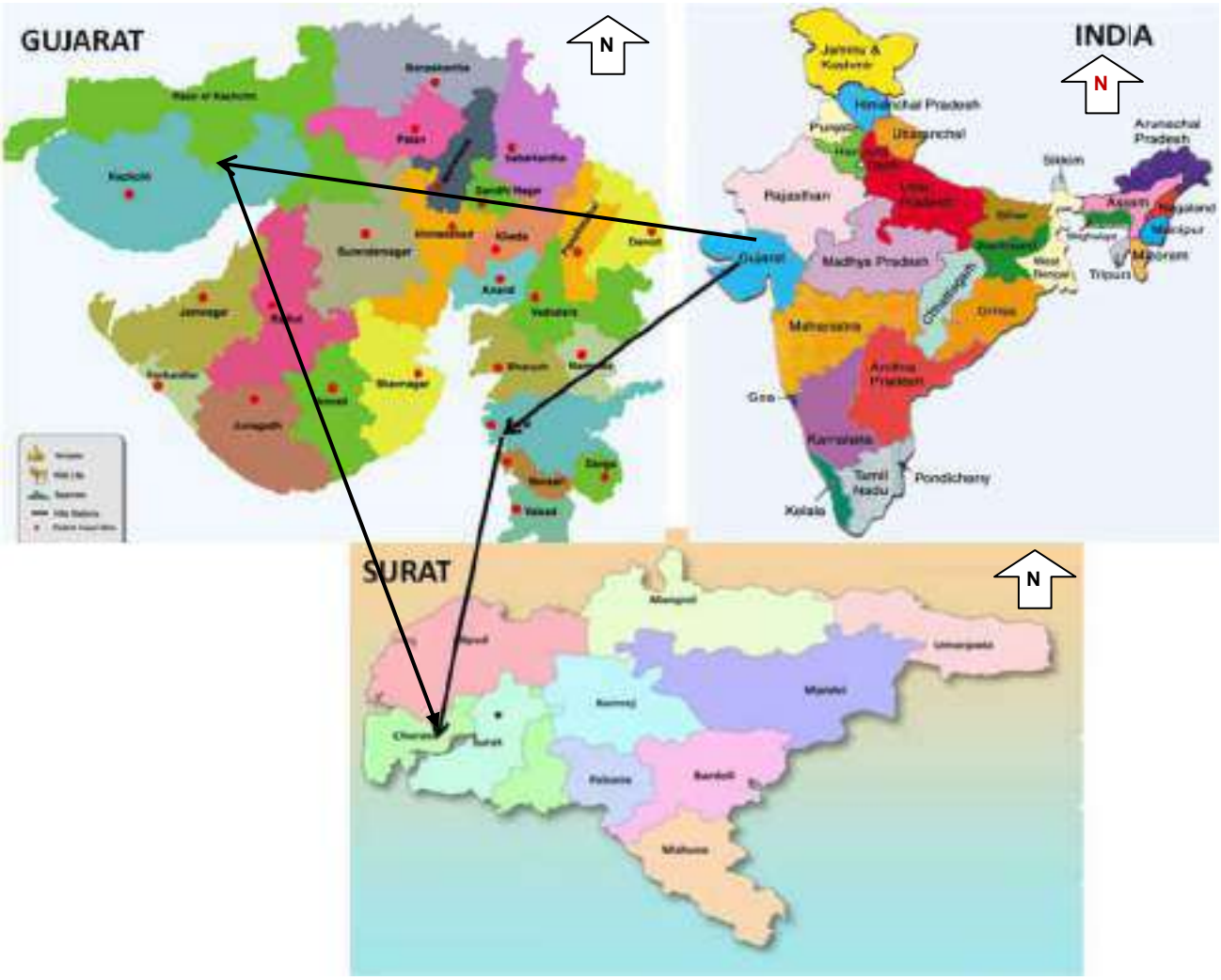


Figure 2.1 Location Map

Table 2.1: Coordinates of Project Site

Points	Latitude	Longitude
A	21° 9'0.08"N	72°39'0.68"E
B	21° 8'59.46"N	72°39'1.09"E
C	21° 9'0.78"N	72°39'3.62"E
D	21° 9'0.12"N	72°39'4.09"E
E	21° 9'0.81"N	72°39'5.20"E
F	21° 9'0.29"N	72°39'5.47"E
G	21° 9'1.18"N	72°39'6.90"E
H	21° 9'0.93"N	72°39'7.90"E
I	21° 9'0.86"N	72°39'9.24"E
J	21° 9'0.46"N	72°39'11.28"E
K	21° 8'59.84"N	72°39'11.93"E
L	21° 8'58.72"N	72°39'11.71"E
M	21° 8'57.60"N	72°39'12.32"E
N	21° 8'55.54"N	72°39'11.61"E
O	21° 8'54.57"N	72°39'10.56"E
P	21° 8'54.59"N	72°39'9.07"E
Q	21° 8'55.54"N	72°39'8.23"E

R	21° 8'55.22"N	72°39'5.49"E
S	21° 8'56.94"N	72°39'1.80"E
T	21° 8'57.07"N	72°39'0.75"E
U	21° 8'58.75"N	72°39'0.36"E

Figure 2.2 Long view of Project site

Figure 2.3 Short view of Project site

2.5 SIZE OR MAGNITUDE OF OPERATION

2.5.1 Products/Production Capacity

Proposed project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Village Shivrampur, Taluka- Choryasi, District Surat, Gujarat by Sanghi Industries Ltd.

2.5.2 Capital Cost

Estimated cost of this project is about Rs. 282.28 Crores. The anticipated capital expenditure for the pollution control measures is about Rs. 9.11 Crores.

2.6 ASSOCIATED ACTIVITIES REQUIRED BY OR FOR THE PROJECT

2.6.1 Raw Materials/Fuel and its Source

The major raw material is clinker, fly ash, gypsum and slag for the production of cement. The coal / lignite /pet coke will be used as fuel. The details of raw material, its quantity, the source and mode of transportation are provided in Table 2.2 and Table 2.3.

Table 2.2: Raw Material Requirement

S.No.	Material	Requirement per Annum - Million Ton/Annum			
		100% OPC	100% PPC	100% PSC	Max per Annum
1.	Clinker - OPC	1.90	--	--	1.90
	Clinker - PPC	--	1.20	--	
	Clinker - PSC	--	--	1.10	
2.	Gypsum	0.10	0.10	0.10	0.10
3.	Fly Ash	--	0.70	--	0.70
4.	Slag	--	--	0.80	0.80

5.	Lignite / Coal / Petcoke	--	--	0.06	0.06

Table 2.3: Sources of Raw Material

S.No	Material	Source	Source Locality	Mode of Transport
1.	Clinker	Captive	In house from Sanghipuram plant	Sea/Road
2	Coal	Purchase	Open Market	Road
3.	Fly ash	Purchase	Nearby Power Plant & Open market	Road
4.	Gypsum	Purchase	Open Market	Road
5.	Slag	Purchase	Nearby Steel plants & Open Market	Road

Table 2.4: Chemical Composition of Raw Materials

S.No.	Element	Composition				
		Clinker	Chemical Gypsum	Mineral Gypsum	Fly Ash	Slag
1.	SiO_2	19.80	2.87	-	60.24	35.10
2.	Al_2O_3	5.60	6.86	-	27.23	16.55
3.	Fe_2O_3	4.10	8.04	-	6.82	1.56
4.	CaO	63.70	23.88	-	-	35.96
5.	MgO	3.40	0.80	-	3.82	6.84
7.	Loss on ignition	0.32	19.37	0.76	0.67	0.85
8.	Free Lime	2.00	-	-	-	-
9.	LSF	98.26	-	-	-	-
10.	C_3S (Tri-calcium Silicate)	51.44	-	-	-	-
11.	C_2S (Di-calcium Silicate)	18.04	-	-	-	-
12.	C_3A (Tri-calcium Aluminate)	7.91	-	-	-	-
13.	Moisture	-	-	0.59	-	12.98
14.	Insoluble Residue (%)	0.28	1.72	-	-	1.6
15.	Na_2O	0.28	-	-	0.09	0.91
16.	K_2O	0.31	-	-	0.30	
17.	Cl	0.047	0.08	0.02	0.06	0.043
18.	SO_3	2.00	33.43	43.01	0.63	0.368
19.	Bulk Density (t /m^3)	1.5	-	-	-	-
20.	Purity (%)	-	66.64	92.48	-	Glass content≈ 92
21.	Heavy Metals: Arsenic, Chromium, Coppper, Iodine, Lead, Mercury, Molybdenum, nickel, Selenium & Zinc	ND	ND	ND	ND	ND

Source: Pollucon Laboratory Pvt. Ltd. Dtd. 05/03/2018

2.6.2 Quantity and Chemical Composition of Fuel

The quantity of fuel required at Surat GU is as follows:

Type of Fuel	Source	Max. Quantity (TPH)
Coal/Lignite/Petcoke	Open Market	12.00

Typical chemical analyses of the fuels are given in the **Table 2.5.**

Table 2.5 Quality Analysis Test Report of fuel

S.No.	Properties	Unit	Quality/Range		
			Imp. Coal	Lignite	Pet Coke
1.	Total Moisture	%	11.3	35.2	8.12
2.	Inherent Moisture	%	3.5	33.9	2.6
3.	Ash	%	10.2	33.4	0.92
4.	Volatile Matter	%	23.5	39.5	10.3
5.	Sulphur	%	0.6	4.46	6.9
6.	Gross/Net Calorific Value	Kcal/Kg	4200	3140	7700
7.	Heavy Metals: Arsenic, Chromium, Copper, Iodine, Lead, Mercury, Molybdenum, Nickel, Selenium and Zinc.	%	ND	ND	ND

Source: Pollucon Laboratory Pvt. Ltd. Dtd. 05/03/2018

2.6.3 Transportation & Storage of Raw Materials

The clinker shall be transported from Sanghipuram (IU) to Surat GU mainly by sea. Clinker shall be extracted from the Clinker load out silos at IU, transported to the captive Jetty of SIL by trucks and loaded on to the barges by grab cranes. Barges shall transport the Clinker to the ship stationed at high seas. At Surat, the Clinker shall be unloaded from the ship at nearest port and transported to the Surat GU site by trucks. The clinker received through self-tipping trucks shall be unloaded by into a box feeder and transported to clinker storage silo through conveyor and elevator. The clinker storage has been envisaged in RCC silos of capacity 50,000 Ton, adequate for about 10 day requirement of the plant. Clinker shall be extracted from the bottom of the clinker silos and fed to the clinker hoppers in the cement grinding section through a belt conveyors and elevator.

Additive & Fuel Crushing and Handling

The project envisages use of chemical gypsum and slag as additives and coal/lignite/petcoke as a fuel. Hence, additive crushing is not envisaged. The material shall be received in the plant by trucks, unloaded into a box feeder. The material is transported & stored with the help of sets of belt conveyor and stacker into covered stock pile. The material will be reclaimed by reclaimer and conveyed upto respective hopper through conveyor and elevator. The crusher will be provided for fuel crushing only for required sizing for HAG.

Additive Storage

Gypsum :

Total cement produced = 6,060 TPD (2.0 Million TPA)

Gypsum addition envisaged = 5%

Gypsum requirement per day = 6,060 x 5%

= 303 TPD

SIL proposes Gypsum storage of 1 x 3000 Ton, which is adequate for about 10 days of requirement. SIL shall have to ensure efficient logistics to ensure against stock out situation.

Slag

Total cement produced = 6,060 TPD (2.0 Million TPA)
Salg addition envisaged = 50%
Gypsum requirement per day = 6,060 x 50%
= 3030 TPD

SIL proposes slag storage of 1 x 4000 Ton, which is adequate for about 1.5 days of requirement. SIL shall have to ensure efficient logistics to ensure against stock out situation.

Fuel

Fuel requirement per day = 12 TPH x 21 hr
= 252 TPD

SIL proposes fuel storage of 1 x 2000 Ton, which is adequate for about 8 days of requirement. SIL shall have to ensure efficient logistics to ensure against stock out situation.

Fly Ash Handling & Storage

Total cement produced = 6,060 TPD (2.0 Million TPA)
Fly ash addition envisaged = 25%
Fly ash requirement per day = 6,060 x 25%
= 1,515 TPD

SIL proposes Fly ash storage of 1 x 5000 Ton, which is adequate for less than 3.3 days of requirement. SIL shall have to ensure efficient logistics to ensure against stock out situation. It is envisaged that the fly ash shall be brought through road bulk carriers and shall be unloaded pneumatically in the silo. From the silo, fly ash shall be transported to the hopper at cement mill by air slides and bucket elevator.

Cement Grinding System

Cement Mill capacity required = (6,060 x 1.15)/21
= 332 TPH

335 TPH (say) PPC @ 3,600 blaine

(Considering 21 hrs of operation per day and 15 % safety margin)

1.3.6. Cement Storage

Total cement produced per day = 2,000,000/ 330
= 6,060 Ton

SIL proposes cement storage of 3 x 7000 T, which is adequate for about 3 day of production. SIL shall have to ensure effective maintenance to ensure against stock out situation. Cement from the grinding system is transported to the silos with the help of air slides and bucket elevators. From the silos, cement shall be transported to the packer with the help of a set of air slides and bucket elevators.

2.6.4 Main Machinery/Equipment

2.6.4.1 Main Machinery Sizing

GRINDING UNIT CAPACITY		
S.No.	**Item**	**Grinding Unit Capacity**
1.	Cement Grinding	335 TPH PPC @ 3,600 Blaine
2.	Packers	2 x 240 TPH
3.	Truck Loaders	6 Nos.

GRINDING OPERATING CAPACITY				
S.No.	**Item**	**Operation Hrs/day**	**Days Operation per year**	**Safety Factor**
1.	VRM	21	330	1.15
2.	Packing Plant	15	360	1.25

2.6.4.2 Main Storage per ton

S.No.	Item	Grinding Unit Storage (Ton)
1.	Clinker Silo	50,000
2.	Fly Ash Silo	5,000
3.	Gypsum	3,000
4.	Slag	4,000
5.	Fuel	2,000
6.	Cement	3 x 7,000

2.6.4.3 Main Storage per day

S.No.	Item	Grinding Unit Storage (day)
1.	Clinker Storage	10
2.	Fly Ash Storage	3.3
3.	Gypsum Storage	10
4.	Cement Storage	3
5.	Slag Storage	1.5
6.	Fuel	8

2.6.4.4 Technical details Cement Grinding System

Based on the evaluation of parameters like power consumption, investment cost, proven performance, it is proposed to install VRM of capacity ~ 1 x 335 TPH.

The brief technical details of the cement drying & grinding system are as follows:

Cement Mill Bin(s): 2 Nos. hoppers for mill system comprising of 400 T capacity for clinker, 300 t each for gypsum & two additional for future material shall be installed.

Cement Mill Feeding: Weigh-feeders have been considered for extraction of clinker and gypsum in required proportion under the cement mill hoppers. Weigh feeders shall feed the material on a belt conveyor, which shall feed the material to mill circuit. Controlled/ measured quantities of fly ash will be drawn from fly ash silo through dozing valves and shall be fed to the dedicated solid flow meters through the weigh bin. Load cells will be provided for online check weighing and/or calibration of solid flow meters.

Vertical Roller Mill Circuit (VRM): Clinker with additives are grinded in Vertical Mill where material is discharge at the center of Rotating table and by centrifugal force material is distributed beneath the hydraulically operated rollers which apply pressure on the material bed to grind the material. The fly ash shall be added directly below the classifier in mill. Mill shall be considered open to sky i.e. without EOT crane. Maintenance shall be done through the mobile crane, shall be arrange as required on rent.

Product C ollection: The ground material is air swept to the high efficiency separator, where coarse material falls back on grinding table. Fines from separator will be collected in a bag filter. Fines collected in bag filter will be transported to cement storage silo by a system of air slides and bucket elevator.

Mill de dusting: The Mill is in negative suction and the product is collected in a bag filter which is designed as per Environmental norms. All auxiliary circuit shall be de dusted by means of bag filters. All Bag filters will be designed to meet the requirements of prevalent environmental norms.

Sampling: An auto sampler shall also be installed after the discharge of air slides taking product from bag house

Hot Gas Generator: In order to maintain the required gas flow through mill nozzle ring, hot gas may be required during mill startup. Hence, a suitably sized hot air generator (HAG) is envisaged. Diesel tank, pumps & transport line to HAG is considered. Cost of HAG, tank & transport system is considered in the project cost grinding package.

2.6.4.5 Cement Production

Total cement produced per day = 2,000,000/ 330 = 6,060 T

Cement storage of 3x 7,000 Ton silo is proposed, which is adequate for about 3 day of production. The silo is considered keeping in view that the different types of cement as per the market demand can be prepared and stored in future.

Cement from the grinding system is transported to the silos with the help of air slides and bucket elevators. From the silos, cement shall be transported to the packer with the help of a set of air slides and bucket elevators.

2.6.4.6 Cement Packing and Dispatch

Cement Sil os Extraction: The cement silos shall be capable of complete emptying by an appropriate design of the silo bottom and the aeration system. Silo extraction systems with multiple outlets and collecting hoppers shall be provided.

Cement Transport to packing Plant: Transport of cement from cement silo to packing machines by means of air slides and bucket elevators has been considered.

Cement Packing Plant: Total cement per day = 2,000,000/ 360 = 5,555 t (Considering 360 days of operation) Packer capacity required = 5,555 x 1.25/15 = 462 TPH, 2 x 240 TPH (say).

(As substantial portion of the dispatches will be through bulk, 2 packers are considered enough)

2 X 240 TPH, 16 spouts, double discharge packing machines has been considered. 6 Nos. semi-automatic truck loaders for loading of bags to road trucks have been considered. The rotary packer outlet up to loading of the packed bags, suitable system with flat transport belts and diverters has been considered. Also, installation of 2 Nos. of bulk loading system is considered.

2.7 SCHEDULE FOR APPROVAL AND IMPLEMENTATION

The implementation period has suggested 15 months for project execution activities after placement of main machinery order until the plant commissioning. The detailed time schedule for project execution after placement of main machinery order up to commissioning of the plant, in the form of bar charts is given below.

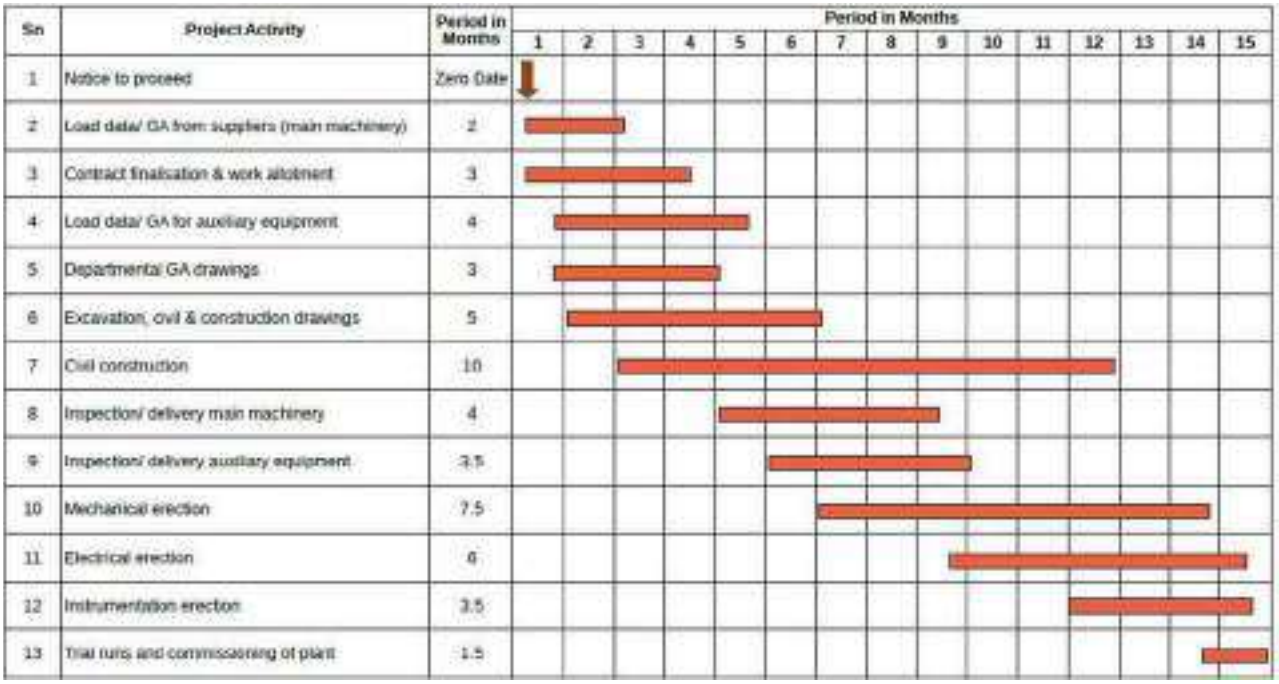


Figure 2.4 Project Implementation Schedule

2.8 TECHNOLOGY AND PROCESS DESCRIPTION

2.8.1 Cement Grinding Process

Clinker and additives like Gypsum, Fly ash & Slag shall be filled in to the respective hoppers through suitable material handling system. SIL has proposed to install 1 x 335 TPH Vertical roller mills for cement Grinding. A arrangement for cement mill is considered for clinker storage, additive

storages, Cement storage and packing plant. Clinker unloading and bagged cement loading to trucks for road transport is proposed along with bulk cement loading facility in the plant.

The grinding, drying and classification of the grinding material is performed inside the mill. The horizontal grinding table is rotated by a gear box. Feed material falls onto the center of the grinding table and spreads outwards under the effect of centrifugal force. The material passes under the hydro pneumatically spring-loaded grinding rollers, which grind the material by the application of compressive force and shear force. As it is ground, the material flows over the dam ring and enters the fast moving hot gas stream rising from the louvre ring which surrounds the table. The rising hot gas stream carries the ground material upward through the mill body to the classifier, which is directly located on top of the mill body. Through contact with hot gas the moisture of the ground material evaporates. The classifier controls the size of particles permitted to leave the mill. Those particles which are coarser than required are rejected to the table for regrinding via a grit cone below the classifier rotor. The particles which have reached the necessary fines pass the classifier.

Hot air required for the purpose of drying of moisture in Slag / Gypsum shall be generated by Hot Air Generator. HAG shall meet the drying heat requirement of Cement Grinding mill. Lignite/Coal/Petcoke will be required for such purpose and will be sourced from open market. The fuel will be transported to the plant site by road. Solid fuel will be stored at closed yard. The fuel will be fed to a crusher of 12 TPH capacities through a belt conveyer. Crushed fuel will be fed to HAG through bin.

The exhaust of VRM fan will be connected with bag filter. Product collected at bag filter shall be transported to the cement silo through a set of air slides and bucket elevator.

2.8.2 Cement storage

RCC silo of capacity 21000 ton (3 x 7000) shall be constructed for storage of cement.

2.8.3 Cement packing

The cement from silos will be extracted and fed to the installed 2 Nos. of electronic packers, sixteen spout, double discharge with a capacity of 240 TPH each through air slides, bucket elevators and screens. Each packer will be connected with 3 Nos. truck loaders for loading packed cement bags. The packed bags from packers will be transported to truck loading bays by suitable flat belts conveyors and diverters. A separate provision will be also available to load bulk cement through closed tankers / jumbo bags.

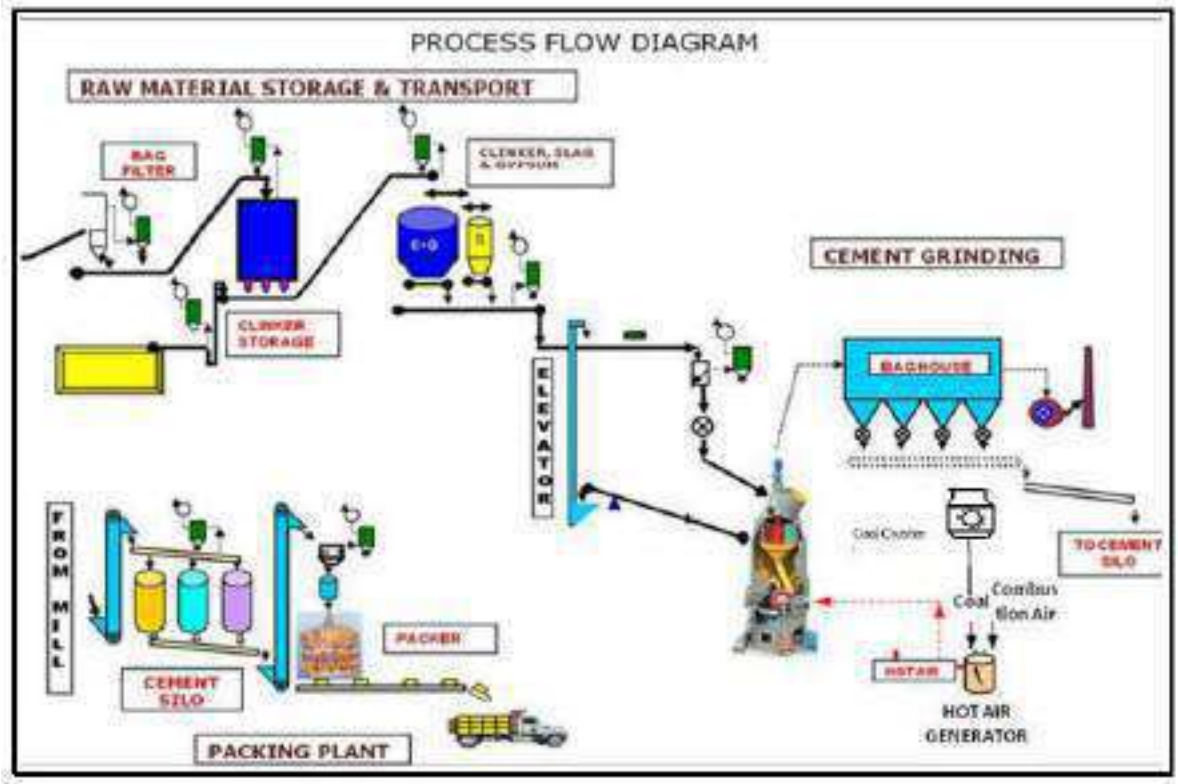


Figure 2.5: Process flow diagram of Cement grinding unit

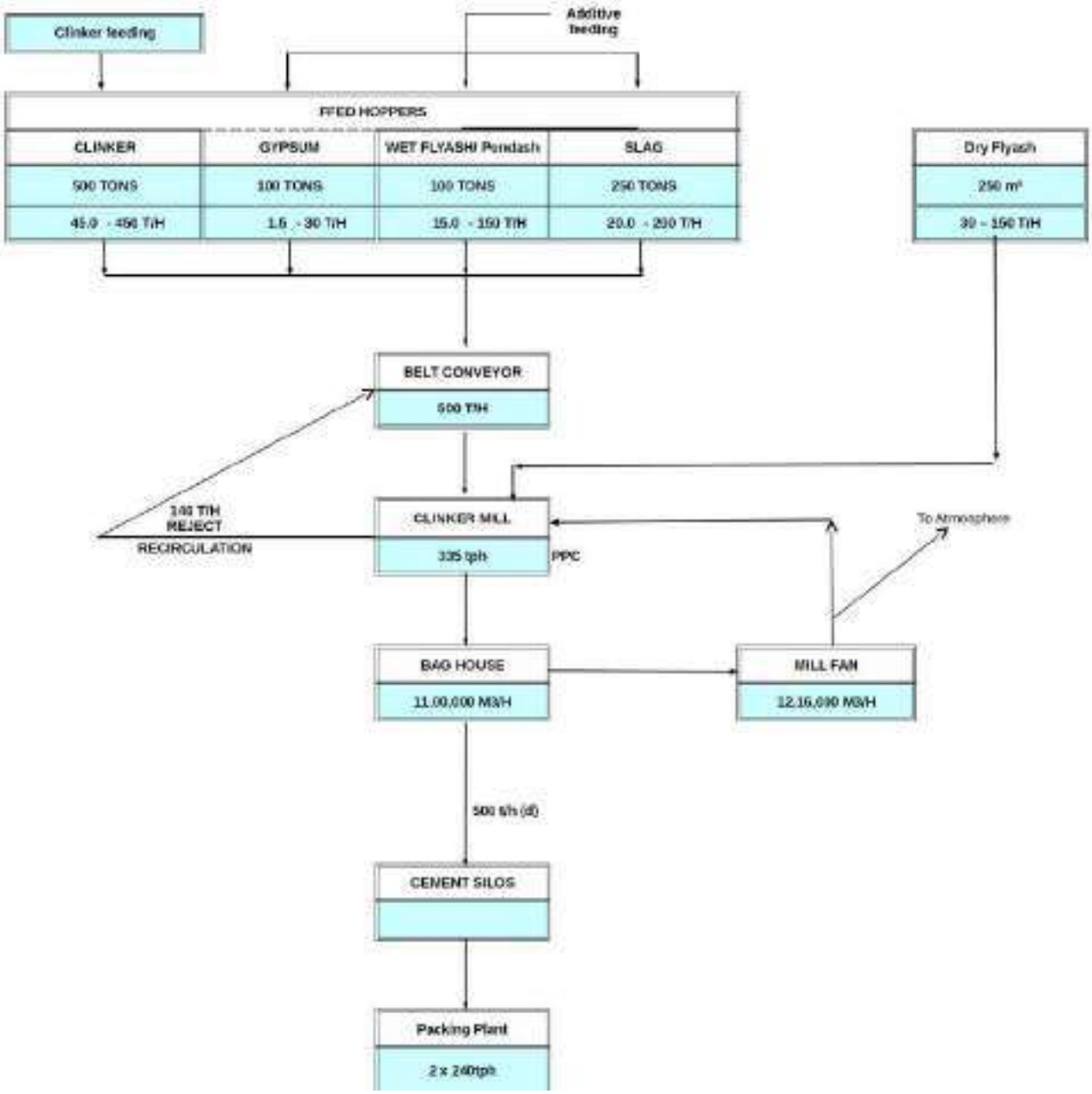


Figure 2.6: Mass balance of Cement Production

2.8.4 Quality control

The quality control department at the proposed plant shall have the following facilities:

Chemical / Physical Analysis laboratory

Facilities for testing the physical properties like sieve analysis, setting time, soundness, fineness, CCS, Grindability, moisture content, drying shrinkage, etc. X-ray diffractometer (XRD) and conventional chemical analysis equipments are envisaged for the analysis. To determine the PSD of the clinker, cements, etc. a laser diffraction type PSD analyser will be installed having typical particle size range of 0.3 mm 400 micron.

Quality Control Plan

To produce good quality cement, it is imperative that sampling & testing of various raw materials like clinker, gypsum, fly ash, Slag and the final product is carried out regularly at the required intervals for taking corrective action timely as per standards. To ensure consistent product quality and to permit the trouble free and cost effective operation, the quality control plan for sampling &

testing of various raw materials, in-process materials and the final product is suggested. While proposing the methods and procedures for quality control, the following aspects have been taken into account.

Requirements and norms, particularly in cement testing

- Corrective measures to be undertaken as quickly as possible in the process operation.
- Desired degree of automation.
- Available raw materials and process equipment.
- The main area of quality control has been envisaged as Before Cement Mill, After Cement Mill & Laboratory

The laboratory will be accommodated in the Central Control Room (CCR) building at the proposed plant site. The laboratory shall have the provision of chemical and physical testing facilities for raw materials, clinker, gypsum, fly ash, Slag and cement.

2.8.5 Maintenance

Workshop: A mechanical and an electrical workshop is envisaged to take care of the regular maintenance/ repair jobs in the plant.

Central st ores: A store building needs to be constructed for storing tools, spare parts, consumables, etc. Open area to be earmarked for storing machinery and construction materials for the proposed grinding unit site.

Cranes, Monorails and Pulley blocks-Adequate sized maintenance cranes/ hoists, monorails and pulley blocks to be provided at all suitable locations at the plant site for ease of maintenance and operation.

2.9 PROJECT COMPONENTS

Various resources like capital investment, land, utility, power, water, manpower etc. will be utilized for the proposed project. Each of the resources is briefly described in the following sections:

2.9.1 Capital Investment

The capital cost to set up the expansion is Rs. 282.28 Crores, which include land purchase cost, building and civil work, plant and machinery, utility/pollution Control and others. Capital cost including cost towards environmental management plan etc. is mentioned in table below.

Table 2.6 Project Cost Bifurcation

S.No.	Description	Amount (Rs. Lakhs)
1.	Land & Site Development	3819.0
2.	Civil works & Structures	7633.0
3.	Plant & Machinery	13334.0
4.	E & I Installation	2390.0
5.	Environment Management system	911.0
6.	Engineering	130.0
7.	Lab equipment/set up	0.50
8.	Expense on Training	10.0
9.	Contingency	0.50
	Total	**28228.0**

2.9.2 Land

Sanghi Industries Ltd. has procured 48,563.00 m^2 land to develop the standalone grinding unit. Land document is enclosed as Annexure II. Proposed project will be set at, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat. Out of 48,560 m^2 area

approx. 32,063 m^2 will be utilized for proposed project and remaining 16,500 m^2 area will be kept for greenbelt development. Construction of admin building, plant building, Raw material storage area, finished products storage area, utility area, treatment facility, parking, fire hydrant and other ancillary amenities shall be undertaken within the plot area. Proposed project will be developed in accordance with local development plan and used for industrial purpose. Bifurcation of plot area is mentioned in table below.

Table 2.7 Land Breakup of Cement Grinding Unit

#	Particulars	Total Area (in Ha.)	Area
1.	Production Plant	0.712	14.66%
2.	Office & Lab Area	0.022	0.46%
3.	Raw Materials Storage Area	0.632	13.01%
4.	Solid Waste Storage Area	0.005	0.10%
5.	Open Space	1.835	37.79%
6.	Green Belt	1.650	33.98%
	Total	**4.856**	**100.00%**

2.9.3 Water

The water requirement in operation phase including industrial and domestic purposes is about 278 KLD out of which 200 KLD is fresh. Water is required for equipment cooling, drinking, sanitation, Dust Suppression, Green belt etc. water shall be met through Local body/Irrigation Department, Surat. The application has been already submitted to Irrigation Department and attached as **Annexure-IV.** For plant equipment, water shall be re-circulated to avoid any wastage and only losses shall be making up from fresh water. Total water consumption is given in table below.

Table 2.8: Water Consumption in Cement Grinding Unit

S. No.	Particulars	Water Consumption, (KLD)
A.	**Domestic**	**15.0**
B.	**Industrial**	
1.	Processing/Cooling	150
2.	Dust suppression & Fire Fighting	10 KLD Fresh Water + 58 KLD from Blow down = 68 KLD
	Total Industrial	**160.0**
C.	**Gardening**	25 KLD Fresh water + 20 KLD recycled= Total 45
	Total Fresh water Requirement	**200.0**
	Total water Requirement	**278.0**

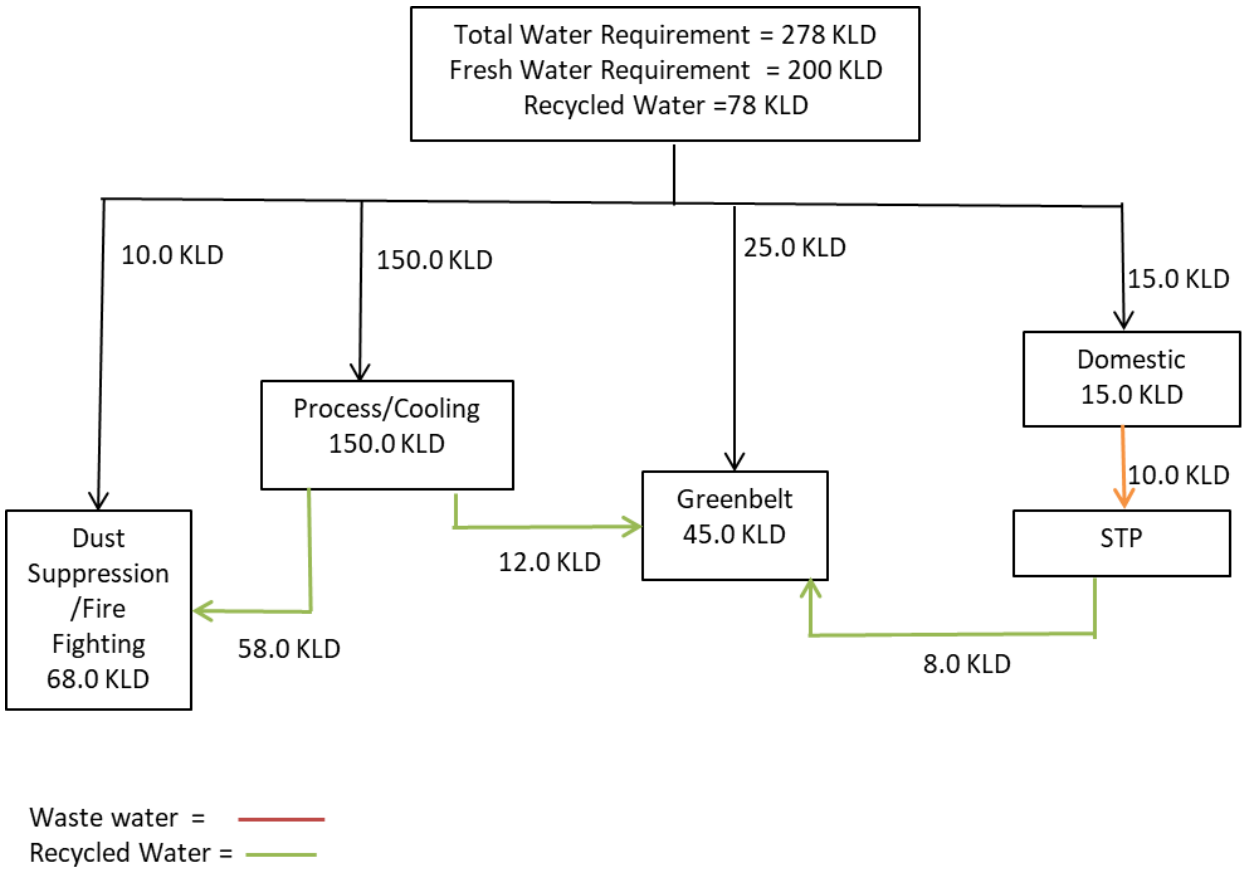


Figure 2.7: Water Balance Diagram

2.9.4 Electricity/Power Requirement

During Construction Phase: The construction power is envisaged to be made available from state electricity board.

During Operation Phase: The maximum estimated power demand for the proposed grinding and packing plant is estimated as 13.5 MW. The DG set of 2 MW will be installed for emergency power backup. The power requirement for the grinding unit shall be met from dedicated connection from the State Grid and/or SIL power plant Sanghipuram (CPP) shall be taken.

Drives for the grinding unit

The type of drives considered is based on following requirements:

- Load Characteristics
- Starting Torque
- Operating characteristic i.e. high power factor and efficiency at operating points
- Accuracy and range of speed control required for specific applications.

All Motors, 200 kW to 1200 kW shall be connected at 690 V and above 1200kW at 11 KV and motors below 200 kW at 415 V. Power saving equipment like variable frequency drives are taken into consideration for drives to have added economy in energy cost as well as to achieve precise speed control.

Power factor improvement for the grinding unit

For maintaining a high overall plant power factor (PF) and in order to reduce the demand charges, static power factor improving capacitors of suitable kVAR rating and voltage grade are considered. In the envisaged scheme, suitable size capacitors have been considered for direct connection across stator switch terminals of respective 11 KV motors. For compensation of LT

load, multi –step automatic controlled capacitor banks have been considered for connection at Main LT switchboards. The capacitor banks are sized to maintain the overall plant power factor of about 0.98 lag.

Earthing for the grinding unit

Adequate provision of sub-station earthing and earthing of high and low voltage equipment have been considered for the safety of operating personnel as well as for proper system operation as per requirements of Indian Electricity Rules and IS: 3043.

Illumination for the grinding unit

An efficient illumination scheme for inside and outside buildings shall be provided. Sufficient number of lighting boards and distribution boards are considered for lighting of various locations of the plant.

Fire detection and alarm system

For detection of fires in electrical buildings, Ionization type dual chamber/dual source smoke detectors will be used where incipient fires are likely, *e.g.* in cable cellars, switch gear rooms, control rooms etc. Fixed temperature cum rate of rise type heat detectors will be installed in transformer rooms, battery rooms etc. Multi zone type fire alarm panels will be installed in the electrical buildings. The fire detectors will be wired in zones. On detection of fire/fault in any zone, audio-visual alarm will be sounded in control panel and also by electronic hooters fixed in various locations in the electrical buildings. The alarm shall also be sounded at the central position.

Cable & Cable laying for the grinding unit

Following type of cables are proposed to be provided in the plant

Power(HT)	:	11 KV, armoured, XLPE insulated aluminium cables
Power(LT)	:	1.1KV, armoured, PVC(Alternatively XLPE) insulated aluminium cables
Control	:	1.1 KV grade, unscreened, armoured, PVC insulated, copper 1.5 & 2.5 sq. mm
Instrumentation	:	1.1 KV grade, unscreened, armoured, PVC insulated, copper 0.5 & 1.0 sq. mm

Control & Instrumentation

For effective control of various process variables, integrated & distributed microprocessor based, control & instrumentation system has been considered keeping in view the following objectives:

- Dependable and rugged instrumentation network
- Maximum protection against dust and vibration
- Operational safety
- Easy maintenance and repairs
- Flexibility to adopt future development/modifications
- Optimum operational efficiency and good quality product
- Maximum standardization to keep the inventory low

The control and instrumentation system envisaged incorporates the following essential features for safe operation of the plant and machinery and provides necessary operating data to evaluate the operating performance and fault monitoring.

- Suitable programmable logic control (PLC) system for sequence interlocking and automatic closed loop control through PI and PID action.
- Control of electronic weigh feeders for desired proportioning and feed rate.
- Sequential start/ stop of plant sections through process level PC controls, when the local/ remote switch at individual drive of the sequence is in remote position.
- It shall be possible to stop any drive from the field for safety reasons, from the local push button station near the drive or through safety switches.
- Color graphic and alphanumeric display with equipment fault monitoring system.
- Log trends for selected process parameters.
- Display of important process data.
- Printers for event/ alarm list(s) and report generation.
- Hard copy printer for print out of display at VDU.

Central control system for the grinding unit (GU)

Integrated and distributed hierarchical digital controls for centralized monitoring and control from central control room (CCR) have been envisaged. The central control system is structured into 4 level hierarchical configurations as given below:

- Level —1 (Field Level) - At field level the instruments and sensors have been installed in accordance with P & I diagrams. For certain systems e.g. mills, silos, weighing systems etc. control systems are also located in the field.
- Level — 2 (Department Control Level) - Using the process stations-with their process input/ output devices assuring the safe operation of machines and of the production process.
- Level — 3 (Supervisory Level)- Using operator station having supervisory processor with visual display unit, keyboards, mouse, printers & hard copier etc.
- Level — 4 (Optimization and Information Level- Future)- The Management Station shall be capable to handle monitoring functions for the plant management and to provide tools for the optimization and the strategic planning/ control of production. Management stations are envisaged such that the plant operations are maintained during shut down periods of these stations.

Programming terminal

One programming device with necessary VDU & keyboard for programming from operator level processor or process level PCs has been considered. Hand held terminals shall also be provided for word and bit examination and alteration and I / 0 bit forcing at process level.

Process/ instrumentation

Necessary field sensors shall be installed to monitor process variables like pressure, temperature, flow, level, speed, etc. The sensors shall be linked to plant control system through field transmitters/ transducers to display the parameters on operator station and exercise the desired controls. The broad technical features of sensors and instruments are described as follows:

- Pyrometers- For temperature measurement in hot zones non-contact type radiation pyrometers are proposed to be used. Pyrometers would include air purging and water cooling arrangements.
- Level sensors- Specially designed level sensors will be deployed for monitoring and control of material level in clinker discharge hoppers. RF admittance type sensors would be used for point level control. For continuous level monitoring, ultrasonic/ electromechanical type of instruments would be used.
- Speed switches- These are proposed to be deployed for achieving zero speed protection for various equipment. The unit chosen would have built in initial by-pass time delay and designed to operate over a range of speeds. The primary sensor would be non-contact type designed to achieve unlimited number of operations. The unit as well as sensor would have a high degree of environmental protection.
- Dust monitor- A microprocessor based monitoring device would be deployed which will provide concentration of particles in each stack. The equipment would have a built in air purge system.

2.9.5 Manpower

Direct and indirect employment will be generated due to the project. The total manpower requirement (Direct + Indirect) for the project is estimated as 500 persons during construction phase & 280 persons during operation phase. Unskilled/ semi-skilled manpower can be sourced from the local area and skilled manpower shall have to be sourced from outside/ local. The locals will be given preference on the basis of their qualification for the recruitment of manpower in cement grinding unit. The manpower requirement is given below:

Table 2.9: Manpower Requirement

Particulars	Construction Phase			Operation Phase		
	Direct	Indirect	Total	Direct	Indirect	Total
Skilled	45	280	325	20	30	50
Semi – Skilled	--	100	100	--	125	125
Unskilled	5	70	75	5	100	105
Total	**50**	**450**	**500**	**25**	**255**	**280**

2.9.6 Fuel

Approx. 12 TPH coal/lignite/petcoke will be required for the proposed project. Allocation letter for the same is being attached as **Annexure V.**

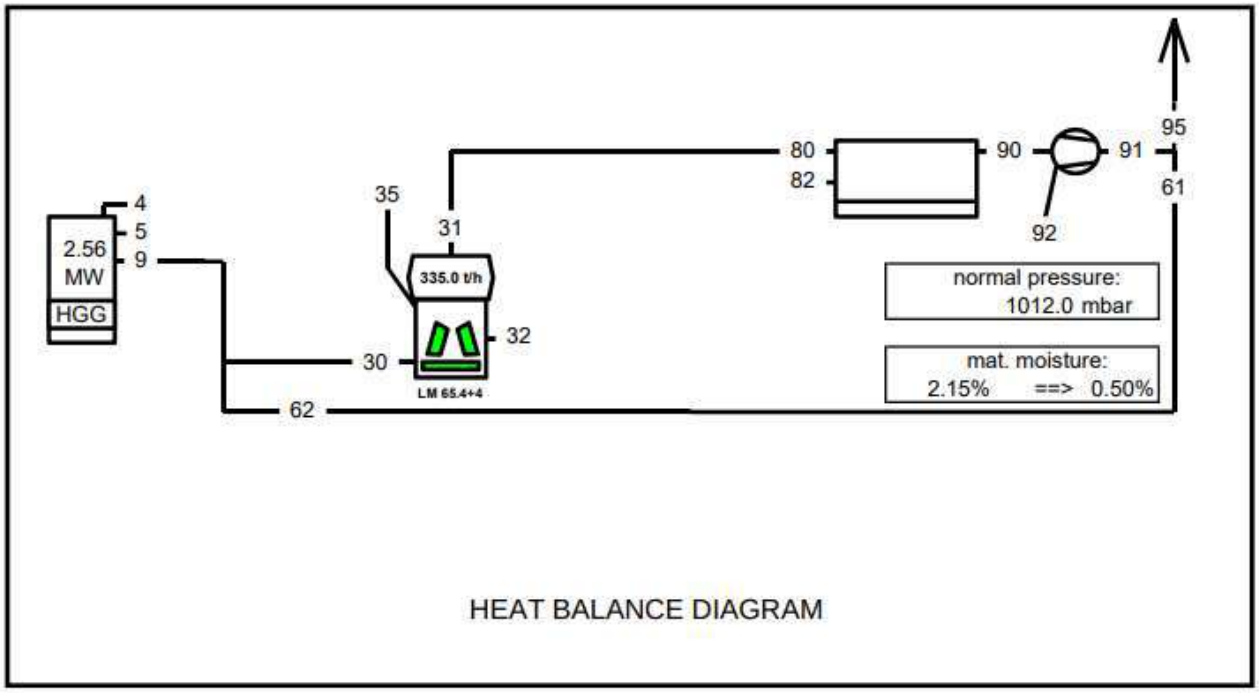


Figure 2.8: Energy Balance Flow diagram

2.10 PROJECT DR AWINGS SH OWING PROJECT LAYOUT, COMPONENTS OF PROJECT

Layout plan showing location of standalone cement grinding unit, storage area, water storage area, emergency vehicle location, greenbelt area, internal road, entry and exit gate, parking etc. is depicted as Figure 2.9 and the same is enclosed as **Annexure-III**. Construction of, plant building, raw material storage area, finished products storage area, utility area, treatment facility, parking, fire hydrant and other ancillary amenities will be undertaken within the plot area after obtaining statutory clearances from local authority. The layout will be planned considering the need of plant machinery, separate storage, administration and parking requirement prevailing wind direction, nearby

infrastructure facilities, requirement of approachable peripheral road for excavation and emergency purpose of vehicular movement etc.

2.11 NEIGHBOURING FACILITIES NEAR GRINDING UNIT

The infrastructure facilities near the site are well developed with approach road, State and National Highway (NH-6 & SH168). Proposed unit will be placed in , where all infrastructural facilities already available.

Additional Facilities Includes:

Technical & Laboratory/QC office- A suitable technical office & laboratory / QC office shall be constructed for the project activities and operation phase.

Administrative & Time and Security office- A suitable administrative, time & security office shall be constructed for the project activities and operation phase.

Fire-fighting system- Fire detection and extinguishing system shall be provided in all buildings.

Weighbridge- The electronic weighbridge shall installed to take care of the incoming and outgoing materials at site.

Bags Godown- Space shall be provided in the packing plant for the storage of empty bags.

Parking: Adequate parking space will be provided in the plant premises for the parking of vehicles.

Roads: All internal roads will be of concrete roads.

2.12 SCHEMATIC REPRESENTATIONS OF THE FEASIBILITY DRAWINGS

The drawing of the project will be designed considering the seismic zone III of the area, the civil structures will be earthquake proof.

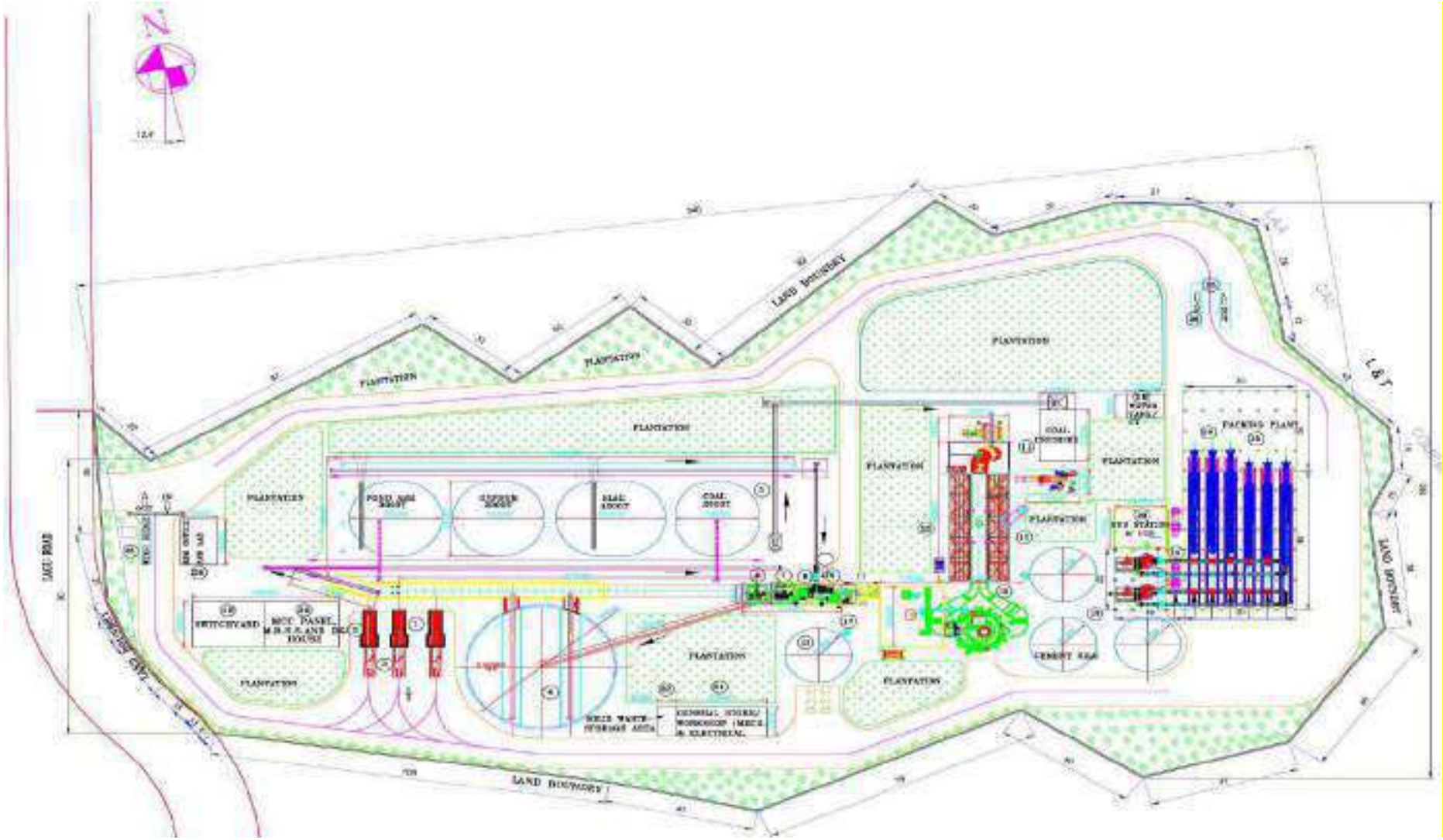


Figure 2.9. Layout showing Cement Grinding Unit

2.13 DESCRIPTION OF THE ASPECTS AND IMPACTS

2.13.1 Air Emission

In the plant, main sources of emissions will be from stacks attached to cement mill, Hot Air generator and packing of cement. The emissions of particulate matters from all the stacks is/will be limited to 30 mg/Nm^3.

PM10 and PM2.5 is considered as major air pollutants from this source. No process gas emission will be generated.

The unloading area of clinker, gypsum, fly ash and fly ash storage silo, clinker grinding mill, cements silos and packing machines are the main areas where dust is likely to be generated.

The emission from these sources would be fugitive in nature and bag filters are proposed as APCM to control fugitive emission. All other dust sources are considered as secondary sources since they are not process implied. These dust sources are likely to occur wherever relatively dry and dusty material is handled, conveyed, pumped or extracted. As such, for all these places high efficiency bag filters have been considered to minimize the fugitive emission.

- Unloading of coal from trucks will be carried out with proper care avoiding dropping of the materials from height. It is advisable to moist the material by sprinkling water while unloading.
- Dust suppression system will be installed in dust prone area.
- Fly ash will be handled in closed automated system and stored in covered silo
- Thick greenbelt will be developed around the plant to arrest the fugitive emissions.
- The online monitoring of air emission will be installed as per CPCB guidelines.

Table 2.10. Type of Emission and APC

S.No.	Location	Qty. Nos.	Capacity	Stack Details
A. Main Process Bag house				
A1	Cement Mill (VRM)	01	11,00,000 m^3/hr	Height – 55 m Dia – 3.2 m APC: Bag filters *Air emission:* PM 30 mg/Nm^3 SOx 100 ppm NOx 100 ppm
B. De-dusting Bag filters				
B1	Clinker & additive unloading station	02	11,000 m^3/hr	--
B2	Clinker Silo top	01	25,000 m^3/hr	--
B3	Cement Silo top	03	3,000 m^3/hr (each)	--
B4	Cement extraction under silo	03	3,000 m^3/hr (each)	--
B5	Packing plant top	01	45,000 m^3/hr	--
B6	Bulk cement loading	01	5,000 m^3/hr	--
B7	Fly ash silo top	01	3,000 m^3/hr	--
B8	Feed Hopper for HAG	01	5,000 m^3/hr	-

2.13.2 Wastewater Generation and Treatment

Total water requirement for the proposed plant is about 278 m^3/day. Primarily, water requirements for the unit shall be met by local body / irrigation department. The water balance of plant is presented in Figure 2.7. The waste water generation in proposed plant is given below.

Table 2.11: Waste Water Generation

#	Particulars	Fresh Wat er Consumption (KLD)	Total w ater requirement (KLD)	Effluent generation (KLD)	Recycled water (KLD)	Remarks

A.	**Domestic**	**15.0**	**15.0**	**10.0**	**8.0**	Recycled water will be used for greenbelt
B.	**Industrial**					
1.	Cooling Tower	150.0	150.0	-	70.0 Blow down	80.0 KLD evaporation loss, blow down water will be used for dust suppression and Greenbelt
2.	Dust suppression	10.0	68.0 (58.0 from blow down + 10 KLD fresh water)	-	-	-
	Total Industrial	**160.0**	**218.0**	**-**	**-**	**-**
C.	**Gardening**	25.0	45.0 (12.0 from blow down + 8.0 kld from STP)	-	-	-
	Total (A+B+C)	**200.0**	**278.0**	**-**	**78.0**	**-**

Wastewater Generation from industrial use: In operations phase, waste water will be generated from cooling tower.

Wastewater Generati on from Dome stic Uses: The sewage wastewater will be treated in STP having 15.00 KLD capacity. The treated sewage water will be used for greenbelt and dust suppression

2.13.3 Noise Generation

The heavy machinery and large fans equipped in various parts of the cement grinding unit can give rise to noise and/or vibration emissions. Any operations involving crushing, milling and screening of raw material, fuels, exhaust fans. Plants are required to comply with reduction standards in compliance with national legislation, and noise surveys will be conducted and evaluated. Natural noise barriers, such as office buildings, walls, trees or bushes will be used to reduce noise emissions. All the equipment will be designed to comply with the Factories Rules and Stipulations and will not exceed 90 dB (A) at 1 m distance from source of noise. Walls and ceilings of the concerned buildings will be lined with sound absorbing materials. Properly insulated enclosures will be provided for high noise generating plant machinery. Personal Protective Equipment like earplugs and earmuffs will be provided to the workers. Regular monitoring of noise level will be carried out to ensure that noise level is maintained as per the norms.

2.13.4 Solid/Hazardous Waste Generation and Utilization

The entire quantity of solid/hazardous waste will be handled and disposed as per Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules - 2008. No solid waste will be generated from the cement manufacturing process. Ash generated by the HAG will be 100% utilized in cement manufacturing process (PPC) Dust collected from air pollution control equipment will be

totally recycled in process. A part of used oil will be utilized for lubrication purpose & remaining will be sent to own clinker unit located at Sanghipuram, Kutch

Table 2.12 – Details of solid / hazardous waste

S.No.	Waste	Qty / Annum	End use / Disposal
1	Dust collected from APCM	--	Totally recycled in process
2	Ash generated from HAG	18000 MT	100 % recycled in the plant in PPC
3	Used Oil	60 MT	Secondary lubrication / send to Own Clinker plant under AFR

2.13.5 Occupational Health and Safety

The project proponent is committed towards the health and safety of workers. All the necessary measures will be planned for occupational maintaining good health of the employees. Routine medical examination of each person will be carried out as a systematic program on a regular basis. Medical surveillance for the workers working in risk zone will be carried out regularly and annual report of the health status of workers for the same will be maintained. Standard Operating Procedures (SOP) for different works/activities will be in place.

2.14 MITIGATION MEASURES

There will be impact due to proposed project activities of the cement production (standalone grinding unit). Based on type of activities, Impacts may be long or short term. Impacts due to generated pollutant may be significant on environmental parameters if it is not mitigated properly. Project activities and cause of impact along with its characteristics are mentioned in table below-

Table 2.13: Aspects & Impacts Analysis

Activity	Environmental Attribute	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Intensity a nd Significance
Vehicle Movement and utilities operation	Air Quality	Exhaust Emissions *i.e.* NO_x, SO_2 Fugitive emission	Negative	Short Term	Reversible	Low, due to movement of vehicle only for loading and unloading of raw material. Provision of APC's.
	Noise Levels	Noise Generation	Negative	Short Term	Reversible	Low, due to limited activity
	Risk & Hazards	Accidents, collision of transport vehicles	Negative	Short Term	Reversible	Medium due to loss of property and injury to manpower.
Process of cement production and raw material handling, storage	Noise Levels	Noise Generation from utilities, processing machineries and reaction vessels	Negative	Long Term	Reversible	Low, due to noise reduction measures
	Work Zone Air Quality	Flue gas generation	Negative	Long Term	Reversible	Medium, due to air pollution control devices (APC's)
	Risk & Hazards	Catch fire accidents	Negative	Short Term	Reversible	High, due to injury to manpower and loss of properties and

Activity	Environmental Attribute	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Intensity a nd Significance
						fatal accidents
Solid/ Hazardous Waste Disposal	Land and Soil	Generation of Solid Waste	Negative	Short Term	Reversible	Will be utilized in own cement plant.
Green Belt Development	Ecology	Planting of Trees	Positive	Long Term	Reversible	High, Positive Impact
	Air Quality	Dust barrier	Positive	Short Term	irreversible	Low, Positive Impact
	Noise	Noise barrier	Positive	Short Term	irreversible	Low, Positive Impact
	LU/LC	Conservation of Land	Positive	Long Term	irreversible	Medium, Positive Impact
	Soil	Increase in soil fertility	Positive	Long Term	Irreversible	Medium, Positive Impact
	Water	Water consumption	Negative	Long term	Irreversible	Low, due to water circulation
Employment Generation	Socio Economic Status	Direct and Indirect employment	Positive	Long term	Irreversible	High, the project will generate employment

2.15 ASSESSMENT OF NEW & UNTESTED TECHNOLOGY

No recommendation of assessment of New and untested technology as Worldwide tested technology for the cement product (OPC, PPC, PSC) shall be used.

2.16 CONCLUSION

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat. This activity falls in Category- B under Project/Activity 3(b) schedule as per EIA Notification dated 14th September, 2006, as subsequent amendments. Estimated cost of this project is about Rs. 282.28 Crores. The anticipated capital expenditure for the pollution control measures is about Rs. 9.11 Crores. The project envisages use of chemical gypsum and slag as additives and coal/lignite/petcoke as a fuel. The implementation period has suggested 15 months for project execution activities after placement of main machinery order until the plant commissioning. The water requirement in operation phase including industrial and domestic purposes is about 278 KLD out of which 200 KLD is fresh. The total manpower requirement is 280 persons during operation phase.

3 DESCRIPTION OF THE ENVIRONMENT

3.1 GENERAL

The baseline environmental quality is assessed through field studies within the probable impact zone for various components of the environment *viz*. Air, Noise, Water, Soil, Ecology & Bio diversity and Socio-economy. The baseline environmental study has been conducted for the study region within 10 km radius. An exhaustive attempt has been made in the current chapter to disclose all possible baseline status of environmental quality in the study area, which further serves as the basis for identification, prediction and evaluation of impacts. The study area map is shown in the **Figure 3.1.**

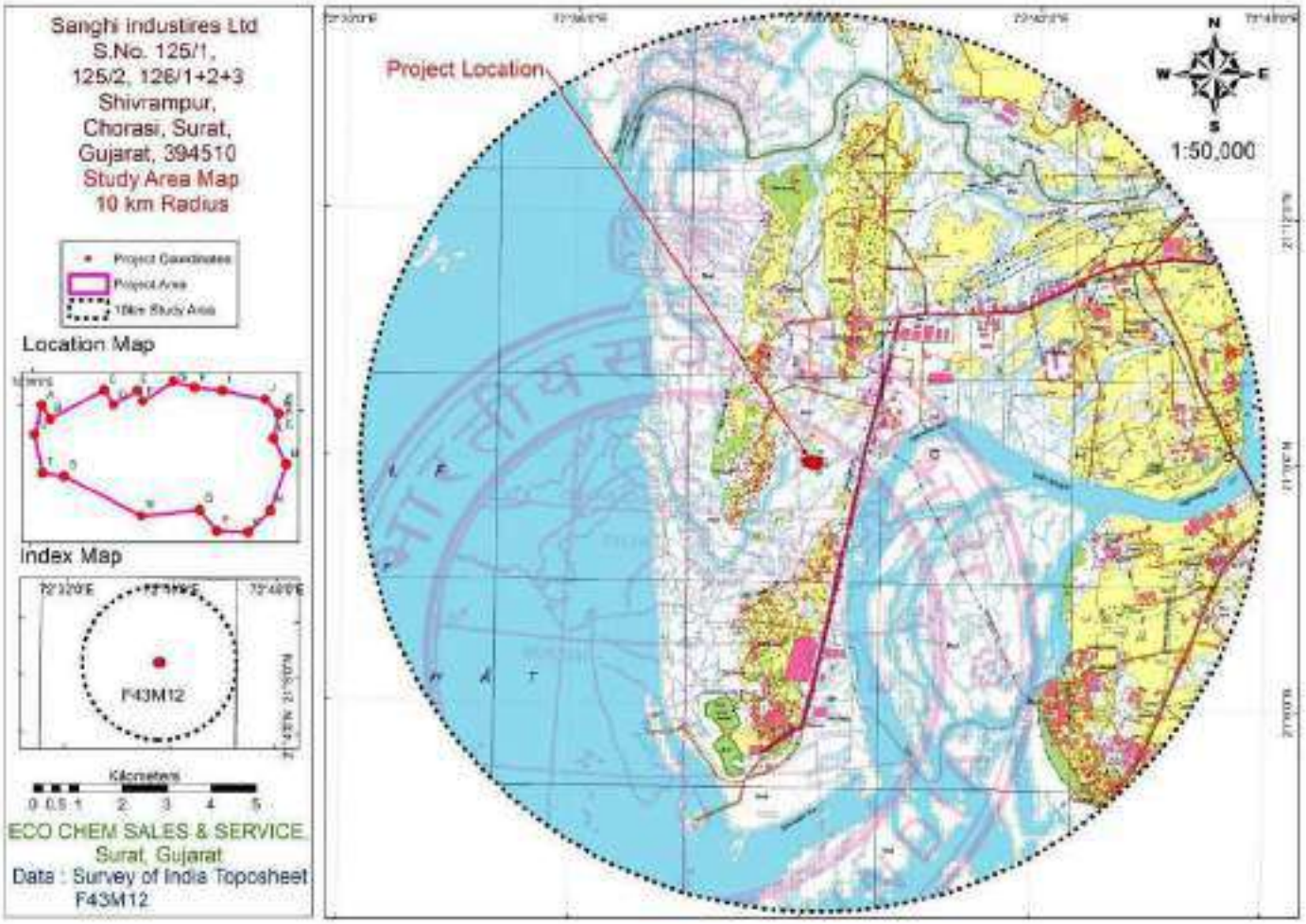


Figure 3.1: Study Area Map

3.2 BASELINE STUDY AREA AND PERIOD

The baseline environmental study has been conducted for the study region within 10 km radius of the project site for the period 1st Oct 2018 to 31st Dec 2018. An exhaustive attempt has been made in the current chapter to disclose all possible base line status of environmental quality in the vicinity of the project, which further serves as the basis for identification, prediction and evaluation of impacts.

3.3 VALUED ENVIRONMENTAL COMPONENTS (VECS)

The Valued Environmental Components (VECs) to be included in study area (10 km radius w.r.t. project site) including physical, biological and social component is provided in subsequent sections of this chapter.

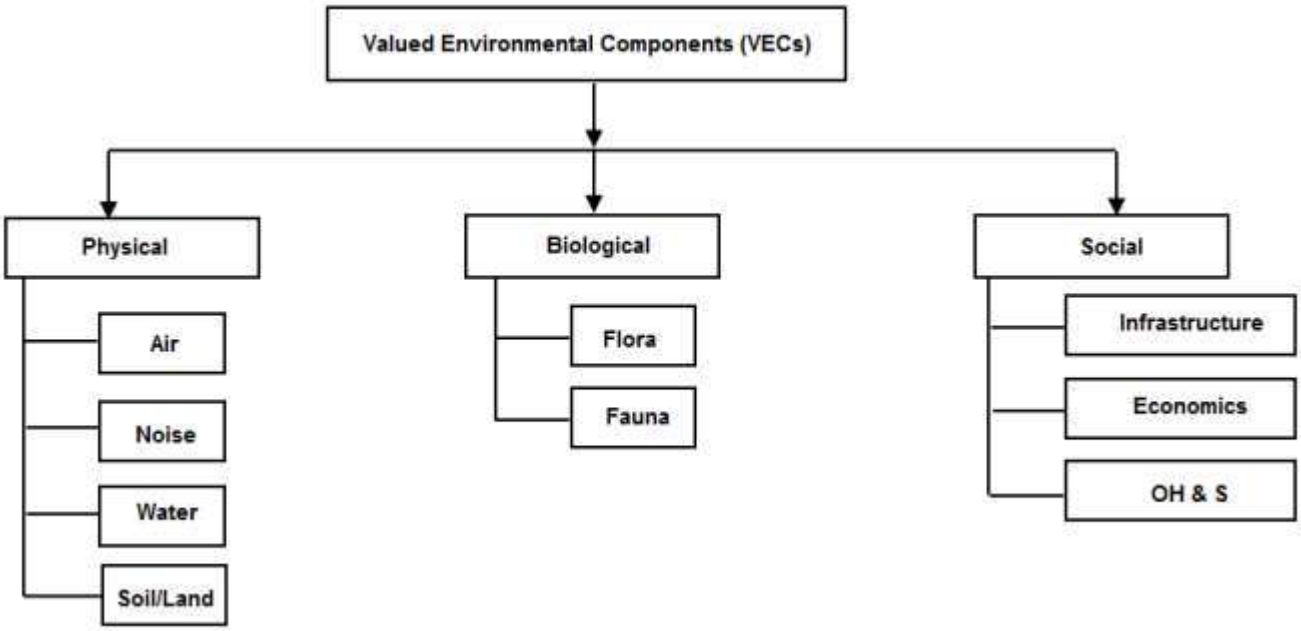


Figure 3.2: Schematic presentation of Valued Environmental Component

3.4 METHODOLOGY

The baseline environmental study was carried out for the various environmental components viz, Air, Water, Soil, Ecology and Biodiversity, Socio Economy and Noise. A desktop study was carried out to select the sampling locations and site visit was done by our field area experts. After the site visit, locations were finalized. During the submission of field area expert report and discussion looking to the extent of impact, 5 km radius was considered as core zone and rest 5 km radius was considered as buffer zone. All the locations have been selected within 10 km radius from the project site as per the requirement of TOR and environmental samples were collected from the selected locations of the study area. Before starting the survey activity for ecology and bio diversity, secondary data were used as reference during the desktop survey for listing the species of study zone and planning the survey. In case of socio economy, secondary data have also been used for deciding the parameters to be surveyed during socio economic data collection. As a secondary source of data, for Ecology and Biodiversity survey various publications by the government of India and literature available on internet site were used.

3.4.1 Frequency of Sampling

Details of frequency of environmental sampling considered for the study are illustrated in **Table 3.1.**

Table 3.1 Frequency of Environmental Monitoring

Attributes	Sampling		
	Locations	**Parameters**	**Frequency**
A. Air Environment			
Micro-meteorological Data	Nr. Project Site	Temperature, Relative Humidity, Precipitation Wind direction, Wind Speed.	Hourly data for the period 1st Oct 2018 to 31st Dec 2018.
Ambient Air Quality	8 numbers of locations in the study area of 10 km radius.	$PM_{2.5}$, PM_{10}, SO_2, NO_x, CO and Total VOC	24 hour basis, twice a week during study period.

B. Noise	8 numbers of locations in the study area of 10 km radius.	Noise Levels in dB (A).	Once in Study Period.
C. Water			
Ground Water	Samples from 7 numbers of locations within 10 km radius from the project site.	Physical, Chemical, Microbiological and Heavy Metal.	Once in Study Period.
Surface Water	Samples from 6 numbers of locations within 10 km radius from the project site.	Physical, Chemical, Microbiological and Heavy Metal.	Once in Study Period.
Marine Water	Samples from 1 number of location during high tide and low tide within 10 km radius from the project site.	Physical, Chemical, Microbiological, Zooplankton, Phytoplankton, Benthos, Sediment and Heavy Metal.	Once in Study Period.
D. Soil Quality	Samples from 4 numbers of locations within 10 km radius from the project site.	Physical, Chemical Characteristics, Soil Texture.	Once in Study Period.

3.4.2 Method of Environmental Sampling and Analysis

The methods adopted for environmental sampling and analysis are illustrated in following **Table 3.2**

Table 3.2 Method of Environmental Sampling and Analysis

Attributes	**Methods**	
	Sampling/Preservation	**Analysis/data analysis**
A. Air Environment		
Micro-meteorological Data	Data collected on hourly basis using wind monitor as per CPCB Guideline.	NA
Ambient air quality	As per IS: 5182, CPCB & AWMA.	As per IS:5182,CPCB & AWMA
B. Noise	Instrument : Sound level meter	Survey carried out as per CPCB guideline.
C. Water		
Ground Water	Standard Methods for Examination of Water and Wastewater, 23rd edition, APHA 2017.	IS 3025 & Standard Methods for Examination of Water and Wastewater, 23rd edition, APHA 2017.
Surface and Marine Water	Standard Methods for Examination of Water and Wastewater, 23rd edition, APHA 2017.	IS 3025 & Standard Methods for Examination of Water and Wastewater, 23rd edition, APHA 2017.

D. Soil Quality	IS 2720, Soil Testing in India (Department of Agriculture & Cooperation).	IS 2720, Laboratory developed Method as per NABL requirement and Book - Soil Testing in India (Department of Agriculture & Cooperation).

Ambient air – Damka Village

Ground water – Hazira village

Ambient air – Mora Village

Surface water – Mora Village

Traffic Study – NH 6

Project site – Noise

Project Site – Ambient air

Project Site –Soil

EB Survey	SE Survey

Figure 3.3 Photograph showing the sampling activity

3.5 MICROMETEOROLOGY

The study of micro meteorological data helps to understand the variations in the ambient air quality status in that region. The prevailing micrometeorological condition at project site plays a crucial role in transport and dispersion of air pollutants. The persistence of the predominant wind direction and wind speed at the project site decide the direction and extent of the air pollution impact zone. The principal variables which affect the micrometeorology are horizontal transport and dispersion, convective transport and vertical mixing and topography of the area towards local influences. Micrometeorological data were collected by using the wind monitor as per CPCB guideline which was installed near project site. All the micrometeorological data were collected on hourly basis. Meteorological conditions of the study area are presented in **Table 3.3.**

Table 3.3 Meteorological Condition of Study Area

Month	Temperature (°C)		Relative Humidity (%)		Wind Speed (km/hr)	
	Min.	Max.	Min.	Max.	Min.	Max.
Oct'18	21.7	38.1	22	93	0.1	8.0
Nov'18	18.1	37.1	23	91	0.1	7.0
Dec'18	13.1	33.0	22	95	0.1	10.0

3.5.1 Temperature

During the study period minimum temperature was recorded 13.1°C on 29th Dec 2018 and maximum temperature was recorded as 38.1°C on 02rd Oct 2018. Temperature data were collected on hourly basis during the study period. Variation of temperature is graphically presented in **Figure 3.4**.

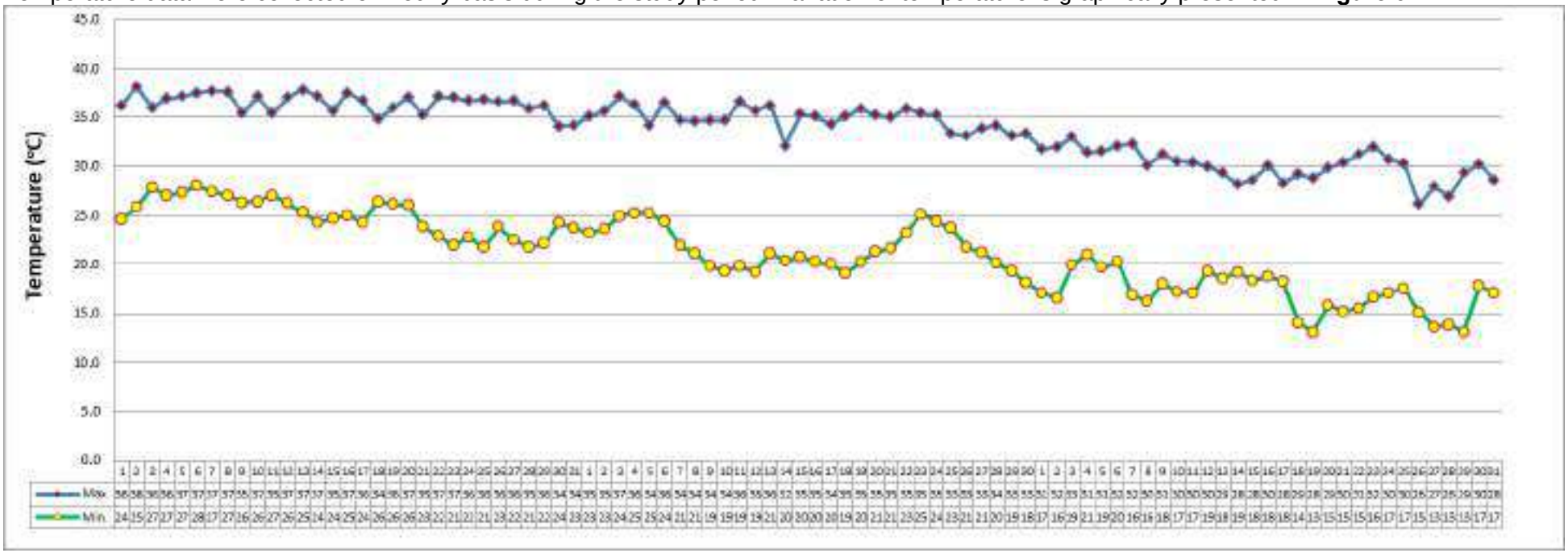


Figure 3.4 Graphical Presentation for the month wise Temperature Variation

3.5.2 Humidity

Humidity affects the nature and characteristics of pollutants in the atmosphere as it is the measure of amount of moisture in the atmosphere. Humidity helps suspended particulate matter to coalesce and grow in size to settle under the gaseous pollutants by providing them aqueous medium. During the study period minimum Humidity was recorded 22% on 22nd Oct 2018 and 19th Dec 2018 and maximum Humidity was recorded 95% on 11th Dec 2018. The variation in humidity is represented graphically in **Figure 3.5.**

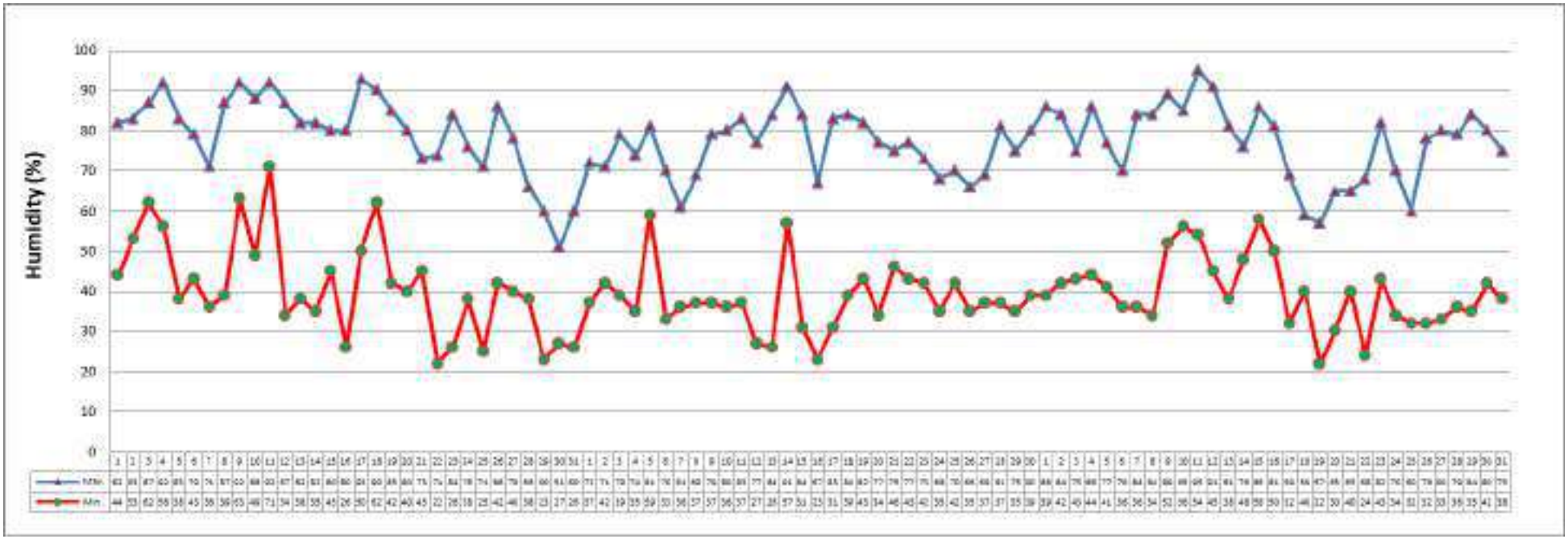


Figure 3.5 Graphical Presentation for the month wise Humidity Variation

3.5.3 Wind Speed and Wind Direction

Hourly wind speed data were collected for the period 1st Oct 2018 to 31st Dec 2018 with the help of wind monitor. The rate of dispersion, diffusion and transportation of pollutants in the atmosphere mainly depend on wind speed and its direction. Wind direction and velocity data have been collected during the study period. Dominant wind direction in the study period was from NE –SW during the study period. Wind speed was observed from 0.1 to 8.0 km/hr in the month of Oct 2018, from 0.1 to 7.0.0 km/hr in the month of Nov 2018 and from 0.1 to 10.0 km/hr in the Month of Dec 2018. Month-wise maximum and minimum wind speed data are tabulated in **Table 3.3.**

3.5.4 Wind Rose

Wind rose diagram is a graphical representation of the magnitude and direction of wind speed considering all the directions. From the knowledge of wind rose one can easily predict the direction and extent of spreading of the gaseous and particulate matter from the source. Wind rose diagram has been prepared by using hourly wind velocity and dominant wind direction data and is presented in **Figure 3.6**

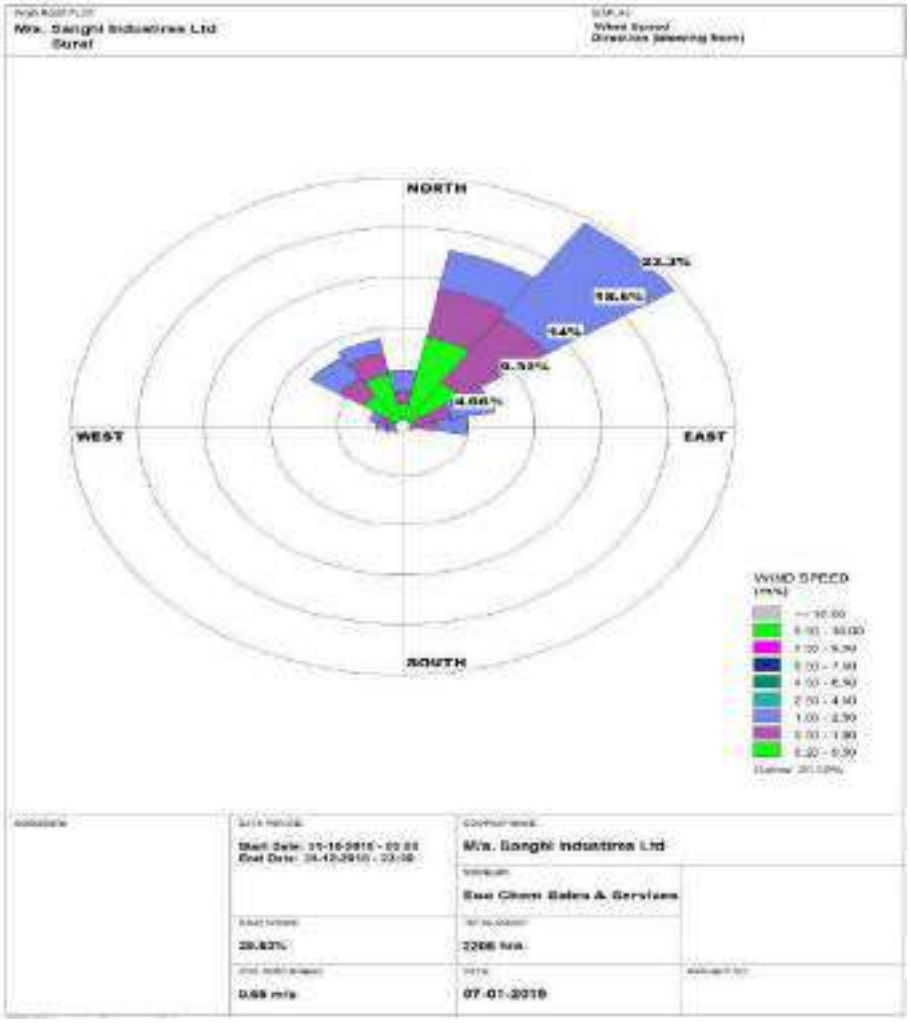


Figure 3.6 Wind Rose Diagram

3.5.5 Interpretation of Micrometeorological Data

Wind rose diagram indicate that the dominant wind direction can be considered NE to SW. Based on micrometeorological data, of wind direction and wind speed it is interpreted that chances of maximum dispersion of pollutants will be in SW direction due to upcoming project during the period Oct to Dec. 2018.

3.6 AIR ENVIRONMENT

Air is the Earth‘s atmosphere having the gases in which living organisms live and breathe but air is being deteriorated day by day due to the anthropogenic and natural sources. In present scenario Industrialization,

Energy production and the burning of fossil fuels has polluted the air environment. Ambient air quality monitoring was carried out for the assessment of the existing status of background air quality in the study area. This will be useful for assessing the conformity of the ambient air quality to the standards even after commencement of the proposed project.

3.6.1 Selection of Sampling Locations

Following points were considered during the selection of Ambient Air Quality Monitoring locations.

- Topography/terrain of the study area,
- Regional synoptic scale climatologically norm‘s,
- Densely populated areas within the region,
- Location of surrounding Industries,
- Representation of regional background,
- Facility for Ambient Air Monitoring,
- Representation of valid cross – sectional distribution in downwind direction,
- Avoidance of proximity of roads, construction activity or any other perturbing activity which may be temporary in nature, which may lead to some erroneous conclusions.
- Availability of manpower, electricity, approach, sturdy structure and protection of samplers.
- Dominant Wind Direction.

To establish the baseline status around the project site of the study region, monitoring was conducted for 8 numbers of locations during 1st Oct 2018 to 31st Dec 2018. At the time of location selection previous micrometeorological data was referred and general wind pattern in the study region was considered for the selection of location in such a way so that minimum one location in the downwind direction and one location in upwind direction. 1 location has been selected in WSW direction considering the chances of more dispersion. There is no village in SW direction as SW direction is covered with water body therefore location has not been selected in pre dominant downwind direction. However, ambient air monitoring locations were also selected in cross sectional wind direction looking towards the possibility of change in wind pattern during the study period. Ambient Air Quality monitoring locations are presented in Figure 3.7 and Table below.

Table 3.4 Ambient Air Quality Monitoring Locations in the Study area

Code	Location	Distance/Direction from the Project site	Latitude and Longitude	Selection Criteria
A1	Project Site	-	21°08'58.05"N 72°39'04.54"E	-
A2	Sunvali	1.2 km/WSW	21°08'46.44"N 72°38'19.73"E	Crosswind
A3	Mora	2.9 km/NNE	21°10'28.91"N 72°39'34.29"E	Upwind
A4	Damka	5.0 km/N	21°11'41.42"N 72°39'39.73"E	Crosswind
A5	Rajgari	3.8 km/NNW	21°11'05.08"N 72°38'39.66"E	Crosswind
A6	Kavas	7.4 km/NE	21°10'42.01"N 72°42'49.76"E	Upwind
A7	Hazira	5.7 km/S	21°05'51.08"N 72°38'55.54"E	Crosswind
A8	Dumas	7.9 km/SE	21°06'04.42"N 72°42'23.71"E	Crosswind

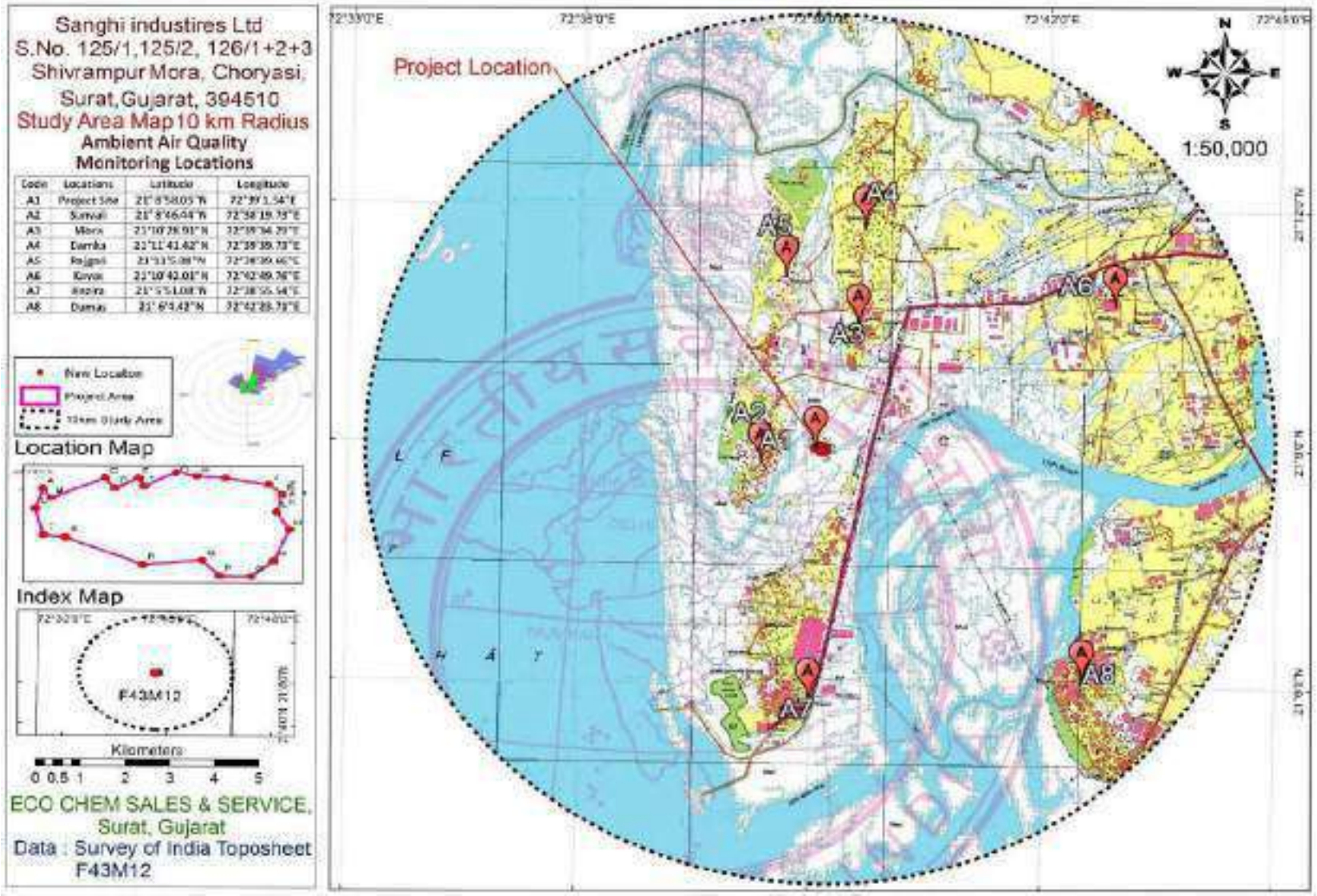


Figure 3.7 Map showing the Study area location of Ambient Air

3.6.2 Frequency and Parameters for Sampling

Sampling team was appointed with one FAE and Technical Assistant to carry out Ambient Air Quality Monitoring for 8 numbers of locations within 10 km radius from the project site. Sampling and analysis was carried out as per CPCB, IS 5182 & EPA and instrument operation manual for the parameters $PM_{2.5,}$ $PM_{10,}$ SO_2, NOx, CO and Total VOC. After the completion of sampling, samples were brought to the laboratory in Ice box and filter box for analysis. Frequency of sampling was twice a week during study period.

3.6.3 Methodology for Sampling and Analysis

Samples were collected by using the PM_{10} and $PM_{2.5}$ micron dust samplers at suitable height from obstruction free area as per the availability of the facility. Sampling and Analysis was carried out as per CPCB Guideline, instrument operational manual and National Environmental Engineering Research Institute. Detail of reference method is presented in table below.

Table 3.5 Details of Analysis Method

Sr. No.	Parameters	Test Method
I.	Particular matter ($PM_{2.5}$)	CPCB Guideline, SOP No. WI/5.4/02-B/03,Issue No.1 Date:01/01/2010
II.	Particulate Matter (PM_{10})	IS 5182 (Part 13):2006/Reaffirmed 2012
III.	Sulphur Dioxide (SO_2)	IS 5182 (Part 2):2001/Reaffirmed 2012
IV.	Oxide of Nitrogen (NO_x)	IS 5182 (Part 6):2006
V.	Carbon monoxide (CO)	Methods of Air Sampling & Analysis AWMA, APHA (CO Analyser)
VI.	Total VOC	Methods of Air Sampling & Analysis AWMA, APHA (Multi Gas Analyser)

3.6.4 Quality of Ambient Air

Minimum, maximum, average and percentile value for the parameters $PM_{2.5,}$ $PM_{10,}$ SO_2, NO_x, CO and Total VOC are tabulated in Table 3.6 to Table 3.8 to describe the quality of Ambient Air.

Table 3.6 Min, Max, 98th Percentile and Average Value of PM10 and PM2.5

Code	PM_{10} (µg/m^3)				$PM_{2.5}$ (µg/m^3)			
	Min.	Percentile 98th	Max.	Avg.	Min.	Percentile 98th	Max.	Avg.
A1	66.5	82.4	82.4	75.7	36.3	46.2	46.6	42.4
A2	70.2	84.6	86.4	77.0	37.6	46.6	47.6	42.0
A3	64.8	78.9	79.1	73.5	34.4	44.4	45.0	41.0
A4	68.6	84.4	84.5	76.9	35.5	44.6	45.5	41.6
A5	68.7	83.3	84.2	76.1	38.0	46.0	46.3	42.1
A6	66.5	80.9	81.6	73.7	35.4	43.4	43.6	40.3
A7	69.0	82.4	82.5	75.8	38.0	46.4	47.3	42.4
A8	61.8	75.8	77.8	69.6	31.6	42.5	42.6	38.9

NAAQ Standard limit	**100**	**60**

Table 3.7 Min, Max, 98th Percentile and Average Value of SO_2 and NOx

Code	SO_2 (µg/m^3)				NO_X (µg/m^3)			
	Min.	Percentile 98th	Max.	Avg.	Min.	Percentile 98th	Max.	Avg.
A1	9.9	14.9	14.9	13.1	14.8	20.3	20.3	18.9
A2	10.0	14.3	14.3	12.5	15.3	20.4	20.4	18.0
A3	9.6	13.4	13.7	11.6	15.3	20.0	20.8	17.5
A4	9.8	14.7	14.9	12.5	15.7	20.6	20.6	18.2
A5	9.4	15.1	15.3	12.2	15.6	20.8	21.0	18.4
A6	9.7	14.7	14.8	12.2	15.2	20.2	20.6	18.4
A7	10.1	15.2	15.9	12.4	16.3	22.0	22.8	18.8
A8	9.0	13.9	14.1	12.1	13.1	19.1	19.2	17.7
NAAQ Standard limit	**80**				**80**			

Table 3.8 Min, Max, 98th Percentile and Average Value of CO & Total VOC

Code	CO (µg/m^3)				Total VOC (ppm)			
	Min.	Percentile 98th	Max.	Avg.	Min.	Percentile 98th	Max.	Avg.
A1	456	580	584	523	1.4	2.8	2.8	2.1
A2	402	502	504	455	1.2	2.7	2.7	2.1
A3	414	524	528	458	1.3	2.9	2.9	2.1
A4	406	518	522	462	1.3	2.6	2.6	2.0
A5	456	521	524	484	1.2	2.5	2.5	1.9
A6	414	525	528	459	1.2	2.9	2.9	2.2
A7	436	541	544	492	1.9	3.1	3.1	2.5
A8	420	530	532	479	1.7	3.0	3.1	2.2
NAAQ Standard limit	**2000**				**-**			

3.6.5 Summary of Ambient Air Quality

- $PM_{2.5}$ was observed in the range of 31.6 – 47.6 µg/m^3. Maximum concentration of $PM_{2.5}$ was found at Suvali village and minimum concentration at Dumas during the study period.
- PM_{10} was observed in the range of 61.8 – 86.4 µg/m$^{3.}$ Maximum concentration of PM_{10} was found at Suvali village and minimum concentration at Dumas during the study period.
- SO_2 concentration was observed in the range of 9.0 -15.9 µg/m^3, which is well within the standard limit.
- NO_x concentration in was observed in the range of 13.1- 22.8 µg/m^3, which is well within the standard limit.
- Sampling and analysis was also carried out for CO and Total VOC. All results were found well within the limit and desired range.

3.6.6 Interpretation of Ambient Air Quality Data

Based on comparison study of results with NAAQS for tested parameters, ambient air quality of studied locations can be considered good as all the results of tested parameters are well within the limit. Looking

towards the increasing pattern of PM_{10} and $PM_{2.5}$ concentration in ambient air, it is suggested that proper air pollution control measures must be adopted by the industry. This interpretation relate to the results found during the monitoring for particular location and date of monitoring.

3.7 NOISE ENVIRONMENT

The objective of the baseline noise survey was to identify existing noise sources and to measure background noise levels at the sensitive receptors within the study area. Peoples' perception of noise varies depending on number of factors including their natural sensitivity and hearing ability, past experience of sound, cultural factors and the time of day at which sound is experienced. Continuous sound is perceived quite differently from intermittent sound at the same level. High or continuous noise levels may cause permanent loss of hearing ranging from reduced perception at certain frequencies to total deafness. At comparatively lower levels noise may have psychological effects including disturbance of sleep, annoyance and irritation.

3.7.1 Sources of Noise Pollution

The sources of noise pollution in the study area are industrial noise, noise due to commercial activities, noise generated by Community, Vehicular traffic etc.

3.7.2 Noise Level in the Study Area

Noise level monitoring was carried out with the help of sound level meter at 8 different locations fall under residential, industrial and high noise generating source. Noise sampling locations are presented in **Figure 3.7** and **Table 3.9**. Analysis results are presented in **Table 3.10** and **Table 3.11**.

Table 3.9 Noise Monitoring Locations in the Study Area

Code	Location	Distance from project site/Direction	Latitude and Longitude	Selection Criteria
N1	Project Site	-	21°08'57.76"N 72°39'01.90"E	Industrial area
N2	Sunvali	1.3 km/WSW	21°08'45.80"N 72°38'20.29"E	Residential area
N3	Mora	2.9 km/NNE	21°10'29.42"N 72°39'33.42"E	Residential area
N4	Hazira	5.8 km/S	21°05'49.46"N 72°38'53.85"E	Residential area
N5	Damka	4.8 km/N	21°11'41.41"N 72°39'34.74"E	Residential area
N6	Rajgari	3.9 km/NNW	21°11'01.78"N 72°38'36.01"E	Residential area
N7	National Highway -6	1.1 km/E	21°08'52.07"N 72°39'39.29"E	Road
N8	State Highway -168	8.7 km/NW	21°11'05.23"N 72°43'33.02"E	Road

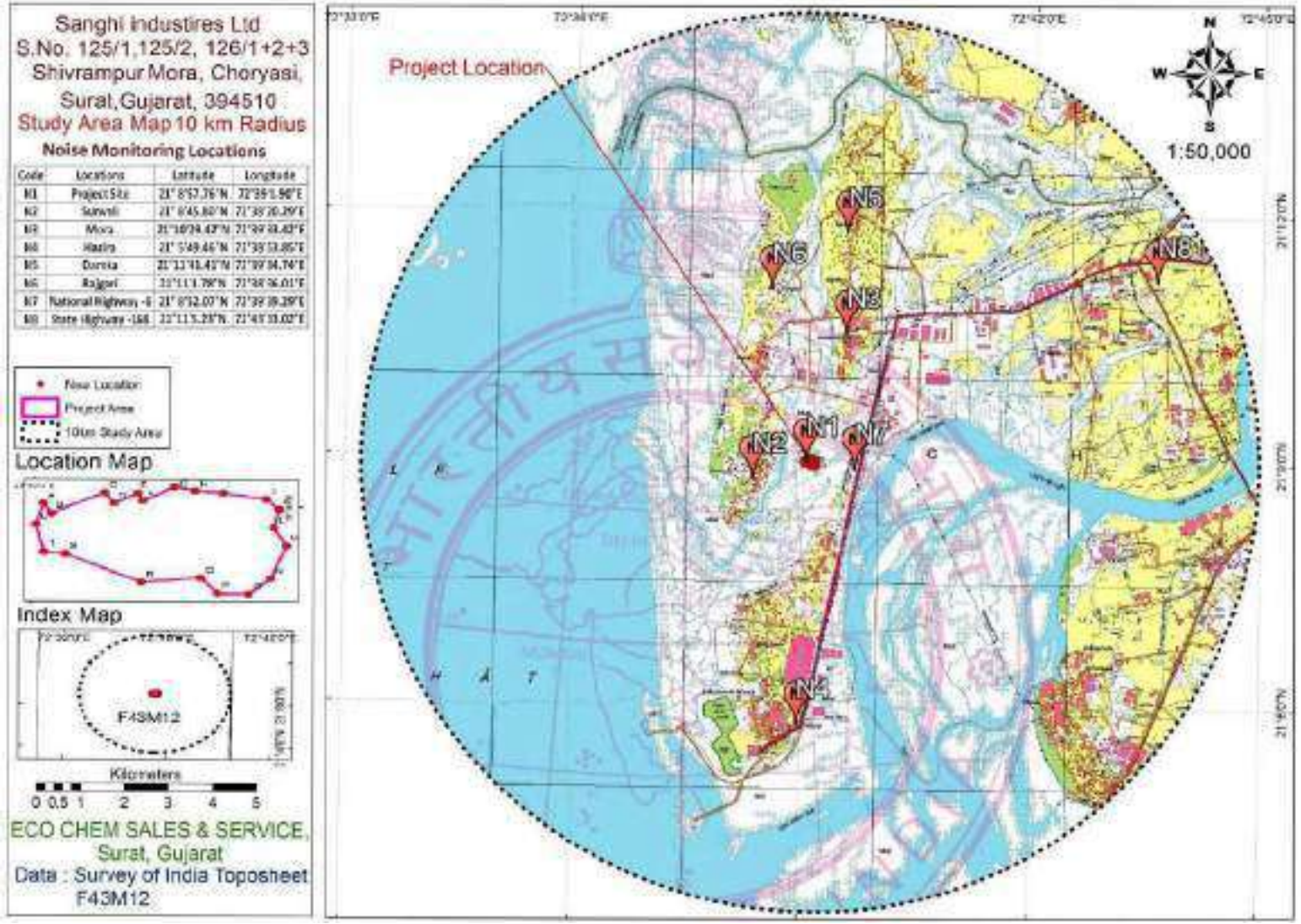


Figure 3.8 Map showing the study area location of Noise

Table 3.10 Noise Monitoring report during day time

Code	L_{min} dB	L_d dB(A)	L_{max} dB	Zone	Limit dB(A) as per Noise Pollution (Regulation and Control) Rules, 2000
N1	49.1	52.4	56.3	Industrial	**75**
N2	46.8	50.3	54.1	Residential	**55**
N3	46.2	50.7	54.4	Residential	**55**
N4	47.1	51.2	54.7	Residential	**55**
N5	46.6	50.3	53.8	Residential	**55**
N6	46.2	49.6	53.4	Residential	**55**
N7	72.4	77.4	81.2	Road	**-**
N8	68.1	73.2	77.4	Road	**-**

Table 3.11 Noise Monitoring report during night time

Code	L_{min} dB	L_n dB(A)	L_{max} dB	Zone	Limit dB(A) as per Noise Pollution (Regulation and Control) Rules, 2000
N1	45.2	48.8	52.4	Industrial	**70**
N2	39.4	42.1	44.3	Residential	**45**
N3	39.8	42.4	44.7	Residential	**45**
N4	40.3	42.9	44.9	Residential	**45**
N5	39.6	42.5	44.1	Residential	**45**
N6	40.1	42.1	44.4	Residential	**45**
N7	68.1	72.4	77.1	Road	**-**
N8	64.4	68.8	73.4	Road	**-**

Note: Day time –6.00 AM to 10.00 PM, Night time – 10.00 PM to 6.00 AM

Noise standards have been designated for different types of land use i.e. residential, commercial, industrial areas and silence zones, as per The Noise Pollution (Regulation and Control) Rules, 2000, Notified by Ministry of Environment and Forests, New Delhi, February 14, 2000. Different standards have been stipulated for day (6 AM to 10 PM) and night (10 PM to 6 AM). The noise level study shows that the noise levels are meeting the acceptable norms.

3.7.3 Summary of Noise Data

- Equivalent noise level was recorded 52.4 dB (A) at Project Site and it is 49.6 to 50.3 dB (A) in residential area during day time.
- Equivalent noise level was recorded 48.8 dB (A) at Project Site and it is 42.1 to 42.9 dB (A) in residential area during night time.
- Noise level monitoring was carried out 1 meter away from National Highway – 6 and equivalent noise level was recorded 77.4 dB (A) during day time and 72.4 dB (A) during night time as per factory act 1948 noise level exposure limit for 8 hrs. is 90 dB (A).
- Noise level monitoring was carried out 1 meter away from State Highway – 168 and equivalent noise level was recorded 73.2 dB (A) during day time and 68.8 dB (A) during night time as per factory act 1948 noise level exposure limit for 8 hrs. is 90 dB (A).

3.7.4 Interpretation of Noise Data

Based on noise level data obtained during the survey for residential area and industrial area, it is interpreted that noise levels are within the standard norms prescribed by MoEF & CC. Looking towards the increase in noise generating sources it is suggested that there is need to apply noise reducing devices at noise generating sources and generate public awareness.

3.8 LAND ENVIRONMENT

3.8.1 Land Use Pattern of the Study area

Studies on land use aspects of eco system play an important role to identify sensitive issues and to take appropriate action for maintaining ecological homeostasis in the region. The main objective of this section is to provide a baseline status of the area, so that temporal changes due to the proposed project on the surroundings can be assessed in future.

Data Used: United States Geological Survey (USGS) Satellite Data: Land sat 8 cloud free data has been used for Land use /Land cover analysis, Satellite Sensor–OLITIRS multi-spectral digital data has been used for the preparation of land use/ land cover map of present study. Survey of India reference map on 1:50,000 scales have been used for the preparation of base map and geometric correction of satellite data. Ground truthing has been carried out to validate the interpretation accuracy and reliability of remotely sensed data, by enabling verification of the interpreted details and by supplementing with the information, which cannot be obtained directly on satellite imagery.

Methodology: The methodology used for the study consists of following components.

Methodology Adopted for Thematic Data Extraction from the Satellite Imageries

ERDAS image processing 10.0 software and ARC/GIS 10.0 software were used for the project. ERDAS 10.0 image processing software was used for digital processing of the spatial data. Digital image processing techniques were applied for the mapping of the land use land cover classes of the provided area from the satellite data.

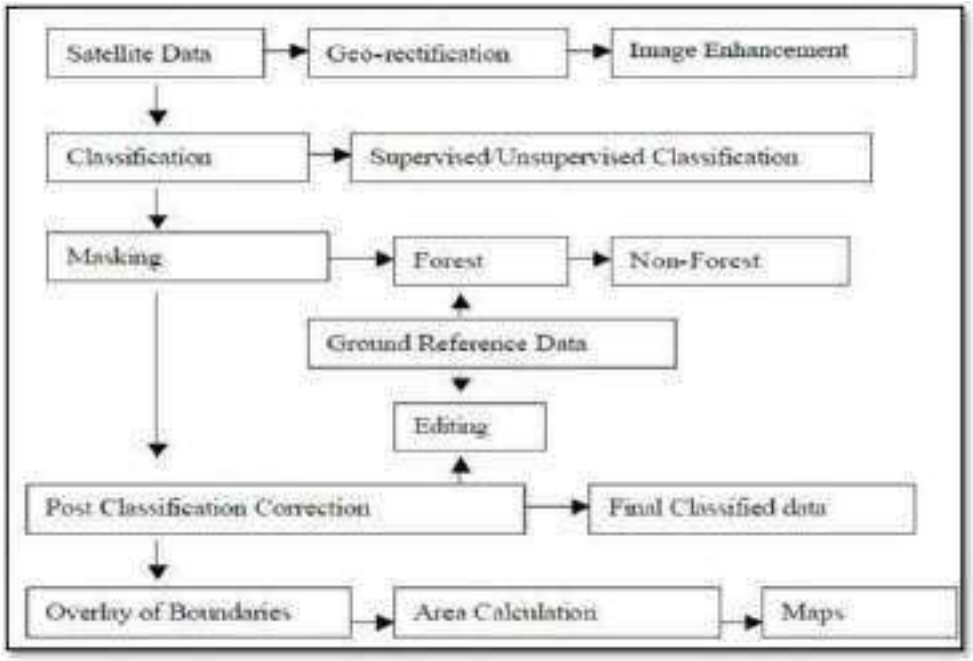


Figure 3.9 Methodology Used for Land use Classification

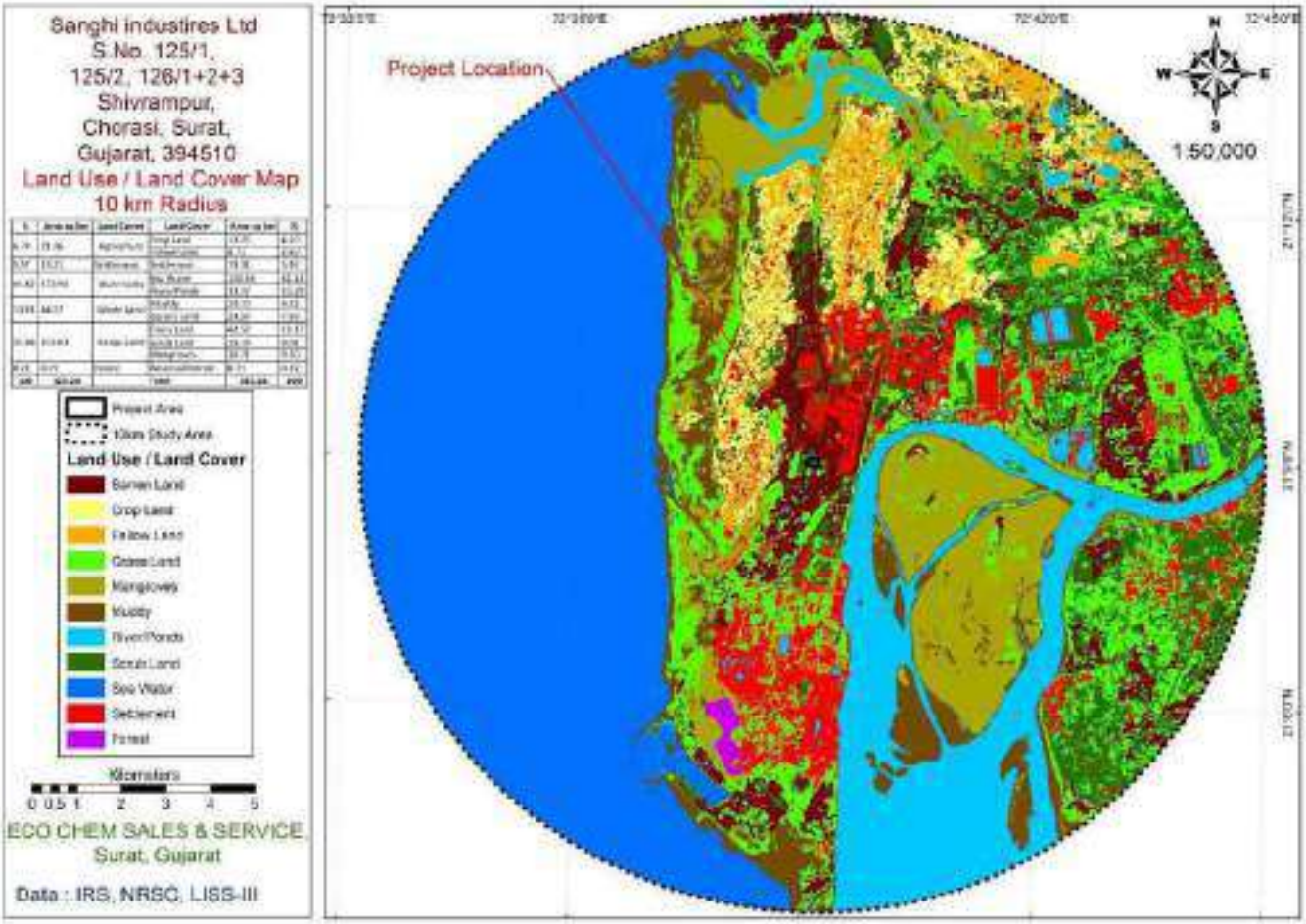


Figure 3.10 Land Use Map

Table 3.12 Land use Statistics (10 km)

(Source: Land use mapping and primary survey of the area)

%	Area sq km	Land Cover	Land Cover	Area sq km	%
6.79	21.96	Agriculture	Crop Land	13.25	4.10
			Fallow Land	8.71	2.69
5.97	19.31	Settlement	Settlement	19.31	5.97
41.42	133.92	Water body	Sea Water	100.65	31.13
			River/Ponds	33.27	10.29
13.91	44.97	Waste Land	Muddy	20.10	6.22
			Barren Land	24.87	7.69
31.68	102.43	Range Land	Grass Land	42.57	13.17
			Scrub Land	29.14	9.01
			Mangroves	30.71	9.50
0.22	0.71	Forest	Reserved Forest	0.71	0.22
100	**323.28**	**Total**		**323.28**	**100**

3.8.2 Summary and Interpretation

The area surrounding the project site is largely water body like sea water and River water are covering around 41.42% of the total study area. Settlement is covering around 5.97% of the total study area. Agriculture land is covering around 6.79% of the total study area. Range Land like Scrub land and Grass land are covering around 31.68 %. Proposed project will be set up in industrial zone therefore there will be no change in land use.

3.9 GEOLOGICAL AND GEO-HYDROLOGICAL STATUS

3.9.1 Physiography

Geographically, the district belongs to the western coastlands of the Deccan peninsula. The main Sahyadri scarp is a little outside the limits of the district towards east, but it gives the district its orientation, landscape features and drainage pattern. Distinct zones, viz., hilly areas, piedmont slopes, alluvial plains and coastal plains.

Hilly areas: The north-eastern parts of the district fall in this category. Here the general elevations are more than 100m amsl. The topography is rugged with low to moderate high hills and steep hill slopes. These parts are poorly populated and are infested by dense jungle of teak and bamboo.

Piedmont slopes: East-central parts of the district fall in this category. Here the elevations range between 60 and 100m.amsl. These parts show a gentle slope towards west. Topography is mainly plain with moderate to deep cutting river valleys and occasional hillocks.

Alluviual plains: Alluvial plains towards situated in the central parts of the district are characterized by flood plains of the Tapi, Kim and Purna rivers. Tapi has a meandering channel entrenched fairly deep and has cut deep terraces. The topography is generally plain with gentle slope towards west. The general elevations are below 60 m.amsl, the lowest elevation being 45m.amsl near Madhi.

Coastal Plains: The alluvial plains towards west merge into a dry barren sandy coastal plain fringed by marshy shore line. All the rivers form estuarine mouths. There are sand bars and spits near the shore.

3.9.2 Drainage

The Tapi is the major river which passes through the central parts of the district and flows towards the west. The river is perennial in nature. It originates in Madhya Pradesh near Betul and has about 62225 sq. Km. of catchment area. The average width of the river upstream of Kathor bridge in about 500m. Downstream of the bridge the average being about 700m. Pickup weir was constructed on the Tapi River in 1954 at Kakarapar about 56km west of Surat. Ukai dam, constructed in 1965, is situated about 25km upstream of Kakarapar weir. Other prominent rivers draining the district are Kim, and Purna.

3.9.3 Geology

Major geological formations exposed in the district are Quaternary alluvium, Tertiary limestone and sandstones and Deccan Trap basalt. Below table shows the geological succession of the district and the succession of geological formations in the district, as given by Geological survey of India.

Table 3.13: Geological Succession

Era	Period	Epoch/Series	Description
Cenozonic	Quaternary	Holocene	Soil, Younger alluvium Blown and Fluvio-marine deposits.
	Tertiary	Pleistocene	Older alluvium, conglomerate
		Miocene	Ferruginous sandstone (Gaj)
		Eocene	Numulitic limestone
		Palaeocene	Sub-Numulitic limestone, gypseous shale,Supra- Trappean sediments lateritised and having bauxite pockets.
Mesozoic	Lower Tertiary to Upper Cretaceous	Early Eocene To Upper	Deccan Trap basalt with dykes

3.9.4 Hydrogeology

Aquifer System

The hydrogeological frame work of the area is essentially governed by geological setting, distribution of rainfall and facilities of circulation and movement of water through inter connected primary and secondary porosity of the geological units forming the aquifers. The major aquifers in the district are formed by alluvium and Deccan Trap basalt with Tertiary formations occupying a small patch. The alluvium occurs in the western part of the district and along the streams whereas in eastern parts weathered and fractured basalt form aquifers. Hydrogeological units:

1. Fissure Formations,
2. Porous Formation.

- **Fissure Formations**

Deccan Traps from the aquifers in north-eastern, eastern and south eastern parts of the district comprising Mangrol, Mandvi, Vyara, Valod Mahuva, Songadh, Uchchhal and Nizar talukas. The ground water occurs in unconfined to semi-confined conditions. The occurrence and movement of ground water is governed by the thickness and extent of weathered zone and presence of fractures and joints. At places, dykes act as ground water barriers and restrict the flow of ground water. On the other, at places, the dykes themselves from good aquifers owing to deeper levels of weathering in them. Depths of dug wells in Deccan traps ranges from less than 2m to 25m with maximum number of wells, about 80%, being 5 to 15m deep. The depths to water levels in the dug wells range from 1 to 20m. However, in 90% of the wells, the water levels are less than 10m. bgl. Yields of the dug wells are low to moderate in central parts whereas they are low to very low on the hill slopes. The dug wells generally sustain pumping for 4 to 5 hours at the yields of 50 to 150 m^3/day. Recuperation of water levels is generally slow.

- **Alluvium**

The western and north western parts of the district comprising Choryasi, Olpad, Kamrej, Palsana and parts of Bardoli talukas is covered by Alluvium. This aquifer can broadly be demarcated into two zones namely newer alluvium and older alluvium. The newer alluvium is present along the river courses and comprises fine to coarse grained sand trap wash with cay intercalations. The sand is unconsolidated but shows some degree of cohesion at places. Water levels are in general deeper in newer alluvium. Older alluvium is present in inter river plains and comprises sand, clay, kankar, grave and silt. The ground water occurs mostly under unconfined conditions but at places semi-confined conditions are also observed, probably due to presence of clay lenses. The depths of the wells in alluvium generally range from 3.0 to 30.0m with some of the wells having bores down to 50m below bottom of the wells. The maximum number of wells, about 80% is 5 to 20m deep. Depths to water levels in the wells range from 0.5 to 15m bgl about 90% wells shows water levels less than 10m bgl. Yields of the dug wells and dug-cum- bored wells range between 100 and 450 m^3/day.

- **Aquifer Parameters**

In Alluvial areas the depth of the tube wells range from 36 to 169m with piezometric levels varying between 2 to 10m. The specific capacity of the wells ranges from 19 to 1658 m^3/day/m. The transmissivity values obtained at these tube wells ranges from 104 (Kosad) to 2965 m^2/day (Vihan).

- **Depth to Water Level**

The map depicting the depth to water level has been prepared based on water level data for May and November 2012 collected from NNHS.

- **Changes in Ground Water Scenario over the years**

Long term water level data is available for 24 NNHS since 2003 and data was analyzed for the period between January 2003 to November 2012. Pre-monsoon water level trend shows that 22% of the hydrograph stations indicate a rise of water level ranging from 0.0331 m/year to 0.338m/year where as 78% of the hydrograph stations indicate a decline of water level ranging from 0.0037 m/year to 0.4293 m/year. During post- monsoon period water level trend shows that 39% of the hydrograph stations indicate a rise of water level ranging from 0.0202 m/year to 0.447 m/year where as 61% of the hydrograph stations indicate a decline of water level ranging from 0.0058 m/year to 0.6439 m/year

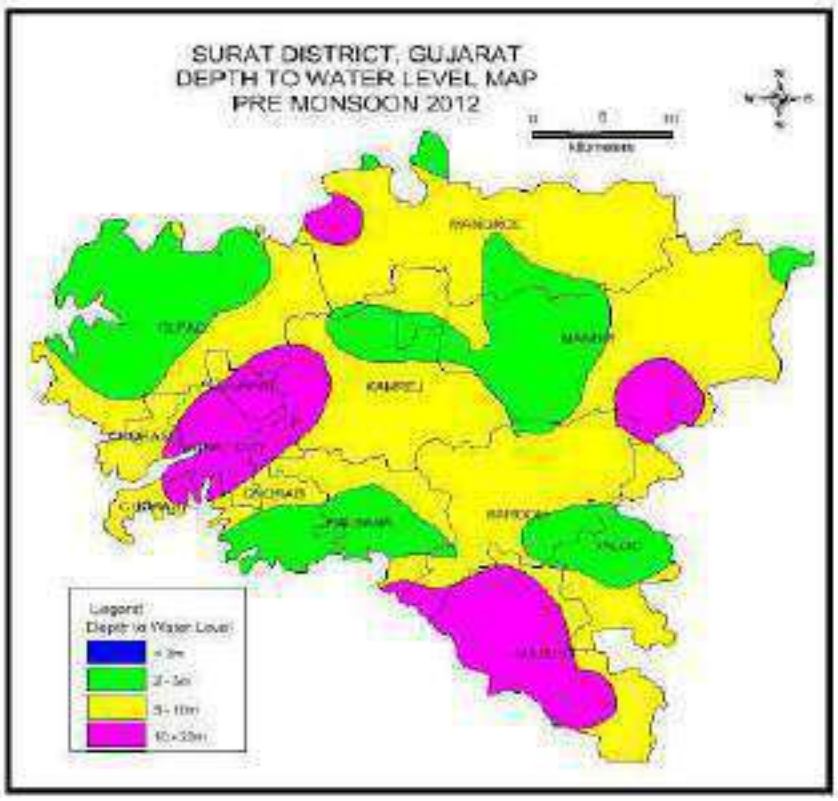


Figure 3.11: Ground water level during Pre Monsoon period

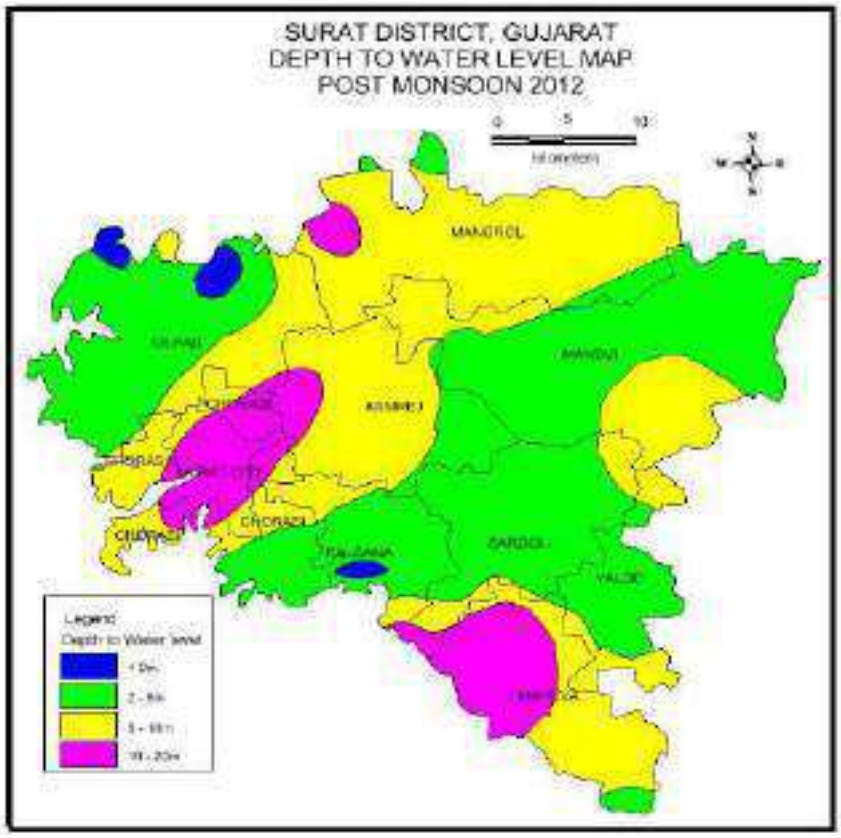


Figure 3.12: Ground water level during Post Monsoon period

3.10 TRAFFIC STUDY

Traffic study measurements were performed at National Highway 6 and State Highway 186. Proposed project will attract to commercial vehicles as a result traffic load will also increase on highways. Traffic load play a major role in polluting the air. To assess the traffic load, 4 no. of surveyors were appointed to survey for National Highway 6 & National Highway 186.

Traffic data collected continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined. Traffic study is conducted on National Highway 6 & National Highway 186 from 26th and 27th Dec 2018

Table 3.14(a) Traffic Study Report

S.No.	Vehicles Distribution	No. of Vehicles/Day		Passenger Car Unit (PCU)	Total No. of Vehicle in PCU		Total No. of Vehicle (PCU)/Hour	
		National Highway 6	State Highway 168		National Highway 6	State Highway 168	National Highway 6	State Highway 168
1.	Cars	20538	9087	1.0	20538	9087	856	379
2.	Buses	1080	754	3.0	3240	2262	135	94
3.	Trucks	2036	1256	3.0	6108	3768	255	157
4.	Two wheelers	5612	3845	0.5	2806	1923	117	80
5.	Three wheelers	1863	1056	0.75	1397	792	58	33
Total		**31129**	**15998**		**34089**	**17832**	**1421**	**743**

Table 3.14(b) Existing Traffic Scenario with respect to LOS

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
National Highway 6	1421	3000	0.47	C
State Highway 186	743	1250	0.59	C

V/C	LOS	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/Average/Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

3.10.1 Interpretation of Traffic Study

LOS values have been calculated based on traffic data on National Highway 6 & State Highway 168 and it has been found 0.47 and 0.59 respectively. LOS value indicates that the perf
ormances of NH-6 & SH-168 are good.

3.11 SOIL QUALITY

Four soil samples were collected from surrounding areas including the project site covering 10 km radius to assess the baseline status of soil quality. The soil samples were analysed for physical and chemical parameters. Soil samples were collected by using core cutter (0-15 cm depth) and brought to the laboratory in polythene bags. Standard procedures have been followed for soil sampling and analysis.

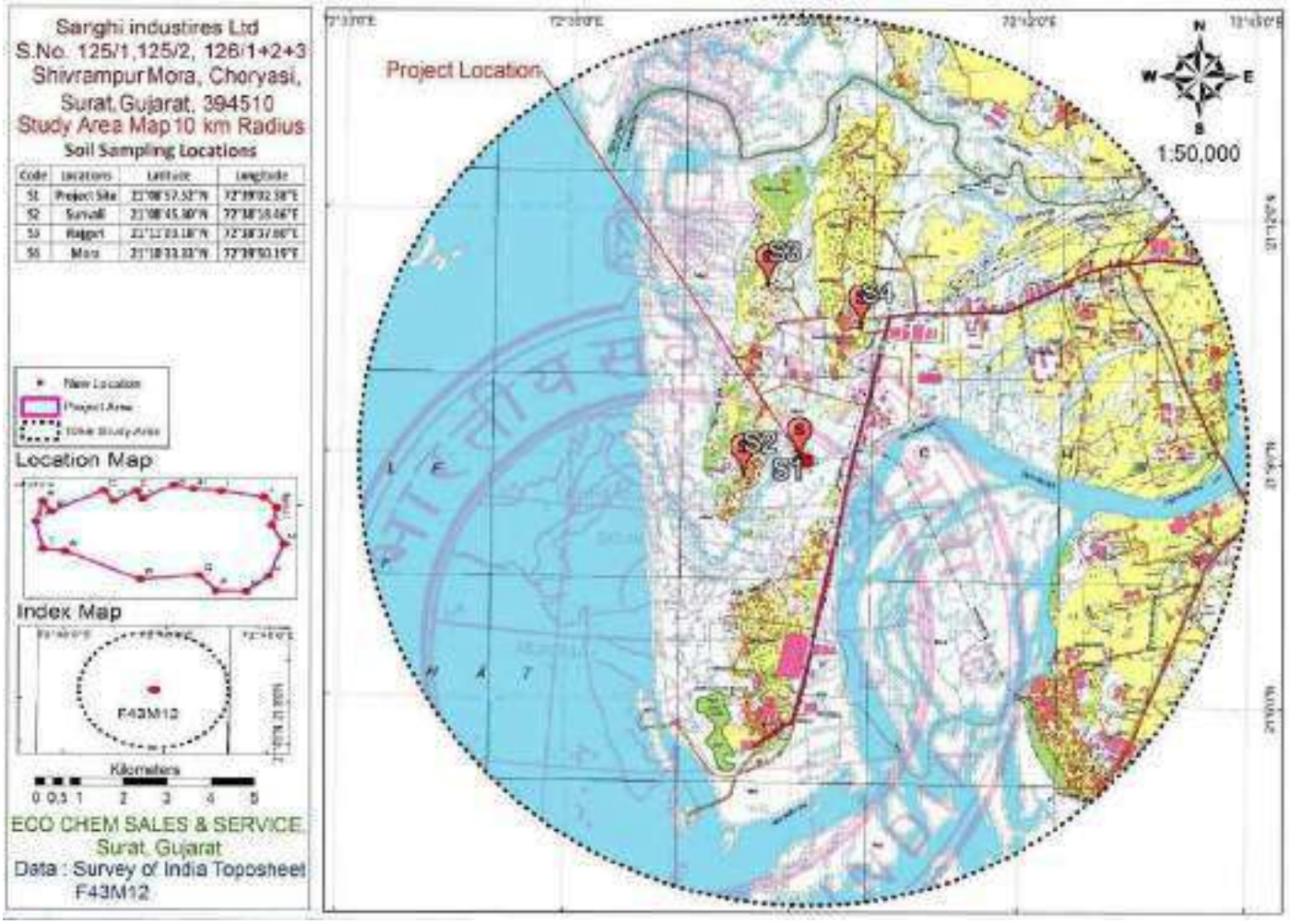


Figure 3.13 Map showing the study area location of Soil

Table 3.15a Details of Soil sampling location

Code	Location	Distance from the project site/Direction	Latitude and Longitude	Selection Criteria
S1	Project Site	-	21°08'57.52"N 72°39'02.38"E	Non Agriculture Land
S2	Sunvali	1.3 km/WSW	21°08'45.30"N 72°38'18.46"E	Agriculture Land
S3	Rajgari	3.9 km/WNW	21°11'03.18"N 72°38'37.80"E	Agriculture Land
S4	Mora	3.2 km/NNE	21°10'33.33"N 72°39'50.19"E	Agriculture Land

Table 3.15b Soil Sample Analysis Result

S. No	Parameters	Unit	S1	S2	S3	S4
1	Water Holding Capacity	%	44.42	37.41	36.32	35.14
2	Porosity	%	38.56	45.82	46.28	48.21
3	Bulk Density	g/cm^3	1.63	1.44	1.42	1.37
4	Particle Size Distribution					
a.	Sand	%	25.2	48.2	45.6	47.1
b.	Silt	%	30.1	20.6	19.6	22.5
c.	Clay	%	44.7	31.2	34.8	30.4
5	Texture	-	Clay	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
6	Cation Exchange Capacity	meq/100 g	47.1	38.9	36.7	34.4
7	pH	-	7.84	7.62	7.78	7.88
8	Electrical Conductivity	dS/m	1.4	1.0	1.0	0.9
9	Exchangeable Sodium	%	13.2	13.9	14.2	14.8
10	Exchangeable Calcium	meq/100g	25.1	20.4	18.8	17.4
11	Exchangeable Magnesium	meq/100g	14.4	12.1	11.6	10.8
12	Exchangeable Sodium	meq/100g	6.2	5.4	5.2	5.1
13	Exchangeable Potassium	meq/100g	1.4	1.0	1.1	1.1
14	Organic Carbon(OC)	%	0.84	0.60	0.57	0.63
15	Total Nitrogen	%	0.073	0.052	0.049	0.055
16	Nitrate N	kg/ha	138.9	233.0	241.9	250.9
17	Total Phosphorus	kg/ha	219.5	353.9	389.8	414.4
18	Total Iron	mg/100gm	78.5	85.4	80.5	86.8
19	Total Zinc	mg/100gm	3.1	3.6	2.8	3.3
20	Total Copper	mg/100gm	1.4	1.1	1.0	1.2
21	Total Boron	mg/100gm	3.36	2.62	3.14	3.16
22	Total Chromium	mg/100gm	1.60	1.72	1.88	1.83

3.11.1 Summary of Soil Data

The soils are categorized as sandy clay loam to clay based on different soil separates (sand, silt and clay).They have moderate good holding capacity (35.14 to 44.42 %) and porosity (38.56 to 48.21 %) but moderate drainage capacity as texture is sandy clay loam to clay having 50 to 70 % silt+ clay. The soil is categorized as deep black having >1m depth. The pH of the soil samples narrowly ranged from 7.62 to 7.88 during the study period, indicating that soils are normal (pH 6.5 to 7.8). The soil EC varied from 0.9 to 1.4 dS/m and ESP ranged from 13.2 to 14.8. These parameters indicate that soils are neutral to in reaction, saline (EC < 0.8 dS/m), but non-sodic as ESP in is not exceeding 15. Among exchangeable basic cations predominance of calcium (17.4 to 25.1 meq/100 g soil) was seen followed by Mg (10.8 to 14.4 meq/100 g soil),Na(5.1 to 6.2 meq/100 g soil) and K (1.0 to 1.4 meq/100 g soil). The loss on ignition (0.57 to 0.84 % OC) indicate that soils are medium (OC=0.50 to 0.75 %) to high (>0.75 %) in organic carbon status. This shows that soils are medium to high in nitrogen status. Considering only 2% available phosphorus based on total P, soils are classified as poor (>28 kg P2O5/ha) in available P and considering exchangeable potassium values, soils are rated as high in available potassium (>280 kg K2O/ha). The soils are medium to

high in nitrogen and low in available phosphorus, but rich in potassium. The results relating to total Fe, Cu, Cr, B and Zn do not show alarming concentrations in different soil samples.

3.11.2 Interpretation of Soil Data

Based on soil analysis data it is concluded that surface soils are neutral in reaction and saline (EC > 0.8 dS/m). However, looking to the ESP values soils are categorized as non-sodic as ESP in all samples is <15.0. The soils are medium to high in nitrogen as well as high in potassium (>280 kg K2O/ha) status and low in phosphorus. The levels of total Fe, Cu, Cr, B and Zn are within the limits. However, for successful greenbelt development liberal quantity of organic manure (50 tons/ha) and 20% less K fertilizer and double the recommended dose of P should be applied. The soil at the project site should be periodically monitored for EC, pH and ESP.

3.12 WATER ENVIRONMENT

Physical, Chemical and Microbiological factors influencing water quality are so interrelated that a change in any water quality parameter may trigger other changes in a complete network of interrelated variables. Selected water quality parameters for surface and ground water resources along with biological indicators within study region have been used for water environment and assessing the impact on it by proposed project. A study on water environment aspects of ecosystem plays an important role in environmental assessment to identify water related sensitive issues.

3.12.1 Reconnaissance

As a significant part of predefined framework of the present study water samples were collected from selected locations. The Reconnaissance survey was undertaken and monitoring locations were finalized based on:

- Presence, Location and uses of major water bodies in the region,
- Type and Location of Industrial/residential areas, their intake and effluent disposal locations,
- Likely areas that can represent baseline conditions.

3.12.2 Water Quality

With the start of water quality study, the water resources in the study area were divided into three categories for getting ideal upshot of baseline status of water quality of the region. These three categories as determined are:

- Ground water resources (tube well, open well, springs etc.)
- Surface water resources including ponds, river, canals.
- Marine water

3.12.3 Sampling and Analysis

All the water samples were collected and analyzed as per –Standard Methods for Examination of Water & Wastewater", APHA 23rd edition, 2017. Water Samples for the analysis of physico-chemical parameters were collected in plastic carboy and parameter wise preserved onsite as per the technique defined in the book of APHA, 23rd edition, 2017. Temperature, pH and DO were analyzed onsite and samples were brought to the laboratory for the analysis of remaining parameters.

3.12.4 Ground Water

To assess the quality of ground water, samples were collected from 7 numbers of locations for the analysis of physico-chemical and microbiological parameters. Ground water sampling locations are presented in **Table 3.16** and analysis results are presented in **Table 3.17.**

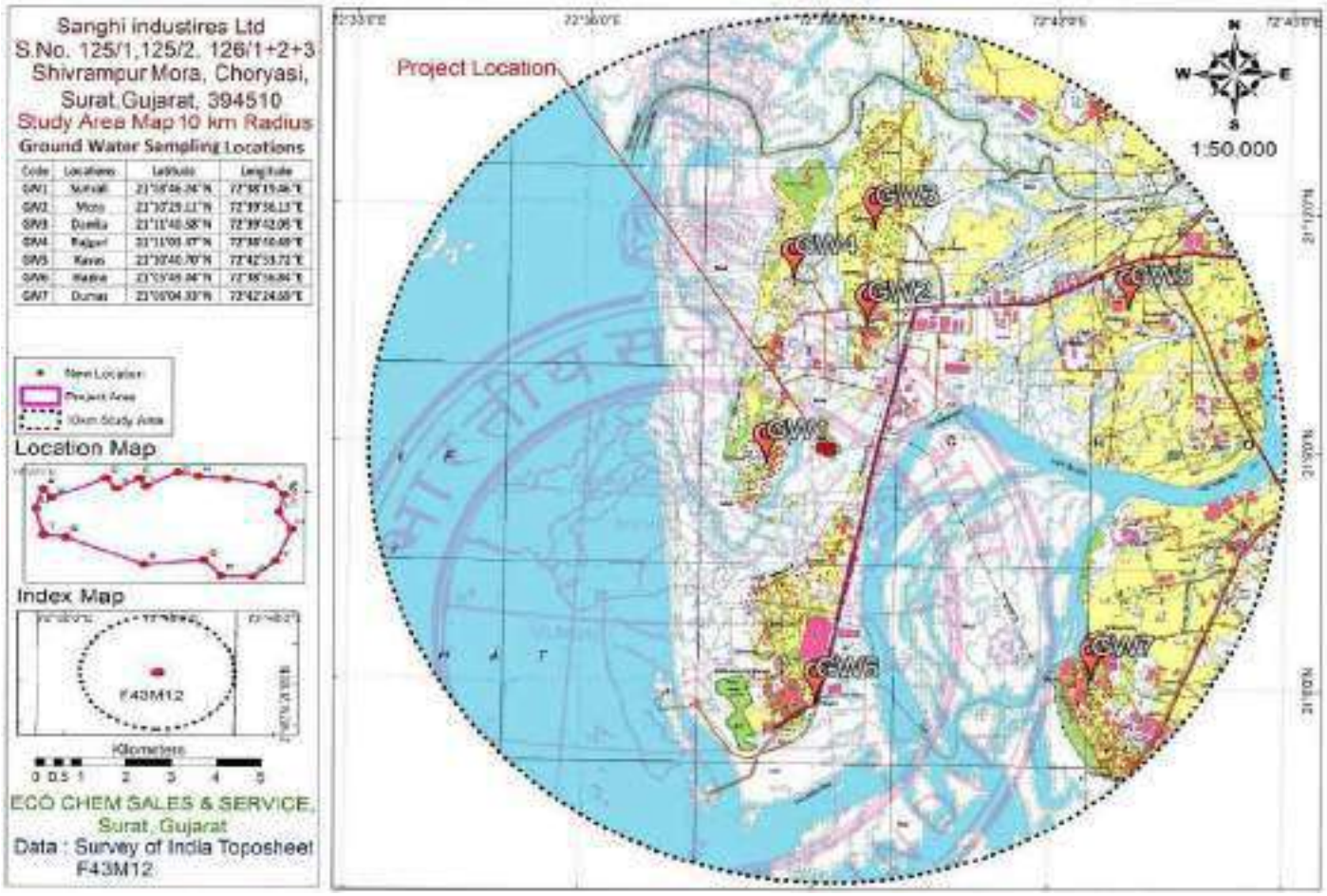


Figure 3.14 Map showing the study area with locations for Ground Water

Table 3.16 Details of Ground Water sampling locations

Code	Location	Distance from the project site/Direction	Latitude and Longitude	Source
GW1	Sunvali	1.3 km/WSW	21°08'46.24"N 72°38'19.46"E	Well
GW2	Mora	3.0 km/NNE	21°10'29.11"N 72°39'36.13"E	Well
GW3	Damka	5.0 km/N	21°11'40.58"N 72°39'42.05"E	Bore well
GW4	Rajgari	3.9 km/NNW	21°11'03.47"N 72°38'40.69"E	Well
GW5	Kavas	7.3 km/NE	21°10'40.70"N 72°42'53.72"E	Well
GW6	Hazira	3.9 km/S	21°05'49.04"N 72°38'56.84"E	Well
GW7	Dumas	7.9 km/SE	21°06'04.93"N 72°42'24.69"E	Well

Table 3.17 Ground water Analysis Results

S. No.	Parameters	Unit	GW1	GW2	GW3	GW4	GW5	GW6	GW7	Drinking Water Specification IS 10500: 1992 (Reaffirmed 2012)	
										Desirable Limit	Permissible Limit
1.	Temperature	^{0}C	25.5	25.0	25.5	24.5	25.0	25.0	24.5	--	--
2.	pH @ 25^{0}C	pH Unit	7.75	7.30	8.41	8.01	8.12	7.40	7.68	6.5 – 8.5	No Relaxation
3.	Colour	Hazen	<5	<5	<5	<5	<5	<5	<5	5	15
4.	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	--
5.	TDS @ 180^{0}C	mg/L	806	6722	1600	1220	815	950	992	500	2000
6.	Conductivity	µmho/cm	1279	10670	2540	1936	1294	1508	1575	--	--
7.	TSS	mg/L	<2	<2	<2	<2	<2	<2	<2	--	--
8.	Turbidity	NTU	1.7	4.8	2.8	1.8	1.4	2.0	2.2	1	5
9.	Total Hardness as $CaCO_3$	mg/L	478	1500	356	472	314	522	582	200	600
10.	Calcium	mg/L	66	160	62	119	58	88	72	75	200
11.	Total Alkalinity as $CaCO_3$	mg/L	400	756	584	532	432	492	528	200	600
12.	Chloride	mg/L	153	3194	506	274	162	204	194	250	1000
13.	Magnesium	mg/L	76	267	49	43	41	73	98	30	100
14.	Sulphate	mg/L	102	478	78	142	61	79	110	200	400
15.	Total Phosphorus	mg/L	1.5	4.8	3.4	3.1	1.8	2.1	2.6	--	--

	(PO_4-P)										
16.	Sodium	mg/L	90	1850	480	260	180	140	150	--	--
17.	Potassium	mg/L	52	230	30	38	22	41	19	--	--
18.	Fluoride	mg/L	0.5	0.7	0.6	0.6	0.6	0.5	0.6	1.0	1.5
19.	Phenolic Compound	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.001	0.002
20.	Oil and Grease	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--
21.	Dissolved Oxygen	mg/L	5.3	4.8	4.9	5.0	5.3	5.1	5.0	--	--
22.	Nitrate	mg/L	0.5	0.8	0.7	0.6	0.5	0.6	0.6	45	No Relaxation
23.	Total Nitrogen	mg/L	1.1	1.9	1.4	1.3	1.1	1.2	1.3	-	-
24.	Iron	mg/L	0.10	0.09	0.08	0.04	0.16	0.66	0.05	0.3	No Relaxation
25.	Copper	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1.5
26.	Boron	mg/L	0.06	0.14	0.1	0.08	0.05	0.07	0.09	0.5	1.0
27.	Chromium	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	No Relaxation
28.	Zinc	mg/L	0.12	0.21	0.17	0.14	0.1	0.12	0.15	5	15
29.	Total Coliform	Present/Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Shall not be detectable in any100 ml of sample	

3.12.5 Summary of Ground Water Quality

The test results were compared with the Drinking Water Specification: IS: 10500, 1992 (Reaffirmed 2012) and it is summarized as under.

- The pH was observed in the range of 7.30 – 8.41, which meets with drinking water norms.
- Turbidity was found in the range of 1.4 – 4.8 NTU.
- Total Dissolved Solid (TDS) were recorded in the range of 806 - 6722 mg/L with minimum at Suvali village and maximum at Mora village.
- Conductivity varies from 1279 to 10670 µmho/cm. The ratio of TDS to conductivity was observed in the range of 0.6 to 0.65 which is within the desired range.
- Total Hardness was in the range of 314 - 1500 mg/L with minimum at Kavas village and maximum at Mora village.
- Total Alkalinity was found in the range of 400 - 756 mg/L with minimum at Suvali village and maximum at Mora village.
- Chloride was found in the range of 153 to 3194 mg/L and Sulphate varies from 61 to 478 mg/L.
- Iron was found in the range of 0.04- 0.66 mg/L with minimum at Rajgari village and maximum at Hazira village.
- As microbiological parameters MPN analysis was also carried out and it was found absent.

3.12.6 Interpretation of Ground Water Quality Data

Based on comparison study of results of tested parameters with drinking water norms, it is interpreted that water qualities of the studied locations can be considered portable/drinkable as results are within the drinking water norms except Hazira village. Iron content was found 0.66 mg/L in the ground water sample collected from Hazira village, which is more than prescribed limit and in case of the ground water sample collected from Mora village TDS, Hardness, Chloride and Alkalinity value was found higher side. Reason of high TDS in ground water sample in Mora village may be due to ingress of salinity as sea is very near to this village. To save the ground water from contamination and improving the quality, rainwater harvesting and ground water recharging may be helpful.

3.12.7 Surface Water

To assess the quality of Surface water, samples were collected from 6 numbers of locations for the analysis of physico-chemical and microbiological parameters. Frequency of sampling was once during the study period. Sampling and analysis was carried out as per —Standard Methods for Examination of Water and Wastewater APHA 23rd edition, 2017. Surface water sampling locations are presented in the **Table 3.18.** Analysis results are presented in **Table 3.19 & 3.20.**

Table 3.18 Details of Surface Water Sampling Locations

Code	Location	Distance from the project Site/Direction	Latitude and Longitude	Source
SW1	Sunvali	1.2 km/WSW	21°08'30.86"N 72°38'30.41"E	Pond
SW2	Mora	3.2 km/NNE	21°10'30.53"N 72°39'52.70"E	Pond
SW3	Damka	6.9 km/NNE	21°12'34.08"N 72°40'16.24"E	Pond
SW4	Rajgari	3.4 km/N	21°10'51.21"N 72°38'50.21"E	Pond
SW5	Hazira	5.8 km/S	21°05'50.92"N 72°38'52.44"E	Pond
SW6	Tapi River	6.7 km/E	21°08'43.06"N 72°42'50.50"E	River

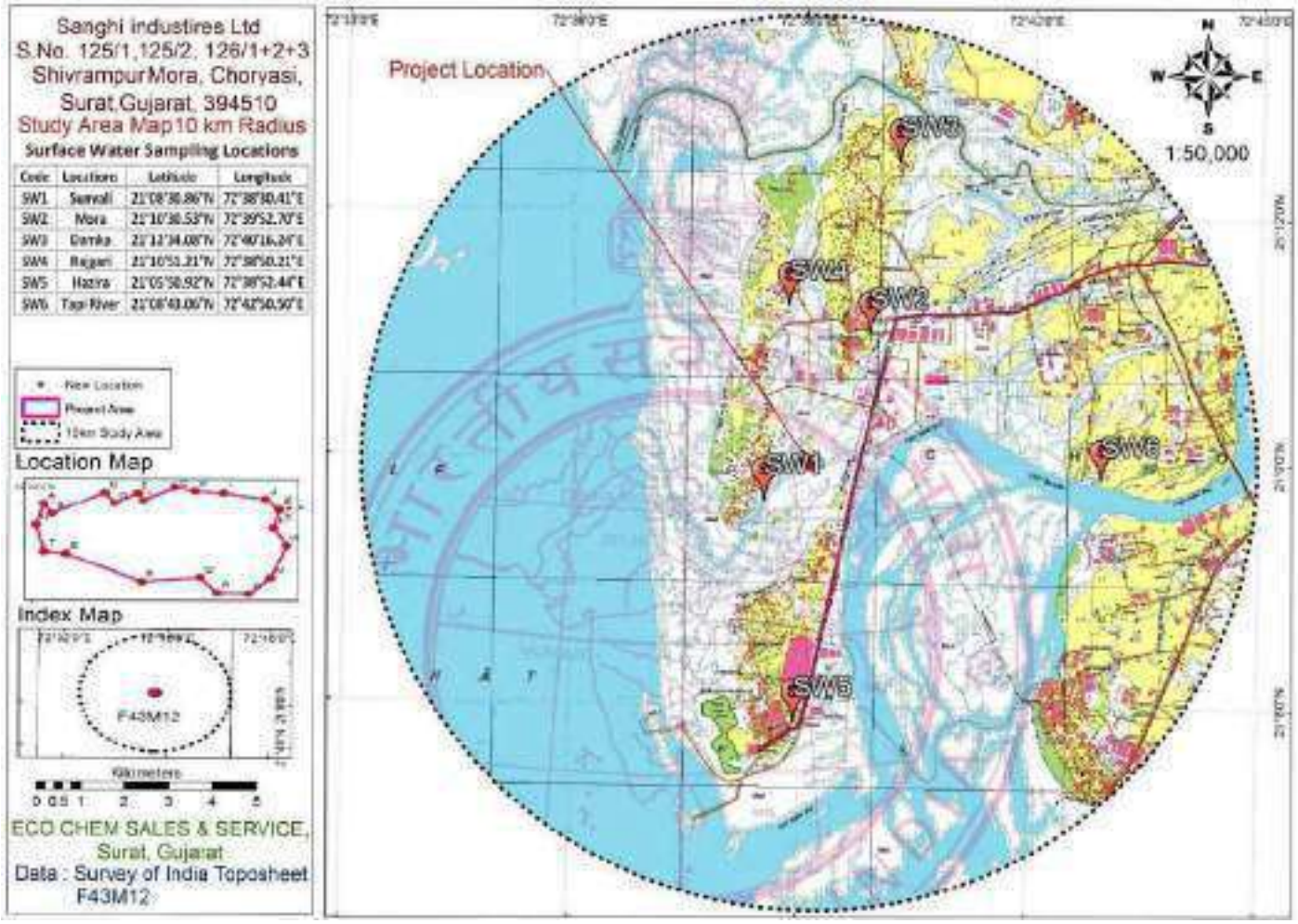


Figure 3.15 Map showing the locations for Surface water

Table 3.19 Surface water Analysis Results

#	Parameters	Unit	SW1	SW2	SW3	SW4	SW5	SW6	Drinking Water Specification IS 10500: 1992/(Reaffirmed 2012)	
									Desirable Limit	Permissible Limit
1.	Temperature	^{0}C	23.5	24.0	24.5	23.0	23.5	24.0	-	-
2.	pH @ 25^{0}C	pH Unit	7.84	8.07	7.60	7.98	8.36	6.85	6.5 – 8.5	NR
3.	Colour	Hazen	8	8	6	14	10	10	5	15
4.	Odour	-	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Agreeable	-
5.	TDS @ 180^{0}C	mg/L	2007	1037	1053	15940	3066	26863	500	2000
6.	Conductivity	µmho/cm	3245	1646	1672	25860	5028	42640	-	-
7.	TSS	mg/L	8	10	12	14	8	18	-	-
8.	Total Hardness as $CaCO_3$	mg/L	452	224	188	2340	482	6100	200	600
9.	Calcium	mg/L	58	28	29	200	62	582	75	200
10.	Total Alkalinity as $CaCO_3$	mg/L	348	380	356	208	406	212	200	600
11.	Chloride	mg/L	788	258	245	9050	1088	15280	250	1000
12.	Magnesium	mg/L	75	37	28	447	79	1129	30	100
13.	Sulphate	mg/L	196	132	167	490	538	1444	200	400
14.	Total Phosphorus	mg/L	2.6	1.8	2.1	5.4	3.2	6.8	-	-
15.	Sodium	mg/L	550	290	300	5100	900	7600	-	-
16.	Potassium	mg/L	29	30	31	210	54	360	-	-
17.	Fluoride	mg/L	0.5	0.7	0.7	0.6	0.7	0.9	1.0	1.5
18.	Phenolic Comp.	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.001	0.002
19.	Oil and Grease	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
20.	Dissolved Oxygen	mg/L	4.9	5.0	5.0	4.6	4.8	4.8	-	-
21.	COD	mg/L	14	12	12	24	18	18	-	-
22.	BOD(3 days at 27 ^{0}C)	mg/L	5	4	4	8	5	5	-	-
23.	Nitrate	mg/L	0.8	0.7	0.6	1.1	0.8	1.2	45	NR
24.	Total Nitrogen	mg/L	1.7	1.5	1.3	2.6	1.7	2.8	-	-
25.	Iron	mg/L	0.08	0.52	0.15	0.12	0.66	0.88	0.3	NR
26.	Copper	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1.5
27.	Boron	mg/L	0.08	0.05	0.06	0.16	0.09	0.22	0.5	1.0
28.	Chromium	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	NR
29.	Zinc	mg/L	0.14	0.11	0.12	0.25	0.18	0.32	Nil	15

Table 3.20 Bacteriological Analysis of surface Water

Code	Total coliform	Faecal coliform	*Escherichia coli*	Faecal Streptococci
	Most Probable No (MPN): No/100 mL			
SW1	26	22	<1.8	<1.8
SW2	22	18	<1.8	<1.8
SW3	20	16	<1.8	<1.8
SW4	32	28	2.0	<1.8
SW5	24	20	<1.8	<1.8
SW6	22	18	<1.8	<1.8

Table 3.21 Standard limit as per IS 10500:2012 for Microbiological parameters

S.No.	Organisams	Requirements
1.	All water intended for drinking: a) *E. coli* or thermo tolerant coliform bacteria	Shall not be detectable in 100 ml sample
2.	Treated water entering the distribution system: a) *E. coli* or thermo tolerant coliform bacteria b) Total coliform bacteria	 Shall not be detectable in 100 ml sample Shall not be detectable in 100 ml sample
3.	Treated water in the distribution system: a) *E. coli* or thermo tolerant coliform bacteria b) Total coliform bacteria	 Shall not be detectable in 100 ml sample Shall not be detectable in 100 ml sample

1) Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.
2) Although, *E.coli* is the more precise indicator of fecal pollution, the count of thermo tolerant coli form bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.
3) It is recognized that, in the great majority of rural water supplies in developing countries, fecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

3.12.8 Summary of Surface Water Quality

The following description is based on the analysis of the samples:

- During the analysis pH of the samples was found in the range of 6.85 – 8.36.
- TDS analysis was also carried out for surface water sample and it was found in the range of 1037-26863 mg/L.
- TSS was found in the range of 8 – 18 mg/L.
- Total Hardness ranges from 188– 6100 mg/L with maximum in the water sample of Tapi River and minimum in Damka Lake.
- DO is one of the important parameter to indicate towards the contamination of organic matter. DO level decreases as soon as organic contamination increases. During analysis DO was found in the range of 4.6-5.0 mg/L.
- COD and BOD analysis was also carried out during the study period and results were found more than the expected value. Various literatures show that BOD should be less than 4.0 mg/L for the better survival of aquatic life.
- Total Nitrogen was found in the range of 1.3 – 2.8 mg/L.
- Heavy metal analysis was also carried out and the Iron content was found in the range of 0.08- 0.88 mg/L.

- MPN test was also carried out for this surface water sample and it was found positive. It indicates towards the faecal contamination in surface water body.

3.12.9 Interpretation of Surface Water Quality Data

TDS value was found more than the drinking water norms in surface water sample of Sunvali, Rajgari, Hazira and Tapi River. The reason of high TDS is salinity ingress from sea. Based on test result data comparison study, it is interpreted that surface water cannot be directly used in drinking as surface water of the studied locations is contaminated with organic matter and microbes. Surface water of village Suvali, Mora and Damka can be used in irrigation as well as in other domestic purposes except drinking and bathing.

3.12.10 Marine Water

To assess the quality of Marine water sample was collected during low tide and high tide for the analysis of physico chemical, nutrient, heavy metal, demand analysis, microbiological and biological parameters. Frequency of sampling was once during the study period and samples were collected as per standard method for the examination of water & wastewater APHA 23rd Edition, 2017. Sediment sample was also collected for the analysis of nutrient and heavy metal parameter.

Table 3.22 Details of Marine and Sediment Sampling Locations

Code	Sampling Location	Distance from the project Site/Direction	Latitude and Longitude	Source
M1	High Tide	7.1 km/W	21°09'03.90"N 72°34'58.77"E	Marine
M2	Low Tide	7.1 km/W	21°08'44.39"N 72°34'58.57"E	Marine
Sd	Sediment	7.1 km/W	21°08'55.30"N 72°35'09.70"E	Sediment

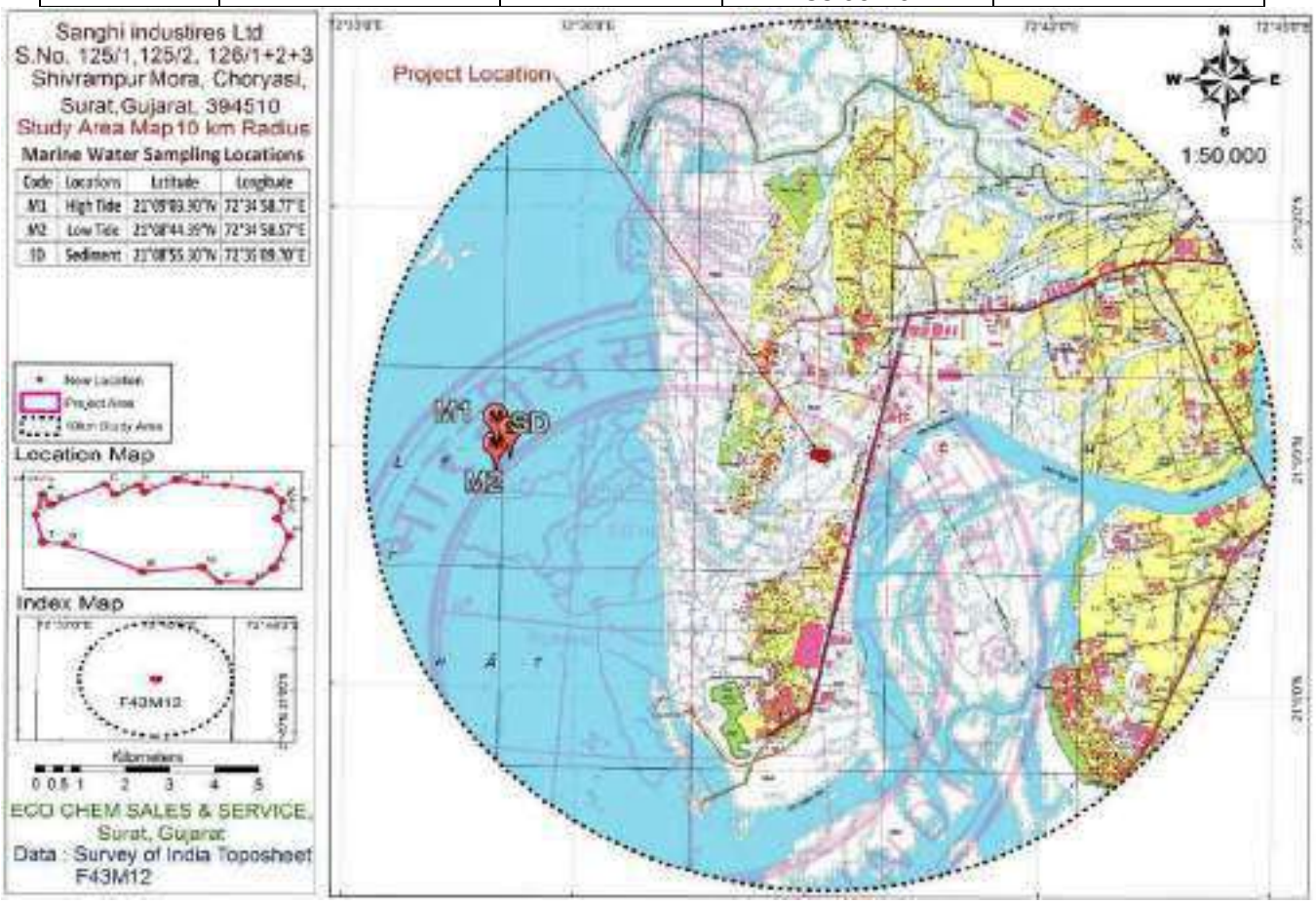


Figure 3.16 Map showing the locations for Marine water sampling

Table 3.23 Marine Water Analysis Result during low tide

S.No.	Parameters	Unit	M1	M2
1.	pH	-	8.02	7.85
2.	Temperature	^{o}C	23.5	24.0
3.	TSS	mg/L	456	402
4.	Total Hardness	mg/L	7200	6500
5.	Total Alkalinity	mg/L	172	184
6.	Salinity as NaCl	ppt	32.2	31.0
7.	Sulphate	mg/L	2473	2968
8.	Total Nitrogen	mg/L	1.3	1.5
9.	Total Phosphorous	mg/L	1.2	1.8
10.	Oil & Grease	mg/L	<1.0	<1.0
11.	DO	mg/L	5.4	5.1
12.	BOD	mg/L	<4	<4
13.	Iron	mg/L	0.25	0.31
14.	Copper	mg/L	<0.05	<0.05
15.	Zinc	mg/L	0.3	0.5
16.	Boron	mg/L	<0.01	<0.01
17.	Chromium	mg/L	<0.03	<0.03

Table 3.24 Microbiological Analysis Result for Marine Water Sample

S. No.	Location Code	Total coliform	Faecal coliform	*Escherichia Coli*	Faecal Streptococci
		Most Probable No (MPN): No./100 Ml			
1.	M1	18	16	<1.8	<1.8
2.	M2	20	18	<1.8	<1.8

Table 3.25 Zooplankton Analysis Result for Marine Water Sample

S. No.	Location Code	Total Count per m^3	Percentage of Organism in each group		
			Protozoa (%)	Rotifera (%)	Copepoda (%)
1.	M1	6200	78	12	10
2.	M2	5800	74	16	10

Table 3.26 Pigment Analysis and Phytoplankton cell Result for Marine Water Sample

S. No.	Location Code	Chlorophyll-a (mg/m^3)	Pheophytin (mg/m^3)	Cell count (Unit/L)
1.	M1	0.72	0.18	180
2.	M2	0.65	0.21	210

Table 3.27 Benthos Detail

Systematic Group	Results
Polychaetes	+
Mysides	-
Ostracodes	+
Isopodes	+
Amphipodes	+
Brachyurans	+
Insects	+
Gastropodes	-
Pelecypodes	-
Copepode	+
Fishlarvae	+

Note: + denotes present and – denotes absent

Dominant groups are Polychaetes, Ostracodes and Brachyurans.

Table 3.28 Sediment Quality Analysis

Sampling Location	Sediment Texture class	Sand (%)	Clay (%)	Silt (%)	Total Phosphorous mg/kg	Cr mg/kg	Mn mg/kg	Fe mg/kg	Zn mg/kg	Cu mg/kg	Organic Carbon %	Total Nitrogen mg/kg
Sd	Sandy clay	48.2	35.6	16.2	90	7.5	13.2	694	28	12	0.7	162

3.12.11 Summary of Marine Water Quality

- Temperature was found in the range of 24.5 to 25.0°C.
- The pH was found in the rage of 7.85 to 8.02.
- Salinity was found in the range of 31.0 to 32.2 ppt.
- Total Phosphorous was found in the range of 1.2 to 1.8 mg/L.
- TSS was found in the range of 456 to 402 mg/L.
- Oil & Grease was found below detection limit i.e. almost nil.
- DO was found in the range of 5.1 to 5.4 mg/L.
- BOD was found below detection limit.

3.12.12 Interpretation of Marine Water Quality Data

During the analysis it was found that temperature of the marine water was below the ambient temperature it indicates that there is no exothermic reactions take place. pH of the water sample for different locations was found near 8.0. Some marine organism can survive at the DO level of >4 mg/L and certain microorganism can survive up to DO level 0.2mg/L. During testing it was found that DO of the marine sample was >5 mg/L. Based on the test results it is interpreted that the water quality of marine is good and suitable for the survival of fishes and other aquatic life. High DO and less BOD indicate that contamination of organic matter in marine water body is not more than its self-purification capacity and probability of organic matter in the sample is almost negligible.

3.13 ECOLOGY AND BIODIVERSITY

Mainly two types of Vegetation cover are on the earth surface. One is self-growing and another is cultivated. Plants are renewable resource and useful to living organism in many ways. It is therefore the role of man in manipulating and changing vegetation population. Due to lack of awareness deforestation is occurring which in turn is responsible for imbalance of ecosystem. The main objective of the ecological survey is aimed to find out baseline status of flora and fauna of the study region. An ecological survey of the study area was conducted particularly with reference to listing of species and assessment of the existing baseline ecological (terrestrial and marine ecosystem) conditions in the study area.

Methodology Adopted for the Study of Flora and Fauna

The EB surveys have been conducted as per our QMS Quality Procedure for Ecology and Biodiversity for conducting ecology and biodiversity study.
Core Zone: Projects site and 3 km radii w.r.t. project site.
Buffer Zone: 10 km radii w.r.t. project site.
Study Period: 1st Oct 2018 to 31st Dec 2018

Floral Diversity of the Study Area

The objective of this floral inventory of the study area is to provide necessary information on floristic structure in the study area for formulating effective management and conservation measures. The climatic, edaphic and biotic variations with their complex interrelationship and composition of species, which are adapted to these variations, have resulted in different vegetation cover, characteristic of each region (Ohasi, 1975). The tree species, herbs, shrubs, climbers and major crops, were documented during this base line study.

Table 3.29: List of Trees in the Study area

S. No.	Family and Scientific Name	Vernacular Name
1.	**Fabaceae**	
1/1	*Acacia auriculiformis*	Bengali Baval
2/2	*Acacia nilotica*	Desi Baval
3/3	*Albizzia odoratissima*	Kalo Siras
4/4	*Albizzia procera*	Killai (kelvo)
5/5	*Cassia fistula*	Garmalo
6/6	*Dalbergia sissoo*	Sissoo
7/7	*Pithecellobium dulce*	Mithi Amli (Goras Amli)
8/8	*Pongomia pinnata*	Karanj
9/9	*Prosopis juliflora*	Gando Baval
10/10	*Tamarindus indica*	Amli
2.	**Simaroubaceae**	
11/1	*Ailanthas excels*	Ardusa
3.	**Cornaceae**	
12/1	*Alangium salvifolium*	Ankol
4.	**Meliaceae**	
13/1	*Azadirachta indica*	Limdo

5.	**Leguminosae**	
14/1	*Bauhinia purpurea*	Kachnar
6.	**Casuarinaceae**	
15/1	*Casuarina equisetifolia*	Sharu
7.	**Boraginaceae**	
16/1	*Cordia gharaf*	Gundi
8.	**Myrtaceae**	
17/1	*Eucalyptus species*	Nilgiri
18/4	*Ficus glomerata*	Umero
19/5	*Ficus religiosa*	Pipdo
20/6	*Morus alba*	Shetur
9.	**Arecaceae**	
21/1	*Phoenix sylvestris*	Khajuri

Table 3.30: List of Shrub in the Study area

S. No.	Family and Scientific Name	Vernacular Name
1.	**Rosaceae**	
1/1	*Rosa damascena*	Rose
2.	**Apocynaceae**	
2/1	*Calotropis procera*	Akdo
3/2	*Carissa conjesta*	Karmada
4/3	*Nerium indicum*	Karen
3.	**Rutaceae**	
5/1	*Cirtus limon*	Limbu
4.	**Fabaceae**	
6/1	*Clerodendro nincerne*	Vilayati Mendi
7/2	*Tephrosia purpurea*	Sartankho
5.	**Solanaceae**	
8/1	*Datura metel*	Dhanturo
6.	**Loranthacea**	
9/1	*Dendrophthoe falcate*	Vando
7.	**Malvaceae**	
10/1	*Hibiscus rosa-sinensis*	Jasud
11/2	*Thespesia lampas*	Paras Piplo
8.	**Lythraceae**	
12/1	*Lawsonia inermis*	Mendi
9.	**Oleaceae**	
13/1	*Nyctanthus arbortristis*	Parijatak

Table 3.31: List of Herbs in the Study Area

S. No.	Family and Scientific Name	Vernacular Name
1.	**Papaveraceae**	
1/1	*Argemone mexicana*	Darudi
2.	**Amaranthaceae**	
2/1	*Aerva sanguinolenta*	Karadia
3/2	*Achyranthes aspera*	Anghedi
3.	**Apocynaceae**	
4/1	*Catharanthus roseus*	Barmasi
4.	**Solanaceae**	
5/1	*Capsicum annum*	Marchi
6/2	*Datura metel*	Ganthovalo Dhanturo
5.	**Apiaceae**	
7/1	*Centella asiatica*	Bhrami
6.	**Malvaceae**	

8/1	*Hibiscus lobatus*	Tali
7.	**Convolvulaceae**	
9/1	*Ipomoea aquatic Forsk*	Mali Ni Bhaji
8.	**Fabaceae**	
10/1	*Trigonella foenum-graecum*	Methi
9.	**Musaceae**	
11/1	*Musa paradisiacal*	Kela
10.	**Lamiaceae**	
12/1	*Ocimum sanctum*	Tulsi
11.	**Phyllanthaceae**	
13/1	*Phyllanthus fraternus*	Bhonya Amli

Table 3.32: List of Climbers in the Study Area

S. No.	Family and Scientific Name	Vernacular Name
1.	**Vitaceae**	
1/1	*Ampelocissus latfolia*	Jungli
2.	**Nyctaginaceae**	
2/1	*Bougainvillea spectabilis*	Bougainvelia
3.	**Cucurbitaceae**	
3/1	*Cucurbita maxima*	Kolu
4.	**Menispermaceae**	
4/1	*Tinospora cordifolia*	Gulvel

Table 3.33: List of Mammals in the Study Area

S. No.	Scientific Name	Common Name	Schedule as per WPA 1972
1.	*Rattus rattus*	Rat	Schedule V
2.	*Mus musculus*	Mouse	Schedule V
3.	*Chiroptera*	Bat	Schedule V

Table 3.34: List of Birds in the Study Area

S. No.	*Scientific Name*	Common Name	Local Name	Schedule and Status	Mig. Status
1.	*Ardeola grayii*	Indian pond heron	Kani Bagli	Schedule IV	R
2.	*Bubulcus ibis*	Cattle egret	Baglo	Schedule IV	R
3.	*Egretta garzetta*	Little egret	Dhodo Baglo	Schedule IV	R
4.	*Phalacrocorax fuscicollis*	Indian cormorant	Pani Kagdo	Schedule IV	R
5.	*Pseudibis papillosa*	Black ibis	-	Schedule IV	R
6.	*Elanus caeruleus*	Blackwinged kite	-	LC	R
7.	*Vanellus indicus*	Red-wattled lapwing	Titodi	Schedule IV	R
8.	*Vanellus malabaricus*	Yellow-wattled lapwing	Titodi	Schedule IV	R
9.	*Charadrius dubius*	Little ringed plover	Titodi	Schedule IV	R
10.	*Tringa ochropus*	Green sandpiper	Leelitutvari	LC	R
11.	*Himantopus himantopus*	Blackwinged stilt	-	LC	R

12.	*Sterna aurantia*	Indian river tern	Kenchi Punch	LC	R
13.	*Columba livia*	Blue rock pigeon	Parevun	Schedule IV	R
14.	*Streptopelia decaocto*	Indian ring dove	Dhol	LC	R
15.	*Streptopelia chinensis*	Spotted dove	Vanaholi	LC	R
16.	*Psittacula krameri*	Rose ringed parakeet	Sudo, Popat	LC	R
17.	*Psittacula cyanocephala*	Blossom headed parakeet	Tui, Popat	Not listed	R
18.	*Eudynamys scolopacea*	Koel	Koyal	LC	R
19.	*Caprimulgus asiaticus*	Common Indian nightjar	Deshi chhapo	LC	R
20.	*Alcedo atthis*	Common kingfisher	Lagothi	Schedule IV	R
21.	*Halcyon smyrnensis*	White breasted kingfisher	Kalkaliyo	Schedule IV	R
22.	*Coracias benghalensis*	Indian roller	Nilkant	Schedule IV	R
23.	*Hirundo daurica*	Redrumped swallow	Kenchiababil	LC	R
24.	*Dicrurus adsimilis*	Black drongo	Kalokoshi	Schedule IV	R
25.	*Sturnus pagodarum*	Brahminy myna	-	Schedule IV	R
26.	*Acridotheres tristis*	Indian myna	Kabar	Schedule IV	R
27.	*Pycnonotus cafer*	Red vented bulbul	Bulbul	Schedule IV	R
28.	*Turdoides caudatus*	Common babbler	Sheradi	Schedule IV	R
29.	*Megalurus palustris*	Striated marsh warbler	-	LC	R
30.	*Copsychus saularis*	Magpie robin	Daiyad	LC	R
31.	*Saxicoloides fulicata*	Indian robin	Deoli	LC	R
32.	*Parusx anthogenys*	Yellow cheeked tit	-	Schedule IV	R
33.	*Motacilla flava melanogrisea*	Yellow wagtail	Matanopilakya	LC	R
34.	*Nectarinia asiatica*	Purple sunbird	Phul chakli	LC	R
35.	*Aethopyga siparaja*	Yellow backed sunbird	-	LC	R
36.	*Ploceus philippinus*	Baya	Sughari	Schedule IV	R

Table 3.35: List of Reptiles in the Study Area

S. No.	Scientific Name	Common Name	Schedule as per WPA 1972
1.	*Calotes versicolor*	Common garden lizard	Not listed
2.	*Calotes rouxi*	Roux's forest lizard	Not listed
3.	*Sitana ponticeriana*	Fan-throated lizard	Not listed
4.	*Chameleon zeylanicus*	Indian chameleon	Not listed

Source: Primary Survey and Forest Department, Surat District.

Table 3.36: Details of Marine Fishes

S. No.	Species	S. No.	Species
1.	White Pomfret	6.	Levta
2.	Black Pomfret	7.	Mullet
3.	Bombay Duck	8.	Ribbon Fish
4.	Thread Fin	9.	Cat Fish
5.	Leather Jacket	10.	Crab

Source: Primary Survey and Fisheries Department, Surat District.

Interpretation of Ecology and Biodiversity

Dominant flora of the study region is bangali baval, gando baval and desi babool. Area is not rich with floral diversity. Natural vegetation of study area is in degraded condition and wild mammal's density is also very low. There is no threatened or endangered species in study region.

3.14 SOCIO-ECONOMIC ENVIRONMENT

The rapid industrialization of the study region has greatly influenced the socio economic and health environment in the villages. Increasing industrialization and population density has increased pressure on resources, civic amenities and public infrastructure. Economic conditions of the local people have improved with the increasing industrialization and greater employment opportunities. The socio-economic environment includes demography structure, population density, literacy level, and employment levels. The data establish a baseline for the prediction of likely impacts of the proposed activity on the socio-economic environment. Secondary information pertaining to the study area villages was collected from Government Agencies, Census data for the year 2011, and statistical abstracts to compile the socio-economic data.

3.14.1 Socio-Economic Survey Methodology

Socio-economic survey tools provide a means of improving understanding of local resource management systems, resource use and the relative importance of resources for households and villages. They can also be used to elicit insights on interaction with government decision-making systems, community perceptions of trends and priority issues, and community-based institutions and their role in the sustainable use and conservation of natural resources.

Data Collection: Following steps were considered for the collection of primary data:

1. Identification of Study Area: The study area was identified before carrying out the survey. All the related information which could affect the prosperity, development & literacy were also collected.

2. Site Visit: Location wise survey plan & format for data collection were prepared for site visit. Data regarding Land Characteristics, Population, Literacy, Workers and Amenities were collected during the survey.

3. Analysis of Data: The data collected by primary survey were verified with secondary data collected from sources like Government Agencies, Census data for the year 2011, and statistical abstracts.

3.14.2 Demography

Almost all villages in the study area are experiencing a rapid growth of population due to industrialization. The total population of study region is summarized in table below.

3.14.3 Population Density

Population density in the study area is given in the table below:

Table 3.37 Details of Population in Study Area

Villages	No. of Household	Total Population	Total area (sq.km)	Population density Person/sq.km

Tena	470	1976	7.57	261
Damka	1331	5604	10.51	533
Mora (CT)	11115	2809	13924	253
Rajgari	318	1300	3.51	370
Vansva	584	2498	4.97	503
Bhatlai	1144	4066	1.93	2107
Sunvali	975	4165	13.05	319
Hajira (INA)	1775	5562	10	556
Kavas (OG) WARD NO.-0102	1602	6500	10	650
Limla (CT)	926	3683	10	368
Bhatpor (OG) WARD NO.-0103	792	3449	10	345
Total	21032	41612	-	-

3.14.4 Sex Ratio

The sex ratio i.e. the number of females per 1000 males is in range of 0 – 1021 with lowest in Bhatlai and highest in Bhatlai village. The Sex ratio i.e. the number of females per 1000 males indirectly reveals certain sociological aspect in relation to female births, infant mortality among female children. Details of the same are tabulated in table below.

Table 3.38 Details of Sex Ratio in Study Area

Zone of Study	Male Population	Female Population	Total Population	Sex Ratio (Female to 1000 Male)
Tena	1075	901	1976	838
Damka	3118	2486	5604	797
Mora CT	11115	2809	13924	253
Rajgari	716	584	1300	816
Sunvali	2308	1857	4165	805
Vansva	1270	1228	2498	967
Bhatlai	2786	1280	4066	459
Limla (CT)	1922	1761	3683	916
Bhatpor (OG) WARD NO.-0103	1855	1594	3449	859
Kavas (OG) WARD NO.-0102	4108	2392	6500	582
Hajira (INA)	3375	2187	5562	648
Total	**33648**	**19079**	**52727**	**7940**

3.14.5 Literacy Rate

Table 3.39 Details of Literacy Rate in Study Area

Zone of Study	Literate			Literacy (%)		
	Male	Female	Total	Male	Female	Total
Tena	895	667	1562	57	43	79
Damka	2604	1890	4494	58	42	80
Mora CT	10271	2210	12481	92.41	78.68	89.64
Rajgari	625	458	1083	58	42	83

Sunvali	1966	1365	3331	59	41	80
Vansva	1070	930	2000	54	46	80
Bhatlai	2458	898	3356	73	27	83
Limla (CT)	1805	1620	3425	53	47	93
Bhatpor (OG) WARD NO.-0103	1421	1120	2541	56	44	74
Kavas (OG) WARD NO.-0102	3385	1638	5023	67	33	77
Hajira (INA)	2774	1643	4417	63	37	79
Total	**29274**	**14439**	**43713**	**60**	**40**	**80**

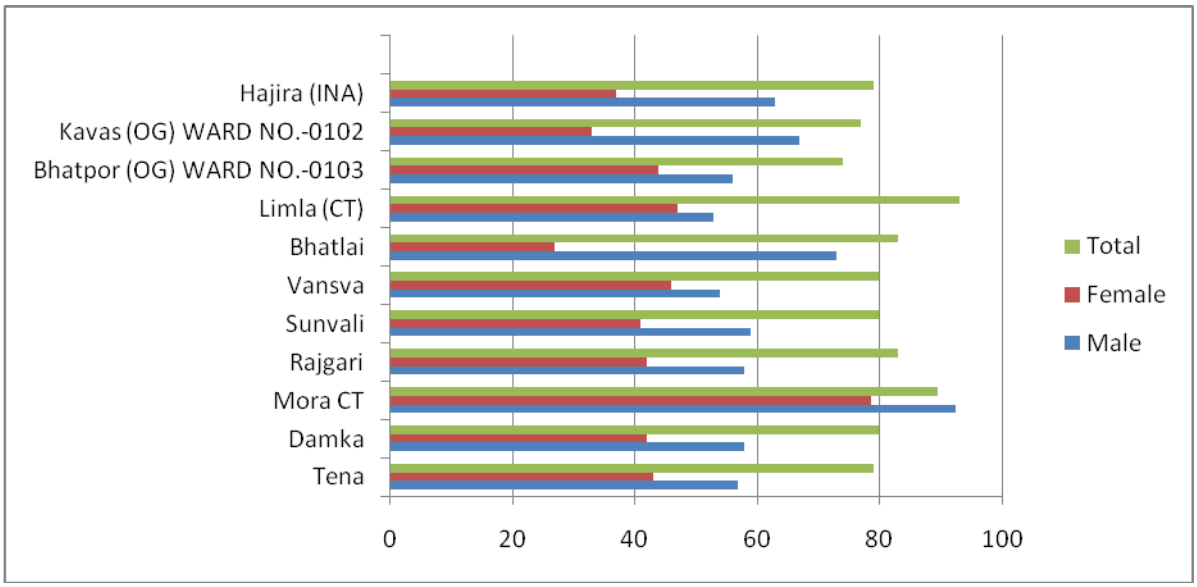


Figure 3.17 Literacy Rate of the Study Area

Among all the villages of study area Limla (CT) is having high literacy rate i.e. 93%. There is not much difference between female literacy rate and male literacy rate in the study region. Female literacy rate is an important indicator for social change.

3.14.6 Economic Aspects

Economic aspects of the study area include the economic structure of the people of the surrounding area. It can be predicted that economic structure of the study area will be improved with time, because it consists large industrial estate and hence there are more employment opportunities.
According to working status, whole population of the study area is divided into,

- Marginal workers
- Non workers
- Main workers

Census department has defined 10 categories of workers in Main workers. It consists of cultivators, agricultural, labourer those engaged in livestock, forestry, fishing, mining and quarrying, manufacturing, processing and repairs in household industries and other services. Workers engaged in the work for a period less than 6 month during the reference year falls under marginal workers. Workers engaged in unpaid household duties e.g. students, retired person, dependents etc. falls under non-workers. Detail of occupational structure is shown in table below.

Table 3.40 Details of Occupational Structure

Zone of Study	Non-Workers (%)	Total Workers	
		Main Workers (%)	Marginal Workers (%)
Tena	61	37	2

Damka	60	39	1
Mora CT	27	69	4
Rajgari	51	47	2
Sunvali	52	43	5
Vansva	63	35	2
Bhatlai	42	55	3
Limla (CT)	66	33	1
Bhatpor (OG) WARD NO.-0103	56	40	4
Kavas (OG) WARD NO.-0102	51	43	6
Hajira (INA)	49	49	2
Total	**54**	**42**	**4**

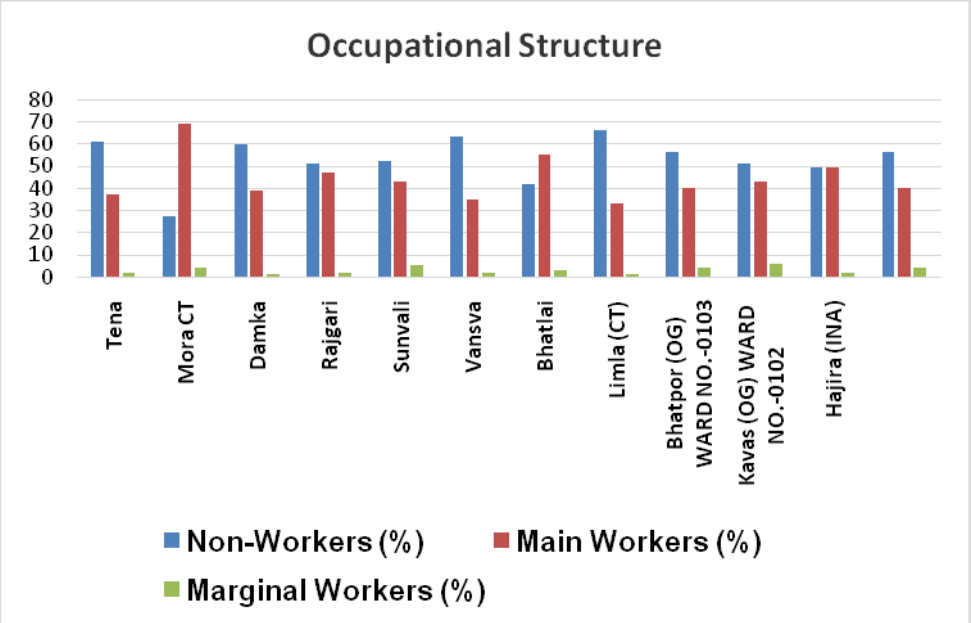


Figure 3.18: Occupational Structure of the study area

Almost all the villages have more than 50% people as non-workers. Rapid industrialization in the last two decades has resulted in significant changes in the occupational profile of the local people. There is an overall trend among the youth to opt for employment in service sector and move away from traditional occupation.

3.14.7 Infrastructures Resource base

The infrastructure resources base of the eleven study areas with reference to education, medical facility, water supply, post and telegraph, transportation, communication facility, power supply and existence of nearest town etc. according to the Village Directory Census CD 2011 of Gujarat State.
The significant features of these important parameters for each study area are discussed as follows:

Education

As per 2011 village directory record, almost all villages having education facility in the form of primary schools, and middle school are as follows.

Table 3.41 Infrastructures Resource Base

Private Pre - Primary School (Nursery/LKG/UKG) (Status A(1)/NA(2))	Govt. Primary School (Numbers)	Private Primary School (Numbers)	Govt. Secondary School (Numbers)	Govt. Senior Secondary School (Numbers)	Private Senior Secondary School (Numbers)
-	2	-	2	1	-

Medical/Primary Health Care

Medical facilities in terms of community health workers are available in some of the villages. Primary health center and primary health sub centers are available in few villages.

Primary Health Centre (Numbers)	Primary Health Sub Centre (Numbers)	Maternity And Child Welfare Centre (Numbers)	Veterinary Hospital (Numbers)
1	1	-	-

Drinking Water

The water supply in the area is through dug wells, hand pumps, taps and other allied sources.

Tap Water Untreated	Covered Well	Uncovered Well	Hand Pump	Tube Wells/Borehole	River/Canal
4	1	6	2	4	2

Drainage and Sanitation Facilities

Drainage and sanitation facilities were not adequate in the study area. Mostly Open drainage, and open kuccha drainage observed in the village.

Open Drainage	No Drainage	Open Pucca Drainage Uncovered	Open Kuccha Drainage
5	4	2	4

Communication

Communication facility is fairly good in this region. Most of villages having telephone connectivity and having post office.

Sub Post Office	Post And Telegraph Office	Telephone (landlines)	Public Call Office /Mobile (PCO)
2	0	6	4

Transportation

A well planned and efficient network of transport is an essential component for a developing country. In the absence of efficient network of transport, a State's economy would suffer from major grid lock in terms of overall growth potential of that area. In village public bus facility was availed and other facilities were private bus.

Public Bus Service	Railway Station	Auto/Modified Autos	Vans	Tractors	Carts Drivens by Animals
6	-	4	-	DNA	DNA

DNA= Data not available

Road Approach Facilities

Road condition facility was found in village from following.

Black Topped (pucca) Road	Gravel (kuchha) Roads	Water Bounded Macadam	All Weather Road	Foothpath
6	6	2	-	6

Bank Facilities

Banking and credit society facility was found in village. Self-help group activities were performed by the women groups

Commercial Bank	Cooperative Bank	Agricultural Credit Societies	Self - Help Group (SHG)
1	0	0	6

Power Supply

Almost all villages are electrified in the region and electricity is available for both domestic and agriculture.

Power Supply For Domestic Use	Power Supply For Agriculture Use	Power Supply For Commercial Use	Power Supply For All Users
6	6	6	6

Source: DCHB 2011, Gujarat

3.14.8 Interpretation of Socio Economic Data

During the primary survey it was observed that almost pakka road facility is available in all villages within 10 km radius. Literacy rate of the study region is from 72% to 93%. On the basis of survey for literacy rate data it is interpreted that there is need to promote education among more and more people. Almost all the villages have more than 50% people as non-workers. It indicates that the problem of unemployment can be solved by providing proper training and education. There is also need to establish more industries so that maximum number of employment can be generated.

3.15 SUMMARY

Ambient air quality monitoring

S.No.	Criteria Pollutants	Unit	Maximum Value	Minimum Value	98th percentile value	Prescribed standard
1.	PM10	µg/m3	86.4	61.8	84.6	100
2.	PM2.5	µg/m3	47.6	31.6	46.4	60
3.	SO2	µg/m3	15.9	9.0	15.2	80
4.	NOX	µg/m3	22.8	13.1	22.0	80

Based on comparison study of results with NAAQS for tested parameters, ambient air quality of studied locations can be considered good as all the results of tested parameters are well within the limit. Looking towards the increasing pattern of PM10 and PM2.5 concentration in ambient air, it is suggested that proper air pollution control measures must be adopted by the industry. This interpretation relate to the results found during the monitoring for particular location and date of monitoring.

Noise Monitoring

S.No.	Parameter	Unit	Maximum Value	Minimum Value
1.	Leq (Day)	dB(a)	77.4	49.6
2.	Leq(Night)	db(a)	72.4	42.1

Based on noise level data obtained during the survey for residential area and industrial area, it is interpreted that noise levels are within the standard norms prescribed by MoEF&CC. Looking towards the increase in noise generating sources it is suggested that there is need to apply noise reducing devices at noise generating sources and generate public awareness.

Soil Quality and Characteristics

S.No.	Parameter	Unit	Maximum Value	Minimum Value
1.	pH	-	7.88	7.62
2.	electrical Conductivity	dS/m	1.4	0.9
3.	Exchangeable Sodium	meq/100gm	6.2	5.1

4.	Exchangeable Potassium	meq/100gm	1.4	1.0
5.	Phosphorous	kg/ha	414.4	219.5
6.	Total Nitrogen	%	0.073	0.049

Ground water

S.No.	Parameter	Unit	Maximum Value	Minimum Value	Desirable Limit	Permissible Limit
1.	pH	-	8.41	7.30	6.5-8.5	No Relaxation
2.	tds	mg/L	6722	806	500	2000
3.	tss	mg/L	<2	<2	-	-
4.	Total hardness	mg/L	1500	314	200	600
5.	Chloride	mg/L	3194	153	250	1000
6.	Total Alkalinity	mg/L	756	400	200	600
7.	Fluoride	mg/L	0.7	0.5	1.0	1.5
8.	Iron	mg/L	0.66	0.04	0.3	No Relaxation

Based on comparison study of results of tested parameters with drinking water norms, it is interpreted that water qualities of the studied locations can be considered portable/drinkable as results are within the drinking water norms except Hazira and Mora village. Iron content was found 0.66 mg/L in the ground water sample collected from Hazira village, which is more than prescribed limit and in case of the ground water sample collected from Mora village TDS, Hardness, Chloride and Alkalinity value was found higher side. Reason of high TDS in ground water sample in Mora village may be due to ingress of salinity as sea is very near to this village. To save the ground water from contamination and improving the quality, rainwater harvesting and ground water recharging may be helpful.

Surface water

S. No.	Parameter	Unit	Maximum Value	Minimum Value	Desirable Limit	Permissible Limit
1.	ph	-	8.36	6.85	6.5-8.5	No Relaxation
2.	tds	mg/L	26863	1037	500	2000
3.	DO	mg/L	5.0	4.6	-	-
4.	COD	mg/L	24	12	-	-
5.	BOD	mg/L	8	4	-	-

TDS value was found more than the drinking water norms in surface water sample of Sunvali, Rajgari, Hazira and Tapi River. The reason of high TDS is salinity ingress from sea. Based on test result data comparison study, it is interpreted that surface water cannot be directly used in drinking as surface water of the studied locations are contaminated with organic matter and microbes. Surface water of village Sunvali, Mora and Damka can be used in irrigation as well as in other domestic purposes except drinking and bathing.

Marine water

During the analysis it was found that temperature of the marine water was below the ambient temperature it indicates that there is no exothermic reactions take place. pH of the water sample for different locations was found near 8.0. Some marine organism can survive at the

DO level of >4 mg/L and certain microorganism can survive up to DO level 0.2mg/L. During testing it was found that DO of the marine sample was >5 mg/L. Based on the test results it is interpreted that the water quality of marine is good and suitable for the survival of fishes and other aquatic life. High DO and less BOD indicate that contamination of organic matter in marine water body is not more than its self-purification capacity and probability of organic matter in the sample is almost negligible.
Ecology and Biodiversity
Dominant flora of the study region is bangali baval, gando baval and desi babool. Area is not rich with floral diversity. Natural vegetation of study area is in degraded condition and wild mammal‘s density is also very low. There is no threatened or endangered species in study region.
Socio economic
During the primary survey it was observed that almost pakka road facility is available in all villages within 10 km radius. Literacy rate of the study region is from 72% to 93%. On the basis of survey for literacy rate data it is interpreted that there is need to promote education among more and more people. Almost all the villages have more than 50% people as non-workers. It indicates that the problem of unemployment can be solved by providing proper training and education. There is also need to establish more industries so that maximum number of employment can be generated.

4. IMPACT PREDICTION AND MITIGATION MEASURES

4.1 GENERAL

This chapter provides the information on anticipated impact due the proposed activities and its mitigation measures to negate the impact on environmental as well as social life.

4.2 ANTICIPATED ENVIRONMENTAL IMPACTS DURING CONSTRUCTION PHASE

The construction phase involves the activities like erection of civil units, new equipment and machinery installation, green belt development *etc.* Different components of environment are likely to be effected by the activities. But the impacts will be marginal and for short term only. The green belt (33%) development will have positive impacts.

4.2.1 Matrix Representation

Table 4.1 Impact Identification Matrix (Construction Phase)

Activities	Environmental Attributes										
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Occupational Hazardous	Ecology and Biodiversity	Socio Economic
Transportation and Movement/Operation of materials & machinery	✔	-	✔	✔	-	-	-	-	✔	✔	✔
Storage and Handling of Construction Material	✔	–	✔	✔	-	-	-	-	✔	-	-
Civil Construction Activity	✔	✔	✔	✔	✔	-	✔	✔	✔	-	✔
Generation of Construction waste	✔	-	✔	–	-	-	-	✔	–	-	–
Waste water/Sewage disposal	–	✔	✔	–	–	-	–	✔	–	✔	–
Employment	–	✔	–	-	-	-		✔	-	–	✔
Green belt Development	✔	✔	✔	✔	✔	✔	✔	-	-	✔	✔

Table 4.2: Severity Criteria for Magnitude of Impacts

S. No.	Category	Description of category	Impact	
			Adverse	Beneficial
1.	No impact	-	0	0
2.	No appreciable impact	Short term reversible	-1	1
3.	Significant impact	Long term reversible	-2	2
4.	Major impact	Irreversible but of lesser extent	-3	3
5.	High impact	Irreversible but of medium extent	-4	4
6.	Permanent impact	Severe irreversible impact	-5	5

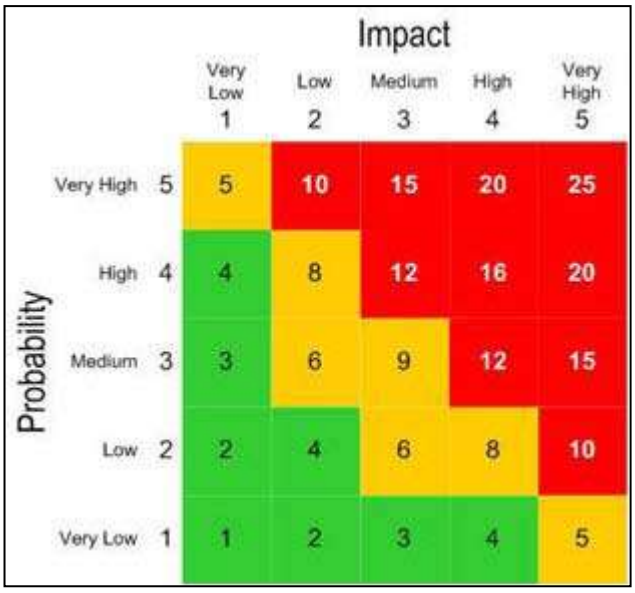


Figure 4.1 Probability vs. Impact Chart

Table 4.3: Cumulative Score range for beneficial and adverse impacts

S. No	Total score	Outcome
1.	+ve / -ve	Beneficial impact / adverse impact
2.	0-150	No appreciable Beneficial impact / adverse impact
3.`	151-300	Appreciable but reversible adverse impact-mitigation measures are needed
4.	301-450	Significant adverse impacts: most of the impacts are reversible. Mitigation measures are crucial.
5.	451-600	Major adverse impacts; most of the impacts are reversible. Alternative site selection to be considered.
6.	>600	Permanent irreversible impact; alternatives to the project need to be explored

Table 4.4 Environmental Impact Matrix without Mitigation Measures (Construction Phase)

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Hazard	Ecology and Biodiversity	Socio Economic	Total
Transportation and Movement/Operation of materials & machinery	-12	-	-4	-16	-	-	-	-	-16	-4	9	-43
Storage and Handl ing of C onstruction Material	-6	-	-4	-4	-	-	-	-	-4	-	-	-18
Civil C onstruction Activity	-12	-12	-12	-12	-6	-	-	-9	-6	-	9	-60
Disposal of construction Debris	-4	-	-6	-	-	-	-	-6	-	-	-	-16
Waste w ater/Sewage disposal	-	-6	-4	-	-	-	-	-2	-	-4	-	-16
Employment/Manpower	-	-12	-	-	-	-	-	-9	-	-	9	-12
Green belt Development	9	-4	6	9	6	-2	-2	-	-	12	2	36
Cumulative score	-25	-34	-24	-23	0	-2	-2	-26	-26	4	29	-129

Total cumulative score for various environmental parameters without mitigation measures is -129 which means no appreciable adverse impact during construction phase will be envisaged.

4.2.2 Air Environment

Table 4.5: Impact and Mitigation Measures on Air Environment

Project Activity	Aspect and Probable Impact	Mitigation Measures
Transportation an d movement/operation of machineries	• Fugitive Dust Emissions due to vehicle Movement. • Exhaust emissions from vehicles and equipment deployed during the construction phase is also likely to result in marginal increase in the levels of SO_2, NOx and PM which leads to respiratory ailments like asthama and other dust related problems to the human health.	• Regular water sprinkling will be done to avoid dust generation from transportation. • Trucks used for transportation of construction materials shall be covered with tarpaulin sheet to avoid dust dispersion at site. • Only valid PUC vehicle will be used for the transportation of materials and equipment. • Construction site will be barricaded with sheet to avoid dust emission due to wind from project site.
Civil C onstruction Activities	• Increase of dust and airborne particulates. • Dust generation during material handling. • Air emission during construction activities.	• Regular water sprinkling will be done to control dust emission. • Personnel Protective Equipment for construction workers (PPEs) will be provided to the construction workers. Hence there will be no significant impacts on their health due to the dust particle. • Barrier will be provided around the project site
Disposal of Construction Debri s and domestic garbage.	The construction debris/construction waste (200 Tons) will be generated which have negative impact.	The construction debris and construction waste will be utilized in internal road and land leveling.

Project Activity	Aspect and Probable Impact	Mitigation Measures
Wastewater-sewage disposal	• Odour generation due to sewage disposal.	• Sanitation facilities/Mobile toilet will be made available for construction workers.
Greenbelt Development	• It will act natural barrier for dust and noise emission.	• More than 33% will be utilize for Greenbelt development and 4125 tress will be planted.

4.2.3 Water Environment

Table 4.6: Impact and Mitigation Measures on Water Environment

Project Activity	Aspect and Probable Impact	Mitigation Measures
Civil Construction Activity	• The water will be sourced from the local body/Irrigation department (surface); hence no impact on ground water quality.	• Regular monitoring will be done to check the incoming water supply for construction purpose. The ground water will not be used.
Storage and Ha ndling of Construction material	• Run-off from storage areas of construction material.	• Proper storm water drainage system will be made available for rain.
Wastewater/ Se wage Disposal	• Untreated sewage from construction area may have negative impact.	• Sanitation facility will be made available for construction workers.

3.15.1 Soil Environment

Table 4.7: Impact and Mitigation Measures on Soil Environment

Project Activity	Aspect and Probable Impact	Mitigation Measures
Transportation and movement/operation of machineries	• Compaction of soil due to vehicular movement. • Soil degradation due to spillage/leakage of oil and grease from vehicles and machineries.	• RCC roads and pavements of working area for prevention of oil & grease getting mixed with soil.
Civil construction activities	• Generated Construction waste will contaminate the soil quality. • Spillage of oil during construction activities. • Soil erosion due to construction and runoff during monsoon season. • Loss of Top fertile soil.	• Construction waste will be categorized in to recyclable and non-recyclable and stored separately. • Designated construction area for prevention of oil & grease getting mixed with soil. • A well designed storm water drainage network and sewerage network will be provided for the proposed project for carry away of rainwater runoff.
Storage and handling of construction material	• Soil contamination due to handling and storage of construction material. • Oil spillage can affect physical and chemical properties of the soils.	• The construction material & diesel /oil to be used for various construction activities shall be stored in designated storage yards to reduce the spills into unwarranted areas. • Good practices of storage and material handling will be carried out. • Spillage control will be carried out by disposing the affected soil at adequate place
Transportation and Disposal of Construction Debris	• Contamination of the soils of surrounding area due to construction materials such as	• The construction wastes shall be utilized for PCC works, road construction and other filling

Project Activity	Aspect and Probable Impact	Mitigation Measures
	cement, sand, oils, etc.	requirement etc. • Construction waste will be categorized in to recyclable and non-recyclable and stored separately.
Wastewater-sewage Disposal	• Contamination of soil due to discharge of waste water.	• No wastewater from construction site will be allowed to disposed-off on land. • Adequate sanitation facilities for labors will be provided. • Regular monitoring/ checking/ inspection of the sewage network system.
Green belt Development	• The improvement in soil texture due to binding of top soil materials and root structure.	• The greenbelt (33%) will be developed and this will control the soil erosion due to wind and runoff water, Regular maintenance of greenbelt will be done.

4.2.4 Noise Environment

Table 4.8: Impact and Mitigation Measures on Noise Environment

Project Activity	Aspect and Probable Impact	Mitigation Measures
Transportation and movement/operation of machineries	• Continuous Noise pollution affects the human working efficiency. • Chances of hearing loss due to continue noise emission.	• Provision of ear muffs and ear plugs to prevent continuous noise exposure risk to laborers working on site. • Avoid high noise generating activity during night-time and their frequency to be minimized to avoid continuous noise exposure. • Tree plantation beside the road area will be carried out. • Traffic management plan within and outside the factory premises will be followed. • Unnecessary horn honking will be avoided and strictly prevented.
Civil Construction Activities		
Storage and handling of construction material		
Green belt Development	• Reduction in noise waves to receptors serving as a noise barrier.	Development of greenbelt (33%) will create aesthetic view as well as act as a barrier for noise.

4.2.6Land Use/Land Cover/ Hydrology/Geology

The project will set up on industrial zone hence no land use will be changed, there will be changes in hydrology and geological structure of the area due to construction of building and other amenities.

3.15.2 Solid/Hazardous Waste

Table 4.9: Impact due to generation of Solid/ Hazardous Waste and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Civil Construction Activities	• The excavated earth material if stacked loosely may result into runoff during rainy season resulting in loss of top soil. The 200 tons construction debris will be generated from construction.	• Excavated earth shall be stored in stockpiles and covered with plastic/tarpaulin sheets or stored in closed room and reused for landscape development along the corridor. The construction wastes/debris shall be utilized for leveling of land etc.

Project Activity	Impact	Mitigation Measures
Transportation and Disposal of Construction Debris	Fuel leakage/ spillage used for construction equipment or vehicles may cause land contamination.	• Fuel leakage/spillage shall be mitigated by providing properly lined storage area.
Wastewater-sewage Disposal	• The wastewater generated from the domestic activities of construction workforce may cause land contamination.	• Proper sanitation and drinking water facilities shall be provided for construction workers. Sewage generated will be disposed through soak pit to avoid any adverse impacts on land.
Green Belt Development	• Plant shed out materials like leaves, roots, branches etc. from the environment for growth and other processes.	• Daily collection of municipal waste will be carried out and composting of this waste will used as manure for greenbelt.

4.2.7Risk & Hazards

Table 4.10: Risk and its Mitigation Measures

Project Activity	Aspect and Probable Impact	Mitigation Measures
Transportation and movement/operation of machineries **Civil Construction Activities** **Storage and handling of construction material**	• Chances of accident during transportation of material. • Fall from height, cut injury and fall injury due to construction activities.	All transportation within the main working will be carried out directly under the supervision and control of the management. The vehicles must be maintained in good repairs and checked thoroughly at least once a week by the competent person authorized for the purpose by the Management. Safe construction practices will be followed under supervisor‘s direction.

4.2.8Ecology and Biodiversity

Table 4.11: Impact and Mitigation Measures on Ecology and Biodiversity

Project Activity	Aspect and Probable Impact	Mitigation Measures
Transportation and movement/operation of machineries **Civil Structure**	• Construction works, construction machineries and equipment noise will create stress on avifauna and may disturb their activities.	Speed limit of vehicles will be maintained. • Loud horn in the vehicles will not be allowed. Acoustic -enclosure will be provided to construction machineries and equipment.
Greenbelt Development	• Greenbelt development may cause positive impacts on the flora by enhancement of green spaces.	• Efficient management of greenbelt and their conservation. • Regular watering and maintenance of the greenbelt for sustained plant growth.

4.2.9Socio-Economic

Table 4.12: Impact and Mitigation Measures on Socio Economic conditions

Potential Aspects	Aspect and Probable Impact	Mitigation Measures

Transportation and movement/operation of machineries	• The construction phase will generate employment opportunity (500 Nos) of in the skilled as well as unskilled categories. Although the workforce requirement will be temporary in nature, it will be met from the local populace hence there will be positive impact. • Construction workers will require essential basic infrastructure facilities *viz*. safe drinking water, adequate sanitation, etc. will have temporary impact on the existing facilities.	Local agencies will be appointed for the transportation of materials and machinery.
Civil Construction Activities		Preference will be given to local labor in terms of providing employment for construction phase.
Employment		
Green belt Development		Construction wastes will be disposed-off adequately. Solid wastes/construction debris will be handled/disposed according to the C&D Rules, 2016.

Table 4.13 Environmental Impact Matrix with Mitigation Measures (Construction Phase)

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Hazards	Ecology and Biodiversity	Socio Economic	Total
Transportation and movement/operation of machineries	-2	-	-	-2	-	-	-	-	-2	-2	+9	+1
Storage and handling of construction material	-2	-	-	-	-	-	-	-	-	--	-	-2
Civil Construction Activities	-2	-4	-2	-2	-	-	-	-2	-2	-2	+9	-7
Disposal of Construction Debris	-	-	-2	-	-	-	-	-2	-2	-	-	-6
Wastewater-sewage Disposal	-	-2	-2	-	-	-	-	-	-2	-	-	-6
Employment Generation	-	-2	-	-	-	-	-	-	-	-	+9	+7
Greenbelt Development	+9	+4	+6	+9	+2	+2	-	-4	-	+12	+2	+43
Cumulative score	+3	-4	-	+5	+2	+2	-	-8	-8	+8	+29	+30

After taking mitigation measures as suggested, the score cumulative score of impact on environment after taking mitigation measures is +30 during construction phase which represent appreciable beneficial/adverse impact.

4.3 ANTICIPATED ENVIRONMENTAL IMPACTS DURING OPERATION PHASE

This phase of the project is important because it generates long-term impacts as the project implementation phase starts. The impacts during operation phase are anticipated as the commissioning of project require natural resources *viz.* fuel, energy, manpower, water, etc. Identification of impacts during operation phase is described - in sub-section 4.3.1.

4.3.1 Matrix Representation

The identification of impacts during operation phase is presented in the form of a matrix in table 4.16. The scores for various parameters and activities are presented in table below:

Table 4.14 Impact Identification Matrix (Operation Phase)

Activities	Environmental Attributes										
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk Hazardous	Ecology and Biodiversity	SE
Vehicle Movement	✔	-	-	✔	-	-	-	-	✔	✔	✔
Raw material handling, storage etc.	✔	✔	✔	✔	-	-	-	✔	✔	✔	✔
Process stage/Operation	✔	✔	✔	✔	-	-	-	✔	✔	✔	✔
Employment	-	✔	-	-	-	-	-	✔	-	-	✔
Green Belt Development	✔	✔	✔	–	–	✔	✔	–	-	✔	✔

Table 4.15 Environmental Impact Matrix without Mitigation (Operation Phase)

Activities		Environmental Attributes										
		Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Hazard	Ecology and Biodiversity	SE	Total
Vehicle Movement		-16	-	-	-16	-	-	-	-	-16	-16	-2	-66
Raw material handling, storage etc.		-25	-9	-9	-12	-	-	-	-16	-9	-9	+9	-80
Process stage/ operation	Fuel storage & processing	-25	-20	-6	-20	-	-	-	-20	-16	-16	-9	-132
	Combustion of fuel												
	Flue gas Cleaning												
	Grinding and Packing												
	Cooling system												
Employment		-	-6	-	-	-	-	-	-6	-	-	+9	-13
Green Belt Development		+16	-16	-4	+4	+6	-6	-6	-	-	+12	-	-3
Cumulative score		-41	-51	-19	-44	+6	-6	-6	-42	-41	-29	+7	-294

The cumulative scoring of impact occurred during plant operation is -294 which represent reversible adverse impact due to proposed activities, hence proper mitigation measures are required to address and implement during entire life of unit.

4.3.2 Air Environment

Impact Due to Transport: The sources likely to be affecting the pollutant concentrations in project area would be vehicular emission due to transportation of raw material and fuel. On account of various associated activities, there will be increased vehicular traffic on connecting roads. Generation of gaseous emissions is therefore, of primary concern. Mode of transportation of each incoming and outgoing material is presented in table below and for computation of traffic modeling studies frequency of vehicles has been calculated.

Table 4.16: Recommendations on Traffic Capacity as per IRC 2010

S.No.	Category of Road	Maximum PCU/hr	Dispatch Ratio (%)
1.	**National Highway 6**	3000	60
2.	**State Highway 186**	1250	40

Source: ***IRC:SP:37:2010***

Table-4.17: Incoming & Outgoing Transportation

Incoming Raw Material Transportation							
S.No	**Raw Material**		**Quantity TPA**	**Quantity TPD**	**Source**	**Mode of Transport**	**No. of Vehicles (Truck/day)**
1.	Clinker		2000000	6061	Captive	Sea	184
2.	Additives like Gypsum, Fly Ash, Slag				Purchase	Road	
	Fuel		60000	182	Purchase	Road	
Total No. of Trucks deployed / day will be							**184**
Outgoing Product Transportation							
S.No	**Product**	**Quantity Million TPA**	**Quantity TPA**	**Quantity TPD**	**Source**	**Mode of Transport**	**No. of Vehicles (Truck/day)**
1.	Cement	2.0	2000000	6061	Captive	Road/Sea	179
Total No. of Trucks deployed / day will be							**363**

Frequency of Vehicles:

Total Capacity (Fuel, Clinker, Fly ash)	40, 60,000 TPA
No. of working days	330
Transportation of incoming and outgoing material	12303 Tons/day
Working hours per day	24 hour (3 shifts)
Truck/Tanker Capacity	34 Tons
Frequency of trucks/day (91 No.x 4 trips/day x 2 (up/down)	363 x 2
Frequency of trucks deployed/hr	16
Increase in PCU/hr	16 x 3= 48

Table 4.18: Modified Traffic Scenario and LOS

S.No	Road	Increased PCUs	Modified V	C	Modified V/C Ratio	Modified V/C Ratio
1.	**National Highway 6**	48*60%= 29	1421+29= 1450	3000	0.48	C
2.	**State Highway 186**	48*40%= 19	743+19= 762	1250	0.61	D

Minimum impact on local transport as only 91 Nos. [4 trips/day x 2 (up/down)] Trucks will be required for transport of cement and raw material. The LOS value from the proposed project will be the almost

same as before *i.e.* **"C" "Good"** for the National highways falling in the study area. So, the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse effect. The company has planned Coastal Shipping of Cement, accordingly cement terminals have been developed at various locations. This will reduce the load on rail/road network / transportation.

4.3.3 Air Quality Index

Air Quality Index (AQI) is one such tool for effective dissemination of air quality information to people. There are six AQI categories, namely Good, Satisfactory, Moderately polluted, Poor, Very Poor, and Severe. The proposed AQI will consider eight pollutants (PM_{10}, $PM_{2.5}$, NO_2, and SO_2,) for which short-term (up to 24-hourly averaging period) National Ambient Air Quality Standards are prescribed. Based on the measured ambient concentrations, corresponding standards and likely health impact, a sub-index is calculated for each of these pollutants. The worst sub-index reflects overall AQI. AQI to be calculated by using the pollutant concentration data, the following table, and the following equation (linear interpolation):

$$I_p = \frac{I_{Hi} - I_{Lo}}{BP_{Hi} - BP_{Lo}}(C_p - BP_{Lo}) + I_{Lo}$$

Where,
Ip = the index for pollutant p
Cp = the rounded concentration of pollutant p
BPHi = the breakpoint that is greater than or equal to Cp
BPLo = the breakpoint that is less than or equal to Cp
BPHi = the breakpoint that is greater than or equal to Cp
IHi = the AQI value corresponding to BPHi
ILo = the AQI value corresponding to BPLo

Table 4.19: AQI Categories

Air Quality index (AQI) values	Levels of health concern	Description	Color
0 – 50	Good	Minimal Impact	Dark Green
51 - 100	Satisfactory	Minor breathing discomfort to sensitive people	Light Green
101 – 150	Moderate	Breathing discomfort to the people with Lung, heart disease, children and other adults.	Lemon Yellow
151- 200	Poor	Breathing discomfort to people on prolonged exposure	Yellow
201 – 300	Very Poor	Respiratory illness to the people on prolonged exposure	Red
301 - 500	Severe	Respiratory effects even on healthy people.	Brown

Source: Central Pollution control board series CUPS/8z/2014-15

S.No.	Locations	SUB INDEX				AQI
		PM_{10}	$PM_{2.5}$	SO_2	NO_2	
1.	Project Site	76	71	16	24	76
2.	Sunvali	77	70	16	23	77
3.	Mora	74	68	15	22	74
4.	Damka	77	69	16	23	77
5.	Rajgari	76	70	15	23	76
6.	Kavas	74	67	15	23	74
7.	Hazira	76	71	16	24	76
8.	Dumas	70	65	15	22	70

- The AQI for 4 parameters has been calculated for running 24-hr averages. It can be seen that for pollutants air quality is satisfactory.
- From the above representative table of air quality index for 10 km radius of project site, responsible parameter for pollution is PM_{10} and $PM_{2.5}$. Maximum AQI and responsible parameter for pollution are recorded in project area are PM_{10} with satisfactory impact.

4.3.4 Air Quality Modeling Study

Atmospheric dispersion modeling is the mathematical simulation of how air pollutants disperse in the ambient atmosphere. It is performed with computer programs that solve the mathematical equations and algorithms which simulate the pollutant dispersion. The dispersion models are used to estimate or to predict the concentration of air pollutants by using various inputs such as meteorological parameters *viz.* temperature, wind speed and direction, mixing depths, inversion level, *etc.* and source emissions emitted from sources on the desired area. Such models are helpful to the government agencies for protecting and managing the ambient air quality. The models are typically employed to determine whether the ambient air quality level due to proposed project will comply with the National Ambient Air Quality Standards (NAAQS) or not. Over and above the prediction of the concentration of pollutant at a particular area / locations, it also assists in the designing of effective control measures / strategies to reduce emissions of harmful air pollutants during operation. It also guide on the required pollution control equipment. For the proposed atmospheric dispersion modeling study, United States Environmental Protection Agency (USEPA) approved and also recommended by the Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India, regulatory air quality model *i.e*. Industrial Source Complex Short Term (ISCST3-version 3) is applied to predict ground level incremental concentrations (GLCs) of concerned critical pollutants. Prior to air quality modeling exercise, meteorological condition during one season over project site is extensively studied and were also compared with secondary data from the government sources. Concentrations are estimated for the critical pollutants assessed over appropriate averaging times (*i.e.* 8 hours and 24 hours) based on the applicability of the National Ambient Air Quality Standards (NAAQS).

To assess the impact of air emissions from various continuous point sources, air dispersion modeling study has been conducted with the help of Industrial Source Complex Short Term Model (ISCST3) version 5.0 model of AermodCloud™ developed by Envitrans Infosolution Pvt. Ltd.

Model Setup

Detailed model set up is given in the following table**:**

Table 4.20: Parameters for ISCST3

S.No.	Parameter	Details
1.	Model Name	ISCST3
2.	Software Name	AermodCloud™
3.	Model Type	Steady state Gaussian plume air dispersion model
4.	Topography	Rural, Plain terrain
5.	Average Time	24 hours
6.	Source Type	Point source
7.	Boundary Limits	10 km X 10 km
8.	Co-Ordinates System	Polar grid
9.	Anemometer	10 m
10.	Surface Meteorology Data	Site specific data processed by AERMET

Model Input Data

The air pollution caused by the gaseous emissions from a stack is a local phenomenon. Its impact will occur at a distance ranging from within the immediate vicinity of the stack to 1 km away from the stack. To evaluate the impact on air quality following data is required to input in simulation.

- Co-ordinates (X and Y) of sampling location within study area

- Micro-metrological data such as Cloud Cover, Temp (°C), Relative Humidity (%), Wind Direction(deg), Wind Speed(km/h), mixing height for study period (Oct.– 2018 to Dec.– 2018)

Table 4.21: Data Considered for Air Modelling for proposed project

#	Plant	Diameter of Stack (in mm)	Height of Stack (m)	Flue G as Temperature	Exit Velocity (m/s)	Gas relea sed from Stack
1.	Cement Mill	2700 mm	55 m	50 – 70◦C	6.8	SO_2, NOx, PM

The predicted incremental Ground Level Concentrations (GLCs) for PM, SO_2 and NOx likely to be contributed by the proposed project are given below:

Table 4.22: Ground Level Concentration value

Location	Incremental GLC (µg/m^3)	X Coordinate	Y Coordinate	Distance (m)	Direction
Particulate Matter					
Sunvali	0.77	254793.00	2340155.00	1341.00	WSW
Mora	0.05	256991.00	2343276.00	2925.00	NNE
Damka	0.01	257181.00	2345504.00	5128.00	NNE
Rajgari	0.13	255431.00	2344412.00	3974.00	N
Kavas	0.07	262637.00	2343596.00	7244.00	ENE
Hazira	0.21	255746.00	2334746.00	5757.00	S
Dumas	0.31	261762.00	2335068.00	7848.00	SE
Sulfur di oxide					
Sunvali	0.53	254793.00	2340155.00	1341.00	WSW
Mora	0.03	256991.00	2343276.00	2925.00	NNE
Damka	0.00	257181.00	2345504.00	5128.00	NNE
Rajgari	0.09	255431.00	2344412.00	3974.00	N
Kavas	0.05	262637.00	2343596.00	7244.00	ENE
Hazira	0.17	255746.00	2334746.00	5757.00	S
Dumas	0.22	261762.00	2335068.00	7848.00	SE
Oxide of Nitrogen					
Sunvali	0.61	254793.00	2340155.00	1341.00	WSW
Mora	0.04	256991.00	2343276.00	2925.00	NNE
Damka	0.01	257181.00	2345504.00	5128.00	NNE
Rajgari	0.10	255431.00	2344412.00	3974.00	N
Kavas	0.06	262637.00	2343596.00	7244.00	ENE
Hazira	0.19	255746.00	2334746.00	5757.00	S
Dumas	0.25	261762.00	2335068.00	7848.00	SE

It may be noted from the computed results for the proposed scenario that the maximum 24 hourly average GLC value for the proposed scenario is 0.77 µg/m^3 for SO_2, 0.53 µg/m^3 for NOx, 0.61µg/m^3 for PM and 0.18 µg/m^3 for Fluorine.

Table 4.23: Resultant Concentrations Value

Location	Background Maximum Conc. (µg/m^3)	Incremental Conc. (µg/m^3)	Resultant Conc. (µg/m^3)
PM_{10} µg/m^3 (Permissible Limit :100 µg/m^3)			
Project site	82.4	0.00	82.40
Sunvali	86.4	0.77	87.17
Mora	79.1	0.05	79.15
Damka	84.5	0.01	84.51
Rajgari	84.2	0.13	84.33
Kavas	81.6	0.07	81.67

Location	Background Maximum Conc. (µg/m^3)	Incremental Conc. (µg/m^3)	Resultant Conc. (µg/m^3)
Hazira	82.5	0.21	82.71
Dumas	77.8	0.31	78.11
SO_2 µg/m^3 (Permissible Limit :80 µg/m^3)			
Project site	14.9	0.00	14.90
Sunvali	14.3	0.53	14.83
Mora	13.7	0.03	13.73
Damka	14.9	0.00	14.90
Rajgari	15.3	0.09	15.39
Kavas	14.8	0.05	14.85
Hazira	15.9	0.17	16.07
Dumas	14.1	0.22	14.32
NO_X µg/m^3 (Permissible Limit :80 µg/m^3)			
Project site	20.3	0.00	20.30
Sunvali	20.4	0.61	21.01
Mora	20.8	0.04	20.84
Damka	20.6	0.01	20.61
Rajgari	21.0	0.10	21.1
Kavas	20.6	0.06	20.66
Hazira	22.8	0.19	22.99
Dumas	19.2	0.25	19.45

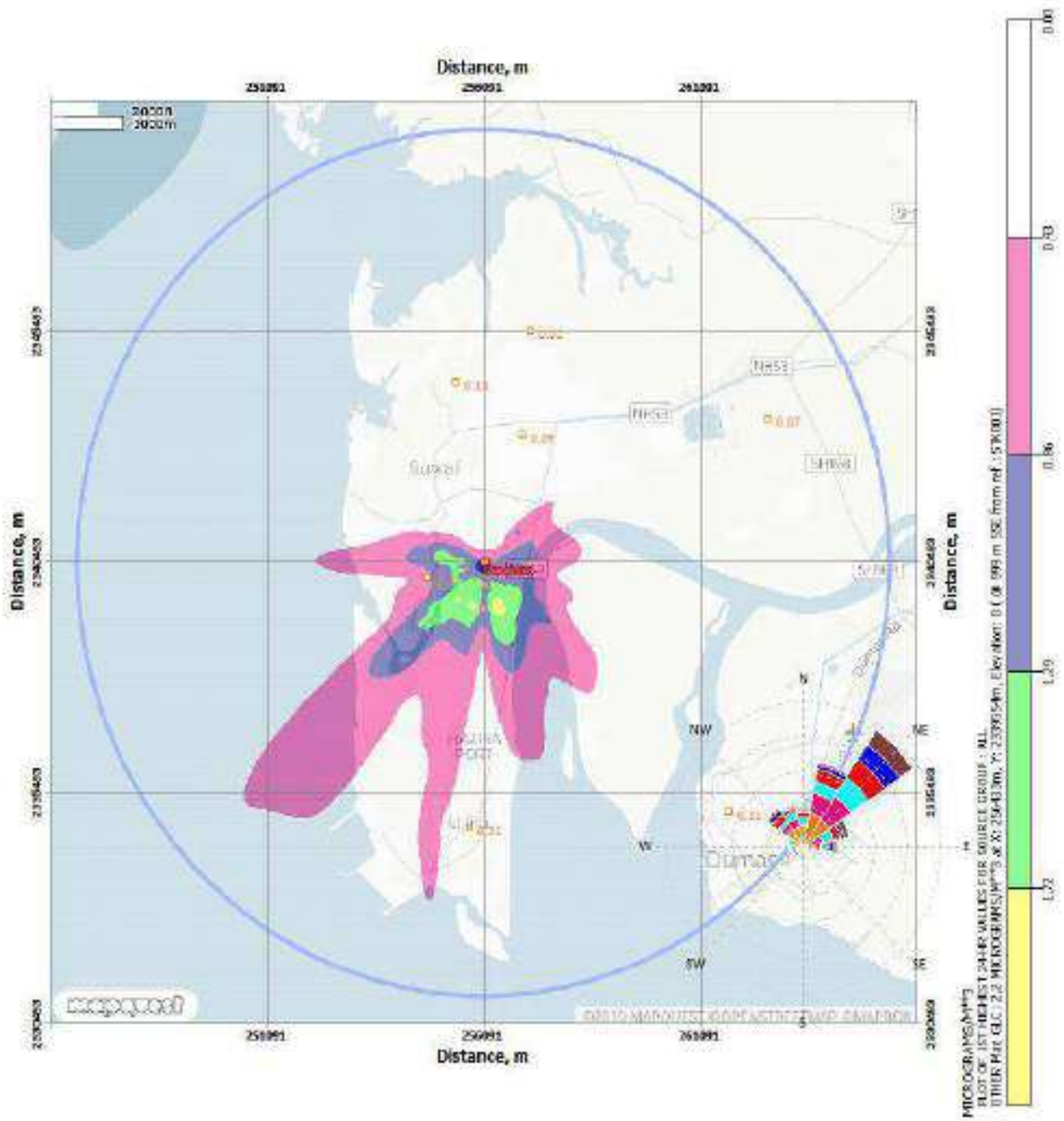


Figure 4.2: Isopleths of PM

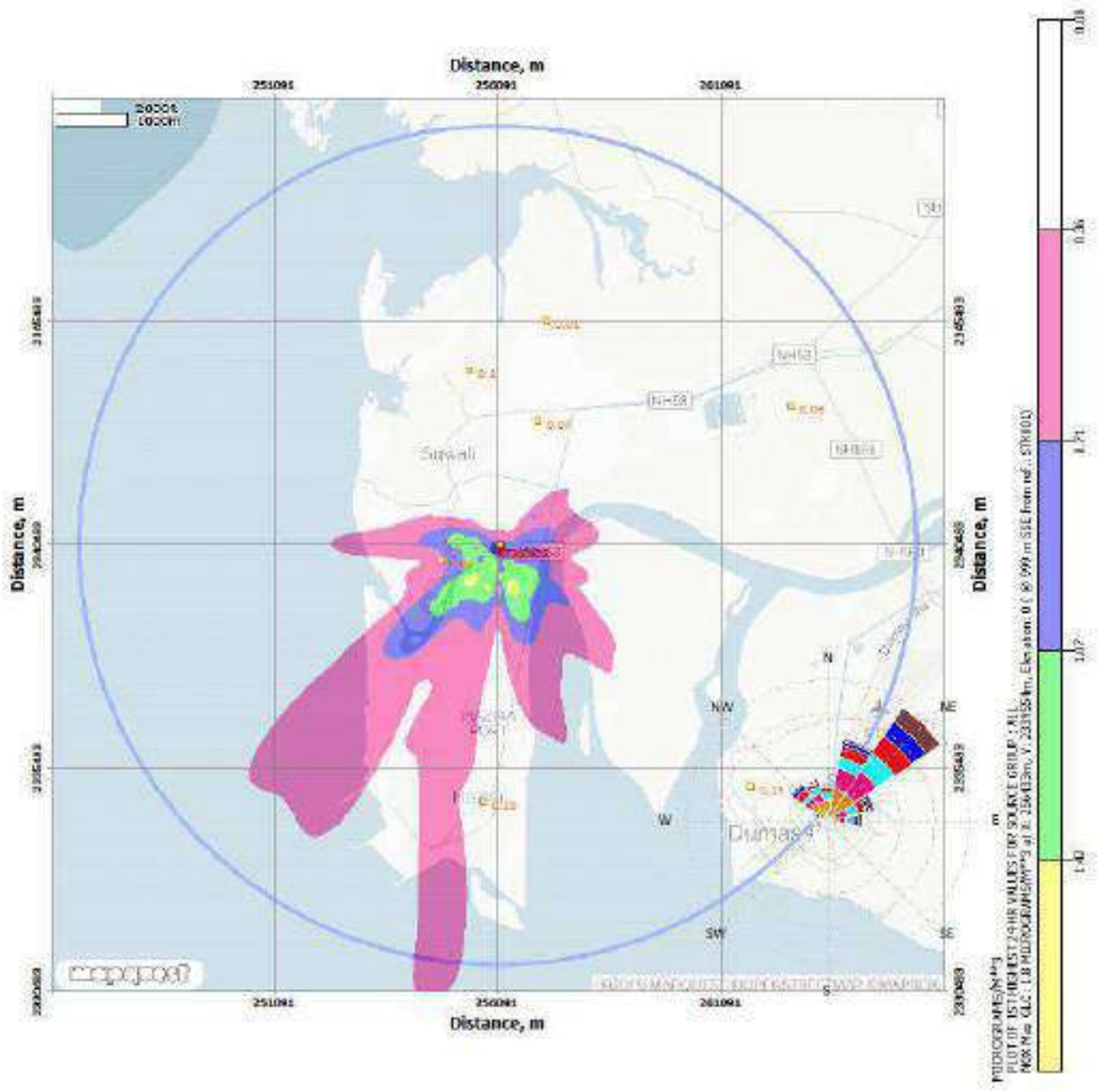


Figure 4.3: Isopleths of NOx

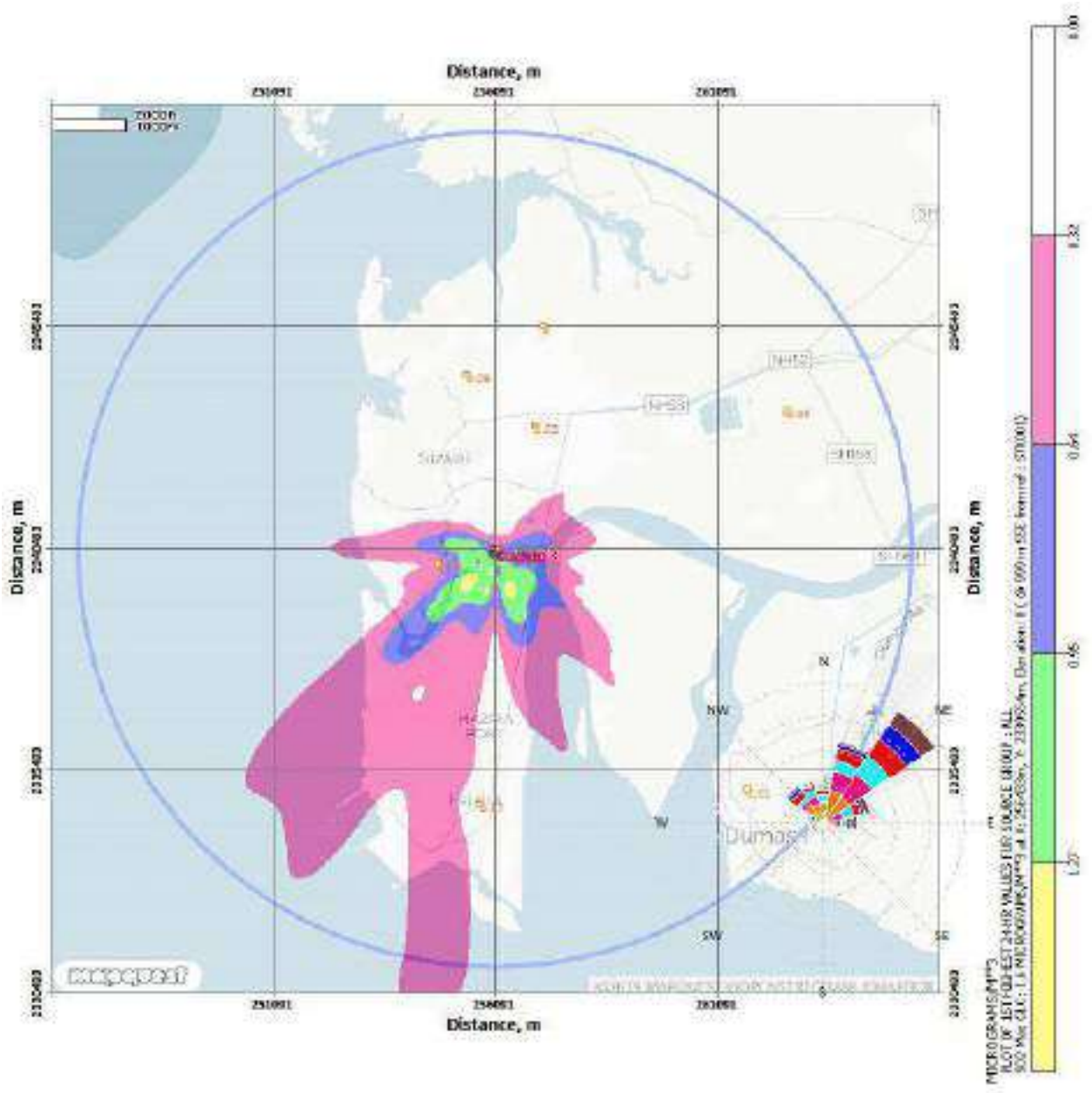


Figure 4.3: Isopleths of SO_2

When predicted 24 hourly ground level concentrations of PM, SO_2, and NO_x, emissions from the source is added to background maximum monitored values, resultant values remain well below the prescribed National Ambient Air Quality Standards at all the location. Hence, there is no significant impact is anticipated on the ambient air quality of the area due to the proposed project. Maximum GLC found at the distance of 1.3km. As part of precautionary measure, to minimize the likely environmental impacts on air environment due to the proposed cement grinding project, necessary mitigation measures are suggested along with APC to negate the air pollution.

Air Environment

Table 4.24: Impact on Air Environment and Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicle Movement	• Release of flue gas emission like PM, SO_2 and NOx from diesel operated vehicles. • Generation of fugitive dust due to vehicle movement for transportation of raw material and finished goods.	• Vehicles with valid PUC will be used for the transportation of materials and equipment. • Regular water sprinkling will be done to avoid dust generation from transportation.

Project Activity	Impact	Mitigation Measures
		• Transportation vehicles will be covered with tarpaulin sheet while transporting materials. • Provided paved roads and concrete flooring at activity area.
Raw Material Handling & Storage	• Release of fugitive emission during handling may cause asthma. • Ultimately in respiratory ailments like asthma, Bronchitis, lung cancer to workers.	• Water sprinkling shall be done on the paved/road prior and during unloading. All transfer point locations would be fully enclosed. • Fuel will be transported up to the storage bunkers through conveyor belts. The closed belt conveyor system and provision of de-dusting bag filters. • Airborne dust at all transfer operations/points would be controlled either by spraying water or by extracting to bag filter • Accumulated dust shall be removed/swept regularly and watering the area after sweeping.
Process Stage/Operation	Emission of particulates, sulphur oxides, nitrous oxides and other hazardous chemicals and toxic metals like Hg, As, *etc.* due to coal burning.	• Pulse jet bag filter will be installed as APC. • Regular water sprinkling will be carried out to control the dust generation. • Regular health check-up will be carried out for workers. • Dust masks will be provided to workers. • CEMS is recommended for online monitoring of air pollution.

4.3.5 Water Environment

Table 4.25: Impact on Water Environment and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Raw material han dling, storage **Process Stage/Operation**	• Contamination of surface water body due to discharge of untreated process water. • Contamination of surface water due to disposal of untreated sewage/effluent water.	• Provision of well-designed internal drainage system with adequate slope and to control the slippage. • Pucca Floor will be provided at stock yard. • Sewage will be disposed through STP and treated water (8KLD) will be used in green belt.
Greenbelt Development	• The water requirement of green belt should be minimized.	• Treated water (8KLD) will also be used for green belt development. • No ground water shall be used for green belt or any other purpose.

4.3.6 Soil Environment

Table 4.26: Impact on Soil Environment and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicle movement	Contamination of soil due to spillage	-Raw material will be handled, stored and

Storage and Handling of Raw materials **Process stage/Operation**	of fuel/oil from vehicle or utility. Fugitive dust will contaminate the soil quality.	transported as per manufacture, storage and import as per Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2016. -Generated used oil will be collected and utilized as alternative fuel in kiln at Sanghipuram.
Green Belt Development	Improvement in soil texture due to binding of top soil materials due to root structure.	Regular maintenance of greenbelt (more than 33%) will be done.

4.3.7 Noise Environment

Table 4.27: Impact on Noise Environment and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicular Movement **Raw ma terial handling, storage** **Process Stage/Operation**	• Decreases the efficiency of workman. • Occupational health issue due to continuous noise exposer. • Loud noise creates waves which struck the walls and weakens the buildings.	• PUC Certified vehicles will be used. • Regular maintenance & lubrication of utilities, equipment and vehicles will be carried out. • Acoustic enclose will be provided wherever applicable. • Noise monitoring will be carried out regularly. • Adequate protective measures in the form of ear muffs/ear plugs will be provided to the workers working in high noise areas. All the necessary noise protective equipment will be supplied to workmen operating near high noise generating sources. In addition, reduction in noise levels in the high noise machinery areas could be achieved by adoption of suitable preventive measures.

4.3.8 Land Use/Land Cover, Hydrogeology and Geology

Table 4.28: Impact on Land Cover/ Land Use Environment and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
This land falls under industrial zone, hence there will no significant impact on Land Use/Land Cover, Hydrogeology and Geology due to project activity.		

4.3.9 Solid/Hazardous Wastes

Table 4.29: Impact due to Solid/ Hazardous Wastes and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Raw ma terial handling, storage **Process Stage/Operation**	• Improper handling and disposal of solid/hazardous waste like fly ash, diesel oil etc. may contaminate the soil fertility. • Impact on the worker's health.	• Solid/ Hazardous waste will be collected, stored, transported and disposed as per the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2016. • Dust collected from air pollution control equipment will be 100% recycled in system. • Generated used oil from plant machinery will be utilized as alternative fuel to burn in existing cement plant at Sanghipuram.
Green Belt Development	Plant shed out materials like leaves,	Daily collection of waste will be carried

Project Activity	Impact	Mitigation Measures
	roots, branches etc.) from the environment for growth and other processes.	out and composting of this waste used as manure for greenbelt.

4.3.10 Risk and Hazards

Table 4.30: Risk & Hazards in GU and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicle Movement	• Chances of vehicle collision due to vehicle failure. • Tilting of moving vehicle due to overloading. • Chances of fatal incident, severe injury and loss of property.	• Well trained, licensed and certified motor vehicle driver will be given job for transportation of raw material and fly ash. • Transport vehicle will be properly examined before transportation. • Concern officer will ensure the raw material loading as per its capacity before transportation.
Raw ma terial handling, storage **Process stage/operation**	• Dust emission due to storage and handling of raw materials and fly ash. • Chances of accident to workers due to spillage, during handling. • Risk of fire within raw material storage area. • Continuous noise exposure to workers in working area • Fire hazards in working area. • Occupational health hazard due to handling of solid/ hazardous waste. • The risk of fall hazard during working. • Accident due to electric shock may cause injury the workers.	• PPE‘s will be provided to workers. • Standard operating procedure is in place and will be strictly followed by workers. • Preventive maintenance of mechanical equipments will be done periodically. • Padding will be done to pumps and blowers. • Safety training will be provided to workers. • Electrically tested electrical resistance Hand Gloves (IS:4770-1968) and rubber mats will be used for safety during electrical purpose. • Industrial safety nets will be provided for workers to avoid fall hazard.

4.3.11 Ecology and Biodiversity

Table 4.31: Impact on Ecology and Biodiversity and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicular Movement	• Settling of fugitive dust on leaves of tree reduces the gaseous exchange process. • Ultimately reduce the plant growth. • Chance of vehicle collisions with wild animal crossing the road.	• Transportation vehicles will be provided with power brakes and power steering. • No pressure horn will be allowed. • Speed limit and PUC certified vehicle will be allowed for the transportation.
Raw ma terial handling, storage Process Stage/Operation	• Flue gas emission will lead to acid rain which will have direct or indirect impact on humans and animals.	• Pulse jet Bag filter will be provided to control/abate the fugitive emission, the dust will be utilized back into the process.
Green Belt Development	• The scenic beauty, aesthetic environment, habitat for avifuana, air quality as a dust barrier, soil fertility and noise barrier.	• Local species will be planed as per soil conditions; regular maintenance of greenbelt will be done.

4.3.12 Socio-Economic

Table 4.32: Impact on Socio-Economic Environment and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicular Movement	• Positive as well as negative impact due to transportation during operation phase: ➢ Positive: Employment Generation ➢ Negative: Loss of human life in case of accident.	• Preference will be given to local population of surrounding villages for employment. Trained driver will be employed to avoid the occurrence of accidents • Limiting the speed of vehicle to 30 km/h for heavy vehicles. Transportation vehicles will be provided with power brakes and power steering.
Raw mat erial handling, storage processing	• Release of SO_2, NO_x, PM from operation of cement mill will have negative effect on health of surrounding village population. • Generation of high noise from plants will have negative effect on hearing, mental status and digestion of surrounding village population.	• Pulse jet bag filter as APC will be installed for control the process emission with 55 m of stack height. • Padding and enclosing will be done to high noise generating machineries and equipment. • Greenbelt will be developed as per guideline to abate the fugitive emission. • Regular health camps will be carried out.
Employment	Positive impact due to employment generation in the area.	• Local people will be given preference.

Table 4.33. Environmental Impact Matrix with Mitigation measures in Operation Phase

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Hazard	Ecology and Biodiversity	SE	Total
Vehicle Movement	-4	-	-	-4	-	-	-	-	-9	-4	+4	-17
Raw material handling, storage etc.	-4	-4	-2	-4	-	-	-	-4	-6	-4	+9	-19

Activities		Environmental Attributes											
		Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Hazard	Ecology and Biodiversity	SE	Total
Process stage/ operation	-2 Combustion of fuel Flue gas Cleaning Grinding & Packing Cooling system	-4	-	-4	-	-	-	-	-2	-2	-2	-4	-18
Employment		-	-4	-	-	-	-	-	-	-	-	+9	+5
Green Belt Development		+16	-2	+8	+16	+6	-	-	-	-	+16	-	+60
Cumulative score		**+4**	**-10**	**+2**	**+8**	**+6**	**0**	**0**	**-6**	**-17**	**+6**	**+18**	**+11**

The cumulative score for various environmental parameters with mitigation measure is +11 which changed from -294 after taking proper mitigation measures.

4.4 SUMMARY

Impacts on land environment, air environment, water environment, noise environment, biological environment, socioeconomic environment and risk and hazard is been introduced in the chapter with their mitigation measures for both during construction as well as operation phase. The cumulative score for various environmental parameters without mitigation measures is -294 during Operation phase and after taking suggested mitigation measures the score will be +11, hence the adverse impact can be negate after taking adequate mitigation measures. The major impact on air and water due to proposed cement grinding. Air modeling study is also been introduced in the chapter showing maximum and minimum GLC in the surrounding areas. The pulse jet bag filter will be installed to control the furtive emission with stack height of 55 m. SIL Grinding Unit has planned to develop more than 33% of greenbelt within the premises.

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

5.1 GENERAL

The aim of this chapter is to provide the information on alternative site and technology to be utilized by a developmental activity. The site analysis has been done for the proposed grinding unit. Two option were analyzed.

5.2 SITE ALTERNATIVES

Two sites have been examined to set up the Greenfield Project of 2.0 Million TPA Standalone Grinding Unit with bulk & bag packing plant. The details of two sites given below-

Option 1. Survey No. 153, 154, Village – Mora, Taluka – Choryasi, District-Surat, GUJARAT – 394510.

Option 2. Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3; Shivrampur Village,Taluka-Choryasi, District- Surat 394510.

After detailed observation, we have selected most suitable site (option 2) i.e. village Shivrampur, S.No. 125/1, 125/2,126/1+2+3) for the same which is located in SSW direction from the Mora village location and also fulfills siting criteria as per technical guidelines of MoEF&CC. The details and environmental settings surround the selected project site is given below-

S.No.	Particulars	Option 1	Option 2
1.	Latitude and Longitude of the site	# Latitude Longitude A. 21°11'11.70"N 72°40'44.15"E B. 21°11'11.23"N 72°40'47.14"E C. 21°11'1.10"N 72°40'42.02"E D. 21°11'1.93"N 72°40'33.03"E	**# Latitude Longitude** A. 21° 9'0.08"N 72°39'0.68"E B. 21° 8'57.60"N 72°39'12.32"E C. 21° 8'55.54"N 72°39'11.61"E D. 21° 8'57.07"N 72°39'0.75"E
2.	Location with S.No.	S.No.153, 154 Village - Mora	S.No. 125/1, 125/2,126/1+2+3 Village - Shivrampur
3.	Plot Area	13.10 Acres / 53000 m^2	12.00 Acres / 48562 m^2
4.	Nearest Village (Human Settlement)	Mora (~1.5 Km in South)	Shivrampur (~1.5 Km in SW) Mora (~3.0 Km in NE direction)
6.	Nearest Town/City	Surat (~10.87 Km in ESE)	Surat (~16 Km in ESE)
7.	Nearest National Highway	NH-6 (0.5 km in South)	NH-6 (0.9 km in East)
8.	Nearest State Highway	SH-168 (4.8 km in East)	SH-168 (8.5 km in North East)
9.	Nearest Railway station	Surat Railway Station (17 km in E)	Surat Railway Station (20 km in NE)
10.	Nearest Airport	Surat Airport (9.86 km in SE)	Surat Airport (10.1 km in SE)
12.	State, National Boundaries	None within 10 Km of study area	None within 10 Km of study area
13.	Sea	Arabian Sea (7.44 km in West)	Arabian Sea (3.92 km in West)
14	Archaeological site	None in 10 km radius	None in 10 km radius
15.	National Park/ Marine sanctuary, etc.	None in 10 km radius	None in 10 km radius

16.	Nearest Industry	Hazira Industrial Area (~ 8 km in SW)	Hazira Industrial Area in adjoining

The selected location (option 2) is located in Industrial Zone of Hazira having good infrastructure and connectivity. Moreover, infrastructure facilities near the site are well developed with approach road, State and National Highway (NH-6 & SH168) and no human settlement within 1 km radius. The selected site is nearer to sea port. Also, this location is most suitable as per the site selection criteria for cement plant. No land use pattern will be changed on this location as this land has converted into industrial use under NA.

5.3 ALTERNATIVE FOR TECHNOLOGY AND OTHER PARAMETERS

During EIA study some alternatives for technology and other parameters were considered and are discussed below:

Table 5.1 Alternative for Technology and other Parameters

S.No.	Site Particular	Alternative Option 1	Alternative Option 2	Remarks
1.	Site Location	Govt. Land	Private Land	Private land for proposed set up of cement grinding unit. **Benefits**: • The proposed activity will be located in Industrial zone, hence easy availability of infrastructure facilities. • No rehabilitation and resettlement • No change in land use pattern. • No forest land is involved and no tree cutting is required. • Proximity to road network.
2.	Manufacturing technology	Automated Machineries	Manual/ Semi - automatic	Preferred automated machineries. **Benefits:** • Increased productivity. • Reduce human error. • Reduce chances of accidents. • Improved quality or increased predictability of quality. • Improved robustness (consistency), of process or product. • Reduced direct human labour cost and expenses • Reduce air and noise pollution.
3.	Employment	Local employment	Outsource employment	Local employment for unskilled / semi-skilled manpower as availability in the area.Technical staff will be outsourced if not available locally. **Benefits:** • Provides employment to local people to enhance livelihood of villagers. • To increase per capita income of villagers.
4.	Manpower transportation	Public transport	Private transport	Local labour will be deployed so they will reach by private transport, bicycle or by foot. **Benefits:** • Cost of transportation will be

				negligible.
5.	Raw material and product transportation	Private transport/ sea route	Public transport	Material will be transported through private trucks or by ships. **Benefits:** • It will give indirect employment. • Cost effective
6.	Water Requirement	Local body/Irrigation Dept.	Bore well	Water supply from nearby area through local body/irrigation department will be preferred. **Benefits:** • No change in the ground water
7.	Road	Metallic road	Kachcha Road	The road is well furnished. Most of the raw material and fuel will be transported through ships (sea route)
8.	Fuel	Coal/Lignite/Petcoke	F.Oil/ Natural Gas	Coal/Lignite/Petcoke will be used as major fuel for cement grinding unit. **Benefits:** • Easy availability of high quality coal from open market.

SIL is experience in the manufacturing and trading of cement. SIL identified opportunity in cement based on market demand and proposes to set up plant in Surat. Within western India, Hazira (Surat) is considered an excellent location since it is an industrial zone, has excellent infrastructure including infrastructure required for management of environment developed by Government authority. Project proponent has been checked viability of various plot within area places and finalize the proposed area i.e. Survey No. 125/1, 125/2,126/1+2+3 , Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat.

5.4 SUMMARY

The Greenfield Project of Standalone Grinding Unit with Bulk & Bag Packing Plant with 2.0 Million TPA Cement (PPC, OPC, PSC) production capacity is situated in Industrial Zone (as per Gazette Notification No. GH/V/156 of 2013/DVP-1412-3759-L dated 13th August 2013), Survey No. 125/1, 125/2,126/1+2+3; Village – Shivrampur, Tal. Chauriyasi, Dist.- Surat- 394510, Gujarat by Sanghi Industries Limited. Hence no R&R is applicable.

6 ENVIRONMENTAL MONITORING PROGRAM

6.1 Post Project Environmental Monitoring

Environmental monitoring describes the processes and activities that need to take place to characterize and monitor the quality of the environment. It is an essential tool for sustainable development and ensuring effective implementation of environmental management plan and mitigation measures adopted. It also updates the environmental management system for effective conservation of environment in-line with the ongoing project activities/operation. Hence, monitoring of critical parameters of environmental quality is very essential in the routine activity schedule of the project operation. The specific aspects of the environment to be studied are determined by environmental objectives and environmental legislation. The purpose of environmental monitoring is to assess the progress made to achieve given environmental objectives and to help detect new environmental issues.

6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

The mitigation measures suggested in Chapter 4 shall be implemented so as to reduce the impact on environment due to the operation of the proposed project. In order to facilitate easy implementation of mitigation measures, these are phased as per the priority implementation as given in **Table 6.1**.

Table 6.1: Implementation Schedule for Monitoring Program

S.No.	Recommendations	Time Requirement	Schedule
1.	Air Pollution Control Measures	Before commissioning of the Grinding Unit.	Immediate
2.	Water Pollution Control Measures	Before commissioning of Grinding Unit.	Immediate
3.	Noise Control Measures	Along with the commissioning of Grinding Unit.	Immediate
4.	Soil Conservation	Before commissioning of Grinding Unit.	Immediate & Progressive
5.	Work Zone	Working environment of Employee during operation.	Immediate & Progressive
6.	CER/CSR	For welfare of nearby community.	Immediate/ Progressive
7.	Occupational Health Surveillance	Along with commissioning of Plant	Immediate
8.	Ecological Change Detection	After commissioning of Grinding Unit.	Progressive

6.3 ENVIRONMENTAL MONITORING

The environment monitoring during operation of standalone Grinding Unit shall be conducted as follows:

- Ambient Air quality;
- Water and wastewater quality;
- Ambient Noise levels;
- Soil Quality;
- Greenbelt Development;
- Corporate Environmental Responsibility;
- Occupational Health Surveillance.

A centralized environment monitoring cell will be established for this unit. Monitoring of important and crucial environment parameters is of immense importance to assess the status of environment during operation of Grinding Unit. With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environment conditions due to operation unit and suitable steps could be taken due in time to protect the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring.

6.3.1 Ambient Air Quality

Monitoring of ambient air quality within the plant premises will be carried at selected location as per guideline. Ambient air quality monitoring (AAQM) will be carried out for $PM_{2.5}$, PM_{10}, NO_x, SO_2 *etc.* for compliance with prescribed limits of CPCB / GPCB. Meteorological parameters like wind speed, wind direction, temperature, relative humidity and rainfall will be recorded continuously to check the weather condition.

6.3.2 Emission from Plant

Periodical monitoring of stack attached to the cement mill will be carried out after the project commissioning. PM, NOx, SO_2 etc. will be generated in stack and monitoring for the same will carried out to assess the performance of pollution control equipment installed. Air pollution parameters of process stacks will be undertaken on a regular basis as per the GPCB/CPCB. Continuous emission monitoring system will be installed as per CPCB norms. It will be ensured that these parameters are within the permissible limits specified by GPCB. Preventive and corrective action will be taken if parameters are exceeded in any case. In case emissions will be found to exceed the norms, the **'on duty'** personnel will check the relevant parameters and take appropriate corrective actions. Along with the performance test of main plant, equipment performance test and calibration of pollution control equipment will be made on a regular basis. A detailed maintenance schedule will be prepared for all pollution control systems. The maintenance will be done strictly as per the schedule.

6.3.3 Noise Levels

Noise levels in the work zone environment and ambient will be monitored regularly. The frequency of noise monitoring will be once in a month in the work zone. The ambient noise levels in the surrounding villages will be monitored fortnightly basis.

6.3.4 Soil Sampling

The environment monitoring cell will be co-ordinate all monitoring programs at site and data generated will be regularly furnished to the regulatory agencies.

6.3.5 Wastewater Quality

In grinding unit operations, waste water will be generated from cooling tower operations and domestic waste water. The cooling water blow down will be treated and utilized for greenbelt, dust suppression and fire fighting. Regular monthly monitoring will be carried out as per standard method.

6.3.6 Solid / Hazardous Waste Generation & Utilization

Management of wastes shall be done as per Hazardous and other waste (Management and Trans-boundary Movement), Rules 2016 of Environment Protection Act, 1986.The EMC will monitor and keep a record of the following:

- Generation of hazardous wastes
- Disposal of hazardous waste.

6.3.7 Green belt development

SIL will developed greenbelt area as per CPCB guidelines. Approx. 1.6500 Ha. (more than 33.00%) area within the plant premises as greenbelt area.

Following activities will be carried out for maintaining the greenbelt area,

- Annual planning for tree plantation with specific number of trees to be planted shall be made. The fulfillment of the plan will be monitored by the EMC every six months
- A plan for post plantation care will be reviewed in the monthly meetings. Any abnormal death rate of planted trees shall be investigated and acted upon immediately
- Watering of the plants, weeding, hoeing will be carried out.

6.3.8 Housekeeping and Work Place Monitoring

The EMC cell will keep a very close monitoring of the housekeeping activities and organize regular meetings with plant personnel and management. Workplace monitoring shall be carried out as per statutory requirement.

6.3.9 Occupational Health & Safety

Routine medical examination of personnel will be carried out at regular intervals of all workers to determine any changes in health condition due to the working conditions. Pre-medical check-up will be carried out at the time of employment. Records related to occupational health check-up will be maintained regularly.

Table 6.2: Monitoring Schedule for Environmental Parameter

S.No.	Particulars		Monitoring Frequency	Duration of Sampling	Important Monitoring Parameters
1.	**Air Pollution**				
	i.	Selected 4 locations in and around plant site specified by GPCB	Twice in a week for 3 seasons	24 hr continuously	PM, SO_2, NOx
	ii.	Stack gas analysis in all stacks.	Once in a month	One time	As per GPCB
	ii.	Fugitive dust sampling (if any) at work zone as per CPCB or GPCB.	Twice in a week	24 hr continuously	PM, RSPM
2.	**Water and Wastewater Quality**				
	A.	Industrial/Domestic			
		Waste water from operational activity	Daily	24 hr	As per CPCB/ GPCB norms
	B.	Water quality in the study area			
	i.	Surface Water	Half yearly	Grab	Parameters specified under IS:10500
	ii.	Water level studies in well or bore wells in plant and surrounding areas	Yearly	Once	Water levels and chemistry of water
	iii.	Marine water	Yearly	Once	As per norms
3	**Industrial Noise Levels**				
	1.	Major noise generating sources at plant site	Every fortnight	24 hr. continuous with 1 hr. interval	As per CPCB/ GPCB norms
	2.	Along Road for transportation noise	Fortnight	24 hr. continuous with 1 hr. interval	As per CPCB/ GPCB norms
	Ambient Noise Levels				
		4 Locations as presented in Chapter 3	Fortnight	24 hr continuous with 1 hr interval	Noise level in dB(A)
4.	**Soil Characteristics**				
	1	Selected 4 locations in core and buffer zone in nearby area	Half Yearly	One Grab sample	As per CPCB/ GPCB norms
5.	Work zone	At plant site	Yearly	Once in work place	Dust, Noise, etc.
6.	Corporate Environmental Responsibility	In core and buffer zone in nearby villages	Half yearly	Once	Activities done by Client

7.	Occupational Health Surveillance	At plant premises	Half yearly	Once	Employee Health Register
8.	Greenbelt Development	Number of plantation (Units), Number of Survived Plants/ Trees, Number of Poor Plant/ Trees	Yearly	Once	Tress, survival rate, landscape area.
9.	Ecological Change detection	Study area	Decadal	Every 10 years	Land cover, forest cover, vegetation, human settlement, concrete, crop etc.
10.	Environmental Audit	As per Directions of Honorary High Court,	Yearly	Once	As per GPCB
11.	Consents and Authorization	Consent to Operate under applicable acts	Renewing 90 days before expiry of validity	Once	Before 90 days of expiry
12.	Compliance of EC Conditions	Submission of 6 monthly Compliance Reports	June and December	Twice in a year	As per EC conditions

6.4 MONITORING METHODOLOGIES

Sample for environment monitoring will be collected as per the guidelines provided by MoEF&CC/CPCB/GPCB. The method followed will be recommended/standard method approved/recommended by MoEF&CC/CPCB.

Table 6.3: Method of Environmental Sampling and Analysis

Attributes	Methods	
	Sampling/Preservation	Analysis/data analysis
Air Environment		
Ambient air quality	As per IS: 5182, CPCB & AWMA.	As per IS:5182,CPCB & AWMA
Noise	As per CPCB Guidelines	Survey carried out as per CPCB guideline.
Water		
Ground Water Surface Water / Marine Water	Standard Methods for Examination of Water and Wastewater, 22nd edition, APHA 2012.	IS 3025 & Standard Methods for Examination of Water and Wastewater, 22nd edition, APHA 2012.
Soil Quality	IS 2720, Soil Testing in India (Department of Agriculture & Cooperation).	IS 2720, Laboratory developed Method as per NABL requirement and Book - Soil Testing in India (Department of Agriculture & Cooperation).

6.5 OCCUPATIONAL HEALTH AND SAFETY

Occupational health and safety is closely related to productivity and good employer-employee relationship. The main factors of occupational health in grinding unit are fugitive dust and noise.

- Provision of rest shelters for workers with amenities like drinking water, toilets etc.
- Provision of personal protective equipment to the workers;
- Rotation of workers exposed to noise premises;
- Dust suppression; and
- First-aid facilities in the plant premises.

Occupational Health Survey of the employees will be carried out at regular intervals.

6.7 DOCUMENTATION & RECORDS

The environmental department in respect of operation of pollution control facility will be maintain following records:

- Instruction manual for operation and maintenance of pollution control,
- Log sheet for self-monitoring of pollution control,
- Instruction manual for monitoring of gaseous parameters and hazardous waste management,
- Monthly, quarterly and annual progress reports,
- Medical checkup reports of employees.

6.8 BUDGETARY FOR ENVIRONMENTAL MONITORING PROGRAMME

On regular basis, environment management cell shall inspect the necessity and availability of the materials, technologies, services and maintenance works. The EMC shall make appropriate budget for this purpose. Regular record review for change in financial requirement of environment management will be done and appropriate budgetary provisions shall be made. With other budget, budget for environmental management will be prepared and revised regularly as per the requirement. The budgetary allocation for the pollution control and monitoring equipment is given below:

Table 6.4: Budgetary Allocation for Environmental Monitoring Program

S.No.	Particulars	Cost (Rs. Lakhs)	
		Capital	Recurring
1.	Air, Water, Soil & Noise Monitoring	32.00	15.81
2.	Ecological Change Detection and Monitoring	12.00	5.00
3.	Legal compliance / CSR/ESC Monitoring	10.00	7.00
	Total	**54.00**	**27.81**

6.9 SUMMARY

The environment monitoring for the grinding unit during operation will be conducted as follows:

- Ambient Air quality;
- Water and wastewater quality;
- Ambient Noise levels;
- Soil Quality;
- Ecological Change detection
- CSR/CER;
- Occupational Health Surveillance.

Monitoring of important and crucial environment parameters is of immense importance to assess the status of environment during operation of grinding unit. All environment monitoring and relevant operational data will be stored in a relational database. Regular data extracts and interpretive reports will be sent to the regulator. The capital cost of Environmental Monitoring Program for Air, Water Soil and Noise will be Rs. 54.0 Lakhs to procure online system (CEMS) and other equipments and the recurring cost for the same will be Rs. 27.81 Lakhs.

7 ADDITIONAL STUDY

7.1 GENERAL

This chapter deals with additional studies such as public consultation, risk assessment and other related studies. Cement grinding unit is associated with potential hazards that effect to the man and natural environment. It would normally require the assistance of emergency services to handle it effectively. The operation shall be taken out under the well management and control by the qualified safety manager. Disaster management plan has to be formulated with an aim of taking precautionary steps to avert disasters and also to take such action after the disaster which limits the damage to the minimum.

7.2 PUBLIC HEARING

As per the provisions of Notification No. S.O. 1533(E) dated 14/09/2006 and its subsequent amendment S.O. 3067(E) dated 01/12/2009, Ministry of Environment, Forest & Climate Change, Government of India, New Delhi, public hearing is conducted for M/s. Sanghi Industries Ltd., for Setting up Standalone Grinding Unit (2.0 Million TPA) with Bulk & Bag Packing Plant, at Survey No. 125/1, 125/2, 126/1+2+3, Vill: Shivrampur, Ta: Choryasi, Dist: Surat (Gujarat). The Public Hearing held on 22-03-2019 at 11:00 hrs. at Project Site, Survey No. 125/1, 125/2, 126/1+2+3, Vill: Shivrampur, Ta: Choryasi, Dist: Surat (Gujarat). This project is covered under Schedule-3(b), Category –B" of above referred Notifications. Public Hearing is conducted under the chairmanship of Shri Dhaval Patel (IAS), Collector & District Magistrate, Surat. Total 118 Nos. of peoples had attended the public hearing. The copy of public hearing proceedings attached as Annexure. Time bound action plan of the issues raised during public hearing is given in Table 7.1.

7.2.1 Advertisement and Photographs

The public notice was advertised as per notification in two newspapers —Times of India" (National) dated 16/02/2019 and –Gujarat Mitra" (Local) dated 16/02/2019 figure 7.1. The photographs of public hearing are shown in figure 7.2 showing Collector and District Magistrate, RO and Public (audience).

ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડ

જાહેર સૂચના

Gujarat Pollution Control Board

Public Notice

Gujarat Mitra (16/02/2019) Saturday

Times of India (16/02/2019) Saturday

Figure 7.1 Advertisement in News Papers for Public notice

Public attended the PH meeting

Collector and District Magistrate & Regional officer

Surat Resident raising Question	**SIL Representative Replying the Question**

Figure 7.2 Public Hearing Photographs

Encapsulation of Public Hearing

Shri P.U.Dave, Regional officer, Gujarat Pollution Control Board, Surat, representative of Member Secretary GPCB; welcomed all the participants who remained present in the Public Hearing. He outlined the various provisions of the Notification and briefed about the procedural details for conducting this Public Hearing, including actions taken by GPCB for wide publicity of this Public Hearing and the advertisement published earlier in the local daily newspaper. He announced that as per the provision of Notification, only affected persons will be allowed to make their representation in the Public Hearing while others having plausible stake may submit their representation in writing which would be included in proceedings. He also made it clear to the gathering that the Committee is responsible only for preparation of proceedings of the meeting covering all the concerns raised during the Public Hearing.

He then opened the forum for public hearing with due permission of Chairman of Public Hearing and invited the Project Proponent to make the presentation of their project in local language.

After the presentation made by project proponent, Regional Officer, GPCB with due permission of Chairman of Public Hearing opened the forum for representations/suggestion/objections/ questions from the locally affected people. Following discussion/ questions - answers took place has been given below in Table 7.1.

#	Respondent and Address	Point Represented and/or written submission	Reply by PP/Representative	Fund
1.	Shri Bhagubhai Manibhai Patel, Sarpanch, Vill :Shivrampura, Ta: Choryasi, Dist.: Surat	• He represented by stating that the project is going to be established in between L&T compound in private land. Which method will be adopted for Storage of raw material like coal, gypsum, clinker so that surrounding people and the employees of the company will not get affected by the dust?	• Raw material of the proposed project will be stored in closed yard and will be sent to the mill through closed belt conveyor. Hence, whole material handling system will be closed so there will be no issue of dusting.	Allocated under capital cost.
		• How coal will be stored? • As closed material handling system is proper because there is a possibility of fire.	• Sprinkler System and Firefighting System will be installed in coal yard.	15 Lakhs
		• Dust emission from stack or silo will be 5% to 10% up to how many kilometer will it effect?	• Air Pollution Control Equipment will be installed to control dust emission and it will be limited to company premises. Moreover, greenbelt will be developed so that no dust will be spread outside the premises.	752.15 Lakhs has been allocated as capital cost and 85.00 Lakhs/annum as recurring cost for Air Pollution Control Devices.
		• What actions will be taken for dust emission from packing plant? • What actions will be taken for deposition of dust in cement plant, on the road and surrounding area?	• Packing Plant of the proposed project will be totally automatic. Bag Filter will be installed for Material Handling System of packing plant as mentioned in the table which will cover transfer point. Dusting will be terminated due to installation of bag filter.	752.15 Lakhs has been allocated as capital cost and 85.00 Lakhs/annum as recurring cost for Air Pollution Control Devices.
		• There is grinding furnace in the plant which will generate noise. How will • It affect health of the surrounding people and employees of the plant?	• Cement grinding process is being carried with two technologies. One of the technology is Ball Mill technology in which grinding media remains in the mill which generates much noise. Cement grinding mill of the proposed project is based on Vertical Roller Technology in which no grinding media is used. Table	Cost is considered under the capital cost.

			centrally rotates and grinding is carried out with three rollers‘ press. Due to this new technology level of noise pollution will be negligible.	
		• How many percentage of local people will be employed in the proposed project? Give in writing. Give priority to local people as technician, welder, fitter, operator or any other job.	• Your suggestion is welcomed. Our approach will be of giving priority to locals for employment and priority will be given to skilled and semi-skilled workers as per their qualification. Utmost preference will be given to locals for employment.	Considered under the operational Cost.
		• This company will bring its raw material from Adani Port. At present 700-800 trailers are running on 20-30 feet road. There is only one approach road for L&T companies which don‘t have a traffic circle. So there is possibility of accident. Road should be extended and circle should be made from Hajira Highway to L&T Company. 2 million ton material will be brought to this plant and roads are not sufficient for the same. What action company will initiate?	• Our requirement is of 2 Million Ton per annum and it will be transported once in a month. So it will not create any effect. Though we will follow speed limit, road site and traffic rules.	Considered under the operational Cost.
		• If any employee recruited from outside in future, please be precautious and take care that no antisocial activity being carried out.	-	-
		• Development of greenbelt is shown only within company premises and pollution spreads outside the campus as well. What action company will initiate for conservation of environment of surrounding villages?	• We will carry out plantation in our internal premises and budget is also allocated for avenue plantation in CER for the same. We will clean our internal roads with the help of sweeper machine.	55.00 Lakhs has been proposed for the Plantation under CER.
		• Nav Chetan Sports Academy has been approved by the Government of Gujarat in Shivrampur and hostel facility has to be augmented in the said Academy. How much fund will be allocated in CSR for the same?	• It will be worked out in coordination and discussion with villagers.	Already allocated Rs. 70.00 Lakhs under CER

2.	Shri Pravinbhai Patel, Member Taluka Panchayat, Village : Bhatlai, Dist. : Surat	• He represented by stating that he has been president of Hajira Kaantha Vistar Samiti for the last 15 years and I have welcomed many industries in Hajira and have experienced many positive and negative incidences. • There is a cement project beside Reliance Company. They stated that their conveyor belt will be close system. But it is not shown whether the same is open or close in the proposed project? • Company reported that they will plant 4000-5000 trees. But they have not planted even 10 to 50 trees till date. It is company's responsibility to take care of humans as well. • We should be compensated because we sacrifice, we suffer pollution, we suffer accident. We are benefited from Reliance Company. We welcomed CPP plant. There is not pollution from CPP Plant • Cement factory have recruited 85 persons from outside and not even our 4 persons recruited. So we request the company to adhere to their commitment. Country will progress due to the industries but basic needs of the people should be satisfied. • We welcome that company will use recycled water. So no water will be discharged outside the premises. As per your statement Rs.482 Lakh per year will be spent in CER activities. Will it be carried out? • I request Hon'ble Collector that plantation should be carried out in fallow land around Notified Area. Because it is necessary to reduce the pollution. • We asked tree guards from office of	• We welcome your suggestion of greenbelt development. It is responsibility of all of us conserving environment along with industrial development. We are new to this area and we are committed to develop the greenbelt with your suggestions.	Rs. 55.00 Lakhs has been allocated under CER.

		Notified Area for planting trees in the villages. But they insisted to contact SUDA as it does not falls under their scope. It is the responsibility of Notified Area Committee. • NTPC have grown trees in 10 acre of land. • Navsari receives much rain which is at the distance of 40 Kms. and rainfall in Hajira is much lesser. What is the reason for the same? Company should do something.		
3.	Shri Dharmendra Bhikhubhai Patel Hajira Gaam Sarpanch District: Surat	• He represented that we welcome this plant and we have also welcomed many large companies. But as time passes, all the companies do not adhere to their commitments. • Company should take care of local issues such as water, pollution, education and employment.	• People in the vicinity of the company will be preferred for employment according to their qualification and skill.	Cost considered under the operational cost.
4.	Shri Dhansukhbhai Kantibhai Patel Village: Kawas, Ta: Choryasi, District: Surat	• He introduced him and represented that company is established after the public hearing and then it has to be inspected by GPCB. There are 10 to 12 large companies in the Hazira area. The equipment which has installed by the company, the report for the same should be sent to the village panchayat. So that people know that in which air and ground they are living. • I like the hospitality of this company and it is sad that there is such a big company in our area that has millions of turn overs. And the Government of Gujarat gets income from the ESIC Hazira Industries, but even there is no	• We will cooperate fully according to planning of our Budget for medical facilities.	Already covered under operation cost.

		small hospital in our area. Due to which 10 to 12 people die every year and there is no facility of 108 in our area. So we request that 108 ambulances should be placed by the Sanghi Charitable Trust so that people get immediate treatment. • Dhulia to Hajira Highway has been fixed as but the route from ONGC cross Road to Kawas is more important which has not been built yet. It has been stopped by petition and stay so I request you to take necessary steps for the same.		
5.	Shri Chhotubhai Ramubhai Patel, Sarpanch Vatlai, President Hazira Katha Vistar, Vill.: Vatlai, Ta.: Choryasi, Dist.: Surat.	• He represented that, rules of pollution are not followed properly, which should be taken care off. Regarding employment, give us in writing. In Hazira, Shivrampura water problem is very high. It is our demand to provide water facility through canal to Junagam, Rajgiri and Suvali by the company or any other.	• Regional Officer replied that, I assure you that if I will get the complaint regarding the non-compliance of the rules for prevention of pollution I will take immediate action against the responsible company as per the environmental laws. • Company's representative replied that, air pollution control equipment is to be installed for the operation phase will control the pollution and monitoring report will be forwarded to the competent authority. Planning has been made for control of pollution by project, its regular monitoring will be carried out and report will be forwarded to the authority.	Cost considered under the operational Cost.
6.	Ku. Avani Joshi Environmental Engineer, Representative of L&T Company, Dist.: Surat	• She represented that, beside this company near gate no. 20, under the project of Government of India there is armor system project in which A.S.C. K-9 Vajra, self-propelled gun is manufacturing is in process and the same will be in process for further more years. What will be company's provision if the issue regarding the quality of the abovementioned project arise due to the dust particle spreading out of company	• Regarding the issue, as mentioned in E.M.P. prevention and dust pollution control steps which is required to be taken will be taken. Continuous monitoring will be carried out to prevent the pollutants to spread beyond company's boundary. •	54.00 Lakhs has been allocated as capital cost for Environmental Monitoring Program

		or due to air pollution by the grinding unit along with E.M.S. system.		
		• It is mentioned that transportation of the fly ash and slug will be carried out by road. So from which thermal power plant will you bring the same.	• Fly ash will be taken from nearby company's captive power plant and Ukai thermal power plant. Slag will be sourced from nearby steel company. •	Cost considered under the operational Cost.
		• As a fuel pet-coal, coal and lignite is mentioned, so out of that which fuel will be used more?	• We will use mix fuel in which there will be 10% pet-coal, 40% lignite and remaining important coal.	Cost considered under the operational Cost.
7.	Shri Dipakkumar Dhansukhbhai Patel, Vill.: Damka, Ta.: Choryasi, Dist.: Surat	• He represented that, as per the law of Gujarat government there is a rule to provided 80% employment to local people. In that 80% whole Gujarat is considered. Out of those 80% some percentage should be reserved by the company for the employment for the people of 10 k.m. radius.	• We will give priority to the local people in employment in the company as per rules and regulations.	Cost considered under the operational Cost.
8.	Shri Kalpesh Raghubhai Patel, Vill.: Junagam, Ta.: Choryasi, Dist.: Surat.	• He represented that, we are welcoming the plant to be established here by the Sanghi Industries. But there is problem of employment over here since many times. So, I hope that employment to the local people will be given. Priority to the local people will be given for transportation and contract works. • It is small plant and around 150 to 200 workers will be employed in it. We hope that, no obstacle will arise to the people residing nearby, there will be conservation of the environment and local people get the employment.	Company's representative replied that, your suggestion is welcome and priority will be given to the local in employment.	Cost considered under the operational Cost.
9.	Shri Dhansukh B. Patel, Vice-Sarpanch, Vill.: Rajgari, Ta.: Choryasi, Dist.: Surat.	• He represented that, company gives priority to the village in which it establish. There are 11 villages within the radius of 10 km from the company, it is our request to cover all those villages under the CSR activity and give priority to them.	• All the villages are covered under the CER activity of the company.	

S.No.	CER Activities	Cost (Lakhs)
1.	Drinking water facility in nearby village	75.00
2.	Up-gradation and hygiene facilities in nearby village	149.00
3.	Plantation in	55.00

				community areas	
				4.	Training and Awareness Program	75.00
				5.	Education/Sports & Farming related activities	70.00
				Total		**424.00**
10.	Shri M.H.Sheikh Ta.: Olpad, Dist.: Surat.	• He suggested that, CZMP are built on coastal belt. In Surat city there are 3% of trees of Gujarat state. Which is very low and the same condition is in SUDA too. Waste land in the Shivrampur should be allotted to any organization or Panchayat by the collector for development as a forest or selecting 10 to 15 hector land in any village and allot it legally for toddy plantation which have been lost these days.	-	-
11.	Shri Ramesh J. Patel, Hazira Katha Vistar Mahamantri, Vill.: Shivrampur, Ta.: Choryasi, Dist.: Surat	• He represented that, this is cement factory and our residence is near to this plant. Proper steps to be taken to prevent the situation of this area to turn in future alike situation in Hazira due to establishment of plant over there. There should be solution of the pollution in the area. Junagam, Shivrampur, Suvali and Rajgari village didn't get canal water. Farming or animal husbandry which is main occupation over here can be carried out in this village only if the water is available in lake of village. Those occupations are destroying. Animal fodders are not available here. Employment is not provided to local. Application to declare our village as Gamtal is pending since many year which is not taken into consideration. So, it should be taken into consideration and our village to be declared as Gamtal and inhabitant.	• Regional Officer informed that, complaint us regarding the pollution, action will be taken on the same. This is not proper forum for representation regarding SUDA but it will covered under public hearing proceedings. • Company's representative replied that, high efficiency APCM will be installed and will be operated with regular maintenance. Even then whatever new technology will be available, company will upgrade and care will be taken to prevent pollution.	752.15 Lakhs has been proposed as capital cost and 85.00 Lakhs/annum for Air Pollution Control Devices.

12.	Shri Pravinbhai Patel, Member of Taluka Panchayat, Vill.: Vatlai, Dist.: Surat.	• He represented that, there are many industries in this area but if ESIC facility will be provided it will be better. ESIC have authorized some hospital accordingly hospital near to this area should also be authorized so that people can get immediate medical treatment.	• Regional Officer informed that, this is not proper forum for your representation but it will be covered under public hearing proceedings.	-
13.	Shri Kalpesh Raghubhai Patel, Vill.: Junagam, Ta.: Choryasi, Dist.: Surat.	• He represented that, ESIC file is pending since 11 year. We have demanded for allot the same in Suvali village. It is our request to construct fire safety station and big hospital.	-	-
14.	Shri Deven Patel, Farmer of Shivrampur, Suvali and Vatlai, Dist.: Surat.	• He represented that, we are welcoming Sanghi cement in this area. Employment opportunity should arise through this company and there should be financial and social development of this area.	-	-

After the discussion the public hearing was ended with vote of thanks to the chairperson and the public.

7.3 RISK AND HAZARD MANAGEMENT

It is presumed that the standalone grinding unit at Shivrampur, Surat will design and engineered with all possible safety measures and standard code of practices of engineering. In spite of this, some design deficiency or operation and maintenance fault may lead to accidental events causing damage to the life and property. This chapter presents an overview of risks associated with the production facilities, suggested remedial measures and a model outline of the emergency preparedness plan. The objectives of environmental risk assessment are governed by the following, which excludes natural calamities:

• To identify the potential hazardous areas so that necessary design safety measures can be adopted to minimize the probability of accidental events.

• To manage the emergency situation or a disastrous event, if any, from the plant operation.

Managing a disastrous event will obviously require prompt action by the operators and the crisis management personnel using all their available resources like alerting the people and other plant personnel remaining inside, deployment of firefighting equipment, operation of emergency shut off valves, opening of the escape doors, rescue etc. Minimizing the immediate consequences of a hazardous event include cordoning off, evacuation, medical assistance and giving correct information to the families of the affected persons and local public for avoiding rumors and panic. Lastly, an expert committee is required to probe the cause of such events and the losses encountered and suggest remedial measures for implementation so that in future such events or similar events do not recur.

7.3.1 Identification of Hazards

The hazards are attributable due to raw materials used in cement making and the plant operation. A list of major raw materials used in the plant and the process units with their hazard potential is presented in **Table 7.1.**

Table 7.1 Hazard Identification of the Proposed Grinding Unit

S.No.	Group	Item	Hazard Potential	Remarks
1.	Raw materials and products	Clinker, Chemical Gypsum, Mineral Gypsum, Coal, Slag	None Moderate None Major Moderate	- Fire - - -
2.	Processing			
ii	Raw material Grinding	Dust	Moderate	Environmental Pollution
iii	Cement Grinding	Dust	Moderate	Environmental Pollution
3	Utilities			
	Electric power Supply	Short circuit	Major	Fire

From the Table, it may be observed that the major on-site emergency situation may occur from the raw material storage and handling, fuel gas handling and electrical short-circuit. The off-site environmental disaster may occur if large-scale fire and explosion occurs, the effect of which extends beyond the plant boundary. The off-site environmental disaster may occur due to significant environmental degradation for a sustained period.

7.3.2 Environmental Risk Evaluation

From environmental hazards point of view for the raw materials and processing of the same in various production units, relative risk potential analysis is made on the following three factors:

• Likelihood of occurrence
• Likelihood of detection
• Severity of consequences

Each of these factors is graded and compiled to determine the risk potential. The factors governing the determination of relative risk potentials are presented in the **Table 7.2.**

Table 7.2 Determination of Risk Potential

Likely hood of occurrence (A)		Likelihood of detection (B)		Severity of consequences (C)	
Criteria	**Rank**	**Criteria**	**Rank**	**Criteria**	**Rank**
Very High	5	Very High	1	None	2
High	4	High	2	Minor	4
Moderate	3	Moderate	3	Low	6
Low	2	Low	4	Moderate	8
Very low	1	Very low	5	High	10

Risk Potential (RP) = (A+B) X C

Based on the above stated criteria for assessing the risk, each probable event has been evaluated by addressing several questions on the probability of event occurrence in the view of the in-built design features detection response, operational practice and its likely consequence. A summarized list of environmental risk potential for the likely events is presented in **Table 7.3**. This evaluation has been done with the presumption of common events as observed from the past experience in the operation of different industries and best practicable designs for the proposed project. The present risk potential evaluation is primarily based on human errors or faulty operation or failure of the control systems.

Table 7.3: Environmental Risk Potential Evaluation

S. No.	Event	Likelihood of Occurrence	Likelihood of Detection	Severity of Consequence	Risk Potential
1.	Fire at the coal Stockyard	Very low (1)	High (2)	High (10)	30
2.	Uncontrolled dust emissions/ failure of Emission control System	High (4)	High (4)	Moderate (8)	64
3.	Occurrence of static Electricity/electric spark in the preheater/Kiln	Very low (1)	Very Low (5)	High (10)	60
4.	Machinery Movement	Low (2)	Moderate (3)	High (10)	50

From the table above, it appears that some events carry risk potential above 50. These events will be considered as risk prone and hazardous events and need adequate safe design operation and maintenance in order to reduce the risk. Emergency Electrical Switch shall be provided in Emergency control room for electrical supply cutoff of entire plant in case of emergency.

7.3.3 Risk Management Measures

The Risk management measures for the project activities require adoption of best safety practice at the respective construction zones within the Works boundary. In addition, the design and engineering of the proposed facilities would take into consideration of the proposed protection measures for air and water environment.

7.3.4 Nature of Hazard

After going through the different process, it was observed that fire hazard is considered as high risk and most probable reason for emergency. The onsite emergency plan shall prepared to deal with fire hazard inside the plant in order to save the life and property.

Causes of Fire

Short circuit, Welding operation, Lightening and ignition due to the inherent heat in coal stack yard during summer are the probable causes of fire disaster.

7.3.5 Electrical Safety

Adequately rated and quick response circuit breakers, aided by reliable and selectively digital would be incorporated in the electrical system design for the proposed project. The metering and instruments would be of proper accuracy class and scale dimensions.

7.4 DISASTER MANAGEMENT PLAN

In a plant like this one, it is imperative that accidents occurring due to unforeseen acts and events will not affect the surrounding areas. Therefore an onsite emergency plan for prevention and mitigations of accidents will be enough to cater for unforeseen acts and events that may occur. Apart from onsite, off-site emergency plan is also required to prevent any mis-happening.

Industrial Safety and Fire Fighting

For protection of working personnel, equipment and machineries from any damage or loss and to ensure uninterrupted production, adequate safety and firefighting measures will be planned for this project. Important provisions are as follows:

- Provision of adequate personal safety appliances to workers engaged in hazardous installations
- Provision of detection and alarm system to allow a developing fire to be detected at an early stage.
- Provision of water spray fire extinguishing system and portable extinguishers using carbon dioxide or chemical powder.

Portable Fire Extin guishers: All plant units, office, buildings, stores, etc. will be provided with adequate number of portable fire extinguishers. The distribution and selection of extinguishers will be done in accordance with the requirement of fire protection manual.

Fire Hydrant System: Internal hydrants will be provided at suitable locations and in different levels inside the plant buildings. Yard hydrants will be provided in the vicinity of plant unit, normally along the road to meet the additional requirement of water to extinguish fire. The proper pressure of water in the hydrant network of the road level will be maintained.

Fire Statio n: One fire station in Hazira, which provide the necessary assistance required for fighting fire in any of the plant units and associate premises with requisite augmentation. The equipment like water tender, portable pump, Wireless set, Hoses will be provided in fire station. The safety appliances like, Industrial safety boots, Industrial helmets, Hand gloves, Ear muffs, Welders screens and aprons etc. will be provided for the personnel exposed to the different types of hazards in various plant units.

7.4.1 On Site Emergency Preparedness Plan

This plan will be specific to the needs of the plants *i.e.* size, complexity, nature and quantum of hazard. Instruction and information will be inculcated among SIL employees to be strictly followed during emergencies as per the situational demand.

Objective of Onsite Emergency Plan

The main objective of the plan is to take immediate actions to meet any emergency situation for speedy and efficient rescue and relief operations. The major steps during an onsite emergency plan are described below:

i. To define the hazards and assess the risk and identify the Maximum Credible Loss Scenario (MCLS);
ii. To outline facilities provided and the organizational response to control and containment risks arising out of loss of containment of flammable liquids and resultant fire;
iii. To outline the responsibilities and functions of the key members of the emergency response team, to safeguard other employees, the people living in the surrounding area and environment.

iv. To conduct regular emergency response drills to train employees as per the responsibilities assigned to them to ensure prompt emergency response.
v. Rescue and treatment of the casualty;
vi. Safeguard people; (both at site and neighborhood);
vii. Rehabilitate the areas affected;
viii. Provide information to media and government agencies;
ix. Preserve records/equipment for subsequent inquiry;
x. Ensure rapid return to normal operation after emergency.

Alarm and Communication S ystem: In case of emergency, the Plant Manager shall declare emergency after assessing the situation. The evacuation, head count and other necessary arrangements will be performed under the guidance of safety Officer. Alarm (Sirens) will be raised by the Security personnel on the main gate of each site after receiving instructions from Plant Manager.

Table 7.4: Alarming System at Plant Site

S.No.	Type	Duration
1.	Normal Plant Siren (Shift Siren)	Continuous 30 Seconds
2.	In case of Fire and Other Emergency	15 Seconds ON 5 Seconds OFF, same shall be repeated for a continuous period of 3 minutes. Thus, 9 times ON and 8 times.
3.	All Clear Signal	Continuous 1 Minute

Besides, to alert other people during the emergency and also during situation of power failure, people have been instructed to run to / send messengers to various departments shouting emergency. A reliable and prompt communication system is extremely important in controlling a major emergency. Corrective action can be initiated in time only, if information can be passed on to key personnel quickly.

Equipment Checks: All firefighting equipment like valves, fire hydrants, pumps, monitors, etc., will be checked weekly to detect defective parts and such parts would be immediately replaced.

Mock Drills and Rehearsing: Emergency plan will regularly communicated to all personnel in order to clarify ones roles and responsibility during emergency and accident situations. The plan will be tested by simulating probable emergency situations, wherever practicable; the Frequency of carrying out the mock drills shall at least once in a quarter. These mock drills bring out improvement opportunities in the plan and ensure that appropriate actions shall be taken in real life situation. Observers will posted at different sites who verify the effectiveness of the emergency preparedness like communication, response actions, roll call, mitigation etc. Records pertaining to the same will be maintained.

Emergency Plann ing for Disas ter due to Fire: Coal storage, cable rooms, transformer unit, auxiliary transformers, etc., within the plant are the likely area for which plan will outlined to deal with any eventuality of fire. Stores, workshop, dining area and administration building will have also been included.

Classification of Fires

i. **Class A -** Fire due to combustible materials such as wood, textiles, paper, rubbish and the like.
ii. **Class B -** Fire in flammable liquids like oil, elements, paint etc.
iii. **Class C -** Fire arising out of gaseous substances.
iv. **Class D -** Fire from reactive chemicals, active metals and the like.
v. **Class E -** Fire involving electrical equipment and delicate machinery and the like.

Fire Fighting Methods: To deal with fires - other than carbonaceous fires, which can be dealt with by water-suitable fire extinguishers is required to do the job effectively. Adequate number of fire stations is to be established with the following types of equipment and arrangements:

- CO_2 Extinguishers,
- Dry chemical powdered type,
- Foam type extinguishers,

- Fire buckets,
- Fire hydrant hoses.

Fire Fighting System

A state of the art fire-fighting system is proposed for the project to prevent and control fire outbreaks. The firefighting system will consist of portable fire extinguishers, hose reel, wet riser, yard hydrant, automatic sprinkler system, and manual fire alarm system. The proposed buildings will also be provided with automatic fire detection and alarm system.

The fire and safety consideration will be as per the applicable National Building Code 2005 and stand industry practices. Important component are mentioned below.

- Provision of hose reels, external hydrants and wet risers
- Provision of firefighting water storage tank
- Provision of overhead water storage tank on buildings
- Provision of firefighting pumps with hydrant lines.
- HT and LT panels will be protected with manually operated CO_2 protection system.
- Automatic sprinklers will be installed in fuel handling system
- Portable fire extinguishers shall be provided at strategic locations
- Automatic fire detection system *i.e.* smoke/ heat detection system shall be provided in the buildings at appropriate places. The system will be connected to the fire alarm system

The proposed fire hydrant layout is attached herewith and firefighting equipments are given in below table:

S.No.	Firefighting equipment's	Qty	Remarks
1.	Single outlet hydrant points	27 Nos.	Plant and RMH area
2.	Water Monitor risers points	04 Nos.	Fuel storage yard & HAG
3.	Hose reels – 60 meters	10 Nos.	Fire prone area
4.	Fire extinguisher – CO2	63 Nos.	Strategic locations
5.	Fire extinguisher – DCP	85 Nos.	Strategic locations
6.	Fire extinguisher – Foam	25 Nos.	Strategic locations
7.	Fire buckets	12 Nos.	Strategic locations
8.	Automated sprinkling system	02 Nos.	Fuel handling conveyors
9.	Smoke / heat detection system	03 Nos.	PP bag godown, CCR & Admin buildings
10.	Manual system- CO2 protection	01 Nos.	Electrical panel room
11.	Emergency response station	01 Nos.	With trained firemen staff

SIL will be provided below mentioned firefighting equipment and fire hydrant system for the expansion and Fire Layout plan is mentioned in **Figure 7.1.**

Table 7.5: Proposed Fire Hydrant Points and Risers

Particulars	Units
Single outlet Hydrant valve	27 Nos.
Water Monitor	4 Nos.
Hose Box	25 Nos.

Table 7.6: Fire Extinguisher Statement

Summary for Fire Extinguishers	
Type	**Grinding Unit**
CO_2	20
DCP	90
Foam	11
Total Result	**121**

Table 7.7: List of PPEs

S.No.	Personal Protective equipment	Parts to be protected	Proposed Qty
1.	Industrial safety Helmet (IS 2925-1975)	Head	150 Nos.
2.	Face Shield with replaceable acrylic visor (IS:8521-1977)	Face	15 Nos.
3.	Zero Power Plain goggles with cup type filters on both ends (IS:2553-1977)	Eyes	80 Nos.
4.	Zero Power goggles with cup type filters on both sides and blue color glasses (IS: 2553-1977), Welders equipment for eye and face (IS: 1179-1967).	Eye	50 Nos.
5.	Cylindrical type earplug (made from foam) Ear muffs (IS:9167)	Ear	150 Nos.
6.	Dust Respirator with Filter Canister Gasmask (IS:8523)	Respiratory	90 Nos.
7.	Safety Belt/Line man's safety Belt (IS:3521)	Body	50 Nos.
8.	Leather Hand Gloves (IS:6994-Part-1-1973) Asbestos Hand Gloves Lead Hand Glove Electrically tested electrical resistance Hand Gloves (IS:4770-1968)	Hand	35 Each
9.	Industrial safety shoes with steel toe (IS:5852)	Foot	150 Nos.

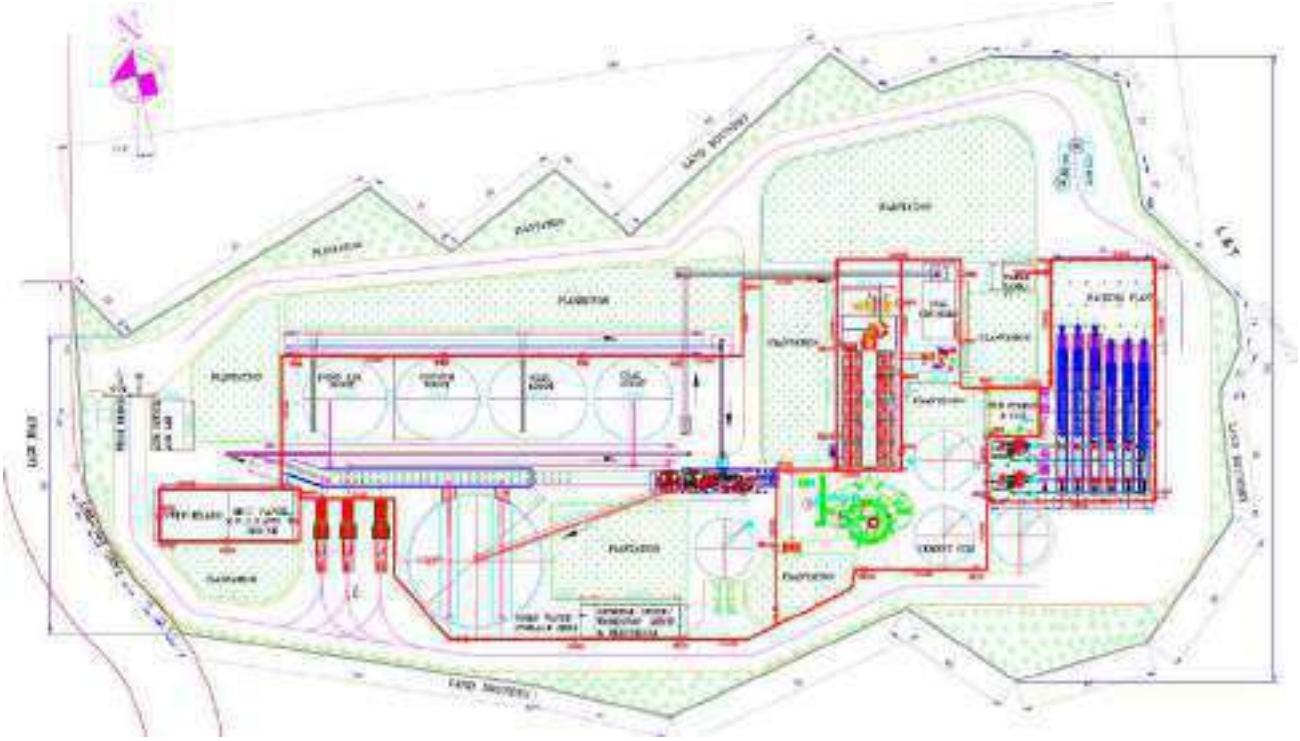


Figure: 7.1 Fire Layout Plan

Key perso nnel and Responsibilities: These are individuals nominated to take specific responsibilities during an emergency:

Emergency coordinator: Takes full charge at the site of the incident and directs all the efforts. His main responsibilities during an emergency shall be to:

- Assess the situation, decide and activate the emergency procedure;
- Take actions for controlling the incident, securing the safety of personnel and minimizing damage to environment, plant and material;
- Direct the rescue and firefighting operations at site;
- Co-ordinate with emergency services at site;
- Search for causalities and arrange for proper first aid for them;
- Evacuate non-essential persons from site to safe location;
- Ensure good communication with Emergency Control Centre;
- Preserve evidence for inquiry.

Rescue Operations coordinator: Takes decisions affecting the whole works. Overall responsibility of directing emergency actions from the Emergency Control Centre.

Main responsibilities include:

- Assess situation and decide and initiate actions if not done already;
- Ensure proper communication to inside and outside emergency services including
- Fire services and Ambulance;
- Take direct operational control of works area not affected by the incident;
- Determine probable course of events and review the situation to initiate actions accordingly;
- Direct shutting down of plants and evacuation of personnel;
- Control traffic movement;
- Arrange to keep a record of incidents;
- Arrange communication with media and government agencies;

Other Key personnel and Essential workers nominated to play an active role during an emergency.

- **Senior Exe cutives -** To assist rescue operation coordinator in his various responsibilities and report to the Emergency Control Centre.
- **Operators** required for shutting the plants safely within stipulated time
- **Emergency Engineering Staff** including Safety Executives

- **Public relations staff**
- **Roll call leaders**
- **Traffic controllers**
- **Running messengers**

Emergency Control Center: The separate unit in admin building will designated as the Central Control Room and it will be a safe place from where the Rescue Operation Coordinator directs emergency actions. The Main Center Following facilities will be provided in the emergency control center:

- Important external and internal telephones numbers and address;
- Wireless sets;
- Nearby area location map;
- A detailed plan of the works showing hazardous area,
- Location of safety equipment, layout of firefighting system, assembly points, possible escape routes.
- Adequate writing pad, paper and pen;
- List of key personnel, first aiders, fire fighters and other essential personnel;
- Shift schedule of employees;
- Action and co-ordination plan on site.

To control and contain an incident it is necessary to take appropriate decisions at site and act accordingly. Following aspects will be considered for this purpose:

7.4.2 Action and Coordination at Site

Evacuation: In order to evacuate non-essential personnel, assembly points will be made in safe areas. A final decision on evacuation will be taken depending on type and location of the incident. Necessary safety communication system will be available at these points. Persons will be designated in the plan to take roll call in these assembly points, keep in touch with the Rescue Operation Controller to decide course of action and guide personnel at the point accordingly. Emergency Evacuation plan is shown in **Figure 7.2.**

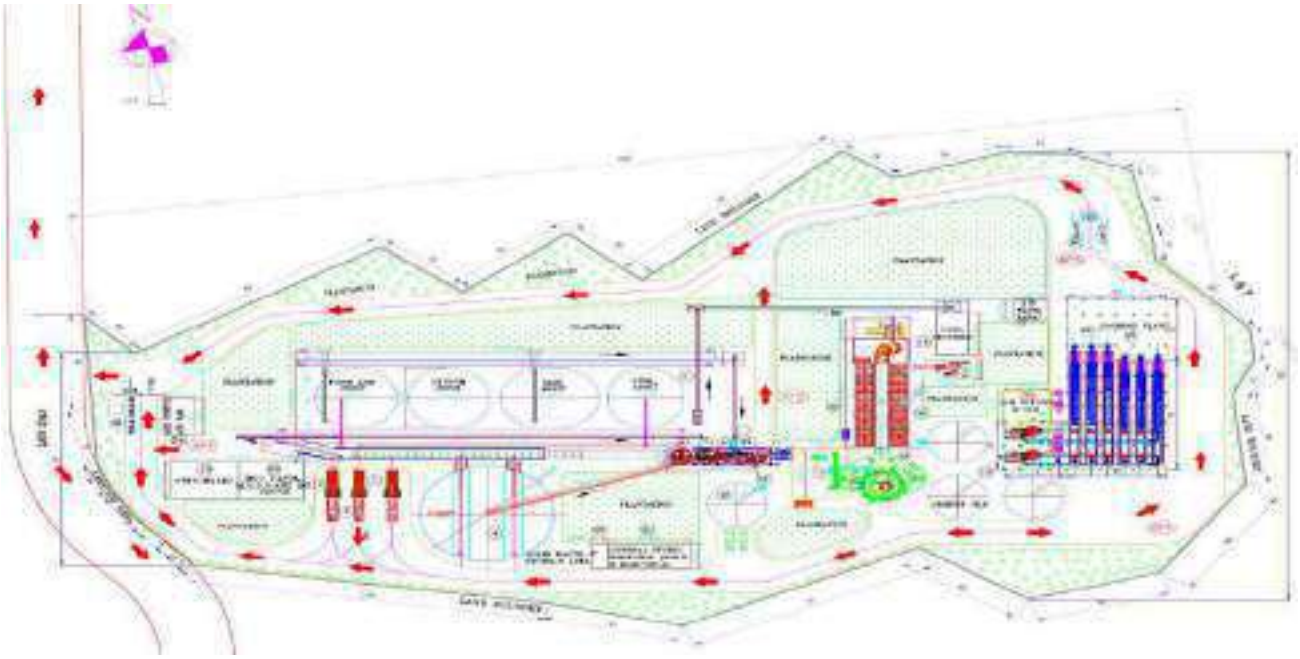


Figure 7.2: Emergency Evacuation Plan

Accounting for personnel: Though is a difficult task in large installations, it is important to ensure safety of people inside works. A key person at the Emergency Control Center shall be responsible to contact various Assembly points and account for all the people in the works.

Rehabilitation: After bringing the incident under total control, care is required while recentering the affected area. Government agencies also may require that nothing be disturbed till they have done their inquiry. Safety committee members will take a leading role in the above areas.

7.4.3 Post Disaster Management

In case of Fire emergency, the same shall be extinguished using the appropriate type of fire extinguisher and the debris shall be collected and buried at a safe site. In case water is used, then the firewater will be re-used after necessary treatment e.g. diverting to soak-pits etc. The people in the assembly area shall also be informed for resuming work and normal operation. Besides, a meeting of the Management and Safety Committee, the outcomes will be convened to analyze the actions taken and loss encountered, suggesting/ incorporating any corrective and preventive mechanisms and for modifying the Emergency Plan.

7.4.4 Mutual aid and Communication with External Agencies

In a major emergency situation the resources available at the internal source may not be sufficient and external help may be required. The resources, with the emergency services like fire department, hospitals *etc*. are also generally limited. These services may not have enough special equipment like breathing apparatus, special foams, etc. to fight emergency. This constrain on resources, can be overcome in an area where other industries are situated, by a mutual aid scheme. These industries can set up a good communication system among them and assist each other during an emergency. Resources available with external agencies like fire services, hospitals and police, local administration, voluntary service agencies *etc*. could also be availed of proper liaison will maintained to obtain the resources available with external agencies like fire services, hospitals and police, local administration, voluntary service agencies etc.

7.4.5 Rescue Operation Coordinator

Plant Manager on hearing the information will come to clinic and take charge from shift in-charge. He will assess the situation in consultation with medical officer decide and order for shifting of victims to outside hospitals for immediate treatment or call outside Doctors for help. He will also inform the situation to at least one safety Committee Executive Member. To liaise with outside hospitals, police and district authorities for necessary immediate help and to inform statute authorities like inspector of factories and inspector of police in case of serious incidents.

Plant Medical Officer: Medical Officer on arrival to clinic discuss with canteen supervisor about the food served and asses the condition of victims with para medical team and if necessary give immediate correction of dehydration either by oral dehydration fluid or by intravenous fluids. Antibiotics therapy if the poisoning is due to inactive food material. He will also alert Doctors in nearly hospitals for keeping beds and medicines ready for immediate treatment. He will also appraise the conditions to Rescue Operation Coordinator and advice for shifting of victims to different hospitals or call other doctors to extend help.

Security Officer: To control traffic and see that the rail gate is kept open for traffic till the situation comes under control. He will control all unwanted elements entering the plant during the emergency.

Safety Engineer: Co-ordinate with Welfare Officer and supervisor to search for possible evidences and to collect samples of food and raw material for further analysis if required.

All Other Staff: Will assemble near clinic along with first aiders to help site controller for shifting victims to hospitals and informing the family members of victims.

Medical Management: Immediate correction of dehydration either by oral dehydration fluids or by intravenous fluids. Antibiotic therapy if the poisoning is due to inactive material.

7.4.6 Instructions for Handling Emergencies

Shock

- Lay the patient on his back
- Stop bleeding, if any
- Relieve pain by supporting injured part
- Keep the patient comfortable, but not hot. Do not cause sweating

- Fluids may be given in small amounts unless the patient is nauseated, unconscious,
- likely to be operated on, or has an abdominal wound
- Reassure and cheer up the patient

Wounds

Stop the bleeding by any one of the following method:

- direct pressure
- direct finger pressure into the wound in cases of large bleeding wounds
- tourniquet (seldom needed) use only as a last resort
- Avoid touching the wound with hands or unsterile material
- Clear the wound with running water and surrounding area with soap or spirit with clean gauze washing away from the wound. Apply readymade adhesive gauze bandage or sterile gauze and roller bandage as needed
- Keep the patient quiet, raising the extremity if it is the bleeding part. Give no stimulants
- Never apply antiseptic ointment, lotion or iodine or germicide to the wound.

Abdominal Wounds

- No time must be lost in sending the patient to the hospital,
- Keep the patient flat,
- Maintain warmth,
- Give nothing by mouth,
- If intestine protrude from the wound, do not attempt to touch or replace them,
- Apply sterile dressing and binder on the wounds,
- Provide careful, immediate transportation to the hospital.

Eye Wounds

- Removal may be attempted if foreign body is not embedded.
- Do not apply oil or ointment.
- If there is a foreign body embedded in the eye ball, send the worker immediately to the doctor after applying pad and loose bandage.

Suffocation

- Remove the patient from the source of danger.
- Make a rapid examination to ensure that the air passages are free and to clean then if necessary.
- Restore natural breathing by artificial respiration, if breathing has ceased.

Electric Shock

- Remove the patient from the source of danger.
- Make a rapid examination to ensure that the air passages are free (clean them as necessary).
- Restore natural breathing by artificial respiration, if breathing has ceased.

Insensibility

- Send a doctor if possible, pending his arrival.
- Where the patients face is pale, lay him flat and face downwards with hid head turned to one side. If his face is flushed or blue, raise and support the head and shoulders.
- Control any serious bleeding.
- Loosen any tight clothing and let him have plenty of air.
- Do not give anything by mouth.
- If doctor is not available send the casualty to hospital.

Back Bone (Spinal) Fracture

- Transport on a rigid frame. This frame may be improvised by using boards on a door
- The rigid frame may be placed on a stretcher for transportation.
- If a frame cannot be improvised, transport patient on abdomen on a stretcher made of canvas or blanket.
- In neck fracture cases try to get a doctor to the scene, as the danger is high.

Bruises

- Cold applications at first, 24-48 hours, Later hot, after 24-48 hours.

Burns

- Act quickly.
- Put the affected part in cold water.
- Pour the water over burns that can‘t be immersed (Cold water relieves pain, reduces fluid loss).
- Cover with a sterilized dressing.

Snake Bite

- Calm and reassure the patient.
- Immobilize the bitten limb by splinting it.
- Wash and cool the wound with soap and water.
- Do not cut, rub or suck the bite.
- Take to a doctor.
- Press hard over the wound for up to 15 minutes.
- Do not remove cloth if it has been placed.

7.4.7 Off-Site Emergency Preparedness Plan

If an accident takes place in an industry and its effects are outside the plant area, the situation thus generated is called an Off -Site Emergency. A major emergency may affect areas outside the works also and hence off-site emergency plan is an essential part of a major hazard control system. In case of an offsite emergency, The Emergency coordinator will report to the Collector of the District who is chairman of the District Emergency Committee.

An off-site plan must clearly identify an Emergency coordinating Officer as overall in-charge of all off-site actions. Well-equipped Emergency Control Centers are an essential feature of a plan. The Emergency Control Center of SIL will well equipped with the following essential documents and procedures to combat with any eventualities. These will be:

- Organization Structure,
- Command system,
- Warning procedure,
- Operational Emergency control center,
- Communication system,
- List of specialized equipment,
- List of organization and people concerned,
- Detail list of Emergency Services available nearby,
- Assembly point with evacuation plan & safe route,
- List and contact address of Medical & rehabilitation facilities available,
- System to inform public media,
- Education & Rehearsal schedule

7.4.8 Aspects Proposed to be considered in the Off-Site Emergency Plan

The main aspects, which shall be included in the emergency plan, are:

• **Organization**

Names and appointments of incident controller, site main controller, their deputies and other key personnel.

• **Communications**

Identification of personnel involved, communication center, call signs, network, lists of telephone numbers.

• **Voluntary organizations**

Details of organizers, telephone numbers, resources etc.

- **Meteorological information**

Arrangements for obtaining details of weather conditions prevailing at the time and its forecasts.

• **Humanitarian arrangements**

Transport, evacuation centers, emergency feeding treatment of injured, first aid, ambulances, temporary mortuaries.

• **Public information**

Arrangements for dealing with the media press office; and informing relatives, etc.

• **Assessment of emergency plan**

Arrangements for:

(a) Collecting information on the causes of the emergency;

(b) Reviewing the efficiency and effectiveness of all aspects of the emergency plan.

7.4.9 Role of the Emergency Co-coordinating Officer

The various emergency services will be coordinated by an emergency coordinating officer (ECO), who will designated by the district collector. The ECO shall liaise closely with the site main controller. Again depending on local arrangements, for very severe incidents with major or prolonged off-site consequences, the external control shall be passed to a senior local authority administrator or even an administrator appointed by the central or state government.

7.4.10 Role of the Local Authority

The duty to prepare the off-site plan lies with the local authorities. The Emergency Planning Officer (EPO) will appointed to do his duty in preparing for a whole range of different emergencies within the local authority area. Rehearsals for off-site plans will be organized by the EPO.

7.4.11 Role of Police

Formal duties of the police during an emergency include protecting life and property and controlling traffic movements. Their functions shall include controlling bystanders evacuating the public, identifying the dead and dealing with casualties, and informing relatives of dead or injured.

7.4.12 Role of Fire Authorities

The control of fire shall be normally the responsibility of the senior fire brigade officer who would take over the handling of the fire from the site incident controller on arrival at the site. The senior fire brigade officer shall also have a similar responsibility for other events, such as explosions and toxic release. Fire authorities in the region shall be apprised about the location of all stores of flammable materials, water and foam supply points, and fire-fighting equipment. They shall be involved in on-site emergency rehearsals both as participants and, on occasion, as observers of exercises involving only site personnel.

7.4.13 Role of Health Authorities

Health authorities, including doctors, surgeons, hospitals, ambulances, and so on, shall have a vital part to play following a major accident, and they shall form an integral part of the emergency plan. For major fires, injuries shall be the result of the effects of thermal radiation to a varying degree, and the knowledge and experience to handle this in all but extreme cases may be generally be available in most hospitals. Major off-site incidents are likely to require medical equipment and facilities additional to those available locally, and a medical mutual aid scheme shall exist to enable the assistance of neighboring authorities to be obtained in the event of an emergency.

7.4.14 Role of Government Safety Authority

There will be the plant inspectorate available in the region. Inspectors are likely to want to satisfy themselves that the organization responsible for producing the offsite plan has made adequate arrangements for handling emergencies of all types including major emergencies. They may wish to see well documented procedures and evidence of exercise undertaken to test the plan. In the event of an accident, local arrangements regarding the role of the plant inspector will apply. These may vary from keeping a watching brief to a close involvement in advising on operations in case of involvement in advising on operations.

7.5 NATURAL DISASTERS

A disaster is a catastrophic situation in which suddenly, people are plunged into helplessness and suffering, as a result, need protection, clothing, shelter, medical and social care and other necessities of life. Disasters can be divided into two main groups. In the first, disasters resulting from natural phenomena like earthquakes, volcanic eruptions, storm surges, cyclones, tropical

storms, floods, avalanches, landslides, forest fires etc. Natural Hazard identification map of Gujarat is shown in **Figure 7 .3, 7.4** and **7.5** below. The second group includes disastrous events occasioned by man or mans impact upon the environment. All disaster brings in their wake similar consequences that call for immediate action, whether at the local, national or international level, for the rescue and relief of the victims. This includes the search for the dead and injured and removal of debris and social care, the provision of temporary shelter to the homeless food, clothing and medical supplies, and the rapid re-establishment of essential services.

The objective of the industrial disaster management plan is to make use of the combined resources of the plant and the outside services to achieve the following:

- Effect the rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Identify any dead;
- Provide for needs of relatives;
- Provide authoritative information to the news media;
- Secure the safe rehabilitation of affected area;
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

In effect, it is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy.

There are no records of cyclone hazard since last 10 years in the study area .There are no any records of flood hazard in the study area found date back to 10 years.

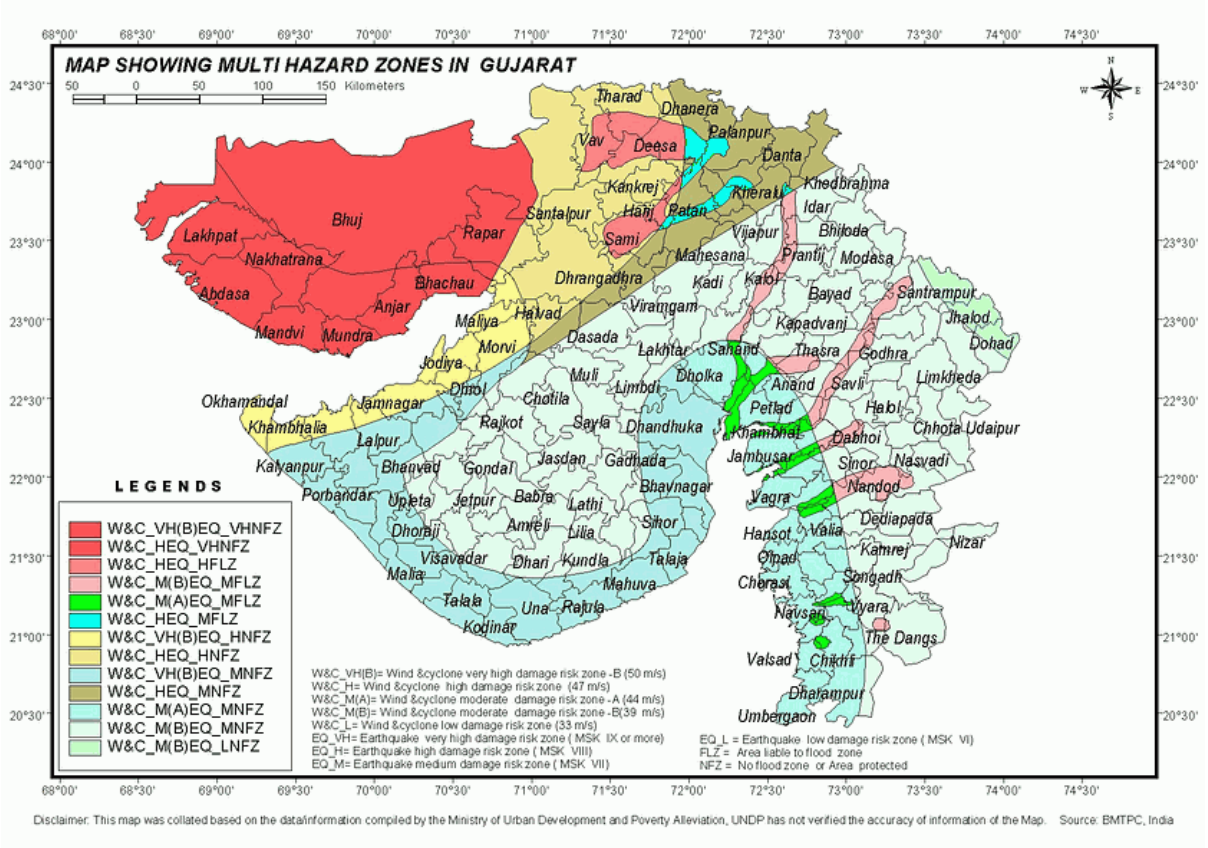


Figure: 7.3 Multi Hazard Zones in Gujarat

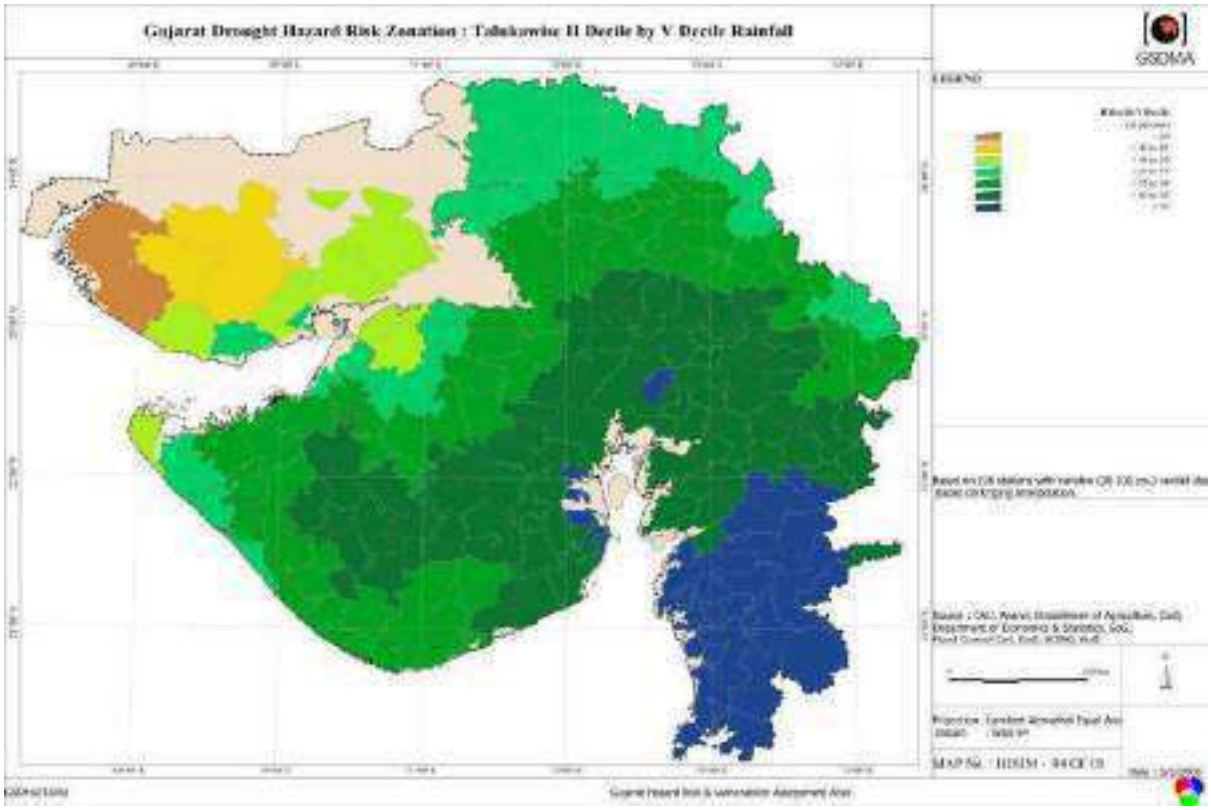


Figure: 7.4 Drought Map of Gujarat

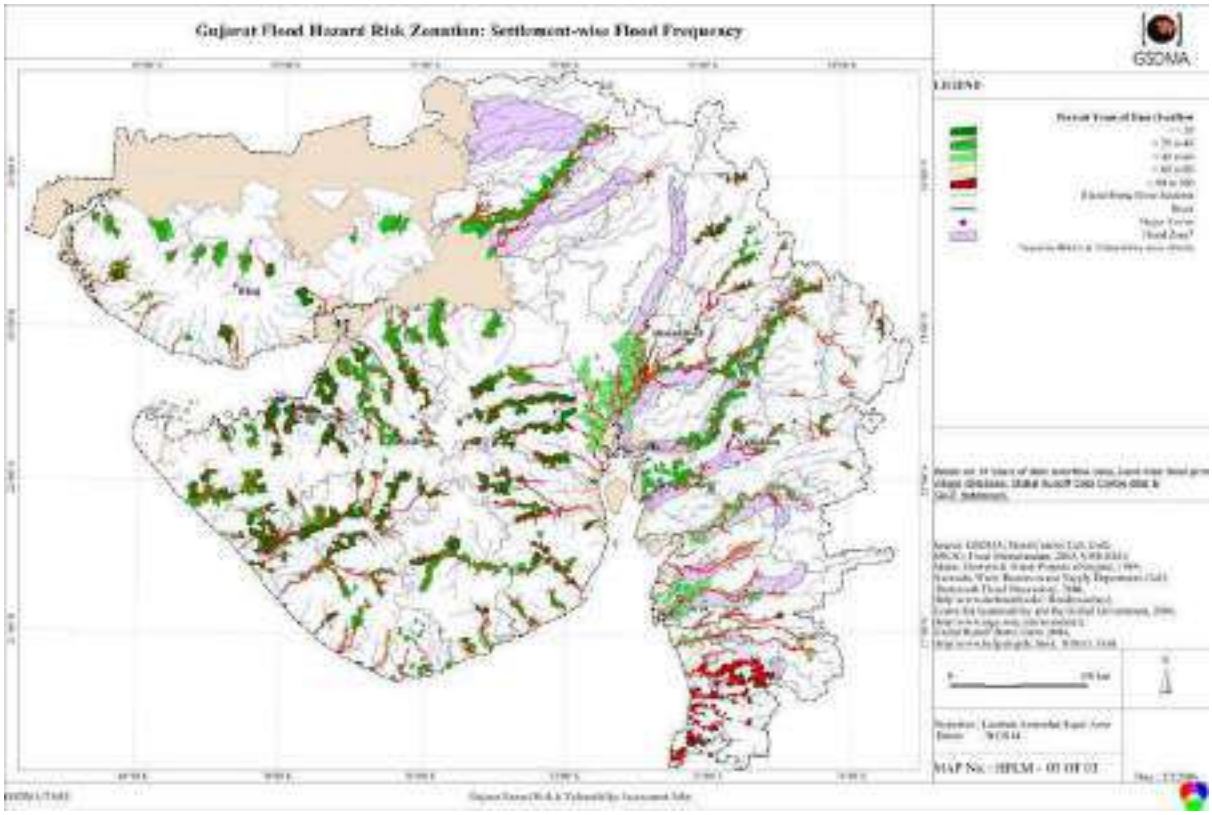


Figure 7.5: Flood Map of Gujarat

7.6 OCCUPATIONAL HEALTH AND SAFETY

Large industries, in general where multifarious activities are involved during construction, erection, testing, commissioning, operation and maintenance, the men, materials and machines are the basic inputs. Along with the boons, the industrialization generally brings several problems like occupational health and safety. The industrial planner, therefore, has to properly plan and take the steps to minimize the impacts of industrialization and to ensure appropriate occupational health, safety including fire plans. All these activities again may be classified under construction and erection, and operation and maintenance. The proposed safety plan is given below:

7.6.1 Occupational Health

Occupational health needs attention both during construction and erection and operation and maintenance phases. However, the problem varies both in magnitude and variety in the above phases.

Sanghi Cement Industries (SIL) will provide free medical consultation in OHC and round-the-clock medicinal disbursement with emergency management at nearby Health Center to all employees

• Construction and Erection

The occupational health problems envisaged at this stage can mainly be due to constructional accident and noise. To overcome these hazards, in addition to arrangements to reduce it within TLVs, personal protective equipment shall also be supplied to workers.

• Operation and Maintenance

The problem of occupational health, in the operation and maintenance phase is due to noise hearing losses. Suitable personnel protective equipment shall be given to employees. The working personnel shall be given the following appropriate personnel protective equipment.

Table 7.8 Usage of PPE with IS Code

Parts to be protected	Personal Protective equipment	Protection against
Head	Industrial safety Helmet (IS 2925-1975) Crash Helmets (IS: 4151:1976) (Red Color) Firemens Helmet (IS: 2745: 1969)	Failing Objects Head Injuries Head injuries
Face	Face Shield with replaceable acrylic visor (IS:8521-1977)	Frontal hazards against splash of chemicals
Eyes	Zero Power Plain goggles with cup type filters on both ends (IS:2553-1977)	Eye injuries due to flying objects
	Zero Power goggles with cup type filters on both sides and blue color glasses (IS: 2553-1977), Welders equipment for eye and face (IS: 1179-1967).	Radiation due to sparks/flames Radiation
Ear	Cylindrical type earplug (made from foam) Ear muffs (IS:9167)	Hearing losses (if noise level is above 85 dB)
Respiratory	Dust Respirator with Filter Canister Gasmask (IS:8523)	Inhalation of harmful dust Inhalation offensive and harmful fumes vapors & gases
	Self-contained breathing apparatus (IS:1910-1961)	Hazards of oxygen deficiency and toxic gases.
Body	Leather apron Asbestos apron Rubberized apron Acid/KPD Proof (IS:4501-1967) Lead apron Aluminized fiber glass fix proximity suit with hood and gloves Safety Belt/Line man's safety Belt (IS:3521)	Flying particles chips, hot slags etc. Heat Radiations & Contacts Contact with corrosive chemicals Radiation due to radioactivity Heat Radiation & contact with hot objects Fall from height
Hand	Leather Hand Gloves (IS:6994-Part-1-1973) Asbestos Hand Gloves Acid/KPD Proof rubbensed hand gloves	Contact with moderately hot substances/uneven surfaces Contact with hot materials.

	Canvas cum leather Hand Gloves with leather palm (IS:6994) Lead Hand Glove Electrically tested electrical resistance Hand Gloves (IS:4770-1968) – (to be purchased with the certificate)	Contact with corrosive chemicals Contact with oily greasy objects/uneven surfaces Radiation Electric shock
Foot	Industrial safety shoes with steel toe (IS:5852) Electrical safety shoes without steel toe Hunter Shoes Gum Boots Firemans leather safety boots (IS:4218 with steel toe as per IS:5052)	Crushing injuries to foot fingers Electric shock Hazards of insects etc. Injuries due to corrosive chemicals etc. Crushing injuries

Full fledge hospital facilities shall be made available round the clock for attending emergency arising out of accidents, if any.

Budget for Occupational Health & Safety

A capital Budget of **Rs. 49. 85 Lakhs** and **Rs. 18. 30 Lakhs/Annum** as recurring cost has been allocated for Occupational Health and Safety.

7.6.2 Safety Plan

Safety of both men and materials during construction and operation phases is of concern. The preparedness of an industry for the occurrence of possible disasters is known as emergency plan. The disaster in proposed plant is possible due to leakage of fuels, collapse of structures and fire/explosion etc.

Keeping in view the safety requirement during construction, operation and maintenance phases, the plant will formulated safety policy with the following regulations:

- To allocate sufficient resources to maintain safe and healthy conditions of working environment.
- To take steps to ensure that all known safety factors are taken into account in the design, construction, operation and maintenance of plants, machinery and equipment.
- To ensure that adequate safety instructions are given to all employees.
- To provide wherever necessary protective equipment, safety appliances and clothing and to ensure their proper use.
- To inform employees about materials, equipment or processes used in their work which are known to be potentially hazardous to health or safety.
- To keep all operations and methods of work under regular review for making necessary changes from the point of view of safety in the light of experience and upto date knowledge.
- To provide appropriate facilities for first aid and prompt treatment of injuries and illness at work.
- To provide appropriate instruction, training, retraining and supervision to employees in health and safety, first aid and to ensure that adequate publicity is given to these matters.
- To ensure proper implementation of fire prevention methods and an appropriate firefighting service together with training facilities for personnel involved in this service.
- To organize collection, analysis and presentation of data on accident, sickness and incident involving personal injury or injury to health with a view to taking corrective, remedial and preventive action.
- To promote through the established machinery, joint consultation in health and safety matters to ensure effective participation by all employees.

7.6.3 Safety Training

A full-fledged training center will be provided at the plant. Safety training will be provided by the Safety Officers with the assistance of faculty members called from Corporate Center. In addition to regular employees, limited contractor labors will also be provided safety training. To create safety awareness safety films shall be shown to workers and leaflets etc. Some precautions and remedial measures proposed to be adopted to prevent fires will be:

- Compartmentation of cable galleries, use of proper sealing techniques of cable passages and crevices in all directions would help in localizing and identifying the area of occurrence of fire as well as ensure effective automatic and manual firefighting operations;
- Spread of fire in horizontal direction would be checked by providing fire stops for cable shafts;
- Reliable and dependable type of fire detection system with proper zoning and interlocks for alarms are effective protection methods for conveyor galleries.
- Housekeeping of high standard helps in eliminating the causes of fire and regular fire watching system strengthens fire prevention and firefighting;
- Proper fire watching by all concerned would be ensured.

7.7 SUMMARY

Public hearing shall be conducted after submitting draft EIA report and the action plan will be prepared accordingly. SIL has developed Emergency preparedness plan and Disaster Management Plan. Fire alarm panel (electrical) will cover the entire plant. The Environmental Management Cell (EMC) will handle of all the related activities such as collection of statistics of health of workers and population of the region, afforestation and green belt development. The fire protection system for the unit is to provide for early detection, alarm, containment and suppression of fires. The Occupational Health Centre with adequate facilities will be developed at plant site. It will be maintained round the clock by a compounder cum dresser and a doctor. Medical Personnel/ Medical Doctor will be available at site for emergency relief. First aid kit will be provided. Appropriate personal protective equipment will be provided to all workmen as and when required. All records of On-Site and Off-Site Emergency Plan shall be well maintained and preserved. A capital Budget of Rs. 49.85 Lakhs and Rs. 18.30 Lakhs/Annum as recurring cost has been allocated for Occupational Health and Safety.

8 PROJECT BENEFITS

8.0 GENERAL

This chapter gives information on direct and indirect benefits to the environment, nation and proponent. Proposed project will result in growth of the surrounding areas by increased direct and indirect employment opportunities in the region including ancillary development and supporting infrastructure. Special emphasis on financial and social benefits will be given to the local people in the area. Development of social amenities will be in the form of medical facilities, education to underprivileged and creation of self-help groups, Socio-economic status of the region will definitely improve due to flow of money to nearby villages.

8.1 PHYSICAL BENEFITS

Infrastructure: Creation of community assets (infrastructure) like drinking water facilities in nearby villages as a part of corporate environment responsibility will be developed. Rain water harvesting will be implemented at the project site to conserve the environment.

Enhancement of Green Cover: Plantation of trees on road side and development of nursery will be done as a part of corporate social responsibility.

Green Belt Development: 16,500 m^2 Green belt area 33.98% of plot area will be developed by proponent.

8.2 SOCIAL BENEFITS

- **Employment Potential:** The employment of local people in primary and secondary sectors of project shall upgrade the prosperity of the region. This in-turn will improve the socio-economic conditions of the area. During construction phase of the project approx. 500 people will be required; thus, this project will provide temporary employment to many unskilled and semi-skilled laborers in nearby villages. During Operation phase of the project approx. 280 nos. people will be required. This project will also help in generation of indirect employment to those people who render their services for the personnel directly working in the project and during operational phase, considerable number of people will be benefited by provision of various services, such as transportation, technical services, skilled and semi-skilled services and indirectly it will flourish various business activities. Thus, the direct and indirect employment generation by this project will be highly significant.
- **Enterprise Social Commitment:** SIL have regularly contributed their part for improving the socio-economic conditions of the surrounding area. The unit will take part for the eco-development measures including community welfare measures in the project area for the overall improvement of the environment through Hazira Industrial Association and GPCB. The proponent has planned extensive pollution control and environmental conservation measures with CER.
- **Sustainable Livelihood Options and Women Empowerment**
- **Education Initiatives** such as Scholarship for education excellence; Promotion of girl child education; Incorporation of extracurricular activities etc.
- **Health Initiatives such as** Support to the nutritional program of mother, child and school goers, Support the district health administration in the community health activities; Knowledge enhancement on preventive health care etc.
- **Community Infrastructure and Facilities such as** Enhancement of green coverage, Promotion of renewal energy etc.

Sanghi Industries Ltd will spent **Rs. 4.24 Cr** under CER activities and the budget allocated for the next five year CER Plan in given in Chapter 10.

8.4 OTHER TANGIBLE BENEFITS

- Project will encourage industrial growth of this sector specifically in cement industries in the region;
- The company will have market growth of its own brands name in various overseas countries;
- The company will cater needs of the domestic market also.

- Project will gain income and upsurge the turnover of SIL directly or indirectly.
- Employment opportunities would increase directly.
- More infrastructure will develop in the region due to proposed project.
- Migration of the local people will decrease in search of employment.
- Medical facility will be increased and chances to save life.
- Government will earn huge revenue by way of various taxes and levies and transportation through sea route.

8.5 SUMMARY

The project activity and the management will support the local villagers and provide other forms of assistance for the development of public amenities in this region. The management will recruit skilled and unskilled workers from the nearby villages. Local construction workers will be employed from surrounding area. It is estimated that 500 Nos. of Local workers (skilled and semiskilled) will get direct employment during construction phase. It is estimated that 280 nos. technical people will get direct and other contractor worker will get indirect employment during operation phase. Sanghi Industries Ltd. has allotted Rs. 4.24 Cr for corporate environmental responsibility (CER) for next 5 years.

9 ENVIRONMENTAL COST BENEFIT ANALYSIS

9.1 GENERAL

Environmental Cost Benefit Analysis (CBA) is an analytical way to make an educated decision regarding the commencement of an industrial activity or similar trade/commercial/infrastructure activity. This involves a comparison of the costs of an action with considerations of the benefits associated with that action. CBA assists the regulators to evaluate the benefits and challenges imposed by the upcoming activity in commercial terms with respective to the impact on the environmental scenario such as human wellbeing, quality of life and environmental wellbeing.

An important component of a CBA is a base situation which is a situation when no changes take place. All decisions are then compared to the base situation. Once the base and a relevant time period are established, benefits and costs can be calculated in terms of human and environmental well-being. In this case, a benefit is defined as anything that increases human well-being, and a cost is anything that decreases it. CBA aims to maximize economic efficiency at a point where marginal benefits and marginal costs are equal.

9.2 APPLICABILITY OF CBA AND SUMMARY

During the scoping/ToR stage, no recommendation of environmental cost benefit analysis was suggested by the appraisal committee. Hence, conducting a detailed CBA is deemed not necessary for this particular project.

10 ENVIRONMENTAL MANAGEMENT PLAN

10.1 General

The Environmental Management Plan (EMP) constitutes an important part of the EIA report. The main purpose of EMP is to minimize the identified potential environmental impacts to be generated from the proposed project and to mitigate the consequences. SIL, on basis of the impacts identified, sets targets to reduce the negative impacts, plans and decides action plan to achieve the target effectively and efficiently. EMP ensures an effective implementation methodology and alternatives for mitigation measures planned/recommended to reduce or eliminate the adverse impacts to maximum possible extent during the operation of the proposed project.

10.2 OBJECTIVES OF ENVIRONMENTAL MANAGEMENT PLAN (EMP)

As mentioned in earlier section, EMP is a system to address potential adverse impacts, to instruct project proponent to introduce standards of good practice to be adopted for all project activities.

Following are long-term objectives of the Environmental Management Plan for all the environmental attributes:

- To comply with all the regulations stipulated by Central/State Pollution Control Board related to applicable laws.
- To create good working conditions.
- To encourage support and conduct developmental works for the purpose of achieving environment standards and to improve methods of environment management.
- Streamline environmental activities to add value to efficiency and effectiveness.
- To encourage and achieve highest performance and response from individual employees and contractors.
- To plan out the complete strategy to take care of stakeholder engagement.
- To contribute significantly for sustainable development

10.3 Concept of Waste Minimization (Reuse, Recycle & Minimization Techniques), Energy and Natural Resource Conservation Measures

Waste Minimization - 3RS

Reuse: Fly Ash generated from CPP and slag generated from nearby steel plant will be totally reused as raw material in cement grinding process.

Waste generated from construction activity will be utilized in leveling of land.

Recycle: Treated water from STP will be reused for cooling and greenbelt development.

The dust collected from pollution control equipment will be recycled in the process.

Recovery: The sludge generated from the STP will be used as manure for Green Belt Development / plantation.

10.3.1 Energy Conservation

Cement grinding process are energy intensive industries. Electric energy and fuel cost represent 40–50% of total production costs. To conserve energy and fuel various measures are taken in proposed project. Following measures will be implemented to make the project energy efficient. Process wise energy required per metric ton of product is listed below:

Feeding Raw Material: 0.65 kWh/MT

Cement Grinding: 34.00 kWH/MT for PPC & PSC & 31 kWH/MT for OPC

Bag Packing: 1.9 kWH/MT

i. Use of energy saving light fittings (LED).

ii. Manufacture of PPC and PSC along with OPC.

Possible Savings: Solar light system shall be installed in common areas, street lights, parking and the same shall be maintained properly.

Energy saving in raw material preparation

- Efficient transport systems for raw material preparation (Dry process)
- Raw meal blending system (Dry process)
- Raw meal process control for vertical mills (Dry Process)
- Use of roller mills for grinding (Dry Process)
- High efficiency classifiers /separators (Dry Process)

Energy saving in Finish Grinding

- Use Vertical roller mills for finish grinding
- Expert Process control and management in grinding mills for finish grinding
- High efficiency classifiers and fans
- High efficiency motors and adjustable or variable speed drivers
- Reduce leaks in compressed air systems
- Reducing the inlet air temperatures in compressed air systems
- Sizing pipe diameter correctly in compressed air systems
- Using LED lights and good lighting control for plant wide lighting

10.3.2 Natural Resource Conservation

i. Fly ash generated from the various local power plant/industries will be blended with clinker to produce cement. This practice will conserve large amount of Limestone reserves and the land which otherwise would be used for land filling of fly ash generated from the process.
ii. Use dry process based technology to reduce the water consumption by almost 90%.
iv. Recycle and reuse of the domestic waste water to conserve water resources.
vi. Surface rainwater runoff available from paved area, green area and open land shall be harvested.
vii. Rain water harvesting system will be installed to conserve rain water and to replenish ground water resources of the area for long term sustenance of the industry.
Also equipment will be selected considering Environmental protection measures in accordance with applicable Indian norms and standards.

10.3.3 Environmental Protection Measures

- Use of a simple, linear layout for materials handling operations to reduce the need for multiple transfer points
- Storage of pulverized coal in bunker.
- Storage of clinker in covered / closed bays or silos with mechanized extraction.
- Storage of cements in silos with automatic reclaiming and loading of bulk tankers. Implementation of automatic bag filling and handling systems to the extent possible, including using a rotary bag filling machine with fugitive emission control. Using automatic weight control for each bag during discharge.
- Conduct material handling (e.g. crushing operations, raw milling, and clinker grinding) in enclosed systems maintained under negative pressure by exhaust fans. Collecting ventilation air and removing dust using cyclones and bag filters.

10.3.4 Water Conservation

Rain Water Harvesting (RWH)

Rain Water can be harvested either storing in containers for ready use or charged into soil for withdrawal later *i.e.* ground water recharging. SIL has decided to installed Rain Water Harvesting system to prevent runoff and to help resource conservation. Storm water network will be designed

throughout the site for collection of roof top as well as internal runoff during the monsoon season. Pipeline and storm water drainage will be connected/ diverted to water harvesting area without any contamination or after removing impurities *i.e.* leaves, floating materials etc. The main elements of rain water harvesting systems are catchments, conduits and storage facility either above the ground or under the ground. During rainy season, the rain water will be collected from roofs in collection tank having adequate capacity and the collected water will be used for industrial activities. During rainy season, the rain water will be collected from roofs through closed pipes or separate drain channel. Typical rain water harvesting pit diagram is given in **Figure 10.1.**

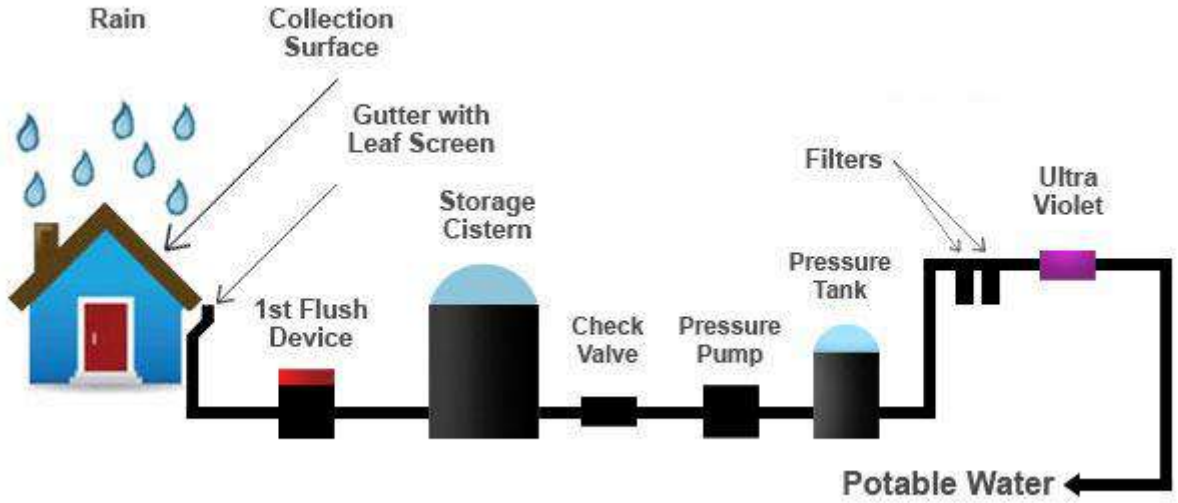


Figure 10.1: Typical Rain Water Harvesting diagram

Average Rainfall: 1192 mm

a. Roof top area available for RWH: 13710 m^2
   Rain Water that can be harvested: (13710) * (1.192) * (0.8) = 13074 m^3

b. Open & Greenbelt area available for rain water harvesting: 34850 m^2
   Rain Water that can be harvested: (34850) * (1.192) * (0.3) = 12462 m^3

Total Rain Water that can be harvested in Monsoon season = 25536 m^3

The 25536 m^3 rain water will be available in one season of 120 days; hence 213 per day rain water will be collected. Looking to 2- 3 days of storage; approx. 3 No. of 200 KL each storage tank will be provided at site for rain water harvesting, the collected rain water will be used for dust suppression and green belt development.

The effectiveness of the drainage system depends on proper cleaning of drainage pipes/channels *etc.* Regular checking before and during the monsoon will be done to see that none of the drains/drainage facilities are clogged and are efficient to collect the rainwater under rain water harvesting program. The clogged drains will be cleaned up immediately on report of any clogging or blockage. This checking and cleaning will be meticulous during the monsoon season, especially if heavy rains are forecasted.

10.4 ENVIRONMENT MANAGEMENT DURING CONSTRUCTION PHASE

There will be construction of Production plant, Office & laboratory area, Storage rooms, Utility buildings, etc. Anticipated environmental impacts due to proposed project during construction phase are already discussed in chapter – 4 of EIA report. Following environmental management plan will be implemented to mitigate any adverse impact or reduce the magnitude of impact. There will be no

long-term impact during construction phase. The project proponents, in order to minimize these impacts would undertake adequate preventive and remedial measures as outlined below:

10.4.1 Air Pollution Management

Potential sources of air pollution during construction phase are (i) dust emissions due to vehicle movement and (ii) exhaust emissions from diesel generators, construction equipment and vehicles. Moreover, Construction phase will be for a short period and hence the impacts will also be for a short and temporary period. The impact on air quality during construction phase will be minimized by adopting following mitigation measures:

- Dust suppression by regularly spraying water on roads and work sites shall be practiced.
- Wetting or covering stockpiles, the proper location of material stockpiles and covering loaded trucks during the transportation of material shall be ensured.
- Separate civil construction material storage yard will be created within the site and it will be enclosed.
- Use of low-emission vehicles and, wherever feasible, construction equipment powered by electricity shall be preferred.
- Maintenance of engines and use of vehicles with PUC Certificates. Contractors will be required to strictly implement these measures.
- Engines of idle vehicle machineries/equipment not in use, shall be turned off.
- All construction workers will be provided appropriate Personal Protective Equipment (PPEs) like dust mask, ear plug, helmet, safety belt etc. and made to wear them during working hours.
- Regular inspection for proper implementation of mitigation measures shall be done.

10.4.2 Noise Environment

Noise generation during construction phase is due to the operation of heavy equipment and increased frequency of vehicular traffic in the area. However, these impacts are short term, intermittent and temporary in nature. The effect of noise on the nearest inhabitants during the construction activity will be negligible. Following is the management plan to minimize/eliminate any noise impacts:

- Noise generation due to movement/operation of vehicles and equipment/ machineries shall be well managed by restricting the movement/operation during night hours.
- Management will ensure effective set up of traffic management system in order to minimize the usage of horns and other such equipment which may add to noise generation. Further the management will restrict the movement of heavy vehicles during night.
- All machineries to be used for construction purpose will be of highest standard of reputed make and compliance of noise pollution control norms by this equipment will be emphasized by company.
- Further, it will also ensure to carry out periodic and regular maintenance of the equipment, machines and spare parts which shall include lubrication, replacement of defective parts etc. in order to bring down the decibel of noise to maximum possible extent.
- Feasibility of putting up acoustic enclosure / temporary barrier around areas with high noise levels will also be explored.
- Management will ensure that no hazard is caused due to noise generation during the course of work. For this purpose the management shall ensure that the workers are provided with individual protective equipment like ear muffs or ear plugs in areas with high exposure to noise.

10.4.3 Water Environment

The water environment is likely to change due to the construction activity because of the effluents from sanitary facilities for the construction workers, washing of vehicles and spillage of fuels. Unauthorized dumping of waste oil shall be prohibited. Proper sanitation facility will be developed at the plant site. Mobile toilet facility will be provided for construction workers. Further the proponent

shall ensure to implement good operation practices to minimize the use of water, so as to reduce the depletion of water resource to maximum possible extent. Proper drinking water facility will be made available to the construction workers. The management will ensure proper management to avoid spillage of effluent which may cause seepage and contaminate ground water. Due care will be taken to avoid formation of stagnant pools, which may cause damage to the aesthetic condition as well as other environmental & socioeconomic factors.

10.4.4 Land Environment

As soon as the construction is over, the surplus earth has to be utilized to fill up low-lying areas, the rubbish is to be cleared and all un-built surfaces reinstated. The site will covered by shrubs and is devoid of trees. Thus, it does not involve any cutting of trees. Appropriate vegetation shall be planted after construction activity and all areas shall be landscaped.

10.4.5 Flora and Fauna

The measures required to be undertaken to minimize the impact on the ecology are:

- No vegetation clearance required and no trees in existence on land/site.
- No felling of trees will be done at site;
- The greenbelt having vegetation density of 1000 trees/ha will be developed.

10.4.6 Socio-Economics and Demography

Normally, the construction activity will benefit the local people in a number of ways such as supply of construction labourers-skilled, semi-skilled and untrained, secondary sector employment and provision of goods and services for daily needs including transport.

10.4.7 Storage of Hazardous Material

The hazardous materials anticipated to be stored at the site during construction include petrol and diesel, gas for welding purpose, paints and solvents. These materials shall be stored as per the international safety norms in ventilated enclosures. Site has to be identified for the storage of diesel away from the construction site. The major problem will be disposal of excess excavated earth generated during construction phase which shall be well handled by landfills to level the low lying areas.

- Construction waste shall be reused for PCC works, development of roads and misc. filling for construction works.
- Excavated soil shall be used for landscaping & gardening/greenbelt development
- Storage & handling of construction materials shall be done properly to avoid spillage or leakage.

10.5 ENVIRONMENT MANAGEMENT DURING OPERATION PHASE

10.5.1 Air Pollution

In the plant, main sources of emissions will be from stack attached to cement mill. The emissions of particulate matters from the stack will be limited to 30 mg/Nm^3. PM_{10} and $PM_{2.5}$ is considered as major air pollutants from this source. This is due to the handling of fine powders at each stage of manufacturing. The sources of air pollution from the grinding unit will be stack emissions and fugitive emissions. No process gas emission will be generated. The details of stack design, emission details, and control equipment for the proposed plant are given in **Chapter-2** and **Chapter-4**.

The maximum short-term 24 hourly incremental ground level concentration due to the operation of the plant are likely to be well within the NAAQ standards. Therefore, the proposed activity is not likely to have any significant adverse impact on the air environment.

Air Pollution Control Schemes

Adequate and efficient control equipment will be installed in plant. Major pollution control system and other ventilation systems will be installed in the cement grinding unit to keep the dust emission at a minimum. The details of the control equipment are given in **Table 2.10**. A suitably designed bag

house and Bag-filter will collect more than 98% of the incoming dust in flue gas and limit the dust concentration at its outlet to well within 30 mg/m^3.

- Unloading of coal from trucks will be carried out with proper care avoiding dropping of the materials from height. It is advisable to moist the material by sprinkling water while unloading.
- Dust suppression system will be installed in dust prone area.
- Fly ash will be handled in closed automated system and stored in covered silo.
- Thick greenbelt developed around the plant to arrest the fugitive emissions.
- The online monitoring of air emission will be installed as per CPCB guidelines.

Table: 10.1 Technical Description of Bag House

Item	Details	Unit	Cement Mill Bag House
General	Gas Volume	m^3/hr	1100000
	Dust Concentration	gm/m^3	400
	Inlet temperature	^oC	80-120
	Installed fan pressure	mbar	89
	Pressure drop	^oC	by supplier
	Dew point temperature	%	by supplier
	Inlet moisture	mg/Nm^3	by supplier
	Outlet emission	-	25
	Type of bag house cleaning	-	Pulse Jet type
Mechanical design condition	Temperature	^oC	150
	Pressure	Pa	by supplier
Material transport	Inlet temperature	^oC	120
	Capacity	TPH	500
	Type of dust	-	Fine cement dust
Dilution air fan specification	Ambient temperature	^oC	-
	Flow	m^3/hr	-
	Static pressure at rated capacity	mmWg	-

Fugitive Emissions

To control the fugitive emissions, the following measures are proposed:

- High efficiency pulse air jet type bag filters will be considered to arrest the air borne dust at all the locations where transfer of material are takes place;
- The automatic bagging machine with bag filters will be installed for packing plant;
- Unloading of coal trucks will be carried out with proper care avoiding dropping of the materials from height. It is advisable to moist the material by sprinkling water while unloading;
- The sprinkling of water will be done along the internal roads in the plant in order to control the dust arising due to the movement of vehicular traffic;
- All the workers inside the plant will be provided with disposable dust masks; and
- Thick greenbelt will be developed around the plant to arrest the fugitive emissions.

10.5.2 Noise Pollution Management

Noise generation from production activities and plant equipments/machineries will be confined within plant boundary. The greenbelt developed around the boundary of the plant will further attenuate the noise emitted by the various sources in the plant. Other than the regular maintenance of the equipment, earplugs will be provided for the personnel working close to the noise generating units as a part of the safety policy. Apart from this, some of the design features provided to ensure low noise levels are as follows:

- All rotating machinery are well lubricated and provided with enclosures as far as possible to reduce noise transmission;
- Provision of silencers will be made wherever possible;

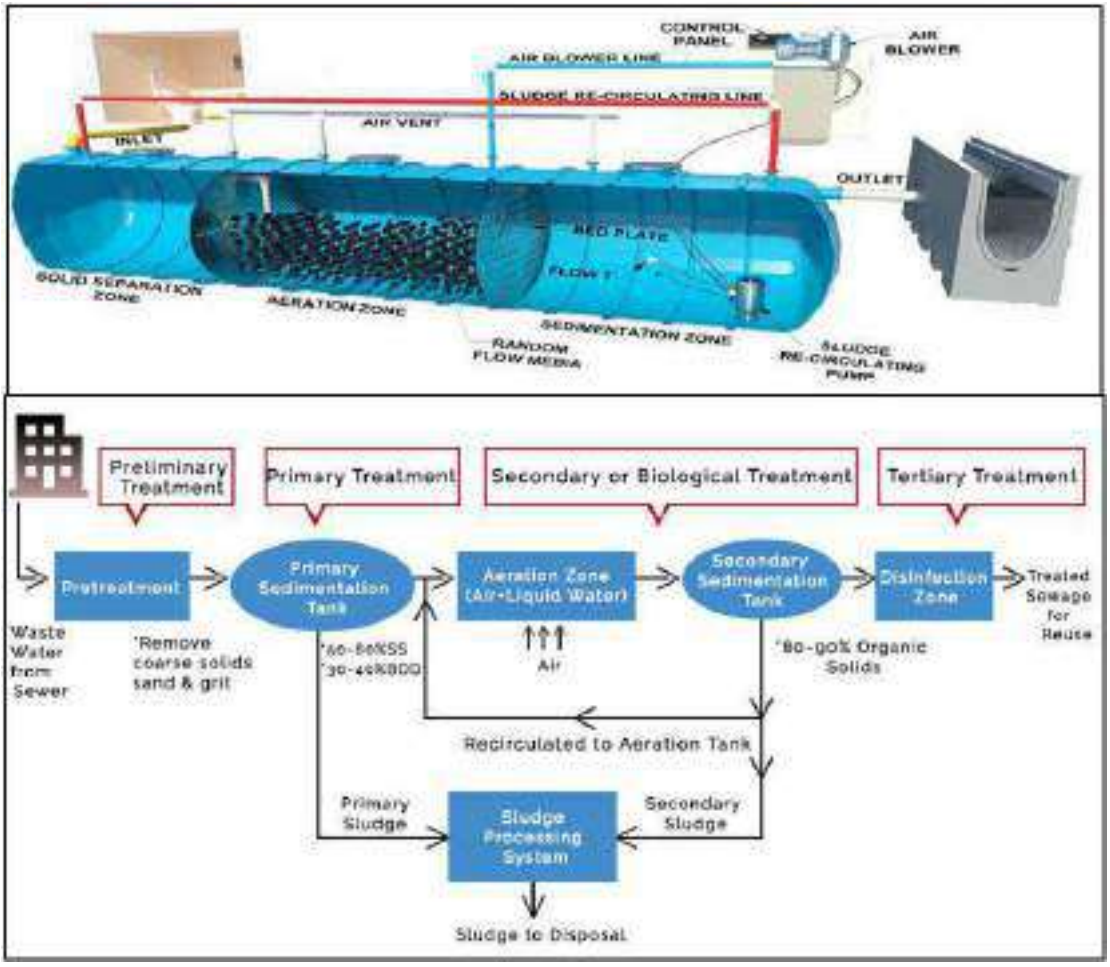
- The insulation provided for prevention of loss of heat and personnel safety also act as noise reducers;
- Layouts, equipment foundations and structures will be designed keeping the requirement of noise abatement in view.
- Necessary enclosures will also be provided on the working platforms/areas to provide local protection in high noise level areas;
- All equipment will be kept in a well maintained condition with proper lubrication and housekeeping to avoid excessive noise generation.
- The workers will be provided with ear plugs.
- Strict instruction to all the vehicles entering in plant premises not to blow horn unnecessarily and exceed the speed limit.

10.5.3 Water Pollution Management

The generated sewage will be treated in the sewage treatment plant having capacity of 15 KLD. Treated sewage water will be used for watering the greenbelt. In operations phase, waste water will be generated from cooling tower. The cooling tower blow down water will be recycled in dust suppression.

Wastewater Treatment -Sewage Treatment Plant (STP)

The Package Sewage Treatment Plant of capacity of 15 KLD will be proposed for the treatment of domestic sewage. This is a time tested system called the world over as the 'Activated Sludge Process (ASP)'. It is the oldest system worldwide and is the most used process world over. Treatment of sewage is based on a method provided by nature, i.e. by using microbial action. When a steady consistent supply of air is pumped into a tank containing sewage which has been screened to remove all floating debris and non-soluble contents in sewage, microbes which are present in it get activated. These microbes are present in the sludge which makes up a substantial part of sewage, and they consume the pollutants in the sewage while the air supply brings them to life and keeps them alive and multiplying. The flow diagram of the process is given below:



Basic treatment steps involved in sewage treatment plant are as follows:

Pretreatment: This treatment is the first step in processing waste water which is also called as mechanical/physical treatment process which needs to be done previous to primary treatment. During this stage, solids are removed through screening, sedimentation and skimming. Its major objective is to remove coarse solids through screening. Incoming wastewater called influent passes through mechanical screens consisting of bars where rags, sticks, papers, drinking cans and other similar items will get removed. It involves grit chamber to remove sand and grit. This treatment also removes excessive amount of oils and greases.

Primary Treatment: It is also known as physical-chemical treatment which is to be done prior to biological treatment called secondary treatment. It aims at removing organic and inorganic solids by the processes of sedimentation and floatation. Partially treated wastewater from preliminary treatment is allowed to pass through tanks called primary clarifier or sedimentation tank. During this treatment flow of wastewater is reduced to encourage sedimentation and thereby allowing the heavier solids to settle at the bottom and significant amount of floating material such as grease and oil will rise to the surface and be skimmed off. The settled solid is called as primary sludge which will be used as manure in greenbelt development. This particular treatment removes about 50-60% of influent suspended solids and reduces BOD level up to 30-40%. The clarified water flows on to the next step of treatment.

Secondary Treatment: This treatment is referred as biological treatment process which generally uses one of the biological aerobic processes called —Activated sludge process" to degrade organic matter. During this process, primary effluent enters into aeration tanks, where it is mixed with microorganisms. Air is pumped into aeration tanks and hence bacteria growth will get increase to breakdown the organic matter that still present in the effluent. Now aerated wastewater flows into secondary clarifier where heavier particles and other solids settle to the bottom as secondary sludge. Some of the sludge will be re-circulated back to aeration tank to stimulate activated sludge process

to remove as many pollutants as possible. The remaining sludge is removed from the tank and mixed with primary sludge in sludge processing system will be used as manure in greenbelt development. This stage removes about 80-90% of organic solids. Once the water moves out of this stage, it enters into last stage called tertiary stage or disinfection stage.

Tertiary Tr eatment: It is the final stage in packaged sewage treatment plant which involves physical, chemical or biological processes to remove any residual or remaining suspended solids and dissolved solids. Even after primary and secondary treatment, treated wastewater may contain some disease causing microorganisms and that is why disinfection is required. Disinfection disinfects and kills harmful microorganisms from the effluent and it is done by using disinfectants like chlorine, UV light or other chemical disinfectants. Tertiary treatment is also called as disinfection treatment which is an essential step because it protects humans' health. The treated water coming through entire process will be reused for greenbelt development, firefighting and dust suppression in the plant.

Salient Features of Packaged Sewage Treatment Plant:

- Treated water quality within permissible limit by SPCB / CPCB
- Underground structure with compact design and completely covered plant.
- No foul odor around the STP area or in the receiving environment.
- Does not require continuous monitoring and operation.
- Works well with inconsistent grey water flow.
- Minimal sludge generation and extremely low Maintenance.
- 50 – 70% less power consumption compared to other treatment

Waste water Disposal

The treated water will be used for dust suppression and plantation. there will not be any adverse impact on the water quality as no waste water will be discharged outside the plant premises.

10.5.4 Solid Waste Management

Dust collected from air pollution control equipment will be 100% recycled in process and thus there will be no solid wastes in cement grinding process. There is no any hazardous waste will be generated from the project. Ash generated by the HAG will be 100% utilized in cement manufacturing process (PPC) Dust collected from air pollution control equipment will be totally recycled in process. A part of used oil (60 MT/annum) will be utilized for lubrication purpose & remaining will be sent to own clinker unit located at Sanghipuram, Kutch.

Cleaner Production Activities:

The project proponent is committed to implement strategy of cleaner production activities since equipments / machineries selection / designing stage and considered various technology alternatives. Following strategy is implemented for cleaner production activities.

- Installation of Vertical Roller Mill – Following are the benefits of selecting the technology.
  - ✓ Energy efficiency - Consume less electrical energy compared to ball mill system
  - ✓ Simple with a compact layout - Requires about 70% of the ball mill system area and about 60 percent of building space.
  - ✓ Product quality is stable and easy to detect
  - ✓ Generate less noise compared to ball mill system
- Installation of new age bag filter with membrane filter bags as a mitigation measures of air pollution
- Cement will be manufactured by dry process technology. No waste water will be generated from the process.
- The domestic sewage will be treated in STP and utilized for greenbelt development
- Slug generated from STP will be utilized as manure in greenbelt development
- Blended cement will be manufactured from the proposed plant hence fly ash and slag generated from other industries will be recycled under alternative fuel and Raw material (AFR Scheme).

Table 10.2: Environmental Management Plan

#	Aspects due to proposed activity	Impact zones	Management plan	Responsibility
Air Environment				
1.	Dust generation	Near storage area	➢ Dust collection system will be provided ➢ De-dusting bag filter will be provided.	EHS In-charge/ EHS team
2.	Dust generation due to grinding of Clinker with other materials.	Near grinding area	➢ Dust collection system will be provided ➢ Ensured continuous monitoring SPM concentration as per consent norms. ➢ Bag filters are proposed as APCM to control fugitive emission	EHS In-charge/ EHS team
3.	PM_{10} emission due to operation of Hot Air generator and operation of drying and cooling section in process	--	➢ Stack of 55m will be provided. ➢ Ensure monitoring of stack for SPM concentrations as per regulatory norms	EHS In-charge/ EHS team
4.	Transportation activities during construction and operation phase	nearby highway/Sea route	➢ Transportation of raw materials and finished goods will be carried out in well covered trucks ➢ Traffic Management Plan will be made and followed ➢ Records will be maintained for entry and exit of vehicles	EHS In-charge/ EHS team
Water Environment				
1.	Sewage generation due to Influx of workers during construction and Operation phase	Within plant premises	➢ Sewage will be treated into Sewage treatment plant.	Design Head
2.	Consumption of water for operation of plant	Fresh water reservoir	➢ Online flow meters shall be installed at each of raw water consumption point. ➢ The fresh water demand will be reduced by recycling and reuse of waste water	EHS In-charge/ EHS team
Land Environment				
1.	Soil Contamination due to Settling of particulate matter on nearby vegetation field		➢ Highly efficient bag filter shall be installed to collect particulate matter. ➢ Plant load will be lowered during monsoon season ➢ Green belt will be developed around the plant area	Design Head/ EHS In-charge/ EHS team
2.	Generation of ash from operation of Hot Air generator	Within plant premise	➢ Ash generated by the HAG will be 100%	EHS In-charge/ EHS team

			utilized in cement manufacturing process (PPC) Dust collected from air pollution control equipment will be totally recycled in process.	
3.	Generation of scraps during construction and operation phase	Within plant premise	➢ Ensuring that solid waste are handled as per Solid Waste Management Rule, 2016 and sold to registered and authorized vendors	EHS In-charge/ EHS team
Noise Environment				
1	Noise from operation of crushing and grinding units in plant	Within plant premise	➢ Green belt will be developed around the site with noise absorbing trees ➢ Proper maintenance of equipment will be done ➢ Proper PPE like Ear Plugs & ear muffs will be provided	Plant In-charge/ EHS In-charge/ EHS team
2	Noise from operation of D.G set etc.	Near utility area	➢ Proper maintenance of equipment will be done ➢ Inbuilt acoustic enclosures will be ensured	Plant In-charge
3	Noise due to Transportation of raw material and finished goods	Within site and transport route	➢ Valid PUC vehicles will be ensured during construction and operation phase.	EHS In-charge/ EHS team
Risk and Hazard				
1	Emergency preparedness	Within site	➢ Fire protection and safety measures to be taken ➢ Safety training to avoid accidents ➢ Mock drill records, on site emergency and evacuation plan	EHS In-charge/ EHS team

10.6 ECOLOGICAL GREEN BELT DEVELOPMENT

Greenbelt areas have been proved to be an ideal place for diversified flora and fauna and it will improve air quality within premises, act as barrier for noise propagation and also add aesthetic beauty of the industrial area. SIL proposes to develop 16500 m^2 (>33%) greenbelt area of total land *i.e.* 48563.0 m^2. The company will develop green belt along the periphery of the plant site and in common premises available outside the company premises after consultation with horticulture expert. Domestic species suitable for the local climatic conditions, perennial and evergreen trees, Air pollution resistive plants will be considered to be planted in the proposed greenbelt area.

The following points will be considered for selection of plants species to be grown:

- Greenbelt absorbs both gaseous as well as particulate pollutants to a great extent. Thus, removes/reduce pollutant from the atmosphere. For absorbance of gases, the duration of the foliage should be longer.
- Characteristics of tree/plants including shapes of crowns considered necessary for effective removal of dust particles.

- Greenbelt/Plant species having good root system will be selected, so that soil erosion rates can be controlled significantly.

The greenbelt will provide benefits to improve beautification of plant. It will also result in the prevention of land degradation due to industrial activities; enhancing the canopy cover as a wind breaker wall and restrict the carry away dust outside the premises as well as act as noise barrier. Proposed green belt area will comprise of rows of varying height of trees of native species with thick foliage, along the periphery of the unit. Approx. 4125 Nos. of trees and varieties of local shrubs will be planted within next five years. The proposed greenbelt will be developed in three tier manner which is mentioned below:

Table 10.3: Greenbelt Development in Three Tier

S. No.	Tire	Habit	Height (m)	Rows
1.	1st Tier (Towards Boundary)	Trees	10-20	4
2.	2nd Tier (Middle layer)	Small Trees	5-10	6
3.	3rd Tier (Towards Plant)	Shrubs	1-5	Thick Pattern

Roadside Plantation: Separate list of herbs/shrubs/trees should be given for roadside plantation and for Lawn also. The Green belt should not be inclusive of lawn, etc.

For the Calculation of Cost for Green belt Development, following parameters has been considered.

For Capital Cost

a) Cost of Sapling (Trees)
b) Shrub/Herbs
c) Transportation Charges
d) Planting cost (Including soil workings, pits etc.)
e) Fencing Cost

For Recurring Cost:

a) Cost of drip irrigation
b) Annual weeding and soil working
c) Req. of water for irrigation
d) Fertilization Cost
e) Security and Vigilance

A budget of **Rs. 20.00 Lakhs** as a capital cost and **Rs. 12.00 Lakhs per Annum** as a recurring cost has been allocated for green belt development.

Table 10.4: Year wise Greenbelt Development Program

S.No.	Year	No. of Trees	Remarks
1.	Ist	1200	The green belt will be developed in 3 tier plantation as per guideline. The heighted tree with 10-15 m will be planted in the first row from the boundary and then gradually smaller tree will be planted to make green belt and to arrest maximum fugitive emission from the unit.
2.	IInd	1000	
3.	IIIrd	825	
4.	IVth	700	
5.	Vth	400	
Total		4125	

Table 10.5: List of Trees and shrubs to be planted

S.No.	Name of Species	Common Name	Ecological Performance	Place/s to Plant tree/s as per MoEFCC/CPCB
1.	*Acacia auriculiformis*	*Earleaf* Acacia	CN, DC	Periphery GB, RWH tank
2.	*Acacia nilotica*	Desi Babool	CN, DC	Periphery GB, Agriculture hedges
3.	*Acrus sapota*	Chikoo	CN, DC, OG	Orchard P, Agriculture hedges
4.	*Adina cordifolia*	Kadam	CN, DC, OG	Periphery GB, Public Place
5.	*Aegle marmelos*	Bel	CN,DC	Periphery GB, Public Place
6.	*Annona squamosa*	Custard apple	CN, DC, OG	Orchard P, Agriculture hedges

7.	*Azardirachta indica*	Neem	CN, DC, OG	Periphery GB, Agriculture hedges
8.	*Bombax ceiba*	Silk Cotton tree	CN, DC, OG	Periphery GB, RWH tank
9.	*Casuarina equisetifolia*	Jungli saru	CN	Road Side P, Water Body, Public Place
10.	*Cocos nucifera*	Coconut	DC	Road Side P, Agriculture hedges
11.	*Delonix regia*	Gulmohar	DC	Periphery GB, Road side P, Agriculture hedges
12.	*Ficus bengalensis*	Vad	CN,DC	Periphery GB, Public Place
13.	*Ficus reeimosa*	Fig	CN, DC, OG	Periphery GB, Agriculture hedges
14.	*Ficus religiosa*	Peepal	CN, DC, OG	Periphery GB, Public Place
15.	*Leucaena leucocephala*	*Lead tree*	CN, DC	Road Side P, Water Body, Agriculture hedges
16.	*Mangifera indica*	Aam	CN, DC, OG	Orchard P, Agriculture hedges
17.	*Millettia pinnata*	Karanj	CN, DC, OG	Orchard P, Water Body
18.	*Moringa oleifera*	Drum stick	CN, DC	Road Side P, Public Place
19.	*Pithecellobium dulce*	Sweet Tamarind	CN, DC	Orchard P, Agriculture hedges
20.	*Psidium guajav*	Guava	CN, DC, OG	Orchard P, Agriculture hedges
21.	*Saraca asoca*	Ashoka Tree	CN, DC	Road Side P, Admin
22.	*Tamarindus indica*	Imli	CN, DC, OG	Orchard P, Public Place
23.	*Tectona grandis*	Teak	CN, DC	Periphery GB, Water Body
24.	*Terminalia arjuna*	Arjun	CN, DC, OG	Road Side P, Public Place
25.	*Terminalia catappa*	Badam	CN, DC, OG	Orchard P, Public Place

Ecological Performance: CN –Control Noise level, OG – Absorb Gas Emission, DC - Dust Controller Places- 1. Project area: Periphery, Road side and Orchard Plantation. 2. Road side Plantation, Agriculture hedges, Water body, public place like school, Panchayat, forest land etc.

Regular monitoring and care will be taken with all necessary works like thick plantation, irrigation, fertilization, re-plantation (if required), pest control and other allied factors to achieve adequate growth of greenbelt. Records of the greenbelt development as suggested in environmental monitoring plan shall be maintained and protection of greenbelt area shall be ensured by the project proponent.

10.7 OCCUPATIONAL HEALTH AND SAFETY

The proponent is very much concerned in terms of health, safety and environment protection. The company shall engage a qualified safety Manager and a doctor for regularly checking health of the employees. Additionally, medical aid will be arranged with the help of local hospital. Annual health check of the employees shall also be carried out and records will be maintained. Regular training to plant personnel in safety, firefighting and first aid shall be provided. The following key safety measures shall be implemented in the proposed project:

Construction Phase

The management shall ensure that all workers/employees are provided with basic PPEs like ear plug/muff, safety helmet, face mask, safety gloves, safety goggles, safety shoes etc. PPEs will be properly checked before providing to the workers. It shall also be ensured that all the safety equipments are placed properly and are available instantaneously when required. Safety and first aid facility will be provided to the workers/employees engaged in construction activities. Necessary safety training will be imparted to unskilled workers/ trainee employees in various aspects, viz. handling of the materials, precautionary measures to be taken while working, how to use the safety equipments, etc. to minimize the chances of any accidental mishaps. Adequate and basic sanitary facilities like drinking water, toilet, etc. will be provided to laborers. Arrangements for medical facilities will also be made in case of any disturbance in health/accident during the course of construction work

Operation Phase

The company is very much concerned in terms of health, safety and environment protection. They shall arrange doctor for regular checking health of the employees and medical aid with the help of local hospital. Regular training to plant personnel in safety, firefighting and first aid shall be imparted. To maintain high standards in health, safety and environment; various activities will be undertaken at the site. The following key safety measures will be implemented for proposed project:

- Safety training will be provided to the employees
- Safety sirens with alarm system in case of emergency will be provided
- Emergency control room will be established
- Firefighting network including fire extinguishers, fire hydrant system etc. covering entire plant will be provided
- First aid boxes at appropriate place and safety training will be provided
- Personal protective gears and equipment will be provided to the employees
- Health checkups will be organized at regular intervals
- Proponent will make provision of industrial hygienist and monitoring of the occupational injury and maintain the record of the same as per requirement of Gujarat Factories Rules
- All firefighting equipment and warning devices will be kept in perfect working conditions at all the times. It will be seen that all personnel are aware of the implications of environmental pollution and simple practices to avoid pollution

List of Personal protective equipment is listed in chapter 7 and will be made available easily to all workers and visitors as per requirement. A capital Budget of Rs. 49.85 Lakhs and Rs. 18.30 Lakhs/Annum as recurring cost has been allocated for Occupational Health and Safety.

Table 10.6 Budget for Fire, Safety & Health

S.No.	Particulars	Estimated Cost (Rs. Lakhs)	
		Capital	Recurring
1.	Installation of advance fire frightening system	38.65	6.50
2.	Health Checkup camp	0.00	5.20
3.	PPE and safety aids	1.20	5.10
4.	Training and awareness programs	10.00	1.50
	Total	**49.85**	**18.30**

Housekeeping

Proper housekeeping is an essential part of sound environmental management. It will be rigorously seen that there is no accumulation of wastes, especially combustible wastes inside the plant area. Regular maintenance of greenbelt area will help to reduce to dusting and noise level around the plant.

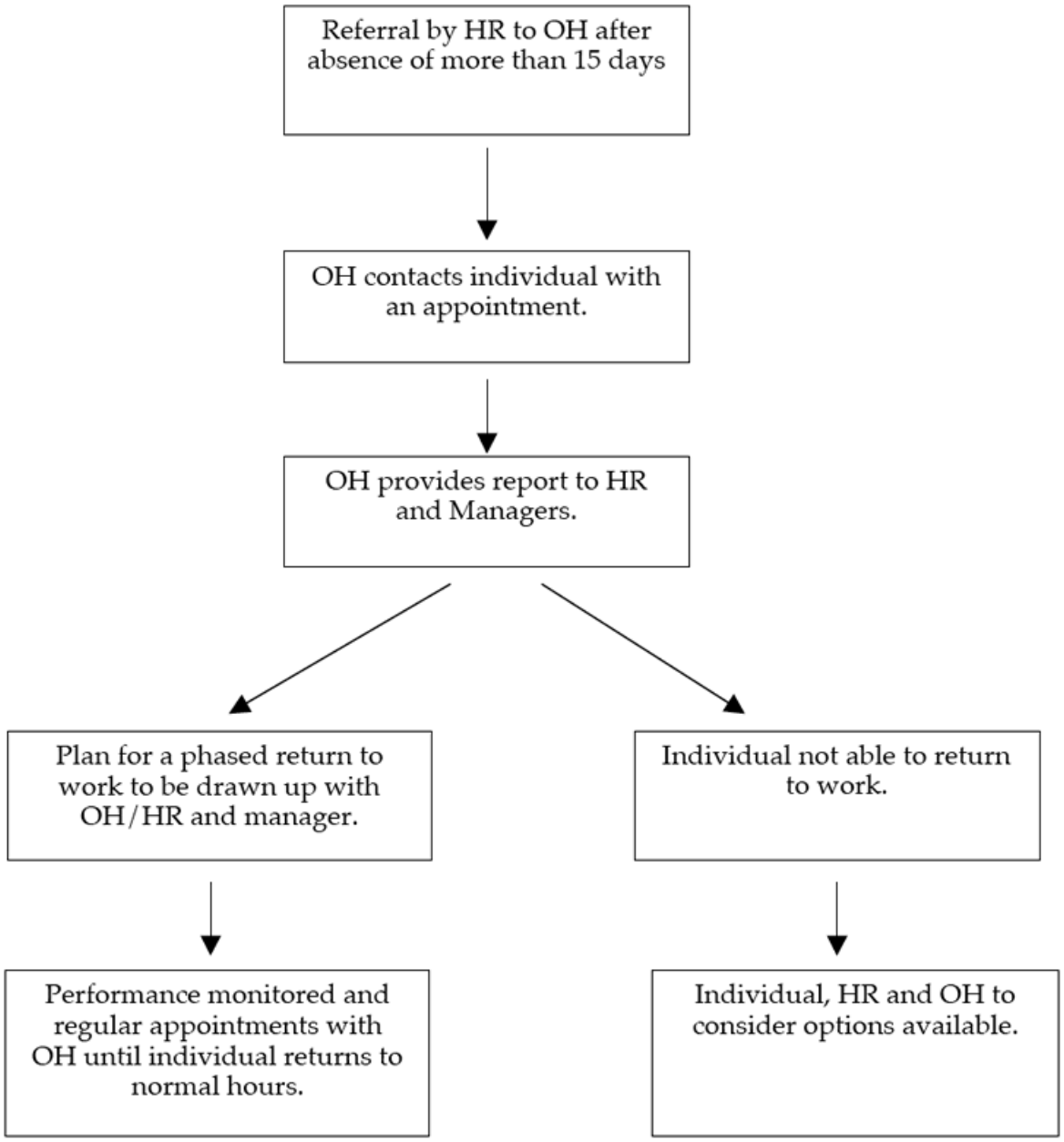


Figure 10.2: Process flow for occupation Health Surveillance

10.8 Enterprise Social Commitment

CER is linked to sustainability and mainly based on the social and environmental consequences. SIL will focus on education, health care, environment area and following activities will be covered in CER plan. Approximately Rs. 424.00 Lakhs (~1.5%) is been allocated for following CER activities for next five years.

Table 10.7 Planned Activities under CER

S.No.	CER Activities	Cost (Lakhs)
1.	Drinking water facility in nearby village	75.00
2.	Up-gradation and hygiene facilities in nearby village	149.00
3.	Plantation in community areas	55.00
4.	Training and Awareness Program	75.00
5.	Education & Farming related activities	70.00
Total		**424.00**

These activities are tentative and can be modified as per actual need time to time on implementation along with budget. The annual budget is fixed as per given in last column.

10.9 ENVIRONMENTAL POLICY

10.9.1 Corporate Environmental Policy (CEP)

Sanghi Industries Limited (SIL) has a well laid down Corporate Environmental Policy (CEP) that includes the standard operating procedures (SOP) for reporting on the performance of environmental management system for improvement further, the administrative order of company to deal with the environmental issues and the reporting mechanism of non-compliance /violation of environmental norms. Environmental Policy is attached as **Annexure VI.**

Corporate Environmental policy of SIL comprises of the following:

1. Creating awareness among its personal on the impact of their actions on the environment and encouraging sound environmental management practices in their day to day activity.
2. Adoption of State of Art Technology for Prevention and Control of Environmental impacts.
3. Conduct the operations in compliance with applicable environmental laws, regulations and standards.
4. According the highest importance to continual improvement and prevention of pollution by instituting the practices and procedures which would reduce wastage and reduce energy to conserve natural resources. Review facilities and programs on regular basis and establish monitorable targets, quantified as appropriate for continuous improvement of our environmental performance.
5. Conversion of waste into wealth and optimum utilization of natural resources helps in reducing carbon footprints.
6. Identification and Evaluation of Non-Conformance and/or Non-Compliances to determine specific corrective and preventive actions. Management review of corrective actions to ensure the status and effectiveness of the actions.

10.9.2 Environmental Management Cell (EMC)

An Environment Management Cell will be developed by an effective mixing of a group of technical experts from various departments of the project to look after the all obligatory requirements and shall be responsible for the effective implementation of all environmental pollution control measures. The organizational set-up for the environment management cell proposed for the project is given in below figure. The cell shall be headed by the General Manager, who will be reporting to the higher authority.

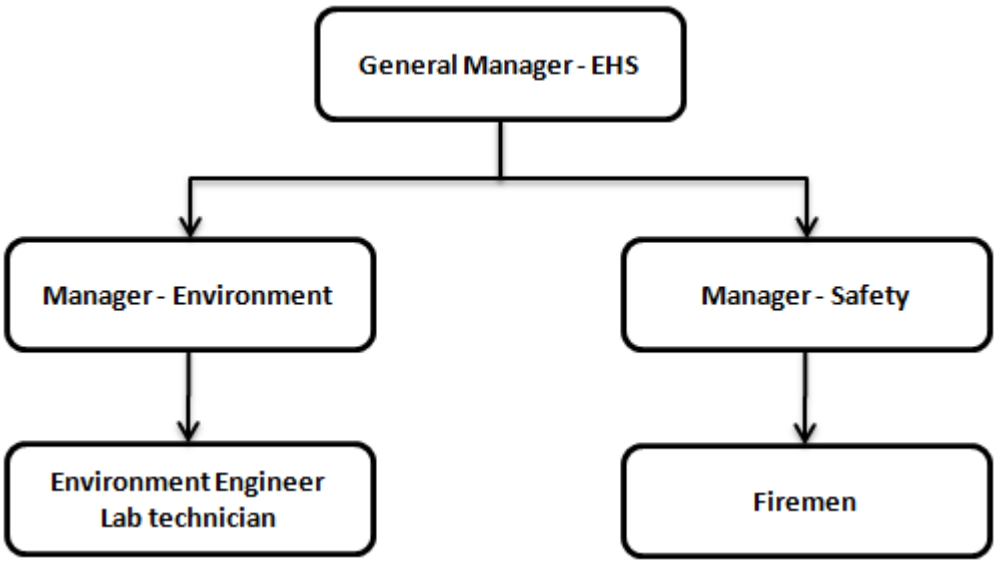


Figure 10.3 Organization Chart

10.9.3 Role and Responsibility of EMC

The major duties and responsibilities of EMC are:

- To implement the EMP.
- To assure regulatory compliance with all relevant rules and regulations stipulated by SPCB/CPCB/MoEF&CC
- To treat the sewage and effluent to be generated from the proposed project in a full-fledged STP for adequate treatment.
- To ensure regular operation and maintenance of air pollution control devices
- To minimize environmental impacts of operations as by strict adherence to the EMP
- To initiate environmental monitoring as per approved schedule
- Review and interpretation of monitoring as per approved schedule
- Review and interpretation of monitoring results and corrective measures in case monitored results are above the specified limit
- To plan and schedule environmental conservation and protection activities for the purpose of achieving environmental standards and to improve methods of environmental management practices.
- To improve working environment for employees by implementing mitigation/control measures for Occupational Health and Safety and by improving condition of workplace environment.
- To make budgetary provision and allocate funds for environment management system and to ensure timely revision of budgetary provisions.
- To implement and ensure effective implementation of planned mitigations including R&D program for innovative technologies for better environment, resource conservation / recovery / recycling / reuse especially to promote waste utilization.
- To encourage and inspire employees and contractor for highest performance and attentive response for environmental conservation, protection and improvement.
- Maintain documentation of good environmental practices and applicable environmental laws as ready reference
- Maintain environment related records
- Coordination with regulatory agencies, external consultant, monitoring laboratories
- Maintain log of public complain and the action taken

10.10 BUDGETARY PROVISION FOR ENVIRONMENTAL MEASURES (EMP)

Proposed project cost is estimated to be **Rs. 282.28 Cro res** which includes cost towards land, construction, machinery purchase and other facilities to be provided for environment management plan. Capital cost of EMP estimates based on cost of wastewater treatment facility, air pollution control equipments, waste management facility, greenbelt development & management plan, safety measures and other components of the EMP shall be implemented along with the commissioning of the proposed project. Total Rs. 911.0 Lakhs is allocated for Environmental control measures/Environmental management plan. To achieve the prescribed norms for water, air and waste it is necessary to operate the EMP regularly. The budgetary provision made for environmental management is briefly illustrated in table below.

Table 10.8: Budgetary Provision for Environmental Management Plan

S. No.	Particulars	Capital Cost (Lakhs)	Recusing Cost (Lakhs/annum)
1.	Air Pollution Control Devices	752.15	85.00
2.	Water Pollution & Reclamation	35.00	5.60
3.	Occupational Health and Safety	49.85	18.30
4.	Environmental Monitoring	54.00	27.81
5.	Green Belt Development	20.00	12.00
	Total	**911.00**	**148.71**

10.11 COMPLIANCE WIT H CORPORATE RE SPONSIBILITY FOR ENVIRONMENTAL PROTECTION (CREP) GUIDELINES

Sanghi Industries Ltd shall ensure to protect the environment in the following manner which is described below:

- Conservation of water
- Conservation of natural resources
- Elimination of toxic substances
- Waste water treatment
- Emission control
- Solid Waste Management
- Monitoring of Effluent, Emission and Ambient Air Quality
- Creation of Environmental Cell

10.12 SUMMARY

The main purpose of EMP is to minimize the identified potential environmental impacts to be generated from the proposed project and to mitigate the consequences. During operation phase the industry will maintain comprehensive environment management plan in place for the proposed project which shall covers all the environment protection measures to mitigate improvised environmental impact. Cement grinding unit (GU) will be operated on the dry process technology; water will be used for mainly cooling and domestic purpose. The sewage wastewater treated in the proposed sewage treatment plant of 15 KLD. Treated sewage water is will be used for watering the greenbelt and dust suppression. Adequate and efficient control equipment will be installed and will meet the prescribed emission. Major pollution control system and other ventilation systems will be installed in the proposed cement plant to keep the dust emission at a minimum. Approximately Rs. 4.24 Crores has been allocated for CER for next five years. Approx. 4125 Nos. trees will be planted within next five years. SIL will formulate an Environmental and Safety Management Cell (EMC) as an integrated managerial body from various disciplines to co-ordinate the project activities concerned with implementation of environment control measures and management.

11 SUMMARY & CONCLUSION

11.1 PROJECT DESCRIPTION

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at at, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi, Dist.- Surat, Gujarat. This activity falls in Category- B under Project/Activity 3(b) schedule as per EIA Notification dated 14th September, 2006, as subsequent amendments. The company has well defined vision, mission and values that the company follows on its path to success. It has a vision to be the business leader, delivering superior value to all our stakeholders with a mission to achieve profitable growth and customer delight through innovation, operational excellence, leadership and teamwork to add value for all stakeholders and society. The coordinates of the site presented below as:

Latitude	Longitude
21° 9'0.78"N	72°39'3.62"E
21° 9'0.29"N	72°39'5.47"E
21° 9'0.46"N	72°39'11.28"E
21° 8'55.54"N	72°39'11.61"E

Table 11.1 Environmental Sensitivity

Particulars	Description
Nearest Village	Shivrampur @.1.5 Km in SW direction
Nearest City/ District	Surat @ 16.0 Km in ESE
Nearest Highway	NH-6 @ 0.9 km in East
Stream / Rivers	Tapi River @ 0.89 km in East
Nearest Industry	L&T, Reliance, Essar etc.
Nearest Sea	Arabian sea
Nearest Historical, religious and other important cultural places	None in 10 km radius
Forest & Wildlife Sanctuary/National Parks, Biosphere Reserves	
Nearest Hill/Mountain	
Defense Installation	

Table 11.2. Project cost - Rs. in Lakhs

S.No.	Description	Amount (Rs. Lakhs)
1.	Land & Site Development	3819.0
2.	Civil works & Structures	7633.0
3.	Plant & Machinery	13334.0
4.	E & I Installation	2390.0
5.	Environment Management system	911.0
6.	Engineering	130.0
7.	Lab equipment/set up	0.50
8.	Expense on Training	10.0
9.	Contingency	0.50
	Total	**28228.0**

Table 11.3 Bifurcation of Plot area

#	Particulars	Total Area (in Ha.)	Area
1.	Production Plant	0.712	14.66%
2.	Office & Lab Area	0.022	0.46%
3.	Raw Materials Storage Area	0.632	13.01%

4.	Solid Waste Storage Area	0.005	0.10%
5.	Open Space	1.835	37.79%
6.	Green Belt	1.650	33.98%
	Total	**4.856**	**100.00%**

11.1.1 Water

Source: Local Body/Irrigation Department
Requirement: 278 KLD (Fresh Water = 200 KLD)

Table 11.4 Water Consumption

S. No.	Particulars	Water Consumption, (KLD)
A.	**Domestic**	**15.0**
B.	**Industrial**	
1.	Processing/Cooling	150
2.	Dust suppression & Fire Fighting	10 KLD Fresh Water + 58 KLD from Blow down = 68 KLD
	Total Industrial	**160.0**
C.	**Gardening**	25 KLD Fresh water + 20 KLD recycled= Total 45
	Total Fresh water Requirement	**200.0**
	Total water Requirement	**278.0**

11.1.2 Electricity

The estimated power demand for the proposed grinding and packing plant is estimated as 13.5 MW, which will be sourced from state electricity board/wheeling from CPP at Sanghipuram.

11.1.3 Fuel

Approx. 12 TPH coal/lignite/petcoke will be required for HAG.

11.1.4 Manpower

Particulars	Construction Phase			Operation Phase		
	Direct	Indirect	Total	Direct	Indirect	Total
Skilled	45	280	325	20	30	50
Semi – Skilled	-	100	100	-	125	125
Unskilled	5	70	75	5	100	105
Total	**50**	**450**	**500**	**25**	**255**	**280**

11.1.5 Raw material

S.No.	Material	Requirement per Annum - Million Ton/Annum			
		100% OPC	100% PPC	100% PSC	Max per Annum
1.	Clinker - OPC	1.90	--	--	1.90
	Clinker - PPC	--	1.20	--	
	Clinker - PSC	--	--	1.10	
2.	Gypsum	0.10	0.10	0.10	0.10
3.	Fly Ash	--	0.70	--	0.70
4.	Slag	--	--	0.80	0.80
5.	Lignite / Coal / Petcoke	--	--	0.06	0.06

Magnitude of the Operation

Total cement produced per day = 2,000,000/ 330 = 6,060 T

Cement storage of 3x7,000 t multi compartment silo, is proposed, which is adequate for about 3 day of production. Cement from the grinding system is transported to the silos with the help of air slides and bucket elevators. From the silos, cement shall be transported to the packer with the help of a set of air slides and bucket elevators.

11.1.6 Air Environment

There will be fugitive emission from cement mill, Hot Air generator and packing of cement; while there will be no process gas emission.

Table 11.5: Fugitive Emission

S.No.	Location	Qty. Nos.	Capacity	Stack Details
C. Main Process Bag house				
A1	Cement Mill (VRM)	01	11,00,000 m^3/hr	Height – 55 m Dia – 3.2 m Air emission: PM 30 mg/Nm^3 SOx 100 ppm NOx 100 ppm
D. De-dusting Bag filters				
B1	Clinker & additive unloading station	02	11,000 m^3/hr	--
B2	Clinker Silo top	01	25,000 m^3/hr	--
B3	Cement Silo top	03	3,000 m^3/hr (each)	--
B4	Cement extraction under silo	03	3,000 m^3/hr (each)	--
B5	Packing plant top	01	45,000 m^3/hr	--
B6	Bulk cement loading	01	5,000 m^3/hr	--
B7	Fly ash silo top	01	3,000 m^3/hr	--
B8	Feed Hopper for HAG	01	5,000 m^3/hr	-

11.1.7 Solid Waste

S.No.	Waste Type	Qty / Annum	End use / Disposal
1.	Dust collected from APCM	--	Totally recycled in process
2.	Ash generated from HAG	18000 MT	100 % recycled in the plant in PPC
3.	Used Oil	60 MT	Secondary lubrication / send to Own Clinker plant under AFR

11.1.8 Noise Environment

The heavy machinery and large fans equipped in various parts of the cement grinding unit can give rise to noise and/or vibration emissions. Properly insulated enclosures will be provided for high noise generating plant machinery. Green belt (33%) will be developed around the site with noise absorbing trees. The adequate PPEs will be made available for all the workers during operation.

11.1.9 Occupational Health and Safety

Project proponent is committed towards the health and safety of workers. Safety training will be provided to the employees. Safety sirens with alarm system in case of emergency will be provided. Emergency control room will be established. Fire-fighting network including fire extinguishers, fire hydrant system etc. covering entire plant will be provided. First aid boxes at appropriate place and safety training will be provided. Personal protective gears and equipment will be provided to the

employees. Health check-ups will be organized at regular intervals. Proponent will make provision of industrial hygienist and monitoring of the occupational injury and maintain the record of the same as per requirement of Gujarat Factories Rules. All fire-fighting equipment and warning devices will be kept in perfect working conditions at all the times. It will be seen that all personnel are aware of the implications of environmental pollution and simple practices to avoid pollution.

11.2 DESCRIPTION OF THE ENVIRONMENT

The baseline study for various environmental parameters viz. air, water, soil, noise has been conducted for one season 1st Oct 2018 to 31st Dec 2018. The PM_{10} observed in the range 61.8 – 86.4 µg/m^3 and while $PM_{2.5}$ was 31.6 – 47.6 µg/m^3 which was under NAAQS limit. All other parameters are found within limit. The TDS in ground water ranged from 806 – 6722 mg/L while in surface water, it ranges between 1037 - 26863 mg/L. For ecological environment; Dominant flora of the study region is bangalibaval, gandobaval and desibabool. Area is not rich with floral diversity. Natural vegetation of study area is in degraded condition and wild mammal's density is also very low. There is no threatened or endangered species in study region. The socio-economic conditions in the study area showsalmost pakka road facility are available in all villages within 10 km radius. Literacy rate of the study region is from 72% to 93%. Almost all the villages have more than 50% people as non-workers. It indicates that the problem of unemployment can be solved by providing proper training and education. There is also need to establish more industries so that maximum number of employment can be generated.

11.3 IMPACT AND MITIGATION MEASURES

Activity	Environmental Attribute	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Intensity and Significance
Vehicle Movement and utilities operation	Air Quality	Exhaust Emissions *i.e.* NO_x, SO_2 Fugitive emission	Negative	Short Term	Reversible	Low, due to movement of vehicle only for loading and unloading of raw material. Provision of APC's.
	Noise Levels	Noise Generation	Negative	Short Term	Reversible	Low, due to limited activity
	Risk & Hazards	Accidents, collision of transport vehicles	Negative	Short Term	Reversible	Medium due to loss of property and injury to manpower.
Process of cement production and raw material handling, storage	Noise Levels	Noise Generation from utilities, processing machineries and reaction vessels	Negative	Long Term	Reversible	Low, due to noise reduction measures
	Work Zone Air Quality	Flue gas generation	Negative	Long Term	Reversible	Medium, due to air pollution control devices (APC's)
	Risk & Hazards	Catch fire accidents	Negative	Short Term	Reversible	High, due to injury to manpower and loss of properties and fatal accidents
Solid/ Hazardous Waste Disposal	Land and Soil	Generation of Solid Waste	Negative	Short Term	Reversible	Will be utilized in own cement plant.
Green Belt Development	Ecology	Planting of Trees	Positive	Long Term	Reversible	High, Positive Impact
	Air Quality	Dust barrier	Positive	Short	irreversible	Low, Positive Impact

Activity	Environmental Attribute	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Intensity and Significance
				Term		
	Noise	Noise barrier	Positive	Short Term	irreversible	Low, Positive Impact
	LU/LC	Conservation of Land	Positive	Long Term	irreversible	Medium, Positive Impact
	Soil	Increase in soil fertility	Positive	Long Term	Irreversible	Medium, Positive Impact
	Water	Water consumption	Negative	Long term	Irreversible	Low, due to water circulation
Employment Generation	Socio Economic Status	Direct and Indirect employment	Positive	Long term	Irreversible	High, the project will generate employment

11.4 Environmental Management Plan

#	Aspects due to proposed activity	Impact zones	Management plan	Responsibility
	Air Environment			
1.	Dust generation	Near storage area	➢ Dust collection system will be provided ➢ De-dusting bag filter will be provided.	EHS In-charge/ EHS team
2.	Dust generation due to grinding of Clinker with other materials.	Near grinding area	➢ Dust collection system will be provided ➢ Ensured continuous monitoring SPM concentration as per consent norms. ➢ Bag filters are proposed as APCM to control fugitive emission	EHS In-charge/ EHS team
3.	PM_{10} emission due to operation of Hot Air generator and operation of drying and cooling section in process	--	➢ Stack of 55m will be provided. ➢ Ensure monitoring of stack for SPM concentrations as per regulatory norms	EHS In-charge/ EHS team
4.	Transportation activities during construction and operation phase	nearby highway/Sea route	➢ Transportation of raw materials and finished goods will be carried out in well covered trucks ➢ Traffic Management Plan will be made and followed ➢ Records will be maintained for entry and exit of vehicles	EHS In-charge/ EHS team
	Water Environment			
1.	Sewage generation due to Influx of workers during construction and Operation phase	Within plant premises	➢ Sewage will be treated into Sewage treatment plant.	Design Head
2.	Consumption of water for operation of plant	Fresh water reservoir	➢ Online flow meters shall be installed at each of raw water consumption point. ➢ The fresh water demand	EHS In-charge/ EHS team

			will be reduced by recycling and reuse of waste water	
Land Environment				
1.	Soil Contamination due to Settling of particulate matter on nearby vegetation field		➢ Highly efficient bag filter shall be installed to collect particulate matter. ➢ Plant load will be lowered during monsoon season ➢ Green belt will be developed around the plant area	Design Head/ EHS In-charge/ EHS team
2.	Generation of ash from operation of Hot Air generator	Within plant premise	➢ Ash generated by the HAG will be 100% utilized in cement manufacturing process (PPC) Dust collected from air pollution control equipment will be totally recycled in process.	EHS In-charge/ EHS team
3.	Generation of scraps during construction and operation phase	Within plant premise	➢ Ensuring that solid waste are handled as per Solid Waste Management Rule, 2016 and sold to registered and authorized vendors	EHS In-charge/ EHS team
Noise Environment				
1.	Noise from operation of crushing and grinding units in plant	Within plant premise	➢ Green belt will be developed around the site with noise absorbing trees ➢ Proper maintenance of equipment will be done ➢ Proper PPE like Ear Plugs & ear muffs will be provided	Plant In-charge/ EHS In-charge/ EHS team
2.	Noise from operation of D.G set etc.	Near utility area	➢ Proper maintenance of equipment will be done ➢ Inbuilt acoustic enclosures will be ensured	Plant In-charge
3.	Noise due to Transportation of raw material and finished goods	Within site and transport route	➢ Valid PUC vehicles will be ensured during construction and operation phase.	EHS In-charge/ EHS team
Risk and Hazard				
1.	Emergency preparedness	Within site	➢ Fire protection and safety measures to be taken ➢ Safety training to avoid accidents ➢ Mock drill records, on site emergency and evacuation plan	EHS In-charge/ EHS team

11.5 CONCLUSION

Based on the EIA study conducted in Post Monsoon of 2018 (Oct. to Dec. 2018) and as per terms of reference given by SEAC, the following highlights emerge:

- There will be minimal pollution potential on air, water and noise environment, which, with the implementation of the mitigation measures and EMP, can be reduced considerably.
- The proposed project activities will have positive beneficial effect on the local population, economic output and other related facilities *viz.* employment, development of business, transportation *etc.*
- Risk assessment including emergency response plan and DMP has been prepared to handle any sort of emergencies.
- Looking to the overall project justification, process, pollution potential and pollution prevention measures /technologies installed by proponent, environmental management activities of proponent; the proposed project would be environmentally acceptable, in compliance with environmental legislation and standards.

Hence, looking to the overall project justification, process, pollution potential and pollution prevention measures/technologies installed by proponent, environmental management activities of proponent; it has been concluded that the proposed project would not have any considerable impacts on environment as well as socio-economic and ecological conditions of the project area. Hence proposed grinding unit at Shivrampur, Hazira is considered environmentally safe.

12 DISCLOSURE OF CONSULTANT ENGAGED

12.1 GENERAL

Sanghi Industries Limited (SIL) has appointed **Eco Chem Sales & Services (ECSS)** for carrying out this Environmental Impact Assessment Study as per the EIA notification, 2006 as amended till date. ECSS has approved EIA coordinators and Field Area Experts for undertaking Environmental and related studies in twenty-one (21) approved sectors by NABET, Quality Council of India, New Delhi.

12.2 BRIEF RESUME AND NATURE OF CONSULTANCY

ECO CHEM SALES & SERVICES (ECSS) is one of the leading companies in the field of Environmental Consultancy Service providers in India. We are NABET Accredited consultant for conducting Environmental Impact Assessment Studies (EIA) and obtaining Environmental Clearances. We also take up services which include and are not limited to Environment Monitoring & Testing, Environment Audit, Risk Assessment Studies, Turnkey solutions, Operation and Maintenance contracts and obtaining various statutory clearances from Ministry of Environment, Forest and Climate Change (MoEFCC) and State Pollution Control Boards. ECSS also has branch offices in Vapi, Dahej and Vadodara, Gujarat. The accreditation certificate number NABET/EIA/1720/RA 051 is valid up to 3rd Feb. 2020.

12.3 EIA TEAM MEMBERS

Eco Chem Sales & Services carried out work presented in this report with active co-operation from Sanghi Industries Ltd. The name of the team members associated in the preparation and studies of EIA/EMP for Standalone grinding unit with bulk and bag packing plant is mentioned in table 12.1.

Table 12.1: Team Members (TM)/FAA involved in EIA studies and EMP Preparation

Name of Internal Team Member	Activity / Area	Involvement	Under Approved Expert
		Actual Work Performed	
Dr. Ashok K. Rathoure	Quality Check & EIA documentation	Project Planning; Site visit; Primary Survey; Technical discussion with client; Water balance; Mass balance, Presentation before committee; Review of each chapters in EIA report; Guidance in writing and modification in Contents; EMP; budgetary outlay.	--
Mr. Praful Patel	EIA documentation & Conduction of PH	Site visit, coordination with environmental monitoring team, sample collection, conducting public hearing, EIA submission, and follow up with GPCB, EIA documentation.	EIA Coordinator
Ms. Priyanka Verma	Help in EIA Report writing	Coordination for data collection, data analysis, coordination with FAEs, various chapter preparations, compiling the primary & secondary data into EIA report.	EIA Coordinator
Mrs. Kanchan Prabha Rathoure	Socio-economics (SE)	Conduction baseline socio-economic surveys through interviews/questionnaire from the surrounding areas/villages of the proposed project, impact identification and mitigation measures for incorporating to EIA documentation.	FAE SE

12.4 LABORATORY INVOLVED FOR BASELINE MONITORING AND OTHER ANALYSIS

One season baseline monitoring and analysis has been done by Ecosystem Management Resource Pvt. Ltd., NABL accredited Laboratory, Certificate No. TC – 6603, issued on dated 26/10/2017 and valid till 25/10/2019. Certificate of NABL is attached as Annexure VII.

Sanghi Industries Limited
Grinding Unit - Surat
Survey No. : 125/1, 125/2, 126/1+2+3
Opp. L&T Piping Center, Gate No. 9,
Hazira, Surat - 394510, Gujarat.

STATE LEVEL EXPERT APPRAISAL COMMITTEE GUJARAT
RECEIVED ON
23 MAY 2019
1133

SANGHI CEMENT
Turning Dream into Concrete Reality

May 23, 2019

To,
The State Level Expert Appraisal Committee (SEAC)
Gujarat Pollution Control Board,
Gujarat Pollution Control Board,
4th Floor, Sector – 10 A,
Gandhinagar – 382010.

Sub: Submission of Additional Information sought by the committee during the appraisal of EC on 16th April 2019 for our proposed project of 2 Million TPA Standalone Grinding Unit with Bulk & Bag Packing Plant at Hazira Industrial Zone, Survey No. 125 / 1, 125 / 2, 126 / 1+2+3; Village: Shivrampur, Tal. Choryasi, District - Surat

Ref: (1) Proposal No. SIA/GJ/IND2/30448/2018
(2) 497th meeting of SEAC – Gujarat dated 16.04.2019

Dear Sir,

Sanghi Industries Limited is the Cement Manufacturing Company having total captive infrastructure of Power, Port located at Sanghipuram, Kutch with State-of-art technology from FL Smidth, USA operating at 4 MTPA Capacity with an investment of Rs.3000 crores. The company has also set up two Cement Terminals (1) Navlakhi – Gujarat State (2) Dharangdhar – Maharashtra State wherein through coastal route, company brings loose cement at the cement terminal and caters the local market. The company has also established Ready Mix Concrete Plant (RMC) at Ahmedabad as well as Rajkot in Gujarat State. The turnover of the company in the year 2018-19 is Rs.1088 crores.

The Company produces superior quality cement of OPC, PPC and PSC having marketing presence in the State of Gujarat, Rajasthan, Maharashtra, Madhya Parades, Cochin.

The company is presently expanding cement capacity from 4 MTPA to 8.6 MTPA with an investment of Rs.1500 crores, which is under advance stage of implementation and expected to commission by March 2020. Thus, total investment would be Rs.5000 crores having 8.6 MTPA capacity at single location.

As per the Company Policy, we believe in State-of-Art Technology to be adopted for the projects to be executed and also has a focus on sustainable development with vigilant eye on ensuring zero pollution with thrust on green environment. Due to our continuous efforts for energy efficiency, sustainable development, Best Industry Practices, company has earned many awards and

CIN No. : L18209TG1985PLC005581
Registered Office : P.O. Sanghinagar, Hayatnagar Mandal, R.R. District, Telangana - 501511.
Tel. : 08415 - 242240 E-mail : companysecretary@sanghicement.com
Website : www.sanghicement.com

Sanghi Industries Limited
Grinding Unit - Surat
Survey No. : 125/1, 125/2, 126/1+2+3
Opp. L&T Piping Center, Gate No. 3,
Hazira, Surat - 394510, Gujarat.

SANGHI CEMENT
Turning Dreams into Concrete Reality

recolonization from National and International reputed institution and even from Government.

The company has always given thrust on sustainable development and has taken various actions for the same. The major actions are:-

- Promotion of alternative fuel and raw materials & waste management
- Reduction of CO2 emission: - Received 38434 energy saving certificate under PAT Cycle - 1.
- Water Management:- Rainwater harvesting in Mines Pit, which helps to meet our demand of water as well as local villagers and also maintains the groundwater table in surrounding area.
- Gujarat Mineral Research and Development Society, an Agency of Government of Gujarat under the aegis of Commissioner of Geology and Mines, Gandhinagar, Gujarat has published a book titled "Working with Elements" and in the said book the water conservation methods and the free distribution of water by the company in the local villages has been highlighted.
- Promoting Bio-diversity:- The first major step was constructing 3 check dams towards the transformation of this barren landscape to impound the rain water harvesting.
- Landmark contribution as 1st in Indian Cement sector
  - ✓ Utilization of pond Ash in raw mix
  - ✓ Co processing of Coal Tar - waste from ceramic industries

The company also taken noteworthy actions in the environment aspects for which following awards has been received by the company:-

1. For Eco-friendly Industrial Development, the company has been awarded Green Rating Project Awards - 3 LEAVES by **Sunita Narain of** Center for Science and Environment, New Delhi.
2. In recognition for outstanding achievement in Environment Management, company received the prestigious "Greentech Environment Excellence Gold Award" in Cement Sector three times i.e. in the year 2008, 2013 & 2014.
3. In recognition of outstanding achievement in Environment Management, company received "Greentech Platinum Award-2018" in Cement sector.

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4. For Excellence in Waste Management Initiatives, we have received Kutch Business Excellence Award - 2013 from Federation of Kutch Industries Association.

5. For the last few consecutive years, company has been awarded First Prize for its captive mines and operations mines for Mines Environment and Mineral Conservation under the aegis of Indian Bureau of Mines, IBM, GOI for;

- Afforestation/Plantation
- Systematic & Scientific Development
- Air Pollution Control Measures
- Water Pollution Control Measures
- Noise vibration control & Aesthetic Beauty
- Overall Performance.
- Community Development
- Mineral Conservation

The company due to its marketing strategies, product quality acceptance etc., has won following awards from various reputed organizations:-

1. India's Most Trusted (Cement Manufacturing) Company Award (2017) International Brand Consulting Corporation, USA.

2. India's Top Challengers 2016-17 Trophy (2016-2017) Construction World Magazine & Media.

3. Most preferred brand by real estate sector (Nov 2017) Real Estate & Infrastructure Round Table & Awards

4. Gujarat Brand Leadership Award – 2018 (Corporate CSR) by ABP News.

5. Cashless Township (2017) Recognized by Hon'ble Prime Minister Shri Narendra Modiji.

6. Two Star Export House (Certificate of Registration) from the office of the Joint Director General of Foreign Trade, Government of India.

7. Emerging Brand of the Year Award - 2018 Cement & Concrete By Realty Plus.

8. Social Media Campaign of the Year – 2019 by Realty Plus.

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For manufacturing of Cement & Clinker company has received International Accreditation:-

- ISO 9001:2015 (Quality Management System Standard)
- ISO 14001:2015 (Environmental Management System Standard)
- OHSAS 1800:2007 (Occupational Hazard and Safety)
- SA 8000:2015 (Social Accountability)
- ISO/ IEC 17025:2005 (NABL accreditation for Chemical and Mechanical Testing

Sanghi Industries Limited had been described by CRISIL, a global leading Rating Agency, in its report of November 2009, as the "Most efficient in Operating Cost Parameters" in the mid segment of cement industry and second most efficient in the industry as a whole.

It is submitted that we are well reputed and well established Cement Manufacturing Company in the Cement Sector. 1

With reference to the captioned subject, our EC proposal was discussed in the 497th meeting of SEAC. After detailed deliberation, the Committee sought additional details. We are submitting the point-wise reply as under:-

Sr. No.	Details sought by the Committee	Our reply
1.	Reacdress ToR No. 5, 40	Attached as **Annexure - 1**
2.	Point wise action plan regarding representation of L&T Ltd., Hazira	Attached as **Annexure - 2**
3.	Submit raw material and product transportation route, its impact on surrounding area and mitigation measures	Attached as **Annexure - 3**
4.	Undertaking regarding no use of Lignite & Petcoke as fuel	Attached as **Annexure - 4**
5.	Sound APCM to control fugitive dust omission during raw material transportation, storage, handling, loading, unloading, transfer, fuel grinding etc.	Attached as **Annexure - 5**
6.	Details of vent / stacks with specific source & Air Pollution Control System	Attached as **Annexure - 6**
7.	Compliance of Coal & Ash handling guidelines and its commitment	Attached as **Annexure - 7**

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In view of the above, we sincerely urge Hon'ble Committee to take pragmatic view in the overall interest for development of the area.

Thanking you,

Yours faithfully,
for **Sanghi Industries Limited**

Authorized Signatory

Encl: As above

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Annexure – 1

Point No. 1 :- Readdress ToR No. 5 & 40

TOR No. 5:
PP shall furnish status of all the applicable Rules, Acts, Regulation, Clearance in the Tabular Form:

Compliance:

Sr. No.	Applicable Rules, Acts, Regulation, Clearances	Status
1.	The Environment (Protection) Act, 1986 and Rules, 1986 as amended to date	Shall be complied as per conditions of Environment Clearance / CTE / CTO
	Environment Clearance under EIA Notification 2006	Application for EC made on 21.12.2018, which is under process.
	Consent to Establish as per Air and Water Act	Applied and payment towards processing fee of Rs. 300,000/- has been deposited on 30.01.2019.
	Consent to Operate as per Air and Water Act	Will apply at the time of commencement of production.
	E-waste (management and Handling) Rules, 2011 as amended to date	CTE/CTO shall be obtained and condition therein will be complied.
	Hazardous and Other Wastes (Management and Trans-boundary Movement) Amendment Rules 2016.	
	The Air (Prevention and Control of Pollution) Act, 1981 and Rules 1982, as mentioned to date.	
	The Noise Pollution (Regulation and Control) Rules, 2000 as amended to date	
	The Water (Prevention and Control of Pollution) Act, 1974 and Rules, 1975 as mentioned to date	
2.	Factory Act 1948 and amendment thereafter	Will be complied during the stage of erection and commission.
3.	Factory Licence	Will apply at the time of commencement of production.

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4.	Workman Compensation Act, 1923 as amended thereafter	Will be complied during the stage of erection and commission.
5.	Contract Labour Regulation and Abolition Act, 1970 as amended thereafter	Will be complied during the stage of erection and commission.
6.	The Bureau of Indian Standards Act, 1986	Will apply at the time of commencement of production.
7.	The Motor Vehicle Act, 1988 and The Central Motor Vehicle Rules, 1989	Will be complied during the stage of erection and commission.
8.	Indian Electricity Act, 2003	We will obtain power from DGVCL and will be applied at the time of erection and commissioning.
9.	Water Permission	Application submitted to Irrigation department on 23.01.2019 and our application is under active consideration as per their letter dated 03.04.2019. Additionally MoU has been signed with Tankers Suppliers to Supply water
10.	Standards of Weights & Measurement Act 1976 and Rules made thereunder	Will apply at the time of commencement of production.

TOR No. 40:
PP shall ensure participation of people during Public Hearing with equality in gender so as to encourage woman participation in Public hearing & at the same time their issues shall also be given weightage.

Compliance:
The public hearing was conducted on dated: 22/03/2019 at the Project Location Site as per the Environment Notification 2006 and as per the directions received and in consultation the GPCB Officials.

Accordingly, we have met the Sarpanch of all villages located within 10 kms of Project Site and apprised them about our proposed project and circulated them the Executive Summary in Gujarati Language. We have requested them to ensure more participation of local people including women participation in Public Hearing. Total 118 Nos. of peoples had participated in Public Hearing on 23.03.219 who have signed. Moreover there are many other people who have also participated in the meeting. Total women participation was approximately 13 Nos.

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Annexure - 2

May 23, 2019

To,
The State Level Environment Impact Assessment Authority (SEIAA)
Gujarat Pollution Control Board
Paryavaran Bhavan, Opp. Bij Nigam
CHH Road, Sector 10 A
Gandhinagar – 382010

Sub: Clarifications and Actions required by Larsen & Toubro Limited from Sanghi Industries Limited for proposed project of 2 Million TPA Standalone Grinding Unit with Bulk & Bag Packing Plant at Hazira Industrial Zone, Survey No. 125/1, 125/2, 126/1+2+3; Village: Shivrampur, Tal. Choryasi, District - Surat

Ref: (1) L&T Letter dated 05.04.2019 submitted to SEIAA
(2) L&T Letter No. HZCS/E-30/2019-20/SIL dated 22.04.2019 submitted to SEIAA

Dear Sir,

With reference to the subject matter, this is to inform your good-self that the representatives of the L&T remained present during the Public Hearing held on 22.03.2019 and L&T representative also has accepted that the APCM has been well planned by the project proponent. Further certain clarification were sought from the project proponent which were clarified to the satisfaction of L&T representative, which is also recorded in the PH proceedings. However, we are submitting here under the point-wise reply of the concerns raised by L&T in their letters under Reference (1) & (2).

Concerns raised in the Letter dated 05.04.2019 & our reply:-

S N	L&T Point	Reply
1	L&T is in business of manufacturing Ultra Critical equipment i.e. Super Critical Turbine Generators, Nuclear equipment and K9 Vajra Self-propelled Howitzer guns at Hazira Manufacturing Complex. Above mentioned production facilities are within 1 km radius of the proposed project of Sanghi Industries Limited. Cement and Coal dust will adversely impact the quality & on field performance of such Critical products of National Security / Safety importance, which could impact to our Business, as well as Nation and Community at Large.	Our proposed location of Grinding Unit is located at Hazira Industrial Area. Hajira is known as the "gateway port" to serve the hinterlands of North, West and Central India as it is situated in the midst of one of the most industrialized area in the country. The existing industrial portfolio of Hajira includes mega industrial projects such as petrochemicals, fertilizers, heavy engineering, steel, Cement, energy, edible oil, LNG Terminal and port related activities having investment of more than 1.8 lakhs crores. More than 20 large and medium companies are located in Hajira, including Bharat Petroleum Corporation, Cairn Energy, Essar Power, Essar Steel, Hindustan Petroleum and Larsen & Toubro, Reliance, NTPC, GSECL, Vedraj Cement, Adani Wilmer among others. Shell has established an LNG Terminal at Hajira in 2004.

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The major industrial units operating in nearby area in the Hazira Industrial Area are shown on the Google Map attached at Annexure – A.

The L&T Defence Unit of the L&T is near Gate No. 20, which is at a distance of Approx 1.25 km away from our proposed project. Site. The Defence Unit of L&T is surrounded by Red Category Industries of its own units viz. L&T MHPS Turbine, MHPS Boilers, Special Steels & Heavy Forgings, Heavy Engineering, Piping Centre etc.

SIL has taken utmost care to control the fugitive emission through the operation of the proposed grinding unit. With High Efficiency APC Devices and implementation of Stringent mitigation measures, the fugitive emission through the plant operation will be negligible.

As per the baseline study conducted during October – December 2018, in crosswind direction maximum GLC value is PM_{10}- 0.77 µg/m^3,So_x- 0.53 µg/m^3 and No_x-0.61 µg/m^3. After Addition of Incremental value in baseline data Resultant concentration will be PM_{10}- 87.17 µg/m^3,So_x-14.83 µg/m^3 and No_x- 21.01 µg/m^3.This shows that even after implementation of Grinding Unit of SIL there will not be any significant increase in levels of PM_{10}, So_x and No_x.

Predominant wind direction is study region is NE to SW and in downwind direction there is no village. Nearest village form the project site is Suvali which is 1.2 km in WSW direction. Maximum incremental concentration of PM_{10}- 0.77 µg/m^3 at Suvali. L&T defense project is appx. 1.25 km away from project site and in NNW direction. The location of Defence Unit of L&T is in crosswind direction. Hence there will be no impact of dust emission at L&T defense site due to proposed project.

Moreover SIL has Proposed a Thick Green belt to the tune of 33% surrounding the project boundary. The plantation shall comprise of large canopy thick foliage and high stomatal Index. This will help in dust absorption and ensure that fugitive dust will not go outside the project premises.

Looking to this, there will be no impact on Air emission

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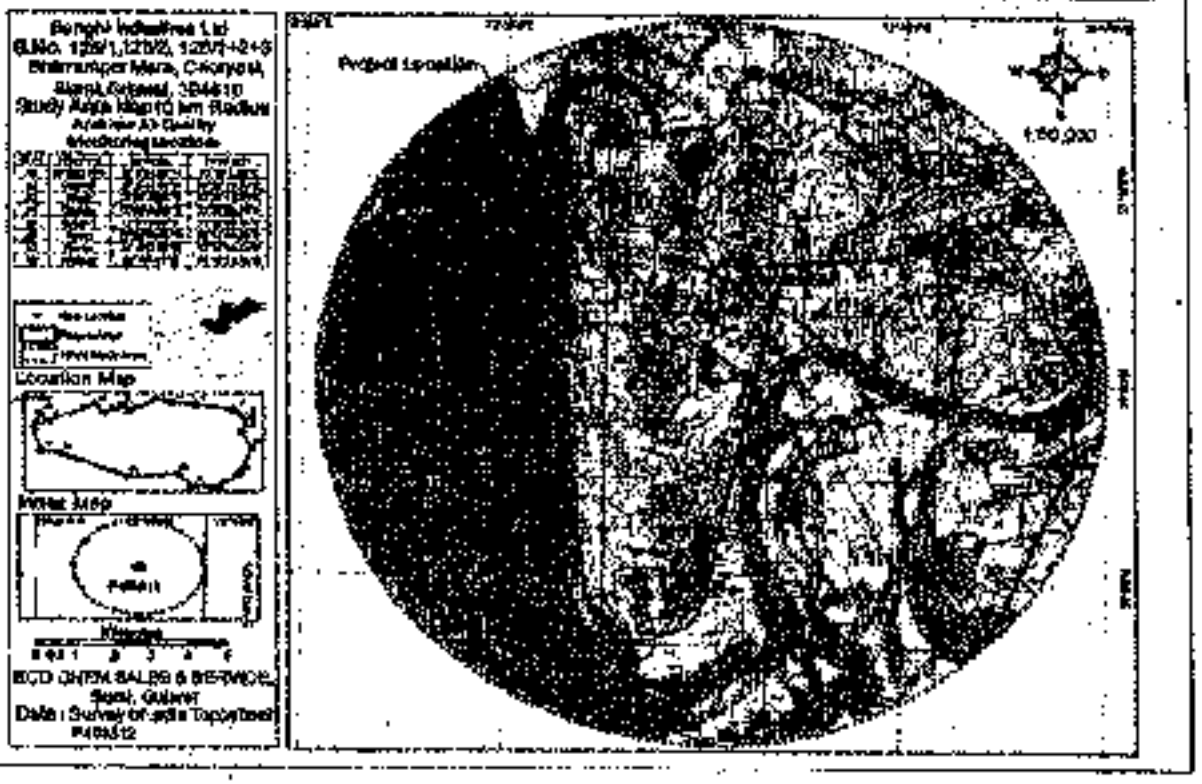
		parameter, which will not adversely impact the quality and on field performance of such critical products of National Security / Safety importance.
2	Transportation, loading, storage, Transfer Operation & Unloading of Coal, Fly Ash, Clinker & Slag will lead to substantial increase in Process / Non-process related Fugitive Emission. This may lead to irreversible damage to us including surrounding Environment.	A list of sources of Air Pollution and mitigation measures taken by SIL to control the process / non-process related Fugitive Emission is attached at **Annexure – B.** SIL will strictly implement the mitigation measures and regular monitoring will be carried out to ensure that ambient air quality parameter will always meet the norms of CPCB/GPCB.
3.	Increased PM2.5 & PM10 exposure may lead to serious health hazards specifically Respiratory and Lung diseases (cancer) to people operating in close vicinity.	In Crosswind direction maximum GLC value is PM_{10}- 0.77 µg/m³, So_x- 0.53 µg/m³ and No_x-0.61 µg/m³. After Addition of Incremental value in baseline data Resultant concentration will be PM_{10}- 87.17 µg/m³, So_x-14.83 µg/m³ and No_x- 21.01 µg/m³. This shows that even after implementation of Grinding Unit of SIL there will not be any significant increase in levels of PM_{10}, SO_x and NO_x.
		

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Code	Location	Distance/Direction from the Project site	Selection Criteria
A1	Project Site	-	-
A2	Suvali	1.2 km/WSW	Crosswind
A3	Mora	2.9 km/NNE	Upwind
A4	Damka	5.0 km/N	Crosswind
A5	Rajgari	3.8 km/NNW	Crosswind
A6	Kavas	7.4 km/NE	Upwind
A7	Hazira	5.7 km/S	Crosswind
A8	Dumas	7.9 km/SE	Crosswind

Predominant wind direction in study region is NE to SW and in downwind direction there is no village. Nearest village form the project site is Suvali which is 1.2 km in WSW direction. Maximum incremental concentration of PM_{10}- 0.77 µg/m^3 at Suvali. L&T defense project is appx. 1.25 km away from project site and in NNW direction. The location of Defence Unit of L&T is in crosswind direction. Hence there will be no impact of dust emission at L&T defense site due to proposed project.

Clarification sought in the Letter dated 22..04.2019 & our reply:-

S.N.	Particular	Concerns / Impacts	Reply
1	Air Pollution	1) Cement dust deposition on water bodies will degraded the potable water quality	The reply is as per the reply given for point no. 1 to 3 of the letter dated 05.04.2019.
		2) Health Hazard – SPM is known to poise health hazards in person working in nearby areas. PM2.5 itself may lead to respiratory diseases like lung fibrosis, mesothelioma of lung, tuberculosis and skin problem	SIL has taken utmost care to control the fugitive emission through the operation of the proposed grinding unit. With APCM and mitigation measures, the fugitive emission through the plant operation will be negligible. Hence there will not be degraded the potable water quality, no adverse impact on the health and quality of Defence products.
		3) Quality of Products: a) Super Critical Turbine Generators Cement Dust exposure will affect the High Voltage endurance capacity, Tan Delta, thereby limiting the life of the winding insulation after assembly which makes the Rotor & Stator Coil assembly not acceptable as per IEC 60034.	SIL will ensure best in class Air Pollution Control Measures. SIL will ensure that there will be no further increase in SPM, SOx and NOx level due to operation of the proposed Grinding Unit. Hence, there will not be any impact on L&T manufacturing

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		(b) & (C) Critical equipment of this project shall be manufactured and maintained in Dust free environment. Dust exposure may affect the reliability & functionality of Defence Product.	facilities and other industries located in the area. The Defence Unit of L&T is surrounded by Red Category Industries of its own units viz. L&T MHPS Turbine, MHPS Boilers, Special Steels & Heavy Forgings, Heavy Engineering, Piping Centre etc. Continuous Ambient Air quality monitoring station will be installed and report of the same will be submitted to GPCB as per the direction. Third Party monitoring will be carried out on monthly basis through GPCB approved Third Party and report will be submitted to GPCB.
2	Use of PetCoke / Lignite as Fuel	Use of low quality grade Lignite & Pet coke will lead to high emission of SOx, NOx and PM.	There will not be use of lignite and petcoke. Undertaking for no use of Lignite and petcoke submitted to the SEAC.
3	Green Belt Damage	Our developed Green belt will be directly exposed to the Cement dust deposition and other process & non-process related fugitive emission. Besides, green belt development proposed by you will take 5 years to grow, which is very much longer time.	With adoption of the mitigation measures, there will be no fugitive emission due to operations of the plant, which will not affect the developed green belt of L&T as envisaged. SIL will develop 33% Green Belt. However, belt on the periphery of the plant will be developed before commencement of the operations and green belt within the plant are will be developed in shortest possible time. On the periphery, green belt width would be approximately in the range of 6 mtr to 8 mtr based on selection of species and location in the plant area. Greenbelt within the plant are will be developed with width ranging from 20 – 30 mtrs. Equal distance between the layers will be maintained. Our green-belt will help to control fugitive emission. Moreover, the green-belt developed at the premises of the L&T will also control fugitive emission.

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			There shall be no impact on developed greenbelt by L&T in their premises.
4	Ground Level Concentration of Pollutants	What will be the level of GLC of SPM, SOx and NOx considering the downwind directions? Moreover, we feel that the proposed project site is within 500 meters of Forest Area. (Ref. GPCB Guidelines for Coal Handling Units)	The reply is as per the reply given for point no. 3 of the letter dated 05.04.2019. Our proposal is for standalone cement grinding unit. As such as location criteria defined by GPCB Guideline is not applicable to us. However, we will ensure all compliance of the coal and ash handling guidelines applicable to cement plant.
5	Total Nos. of Road Trips (Raw Material + Finished Good) Per Day	Capacity of proposed project is 2.0 Million TPA, which means approx. 550 nos. of Trucks movement in a day. This will create frequent traffic issue and non-process related fugitive emission. What is your Traffic Management Plan including Parking facilities.	Daily 363 Nos. of Trips (In & Out) will be required for transport of cement and raw material during the operations of the Grinding Unit. The proposed route of the trucks movement is attached at Annexure – C. The Traffic Management Plan with Parking facilities is atached at Annexure – D.
6	Exact mode and route of Transportation for Raw Materials and Finished Goods,	The proposed project site is in the middle of various L&T Manufacturing. Trucks transportation through internal roads and trucks loaded with clinker, coal, Slag and Fly Ash & Cement will create heavy traffic and non process related fugitive emission.	The google map of the proposed site alongwith the distance of the each unit of the L&T is attached at Annexure – E. The proposed location is in industrial zone. The L&T Units are on the N.H on which daily movement of Heavy Vehicle Traffic are already in existence. Our proposed site is connected to major National High Way which is utilized by all the industries of Hazira. Daily average basis 1421 PCU / Hour passing through Highway presently. There will be increase of 48 PCU / Hour due to our proposed project, which is very nominal @ 3.38%. Hence, the additional load on the carrying capacity of the concern road is not likely to have any significant effect.

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			SIL will ensue best in class Air Pollution Control Measures. Hence, there will be no any non-process related fugitive emission during transportation. After survey of the various sites, SIL has already invested for procuring land in the industrial zone and therefore it is not possible to explore alternate location for the proposed project. Moreover, there is a concern of disposal of fly ash and slag generated in Hazira by Power Plant and Steel Industry. Government is also encourage disposal of fly ash and slag in safe and scientific manner under AFR. Our proposed plant will be one of the solution for disposal of slag and fly ash generated in the area.
7	Responsibility & Liability	If any damage will occur to our Green Belt, Water, Health of Employees, Product Quality and Business due to your operation, who will be responsible for the same?	Our proposed project having sophisticated machinery and control systems and approximate 300 nos. of persons will work in our site. Our prime responsibility is to ensure Health and Safety of our people, plant and neighbours. The Cement is not carcinogenic material. It is hazard less material, which can not have any impact. However, we will take adequate measures not for just L&T but also our own people, plant, neighboring industries. We assure that with implementation of the mitigation plan and regular monitoring, there will not be any degradation of environment, which adversely affect the Green Belt, Water, Health of Employees, Product Quality and business of L&T and other neighboring units.
8	Project Expansion in Future	As Cement Industry falls under 17 Categories of High Polluting Industries declared by GPCB, we will be the direct suffers if at all there is any chance of setting up integrated / full fledged cement plant.	The Defence Unit of L&T is surrounded by Red Category Industries of its own units. The proposed project is only a standalone Grinding Unit. There is no chance of setting up an integrated / fledged cement

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			plant as there is no limestone in the vicinity. SIL has already invested for procuring land in the industrial zone and therefore it is not possible to explore alternate location for the proposed project.
9	Location of proposed Project	Proposed Project site is surrounded by various L&T Manufacturing Units. Hence, there will be having direct impact due to our operation.	With the implementation of the mitigation measures, there will not be any chance of degradation of Environment, which will direct impact on L&T Manufacturing Unit. Alternate site study has been done and most suitable site has been selected for the proposed project based on the siting criteria guidelines. SIL has already invested for procuring the land in the industrial zone, it is not feasible to shift the project site to any other location. Moreover, there is a concern of disposal of fly ash and slag generated in Hazira by Power Plant and Steel Industry. Government also encourages disposal of fly ash and slag in safe and scientific manner under AFR. Our proposed plant will be one of the solution for disposal of slag and fly ash generated in the area

We humbly submit to the State Level Expert Appraisal Committee (SEAC) that the concerns / issues raised by L&T with respect to the fugitive emission due to our proposed project (process / non-process area operation) and effect of the same on their developed green-belt / water body / manufacturing facilities and products are absolutely unwarranted, far from the truth and only imaginary. As explained above, we submit that the Standalone Grinding Unit is not at all a polluting industry as projected by the L&T. Moreover, we have taken abundant precaution in selecting the technology for Grinding Unit, Air Pollution Control Pollution Equipment, Development of Green Belt on periphery and in and around Grinding Unit. Further, we would like to categorically state that there will be no impact of our operations to the nearby located industries.

It is further submitted that the existing manufacturing facilities of L&T must be complying with conditions of the approvals / clearances / permission issued to them by various authorities. Moreover, L&T must have also taken into consideration the existing large scale industries in Hazira Industrial Area as well as future development before setting up their facilities. We feel that

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the L&T must have taken necessary safeguards to ensure that their manufacturing facilities are not affected due to existing as well as future industrial development of the area.

All the points raised by L&T has already been adequately covered while preparing Environment Impact Assessment Report (EIA) and we once again inform that during Public Hearing held on 22.03.2019, L&T representatives has accepted that APCM has well planned by us and points raised during PH were clarified to their best satisfaction. We feel that L&T is interested in shifting our present location on frivolous ground. It is hereby submitted that it is absolutely not possible at this juncture to shift the location to alternate location as we have already made huge investment in the land and project planning has been done including placing of orders for major Plant & Machinery.

We once again reiterate that we have taken abundant precautions for our standalone grinding unit with respect to the pollution parameters (Process / non-process area) as is evident from submitted EIA. It will have no impact to L&T or other industries located nearby.

In view of the above, we request the Hon'ble Committee to kindly take a suitable decision in the interest of the overall development in the region.

Thanking you,

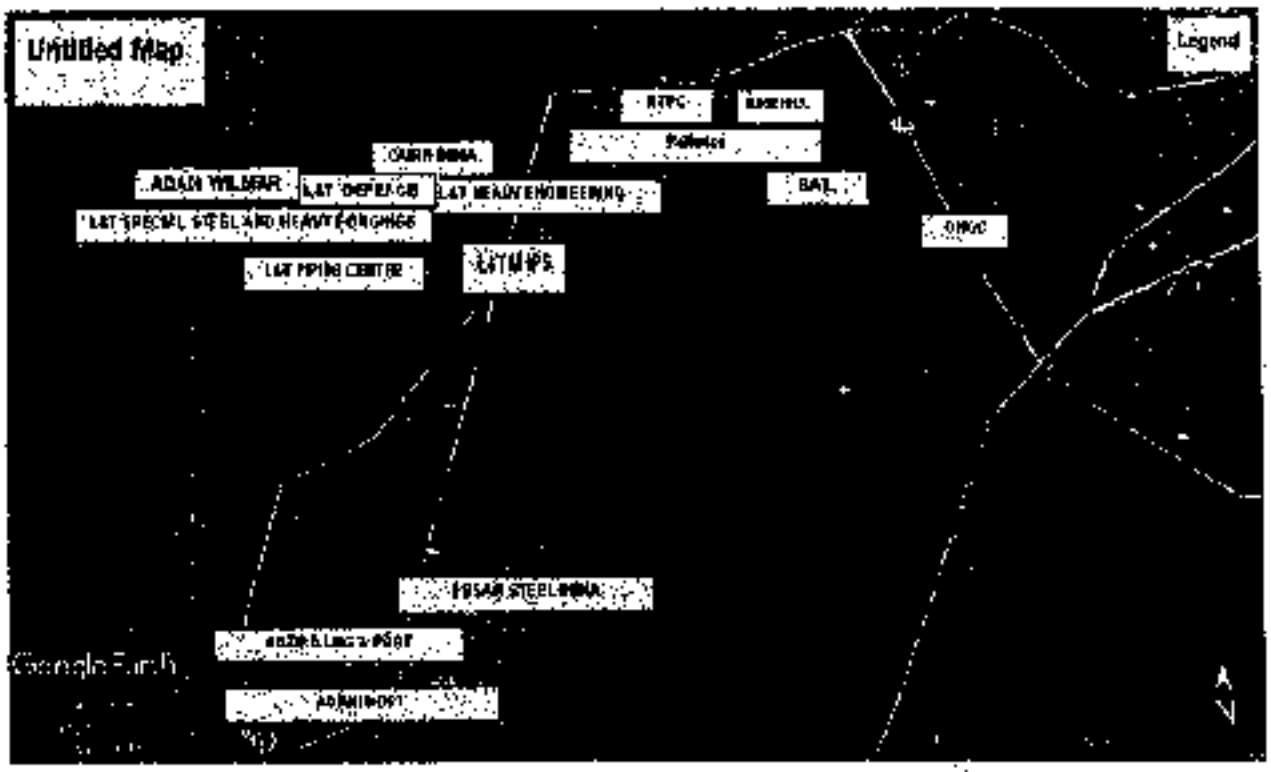
Yours faithfully,
for Sanghi Industries Limited

Authorized Signatory

Encl: As above

CIN No. : L16209TG1985PLC005581
Registered Office P.O. Sanghinagar, Hayatnagar Mandal, R.R.District, Telangana - 501511.
Tel. : 08415 - 242240 E-mail : companysecretary@sanghicement.com
Website : www.sanghicement.com

ANNEXURE – A



Nearest Industries	Distance from Proposed Unit of SIL in km
Reliance	3.25 km, NNE
NTPC	4.70 km, NNE
KRIBHCO	6.40 km, NE
GAIL	6.00 km, NE
ONGC	8.70 km, E
CAIRN INDIA	1.80 km, NNW
ADANI WILMAR	1.30 km, NNW
L&T DEFENCE	1.25 km, NNW
L&T HEAVY ENGINEERING	1.81 km, NNE
L&T MHPS	0.90 km, E
L&T SPECIAL STEEL AND HEAVY FORGINGS	1.01 km, N
L&T PIPING	0.33 km, W
ESSAR STEEL	5.07 km, S
ADANI PORT	7.20 km, SSW
HAZIRA LNG & PORT	6.56 km, SSW

Annexure - B

Sound APCM / EMP against sources of air pollution

(A) **Fugitive Emissions:**

Process & non-process related fugitive emissions sources and mitigation measures are given below:

(1) Process related Fugitive Emission Sources & its mitigation measures / EMP

S N	Types of operation	Activity	Mode	Materials handled	No. of emission source	Mitigation Measures (APCM) / EMP
1	Raw Material Handling & Transfer	Unloading Operation	Feeder	Clinker	1	➢ Fully enclosed unloading station will be provided. ➢ Adequate water sprinkling system will be provided. ➢ Dust extraction (suction apparatus) system with dust collector of capacity 11000 M3/hr will be installed.
			Feeder	Additive - Gypsum, Slag & Coal	1	➢ Fully enclosed unloading station will be provided. ➢ Adequate water sprinkling system shall be provided. ➢ Dust extraction (suction apparatus) system with dust collector of capacity 11000 M3/hr will be installed.
			Pneumatic from closed tankers	Fly ash	0	➢ Fly ash will be pumped directly from the closed tankers to silo by fully automated pneumatic system in closed loop so that fugitive emissions do not occur. ➢ Fly Ash Handling Guidelines will be complied.
			Stacker	Gypsum, Slag & coal	3	➢ Raw materials will be stored in covered yard. ➢ Single entry point with flexible curtain will be provided. ➢ Concrete flooring will be provided in the covered yard. ➢ Closed belt conveyor will be provided from unloading station to piles. ➢ Dust suppression system will be provided at stock piles.
2	Raw Material Handling & Transfer	Loading Operation	Belt conveyor	Clinker	1	➢ An automated closed loop silo extraction system with closed belt conveyor will be provided for clinker loading and transportation from silo to mill. ➢ De-dusting bag filter of 25000 M3/hr capacity will be installed at silo top.
			Reclaimer	Gypsum, Slag and Coal	2	➢ Raw materials will be stored in covered yards. ➢ Single entry point with flexible curtain will be provided. ➢ Reclaimer system will be provided to mechanize loading operation. ➢ Closed belt conveyor will be provided from loading point to mill. ➢ Dust suppression system will be provided at stock piles. ➢ Coal Handling Guideline will be complied.

S N	Types of operation	Activity	Mode	Materials handled	No. of emission source	Mitigation Measures (APCM) / EMP
3	Raw Material Handling & Transfer	Transfer Operation (Transfer Points)	Belt conveyor	Clinker	1	➢ Transfer point will be fully enclosed ➢ De-dusting bag filter of 3000 M3/hr capacity will be installed. ➢ Capture dust from the bag filter will be directly fed into the system in closed loop.
				Gypsum / Slag / Coal	2	➢ Transfer points will be fully enclosed. ➢ Two nos. of de-dusting bag filter with capacity of 3000 M3/ hr each will be installed. ➢ Capture dust from the bag filter will be directly fed into the system in closed loop.
4	Finish Product Handling & Transfer	Mill to Silo	Air slide	Cement	0	➢ The closed looped system of air slides will be provided for finished product transportation from mill to silo.
		Silo to Packing Plant	Belt conveyor	Cement	1	➢ Covered belt conveyor will be installed for material handling. ➢ De-dusting bag filter with capacity of 45000 M3/hr will be installed.
		Silo to bulk loading system	Belt conveyor	Cement	1	➢ Covered belt conveyor will be installed for material handling. ➢ An automated closed bulk loading system will be installed ➢ De-dusting bag filter with capacity of 5000 M3/hr will be installed.
		Silo Vent	--	--	3	➢ Three nos. of de-dusting bag filter with capacity of 3000 M3/hr each will be installed.
5	Packing plant	Cement Packing	Automatic Packer machine / Bulk loading	Cement	03	➢ The packing operation will be performed automatic electronic packers under negative pressure by the centrally installed de dusting bag filters of 45000 M3/hr capacity. ➢ Engineering controls like guiding plate, scrapper brush and self bag cleaning system will be installed. ➢ An automated closed loop system will be provided for bulk cement loading ➢ The spilled cement on the floor will be swept by vacuum sweeping machine periodically and sent for recycling. ➢ The vibratory screen with dust extraction arrangement will be provided for recycling of cement. ➢ Closed air slides and bucket elevators will be installed for finish product transportation in the plant.

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(2) Non-process related Fugitive Emission Sources & its mitigation measures / EMP

SN	Types of operation	Activity	Materials handled	Mitigation Measures / EMP
1	Vehicle Traffic at site	Movement of raw materials & finished product by trucks / dumpers Movement of other vehicles - personnel four / two wheelers	Clinker, Gypsum, Fly ash, Slag, Coal and Cement	➢ Raw materials / finished product will be transpotted in covered trucks / trippers. Fly ash will be transported in bouser. ➢ Paved roads and concrete flooring will be provided in activity area. ➢ Speed of vehicles will be limit up to 10 KMPH. ➢ Sweeping machine will be provided for road and floor cleaning as abundant precaution. ➢ Greenbelt in three layers will be developed along with plant boundary. ➢ Water sprinkling will be done in non-process area. ➢ Valid PUC trucks will be deployed for transportation.
2	Raw Material & finished product Storage	Storage of materials	Gypsum, Slag, Coal, Fly ash, Clinker and Cement	➢ All raw materials will be stored in covered yard. ➢ Single entry point with flexible curtain will be provided. ➢ Concrete flooring will be provided in the covered yard. ➢ Clinker & Fly ash will be stored in silo. ➢ Dust suppression system will be provided at stock piles. ➢ Stacker & reclaimer will be provided to mechanize loading and unloading operation in the yard. ➢ Greenbelt in three layers will be developed around the storage yard. ➢ Clinker, Fly ash and cement will be stored in closed Silo.

(B) Process / Flue Gas Emissions:

SN	Types of operation	Activity	Materials handled	Mitigation Measures / EMP
1	Grinding	Cement grinding in Vertical Roller Mill (VRM)	Clinker, Gypsum & additives - Fly ash and Slag	➢ Latest technology based intensive Jet Bag house of capacity 11,00,000 m3/hr will be installed. ➢ 55 meter high x 3.2 meter Dia. Stack will be provided for dispersion. ➢ SPM <30 mg/Nm3, SOx & NOx < 100 ppm (Norms as per CPCB Guidelines).

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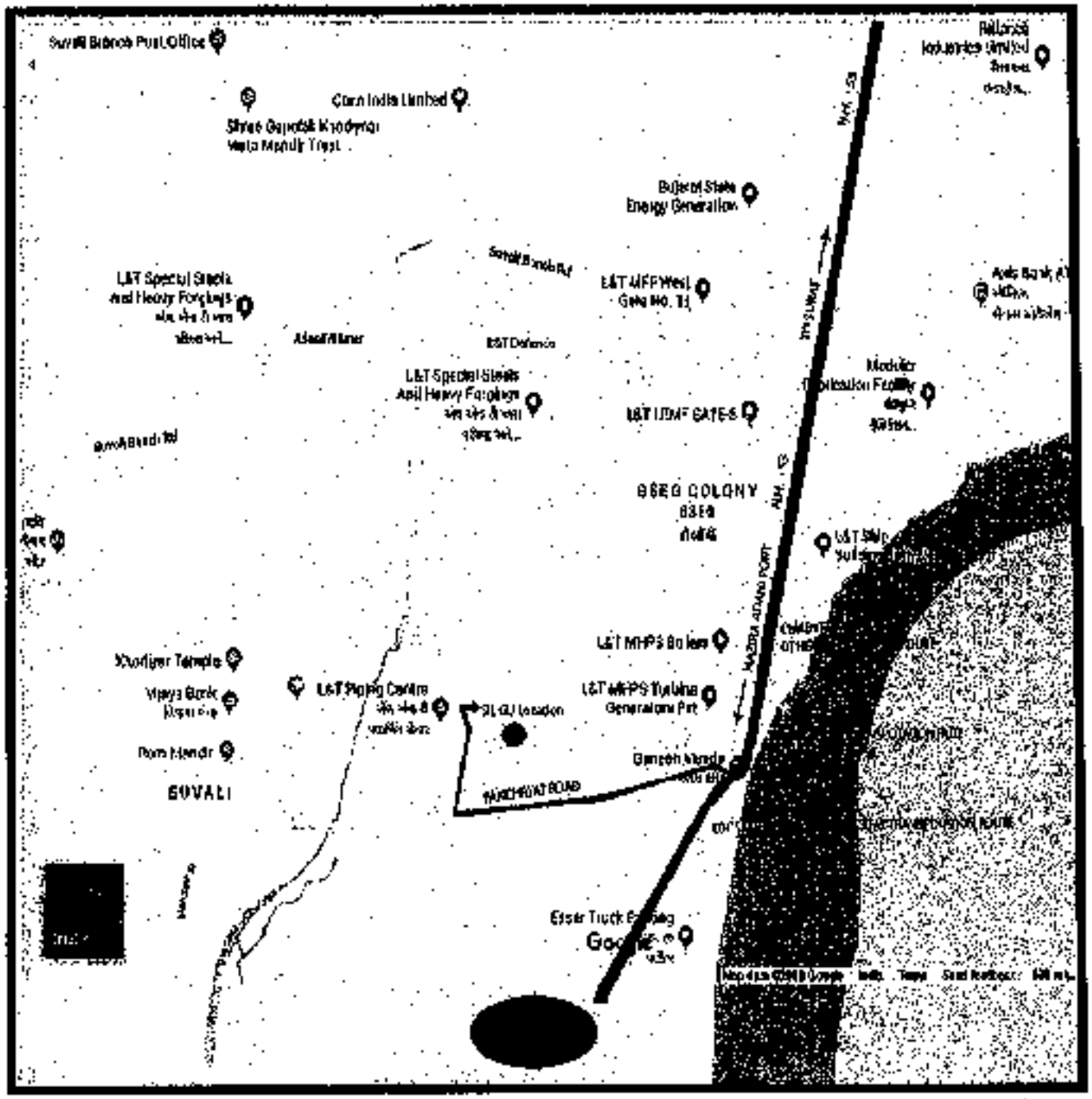
An Environment Management Cell (EMC)

- An Environment Management Cell will be developed by an effective mixing of a group of technical experts from various departments of the project to look after the all obligatory requirements and shall be responsible for the effective implementation of all environmental pollution control measures.
- The head of EMC will be directly report to top management
- The "dust control officer" will be employed under EMC wings
- Regular training will be provided to the personnel operating and maintaining fugitive emission control system
- Regular maintenance of APCD will be carried out as per OEM recommendations
- Sufficient EHS budget will be allocated to implement and ensure effective implementation of planned mitigation including R&D programs for innovative technologies for better environment management
- Regular environmental monitoring will be conducted by SPCB approved 3rd party and reports will be submitted to regulatory authority as per guideline

Annexure – C

Raw Material and Product Transportation Route:



ANNEXURE – D

Traffic Planning and Management Plan

1. Baseline Traffic Scenario:-

Traffic study measurements were performed at National Highway 6 and State Highway 168. Proposed project will attract to commercial vehicles as a result traffic load will also increase on highways. Traffic load play a major role in polluting the air. To assess the traffic load, 4 no. of surveyors were appointed to survey for National Highway 6 & National Highway 186.

Traffic data collected continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined. Traffic study is conducted on National Highway 6 & National Highway 186 from 26th and 27th Dec 2018

Traffic Study Report

S.No.	Vehicles Distribution	No. of Vehicles/ Day		Passenger Car Unit (PCU)	Total No. of Vehicle in PCU		Total No. of Vehicle (PCU)/Hour	
		National Highway 6	State Highway 168		National Highway 6	State Highway 168	National Highway 6	State Highway 168
1.	Cars	20538	9087	1.0	20538	9087	856	379
2.	Buses	1080	754	3.0	3240	2262	135	94
3.	Trucks	2036	1256	3.0	6108	3768	255	157
4.	Two wheelers	5612	3845	0.5	2806	1923	117	80
5.	Three wheelers	1863	1056	0.75	1397	792	58	33
Total		**31129**	**15998**		**34089**	**17832**	**1421**	**743**

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
National Highway 6	1421	3000	0.47	C
State Highway 168	743	1250	0.59	C

Existing Traffic Scenario with respect to LOS

0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/Average/Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

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Interpretation of Traffic Study:-

LOS values have been calculated based on traffic data on National Highway 6 & State Highway 168 and it has been found 0.47 and 0.59 respectively. LOS value indicates that the performances of NH-6 & SH-168 are good.

2. Incremental Traffic:-

The Incremental Traffic due to proposed project is described as below.

Incoming & Outgoing Transportation

1.	Clinker		200000	6061	Captive	Sea	184
2.	Additives like Gypsum, Fly Ash, Slag				Purchase	Road	
	Fuel		60000	182	Purchase	Road	
Total No. of Trucks deployed / day will be							184
Outgoing Product Transportation							
S.No	Product	Quantity Million TPA	Quantity TPA	Quantity TPD	Source	Mode of Transport	No. of Vehicles (Truck/day)
1.	Cement	2.0	2000000	6061	Captive	Road/Sea	179
Total No. of Trucks deployed / day will be							363

Frequency of Vehicles:

Total Capacity (Fuel, Clinker, Fly ash)	40, 60,000 TPA
No. of working days	330
Transportation of incoming and outgoing material	12303 Tons/day
Working hours per day	24 hour (3 shifts)
Truck/Tanker Capacity	34 Tons
Frequency of trucks/day (91 No.x 4 trips/day x 2 (up/down)	363 x 2
Frequency of trucks deployed/hr	16
Increase in PCU/hr	16 x 3= 48

Modified Traffic Scenario and LOS

S.NO	Road	Increase in PCUs	Modified V	C	Modified V/C Ratio	Modified V/C Ratio
1.	National Highway 6	48*60%= 29	1421+29= 1450	3000	0.48	C
2.	State Highway 186	48*40%= 19	743+19= 762	1250	0.61	D

Minimum impact on local transport as only 91 Nos. [4 trips/day x 2 (up/down)] Trucks will be required for transport of cement and raw material. The LOS value from the proposed project will be the almost same as before *i.e.* "C" "Good" for the National highways falling in the study area. So, the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse effect. The company has planned Coastal Shipping of Cement, accordingly cement terminals have been developed at various locations. This will reduce the load on rail/road network / transportation.

3. PURPOSE:-

The purpose of this Traffic Management Plan is to outline the manner in which vehicular, plant and pedestrian movements will be managed on the SIL Project during construction and operation phase, as well as the control measures in place to manage risks associated with Project-related traffic.

SIL acknowledges that the effective management of Project traffic and safety of operators and pedestriansis paramount to the delivery of successful day-to-day activities on site and SIL's overal. Zero Harm objectives and targets for the Project. Primary objectives of this sub-plan include:

- Maximizing operator and pedestrian safety;
- Minimizing wherever possible adverse interfaces between Project vehicles and the general public as a result of traffic and activities;
- Minimizing impact on the local road network
- Minimizing disruption, delays and congestion to local road users;
- Mitigating risks associated with deliveries to the Project;
- Providing clearly defined instruction and parameters cohesive with site traffic protocols to enable compliance to this sub-plan by all Project stakeholders(including visitors);
- Providing a safe Project environment free of hazardous interactions between vehicles, plant, people and infrastructure; and Complying with legislative and contractual requirements.

4. RESPONSIBILITIES:-

The requirements of this plan, SIL shall:
Provide adequate information, instruction and training to enable all Project personnel and other stakeholders to enter, operate across and leave the Project site in a safe manner (including clear installation of signage and training in the requirements of this plan);

- Establish designated pedestrian paths delineated from mobile plant routes wherever possible;
- Ensure all on-site roads established traffic is free of hazards to vehicles and plant requiring access;
- Establish a process to authorize vehicles for operation on site
- Ensure that Project traffic does not cause undue disruption or delays to surrounding public roads through planning, risk assessment and scheduling; and
- Review and update this sub-plan as necessary, in consultation with relevant stakeholders.

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5. GENERAL REQUIREMENTS:-

Traffic movement in and around the Project site presents a number of risks to personnel, as well as the potential for property damage to vehicles, plant and infrastructure. As such, the following parameters will be applied to ensure the safe movement of people, vehicles and plant during construction and operation phase.

- There will be designated areas for pedestrians and vehicles.
- Signage will be placed to direct safe passage around the site.
- Vehicle speed restrictions.

5.1. Site Security:-

The Project site will be secured with a boundary. There will be one main entry and exit point. Security measures will be taken to ensure the safety of the site on a twenty four hour basis.

5.2. Site Access:-

The main entry into the SIL site will be via NH-53 to Internal Gram Panchayat Road The site entry will be designed to accommodate entry and exit of all anticipated vehicles requiring site access.

5.3. Entry Requirements:-

As a minimum, to enter the SIL GU it is expected that all personnel meet the following requirements:

- Completion of Induction
- Completion of Site Delivery Drivers Induction (Transport Contractors Only)

Delivery drivers and visitors can enter SIL GU area without the above requirements if they are escorted by a person who is authorized to operate on the Site.

Note: All persons shall wear the site specific PPE at all times (e.g helmets, safety boots and high visibility clothing, gloves, safety glasses etc.) including delivery drivers. Any delivery driver failing to adhere to this will be refused access to the Site.

5.4. Noise :-

It is SIL's responsibility to comply with planning requirements, permits and any applicable regulations in relation to noise levels produced during construction / operation activities.

Noise generation from plant activities shall be minimized as far as reasonably practicable.

Vehicles / Trucks are queued or temporarily parked up whether it be on Site or off Site will be turned off to reduce noise and greenhouse gas emissions. Blowing of Horne will be restricted at site to avoid noise pollution.

Compression braking shall be avoided near residential areas and sensitive receptors. Noise monitoring shall be conducted on regular intervals.

5.5 Dust Control:-

All operators / Transporters must use vehicles and plant in a manner that minimizes dust generation on the site including using designated roads and observing speed restrictions at all times. All the raw material requirec for the proposed project will be

In solid form except fly ash. The fly ash will be transported in the bouser only. The clinker and coal will be transported in the trucks covered with the Tarpaulin. Strict instructions will be given to the transporter transporting the clinker and coal and special condition in the transport contract will be included to cover the Tarpaulin. SIL will not give entry of the trucks carrying clinker / coal in the premises without tarpaulin cover. The bags cement will be transported in the trucks and loose cement will be transported in the bousers only. Paved roads and concrete flooring will be provided in activity area. Speed of vehicles will be limit upto 10 km/hr within plant premises. Swiping Machine will be provided for road and floor cleaning within the premises. Thick green belt will be developed on the periphery of the plant. The Responsibility of Strict implementation of Mitigation Measures and compliance of EMP shall be handled by EHS In-charge of Environment Management Cell.

5.6 Flora, Fauna and Wildlife:-

All transporters, operators, vehicle drivers should be aware of local wildlife within and outside the Plant area. Drivers having valid licence shall only be allowed to drive vehicle to avoid sediment issues and harm to flora, fauna and wildlife. Any damage, injury or death of wildlife will be reported to the SIL Site Management Team. This will be communicated via Site based inductions, driver packs and toolbox talks.

6. TRAFFIC MANAGEMENT INTERNAL:-

6.1 Access:-

All access to the site will be through the main entry via NH-53 to Gram Panchayat road. The site office and lay down area will be located within the site boundary and will be clearly signposted.

6.2 Pedestrian Delineation:-

Delineation between pedestrian and plant access route will be established using separation methods. Signage will otherwise be implemented to advise of unrestricted pedestrian areas and exclusion zone.

Signage for exclusion zones and restricted access areas will be identify the area supervisor to be contacted in the case of persons requiring entry into the area.

6.3 Right of Way:-

Emergency vehicle entering the project site will have right of way at all times.

6.4 Speed Restrictions:-

10 km/h speed restrictions apply across the project site. Personnel found to be in breach of the site speed limits will be subject to disciplinary actions, which may include removal of access to site.

6.5 Signage:

All appropriate signage will be installed for direction of traffic and the safety of pedestrians. Temporary and permanent signage on site should be positioned for maximum visibility to inform operators of speed restrictions, warning and other critical traffic information for the area. Signage no longer applicable will be promptly removed.

6.6 Reversing:-

SIL will implement on-way system around the site and in loading and unloading area and provide designated turning area. Instruction to the drivers will be given not to reverse, unless absolutely necessary to reduce the reversing operations.

6.7 Proposed Heavy Vehicle Movement:-

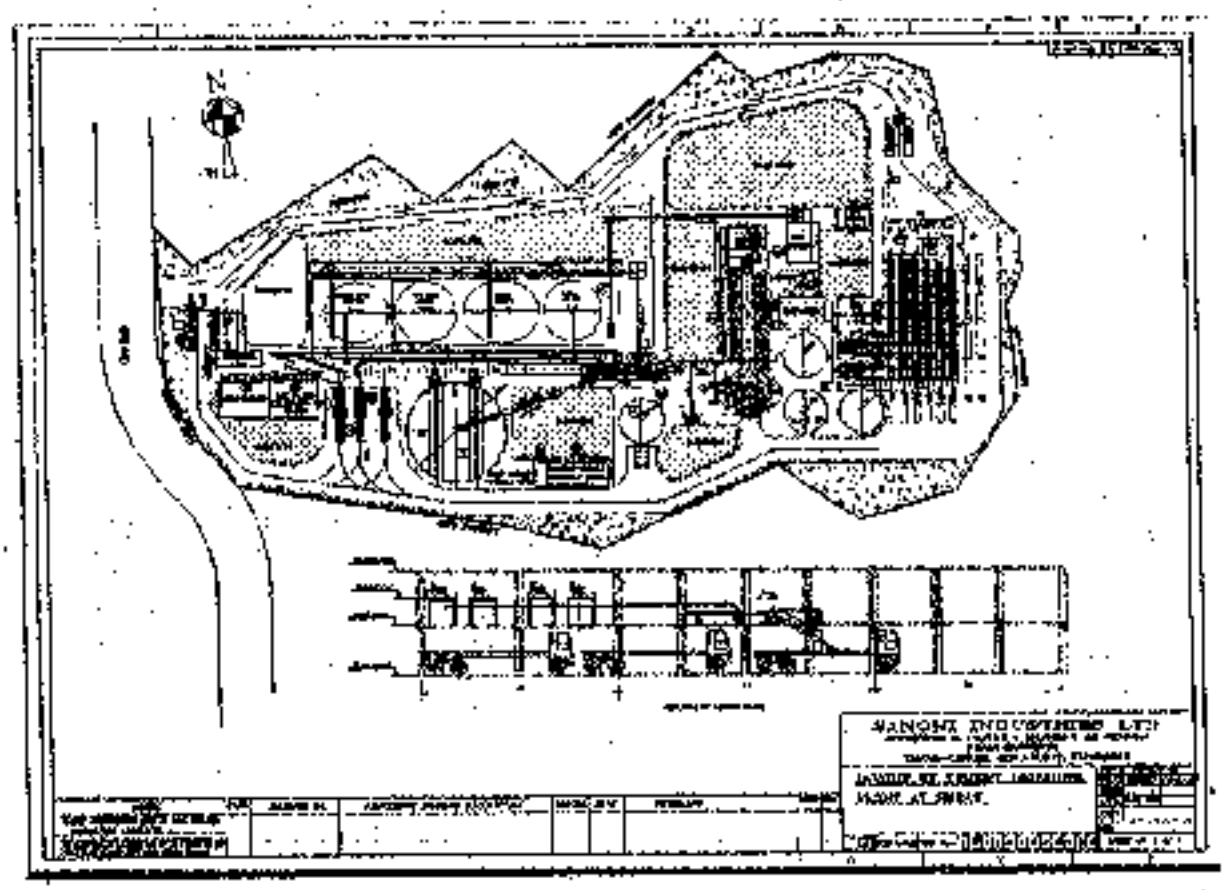
The clinker shall be transported from Sanghipuram (IU) to Surat (GU) mainly by sea route. At Surat, the Clinker shall be unloaded from the ship at nearest port and transported to the Surat GU site by trucks. The additives and fuel requirement of the plant will be transported through trucks. The finished goods will be dispatched through trucks / bousers.

6.8 Parking:

Looking to the in & out flow materials from the plant, SIL has made provision for parking of 40 trucks within the plant boundary below and near the Packing Plant.

Separate arrangement for car parking of the visitors / employees are made near the Administrative Office. A layout showing the Parking Area designated by SIL is Shown here-under. All parking locations will be marked on the site Vehicle Movement Plan (VMP) (posted on notice boards at the main office facilities).

Parking Arrangement within Plant Premises



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7. Traffic Monitoring and Management:-

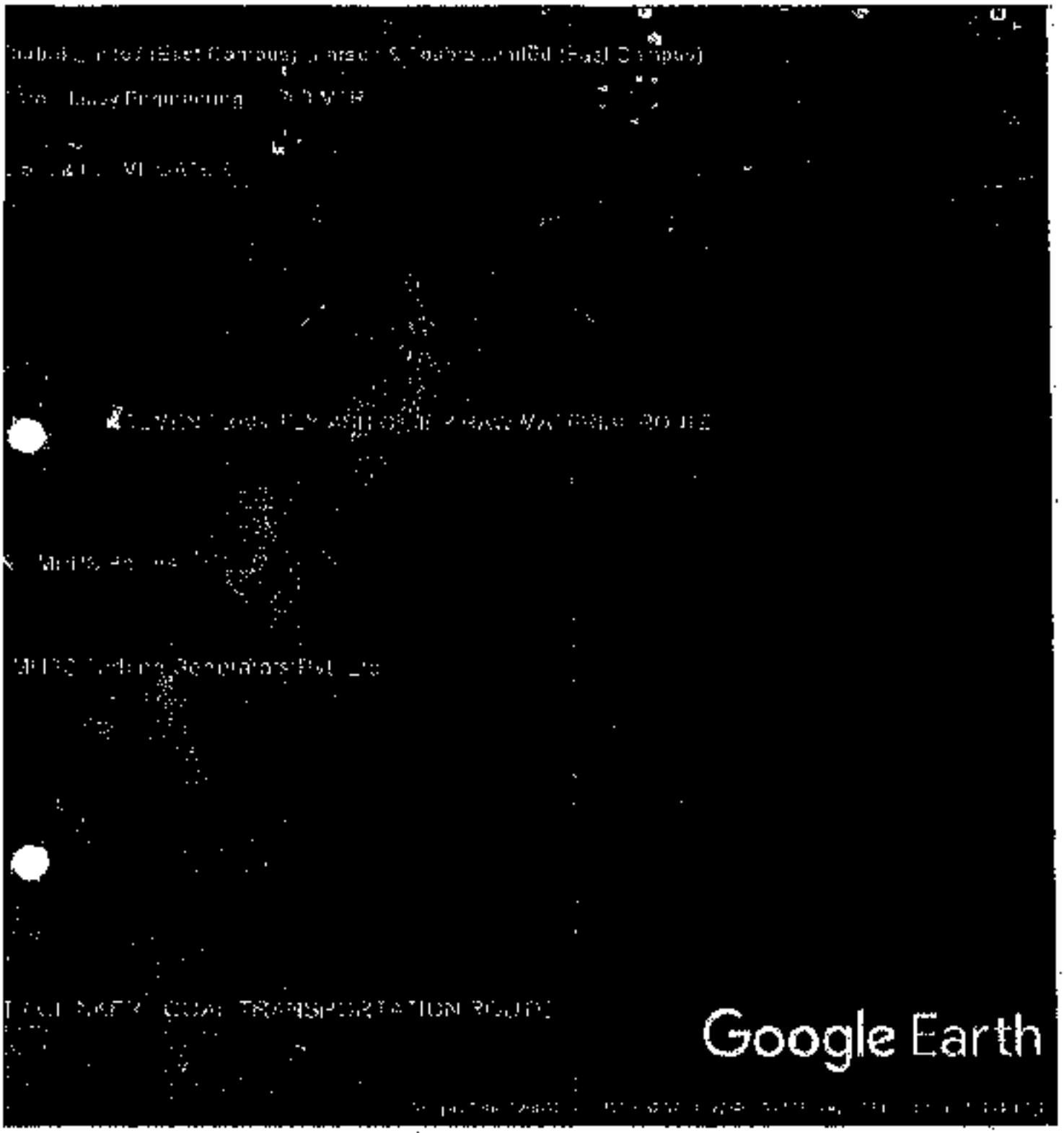
nternal RCC road network and separate entry/exit gate will be provided for smooth functioning of the traffic. Along with the road network, adequate parking space will also be provided at the project site.

The traffic management for Proposed Project of SIL is presented in the following table:

Traffic Management Plan

	Controlled vehicular movement (preferably with clearly demarcated entry/exit) with adequate supervision	Within and immediately outside the site - **Construction and operation phase**	Contractor/ Project Manager during construction phase. Security and concerned departments during operation phase.	Security-in charge and security team
	Demarcation of separate vehicular lanes and pedestrian routes/footpaths	Within the site - **Construction and operation phase**	Contractor/ Project Manager during construction phase. Security and concerned departments during operation phase.	Security team
	Vehicle entry and exit scheduling so that traffic congestion is not created on the external road leading to the site and within the port premises	Within and immediately outside the side - **Construction and operation phase**	Contractor/ Project Manager during construction phase. Security and concerned head of department during operation phase.	Security-in charge and security team

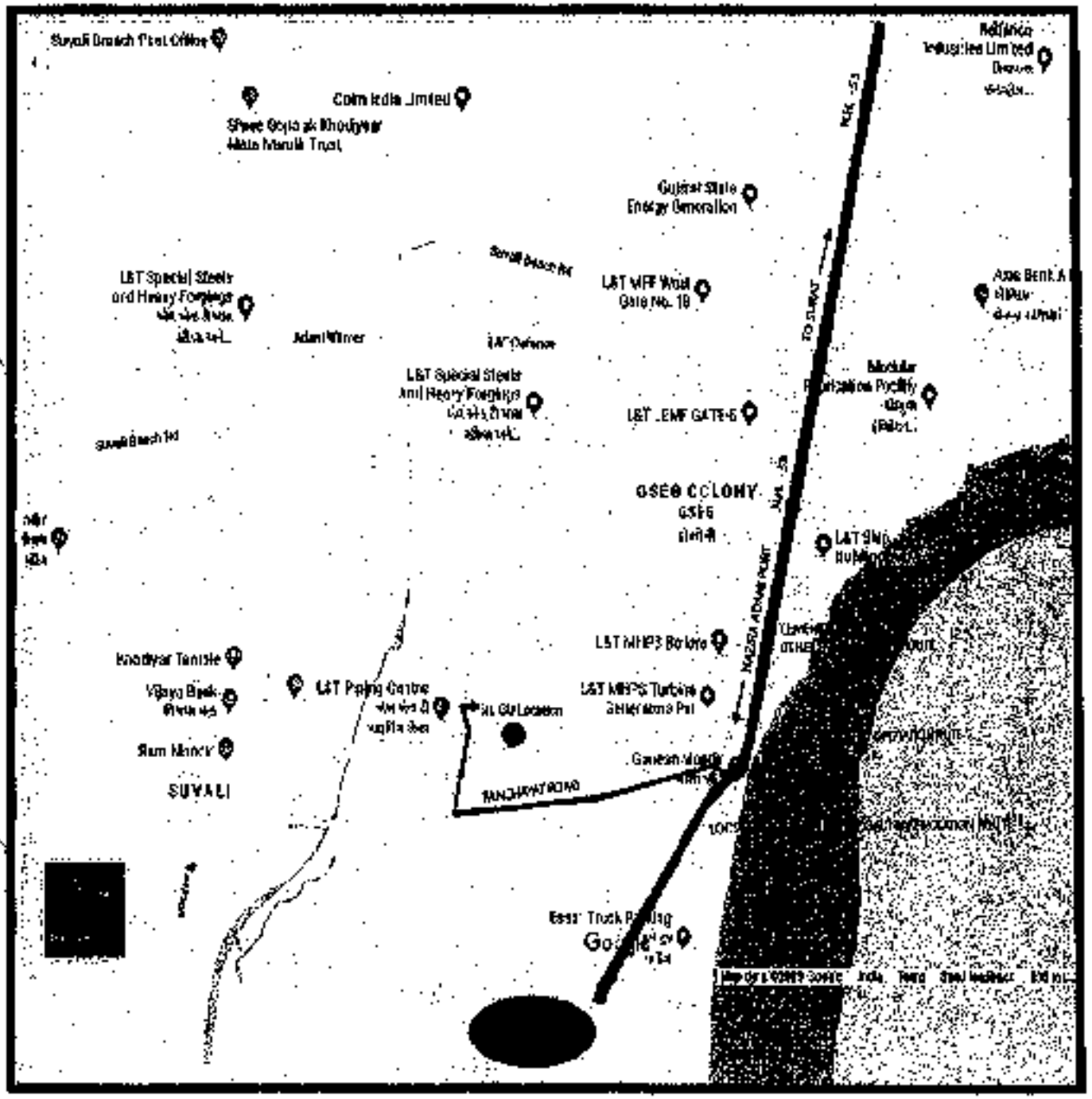
ANNEXURE - E



5 KM

Annexure – 3

Raw Material and Product Transportation Route:



Impact on Surrounding Area and Mitigation Measures

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2.	Additives like Gypsum, Fly Ash, Slag						
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Modified Traffic Scenario and LOS

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2.	**State Highway 186**	48*40%= 19	**743+19= 762**	1250	0.61	D

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AHMEDABAD

IMPACT OF TRAFFIC MOVEMENT ON SURROUNDING AREA & MITIGATION MEASURES

- Release of flue gas emission like PM, SO_2 and NOx from diesel operated vehicles.
- Generation of fugitive dust due to vehicle movement for transportation and handling of raw material and finished goods.
- Release of fugitive emission may cause health impacts.

MITIGATION MEASURES DURING TRANSPORTATION

SN	Activity	Materials handled	Mitigation Measures / EMP
1	Movement of raw materials & finished product by trucks / dumpers Movement of other vehicles - personnel four / two wheeler	Clinker Gypsum Fly ash Slag Coal Cement	• All operators / Transporters must use vehicles and plant in a manner that minimizes dust generation on the site including using designated roads and observing speed restrictions at all times. • All the raw material required for the proposed project will be in solid form except fly ash. The fly ash will be transported in the bouser only. The clinker and coal will be transported in the trucks covered with the Tarpaulin. • Strict instructions will be giver to the transporter transporting the clinker and coal and special condition in the transport contract will be included to cover the Tarpaulin. SIL will not give entry of the trucks carrying clinker / coal in the premises without tarpaulin cover. • The bags cement will be transported in the trucks and loose cement will be transported in the bousers only. • Paved roads and concrete flooring will be provided in activity area. • Speed of vehicles will be limit upto 10 km/hr within plant premises. • Swiping Machine will be provided for road and floor cleaning within the premises. • Thick green belt will be developed on the periphery of the plant. • The Responsibility of Strict implementation of Mitigation Measures and compliance of EMP shall be handled by EHS in-charge of Environment Management Cell. • Valid PUC trucks will be deployed for transportation

Sanghi Industries Limited
Grinding Unit - Surat
Survey No. : 125/1, 125/2, 126/1+2+3
Opp. L&T Piping Center, Gate No. 9,
Hazira, Surat - 394510, Gujarat

SANGHI CEMENT
Turning Dreams into Concrete Reality

Annexure - 4

UNDERTAKING

We, Sanghi Industries Limited solemnly affirm an undertaking that we shall use Imported Coal as a fuel and will not use Petcoke and Lignite in our proposed Cement Grinding Unit located at Survey No. 125/1, 125/2 and 126/1+2+3 of Village: Shivrampur, Taluka: Chorasi, District: Surat.

For , **Sanghi Industries Ltd.**

Authorised Signatory

Date: 23.05.2019
Place: Ahmedabad

CIN No. : L19209TG1985PLC005531
Registered Office P.O. Sanghinagar, Hayatnagar Mandal, R.R District, Telangana - 501511.
Tel. : 08415 - 242240 E-mail : companysecretary@sanghicement.com
Website : www.sanghicement.com

Sound APCM / EMP against sources of air pollution

(A) **Fugitive Emissions:**

Process & non-process related fugitive emissions sources and mitigation measures are given below:

(1) Process related Fugitive Emission Sources & its mitigation measures / EMP

SN	Types of operation	Activity	Mode	Materials handled	No. of emission source	Mitigation Measures (APCM) / EMP
1	Raw Material Handling & Transfer	Unloading Operation	Feeder	Clinker	1	➢ Fully enclosed unloading station will be provided. ➢ Adequate water sprinkling system will be provided. ➢ Dust extraction (suction apparatus) system with dust collector of capacity 11000 M3/hr will be installed.
			Feeder	Additive - Gypsum, Slag & Coal	1	➢ Fully enclosed unloading station will be provided. ➢ Adequate water sprinkling system shall be provided. ➢ Dust extraction (suction apparatus) system with dust collector of capacity 11000 M3/hr will be installed.
			Pneumatic from closed tankers	Fly ash	0	➢ Fly ash will be pumped directly from the closed tankers to silo by fully automated pneumatic system in closed loop so that fugitive emissions do not occur. ➢ Fly Ash Handling Guidelines will be complied.
			Stacker	Gypsum, Slag & coal	3	➢ Raw materials will be stored in covered yard. ➢ Single entry point with flexible curtain will be provided. ➢ Concrete flooring will be provided in the covered yard. ➢ Closed belt conveyor will be provided from unloading station to piles. ➢ Dust suppression system will be provided at stock piles.
2	Raw Material Handling & Transfer	Loading Operation	Belt conveyor	Clinker	1	➢ An automated closed loop silo extraction system with closed belt conveyor will be provided for clinker loading and transportation from silo to mill. ➢ De-dusting bag filter of 25000 M3/hr capacity will be installed at silo top.
			Reclaimer	Gypsum, Slag and Coal	2	➢ Raw materials will be stored in covered yards. ➢ Single entry point with flexible curtain will be provided. ➢ Reclaimer system will be provided to mechanize loading operation. ➢ Closed belt conveyor will be provided from loading points to mill. ➢ Dust suppression system will be provided at stock piles. ➢ Coal Handling Guideline will be complied.

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SN	Types of operation	Activity	Mode	Materials handled	No. of emission source	Mitigation Measures (APCM) / EMP
3	Raw Material Handling & Transfer	Transfer Operation (Transfer Points)	Belt conveyor	Clinker	1	➢ Transfer point will be fully enclosed ➢ De-dusting bag filter of 3000 M3/hr capacity will be installed. ➢ Capture dust from the bag filter will be directly fed into the system in closed loop.
				Gypsum / Slag / Coal	2	➢ Transfer points will be fully enclosed. ➢ Two nos. of de-dusting bag filter with capacity of 3000 M3/hr each will be installed. ➢ Capture dust from the bag filter will be directly fed into the system in closed loop.
4	Finish Product Handling & Transfer	Mill to Silo	Air slide	Cement	0	➢ The closed looped system of air slides will be provided for finished product transportation from mill to silo.
		Silo to Packing Plant	Belt conveyor	Cement	1	➢ Covered belt conveyor will be installed for material handling. ➢ De-dusting bag filter with capacity of 45000 M3/hr will be installed.
		Silo to bulk loading system	Belt conveyor	Cement	1	➢ Covered belt conveyor will be installed for material handling. ➢ An automated closed bulk loading system will be installed. ➢ De-dusting bag filter with capacity of 5000 M3/hr will be installed.
		Silo Vent	–	–	3	➢ Three nos. of de-dusting bag filter with capacity of 3000 M3/hr each will be installed.
5	Packing plant	Cement Packing	Automatic Packer machine / Bulk loading	Cement	03	➢ The packing operation will be performed automatic electronic packers under negative pressure by the centrally installed de dusting bag filters of 45000 M3/hr capacity. ➢ Engineering controls like guiding plate, scrapper brush and self bag cleaning system will be installed. ➢ An automated closed loop system will be provided for bulk cement loading. ➢ The spilled cement on the floor will be swept by vacuum sweeping machine periodically and sent for recycling. ➢ The vibratory screen with dust extraction arrangement will be provided for recycling of cement. ➢ Closed air slides and bucket elevators will be installed for finish product transportation in the plant.

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(2) Non-process related Fugitive Emission Sources & its mitigation measures / EMP

SN	Types of operation	Activity	Materials handled	Mitigation Measures / EMP
1	Vehicle Traffic at site	Movement of raw materials & finished product by trucks / dumpers Movement of other vehicles - personnel four / two wheelers	Clinker, Gypsum, Fly ash, Slag, Coal and Cement	➢ Raw materials / finished product will be transported in covered trucks / trippers. Fly ash will be transported in bouser. ➢ Paved roads and concrete flooring will be provided in activity area. ➢ Speed of vehicles will be limit up to 10 KMPH. ➢ Sweeping machine will be provided for road and floor cleaning as abundant precaution. ➢ Greenbelt in three layers will be developed along with plant boundary. ➢ Water sprinkling will be done in non-process area. ➢ Valid PUC trucks will be deployed for transportation.
2	Raw Material & finished product Storage	Storage of materials	Gypsum, Slag, Coal, Fly ash, Clinker and Cement	➢ All raw materials will be stored in covered yard. ➢ Single entry point with flexible curtain will be provided. ➢ Concrete flooring will be provided in the covered yard. ➢ Clinker & Fly ash will be stored in silo. ➢ Dust suppression system will be provided at stock piles. ➢ Stacker & reclaimer will be provided to mechanize loading and unloading operation in the yard. ➢ Greenbelt in three layers will be developed around the storage yard. ➢ Clinker, Fly ash and cement will be stored in closed Silo.

(B) Process / Flue Gas Emissions:

SN	Types of operation	Activity	Materials handled	Mitigation Measures / EMP
1	Grinding	Cement grinding in Vertical Roller Mill (VRM)	Clinker, Gypsum & additives - Fly ash and Slag	➢ Latest technology based Intensive Jet Bag house of capacity 11,00,000 m3/hr will be installed. ➢ 55 meter high x 3.2 meter Dia. Stack will be provided for dispersion. ➢ SPM <30 mg/Nm3, SOx & NOx < 100 ppm (Norms as per CPCB Guidelines).

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An Environment Management Cell (EMC)

- An Environment Management Cell will be developed by an effective mixing of a group of technical experts from various departments of the project to look after the all obligatory requirements and shall be responsible for the effective implementation of all environmental pollution control measures.
- The head of EMC will be directly report to top management
- The "dust control officer" will be employed under EMC wings
- Regular training will be provided to the personnel operating and maintaining fugitive emission control system
- Regular maintenance of APCD will be carried out as per OEM recommendations
- Sufficient EHS budget will be allocated to implement and ensure effective implementation of planned mitigation including R&D programs for innovative technologies for better environment management
- Regular environmental monitoring will be conducted by SPCB approved 3rd party and reports will be submitted to regulatory authority as per guideline

Details of vents/stack with specific source & Air Pollution Control System

S N	Technical Details	Unit	Source / Location								
			Cement Mill (VRM)	Unloading Stations	Transfer Points	HAG	Clinker Silo	Cement Silos	Fly ash Silo	Packing Plant	Bulk Loading Station
1	APCS	Type	Bag house	Bag filter	Bag filter	Bag filter	Bag filter	Bag filter	Bag filter	Bag filter	Bag filter
2	Technology	–	Intensive Jet Bag house	Pulse Jet Bag filter	Intensive Jet Bag house	Pulse Jet Bag filter	Pulse Jet Bag filter	Pulse Jet Bag filter	Pulse Jet Bag filter	Pulse Jet Bag filter	Pulse Jet Bag filter
3	Quantity	Nos.	01	02	03	01	01	03	01	01	01
4	Capacity	M3/hr	11,00,000	11,000 each	3,000 each	5,000	25,000	3,000 each	3,000	45,000	5,000
5	Compartment	Nos.	10	1	1	1	1	1	1	1	1
6	Bag Size	Meter	8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
7	Bag Quantity	Nos.	4420	110	34	67	256	34	34	460	56
8	Bags quality	Type	100 % Homo polymer poly acrylonitrile	Polyester Needle Felt	Polyester Needle Felt	100 % Homo polymer poly acrylonitrile	Polyester Needle Felt	Polyester Needle Felt	Polyester Needle Felt	Polyester Needle Felt	Polyester Needle Felt
9	Air to cloth ratio	m3/min/m2	1	1.2	1.2	1	1.2	1.2	1.2	1.2	1.2
10	Effective area	M2	18218	148	46	90	345	46	46	621	75
11	Inlet dust load	g/m3	299-371	50-100	50-100	50-100	50-100	50-100	50 100	50-100	50-100
12	Outlet dust load	mg/m3	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30
13	Efficiency	%	99.96	99.95	99.95	99.95	99.95	99.95	99.95	99.95	99.95
14	Stack Diameter	Meter	3.2	NA	NA	NA	NA	NA	NA	NA	NA
15	Stack Height	Meter	55	Vent	Vent	Vent	Vent	Vent	Vent	Vent	Vent

Detail may very during detailed engineering at the time of execution.

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SANGHI INDUSTRIES LIMITED AHMEDABAD

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Sanghi Industries Limited
Grinding Unit - Sazal
Survey No. : 125/1, 125/2, 126/1+2+3
Opp. L&T Piping Center, Gate No. 9,
Hazira, Surat - 394510, Gujarat.

SANGHI CEMENT
Turning Dreams into Concrete Reality

Annexure - 7

UNDERTAKING

We, Sanghi Industries Limited solemnly affirm an undertaking that we shall adhere all the guidelines prescribed by the authority for handling of coal & fly ash in our proposed Cement Grinding Unit located at Survey No. 125/1, 125/2 and 126/1+2+3 of Village: Shivrampur, Taluka: Chorasi, District: Surat.

For , Sanghi Industries Ltd.

Authorised Signatory

Date: 23.05.2019
Place: Ahmedabad

CIN No. : L14209TG1986PLC005581
Registered Office : P.O. Sanghinagar, Hayatnagar Mandal, R R District, Telangana - 501511.
Tel. : 08115 - 242240 E-mail : companysecretary@sanghicement.com
Website : www.sanghicement.com

COMPLIANCE OF COAL HANDLING GUIDELINES OF GUJARAT POLLUTION CONTROL BOARD

S. No.	Guidelines /Conditions	Compliance Status
(A) Location Criteria		
1	Coal handling unit/agency shall not use any agriculture land and shall be located at a minimum distance of 250 meters away from the surrounding agriculture land	Our proposal is for standalone cement grinding unit. As such as location criteria defined by GPCB Guideline is not applicable to us. However, we will ensure all compliance of the coal and ash handling guidelines applicable to cement plant.
2	Government waste land not suitable for any agriculture purpose meeting with the requisite sitting/distance criteria shall be preferred for establishing coal handling units	
3	Coal handling unit/agency shall be minimum 500 meters away from the residential area, School/colleges, Historical Monuments, Religious Places, Ecological sensitive area as well as forest area.	
4	Coal handling unit/Agency shall be located 500 meters away from the Railway line, Express ways, National Highways, state ways and District Roads and from water bodies like River, Nala, Canal , Pond etc	
5	In case of coal handling activities at the ports and jetties or extension thereof, the distance and land use criteria may be relaxed and compensated by advanced /sophisticated pollution control measures and mechanization & thick plantation, however all such ports and jetties, where coal handling is carried out, shall provide closed conveyor belt and mechanization for handling of coal.	
(B) Storage Criteria		
6	Coal handling unit/Agency shall store cover in such a way that coal heap should not be higher than 5 meter and clear distance between two adjoining heaps at G.L. should be 5 meters, so that in case of fire, approach is available.	Covered coal storage area will be provided and > 5 meter distance between will be maintained between two adjoining coal piles.
7	There should be mechanized loading/unloading system from the loading / unloading area to the stacking yards and in to the vehicle	Fully mechanized system i.e. truck trippler, Stacker & Reclaimer system will be provided for loading / unloading
8	Coal handling unit/ Agency shall take all corrective steps to resolve the issue of air pollution at permitted coal storage /handling area where coal is being stored.	Best in class possible all corrective measures i.e. covered storage shed, dust suppression system, stacker & reclaimer with covered belt conveyor, adequate bag filters on transfer points etc will be provided

(C) Transport Criteria		
9	Coal handling unit/Agency shall ensure that all trucks before leaving the storage yard shall be showered with water with adequate system, shall be covered with tarpaulin or any other effective measure/device completely and also that trucks are not over loaded as well as there is no spillage during transportation	Tarpaulin covered trucks will be used for coal handling. It will ensure that trucks are not over loaded as well as there is no spillage during transportation
10	The vehicles carrying the coal should not be overloaded by raising the height of carriage. Weigh scale shall be provided within the loading area only and port / coal park authority shall ensure that no overloading is done.	The vehicles carrying the coal will not be overloaded by raising the height of carriage.
11	The top of the vehicle should be covered with fixed cover instead of tarpaulin cover to avoid spillage or dusting of coal.	The top of the vehicle should be coverec with tarpaulin to avoid spillage or dusting of coal.
12	Coal handling /Agency shall obtain transport permission from the local administration under the relevant rules.	Transport permission will be obtained from the local administration under the relevant rules before commissioning of the project.
(D) Pollution Prevention Criteria		
13	Coal handling unit/Agency shall provide paved approach with adequate traffic carrying capacity.	Paved approach will be provided with adequate traffic carrying capacity.
14	Coal handling /Agency shall construct compound wall all along periphery of the premises with minimum 9 meters height.	Not applicable as coal will be stored in covered storage shed.
15	Continuous water sprinkling shall be carried out on the top of the heap at regular intervals to prevent dusting, fire & smoke. To prevent fugitive emission during loading/ unloading, fixed pipe network with sufficient water storage and pump shall be installed. Water sprinkling shal be carried out at each and every stage of handling to avoid generation of coal dust or other dust within premises.	Continuous water sprinkling will be carried out on the top of the heap at regular intervals to prevent dusting, fire & smoke. Water sprinkling will be carried out at each and every stage of handling to avoid generation of coal dust or other dust within premises.
16	Coal handling unit/Agency shall ensure regular sweeping of coal dust from irternal and main road and also ensure that there is adequate space for free movement of vehicles.	Regular sweeping of coal dust from internal and main road will be carried out and also ensured that there is adequate space for free movement of vehicles.
17	The following adequate Air Pollution Control Measures shall be installed and to be operated efficiently. a) Dust containment cum suppression system for the coal stack, loading and unloading.	Dust suppression system will be installed for the coal stack, loading and unloading.

SAHAJ CHETNA UDYOG LIMITED

	b) Construction of effective wind breaking wall suitable to local condition to prevent the suspension of particles from the heaps.	Coal will be stored in covered storage shed.
	c) Construction of metal road & RCC Pucca flooring in the plot area/godown etc.	Construction of metal road & RCC Pucca flooring in the plant area will be provided.
	d) System for regular cleaning and wetting of the floor area within the premises.	Regular cleaning and wetting of the floor area within the premises will be implemented.
	e) Entire coal storage area/ godown should be covered with permanent weather shed roofing and side walls i.e. , in closed shed, in case of crushing /sieving/grading activity is carried out (i.e. G.I. Sheet) along with adequate additional APCM should be installed.	Coal storage area will be covered with permanent weather shed roofing and side walls along with dust suppression system will be installed.
18	Coal handling/Agency shall carrying out three row plantation with tall growing trees all along the periphery of the coal handling premises, inside & outside of the premises along with road.	Three row plantation with tall growing trees all along the periphery of the coal handling premises, inside & outside of the premises along with road will be carried out as per EMP.
19	Proper drainage system shall be provided in all coal storage area so that water drained from sprinkling & runoff is collected at a common tank and can be reused after screening through the coal slit or any other effective treatment system.	Proper drainage system will be provided in all coal storage area so that water drained from sprinkling & runoff.
20	All the ergineering control measures and state of art technology including covered conveyors belts, mechanized loading and unloading, provision of silo etc. shall be provided in addition to the measures recommended in the environmental guidelines for curbing the pollution.	Covered conveyors belts, mechanized loading and unloading, provision of silo etc. Will be provided for dust emission control.
(E) Safety Requirements		
21	Coal handling unit/Agency shall provide adequate fire fighting measure to avoid any fire or related hazards (including adequate water storage facility, and the premises shall be exclusively used for storage of the coal.	Adequate fire fighting system will be provided with adequate water storage facility in coal storage shed.
22	An onsite emergency plan shall be prepared and implemented by coal handling unit.	An onsite emergency plan will be prepared and implemented accordingly.
(F) Legal Criteria		

23	Necessary permission from all the applicable regulatory authorities and adequate steps under the provisions of applicable environmental acts/rules shall be taken.	Necessary permission from all the applicable regulatory / authorities will be obtained and adequate steps under the provisions of applicable environmental acts/rules will be taken accordingly.
24	Coal handling unit/Agency shall prepare EMP (Environment Management Plan) and implement the same in true spirit and thus maintain overall environment of that area.	EMP (Environment Management Plan) will be prepared and implemented in true spirit and thus maintain overall environment of that area.
25	Coal handling unit/Agency shall not carry out the operation of loading/unloading of coal/coal dust at any place, till adequate air pollution control equipment for dust control/ suppression are installed and efficiently operated and the consent under the provisions of Air (Prevention & Control of Pollution) Act, 1981 is obtained by coal yard owners/Coal handling unit/Agency /Coal importer.	Point Noted.
26	Coal handling unit /Agency shall operate continuous Ambient Air Quality Monitoring Stations as per CPCB guidelines. The results of parameter like SPM, RSPM and SO_2 and NOx shall be submitted to the SPCB every month.	Continuous Ambient Air Quality Monitoring Stations will be installed as per CPCB guidelines. The results of parameter like SPM, RSPM and SO_2 and NOx will be submitted to the GPCB every month.
27	In case of port which provides the facility to individual developers an agreement/ MoU shall be made between port authority and developer for curtailment of pollution. Port authority shall be responsible for supervising and controlling the pollution control related activities and implementation of the environmental guidelines.	For our grinding unit, we will be procuring coal from the local sources, hence, not applicable.
28	The concentration of the following parameters in the ambient air within the premises and a distance of 10 meters from the source (other than the stack/vent shall not exceed the following levels.	Ambient air quality parameters will be complied as per CPCB / GPCB.

PARAMETERS	PERMISSIBLE LIMIT	
	Annual	24 Hrs Average
Particulate Matter - 10 (PM_{10})	60 Microgram/M^3	100 Microgram/M^3
Particulate Matter - 10 ($PM_{2.5}$)	40 Microgram/M^3	60 Microgram/M^3
SO_2	50 Microgram/M^3	80 Microgram/M^3
NO_x	40 Microgram/M^3	80 Microgram/M^3

Compliance of CPCB Guidelines for loading, unloading, storage, transportation of fly ash
Thermal Power Plant

There is no any specific guidelines available for ash handling generated by Hot Air Generator (HAG), hence compliance of CPCB Guidelines for ash handling – Thermal Power Plant is given below:

S.No	Description/ Condition	Compliance/ Status
7.1 Dry collection of fly ash and bottom ash		
a	Coarse fly ash from first field of ESP Hoppers needs to be collected and stored separately into the coarse fly ash silo.	Not applicable as ash will be collected through bag filter. The closed loop system will be provided for ash transportation from bag filter hopper to fly ash silo.
b	Fine fly ash from second field onwards of ESP Hoppers should be collected separately. For some specific usage, fine fly ash may be passed through Classifier for further separation of fine fly ash and stored in separate silo.	Not applicable as ash will be collected through bag filter. The closed loop system will be provided for ash transportation from bag filter hopper to fly ash silo.
c	Bottom ash which is not utilised presently could also be collected in dry form and converted into a valuable resource if processed to match the end use specification. The dry bottom ash removal and its transportation is certainly more environment friendly, compared to that of wet ash removal and transport system. Wet collection & disposal of bottom ash should be minimised as far as possible.	The closed loop system will be provided for ash transportation from HAG to fly ash silo.
7.2. Loading, Unloading and Storage: Installation of Bag Filters with dry fly ash collection and storage in Silos at loading and unloading points are standard practices at both locations i.e. loading at power plant site as well as at the unloading point at user's site. Suggestions for further improvement in existing practices are as under:		
a	Current practice of loading of fly ash in Bulkers / Tankers requires improvement at the stage of loading of fly ash in Tankers. The opening telescopic chutes should be closed and confined to avoid fugitive dust emission.	Not applicable as closed loop system will be provided for fly ash / bottom ash up to storage silo.
b	The Pollution Control Equipment / Cascade Filters, attached with fly ash loading Chute should be periodically cleaned along with regular scheduled maintenance of Bag Filter to avoid choking and malfunctioning of Bag Filter. It would mitigate the dust emission during loading of fly ash	Not applicable as no tanker loading operation involve in the project as only unloading of bulker will be required which will be handled through closed automated pneumatic system.

c	Malfunctioning of level sensor scan be avoided, with regular maintenance, to prevent over filling of fly ash in Tankers.	Not applicable as no tanker loading operation involve in the project as only unloading of bulker will be required which will be handled through closed automated pneumatic system.
d	The Weigh Bridge to be installed under fly ash loading chute to fill just the required quantity of fly ash in Tenkers so that rejection and emptying out of fly ash in open area is avoided which otherwise results in heavy fugitive emission all around.	Not applicable as no tanker loading operation involve in the project as only unloading of bulker will be required which will be handled through closed automated pneumatic system.
e	Opening of Tankers need to be closed and properly locked during transportation of fly ash. Automatic opening / close system need to be installed without fail.	Not applicable as no tanker loading operation involve in the project as only unloading of bulker will be required which will be handled through closed automated pneumatic system.
f	Current practice of unloading of fly ash from Tanker to Storage Hopper through pneumatic system is certainly good. But it has, however, been observed that the leakage of fly ash occur at bends and joints of transportation pipe line. The fly ash being abrasive in nature causes damage at bends and joint locations. Fly ash should, therefore be transported through PVC coated MS pipes to avoid the abrasion otherwise it may lead to leakage of fly ash. The mechanical unloading system should be envisaged to avoid high pressure, more power consumption and dust leakage from unloading pipe lines. As far as possible, number of bends should be minimised.	Closed automated pneumatic system will be provided for fly ash handling from bulkers to silo. Fly ash will be transported through PVC coated MS pipes to avoid the abrasion to avoid leakage of fly ash. The system will be designed in such a way that there will be minimum bends.
g	The fly ash storage silo should to be made up of anti-abrasive or anti corrosive material. It is preferred to provide concrete silo/hopper to avoid leakages.	Concrete silo will be provided for fly ash storage.
h	The bottom ash discharged from boiler bed, may be transported pneumatically in dry form / in slurry form to the ash pond.	Not applicable as no boiler will be installed in the project.
i	Proper functioning of all the level sensor of Storage Hopper has to be ensured to avoid any possible spillage from Hopper opening.	Proper functioning of all the level sensor of Storage Hopper will be ensured to avoid any possible spillage from Hopper opening.
j	The Bag filter made of anti-abrasive material/cloth be provided with telescopic chute.	Advance technology based pulse jet bag filter will be installed. Telescopic chute will be not applicable as no loading operation required

k	Dumping of ash in Ash pond should be loaded mechanically in moist condition so that the ash does not get air borne and pose fugitive dust problem.	Not applicable as no pond ash will be required in the project.

7.3 Transportation

Fly ash transportation has many challenges like distance to be transported, form of ash i.e. dry or wet ash, user's requirement, economic feasibility, requirement of surrounding vicinity and many more site spetific issues. Over and above, in any case contro' of dust emission during transportation is prime concern and more challenging being a non-point source of pollution and larger area coverage due to movement from one place to other passing through various receptors. As fly ash is used by different users for different purpose such as cement manufacturing, brick manufacturing, mine back filling, road construction and filling of low lying area, the handling and transportation have to accordingly suggest. Following modes of transportation and precautions, to avoid fugitive dust emission are, therefore, suggested for different end users of fly ash or bottom ash as the case may be:

a	**Cement/ Asbestos manufacturing**	
I	Specially designed Road Tankers/ Bulkers or mechanically designed covered Truck sand provided with automatic loading and unloading through compresser / vacuum pumps mounted on the tankers need only to be used	Specially designed Bulkers will be utilized with automatic unloading through vacuum pumps system.
II	Special designed railway wagons similar to Bulkers/Tankers need to be used for transportation	Not applicable as fly ash will be transported through bulkers through nearby power plants.
III	Dedicated boats and bargers should only carry fly ash containers for transportation of fly ash. Specially designed jetty with automatic loading and unloading system for transportation of fly ash from silo to container should be developed.	Not applicable as fly ash will be transported through bulkers through nearby power plants.
b	**Flyash based Brick, Tiles, Blocks etc. manufacturing:**	Not applicable as the proposed project is standalone cement grinding unit.
I	Tankers/ Bulkers or mechanically designed covered Trucks need to be used	Not applicable as the proposed project is standalone cement grinding unit.

II	Tractor trolleys with box type cover on top with hydraulic unloading system need only to be dep oyed for transportation of dry or wet fly ash, while traversing through habilitated areas otherwise, Tractor trolleys suitably covered with good quality of tarpaulin (made of HDPE)could be allowed to transport flyash for shorter distance say upto a distance of about 10 Kms.	Not applicable as the proposed project is standalone cement grinding unit.
C	**Mine/ abandoned quarry back filling**	Not applicable as the proposed project is standalone cement grinding unit.
I	Tankers/ Bulkers or mechanically designed covered Trucks need to be used	Not applicable as the proposed project is standalone cement grinding unit.
II	Pipe conveyors, wherever feasible, based on the topography of the area should be used.	Not applicable as the proposed project is standalone cement grinding unit.
III	Thermal Power Plants using wet ash disposal, if permitted can transport ash slurry directly to abandoned mine through ash slurry pipe line.	Not applicable as the proposed project is standalone cement grinding unit.
d	**Road construction and filling of low lying area**	Not applicable as the proposed project is standalone cement grinding unit.
I	Tankers/ Bulkers or mechanically designed covered Trucks need to be used.	Not applicable as the proposed project is standalone cement grinding unit.
e	**Other miscellaneous purposes**	Not applicable as the proposed project is standalone cement grinding unit.
I	Tankers/ Bulkers or mechanically designed covered Trucks need only to be used	Not applicable as the proposed project is standalone cement grinding unit.
7.3.1	The user agency shall obtain prior approval of design of Road Tankers/ Bulkers or mechanically covered Trucks, as the case may be, from the concerned State Pollution Control Board. In no case, flyash or bottom ash shall be allowed to be transported by open trucks / trollies irrespective of distance or end use.	Not applicable as the proposed project is standalone cement grinding unit.
7.4	**Code of Practices for general maintenance of roads, vehicles and conditioning of fly ash**	
a	Thermal power plants and use agency collectively transported in environmentally sound manner prescribed by CPCB	Fly ash will be transported in environmentally sound manner prescribed by CPCB

b	Roads inside power plant and that of flyash user agency should be pavec and plantation of adequate width should be done at both sides. Mechanised Road Sweepers should be deployed. In addition, adequate arrangements for water sprinkling should be made to suppress fugitive dust emission, if any generated.	Paved inter road with plantation of adequate width will be done at both sides. Mechanised Road Sweepers will be deployed. In addition, adequate arrangements for water sprinkling will be made to suppress fugitive dust emission.
c	Pond ash to be transported should be conditioned with water to maintain minimum 15% moisture at the disposal point so that ash does not get air borne and cause fugitive emission.	Not applicable as no pond ash will be required in the project.
d	Adequate free board in trucks should be kept to avoid overflow/spillage during transportation.	Not applicable as fly ash will be transported through bulkers through nearby power plants.
e	In case of any spillage enroute during transportation of fly ash, the agency shall ensure that spilled ash is collected and transported to the disposal/usage site immediately	Not applicable as fly ash will be transported through bulkers through nearby power plants.
f	All the Bulkers and trucks responsible for carrying fly ash should have valid Pollution Under Control certificates.	All the Bulkers utilize for carrying fly ash will have valic Pollution Under Control certificates.
g	The speed limit of vehicles carrying flyash should be strictly enforced and in no case same shall exceed 40 km per hour.	The speed limit of vehicles carrying fly ash will be strictly enforced and in no case same shall exceed 40 km per hour.
h	State Pollution Control Boards shall indicate clearly mode of transportation and method of loading and unloading while granting the consent.	Point Noted
i	Transportation of fly ash through thickly through thickly populated areas populated areas should be avoided as for as possible.	Not applicable as proposed project is located in Hazira industrial zone and transportation of fly ash will be carried out through national highway / state road.
j	General awareness/ training programmes be organised regularly for tanker operating staff like drivers and cleaners on the impact of hazards of fly ash.	General awareness/ training programmes will be organised regularly for tanker operating staff like drivers and cleaners on the impact of hazards of fly ash.

SANGHI CEMENT

Stack height calculation

Based on So2 Emissions	Based on PM Emissions
Impl. Coal - 6.9 TPH S % - 0.5% Total Sulphur in system Kg/Hr = 6.9 x 0.6% x 1000 = 41.67 Kg / Hr H = 14 x (41.67)^0.30 = 15.67 Mtr ~ 16 meter	Max PM - 500 Mg/Nm3 Estimated PM Emission - 0.092839 MT/Hr H = 74 x (0.092839)^0.27 H = 38.95 Mtr ~ 39 Meters

॥ શ્રી ॥

સુંવાલી ગ્રામ પંચાયત

મુ.પો. સુંવાલી,
તા. ચોર્યાસી, જી. સુરત
ફોન નંબર : ૨૮૬૦૭૧૯

વિજય સરકાર નવી સરકાર

Suvali Gram Panchayat

At. & Po. Suvali,
Ta. Choryasi, Di. Surat
Tel. No. : 2860719

જા.નં.૨૦૧૬/૧૦ તા. ૧૧/૦૬/૨૦૧૬

આજ રોજ મોજે સુંવાલી તા.ચોર્યાસી સામાન્ય સા તા. ૩૦/૦૬/૨૦૧૬ નાં રોજ સવારે ૧૧:૦૦ કલાકે સરપંચશ્રી નયનાબેન રાજુભાઇ પટેલના અધ્યક્ષ સ્થાને ગ્રામ પંચાયત સુંવાલી મળી, જેનો ઠરાવ નંબર ૫ ની અક્ષરશ નકલ.

ઠરાવ નંબર ૫ :- સુંવાલી, જુનાગામ ગ્રામ પંચાયત હદમાં મેસર્સ સાંઘી સિમેન્ટ કંપનીની બાબતે સર્વાનુમતે ઠરાવ.

ચર્ચા : ઉપરની બાબતને ચર્ચા હાથ ધરી મેસર્સ સાંઘી ઈન્ડસ્ટ્રીઝ લીમીટેડના સ્થળે શિવરાજપુર, તા. ચોર્યાસી, જી. સુરત ખાતે ૪૮-ક્લીંકર ગ્રાઉન્ડિંગ યુનિટ ૨૦ મીલીયન ટી.પી.એ વાળો સિમેન્ટ પ્લાન્ટ બનવાનો છે. આ પ્લાન્ટની સ્થળ સ્થિતિ સુંવાલી ગામની વસ્તી વિસ્તાર નજીક અને કંપનીને જોઈતો કાચો માલ તેમજ તૈયાર માલ વહન કરવા સુંવાલી ગ્રામ પંચાયતની હદ વિસ્તારના ગ્રામ્ય રસ્તાનો ઉપયોગ થશે. આ ઉપરાંત વધુ પ્રકારની નુકશાન થશે જેની વિગતવાર નીચે મુજબ છે.

(૧) કંપની દ્વારા કારખાના તરીકે ધોરણસર થશે, જેના કારણે સુંવાલી ગામમાં હવા પ્રદુષણનું પ્રમાણમાં વધારો થશે, ગ્રામ્ય જનતાના આરોગ્યને હાની થશે.

(૨) કંપની સિમેન્ટ ઉત્પાદનની પ્રક્રિયા હાથ ધરશે ત્યારે તેમાંથી બારીક રજો છુટ પડશે, જે હવામાં ભળશે અને ગામની બોલી બાજુ જમીનની ફળદ્રુપતાપણ્યાને નુકશાન પોહચ કરવું પડશે.

(૩) સુંવાલી ગામના મુખ્ય રસ્તા બીજા ગામની સાથે જોડતા રસ્તા પર ટુકડે ટુકડે સમાવેશ થયો જ છે. સાંઘી સિમેન્ટ કંપની સિમેન્ટ ઉત્પાદન હાથ ધરશે ત્યારે કાચો માલ પાકો માલ વહન કરવાં મુખ્યત્વે સુંવાલી ગામના ગ્રામ્ય રસ્તાનો જ ઉપયોગ થશે, અને તેથી ટ્રાફિક ભારણમાં વધારો જ વધારો થાય તેમ છે. ગ્રામ પંચાયતને આ રસ્તાની જાળવણી કરવા આર્થિક નુકશાન સહન કરવાનો વારો આવશે.

સરપંચશ્રીના સહીઓ સભ્યશ્રી
સરપંચ
ગ્રામ પંચાયત સુંવાલી
તા. ચોર્યાસી, જી. સુરત

ગ્રામ પંચાયત સુંવાલી
તા. ચોર્યાસી, જી. સુરત

સુંવાલી ગ્રામ પંચાયત

મુ.પો. સુંવાલી,
તા. ચોર્યાસી, જી. સુરત
ફોન નંબર : ૦૨૬૨૨૨૨૦૨૦૨૮

॥ શ્રી ॥
વિના મતદાર નથી ઉદ્ધાર

Suvali Gram Panchayat

At. & Po. Suvali,
Ta. Choryasi, Di. Surat
Tel. No. : 2860719

(૪) સિમેન્ટ ક્લેક્ટ હવામાં ભળશે, હવા સાથે તેના રજકણો પાસે સુંવાલી ગામના પાણીના સ્રોત સાથે ભળશે, પાણીની ગુણવત્તાને નુકસાન કરશે, મનુષ્યના જીવન પરમાઠી અસર થશે.

(૫) ધૂળની ઢાંકણ ઉડ્ડ ઉત્પન્ન થાય તે હવામાં ભળશે, હવાને પણ દૂષિત કરશે, મનુષ્ય જીવન અને અન્ય પ્રાણી જીવન પર તેની માઠી અસર થશે, લોકો/પ્રાણીઓમાં રોગના ભોગ બનશે.

(૬) સિમેન્ટ વહનનું કામ, કાચો માલ લાવવાનું કામ સામાન્ય રીતે દિવસ રાત ચાલશે, અન્ય જીવનની શાંતિને, ખલેલ પહોંચાડશે અને અવાજનું પ્રદૂષણ કરશે.

ઉપરોક્ત થયાને અંતે આ સામાન્ય સભા નીચેના ઠરાવ સર્વાનુમતે કરે છે.

ઠરાવ નંબર ૫ : જોગે : સુંવાલી ગામના જુનાગામ ગ્રામ પંચાયતની હદમાં શિવરામપુર, ચોર્યાસી, જી.સુરતના સર્વે નં. ૧૨૧/૧, ૧૨૫/૨, ૧૨ ૬/૧ ૪૨ ૪૩ માં પેસસે સોંપી સિમેન્ટ ફેકટરીની સ્થાપના બેઠક પણ સંજોગોમાં થવી જરૂરી નથી, અને આ સિમેન્ટ ફેકટરીનું બાંધકામ થશે તો મોટે પ્રદૂષણ વિભાગ અને મે. કલેક્ટર સાહેબને ધ્યાનમાં કરતો આ ઠરાવ સર્વાનુમતે કરવામાં આવે છે.

"ઠરાવ સર્વાનુમતે મંજુર"

નામદાર ગ્રામ પંચાયત/તલાટી
સરપંચ
ગ્રામ પંચાયત સુંવાલી
તા. ચોર્યાસી, જી. સુરત.

તલાટી કમ મંત્રી
ગ્રામ પંચાયત સુંવાલી
તા. ચોર્યાસી, જી. સુરત.

|| SHRI ||

NO PROGESS WITHOUT CO-OPERATION

Suvali Gram Panchayat, Tal. Choryasi, Dist: Surat

SUVALI GRAM PANCHAYAT

At & Post: Suvali

Tal. Choryasi, Dist: Surat

Tel. No.

2860719

Suvali Gram Panchayat, Tal. Choryasi, Dist: Surat

Outward No. 2019/ 20 Date: 11/09/2019

Necessary copy of Resolution No. 5 of the General Meeting of Gram Panchayat, Suvali convened today on date 30/07/2019 at 11:00 hours in the morning which was chaired by Sarpanch, Naynaben Rajubhai Rathod.

Agenda No. 5 : Regarding objection against construction of Sanghi Cement Factory within the limits of Suvali – Junagam Gram Panchayat.

Discussion :

Discussion regarding agenda was taken on hand. A cement plant for Standalone Grinding Unit 2 Million T.P. was to be set up in the name of Sanghi Industries Ltd. At Shivrampur, Tal. Choryasi, District Surat. The place at site is near the populated

village area of Suvali, and the area of village roads within the limits of Suvali Gram Panchayat was to be utilized for transportation of raw materials required for the company and for finished goods. Besides that, various types of damages will be cause, the facts of which are as under.

(1) Coal will be utilized as raw material by the company, and because of that, there will be increase in proportion of air pollution. Damage will be caused to the health of village people.

(2) When the company will undertake process of production of cement, the minute particles emanating from it will get mixed in the air, and the fertility (quality) of agricultural land of the village will have to sustain loss.

(3) There is a big traffic problem on the roads joining other villages with the main road of village Suvali. When Sanghi Cement Company will undertake manufacturing of cement, then for transportation of raw material as well as finished goods, mainly the rural roads of village Suvali will be utilized, and which will result into

increase in traffic problem. Gram Panchayat shall have to suffer financial loss for maintenance of these roads.

(4) Cement dust will mix in the air. Along with the air, its particles will also emanate in the water resources of village Suvali. Damage will be caused to the quality of water. It will cause severe effect on human life.

(5) The dust which will be produced by the Company will get mixed with air, resulting in air pollution. It will have severe effect on human life and other animal beings. People/ animals will suffer from disease.

(6) The work of transportation of cement and the work of bringing of raw materials ordinarily will be done day and night. It will cause disturbance to the peace of village life and cause damage to health.

At the conclusion of above discussion, this ordinary meeting passes this resolution with following opinion.

Resolution No. 5 :: In any circumstances, establishment of factory of M/s Sanghi Cement is not at all necessary on the land bearing Survey No. 125/1, 125/2, 126/1, 42, 43 of Shivrampur, Taluka Choryasi, District Surat within the limits of Junagam Gram Panchayat of Suvali village, and this Resolution is hereby passed to make recommendation to Environment Department and Hon'ble Collector Saheb not to allow construction of this cement factory.

"Resolution unanimously passed"

Sd/- Naynaben Rajubhai Rathod
Sarpanch
Gram Panchayat Suvali
Taluka Choryasi, District Surat

॥ શ્રી ॥

સુંવાલી ગ્રામ પંચાયત

પો.ઓ. સુંવાલી,
તા. ચોર્યાસી, જી. સુરત
ફોન નંબર: ૦૨૬૧૨૭૩૦૧૮

જિલ્લા પંચાયત સુરત

Suvali Gram Panchayat

At. & Po. Suvali,
Ta. Choryasi, Di. Surat
Tel. No.: 2860719

ક્રમાંક ૨૦૧૮/૨૦

તા. ૧૩/૦૬/૨૦૧૮

પ્રતિ,

કલેક્ટર સાહેબશ્રી,

જિલ્લા સેવા સદન-૨,

અઠવાલાઈન્સ,

સુરત.

વિષય: પેરલ સ્થિત સિમેન્ટ ફેક્ટરી બાબત ગ્રામ વિરોધ બાબત.

માનનીય સાહેબ,

વિનંતી સહ જણાવવાનું કે અમારા સુંવાલી-કુંભારીયા શિવમાર્ગ પર આવેલ સર્વે નંબર ૧૨૫/૧, ૧૨૫/૨, ૧૨૬/૧૨૨૩ વાળી જગ્યામાં લાલ સ્થિત સિમેન્ટનો પ્રોજેક્ટ આવનાર હોય જેની સામે અમો સુંવાલી ગામજનો સખત વિરોધ છે. આ પ્લાન્ટ સ્થાપવાથી તેના પ્રદુષણથી માણસો તેમજ જનાવરોના પર મોટી અસર થાય એમ છે. તેમજ જમીનું પ્રદુષણ વધી જશે અને આ પ્રોજેક્ટના લાલ સામાનના પરિવહનથી આવતા હેવી વ્હીકલોથી ટ્રાફિકની સમસ્યા ઉપસ્થિત થાય એમ છે. તેમજ આ પ્લાન્ટની નજીકમાં અમારા ગામે આવેલ નવરોજન વિદ્યાલયમાં આશરે ૧૧૦૦ બાળકો અભ્યાસ કરે છે જેને પણ મોટી અસર થાય એમ છે. જેથી આ પ્લાન્ટ સામે અમારા ગામજનોનો સખત વિરોધ છે. જેથી આપ સાહેબ અમારા દુઃખ સમજીને યોગ્ય આદેશ કરો આપના નજીકના અધિકારી જે આપ સાહેબશ્રીને વિદિત થાય.

આપના આજ્ઞાંકિત

સરપંચ
ગ્રામ પંચાયત સુંવાલી
તા. ચોર્યાસી, જી. સુરત.

|| SHRI ||

NO PROGESS WITHOUT CO-OPERATION

GRAM PANCHAYAT - SUVALI

Suvali Gram Panchayat, Tal. Choryasi, Dist: Surat

At & Post: Suvali
Tal. Choryasi, Dist: Surat
Tel. No. 2860719

Outward No. 2019/20

Suvali Gram Panchayat, Tal. Choryasi, Dist: Surat

Date: 11/09/2019

To,
The Collector,
Jilla Seva Sadan -2,
Athwalines, Surat.

Sub: Regarding protest against construction of Sanghi Cement factory.

Respected Sir,

This is to state with respects that, recently the project of Sanghi Cement is to come up in the land bearing Rev. Survey No. 125/1, 125/2, 125/ 1+2+3 of our village Suvali – Junagam (Shivrampur), against which the villagers of Suvali village has strong objection. On coming up of this plant, it will have a great impact on the people and other living beings because of its pollution, and it will increase air pollution. It will cause a permanent problem of traffic of heavy vehicles on account of transportation of materials of this project. Moreover, about 1100 children are studying in Navchetan Vidhyalaya in our village near this plant, and that will also cause adverse effect on them. Hence, the people of our village has strong protest against this plant. Hence, this is to state to You Sir, that we hope that You will associate in our grief, and expect co-operation in this regard.

Thankfully Yours,

Sd/- Naynaben Rajubhai Rathod

Sarpanch,
Gram Panchayat, Suvali
Taluka Choryasi, Dist: Surat

Note: A copy of resolution of Gram Panchayat, Suvali is annexed.

16 SEP 2019

Sd/- illeg.
Deputy Mamlatdar,
Information Galary/ Registry,
Office of Collector, Surat

૨૯૧

જા.નં./પ્રદુષણ/૨૦૨૦

મેડીકલ ઓફીસર

પ્રા આ કેન્દ્ર સુવાલી

તા.૨૭/૮/૨૦૨૦

પ્રતિશ્રી,

સરપંચ સાહેબશ્રી,

ગ્રામ પંચાયત સુંવાલી.

વિષય:પ્રદુષણનાં કારણે ગંભીર રોગોમાં વધારો થવા બાબત.

સવિનય ઉપરોક્ત વિષય અનુસંધાનમાં જણાવવાનું કે અત્રેનાં પ્રા આ કેન્દ્ર સુવાલીના કાર્ય વિસ્તારમા સુંવાલી,રાજગરી,જુનાગામ,મોરા,હજીરા,દામકા,ભટલાઇ,વાંસવા ગામનો સમાવેશ થાય છે.હજીરા,મોરા,સુંવાલી વિસ્તારમાં મોટા ઉધોગો આવેલા છે.જેનાં કારણે કેન્સર,ટીબી,ચર્મ રોગો ફેલાયેલ છે.જેનાં કારણે લોકોનાં સ્વાસ્થ્ય ઉપર ગંભીર અસર થયેલ છે.હાલમાં આ વિસ્તારોમાં નીચે પ્રમાણે રોગો થયેલ છે.આ માટે આપ તરફથી ઘટતી કાર્યવાહી કરવા વિનંતી.

અ.નં	ગામ	કેન્સર	ટી.બી	ચર્મ રોગ
૧	સુંવાલી.	૩	૦	૧
૨	રાજગરી	૧૦	૧	૦
૩	જુનાગામ	૧૧	૦	૦
૪	મોરા	૨	૦	૮
૫	હજીરા	૧૪	૨	૧૨
૬	દામકા	૫	૨	૦
૭	ભટલાઇ	૧	૦	૦
૮	વાંસવા	૩	૦	૦

મેડીકલ ઓફીસર

MEDICAL OFFICER,
PRIMARY HEALTH CENTER,
SUVALI,
TA. CHORYASI, DIST. SURAT.

Outward 209/Pollution/2020
Medical officer
Primary health Center, Suvali
Date 27/08/2020

To,

Sarpanch Sahebshri

Gram Panchayat Suvali

Subject : Matter of increase in serious diseases due to pollution

With reference to above subject, it is to be mentioned that the work area of Primary health Center of Suvali includes Suvali, Rajgari, Junagam, Mora, Hajira, Damka, Bhatlai, Vansava villages. The large industries are located in area of Hajira, Mora, Suvali which has spread cancer, TB, skin diseases which has seriously affected the health of the people. Currently the following diseases have occurred in these areas. We request you to take appropriate action in this regard.

Sr No	Village	Cancer	TB	Skin Disease
1	Suvali	3	0	1
2	Rajgari	10	1	0
3	Junagam	11	0	0
4	Mora	2	0	8
5	Hajira	14	2	12
6	Damka	5	2	0
7	Bhatlai	1	0	0
8	Vansava	3	0	0

Sd-

Medical Officer
Primary Health Center, Suvali
Tal-Choryasi,
Dist. Surat

Seal of Primary Health Center, Suvali Tal-Choryasi, Dist. Surat

BEFORE THE CENTRAL POLLUTION CONTROL BOARD, NEW DELHI

IN FURTHERANCE OF THE ORDER DATED 21.01.2021

PASSED IN THE MATTER *LARSEN & TOUBRO VS SANGHI INDUSTRIES LTD & ORS. (APPEAL NO.36 OF 2020 – ERSTWHILE APPEAL NO.66 OF 2019)* BY THE HON'BLE NATIONAL GREEN TRIBUNAL (PRINCIPAL BENCH)

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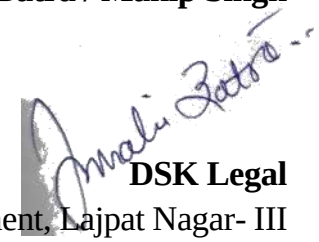
On behalf of Larsen &Toubro

Rimali Batra / Mahip Singh



DSK Legal
G- 29, Basement, Lajpat Nagar- III
Near Mool Chand Hospital,
New Delhi – 110024
E-mail: rimali.batra@dsklegal.com

Place: New Delhi
Date: 19.02.2021

BEFORE THE CENTRAL POLLUTION CONTROL BOARD, NEW DELHI

IN FURTHERANCE OF THE ORDER DATED 21.01.2021

PASSED IN THE MATTER *LARSEN & TOUBRO VS SANGHI INDUSTRIES LTD & ORS. (APPEAL NO.36 OF 2020 – ERSTWHILE APPEAL NO.66 OF 2019)* BY THE HON'BLE NATIONAL GREEN TRIBUNAL (PRINCIPAL BENCH)

WRITTEN SUBMISSIONS ON BEHALF OF LARSEN & TOUBRO

I. MOST RESPECTFULLY SHOWETH

1.1 This is in furtherance of the Order dated 21.01.2021 passed in the matter Larsen & Toubro vs. Sanghi Industries Ltd & Ors. (Appeal No.36 of 2020 – erstwhile Appeal No.66 of 2019) *(hereinafter referred to as the "**Order**")* by the Hon'ble National Green Tribunal (Principal Bench) *(hereinafter referred to as NGT / Tribunal)* wherein the Hon'ble Tribunal directed Central Pollution Control Board (CPCB) to act as a nodal agency for coordination and compliance of the Order.

1.2 The Hon'ble Tribunal has referred the issue of assessment and evaluation of the Environment Impact Assessment (EIA) report prepared by the project proponent to the EAC of the MoEF&CC dealing with the cement plants along with the representatives of CPCB, NEERI and IIT Mumbai.

1.3 Further, the Hon'ble Tribunal has nominated CPCB as the nodal agency for coordination and compliance and directed the parties *inter alia* Larsen & Toubro, the Suvali Gram Panchayat, and the project proponent to file their respective written submissions before CPCB.

II. ORDER DATED 21.01.2021 OF THE HON'BLE TRIBUNAL

2.1 That Larsen & Toubro, that is the Appellant before the Hon'ble National Green Tribunal, challenged the Environmental Clearance *(hereinafter referred to as EC)* on grounds of it being issued in ignorance of environmental concerns. The said is evidenced from the following paragraphs of the Order dated 21.01.2021, extracted below for ready reference:

"1. This ***appeal has been preferred against order dated 23.08.2019 of the State Level Environment Impact Assessment Authority (SEIAA), Gujarat, granting Environmental Clearance (EC) to M/s. Sanghi Industries Limited*** *for setting up of stand-alone Cement grinding unit at Survey No. 125/1 and 126/1+2+3, Village Shivrampur, Ta: Choryasi, Distt.: Surat in category 3(b) of Schedule annexed with Environment Impact Assessment (EIA) Notification dated 14.09.2006.*

*2…..****EC has been granted without consideration of crucial aspects such as air emissions, water availability, wildlife etc****.*

4….According to Larsen & Toubro, such ***concerns relating to increased air and water pollution have not been addressed.*** *Larsen & Toubro has also pointed out discrepancies in the EIA report. It is submitted that neither the EIA report explains potential of compliance with the environmental norms nor State Environment Assessment Committee (SEAC) and SEIAA have given any reasons from which possibility of such compliance can be inferred.* ***The proceedings do now show application of mind on the environmental consequences and the EC has been granted in a mechanical manner.***

5. ***There are mangroves in the area but the project proponent concealed the said information in application Form I. Similarly, there is reserve forest area which will be impacted which has not been mentioned.*** *2 Million Tonnes Per Annum (MTPA) cement is proposed to be grinded which will require raw material including clinker, gypsum, fly ash, slag which has to be transported, involving movement of huge number of trucks.*

6. There is no provision in the EIA for space for parking for the trucks and other vehicles. Shifting of green belt outside the factory complex will defeat the object of mitigation of pollution. The industrial area in question is polluted industrial area which has no capacity for any further polluting activities as held in the order of this Tribunal dated 10.07.2019 in OA No. 1038/2018, News item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels".

2.2 That the Hon'ble Tribunal heard the Appellant i.e. Larsen & Toubro, the project proponent i.e. Sanghi Industries Ltd., and the authorities i.e. State Environment Impact Assessment Committee (SEIAC) at length. However, the Tribunal decided to refer the dispute to the committee and therefore, chose not to examine and comment on the Written Submissions filed by the parties. Accordingly, the Tribunal held as under:

*"12….****We have also perused the written submissions filed by the parties in pursuance of order dated 06.01.2021 passed on conclusion of the hearing. In***

view of the fact that we are giving liberty to the parties to file written submissions before the CPCB for consideration of the Committee to which the matter is being referred, we do not find it necessary to make any comment on the said submissions, beyond the comment on the rival contentions already raised before the Tribunal.

2.3 That in view of the aforesaid, the Hon'ble Tribunal held that the EC is unsustainable until the environmental concerns are duly addressed and accordingly appointed the committee to evaluate the EIA and the EMP prepared by the project proponent. The relevant extract of the order is highlighted for ready reference:

"21. In view of above, we find that the precautionary principle, for which EIA is conducted, remains to be addressed. As held in Hanuman Laxman Aroskar v. Union of India [(2019) 15 SCC 401], the object of EIA is to ensure that all concerns affecting the environment are duly taken care of. ***Thus, the impugned EC cannot be sustained until the environmental concerns are duly addressed.*** *We are informed that the project has not yet commenced. Even learned Counsel for the project proponent and the SEIAA fairly accepted this factual position.*

22. ***Accordingly, we refer the issue of assessment*** *of carrying and load bearing capacity of the Panchayat road in question* ***and evaluation of EIA and EMP prepared by the project proponent to the EAC of the MoEF&CC dealing with the cement plants, alongwith the representatives of CPCB, NEERI and IIT Mumbai.*** *The CPCB will be the nodal agency for coordination and compliance. Coordination with the EAC may be through the MoEF&CC. The Committee may assess how generation of dust and causing of noise pollution by movement of large number of heavy vehicles will be neutralized, given the carrying and load bearing capacity of the Panchayat road in question. The Expert Committee may furnish its report to this Tribunal within three months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF.*

23. Larsen & Toubro, the Suveli Gram Panchayat and the project proponent may file their respective written submissions to the CPCB within two weeks for consideration by the Committee.

A copy of this order be forwarded to the MoEF&CC, CPCB, NEERI and IIT Mumbai by e-mail for compliance."

III. SUBMISSIONS OF LARSEN & TOUBRO

By way of the present Written Submissions, Larsen & Toubro presents its concerns with the EC under challenge as under:

LOCATION OF THE CEMENT PLANT

3.1 That Sanghi Industries Ltd. *(hereinafter referred to as Project Proponent/ SIL)* is setting up a project of 2.0 Million Metric Tonne Per Annum (TPA) Standalone Grinding Unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No.125/1, 125/2, 126/1+2+3. Village Shivrampur, Tal Choryasi, District-Gujarat, Surat *(hereinafter referred as "Cement Plant")*. The location map of the project site is annexed herewith as **Annexure 2**.

3.2 It may be noted that the Hon'ble NGT vide its order dated 10.07.2019 identified Surat as a Polluted Industrial Area (PIA) where the Comprehensive Environmental Pollution Index (CEPI) score was 76.43. The said order is annexed herewith as **Annexure 3** ***(Refer Point 26 at Page 47)*****.**

3.3 It may be noted that cement plants falls under ***red*** category industry due to their high pollution levels based on the CEPI score. The list of Red, Orange, Green and White Category Industries as per CPCB directions is annexed herewith as **Annexure 4** ***(Refer Point 1026 at Page 62).***

3.4 Moreover, it is highly pertinent to state at the outset that cement manufacturing is one of the most hazardous and obnoxiously polluting processes and therefore, cement industries are required to follow stringent check and precautions, which in the present case, have been blatantly flouted by the project proponent. We are annexing a few reports / papers to stress on the impact of cement industry on the surrounding environment as **Annexure 5.**

3.5 It is further to be noted that the project site is surrounded by so many villages and such large population that failure to adhere to the precautionary principles would severely affect the health and livelihood of the local population. It is to be noted that the project site for the cement plant is merely at a distance of less than a kilometre from a school where more than 1100 students are boarding. Moreover, there reside more than 3,000 to 5,000 people around the project site who will be severely affected by the emissions and pollution from the proposed cement plant. We have annexed a few letters from the local villagers to us regarding the local population and the water issues faced by the villagers as **Annexure 6.**

IV. MISREPRESENTATION / CONCEALMENT BY PROJECT PROPONENT OF THE ENVIRONMENTAL SENSITIVITIES (INTER-ALIA MANGROVE, FOREST, WETLANDS, MIGRATORY BIRDS) IN THE PRE-FEASIBILITY REPORT, FORM-1,

TERMS OF REFERENCE, ENVIRONMENT IMPACT ASSESSMENT REPORT AND IMPUGNED ENVIRONMENTAL CLEARANCE

4.1 That the Project Proponent in Para 8 of its Pre-Feasibility Report wherein it lays out the Environmental Management Plan, deliberately fails to disclose the presence of Mangrove Forest, Wetland, migratory Birds in the project area. The Pre-Feasibility Report dated December 2018 is annexed herewith as **Annexure 7**.

4.2 It may be noted that the Form-1 filed by Project Proponent was supported by and based on its Pre-feasibility Report and both were filed together with the relevant authorities**.** Form-I dated December 2018 as submitted by Project Proponent is annexed herewith as **Annexure 8**.

4.3 The Project Proponent in its Form-1 states "*Proposed project will be established on the land of 12 acres already in possession of SIL acquired for the purpose. The proposed land was agriculture land and will be converted for industrial purpose."* ***(Refer Para 1.1 at Page 161)*****.**

4.4 Furthermore, the Project Proponent in Form-1 categorically denied the presence of sensitive flora and fauna species within 15 kms of the proposed project location boundary. The same can be seen from ***Heading (iii) of Form-1*** also reproduced hereinbelow for ready reference:

Environmental Sensitivity:

S. No.	***Area***	***Name/ Identity***	***Aerial distance (within 15 kms) proposed project location boundary***
2.	*Areas which are important or sensitive for ecological reasons – wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains forests;*	*None*	*Arabian Sea @3.62 in west direction* *Tapi River @0.89 in East direction*
3.	*Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration*	*None*	*No*

4.5 That despite there being a specific requirement under the Terms of Reference, the Project Proponent had intentionally failed to provide the environment sensitive information. The Terms of Reference dated 29.01.2019 have been annexed herewith as **Annexure 9.** The relevant part of the T.o.R is reproduced herein for ready reference:

"Terms of Reference (ToR) are prescribed as below for the EIA study to be done covering 10km radial distance from the project boundary
2. Project site specific details and site suitability with respect to siting criteria / guidelines. The site-specific details should include distance of the project site from the nearest (7) National park/ Wild life sanctuary / Biosphere Reserve / Conservation Reserve (8) Reserve Forest / Protected Forest (9) Any other eco-sensitive areas like wetland, mangroves, coral reefs, migratory route of wild animals, turtle nesting grounds etc."

4.6 That the Project Proponent deliberately did not mention presence of Mangroves, which are 2km from the project site. Thus, as a consequence, environment impact evaluation of the same was not evaluated. The Environmental Impact Assessment (EIA) Report dated March 2019 has been annexed herewith as **Annexure 10**. The relevant part of the EIA is reproduced herein for ready reference:

- ***Refer EIA - Pg.205– Table 1.1***

Table 1.1 – Environmental Settings (Valued Environmental Components)

S. No.	***Particulars***	***Description***	***Aerial Distance and Direction***
16.	*Mangrove*	*None within 10 kms radius of the study area*	---

- ***Refer EIA - Pg.261 – Table 3.12***

Table 3.12 Land use statistics (10kms)

Source: Land use mapping and primary survey of the area					
%	***Area sq. km.***	***Land cover***	***Land cover***	***Area sq. km.***	***%***
41.42	*133.92*	*Water body*	*Sea Water*	*100.65*	*31.13*
			River/ Ponds	*33.27*	*10.29*
13.91	*44.97*	*Waste Land*	*Muddy*	*20.10*	*6.22*
			Barren Land	*24.87*	*7.69*
31.68	*102.43*	*Range Land*	*Scrub Land*	*42.57*	*13.17*
			Mangroves	*29.14*	*9.01*
0.22	*0.71*	*Forest*	*Reserved Forest*	*0.71*	*0.22*

- ***Refer EIA – Pg.261 – Para 3.8.2***

"3.8.2 Summary and interpretation
The area surrounding the project site is largely water body like sea water and River water are covering around 41.42% of the total study area. Settlement is covering around 5.97% of the total study area. Agriculture land is covering around 6.79% of the total study area. Range Land like Scrub land and Grass land are covering around 31.68 %. Proposed project will be set up in industrial zone therefore there will be no change in land use."

- ***Refer EIA - Table 3.34 – List of Birds in the Study Area @Pg.283***
- ***Refer EIA - Table 3.35 – List of Reptiles in the Study Area @Pg.284***
- ***Refer EIA - Table 3.36 – Details of Marine Fishes @Pg.285***

4.7 That the Project Proponent, even in the summary and conclusion of the EIA, concealed the environment sensitive information. ***Refer EIA - @Pg.377- Para 11 - Summary and Conclusion***

That the same is evidenced from the extracts of the EIA as reproduced hereinbelow:

Table 11.1 – Environmental Sensitivity

Particulars	***Description***
Forest & wildlife Sanctuary / National Park Biosphere Reserves	*None in the 10km radius*
Defence Installation	

The actual Forest Area is actually 1.7 sq. km as stated @Pg.127 of the Appeal and is at a distance of 3kms, however, as per the Project Proponent, there is no forest within 10kms radius of the project site.

4.8 The Project Proponent has made categorical denial for wetlands in the area in its submissions before the Hon'ble National Green Tribunal. Furthermore, the Project Proponent has also failed to disclose the wetlands in the area where the cement plant is being proposed to set up. That pursuant to the Wetland (Conservation and Management) Rules, 2010, which were subsequently modified in 2016, detailed procedure was laid out in order to set up an industry near a wetland. The said process was evaluated by the Hon'ble Supreme Court in ***M.K. Balakrishnan vs. Union of India*** [2018 (2) SCJ 207]. The Project Proponent has failed to demonstrate in its EIA or the presentation that it has acted in compliance with the said procedure or has taken any steps in order to conserve / protect the wetlands.

- It may be noted that the project site i.e. the Hazira Industrial Area is the city's (Surat) largest wetland and home to at least 68 species of Migratory Birds who

spend four months of a year in the area. That Essar came out with an informative book 'High in the Sky at Hazira' wherein pictures of the migratory birds in the area have been published. The said book covers all aspects of Migratory Birds including field characteristics, distribution habits, call and nesting in the wetlands of Hazira.

- It is further to be noted that the area of Hazira is approx. 168 sq. km and the Wetlands in the area are 33.5 sq. km. Moreover, according to the National Wetland Atlas, the area of Surat is 7657 sq.km. and the Wetlands in the district are around 86062 hectares (860.62 sq.km.), majority of which is in the Hazira area. That Larsen & Toubro has applied to the forest department seeking the area breakup of the wetlands, mangrove and forest in the project site and surrounding villages. The copy of the Application is annexed as **Annexure 11**. The National Wetland Atlas @Pg.110 can be accessed at: http://gujenvis.nic.in/PDF/National%20Wetland%20Atlas%20-%20Gujarat.pdf.

- Please note that 41.42% of the area surrounding the project site is wetland. It is further pertinent to note that the distance of the proposed cement plant is 3.62 from Arabian Sea and 0.89 from Tapi River, as stated by the Project Proponent himself in its Form-1. Reference may be made to judgment of the Hon'ble Supreme Court judgment in ***M.K. Balakrishnan vs Union of India*** [2018 (2) SCJ 207] wherein the Hon'ble Court dealt in detail with the Wetlands (Conservation and Management) Rules 2017 and the principles of Rule 4 of Wetlands (Conservation and Management) Rules 2010.

4.9 Submissions of Larsen & Toubro

👉 Environmental Sensitivity and details as mentioned above, not considered in the pre-feasibility report;

👉 Form-1, which accompanies the PFR, again does not disclose the Environmental Sensitivity of the area and particulars thereof;

👉 The ToR issued by SIEAC, however, mandated the PP to consider the environmental sensitivity as mentioned in para 4.5 above;

👉 The EIA conveniently omits the presence and neglects to evaluate the adverse impact on mangroves, wetlands, forests and migratory birds. However, the presence thereof, in a cursory manner, is reflected in the tables possibly to avoid the charge of concealment.

☞The proposed plant is in violation of the Wetlands (Conservation and Management) Rules 2010 and 2017.

V. INADEQUATE LAND ALLOTMENT DONE BY THE PROJECT PROPONENT

5.1 *Refer EIA Report @Pg.232 – Table 2.7*

Table 2.7 – Land Breakup of Cement Grinding Unit

S. No.	***Particulars***	***Total Areas (in Ha)***	***Area***
1.	*Production Plant*	*0.712*	*14.66%*
2.	*Office and Lab Area*	*0.022*	*0.46%*
3.	*Raw Materials Storage Area*	*0.632*	*13.01%*
4.	*Solid Waste Storage Area*	*0.005*	*0.10%*
5.	*Open Space*	*1.835*	*37.79%*
6.	*Green Belt*	*1.650*	*33.98%*
	Total	*4.856*	*100.00%*

5.2 *Refer EIA Report @Pg.222 – Table 2.2*

Table 2.2 – Raw Material Requirement

S. No.	***Material***	***Requirement per Annum – Million Ton/ Annum***			
		100% OPC	***100% PPC***	***100%PSC***	***Max pe annum***
1.	*Clinker-OPC*	*1.90*			*1.90*
	Clinker-PPC		*1.20*		
	Clinker-PSC			*1.10*	
2.	*Gypsum*	*0.10*	*0.10*	*0.10*	*0.10*
3.	*Fly Ash*		*0.70*		*0.70*
4.	*Slag*			*0.80*	*0.80*
5.	*Lignite / Coal Petcoke*			*0.06*	*0.06*
Total quantity					**3.56**

5.3 *Refer EIA @Pg.225 - Para 1.3.6 – Total Cement*
"Cement Produced per day = 2,000,000/330
= 6,060 Ton"

5.4 *Refer EIA @Pg.238 - Layout Plan*

5.5 The EIA Report as submitted by the Project Proponent does not provide for finished products storage area, loading and unloading area, product transfer area, parking areas for the used trucks and other vehicles, canteen area, security office and other amenities. It may be noted that the land allocation as shown in the EIA Report of the Project Proponent allocates 0% land to any of the above facilities.
The Factories Act, 1948, under various provisions clearly lays down the mandate to have such amenities in any industrial project/factory and allocating no land for the same, puts the Project Proponent in violation of the same.

5.6 Submissions of Larsen & Toubro

☞ It is submitted that the storage and handing of 40,00,00,000 tons raw material / finished products is not feasible in a 12-acre plot of which 4 acres are to be kept for green belt, to provide storage of such huge quantities of raw material, finished product and parking space of 40 trucks of 34 tonnes each, with loading and unloading facilities, to squeezed in an area as mentioned in Table 2.7 reproduced above.

VI. INCORRECT INFORMATION ON TRANSPORTATION AND TRUCKS

6.1 *Refer EIA @Page 301 – Table 4.17*

Incoming Raw Material Transportation							
S. No.	**Raw Material**		**Quantity TPA**	**Quantity TPD**	**Source**	**Mode of Transport**	**No. of Vehicles (Truck/day)**
1.	Clinker		2000000	6061	Captive	Sea	184
2.	Additives like Gypsum, Fly Ash, Slag				Purchase	Road	
	Fuel		60000	182	Purchase	Road	
Total No. of Trucks deployed / day will be							**184**
Outgoing Product Transportation							

S. No.	Product	Quantity Million TPA	Quantity TPA	Quantity TPD	Source	Mode of Transport	No. of Vehicles (Truck/day)
1.	Cement	2.0	2000000	6061	Captive	Road/Sea	179
Total No. of Trucks deployed / day will be							363

6.2 It is pertinent to note that based on the incorrect numbers provided by the Project Proponent and the lack of environment impact evaluation of such huge numbers of truck plying on the kaccha road, the Impugned EC was issued which stated as under:

"47. Number of Trips (in & out) shall not exceed 363 nos. per day for transport of cement and raw material during the operations of the grinding unit."

The impugned Environmental Clearance is annexed herewith as **Annexure 12** ***(Refer Condition No.47 at Page 383)***

- The project site is linked to the main road i.e. the National Highway (NH 53) by a panchayat road, the distance of which is around 2.2kms. The location map is annexed herewith as **Annexure 13**.

  It is highly pertinent to appreciate that the Panchayat road is a Kaccha Road and the same is clearly mentioned in the EIA prepared by the Project Proponent. (***Refer EIA @Pg.315– Table 5.1 – Serial No.7)***

  Table 5.1 Alternative for Technology and other Parameters

S. N	***Site Particula***	***Alternative Option 1***	***Alternative Option 2***	***Remarks***
7.	*Road*	*Metallic Road*	*Kachha Road*	*The road is well furnished. Most of the raw material and fuel will be transported through ships (sea route)*

- That the Project Proponent has not evaluated the impact of hundreds of trucks deploying on a kaccha road and has instead completely ignored by stating that since the dust generated by manufacturing is primary source, they have taken measures for that. However, none for other sources of dust since they are

secondary in nature, including the dust from the kaccha roads, have been considered by the Project Proponent. The EIA of the Project Proponent states as under:

> *"All other dust sources are considered as secondary sources since they are not process implied." (**Refer EIA @Pg.239 - Para 2.13.1 – Air Emission)***

6.3 Submissions of Larsen & Toubro

- It is submitted that the Panchayat Road which is merely 7.5m in width would not be able to handle 363 trucks of 34 tonnes taking two trips i.e., 726 trips per day.

- A normal 34 tonner trucks measures 11 x 2.4 x 3.4m (approx.)

- The EIA fails to take into consideration as to where the 363 [34] tonner trucks, each measuring 11 x 2.4 x 3.4 (approx.), would be parked before unloading / loading of raw material / finished product. The layout plan attached at Pg.378 with the EIA does not address the issue of parking. Larsen & Toubro apprehends that the trucks would eventually be parked on the Panchayat Kachha road and possibly even on the National Highway which would result in severely hampering of the normal movement of traffic and consequent pollution.

- The impugned EC on Point 47, however, stipulates that only 363 in and out trips can be undertaken. In other words, even as per the impugned EC, only half the number of trucks are permissible to be used for transport.

- The EIA does not consider nor factor in the extent of pollution that will be caused by the movement of 726 [34] tonner trucks.

VII. COASTAL TRANSPORTATION

7.1 It is pertinent to note that the Respondent has only made a cursory mention that it intends to use coastal mode of transportation for supplying raw material and taking finished product. However, no evaluation of the same has been done in the EIA.

> *"2.6.3 - Sea / Coastal Transportation*

*The clinker shall be transported from Sanghipuram (IU) to Surat GU mainly by sea. Clinker shall be extracted from the Clinker load out silos at IU, transported to the captive Jetty of SIL by trucks and loaded on to the barges by grab cranes. Barges shall transport the Clinker to the ship stationed at high seas. At Surat, the Clinker shall be unloaded from the ship at nearest port and transported to the Surat GU site by trucks." (**Refer EIA @Pg.222 - Para 2.6)***

*The company has planned Coastal Shipping of Cement, accordingly cement terminals have been developed at various locations. This will reduce the load on rail/road network /transportation. **(Refer EIA @Pg.301 - Para 4.3.2- Air Environment)***

7.2 Submissions of Larsen & Toubro

☞ It is submitted that neither the PFR, nor the EIA or the impugned EC, has taken into consideration, the impact on the environment of transportation of raw material and finished product by Coastal mode of transportation.

VIII. MISREPRESENTATION OF DEVELOPING THE GREEN BELT

8.1 That the Project Proponent has failed to provide clarity with respect to green belt on the project site and there are inconsistencies in its submissions before the authorities, as pointed out below:

"Green Belt and Other Plantation

66. Green Belt shall be developed in an area equal to 33% of the plant area with a native tree species in accordance with CPCB guidelines. The greenbelt shall inter alia cover the entire periphery of the plant;
67. The SIL shall develop green belt within the factory premises as per the CPCB guidelines, consisting of at least three rows of trees of local species on periphery. However, if the adequate land is not available within the premises, the SIL shall take up adequate plantation at suitable open land on road sides and other open areas in nearby locality or schools in consultation with the Gram Panchayat / GPCB and submit an action plan of planation for next three years to the GPCB"; ***(Refer the Impugned Environmental Clearance @Page384)***

8.2

S. N	***Particular***	***Concerns/ Impacts***	***Reply***

3.	*Green Belt Damage*	*Our developed Green Belt will be directly exposed to the Cement dust deposition and other process and non-process related fugitive emission. Besides, green belt development proposed by you will take 5 years to grow, which is very much longer time.*	*With adoption of the mitigation measures there will be fugitive emissions due to operations of the plant, which will not affect the developed green belt of L&T as envisaged.* *SIL will develop 33% Green Belt. However, belt on the periphery of the plant will be developed before commencement of the operations and green belt within the plant are will be developed in shortest possible time. On the periphery, green belt width would be approximately in the range of 6mtr to 8mtr based on selection of species and location in the plant area. Greenbelt within the plant will be developed with width ranging from 20-30 mtrs. Equal distance between the layers will be maintained. Our green belt will help to control fugitive emission.*

8.3 Submissions of Larsen & Toubro

- It is submitted that the layout plan as submitted by SIL (@Pg.238) does not support the aforesaid statement of 6mtr x 8mts;

- It is submitted that Clause 67 of the impugned EC (@Pg.384) negates the very purpose and object of providing 33% of the plant area and is consequently bad in law.

IX. PROJECT PROPONENT CONCEALED THAT THERE IS A DEFENCE INSTALLATION

9.1 It is the case of Larsen & Toubro that its Armoured Systems Complex *(hereinafter referred to as "**ASC**")* is a Defence Installation for the purposes of Environmental Sensitivity as is mentioned in Report 1 Form B.

9.2 In light of the above, it is to be considered whether Larsen & Toubro's ASC would qualify to be a Defence Installation for the purposes of Environmental Sensitivity as is mentioned in Report 1 Form B. The following points fall for consideration while examining whether the ASC qualifies for a Defence Installation:

a. Larsen & Toubro is an Indian Licensed Defence company (ILDC) categorised as having Category A Licence as per Security Manual and Industrial Licence policy of Ministry of Defence.

b. Arms Licence no. DIL (A):09(2018) was issued on 18.06.2018 under Arms Act, 1959 to Larsen & Toubro's ASC for design, development and manufacturing of Firearms and Ammunitions.

c. Larsen & Toubro's ASC is manufacturing a full-fledged defence product i.e. K9 VAJRA-T Gun. These guns are being delivered directly at Army Store. It is pertinent to note that direct delivery of finished products from Larsen & Toubro's ASC to Army Store is at par with ordinance factories under the aegis of the government.

d. Apart from this, Larsen & Toubro's ASC is also executing classified defence projects which cannot be disclosed because of national security.

e. These defence projects require stringent quality standards during production for their required performance. This is monitored by Directorate General of Quality Assurance (DGQA) at defence production site.

f. Larsen & Toubro's ASC was inaugurated by the Hon'ble Prime Minister Narendra Modi in presence of the then Defence Minister Mrs. Nirmala Sitharaman on 19.01.2019.

g. Hon'ble Defence Minister Shri Rajnath Singh flagged-off the 51st K9 VAJRA-T Self-propelled Tracked Howitzers Gun from Larsen & Toubro's ASC on 16.01.2020.

h. Many senior defence officials visit Larsen & Toubro's ASC *inter alia* Chief of Army, Directorate General of Quality Assurance (DGQA) etc.

9.3 The Project Proponent has concealed the aforementioned facts in every document submitted to the relevant authorities and has secured the Impugned Environmental Clearance by not evaluating the effects / impact of the proposed cement plant on the same.

"Environmental Sensitivity:

S. No.	***Area***	***Name/ Identity***	***Aerial distance (within 15 kms) proposed project location boundary***
7.	*Defence Installation*	*No*	*No*

(Refer Form-1 @Pg 170- Heading (iii))

9.4 That the Project Proponent, even in the summary and conclusion of the EIA, concealed the sensitive information pertaining to the Defence installation of Larsen & Toubro in the area. That the same is evidenced from the extracts of the EIA as reproduced hereinbelow:

Table 11.1 – Environmental Sensitivity

Particulars	***Description***
Defence Installation	*None in the 10km radius*

(***Refer EIA - @Pg.371- Para 11 - Summary and Conclusion)***

9.5 It is pertinent to note that in order to get clarity on whether the premise of Larsen & Toubro would qualify to be a Defence Installation for the purposes of Environmental Sensitivity as is mentioned in Report 1 Form B, the Hon'ble Tribunal impleaded the Ministry of Defence as Respondent No.4. The Ministry filed an Affidavit of Reply stating that Larsen & Toubro's ASC would not qualify to be a Defence Installation. Larsen & Toubro disputes the said erroneous stand taken by the Ministry and submit that Larsen & Toubro's ASC is a Defence Installation for the purposes of Environmental Sensitivity as is mentioned in Report 1 Form B.

9.6 Submissions of Larsen & Toubro

☞ Larsen & Toubro submits that Larsen & Toubro is a Defence Installation and the same has been deliberately concealed by the Project Proponent while disclosing the environmental sensitivities in the area.

X. SOURCE OF WATER NOT CONSIDERED

10.1 It is extremely critical to highlight that the Project Proponent has stated in its EIA that it would require 278 kilo litres of water every day i.e. 278 kl/day. However, no information has been provided about the sourcing or procuring this huge amount of water.

10.2 The Project Proponent misrepresented to the authorities in its filing before them wherein it stated that it would procure the said water from irrigation canals. The Respondent failed to mention that they do not have pipelines in place and have no permission from the irrigation department as well for the same.

"2.9.3 Water

- *The water requirement in operation phase including industrial and domestic purposes is about 278 KLD out of which 200KLD is fresh. Water is required for equipment cooling, drinking, sanitation, dust suppression, Green Belt etc. Water shall be met through Local body / Irrigation Department, Surat."* (***Refer EIA @ Pg. 232- Para 2.9.3 - Water requirement)***

"28. Total water requirement for the project shall not exceed 278kl/day. SIL shall reuse 78kl/day of treated effluent for dust suppression and colling tower within premises and hence, fresh water requirement shall not exceed 200kl/day and it shall be met through irrigation department / private tankers. Necessary permission from concern Authority in this regard shall be obtained."
(Refer Impugned Environmental Clearance @Page 382 - Pt. 28)

10.4 Submissions of Larsen & Toubro

☞ It is submitted that till date the source of water and the requisite authorisation has not been placed on record.

XI. CATEGORISATION OF INDUSTRIAL ZONES AS PER SURAT DEVELOPMENT AUTHORITY (SUDA)

11.1 It may be noted that on 12.08.1996, Hazira Industrial Area was notified vide the GIDC Notification under Section 2(g) Gujarat Industrial Development Act, 1962. It may also be noted that Surat at that point was about 50kms way from Hazira Industrial Area;

11.2 SUDA thereafter has been notifying the Development Plans. So far it has published the following development plans:

- Development Plans 1986
- Development Plan 2004
- Development Plan 2035

11.3 Further, it is highly pertinent to note that in the area surrounding the proposed cement plant site, the following major industries are functioning:

SN	Name of Industry	Year of Establishment
1	Reliance	1991
2	NTPC	1992
3	KRIBHCO	1983
4	GAIL	1987
5	ONGC	1984
6	CAIRN India	2002
7	Adani Wilmar	2017
8	ESSAR Steel	1989
9	Adani Port	2010
10	Hazira LNG & Port	2005
11	ABG Cement	2012 (Closed since 3-4 years)
12	ULTRATECH Cement	Approx 1980 to 1985
13	L&T Heavy Engineering	1983
14	Ambuja Cement	1989

It is pertinent to note that most of the aforementioned industries were established prior to the Wetlands Rule, 2010 and the categorisation of industrial zones by SUDA.

11.4 That on 12.10.2017, the Government of Gujarat issued a notification laying down the Comprehensive General Development Control Regulations, 2017 (CGDCR). The said regulations have been annexed herewith as **Annexure 14**

It may be noted that Section C of the CGDCR, 2017 in its heading 7, provides for General Planning and Development Regulations, wherein para 7.1 provides Zone Classification wherein different zones and uses have been conceptualised in Table 7.1.1, reproduced herein below for ready reference: ***(Refer CGDCR @Pg.395)***

Sr. No.	***Use Zone / Use as per Development Plan of Competent Authority***	***As Mentioned***

		Conceptualized Use Zone	***Code***
16.	*Industrial Zone General,* *Industrial Zone,* *Non-Obnoxious & Non-Hazardous Industri* *Zone,* *Light Industrial Zone,* *Industrial-A,* *GIDC.*	*Industrial Zone- 1*	*IZ1*
20.	*Heavy Industrial Zone,* *Industrial Zone- Special,* *Obnoxious & Hazardous Industrial Zone*	*Industrial Zone - 5*	*IZ5*

11.5 Furthermore, the said regulations provide details on the different category of industrial zones and the work permitted and prohibited in the said industrial zones.

"7.2.9 Industrial Zone - 1, 2, 3, 4 (IZ1, IZ2, IZ3, IZ4, IZ7)
This zone is intended for the development of all types of light industries that include small scale factories, transport terminals, etc. except hazardous industries. Other non-hazardous uses like residential buildings for industrial workers, commercial and institutional buildings supporting the existing industries are also permitted subject to relevant regulations.

7.2.10 Industrial Zone – 5, 6 (IZ5, IZ6)
This zone is intended for the development of obnoxious and high hazard industries including storage of inflammable goods and petrol, LPG, CNG and eco-friendly fuel Fuelling stations. The residential dwellings in this zone are only for industrial workers having maximum built up area up to 50 sq. mts. per dwelling unit up to a maximum of 20% of the total utilised FSI of the plot area or subject to the relevant regulations. Dumping of solid industrial wastes is permitted subject to N.O.C. and conditions laid down by Pollution Control Board."
(Refer CGDCR @Pg.399)

11.6 Further, in 2017, SUDA published the General Development Control Regulations of the Revised Draft Plan of SUDA. Regulation 31 of the same specifies the Zoning and Use Provisions, wherein the "Use Zone Table" prescribes as under:

Sr. No.	***Zone***	***Type of development for which the zone is primarily intended***	***Type of development, whic may be permitted by Competent Authority.***	***Type of development, which may not be permitted.***
4	*General Industrial Zone*	*All Industries except obnoxious and hazardous industries as mentioned in Appendix-A. All uses mentioned in col. 3 of zone at Sr. No 3 except col.3 of zone at Sr. no.- 1. Hotel, Restaurant, canteen, bank, business building Development activities related to tourism sponsored/recommended by tourism corporation of Government.*	*a) Storage of inflammable goods such as petrol, diesel, crude oil and kerosene. Residential dwelling only for industrial workers and other public utility service staff working within the industrial premises, querying of gravel, sand, clay and stone. Dumping of solid industrial wastes (subject to N.O.C. and conditions laid down by Pollution Control Board).* *b) All uses mentioned in Column (4) of zone at Sr. No. 1*	*Obnoxious and hazardous industries, mental hospital, hospital for infectious & contiguous diseases, jail, dwelling except mentioned in Col. 4 of this zone.*
5	*Obnoxious ar hazardous industri zone*	*All obnoxious and hazardous industries as mentioned in Appendix -A,*	*Residential dwelling only for industrial worker and other public utility service buildings for staff working within the industrial premises,*	*Residential dwelling except mentioned in Col. 4 of this zone. Hospital or infectious and*

		storage of inflammable goods.	*shops, Restaurants, canteen and bank, business building. Quarrying of gravel, sand clay and stone. Dumping of solid industrial wastes, garbage disposal, treatment plant for solid or liquid industrial /domestic and hospital wastage (subject to N.O.C. and conditions laid down by Pollution Control Board)*	*contagious diseases, mental hospital, jails.*

The said Regulations are annexed herewith as **Annexure 15.** ***(Refer Annexure 15 @Pg.403)***

11.7 That Appendix C of the said Regulation gives "list of obnoxious and hazardous industries" wherein Cement is one of the obnoxious and hazardous industry. ***(Refer Annexure 15 @Pg.418)***

Sr. No.	***Industrial Groups***	***Noxious Characteristics***
X	*Manufacture of Cement & Refractories:* *(1) Portland cement.* *(2) Refractories.* *(3) Thamslling vitreous.* *(4) Glass furnaces of 4 tonne capacity and above.* *(5) Mechanical stone crushing Fertilizers: Nitrogenous and phosphatic manufacturing on a large scale except mixing of fertilizer for compounding.*	*Dust Smoke & Solid wastes Smoke and furnace Fire.* *Dust, Slurry, Noise. Fire, noise, atmosphere pollution due to obnoxious gases fair and dust.*

11.8 That on 08.10.2020, SUDA published the Sanctioned Development Plan, 2035 showing various categories including General Industrial Zone and Obnoxious / Hazardous Industrial Zone (Pink – General Industrial Zone and Dark Pink with Textures – Obnoxious / Hazardous Industrial Zone). It is important to note that the land where the Project Proponent intends to set-up the proposed cement project falls under the General Industrial Zone (shown in Pink colour in the map). The Sanctioned Development Plan has been annexed herewith as **Annexure 16**.

11.9 Moreover, the concerned authorities at Surat Development Authority have, vide their Certificate dated 11.01.2021, confirmed and certified that the area of the proposed cement plant of the Project Proponent falls under General Industrial Zone and not Obnoxious and Hazardous Industrial Zone. The site for the cement plant of Project Proponent is falling at Revenue / Block Survey No.125 and 126. The sale deed of the project land has been annexed herewith as **Annexure 17**. The Zoning Certificate for Survey No.125 and 126 along with the translation has annexed as **Annexure 18.**

11.10 The Hon'ble Tribunal on 10.07.2019 in "*Original Application No. 1038/2018, News item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels"* noted the CEPI index for Surat @S.No.26 at 76.43 and in para 28 directed as under:

"28….. No further industrial activities or expansion be allowed with regard to 'red' and 'orange' category units till the said areas are brought within the prescribed parameters or till carrying capacity of area is assessed and new units or expansion is found viable having regard to the carrying capacity of the area and environmental norms. Pending assessment of compensation, interim compensation be recovered at the scale adopted by this Tribunal in the case of Vapi Industrial area as mentioned in para 22 above."

11.11 Thereafter on 19.08.2019, the NGT modified the aforesaid order and directed to determine viability of such units on 'Precautionary' principle by an appropriate mechanism.

11.12 Submissions of Larsen & Toubro

- The master plan of Surat, keeping in view such exponential growth of the Surat city, has included the Hazira Industrial Area and imposed restrictions on the setting up of the establishment and industries in particular 'red category' 'obnoxious and hazardous industries';

- The city limit of Surat is presently only 10kms from the proposed project site of the Project Proponent;

- However, even if it is assumed that the applicability of the master plan is prospective, it would be in the furtherance of the precautionary principle keeping in view the nature and extent of pollution that would be caused by a cement plant on the rapid expanding city of Surat, that such a plant is not permitted.

- After the notification of SUDA Development Regulations, in particular after the publication of the aforesaid map, it would be appropriate and in the interest of justice, if a red category cement plant (which process is infamous for dust pollution) is not permitted.

XII. NON-APPLICATION OF MIND ON PART OF SEIAC IN GRANTING THE IMPUGNED ENVIRONMENTAL CLEARANCE

12.1 Pre-feasibility Report along with EIA Report are the building blocks for the grant of Environmental Clearance. The said reports are to be prepared after extensive research and ground toothing. The said reports are expected to honestly and truthfully reflect the ground topography and take into account all other relevant consideration particularly in relation to environment. In the present case, the said research is lacking in the report as detailed above and the concerned authorities have neglected the same deliberately or otherwise.

12.2 SEAIC, while considering the said reports, cannot substitute its wisdom without getting the correct research material and an honest ground toothing. SEIAC had merely called upon the Project Proponent to clarify its doubts, which clarification was obviously tailor-made in the interest of the Project Proponent without any material in support thereof.

XIII. CONCLUSION

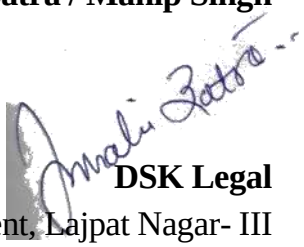
The committee may therefore, in light of the aforesaid, cancel / set aside the Environmental Clearance;

XIV. DELAY CONDONATION

That the Hon'ble Tribunal had granted two weeks' time to make submissions before the committee, however, the present submissions have been made with a delay of 14 days. That on behalf of Larsen & Toubro, we most humbly apologize for the same and pray to kindly condone the same as the same was unintentional and inadvertent.

On behalf of Larsen &Toubro

Rimali Batra / Mahip Singh



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Place: New Delhi
Date: 19.02.2021

Item No. 02 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Appeal No. 36/2020
(Earlier Appeal No. 66/2019 (WZ))

Larsen & Toubro Limited Appellant

Versus

Sanghi Industries Limited & Ors. Respondent(s)

Date of hearing: 06.01.2021
Date of uploading of order: 22.01.2021

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

ORDER

1. This appeal has been preferred against order dated 23.08.2019 of the State Level Environment Impact Assessment Authority (SEIAA), Gujarat, granting Environmental Clearance (EC) to M/s. Sanghi Industries Limited for setting up of stand-alone Cement grinding unit at Survey No. 125/1 and 126/1+2+3, Village Shivrampur, Ta: Choryasi, Distt.: Surat in category 3(b) of Schedule annexed with Environment Impact Assessment (EIA) Notification dated 14.09.2006.

2. The appellant is a company engaged in construction, manufacturing and other industrial/commercial activities. Its grievance is that the project in question will have hazardous impact on Hazira Manufacturing Complex where the appellant is manufacturing defence equipments. The said industrial area at Surat is 'polluted industrial area' classified as such based on data of air water and soil quality, called 'comprehensive

environment pollution index' (CEPI). The unit is of 'red' category in terms of categorisation of industries based on level of contribution to pollution under the Environment (Protection) Rules. EC has been granted without consideration of crucial aspects such as air emissions, water availability, wildlife etc.

3. The appeal was filed on 20.09.2019. Notice was issued on 26.09.2019. The appeal was allowed to be amended on 24.10.2019. IA No. 28/2020 has been filed by the interveners viz. the village Panchayat. IA No. 131/2019 has been filed by the appellant for production of documents relating to compliance status of main cement unit of the project proponent at Kutch in terms of environmental norms.

4. By way of amendment, the appellant has brought on record proceedings of public hearing dated 22.03.2019 wherein, among others, questions with regard to generation of dust from the plant, capacity of the road and source of water were raised. According to the appellant, such concerns relating to increased air and water pollution have not been addressed. The appellant has also pointed out discrepancies in the EIA report. It is submitted that neither the EIA report explains potential of compliance with the environmental norms nor State Environment Assessment Committee (SEAC) and SEIAA have given any reasons from which possibility of such compliance can be inferred. The proceedings do now show application of mind on the environmental consequences and the EC has been granted in a mechanical manner.

5. There are mangroves in the area but the project proponent concealed the said information in application Form I. Similarly, there is reserve forest area which will be impacted which has not been mentioned. 2 Million Tonnes Per Annum (MTPA) cement is proposed to be grinded

which will require raw material including clinker, gypsum, fly ash, slag which has to be transported, involving movement of huge number of trucks. We made a reference to Table 4.17 in the EIA report showing the truck/tanker capacity and the frequency of trucks per day. The said table is reproduced in para 15 of this order. Though EC mentions that only 363 trucks will be permitted for transporting 278,000 liters water per day (as per specific condition no. 47), atleast 799 canters per day will be required. The land allotted is total 12 acres, out of which 33% is to be green area (as per specific condition no. 67 of the EC) Condition no. 67 of the specific conditions mentions that if land for green belt is not available, plantation can be in open land on road sides. The condition is as follows:

> *"67. The SIL shall develop green belt within the factory premises as per the CPCB guidelines,* ***consisting of at least three rows of trees of local species on periphery. However, if the adequate land is not available within the premises, the SIL shall take up adequate plantation at suitable open land on road sides and other open areas in nearby locality or schools in consultation with the Gram Panchayat/GPCB and submit an action plan of plantation for next three years to the GPCB."***

6. There is no provision in the EIA for space for parking for the trucks and other vehicles. Shifting of green belt outside the factory complex will defeat the object of mitigation of pollution. The industrial area in question is polluted industrial area which has no capacity for any further polluting activities as held in the order of this Tribunal dated 10.07.2019 in OA No. 1038/2018, *News item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels".*

7. The project proponent-Respondent No. 1 has filed reply by stating that it has state of art facilities to adhere to the environmental norms. The mangroves have been duly disclosed in the EIA report. The project is at a distance of 1.3 km from the mangroves. The Krishak Bharati Cooperative

Ltd. (KRIBHCO) has agreed to supply water through irrigation pipelines. The water requirement will be partly met by recycling.

8. Reply of the SEIAA, Gujarat is that EC has been granted based on EIA report furnished by the project proponent. Undertaking was given not to use lignite and pet coke which is not permissible fuel. The project was considered by the SEAC in the meeting held on 12.06.2019 in continuation of meeting held on 16.04.2019. The project proponent explained mitigation measures against the emissions on which the members of SEAC were satisfied and on their recommendation SEIAA granted EC on 16.7.2019. Relevant extract from the reply of SEIAA is:

> *" xxx xxx*
> *12. I say that the answering respondent authority after receiving the recommendation considered the same alongwith the relevant material at its meeting held on 16.07.2019. A true copy of the minutes of the meeting of the respondent authority held on 16.07.2019 is annexed herewith and marked as Annexure R4. Being satisfied with the recommendation made by the Expert Appraisal Committee on the basis of the material and consideration of relevant aspects, the respondent authority decided to grant environment clearance for the proposed project. Accordingly, the clearance was issued on 23.08.2019."*

9. Relevant extracts from the minutes of the meetings of SEAC dated 16.04.2019 and 12.06.2019 are:

> ***"The 497th meeting of the State Level Expert Appraisal Committee (SEAC) was held on 16th April, 2019 at Gujarat Pollution Control Board, Sector 10-A, Gandhinagar.***
>
> *xxx xxx xxx*
>
> ***In view of the above, Committee unanimously decided to consider the proposal the proposal after submission of the following details:***
>
> *xxx xxx xxx*
>
> *iii.* ***Fugitive emission details with its mitigation measures****.*
> *Fugitive emission during raw material handling and feeding process and vehicle movements.*

Mitigation measures – High efficiency pulse air jet type bag filters will be considered to arrest the air borne dust at all the locations where transfer of material are takes place; The automatic bagging machine with bag filters will be installed for packing plant; unloading of coal trucks will be carried out with proper care avoiding dropping of the materials from height. Sprinklers will be installed in Raw Material/ Fuel Storage/Loading / Unloading areas. The sprinkling of water will be done along with internal roads in the plant in order to control the dust arising due to the movement of vehicular traffic; Proper maintenance of vehicles shall be carried out; All the workers inside the plant will be provided with disposable dust masks; thick greenbelt will be developed around the plant to arrest the fugitive emissions; and Periodic air quality monitoring shall be carried out as per CPCB/ SPCB norms etc.

xxx xxx xxx

***After deliberation, SEAC unanimously decided to consider the proposal after submission of the following details**:*

1. to 4. xxx xxx xxx

5. Sound APCM to control fugitive dust emission during raw material transportation, storage, handling, loading, unloading, transfer, fuel grinding etc."

xxx xxx xxx

"Minutes of the 514th meeting of the State Level Expert Appraisal Committee held on 12/06/2019 at Committee Room, Gujarat Pollution Control Board, Sector 10-A, Gandhinagar.

xxx xxx xxx

15	*SIA/GJ/IND2/ 30448/2018*	*M/s. Sanghi Industries Limited Survey No. 125/1, 125/2 and 126/1+2+3, Vill.: Shivrampur, Tal.: Choryasi, Distt.: Surat*	*Appraisal – Recommendation*

xxx xxx xxx

iii, ***Fugitive emission details with its mitigation measures:***

xxx xxx xxx

***On Road**:*

- *All internal roads used for transport of vehicles will be paved and maintained properly and repaired immediately when required.*
- *For prevention of road dust emission, speed will be restricted to 10 km/hr for heavy vehicles within the project premises.*

- *All preventive measures i.e. covering of trucks, paving and maintenance of internal roads will be adopted.*
- *Regular vacuum sweeping and water spraying will be done on the internal roads.*
- *Proper maintenance of vehicles will be carried out."*

10. The minutes of the meeting of SEIAA dated 16.07.2019 are:

> ***"Minutes of the 253rd Meeting held on 16th July, 2019 at 09:00 A.M.***
>
> *The 253rd meeting of the State Level Environment Impact Assessment Authority (SEIAA) was held under the Chairmanship of Shri C.L. Meena at Gujarat Pollution Control Board, Gandhinagar. Prof. G.H. Ban, Member of SEIAA and Shri S.M. Saiyad, Member Secretary of the State Level Environment Impact Assessment Authority (SEIAA) attended the meeting.*
>
> *xxx* *xxx* *xxx*
>
> ***2) Sanghi Industries Limited, Dist. Surat***
>
> - ***After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC."***

11. The stand of the Ministry of Defence is that L&T facility is only a defence manufacturing facility and not a defence establishment. Thus, Works of Defence Act, 1903, prohibiting activities within a particular distance therefrom, does not apply.

12. We have heard Shri Raj Panjwani, learned Senior Counsel for the appellant, Shri Pinaki Mishra, learned Senior Counsel for Respondent No. 1 and Shri Maulik Nanavati, learned Counsel for SEIAA, Gujarat and perused the documents on record, with their assistance. We have also perused the written submissions filed by the parties in pursuance of order dated 06.01.2021 passed on conclusion of the hearing. In view of the fact that we are giving liberty to the parties to file written submissions before the CPCB for consideration of the Committee to which the matter is being referred, we do not find it necessary to make any comment on the said

submissions, beyond the comment on the rival contentions already raised before the Tribunal.

13. Shri Panjwani has drawn our attention to Form I, the EIA and the minutes of the SEAC. He pointed out contradictions in the information in the EIA compared to the information furnished in Form-1, particularly with regard to the mangroves, forests and birds. From the EIA documents, it is pointed out that the project proponent is one of largest cement plants at Kutch while the present project is proposed as grinding unit at Hazira Industrial Zone, Village Shivrampur, Taluka-Choryasi, District-Surat, Gujarat. The land procured for the purpose is 4.856 hectare for use as per following break-up:

"Table 2.7 Land Breakup of Cement Grinding Unit

#	*Particulars*	*Total Area (in Ha.)*	*Area*
1.	*Production Plant*	*0.712*	*14.66%*
2.	*Office & Lab Area*	*0.022*	*0.46%*
3.	*Raw Material Storage Area*	*0.632*	*13.01%*
4.	*Solid Waste Storage Area*	*0.005*	*0.10%*
5.	*Open Space*	*1.835*	*37.79%*
6.	*Green Belt*	*1.650*	*33.98%*
	Total	***4.856***	***100.00%***

"

In the above break up, there is no provision for parking of large number of trucks to be used for about 800 trips per day for transporting material and other trucks for transporting water.

14. The main raw material i.e. clinker is to be transported from Kutch plant by sea/road as per statement in the EIA as follows:

> ***"2.6.3 Transportation & Storage of Raw Material***
>
> *The clinker shall be transported from Sanghipuram (IU) to Surat GU mainly by sea. Clinker shall be extracted from the Clinker load out silos at IU, transported to the captive Jetty of SIL by trucks and loaded on to the barges by grab cranes. Barges shall transport the Clinker to*

the ship stationed at high seas. ***At Surat, the Clinker shall be unloaded from the ship at nearest port and transported to the Surat GU site by trucks. The clinker received through self-tipping trucks shall be unloaded by into a box feeder and transported to clinker storage silo through conveyor and elevator. The clinker storage has been envisaged in RCC silos of capacity 50,000 Ton, adequate for about 10 day requirement of the plant. Clinker shall be extracted from the bottom of the clinker silos and fed to the clinker hoppers in the cement grinding section through a belt conveyors and elevator****."*

15. Under the heading 'air environment', the EIA mentions as follows:

"Table-4.17: Incoming & Outgoing Transportation

Incoming Raw Material Transportation							
S.No.	***Raw Material***		***Quantity TPA***	***Quantity TPD***	***Source***	***Mode of Transport***	***No. of vehicles (Truck/day)***
1.	*Clinker*		*2000000*	*6061*	*Captive*	*Sea*	*184*
2.	*Additives like Gypsum, Fly Ash, Slag*				*Purchase*	*Road*	
	Fuel		*60000*	*182*	*Purchase*	*Road*	
Total No. of Trucks deployed/day will be							***184***
Outgoing Product Transportation							
S. No.	***Product***	***Quality Million TPA***	***Quantity TPA***	***Quantity TPD***	***Source***	***Mode of Transport***	***No. of vehicles (Truck/day)***
1.	*Cement*	*2.0*	*2000000*	*6061*	*Captive*	*Road/Sea*	*179*
Total No. of Trucks deployed/day will be							***363***

Frequency of Vehicles:

Total Capacity (Fuel, Clinker, Fly ash)	*40, 60,000 TPA*
No. of working days	*330*
Transportation of incoming and outgoing material	*12303 Tons/day*
Working hours per day	*24 hours (3 shifts)*
Truck/Tanker Capacity	*34 Tons*
Frequency of trucks/day (92 No. × 4 trips/day × 2 (up/down)	*363 ×2*
Frequency of trucks deployed/hr	*16*
Increase in PCU/hr	*16× 3 = 48*

"

16. The mode of transportation mentioned in para 5.3 of the EIA is as follows:

"5.3 ALTERNATIVE FOR TECHNOLOGY AND OTHER PARAMETERS

xxx *xxx* *xxx*

S. No.	***Site Particular***	***Alternative Option 1***	***Alternative Option 2***	***Remarks***
1 to 6	*xxx*	*xxx*	*Xxx*	*Xxx*
7.	*Road*	*Metallic Road*	*Kachcha Road*	*The road is well furnished. Most of*

				the raw material and fuel will be transported through ship (sea route)

17. Under the hearing mitigation measures, table 2.13 is as follows:

"Table 2.13: Aspects & Impacts Analysis

Activity	***Environmental Attribute***	***Cause***	***Impact Characteristics***			
			Nature	***Duration***	***Reversibility***	***Intensity and Significance***
Vehicles Movement and utilities operation	*Air quality*	*Exhaust Emissions i.e. NO_X, SO_2, Fugitive emission*	*Negative*	*Short Term*	*Reversible*	*Low, due to movement of vehicle only for loading and unloading of raw material. Provision of APC's.*
	Noise Levels	*Noise Generation*	*Negative*	*Short Term*	*Reversible*	*Low, due to limited activity*
	Risk & Hazards	*Accidents, collision of transport vehicles*	*Negative*	*Short Term*	*Reversible*	*Medium due to loss of property and injury to manpower.*

"

18. Conclusions in the EIA report are:

"11.5 Conclusion

Based on the EIA study conducted in Post Monsoon of 2018 (Oct. to Dec. 2018) and as per terms of reference given by SEAC, the following highlights emerge:

- *There will be minimal pollution potential on air, water and noise environment, which, with the implementation of the mitigation measures and EMP, can be reduced considerably.*
- *The proposed project activities will have positive beneficial effect on the local population, economic output and other related facilities viz. employment, development of business, transportation etc.*
- *Risk assessment including emergency response plan and DMP has been prepared to handle any sort of emergencies.*
- *Looking to the overall project justification, process, pollution potential and pollution prevention measures/technologies installed by proponent, environmental management activities of proponent; the proposed project would be environmentally acceptable, in compliance with environmental legislation and standards.*

> *Hence, looking to the overall project justification, process, pollution potential and pollution prevention, measures/technologies installed by proponent, environmental management activities of proponent,* ***it has been concluded that the proposed project would not have any considerable impacts on environment as well as socio-economic and ecological conditions of the project area. Hence proposed grinding unit at Shivrampur, Hazira is considered environmentally safe."***

19. Learned Counsel for the appellants has then referred to documents filed with IA No. 8/2020 and documents filed on 18.11.2020 by the intervener – Suvali Gram Panchayat. In para 15 of the reply filed by Suvali Gram Panchayat, it is mentioned that the project is in violation of Comprehensive General Development Control Regulations (CGDCR) notified by the State Government on 12.10.2017 under the Gujarat Town Planning and Urban Development Act, 1976. The CGDCR classify different zones for the permissible activities also specify negative list of activities. According to the said regulations, there is prohibition of Obnoxious & Hazardous industries in general industrial zone.

20. On being called upon, the learned Counsel for the project proponent as well as learned Counsel for the SEIAA were unable to show any discussion in the minutes of the SEAC or any material which may reflect application of mind to the assessment of impact of dust generation during the transportation and mitigation measures against the same. Beyond saying that provision has been made for covering the vehicles during transport and sprinkling of water, it has not shown as to how generation of dust and causing of noise pollution by movement of large number of heavy vehicles will be neutralized, given the carrying and load bearing capacity of the Panchayat road in question.

21. In view of above, we find that the precautionary principle, for which EIA is conducted, remains to be addressed. As held in Hanuman Laxman

Aroskar v. Union of India[1], the object of EIA is to ensure that all concerns affecting the environment are duly taken care of. Thus, the impugned EC cannot be sustained until the environmental concerns are duly addressed. We are informed that the project has not yet commenced. Even learned Counsel for the project proponent and the SEIAA fairly accepted this factual position.

22. Accordingly, we refer the issue of assessment of carrying and load bearing capacity of the Panchayat road in question and evaluation of EIA and EMP prepared by the project proponent to the EAC of the MoEF&CC dealing with the cement plants, alongwith the representatives of CPCB, NEERI and IIT Mumbai. The CPCB will be the nodal agency for coordination and compliance. Coordination with the EAC may be through the MoEF&CC. The Committee may assess how generation of dust and causing of noise pollution by movement of large number of heavy vehicles will be neutralized, given the carrying and load bearing capacity of the Panchayat road in question. The Expert Committee may furnish its report to this Tribunal within three months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF.

23. The appellant, the Suveli Gram Panchayat and the project proponent may file their respective written submissions to the CPCB within two weeks for consideration by the Committee.

A copy of this order be forwarded to the MoEF&CC, CPCB, NEERI and IIT Mumbai by e-mail for compliance.

[1] (2019) 15 SCC 401

List for further consideration on 14.07.2021.

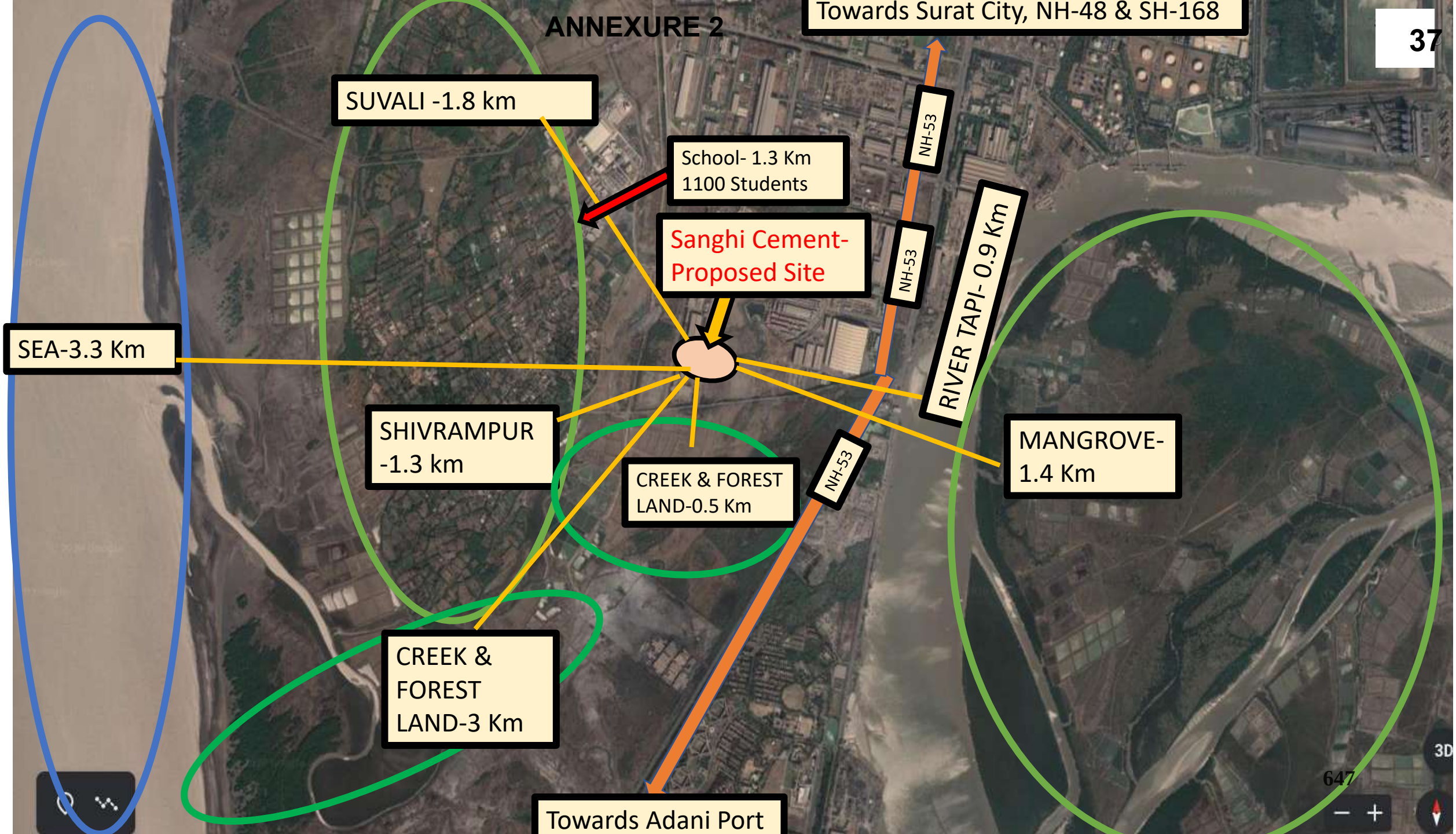
Adarsh Kumar Goel, CP

S.K. Singh, JM

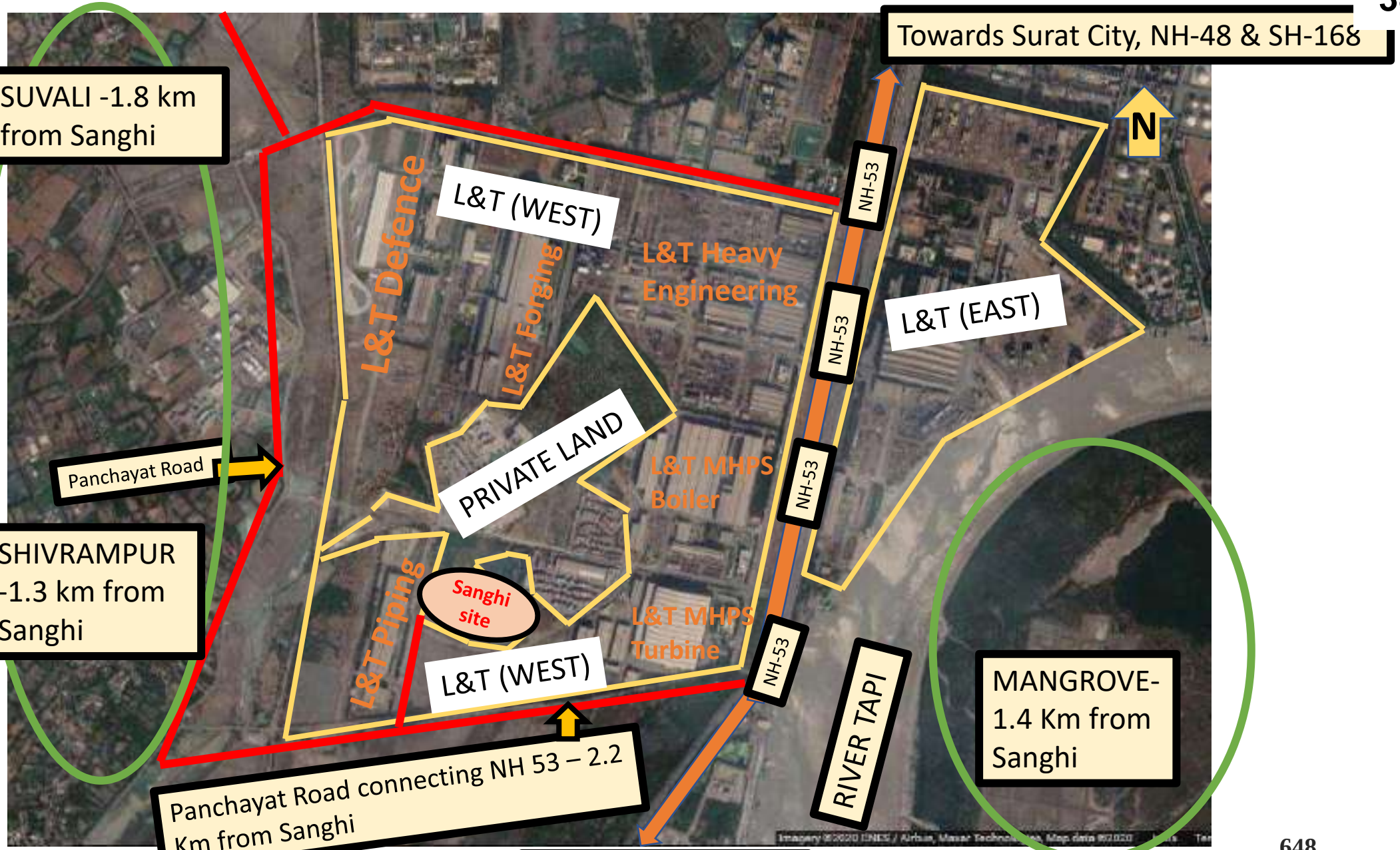
Dr. Nagin Nanda, EM

January 22, 2021
Appeal No. 36/2020
(Earlier Appeal No. 66/2019 (WZ))
DV

ANNEXURE 2


Towards Surat City, NH-48 & SH-168
SUVALI -1.8 km
School- 1.3 Km
1100 Students
Sanghi Cement-
Proposed Site
NH-53
NH-53
NH-53
RIVER TAPI- 0.9 Km
SEA-3.3 Km
SHIVRAMPUR
-1.3 km
CREEK & FOREST
LAND-0.5 Km
MANGROVE-
1.4 Km
CREEK &
FOREST
LAND-3 Km
Towards Adani Port

SANGHI CEMENT SITE LOCATED IN MIDST OF L&T COMPLEX LESS THAN 1 KM OF PERIPEHRY FROM ALL UNS

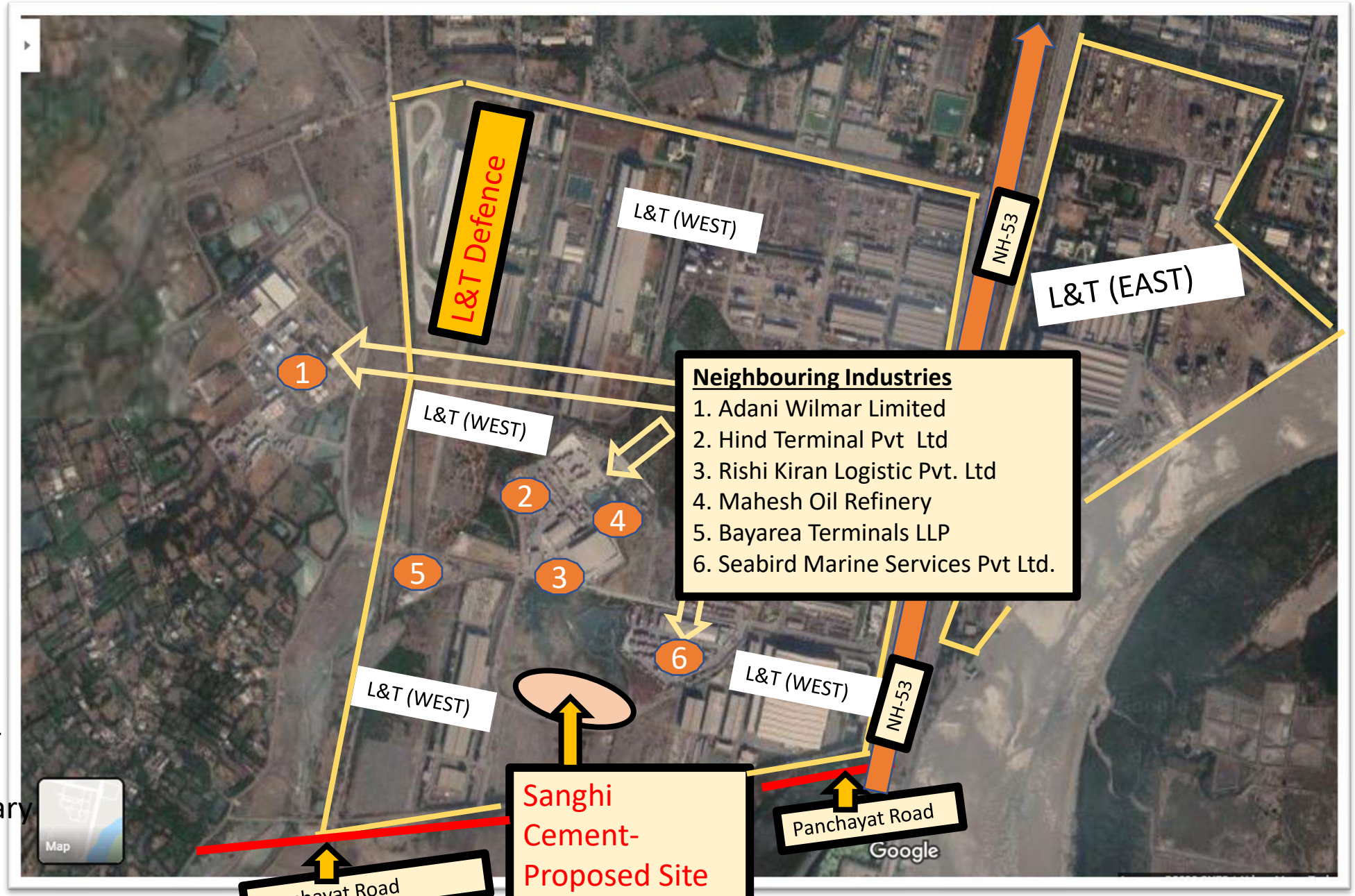


LEGEND

Panchayat Road

L&T Boundary

Neighbouring Industries in midst of L&T Hazira Manufacturing Complex



LEGEND

L&T Boundary

ANNEXURE 3

Item No. 05 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 1038/2018

News item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels"

Date of hearing: 10.07.2019

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE S.P. WANGDI, JUDICIAL MEMBER
HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

For Applicant(s): NONE

For Respondent (s): Mr. Pradeep Misra, Advocate for UPPCB
Mr. TVS Raghavendra Sreyas, Advocate for APPCB
Mr. Dhanajay Baijal, Advocate for TSPCB
Mr. Jogy Scaria, Advocate for KSPCB
Ms. Sakshi Popli, Advocate for DPCC
Mr. Rajkumar, Advocate for CPCB

ORDER

1. The issue for consideration is the remedial action against the polluting industries in the identified polluting industrial clusters. The Tribunal, vide order dated 13.12.2018, treated the news item published in "The Asian Age" dated 06.12.2018 authored by Mr. Sanjay Kaw titled "CPCB to rank industrial units on pollution levels" as an application in view of substantial question of environment which could be dealt with by the Tribunal under Sections 14, 15 and 20 of the National Green Tribunal Act, 2010.

2. We may note the background of the issue briefly. The Central Pollution Control Board (CPCB) in exercise of its statutory functions under the Air (Prevention and Control of Pollution) Act, 1981 (the Air

Act), the Water (Prevention and Control of Pollution) Act, 1974 (the Water Act) and the Environment (Protection) Act, 1986 (the EPA Act) carried out the physical study of the industrial clusters in the country with reference to the Comprehensive Environmental Pollution Index (CEPI) which includes weightages on nature of pollutants, ambient pollutant concentrations, receptors (number of people affected) and additional high risk element. On the basis of the study jointly carried out by the CPCB and State PCBs in 2009-10, 88 industrial clusters were notified as Polluted Industrial Areas (PIAs). These PIAs were ranked as 'critically polluted area' (CPA), 'severely polluted area' (SPA) and 'other polluted areas' (OPAs), depending upon the CEPI scores of each of these industrial areas. Where the CEPI score crossed 70, the areas are designated as CPAs, where the index was between 60-70, they are designated as SPAs and those below 60 as OPAs. As per the CPCB's monitoring of industrial clusters based on CEPI-2009, 43 industrial clusters in 16 cities were identified as CPAs and 32 were identified as SPAs. The CPAs and SPAs were to bring the pollution levels within the norms by formulating and implementing an action plan with short term and long term measures within one year or more. New units in the said areas were prohibited but such ban was later on lifted.

3. In 2016, the criterion for determining CEPI was revised. CPCB revised its CEPI criteria and laid out components which included, scale of industrial activity, scale of exceedance of environmental quality (level of exposure), health related statistics and compliance status of industries.

4. On 26.04.2016, the CPCB issued directions under Section 18 of the Air Act and the Water Act to the SPCB of Andhra Pradesh, Telangana,

Uttar Pradesh, Karnataka, Punjab, Jharkhand, Haryana, Gujarat, Govt. of NCT Delhi, Tamil Nadu, Maharashtra, Madhya Pradesh, Rajasthan, Chhattisgarh, West Bengal, Kerala, requiring continuous environmental quality monitoring in all CPAs and SPAs, installation of Continuous Ambient Air Quality Monitoring Stations (CAAQMS), Continuous Water Quality Monitoring Stations (CWQMS) for CEPI score evaluation as per revised formulae and to formulate their action plans before 15.06.2016. The polluting sources were required to be notified in public domain on websites, environmental quality data was also to be placed in public domain, State Governments were to notify the scaled maps of the industrial areas. The object of placing such data in public domain was to give warning for bringing the pollution levels within the prescribed limits. The polluted clusters were to be kept in mind for permitting setting up of further industries or expanding of the existing industries.

5. Based on the CEPI-2016 criterion, CPCB carried out further monitoring in the year 2017-18 where it was found that number of identified polluted industrial clusters went up to 100. The said number includes 38 critically polluted, 31 severely polluted and remaining 31 as other polluted areas.

6. The Tribunal vide order dated 13.12.2018 directed all the State Pollution Control Boards/Committees (PCCs) to finalize time bound action plans within three months so as to bring all polluted industrial clusters within the safe parameters under the provisions of the Air Act and the Water Act. The SPCBs and CPCB were free to take coercive measures, including recovery of compensation for damages to the environment on 'Polluter Pays' principle and also to adopt precautionary measures on 'Precautionary' principle. The CPCB was

directed to serve a copy of the above mentioned order to all the SPCBs who were to furnish the same to the respective Chief Secretaries of the States for necessary action. The MoEF&CC was directed to take steps on the basis of report of the CPCB. Action taken reports were to be furnished by the CPCB and the MoEF&CC to this Tribunal before 31.05.2019. In the States, action plans were to be prepared by Committees headed by the Chief Secretaries.

7. Ill effects of industrial pollution on the environment and public health are well acknowledged. This has made it necessary to strictly apply the principles of 'Sustainable Development' and permit any activity to be carried out without degrading the environment. The statutory scheme under the Air Act, the Water Act and the EPA Act provides for standards for air and water quality which must be maintained and violation thereof is a criminal offence[1]. Any violation has to be visited with stopping of polluting activity, prosecution and compensation for restoration of environment. Accordingly, in the order dated 13.12.2018 this Tribunal observed:

> *"5. Purpose of economic development in any region is to provide opportunities for improved living by removing poverty and unemployment. While industrial development invariably creates more jobs in any region, such development has to be sustainable and compliant with the norms of environment. In absence of this awakening or tendency for monitoring, industrialization has led to environmental degradation on account of industrial pollution. It is imperative to ensure that steps are taken to check such pollution to uphold statutory norms. Adequate and effective pollution control methods are necessary.*
>
> *6. Dust, smoke, fume and toxic gas emissions occur as a result of highly polluting industries such as thermal power plants, coal mines, cement, sponge iron, steel and ferrow alloys, petroleum and chemicals unless right technology is used and precaution taken. Industry specific clusters have not only become hazardous but*

[1] Section 7 read with Section 15 of the EPA Act, Section 24 read with Section 41 and Section 45A of the Water Act, Section 21 and Section 22 read with Section 37 of the Air Act.

also cause irreparable damage to our ecology and environment, often breaching the environment's carrying capacity, adversely affecting public health.

7. In Karnataka Industrial Areas Development Board vs. C. Kenchappa & Ors[2], the Hon'ble Supreme Court observed, as guiding rules for Sustainable Development, that humanity must take no more from nature than man can replenish and that people must adopt lifestyles and development paths that work within the nature's limit. In Vellore Citizens Welfare Forum Vs. Union of India, the Hon'ble Supreme Court recognized the Precautionary Principle and explained that environmental measures by the State Government and the statutory authorities must anticipate, prevent and attack the causes of environmental degradation.

8. This Tribunal has applied the same principles in deciding matters before it in terms of Section 20 of the National Green Tribunal Act 2010.

13. The action plan to be prepared in the States may be done by the Committee constituted by the Chief Secretary within one month from today as several Departments may be involved in the exercise. The final preparation of the action plan including its execution may be overseen by the Chief Secretary of the concerned State, along with the other connected major environmental issues of the States, such as pollution of river stretches, non-attainment cities in terms of air quality and solid waste management, utilization of treated sewage, covered by order of this Tribunal dated 20.09.2018 in Original Application No. 673/2018, News Item Published in 'The Hindu' authored by Shri. Jacob Koshy titled "More river stretches are now critically polluted: CPCB", order dated 08.10.2018 in Original Application No. 681/2018, News Item Published In 'The Times of India' Authored by Shri Vishwa Mohan Titled "NCAP with Multiple Timelines to Clear Air in 102 Cities to be released around August 15", order dated 20.08.2018 in Original Application No. 606/2018, Compliance of Municipal Solid Waste Management Rules, 2016 and order dated 27.11.2018 in Original Application No. 148/2016, Mahesh Chandra Saxena Vs. South Delhi Municipal Corporation & Ors. The Chief Secretary will take meetings on all these issues once in three months (quarterly) and will forward Report to NGT by e-mail."

8. We may also note that on 16.01.2019, while considering the issue of compliance of Solid Waste Management Rules, 2016 and other Waste Management Rules in *O.A. No. 606/2018, Compliance of MSW Rules, 2016*, the Tribunal required the presence of the Chief Secretaries in

[2] (2006) 6 SSC 383

person after monitoring the subjects mentioned in the said order which included polluted industrial clusters.

9. Accordingly, the Chief Secretaries appeared before this Tribunal and filed their respective versions on the subject. They have been asked to take necessary steps to enforce the environment norms and furnish periodical reports to this Tribunal. The directions include monitoring of important environmental issues including the issue of polluted industrial clusters by a Central Monitoring Committee with representatives from the Central Government and the Chief Secretaries of the States, undertaking carrying capacity study of the areas where violation of environmental norms is established, training programme of the officers concerned with the enforcement of the environmental norms, preparation of annual environmental plan for the country giving status of gaps in compliance of environmental norms.[3] The Tribunal noted the private studies which may need to be verified assessing the number of deaths and diseases from pollution[4]:

> *"38. Death attributable to pollution to be 2.51 million in 2015, highest in the world. Air pollution, the number of deaths in India from ambient air pollution was 1.09 million, while deaths from household air pollution from solid fuels were 0.97 million. In the case of water pollution, 0.5 million deaths were caused by unsafe water source, while unsafe sanitation caused 0.32 million deaths. Deaths from air pollution were a result of diseases such as heart disease, stroke, lung cancer, and chronic obstructive pulmonary disease (COPD). Pollution has been responsible for the most non-communicable disease deaths. India ranks a dismal 110 of 149 countries on the Sustainable Development Index. With rapid urbanization, the country is facing massive waste management challenge. Over 377 million urban people live in 7,935 towns and cities and generate 62 million tonnes of municipal solid waste per annum. Only 43 million tonnes (MT) of the waste is collected, 11.9 MT is treated and 31 MT is dumped in landfill sites. An alarming 80% of India's surface water is polluted. Indian cities generate 10 billion gallons or 38 billion litres of municipal waste water every day, out of which only 29% of it is treated.*
>
> *40. In case extent of convictions for the environment related offences do not correspond to the extent of crime, paradigm shift in*

[3] O.A 606/2018, order dated 17.05.2019, at para 27
[4] *Ibid*

policies and strategies for implementation of law may need to be considered. Similarly, the mechanism for recovery of compensation may need to be revised on that pattern. Such review of policy cannot be left to the Local Bodies or the Pollution Control Boards but has to be at highest level in the State and further review at the national level. As noted in some of the studies, the ranking of the country in compliance of environmental norms needs to be brought to respectable higher position which may be possible only if there is change in policies and strategies for implementation of necessary norms at every level in right direction. The scale of compensation needs to be suitably revised so that the same is deterrent and adequate to meet the cost of reversing the pollution."

10. Some of the States have also filed their reports in the present proceedings apart from the reports of the Chief Secretaries mentioned above. Further, a report has also been filed by the CPCB. According to the CPCB report, order dated 13.12.2018 stands served to all the State PCBs and the PCCs. The CPCB with the concurrence of MoEF&CC carried out environmental quality monitoring in 21 States across the country in respect of the said 100 industrial clusters based on the revised CEPI-2016, by engaging the services of approved laboratories. The said reports have been analysed. Further information has been sought from the State PCBs/ PCCs. Comprehensive exercise and consultative process has been undertaken and CEPI scores of all the 100 Polluted Industrial Areas (PIAs) were submitted to MoEF&CC on 11.01.2019 and the MoEF&CC replied in letter dated 25.02.2019 that there are some gaps in the information. Further information relating to such gaps were sought from the States by the MoEF&CC. Thereafter, updated CEPI scores for all 100 PIAs have been submitted by CPCB to MoEF&CC on 10.04.2019. The CPCB has also prepared a protocol and submitted the same to the MoEF&CC on 17.05.2019 for consideration and appropriate action.

11. During the hearing today, a copy of the letter dated 17.05.2019 was handed over by the Learned Counsel for the CPCB, indicating the

latest CEPI scores for 100 polluted industrial areas/clusters monitored during 2018. The said scores are as follows:

The CEPI Scores in descending order for Industrial Areas/Clusters monitored during 2018

Sl. No.	Name of Polluted Industrial Areas (PIAs)	Air	Water	Land	* CEPI Score	# Status of Environment
1.	Tarapur(Maharashtra)	72.00	89.00	59.25	93.69	Ac_Wc_Ls
2.	Najafgarh-Drain basin including Anand Parbat, Naraina, Okhla, Wazirpur(Delhi)	85.25	86.00	55.75	92.65	Ac_Wc_Ls
3.	Mathura(Uttar Pradesh)	86.00	81.00	45.00	91.10	Ac_Wc_Ln
4.	Kanpur(Uttar Pradesh)	66.00	85.00	45.00	89.46	Ac_Wc_Ln
5.	Vadodara(Gujarat)	82.00	80.75	48.75	89.09	Ac_Wc_Ln
6.	Moradabad(Uttar Pradesh)	76.00	71.50	68.75	87.80	Ac_Wc_Lc
7.	Varanasi-Mirzapur(Uttar Pradesh)	67.50	80.00	39.63	85.35	Ac_Wc_Ln
8.	Bulandsahar-Khurza(Uttar Pradesh)	79.50	76.00	36.75	85.23	Ac_Wc_Ln
9.	Gurgaon(Haryana)	70.00	80.00	36.75	85.15	Ac_Wc_Ln
10.	Manali (Tamil Nadu)	59.75	72.25	71.75	84.15	As_Wc_Lc
11.	Panipat(Haryana)	66.00	72.75	60.00	83.54	Ac_Wc_Lc
12.	Firozabad(Uttar Pradesh)	76.00	72.00	32.50	81.62	Ac_Wc_Ln
13.	Udham Singh Nagar (Uttarakhand)	83.00	79.50	26.00	81.26	An_Wc_Ln
14.	Jodhpur (Rajasthan)	67.00	66.00	65.00	81.16	Ac_Wc_Lc
15.	Pali (Rajasthan)	66.00	65.00	65.50	80.48	Ac_Wc_Lc
16.	Ankleshwar (Gujarat)	72.00	57.50	51.00	80.21	Ac_Ws_Ls
17.	Gajraula Area(Uttar Pradesh)	71.00	70.00	45.00	80.14	Ac_Wc_Ln
18.	Vapi (Gujarat)	66.00	75.00	30.00	79.95	Ac_Wc_Ln
19.	Siltara Industrial Area (Chhattisgarh)	76.00	51.75	31.75	79.94	Ac_Ws_Ln
20.	Bhiwadi (Rajasthan)	66.50	71.00	44.75	79.63	Ac_Wc_Ln
21.	Vellore -North Arcot (Tamil Nadu)	49.00	75.00	35.75	79.38	An_Wc_Ln
22.	Sanganer Industrial Area (Rajasthan)	65.00	71.88	39.50	79.10	Ac_Wc_Ln
23.	Byrnihat (Assam)	67.00	70.30	39.50	78.31	Ac_Wc_Ln
24.	Peenya(Karnataka)	41.00	66.00	70.00	78.12	An_Wc_Lc
25.	Jaipur (Rajasthan)	61.88	71.88	31.75	77.40	Ac_Wc_Ln
26.	Surat (Gujarat)	46.00	68.25	56.00	76.43	An_Wc_Ls
27.	Chandrapur (Maharashtra)	75.00	23.75	23.75	76.41	Ac_Wc_Ln
28.	Agra(Uttar Pradesh)	60.00	66.38	47.00	76.22	Ac_Wc_Ln
29.	Pattancheru Bollaram	56.00	70.30	32.25	75.42	As_Wc_Ln

	(Telangana)					
30.	Jalandhar (Punjab)	53.50	66.88	44.50	74.76	As_Wc_Ln
31.	Ludhiana (Punjab)	53.50	71.00	16.00	73.48	As_Wc_Ln
32.	Tiruppur (Tamil Nadu)	33.00	65.00	64.00	72.39	An_Wc_Lc
33.	Ghaziabad(Uttar Pradesh)	57.50	66.00	32.25	72.30	As_Wc_Ln
34.	Mettur (Tamil Nadu)	41.25	19.38	69.38	71.82	An_Wn_Lc
35.	KIADB Industrial Area, Jigini, Anekal (Bengaluru)	52.00	66.00	28.25	70.99	As_Wc_Ln
36.	Vatva(Gujarat)	57.00	66.00	25.50	70.94	As_Wc_Ln
37.	Raipur (Chhattisgarh)	67.00	45.75	25.00	70.77	Ac_Wn_Ln
38.	Rajkot(Gujarat)	51.75	61.50	45.75	70.62	As_Wc_Ln
39.	Aurangabad(Maharashtra)	45.00	65.38	28.75	69.85	An_Wc_Lc
40.	Dombivali (Maharashtra)	62.00	63.50	27.25	69.67	Ac_Wc_Ln
41.	Nashik(Maharashtra)	56.50	60.00	42.00	69.49	As_Wc_Ln
42.	Batala (Punjab)	63.00	62.75	25.50	68.92	Ac_Wc_Ln
43.	Noida(Uttar Pradesh)	59.75	62.75	27.00	68.76	As_Wc_Ln
44.	Baddi(Himachal Pradesh)	63.00	63.75	19.75	68.26	Ac_Wc_Ln
45.	Vijayawada(Andhra Pradesh)	60.50	49.25	38.75	68.04	Ac_Wn_Ln
46.	Bandel (West Bengal)	59.50	47.00	42.75	67.64	As_Wn_Ln
47.	Ramgarh(Jharkhand)	56.75	50.00	46.25	66.75	As_Ws_Ln
48.	Kukatpally (Telangana)	43.75	61.00	32.00	66.46	An_Wc_Ln
49.	Ib-Valley (Orissa)	48.75	59.00	36.75	66.35	An_Ws_Ln
50.	Tuticorin (Tamil Nadu)	29.75	46.00	61.00	66.34	An_Wn_Lc
51.	Navi Mumbai(Maharashtra)	56.00	63.00	16.00	66.32	As_Wc_Ln
52.	Meerut(Uttar Pradesh)	52.00	65.00	6.00	66.09	As_Wc_Ln
53.	Parwanoo(Himachal Pradesh)	19.00	61.88	53.75	65.77	An_Wc_Ls
54.	Kala Amb(Himachal Pradesh)	17.00	64.00	27.75	65.70	An_Wc_Ln
55.	Bidar(Karnataka)	31.00	60.00	45.50	65.64	An_Wc_Ln
56.	Durgapur(West Bengal)	62.50	43.50	18.75	65.56	Ac_Wn_Ln
57.	Aligarh(Uttar Pradesh)	56.25	61.88	11.88	64.42	As_Wc_Ln
58.	Hajipur(Bihar)	57.50	41.13	39.25	64.36	As_Wn_Ln
59.	Hazaribagh(Jharkhand)	61.00	20.00	41.00	64.20	Ac_Wn_Ln
60.	Coimbatore (Tamil Nadu)	47.25	53.75	45.25	63.64	An_Ws_Ln
61.	Singrauli (UP & MP)	45.00	57.25	27.75	62.59	An_Ws_Ln
62.	Cuddalore (Tamil Nadu)	25.00	58.25	41.25	62.56	An_Ws_Ln
63.	Faridabad(Haryana)	56.25	53.75	28.75	62.17	As_Ws_Ln
64.	Bhavnagar (Gujarat)	61.00	15.50	15.50	61.94	Ac_Wn_Ln
65.	Howrah (West Bengal)	60.50	20.00	16.00	61.76	Ac_Wn_Ln
66.	Paradeep (Orissa)	43.00	57.50	17.00	60.61	An_Ws_Ln
67.	Erode (Tamil Nadu)	34.13	47.00	52.75	60.33	An_Wn_Ls
68.	Saraikela (Jharkhand)	57.75	17.50	34.00	60.26	As_Wn_Ln

69.	Kattedan(Telangana)	42.25	50.75	45.25	60.17	An_Ws_Ln
70.	Dhanbad(Jharkhand)	43.00	37.50	12.50	59.78	An_Ws_Ln
71.	Indore(Madhya Pradesh)	18.50	56.88	20.75	58.53	An_Ws_Ln
72.	Bhadravati(Karnataka)	45.00	52.00	30.00	58.48	An_Ws_Ln
73.	Mandideep (Madhya Pradesh)	56.00	55.25	10.00	58.43	As Ws Ln
74.	Mangalore(Karnataka)	15.00	54.50	54.25	58.20	An_Ws_Ls
75.	Barajamda(Jharkhand)	51.88	25.63	46.75	57.64	As_Wn_Ln
76.	Korba (Chhattisgarh)	43.75	17.75	54.00	57.57	An_Wn_Ls
77.	Ahmedabad(Gujarat)	53.50	48.50	16.00	57.11	As_Wn_Ln
78.	Haridwar (Uttarakhand)	50.75	52.38	13.75	55.70	As_Ws_Ln
79.	Asansol (West Bengal)	54.00	16.25	13.75	55.03	As_Wn_Ln
80.	Chembur(Maharashtra)	52.25	50.75	10.00	54.67	As_Ws_Ln
81.	Morbi (Gujarat)	51.00	47.25	14.00	54.24	As_Wn_Ln
82.	Mandi Govindgarh (Punjab)	23.75	53.75	1.50	53.91	An_Ws_Ln
83.	Raichur(Karnataka)	32.75	47.88	32.50	53.42	An_Wn_Ln
84.	West Singhbhum(Jharkhand)	51.88	25.88	11.25	53.28	As_Wn_Ln
85.	Greater Kochin (Kerala)	47.38	35.88	29.50	52.94	An_Wn_Ln
86.	Pimpari-Chinchwad(Maharashtra)	52.00	6.25	5.25	52.16	As_Wn_Ln
87.	Gwalior (Madhya Pradesh)	50.00	43.13	7.75	51.67	As_Wn_Ln
88.	Junagarh (Gujarat)	47.00	25.00	35.00	51.64	An_Wn_Ln
89.	Jajpur (Orissa)	43.50	26.25	41.25	49.62	An_Wn_Ln
90.	Nagda -Ratlam (Madhya Pradesh)	12.00	47.00	28.00	48.78	An_Wn_Ln
91.	Jamshedpur(Jharkhand)	46.00	19.25	20.25	48.10	An_Wn_Ln
92.	Mahad(Maharashtra)	41.00	35.75	29.00	47.12	An_Wn_Ln
93.	Bhillai-Durg (Chhattisgarh)	43.00	32.75	19.75	46.69	An_Wn_Ln
94.	Angul Talchar (Orissa)	44.75	13.25	23.00	46.43	An_Wn_Ln
95.	Haldia (West Bengal)	45.00	35.00	3.75	45.72	An_Wn_Ln
96.	Vishakhapatam (Andhra Pradesh)	27.25	12.75	42.75	44.74	An_Wn_Ln
97.	Dewas (Madhya Pradesh)	28.00	31.63	31.75	37.79	An_Wn_Ln
98.	Jharsuguda (Orissa)	36.00	21.50	8.75	37.20	An_Wn_Ln
99.	Digboi (Assam)	23.50	25.25	6.50	26.39	An_Wn_Ln
100.	Pithampur (Madhya Pradesh)	13.50	19.50	6.75	20.23	An_Wn_Ln

12. Question for consideration is whether mere making of action plans obviates the requirement of enforcing the law. Continued polluting activities are criminal offences under the law of the land. The rule of law requires prohibiting such activities to[5] safeguard the environment and the innocent victims[6].

13. The answer has to be in the negative. Once the industrial clusters have been notified as polluting, while action plans may certainly be prepared, the polluting activity, which is a criminal offence, cannot be allowed to be continued. The essence of rule of law is that no activity which is against the law is allowed to continue and the person violating the law is punished according to law.[7] Thus merely requiring improvement does not obviate the need for punishing the law violators/polluters; stopping polluting activity and recovering compensation for the damage already caused so as to recover the cost of restoration[8] is the mandate of law. This having not been done, the Tribunal is under a duty to direct the statutory regulators to perform their functions and take steps forthwith for stopping polluting activities, initiating prosecutions against the polluters and assessing and recovering compensation from such identified polluters at least for five years which is the period specified under Section 15(3) of the National Green Tribunal Act, 2010.

[5] Under Section 5 of the EPA Act, Section 31A of the Air Act and Section 33A of the Water Act, the power of Board to give directions includes the power to direct the closure, prohibition or regulation of any industry, operation or process; or the stoppage or regulation of the supply of electricity or water or any other service.

[6] https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(18)30261-4/fulltext stating 1.24 million deaths in India in 2017, which were 12·5% of the total deaths, were attributable to air pollution, including 0·67 million from ambient particulate matter pollution and 0·48 million from household air pollution.

[7] Goa Foundation Vs. Union of India and Ors., (2014) 6 SCC 590, at para 72-75,the Supreme Court noted the power that rests with the Pollution Control Board under Section 31 A of the Air Act and Section 33 A of the Water Act and directed that the authorities should take stringent actions in line with these power in cases of polluting industries.

[8] Tirupur Dyeing Factory Owners Association Vs. Noyyal River Ayacutdars Protection Association & Ors., (2009) 9 SCC 737 in paras 26, 27, 33 & 34, the Supreme Court emphasis on developmental activities to be such that it does not compromises with the ability of the future generation to meet their needs and in this regard, authorities are to take into consideration the macro effect of wide-scale land and environmental degradation caused by absence of remedial measures.

14. We reiterate that economic development is not to be at the cost of health of the public and in violation of law of the land. Unless the polluting industries tackle the problem they have created, their operations have to be stopped/suspended.[9] Reference may be made to the judgement in the case of *Indian Council for Enviro Legal Action & Ors. Vs. Union of India & Ors.*[10]:

> *"Respondents 4 to 8 have earned the dubious distinction of being categorised as "rogue industries". They have inflicted untold misery upon the poor, unsuspecting villagers, de-spoiling their land, their water sources and their environment – all in pursuance of their private profit. They have forfeited all claims of any consideration by this Court. Accordingly, we herewith order the closure of all plants and factories of Respondents 4 to 8 located in Bichhri village. The RPCB is directed to seal all factories/units/plants of the said respondents forthwith."*

15. We may note that this Tribunal has dealt with cases of industrial pollution and exercising its jurisdiction under Sections 14, 15 and 20 of the NGT Act, 2010 directed the regulatory authorities to prohibit polluting activities, prosecute the polluters and assess and recover compensation. In the case of Morbi Industrial Cluster[11], which ranks at 81 based on its CEPI score, (where air pollution is critical though overall index places it in OPA), the Tribunal noted the air quality as shown in the inspection report furnished in the said case, to be as follows:

> *"Ambient Air Quality Status: As per National Green Tribunal committee report average ambient air quality (7 Stations) monitored PM10 = 552.66 µg/m3, PM2.5 = 289.61 µg / m3, SO2 = 152.81 µg /m3. Compared to that, Average ambient air quality monitored (4 Stations) in last 3 months (Aug- 18 to Nov-18) is PM10 = 199.1 µg /m3,*

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[9] M.C Mehta (Badkhal and Surajkund Lakes Matters) vs. Union of India & Ors., (1997) 3 SCC 715 at para 10 & 11, where the Supreme Court prohibited any construction activities around the said lakes on account of precautionary principle to protect these lakes; Vellore Citizens Welfare Forum Vs. Union of India & Ors., (1996) 5 SCC 647 at para 9, where the Supreme Court discussed the rights guaranteed under Article 21 of the Constitution of India and directed that all tanneries which have not obtained the consents will be not reopened and that no new tanneries will be permitted to be open in the prohibited area.

[10] (1996) 3 SCC 212 at para 7D.

[11] Order dated 06.01.2019 in Original Application No. 20/2017 (WZ), Balubhai Ramubhai Saiid Vs. Gujarat Pollution Control Board & Ors.

PM2.5 = 60.6 µg /m3. Though not meeting with standards, this shows improvement in air quality of Morbi-Wankner Region."

16. Since the industries in the said area were operating in violation of Air Act, having adverse consequences on health and environment, applying the Sustainable Development and Precautionary principles, the Tribunal directed the GPCB to close all the coal gasifier industries and take steps for prosecution of such industries which violated the law and recover compensation for the damage to the public health to be assessed by a Joint Committee of GPCB, CPCB and NEERI, taking into account the cost of restoration of the environment and the element of deterrence.[12]

17. The Tribunal observed:

" 22. Purpose of economic development in any region is to provide opportunities for improved living by removing poverty and unemployment. While industrial development invariably creates more jobs in any region, such development has to be sustainable and compliant with the norms of environment. In absence of this, awakening or tendency for monitoring, industrialization has led to environmental degradation on account of industrial pollution. It is imperative to ensure that steps are taken to check such pollution to uphold statutory norms. Adequate and effective pollution control methods are necessary.

23. We may also note that as per data compiled by the CPCB Morbi Wankaner is one of the polluted industrial clusters. Vide order dated 13.12.2018 in Original Application No. 1038/2018, this Tribunal considered the subject matter of critically polluted industrial clusters and directed preparation of action plans by the respective States for remedying the situation.

24. Even though, this area is polluted but not 'critically polluted', the same may not be covered by the said order, but the fact remains that there is high amount of pollution as shown by the latest report of the GPCB quoted above in para no. 13. PM10 is equal to 552.66 and PM2.5 is equal to 289.61. Stringent

[12] Order dated 06.03.2019 in Original Application No. 20/2017 (WZ), Babubhai Ramubhai Saini Vs. Gujarat Pollution Control Board & Ors.

measures are, thus, required in the interest of protection of environment and public health.

25. Accordingly, we allow the applications and direct the GPCB to close all coal gasifiers industries and units operating with the help of coal gasifiers without prejudice to such units switching over to non-coal gasifiers or PNG or technology consistent with the above report. The GPCB must initiate immediate steps for prosecution of the industries which have operated in violation of law and recover compensation for causing damage to the environment and public health. This amount may be assessed by a Committee with representatives of CPCB, GPCB and NEERI. The CPCB will be the nodal agency for coordination and compliance. The Committee may suggest restoration plan."

18. The Tribunal also considered the case of pollution in the Taloja industrial area[13] which finds mention under the title 'Navi Mumbai' at rank 51 based on its CEPI score. High level of pollution was found on the basis of joint inspection conducted by the CPCB and the Maharashtra PCB dated 02.01.2018, as the CETP was not functioning properly. The Maharashtra State PCB gave notice to 92 industries for closure. Apart from requiring the CETP operators to deposit a sum of Rs. 10 crores as compensation, steps were required to be taken to remedy the pollution. The Tribunal held that only option was to permit only such industries to function which had stand alone ETP and are fully compliant with the norms and to close the industries which were non-compliant.[14]

19. The Tribunal directed as follows:

"13. In view of above undisputed position that pollution is still continuing, the only option is to shut down the industries which are source of pollution till remedial action is taken. Learned Counsel for the MIDC as well as MPCB are unable to provide any other solution. It is made clear that mere fact that MIDC has assigned the work to a contractor does not absolve MIDC of its responsibility of operating CETP as per norms.

[13] O.A No. 125/2018, Arvind Pundalik Mhatre v. Ministry of Environment and Forest & Climate Change & Ors

[14] O.A No. 125/2018, Arvind Pundalik Mhatre Vs. Ministry of Environment and Forest & Climate Change & Ors., order dated 09.01.2019

> *14. Accordingly, we direct the MPCB to forthwith suspend the Consent to Operate to the industries in the area not meeting the norms and permit them to operate only after remedial steps are taken. Steps in this direction be taken within two weeks from today. Whether a particular industry is complying or not complying with the norms is the matter to be decided by the MPCB in accordance with law. Action taken report be furnished to the Committee and the Committee may take a final call in the matter, in case of any surviving issue."*

20. Taking cognizance of the untreated effluents being discharged by textile units in Tronica city, Loni area, Ghaziabad, the Tribunal in *Rashid Ali Warsi Vs. UPSIDC & Ors.*[15], directed closure of 53 units until the time CETP was made functional. Thereafter, vide order dated 13.11.2018, the Tribunal allowed operation of only those units which were later found to be achieving the norms.

21. The Tribunal in the case of *M.C Mehta vs. Union of India & Ors.*[16] dealt with the issues regarding continuous illegal discharge of untreated sewer and industrial effluents in Ganga and its tributaries and the connecting drains, apart from the dumping of solid waste, hazardous waste, plastic waste, muck and other wastes. The Tribunal after noting that leather industries at Jajmau, Banthar and Unnao were discharging untreated effluents in the river Ganga, directed that activities of such industries must be straightaway closed till they comply with the norms.[17]

22. In view of water pollution caused by absence/dysfunctional CETPs/ETPs/STPs, the Tribunal has, in the case of *Anjavart Foundation Vs. M/s Vapi Green Enviro Ltd. & Ors.*[18], directed all defaulting industries, other than green and white category, connected

[15] Order dated 25.05.2018
[16] O.A 200/2014, order dated 14.05.2019
[17] *Ibid* at Para 16 & 17
[18] O.A 95/2018, order dated 11.01.2019

with CETP, to make deposits with the CPCB towards interim environmental compensation, pending assessment of actual compensation and further action [19], on the following scale:

(i) Large Industries – Rs. 1 crore each
(ii) Medium Industries – Rs. 50 Lakhs each
(iii) Small Industries – Rs. 25 Lakhs each

23. In the present case, in view of massive exercise already done by CPCB, it is not necessary to require any further verification about the existence of pollution in the said PIAs. The Tribunal can direct that the polluting activities cannot be allowed to continue till adequate measures are taken as the Tribunal is bound to apply the 'Sustainable Development'[20], 'Precautionary'[21] and 'Polluter Pays'[22] principle under Section 20 of the National Green Tribunal Act, 2010 to protect the environment and the victims. The statutory regulatory bodies can be required to straightaway identify the particular industrial units in the said PIAs that are causing pollution, particularly those units which fall under the red and orange category and take action against them by way of closing the polluting activity, initiating prosecution and assessing and recovering compensation. Pending such assessment, interim compensation may be recovered on the scale adopted by this Tribunal in the case of Vapi industrial area[23].

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[19] Para 55, of O.A 95/2018, order dated 11.01.2019

[20] M.C Mehta Vs. Union of India (1997) 2 SCC 353, where the Supreme Court of India held – The development of industry is essential for the economy of the country, but at the same time the environment and the ecosystems have to be protected. The pollution created as a consequence of development must be commensurate with the carrying capacity of our ecosystem.

[21] M.C Mehta vs. Union of India & Ors., (2009) 6 SCC 142, at para 23, 30 & 46, the Supreme Court addressed the issue of wide threat to forest ecology vis-a-vis the mining activities in the Aravalli hills and explained that it is important to evoke the precautionary principle to impose complete ban on mining in the Aravalli Range in state of Haryana.

[22] Indian Council for Enviro Legal Action & Ors. Vs. Union of India & Ors., (1996) 3 SCC 212 Para 16, Vellore Citizens Welfare Forum Vs. Union of India & Ors. (1996) 5 SCC 647 Para 12-18 – holding that "Polluter Pay" principle is 'accepted principle and part of environmental law of the country, even without specific statute. M.C Mehta Vs. Union of India & Ors., W.P (C) No. 13029/2015 order dated 24.10.2017 of the Supreme Court of India., O.A 95/2018, order dated 11.01.2019 & O.A No. 593/2017, order dated 03.08.2018: The Tribunal directed CPCB to take penal action against those accountable for failure in setting up CETPs/STPs/SCPs and to recover compensation for damage to the environment.

[23] *Supra 15*

24. CPCB has compiled data of industrial clusters which are polluting in terms of air, water and other norms together. Under the law, even air pollution or water pollution or other pollution, are independent offences. The sustainable development and precautionary principle require any polluting activity to be prohibited and compensation recovered for damage caused from polluters. If there is air pollution, actionable under the Air Act, even if there is no violation of Water Act or EPA Act, such pollution cannot be ignored. There has to be prosecution, stopping of polluting activity and recovery of compensation for restoration of the environment. We have seen that even when norms of air, water and other pollution are being violated, prosecution, stopping of polluting activities and recovery of compensation is not taking place for which there is no justification. Likewise action to prohibit polluting activity, initiating prosecution and recovery of compensation is required not merely for the PIAs based on violation of norms under all the heads, but also for areas where air, water or other pollution is found individually. Thus areas not covered by PIAs are also required to be governed by our directions for enforcing the law by way of stopping polluting activity and taking other steps. The fact that such pollution is taking place is evidenced by there being acknowledged pollution in the form of 351 polluted river stretches[24] and 102 non-attainment cities[25].

25. CPCB must compile data of polluted industrial areas not confined to more than one parameters as is now being done, but also with respect to polluted areas based on water, air or other pollution individually. Compiling data for categorizing areas as polluted areas based on water pollution alone, or air pollution or other pollution

[24] O.A. 673/2018, News Item Published in 'The Hindu' authored by Shri Jacob Koshy titled "More river stretches are now critically polluted: CPCB", Order dated 20.09.2018
[25] O.A. 681/2018, News Item Published In 'The Times of India' Authored by Shri Vishwa Mohan Titled "NCAP with Multiple Timelines to Clear Air in 102 Cities to be released around August 15" order dated 08.10.2018

alone may be a step in the right direction. Let this be now done in the next three months, with the assistance of State PCBs/PCCs or other experts. In this regard we may note that dealing with the industrial water pollution, this Tribunal directed the CPCB to compile its monitoring report with reference to 97 CETPs installed in different states as this was linked to 100 PIAs also.[26]

26. Needless to state that there is no right to carry on business in violation of pollution norms and right of statutory authorities is coupled with duty. Such right, does not carry any unlimited discretion of not taking action when pollution norms are violated.

27. In view of the material compiled by the CPCB, with the assistance of SPCBs/PCCs, in respect of polluted industrial areas, where action is not being taken by statutory authorities, the Tribunal has to exercise its jurisdiction of directing performance of statutory functions and duties by the State boards/committees, following similar direction by the Apex Court[27].

28. Accordingly, we direct the CPCB in coordination with all State PCBs/PCCs to take steps in exercise of statutory powers under the Air (Prevention and Control of Pollution) Act, 1981, Water (Prevention and Control of Pollution) Act, 1974, Environment (Protection) Act, 1986 or any other law to prohibit operation of polluting activities in the said CPAs and SPAs within three months and furnish a compliance report to this Tribunal. The Central Pollution Control Board, in coordination with the State Boards/PCBs may make

[26] O.A No. 593/2017, order dated 19.02.2019, Paryavaran Suraksha Samiti & Anr, Vs. Union of India & Ors.
[27] M.C Mehta (Calcutta Tanneries' Matter) Vs. Union of India & Ors., (1997) 2 SCC 411, at para 17, the Supreme Court directed the Board to take action against defaulting tanneries which, including those which had not complied with the conditions under Water Act as mentioned in their consents. In M.C Mehta Vs. Union of India & Ors., (2004) 6 SCC 588, paras 37,48, 517 69, the Supreme Court passed direction on closure of industrial units which were illegally operating and were in violation of the Master Plan.

assessment of compensation to be recovered from the said polluting units for the period of last 5 years, taking into account the cost of restoration and cost of damage to the public health and environment and the deterrence element. The scale of deterrence may be related to the period and the frequency of defaults. Such other factors as may be found relevant may also be taken into account. No further industrial activities or expansion be allowed with regard to 'red' and 'orange' category units till the said areas are brought within the prescribed parameters or till carrying capacity of area is assessed and new units or expansion is found viable having regard to the carrying capacity of the area and environmental norms. Pending assessment of compensation, interim compensation be recovered at the scale adopted by this Tribunal in the case of Vapi Industrial area as mentioned in para 22 above.

29. We further direct CPCB, with the assistance of SPCBs/PCCs or other experts, to compile information with regard to polluted industrial areas based on water pollution norms separately, air pollution norms separately and other pollution norm seperately and notify such information on public domain within three months. On completing this exercise, action against identified individual polluters may be initiated on the same pattern on which direction have been issued in para 28 and furnish a report to this Tribunal in this regard also, before the next date.

30. We direct the MoEF&CC to take steps for enforcement of action plan for improvement of the situation.

31. We may also mention that hearing individual industrial unit is not considered necessary for passing the above order as the CPCB/State

PCBs must exercise their respective statutory powers by following the procedure prescribed under the statute even without intervention of this Tribunal. The Tribunal is only requiring such statutory bodies to perform their duties to uphold the law without going into an individual case[28]. Direction is with reference to data compiled, or to be compiled, by the said bodies only.

32. It is made clear that white and green or non-polluting industries which are not causing any pollution will not be affected by this order except that the parameters thereof may be monitored with a view to see that under the garb of label of white/green or otherwise, the polluting activity is not continued.

33. We direct that the CPCB will be at liberty to have an appropriate panel of Experts to augment its capacity, in case the available man-power is found to be inadequate to execute the above order and for this purpose utilise the environment funds available under the environmental compensation head. In this regard, reference may also be made to order dated 22.01.2019, of this Tribunal in O.A No. 101/2019, *Central Pollution Control Board Vs. Assam State Pollution Control Board & Ors.* which enables CPCB to utilise the environment fund for the purpose.

34. Let a compliance report be filed by the CPCB after three months but before the next date by email on judicial-ngt@gov.in.

List for further consideration on 05.11.2019.

[28] M.C Mehta Vs. Union of India & Ors., (2001) 3 SCC 756, at para 8, the Supreme Court repeated the stand that in re M.C Mehta Vs. Union of India (1998) 6 SCC 63, the Court had passed directions to all bus operators in Delhi to make a shift from diesel and other fuels to CNG, the Supreme Court's directions are all *in rem* and not *in personam*.

Adersh Kumar Goel, CP

S.P. Wangdi, JM

K. Ramakrishnan, JM

Dr. Nagin Nanda, EM

July 10, 2019
Original Application No. 1038/2018
AK

ANNEXURE-H

List of Red, Orange, Green and White category industries as per CPCB Directions

1. **Red Catagory Industries-89 Nos.**

Sr. No.	Type code	Industry sector-Types	Reference
1.	1001	Isolated storage of hazardous chemicals (as per schedule of manufacturing, storage of hazardous chemicals rules ,1989 as amended)	
2.	1002	Automobile Manufacturing (integrated facilities) **having either one or combination of polluting activities namely washing, metal surface finishing operations, pickling, plating, electroplating, phosphating, painting, heat treatment etc. Heavy Engineering and ship building are merged in this category**	3-Red, Annexure
3.	1003	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Spent cleared metal catalyst containing copper, Spent cleared metal catalyst containing zinc	
4.	1004	Manufacturing of lubricating oils ,grease and petroleum based Products	
5.	1005	DG Set of capacity > 5 MVA	
6.	1006	Industrial carbon including electrodes and graphite blocks, activated carbon, carbon black	
7.	1007	Lead acid battery manufacturing (excluding assembling and charging of lead acid battery in micro scale)	
8.	1008	Phosphate rock processing plant	
9.	1009	Power generation plant (except Wind and Solar renewable power plants of all capacities and Mini Hydel power plant of capacity <25MW)	
10.	1010	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Spent catalyst containing nickel, cadmium, Zinc, copper, arsenic, vanadium and cobalt	
11.	1011	Processes involving chlorinated hydrocarbons	
12.	1012	Sugar (excluding Khandsari)	
13.	1013	Fibre glass production and processing (excluding moulding) including lead containing glass	
14.	1014	Fire crackers manufacturing and bulk storage facilities	
15.	1015	Industries engaged in recycling /reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM)rules, 2008 - Items namely -Dismantlers Recycling Plants --Components of waste electrical and electronic assembies comprising accumulators and other batteries included on list A, mercury-switches, activated glass cullets from cathode-ray tubes and other activated glass and PCB-capacitors or any other component contaminated with Schedule 2 constituents (e.g. cadmium, mercury, lead, poly-chlorinated biphenyl) to an extent that they exhibit hazard characteristics indicated in part C of this Schedule.	

16.	1016	Milk processes and dairy products(integrated project) (Large & Medium scale)	O-24
17.	1017	Phosphorous and its compounds	
18.	1018	Pulp & Paper (waste paper based without bleaching process to manufacture Kraft paper)	
19.	1019	Coke making , liquefaction, coal tar distillation or fuel gas making	
20.	1020	Manufacturing of explosives, detonators, fuses inducing management and handling activities	
21.	1021	Manufacturing of paints varnishes, pigments and intermediate (excluding blending/mixing)	
22.	1022	Organic Chemicals manufacturing	
23.	1023	Airports and Commercial Air Strips **having waste water generation 100 KLD and above**	O-84
24.	1024	Asbestos and asbestos based industries	
25.	1025	Basic chemicals and electro chemicals and its derivatives including manufacturing of acid	
26.	1026	Cement	
27.	1027	Chlorates, per-chlorates & peroxides	
28.	1028	Chlorine, fluorine, bromine, iodine and their compounds	
29.	1029	Dyes and Dye- Intermediates	
30.	1030	Health-care Establishment (as defined in BMW Rules) having Incinerator Irrespective of waste generation **(or) having total waste water generation 100 KLD and above**	O-85
31.	1031	Hotels having overall waste water generation @ 100 KLD and more **(or) having rooms 100 and above**	O-38
32.	1032	Industries engaged in recycling /reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 -Items namely -Lead acid battery plates and other lead s crap/ashes/residues not covered under Batteries(Management and Handling) Rules,2001. [* Battery scrap, namely: Lead battery plates covered by ISRI, Code word "Rails" Battery lugs cove red by ISRI, Code word "Rakes ".Scrap drained/dry while intact, lead batteries covered by ISRI, Code word "rains "	
33.	1033	Industries engaged in recycling /reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 -Items namely -Integrated Recycling Plants --Components of waste electrical and electronic assembles comprising accumulators and other batteries included on list A, mercury switches, activated glass cullets from cathode-ray tubes and other activated glass and PCB-capacitors or any other component contaminated with Schedule 2 constituents (e.g. cadmium, mercury, lead, poly chlorinated	

		biphenyl) to an extent that they exhibit hazard characteristics indicated in part C of this Schedule	
34.	1034	Manufacturing of glue and gelatin	
35.	1035	Mining and ore beneficiation	
36.	1036	Nuclear power plant	
37.	1037	Pesticides (technical) (excluding formulation)	
38	1038	Photographic film and its chemicals	
39.	1039	Railway locomotive workshop/Integrated road transport workshop/Authorized service centers **having waste water generation 100 KLD and above**	O-BS
40.	1040	Yarn / Textile processing involving any effluent/emission generating processes including bleaching, dyeing, printing and coloring	
41.	1041	Chlor Alkali	
42.	1042	Ship Breaking Industries	
43.	1043	Oil and gas extraction including CBM (offshore & on-shore extraction through drilling wells)	
44.	1044	Industry or process involving metal surface treatment or process such as pickling/electroplating/paint stripping/heat treatment using cyanide bath/ phosphating or finishing and anodizing / enamellings/ galvanizing	
45.	1045	Tanneries	
46.	1046	Ports and harbour, jetties and dredging operations	
47.	1047	Synthetic fibers including rayon, tyre cord, polyester filament yarn	
48.	1048	Thermal Power Plants	
49.	1049	Slaughter house (as per notification S.O.270(E) dated 26.03.2001) and meat processing industries, bone mill, processing of animal horn, hoofs and other body parts	
50.	1050	Aluminum Smelter	
51.	1051	Copper Smelter	
52.	1052	Fertilizer (basic) (excluding formulation)	
53.	1053	Iron & Steel (involving processing from ore/ integrated steel plants) and or Sponge Iron units	
54.	1054	Pulp & Paper (waste paper based units with bleaching process to manufacture writing & printing paper)	
55.	1055	Zinc Smelter	
56.	1056	Oil Refinery (mineral Oil or Petro Refineries)	

57.	1057	Petrochemicals Manufacturing (including processing of Emulsions of oil and water)	
58.	1058	Pharmaceubicals	
59.	1059	Pulp & Paper (Large-Agro +wood) , Small Pulp &Paper (agro based-wheat straw/rice husk)	
60.	1060	Distillery (molasses / grain / yeast based)	
61.	**1061**	**Synthetic detergents and soaps (excluding formulation) having waste water generation 100 KLD and above.**	**O-13**
62.	**1062**	**Automobile servicing, repairing and painting (excluding only fuel dispensing) having waste water generation 100 KLD and above.**	**O-18**
63.	**1063**	**Building and construction projects more than 20,000 sq. m built up area and having waste water generation 100 KLD and above.**	**O-21**
64.	**1064**	**Ceramics and Refractories having coal/fuel consumption 12 MT/day and more**	**O-22**
65.	**1065**	**Fermentation industry including manufacture of yeast, beer, distillation of alcohol (Extra Neutral Alcohol) having waste water generation 100 KLD and above.**	**O-27**
66.	**1066**	**Ferrous and Non-ferrous metal extraction involving different furnaces through melting, refining, re-processing, casting and alloy making-Secondary production of Ferrous and Non-ferrous metals more than 1 MT/hr production (or) Lead extraction irrespective of capacity (or) metal extraction having Induction Furnace clubbed with AOD furnace.**	**O-28**
67.	**1067**	**Industry or processes involving foundry operations having capacity of 5 MT/hr and more as such units require using coal/coke at more than 500 Kg/hr.**	**O-42**
68.	**1068**	**Manufacturing of glass (Lead glass only)**	**O-45**
69.	**1069**	**Non-alcoholic beverages (soft drink) & bottling of alcohol/nonalcoholic products having waste water generation 100 KLD and above.**	**O-53**
70.	**1070**	**Vegetable oil manufacturing including solvent extraction and refinery /hydrogenated oils having waste water generation 100 KLD and above.**	**O-71**
71.	**1071**	**Parboiled Rice Mills having waste water generation 100 KLD and above (or) fuel consumption 12 MTD and above (or) both**	**O-79**
72.	**1072**	**Common treatment and disposal facilities- TSDF**	**1R**

73.	**1073**	**Common treatment and disposal facilities – E-waste recycling**	**1R**
74.	**1074**	**Common treatment and disposal facilities - CBMWTF**	**1R**
75.	**1075**	**Effluent conveyance projects**	**1R**
76.	**1076**	**Common treatment and disposal facilities-Solvent/acid recovery plant**	**1R**
77.	**1077**	**MSW sanitary land fill site**	**1R**
78.	**1078**	**Common treatment and disposal facilities-CETP for Red category Industries**	**1R**
79.	**1079**	**Industrial estates/ parks / complexes/ areas/ export processing zones/ SEZs/ Biotech parks/ leather complex**	**5R**
80.	**1080**	**Pharmaceutical R & D activities (For sustained release/extended release of drugs only and not for commercial purpose)**	**O-74**
LEFT OUT SECTORS IN THE CPCB CATEGORISATION			
81.	1081	Sewage Treatment Plants	Note- R-1
82.	1082	Pyrolysis Plants	
83.	1083	Tyre, tube & rubber components with boiler	
84.	1084	Analytical & material testing lab	
85.	1085	Industrial inorganic gases namely a) Chemical gases: Acetylene, hydrogen, Chlorine, Flourine, ammonia, Sulphur Dioxide etc. b) Hydro carbon gases: Methane, Ethane, Propane	
86.	1086	Reprocessing of waste oil	
87.	1087	Area/Infrastructure development projects covered under EIA notification	O-2-Annexure & O-91
88.	1088	Sand mining Projects of Category A and B_1 under EIA notification	O-1-Annexure and O-90
89.	1999	Miscellaneous (Red)	

NOTE: **Sl. No. 61 to 80 are added to get clarity in CPCB list, and Sl. No. 81 to 88 are added based on scoring done by Committee of PPCB.**

2. **Orange Category Industries-104 Nos.**

Sr. No.	Type code	Industry sector-Types	Reference
1.	2001	Dismantling of rolling stocks (wagons/coaches)	
2.	2002	Bakery and confectionery units with production capacity>1TPD (with ovens/furnaces)/units having production <1TPD with oven/furnace other than electric/gas oven	

3.	2003	Chanachur and ladoo from puffed and beaten rice (muri and shira) using husk fired oven	
4.	2004	Coated electrode manufacturing	
5.	2005	Compact disc computer floppy and cassette manufacturing/Reel Manufacturing	
6.	2006	Flakes from rejected PET bottle	
7.	2007	Food and food processing including fruits and vegetables processing	
8.	2008	Jute processing without dyeing	
9.	2009	Manufacturing of silica gel	
10.	2010	Manufacturing of tooth powder, toothpaste, talcum powder and other cosmetic items	
11.	2011	Printing or etching of glass sheet using hydrofluoric acid	
12.	2012	Silk screen printing, sari printing by wooden blocks	
13.	2013	Synthetic detergents and soaps(excluding formulation) **having waste water generation < 100 KLD**	R-61
14.	2014	Thermometer manufacturing	
15.	2015	Cotton spinning and weaving (medium and large scale)	
16.	2016	Almirah, Grill Manufacturing (Dry Mechanical Process) **with spray painting**	W-39
17.	2017	Aluminum & copper extraction from scrap using oil fired furnace (dry process only)	
18.	2018	Automobile servicing, repairing and painting (excluding only fuel dispensing) **having waste water generation less than 100 KLD**	R-62 W-81
19.	2019	Ayurvedic and homeopathic medicine**(with Boiler)**	G-2
20.	2020	Brickfields (excluding fly ash brick manufacturing using lime process)	
21.	2021	Building and construction project more than 20,000 sq. m built up area **and having waste water generation less than 100 KLD**	R-63
22.	2022	Ceramics and Refractories **having coal / fuel consumption less than 12 MT/day**	R-64
23.	2023	Coal washeries	
24.	2024	Dairy and dairy products (small scale)	R-16
25.	2025	DG set of capacity > 1MVA but < 5MVA	
26.	2026	Dry coal processing, mineral processing, industries involving ore sintering, pelletisating, grinding & pulverization	
27.	2027	Fermentation industry including manufacture of yeast, beer, distillation of alcohol (Extra Neutral Alcohol) **having waste water generation less than 100 KLD**	R-65

28.	2028	Ferrous and Non- ferrous metal extraction involving different furnaces through melting, refining, re-processing, casting and alloy making-**Secondary production of Ferrous and Non-ferrous metals (excluding lead) upto 1 MT/hr production**	R-66
29.	2029	Fertilizer (granulation / formulation /blending only)	
30.	2030	Fish feed, poultry feed and cattle feed	
31.	2031	Fish process ng and packing (excluding chilling of fishes)	
32.	2032	Forging of ferrous and non- ferrous metals (using oil and gas fired furnaces)	
33.	2033	Formulation/pelletization of camphor tablets, naphthalene balls from camphor/ naphthalene powders	
34.	2034	Glass ceramics, earthen potteries and tile manufacturing using oil and gas fired kilns, coating on glasses using cerium fluorides and magnesium fluoride etc	
35.	2035	Gravure printing, digital printing on flex, vinyl	
36.	2036	Heat treatment using oil fired furnace (without cyanilding)	
37.	2037	Hot mix plants	
38.	2038	Hotels (< 3 star) or hotels having > 20 rooms and less than 100 rooms **or having waste water generation > 10 KLD and less than 100 KLD and having a coal/Oil fired Boiler**	R-31
39.	2039	Ice cream	
40.	2040	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 – Items namely - Paint and ink Sludge/residues	
41.	2041	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Brass Dross , Copper Dross, Copper Oxide Mill Scale, Copper Reverts, Cake & Residues, Waste Copper and copper alloys in dispersible form, Slags from copper processing for further processing or refining, Insulated Copper Wire, Scrap/copper with PVC sheathing including ISRI-code material namely "Druid",Jelly filled Copper cables, Zinc Dross-Hot dip Galvanizers SLAB, Zinc Dross-Bottom Dross, Zinc ash/Skimming arising from galvanizing and die casting operations, Zinc ash/Skimming/other zinc bearing wastes arising from smelting and refining, Zinc ash and residues including zinc alloy residues in dispersible form	
42.	2042	Industry or processes involving foundry operations **having capacity < 5 MT/hr as such units require coal/coke at less than 500 Kg/hr**	R-67
43.	2043	Lime manufacturing (using lime kiln)	

44.	2044	Liquid floor cleaner, black phenyl, liquid soap, glycerol mono-stearate manufacturing	
45.	2045	Manufacturing of glass **(except Lead glass)**	R-68
46.	2046	Manufacturing of iodized salt from crude/ raw salt	
47.	2047	Manufacturing of mirror from sheet glass	
48.	2048	Manufacturing of mosquito repellent coil.	
49.	2049	Manufacturing of Starch/Sago	
50.	2050	Mechanized laundry using oil fired boiler	
51.	2051	Modular wooden furniture from particle board, MDF, swan timber etc, Ceiling tiles/ partition board from saw dust, wood chips etc., and other agricultural waste using synthetic adhesive resin, wooden box making (with boiler)	G-64
52.	2052	New highway construction projects	
53.	2053	Non-alcoholic beverages (soft drink) & bottling of alcohol/non alcoholic products **having waste water generation less than 100 KLD**	R-69
54.	2054	Paint blending and mixing (Ball mill)	
55.	2055	Paints and varnishes (mixing and blending)	
56.	2056	Ply-board manufacturing(including Veneer and laminate) with oil fired boiler/ thermic fluid heater(without resin plant)	
57.	2057	Potable alcohol (IMFL) by blending, bottling of alcohol products	
58.	2058	Printing ink manufacturing	
59.	2059	Printing press	
60.	2060	Reprocessing of waste plastic including PVC	
61.	2061	Rolling mill (oil or coal fired) and cold rolling mill	G-40
62.	2062	Spray painting, paint baking, paint shipping	
63.	2063	Steel and steel products using various furnaces like blast furnace /open hearth furnace/induction furnace/arc furnace/submerged arc furnace /basic oxygen furnace /hot rolling reheated furnace	
64.	2064	Stone crushers	
65.	2065	Surgical and medical products including prophylactics and latex	
66.	2066	Tephlon based products	

67.	2067	Thermocol manufacturing (with boiler)	
68.	2068	Tobacco products including cigarettes and tobacco/opium processes	
69.	2069	Transformer repairing/ manufacturing (dry process only)	
70.	2070	Tyres and tubes vulcanization/ hot retreading	
71.	2071	Vegetable oil manufacturing including solvent extraction and refinery /hydrogenated oils **having waste water generation < 100 KLD**	R-70
72.	2072	Wire drawing and wire netting	
73.	2073	Dry cell battery (excluding manufacturing of electrodes) and assembling & charging of acid lead battery on micro scale	
74.	2074	Pharmaceutical formulation and for R & D purpose (For sustained release/ extended release of drugs only and not for commercial purpose)	
75.	2075	Synthetic resins	
76.	2076	Synthetic rubber excluding moulding	
77.	2077	Cashew nut processing	
78.	2078	Coffee seed processing	
79.	2079	Parboiled Rice Mills **having waste water generation < 100 KLD and fuel consumption less than 12 MTD**	R-71
80.	2080	Foam manufacturing	
81.	2081	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 – Items namely -Used Oil – As per specifications prescribed from time to time.	
82.	2082	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 – Items namely –Waste Oil ––As per specifications prescribed from time to time.	
83.	2083	Producer gas plant using conventional up drift coal gasification (linked to rolling mills glass and ceramic industry refectories for dedicated fuel supply	
84.	2084	**Airports and Commercial Air Strips having waste water generation < 100 KLD**	R-23
85.	2085	**Health-care Establishment (as defined in BMW Rules) without incinerator and having total waste water generation less than 100 KLD**	R-30

86.	**2086**	**Common treatment and disposal facilities(CETP for Orange category industries)**	**IR**
87.	**2087**	**Manufacturing of pasted veneers using gas fired boiler or thermic fluid heater and by sun drying**	**G-28**
88.	**2088**	**Tea processing (with boiler)**	**G-63**
89.	**2089**	**Railway locomotive work shop/Integrated road transport workshop/Authorized service centers having waste water generation < 100 KLD**	**R-39**

LEFT OUT SECTORS IN THE CPCB CATEGORISATION

90.	2090	Sand minding projects of Category B, covered under EIA notification.	O-1-Annexure and R-89
91	2091	Area/Infrastructure Development Project including educational institutions, community hall, IT Park, Theme park (Not covered under EIA notification 2006)	O-2-Annexure & R-88
92.	2092	Chemical mixing cum storage units	
93.	2093	Pesticides formulation	
94.	2094	Rice Mills (With or without dryer)> 10 TPD	G-39
95.	2095	Marriage Palaces	
96.	2096	Bottling of gases	
97.	2097	Infrastructure development projects not covered under EIA notification.	
98.	2098	Surgical cotton including wet process	
99.	2099	Building and construction project ≤ 20,000 sq. m built up area	O-21
100.	2100	Light Engineering & Fabrication units with spray painting	
101.	2101	Hosiery /Garment manufacturing with washing only (without bleaching and dying) with discharge greater than or equal to 2 KLD	G-67
102.	2102	Tyre, tube & rubber components without boiler and rubber reclaim industry	
103.	2103	Injection moulding of plastic(only from fresh(virgin) plastic granules and only large & medium scale industry)	G-68
104.	2999	Miscellaneous (Orange)	

NOTE:- Sl. No.84 to 89 are added to get clarity in CPCB list, and Sl. No.90 to 103 are added based on scoring done by the Committee of PPCB.

3. Green Category Industries -70 Nos.

Sr. No.	Type Code	Industry Sector-Types	Reference
1.	3001.	Aluminium utensils from aluminium circles by pressing only (dry mechanical operation)	
2.	3002.	Ayurvedic and homeopathic medicines (without boiler)	0-19
3.	3003.	Bakery /confectionery /sweets products (with production capacity <1TPD (with gas or electrical over)	
4.	3004.	Bi-axially oriented PP film along with metalizing operations	
5.	3005.	Biomass briquettes (sun drying) without using toxic hazardous wastes	
6.	3006.	Blending of melamine resins & different powder, additives by physical mixing	
7.	3007.	Brass and bell metal utensils manufacturing from circles(dry mechanical operation without re-rolling facility)	
8.	3008.	Candy	
9.	3009.	Cardboard or corrugated box and paper products (excluding paper or pulp manufacturing and without using boilers)	
10.	3010.	Carpentry & wooden furniture manufacturing (excluding saw mill) with the help of electrical (motorized) machines such as electrical wood planner, steel saw cutting circular blade, etc.	
11.	3011.	Cement products (without using asbestos / boiler / steam curing) like pipe ,pillar, jalfi, well ring, block/tiles etc.(should be done in closed covered shed to control fugitive emissions)	
12.	3012.	Ceramic colour manufacturing by mixing & blending only (not using boiler and wastewater recycling process)	
13.	3013.	Chilling plant, cold storage and ice making	
14.	3014	Coke briquetting (sun drying)	
15.	3015.	Cotton spinning and weaving (small scale)	
16	3016.	Dal Mills	
17.	3017.	Decoration of ceramic cups and plates by electric furnace	
18.	3018.	Digital printing on PVC clothes	
19	3019.	Facility of handling, storage and transportation of food grains in bulk	

20.	3020.	Flour mills (dry process)	
21.	3021.	Glass , ceramic, earthen potteries, tile and tile manufacturing using electrical kiln or not involving fossil fuel kiln	
22.	3022.	Glue from starch (physical mixing) with gas /electrically operated oven /boiler.	
23.	3023.	Gold and silver smithy (purification with acid smelting operation and sulphuric acid polishing operation) (using less or equal to 1 litre of sulphuric acid/ nitric acid per month)	
24.	3024.	Heat treatment with any of the new technology like ultrasound probe, induction hardening, ionization beam, gas carburizing etc.	
25.	3025.	Insulation and other coated papers (excluding paper or pipe manufacturing)	
26.	3026.	Leather foot wear and leather products (excluding tanning and hide processing except cottage scale)	
27.	3027.	Lubricating oil, greases or petroleum based products (only blending at normal temperature)	
28.	3028.	Manufacturing of pasted veneers using gas fired boiler or thermic fluid heater and by sun drying **(except coal fired boiler)**	O-87
29.	3029.	Oil mill Ghani and extraction (no hydrogenation / refining)	
30.	3030.	Packing materials manufacturing from non asbestos fibre, vegetable fibre yarn	
31.	3031.	Phenyl/toilet cleaner formulation and bottling	
32.	3032.	Polythene and plastic processed products manufacturing (virgin plastic)	
33.	3033.	Poultry, Hatchery and Piggery	
34.	3034.	Power looms (without dye and bleaching)	
35.	3035.	Puffed rice (muri) (using gas or electrical heating system)	
36.	3036.	Pulverization of bamboo and scrap wood	
37.	3037.	Ready mix cement concrete	
38.	3038.	Reprocessing of waste cotton	
39.	3039.	Rice mill (Rice hullers only) < 10 TPD	O-94
40.	3040.	Rolling mill (gas / electric fired) and cold rolling mill	O-61

41.	3041.	Rubber goods industry (with gas operated baby boiler)	
42.	3042	Saw mills	
43.	3043	Soap manufacturing (hand made wi thout steam boiling / boiler)	
44.	3044.	Spice grinding (upto-20 HP motor)	
45.	3045.	Spice grinding (>20 hp motor)	
46.	3046.	Steel furniture without spray painting	
47.	3047.	Steeping and processing of grains	
48.	3048.	Tyres and tube retreading (without boilers)	
49.	3049.	Chilling plant and ice making without using ammonia	
50.	3050.	CO_2 recovery	
51.	3051.	Distilled water (without boiler) with electricity as source of heat	
52.	3052.	Hotels (up to 20 rooms and without boilers) **and having waste water generation < 10 KLD and no hazardous waste generation**	R-31 O-38
53.	3053.	Manufacturing of optical lenses (using electrical furnace)	
54.	3054.	Mineralized water	
55.	3055.	Tamarind powder manufacturing	
56.	3056.	Cutting, sizing and polishing of marble stone	
57.	3057.	Emery powder (fine dust of sand) manufacturing	
58.	3058.	Flyash export, transport & disposal facilities	
59.	3059.	Mineral stack yard / Railway sidings	
60.	3060.	Oil and gas transportation pipeline contains small gas waste power plants upto 5 MW	
61.	3061.	Seasoning of wood in steam heated chamber	
62.	3062.	Synthetic detergent formulation units **which are not manufacturing LABSA**	
63.	3063.	Tea processing (without boiler)	O-88
64.	3064.	**Modular wooden furniture from particle board, MDF< swan timber etc, Ceiling tiles/ partition board from saw dust, wood chips etc., and other agricultural waste using synthetic adhesive resin, wooden box making (without boiler)**	O-51

Left out sectors in the CPCB Categorization.

65.	3065.	D.G. Sets more than 10 KVA	
66.	3066.	Steam calendaring /zero finishing /centering etc. (without washing process)	
67.	3067.	Hosiery /Garment manufacturing with washing only (without bleaching and dying) with discharge less than 2 KLD and is connected to Public sewer	O-101
68.	3068.	Injection molding of plastic(only from fresh(virgin) plastic granules and only small scale industry)	O-103
69.	3069.	Stand alone sand / shot blasting with inbuilt bag filter	
70.	3999.	Miscellaneous (Green)	

Note : Sl No. 64 is added to get clarity in CPCB list, and Sl. No. 65 to 69 are added based on scoring done by the Committee of PPCB.

4. White Categories Industries- 137 Nos.

Sr. No.	Type Code	Industry Sector-Types	Reference
1.	4001.	Assembly of air coolers/conditioners, repairing and servicing	
2.	4002.	Assembly of bicycles ,baby carriages and other small non motorizing vehicles	
3.	4003.	Bailing (hydraulic press)of waste papers	
4.	4004.	Bio fertilizer and bio-pesticides without using inorganic chemicals	
5.	4005.	Biscuits trays etc from rolled PVC sheet (using automatic vacuum forming machines)	
6.	4006.	Blending and packing of tea	
7.	4007.	Block making of printing without foundry (excluding wooden block making)	
8.	4008.	Chalk making from plaster of Paris (only casting without boilers etc. (sun drying /electrical oven)	
9.	4009.	Compressed oxygen gas from crude liquid oxygen (without use of any solvents and by maintaining pressure & temperature only for separation of other gases)	
10.	4010.	Cotton and woolen hosieries making (Dry process only without any dying / washing operation)	
11.	4011.	Diesel pump repairing and servicing (complete mechanical dry process)	

12.	4012.	Electric lamp (bulb) and CFL manufacturing by assembling only	
13.	4013.	Electrical and electronic item assembling (completely dry process)	
14.	4014.	Engineering and fabrication units (dry process without any heat treatment / metal surface finishing operations / painting)	
15.	4015.	Flavoured betel nuts production/ grinding (completely dry mechanical operations)	
16.	4016.	Fly ash bricks/ block manufacturing	
17.	4017.	Fountain pen manufacturing by assembling only	
18.	4018.	Glass ampules and vials making from glass tubes	
19.	4019.	Glass putty and sealant (by mixing with machine only)	
20.	4020.	Ground nut decorticating	
21.	4021.	Handloom/ carpet weaving (without dying and bleaching operation)	
22.	4022.	Leather cutting and stitching (more than 10 machines and using motor)	
23.	4023.	Manufacturing of coir items from coconut husks	
24.	4024.	Manufacturing of metal caps containers etc	
25.	4025.	Manufacturing of shoe brush and wire brush	
26.	4026.	Medical oxygen	
27.	4027.	Organic and inorganic nutrients (by physical mixing)	
28.	4028.	Organic manure (manual mixing)	
29.	4029.	Packing of powdered milk	
30.	4030.	Paper pins and u clips	
31.	4031.	Repairing of electric motors and generators (dry mechanical process)	
32.	4032.	Rope (plastic and cotton)	
33.	4033.	Scientific and mathematical instrument manufacturing	
34.	4034.	Solar module non conventional energy apparatus manufacturing unit	

35.	4035.	Solar power generation through solar photovoltaic cell, wind power and mini hydel power (less than 25 MW)	
36.	4036.	Surgical and medical products assembling only (not involving effluent / emission generating processes)	

Left out sectors in the CPCB categorization.

37.	4037.	Aggarbatti and cosmetic products manufactured by blending (Dry Process)	
38.	4038.	All types of toys & Doll making electrical without wet process.	
39.	4039.	Almirah, Grill Manufacturing (Dry Mechanical Process) **without spray painting**	O-15
40.	4040.	Aluminium, Stainless Steel, Brass Vessel marking units having only process, spinning without use of buffing, polishing and pickling, washing, Hot/Cold rolling annealing furnace and anodizing processes	
41.	4041.	Assembling of Door closer and Rings	
42.	4042.	Assembly of air coolers/conditioners repairing and servicing	
43.	4043.	Assembly of Computer, Computer peripherals and Computer Software	
44.	4044.	Atta Chakki and Millet grinding	
45.	4045.	Audio, Video and consumer electronic equipment assembly only	
46.	4046.	Automobile Body building without wet process	
47.	4047.	Automobile Repair Workshop. (without any wet process)	
48.	4048.	Beauty Parlour	
49.	4049.	Bee keeping	
50.	4050.	Belt Fastner units without wet process	
51.	4051.	Bindi making units	
52.	4052.	Bio-gas	
53.	4053.	Biscuits, Pastries, Cakes, Confectionery, Bread, Bakery upto 100 kg/day	
54.	4054.	Black Smithy Shop	
55.	4055.	Printing, Offset Printing	

56.	4056.	Book Binding	
57.	4057.	Brush making units with fibre/plastic wire	
58.	4058.	Candle manufacture	
59.	4059.	Carpentry & furniture units without Seasoning without electrical motor	
60.	4060.	Carpet weaving	
61.	4061.	Chewing Tobacco packing	
62.	4062.	Coated electrode manufacturing	
63.	4063.	Cotton Belts and Tapes/Cotton Niwar etc	
64.	4064.	Cotton cloth Knitting	
65.	4065.	Cotton quilt and mattresses making	
66.	4066.	Cotton socks-knitting	
67.	4067.	Crown cork making units	
68.	4068.	Dairy farming (Rural Area focal points periphery of ½ K.M)	
69.	4069.	Diesel Generator sets < 10 KVA	
70.	4070.	DPC coating of copper and aluminium were without any wet process	
71.	4071.	Drawing, Surveying and Scientific instrument making with no wet process	
72.	4072.	Dry Grinding of spices	
73.	4073.	Electrical Switches, accessories making and Panel Board without wet process	
74.	4074.	Electrical/electronics testing and measuring instruments without wet process	
75.	4075.	Electronic Components without use of chemicals	
76.	4076.	Embroidery	
77.	4077.	Fabrication units connected with animal drawn vehicles, trailers without any heat treatment, furnace use i.e. with no emissions.	
78.	4078.	Finished leather goods, conversion of finished without wet process.	
79.	4079.	Fish Ponds	

80.	4080.	Floor Polish, Nail Polish, Tooth Powder, Hair Oil, Shampoo and Tooth Paste with blending only	
81.	4081.	Fuel Dispensing only (without Automobile servicing, repairing and painting.	O-18
82.	4082.	Garments manufacturing without wet process.	
83.	4083.	General Wire Industries like wire drawing, barbed wire, Chain links, making units without wet process.	
84.	4084.	Gold/Silver smithy shops with no water or chemical use.	
85.	4085.	Green House/Floriculture under Mechanized process under controlled temperature.	
86.	4086.	Hand Tools without casting.	
87.	4087.	Handicraft.	
88.	4088.	Handlooms without wet process	
89.	4089.	Household appliances and kitchen equipment, without wet process.	
90.	4090.	IT Industry as per Board's office order no. GPC/Inf.Tech/F-53/2010/3 dated 16.2.2010 as amended from time to time	
91.	4091.	Jobbing and machining	
92.	4092.	Knitting cloth/Fabrics (Small Scale) Dry process.	
93.	4093.	Lathe and Welding sets (only electrical) without casting.	
94.	4094.	Manufacture of Cement Blocks/Jallies etc.	
95.	4095.	Manufacture of Steel trunks/boxes/drums/Shutters	
96.	4096.	Marketing/Industrial Consultancy/Advertising Agencies	
97.	4097.	Mechanical clock/watches etc	
98.	4098.	Light Engineering & fabricaton units without spray painting (Dry process only)	
99.	4099.	Mfg. of Transformers without poly chlorinated Hydrocarbon	
100.	4100.	Mosaic tiles, cement pipes. Spun pipes manufacturing units	
101.	4101.	Motor and Pump Making without foundry and wet process	
102.	4102.	Mushroom cultivation under controlled conditions/temperature and its compost making	

103.	4103.	Musical instrument with no wet process	
104.	4104.	Non-conventional Energy Items	
105.	4105.	Nut cracking & roasting	
106.	4106.	Oil extraction by kohlus or expellors without Boiler	
107.	4107.	Optical Frames and glasses without wet process	
108.	4108.	Orthopedic equipments without casting/wet process	
109.	4109.	Packing and Processing of items using Mechanized Process	
110.	4110.	Packing of Agricultural/Forest Produce under controlled Temperature (Mechanized Process)	
111.	4111.	Paints and varnishes (mixing and blending) (without ball mill) (without any wet process)	
112.	4112.	Paper Pins, 'U' Clips, pen Holders, pen & paper products without wet process	
113.	4113.	Paper Products without wet process	
114.	4114.	Plastic Niwar from monofilament yarn	
115.	4115.	Polythene Bags from Monofilament Sheets/polythere sheets	
116.	4116.	Powerloom Weaving (Small Scale) Dry process	
117.	4117.	Preparation of Photo Identify card by using video camera-laser printing	
118.	4118.	R.C.C Bricks	
119.	4119.	Seed Processing Units/hybrid Seeds- Mechanized process	
120.	4120.	Sericulture units	
121.	4121.	Small restaurants, coffee/Tea shops and Snack Bars	
122.	4122.	Solar Energy Panel makings	
123.	4123.	Spinning (Small Scale) Dry process	
124.	4124.	Sports Goods without leather tanning & other wet process	
125.	4125.	STD Booth/cable T.V Net Work/EPBAX	
126.	4126.	Tailoring Shop as SSSBI	
127.	4127.	Tea Grading and packing	

128.	4128.	Telecommunication equipment without wet process.	
129.	4129.	Typing Centre/Xeroxing	
130.	4130.	Tyre rethreading (only cold processing).	
131.	4131.	Umbrellas, Raincoats, Tarpaulins without wet process	
132.	4132.	Weigh Bridge	
133.	4133.	Weighing machines with no wet process	
134.	4134.	Welding Electrodes	
135.	4135.	Wooden and corrugated Crates and Boxes	
136.	4136.	Zip Fasteners	
137.	4137.	Power press	

Note No.1: The exemption from obtaining consent of the Board under the provisions of the Water (Prevention & Control of Pollution) Act, 1974 & Air (Prevention & Control of Pollution) Act,1981 and Hazardous Waste Management Rules, 2016 for the above mentioned 136 White Category of industries, if the unit satisfies the following conditions:-

i) That the industry is established/being established in the demarcated Industrial Estates/Zones classified by the State Authorities viz PSIEC, Department of Industries, PUDA, CTP under draft Master Plan or in mixed category area or predominantly Industrial areas within Municipal limit of a Town/City after classification of the area by CTP/STP/DTP.

ii) That the investment of the industry is not more than Rs. 1 Crore on plant and machinery.

iii) That there will not be any discharge of trade effluent from the industry into stream or well or sewer or onto land and/or that industry will not discharge any air pollution including noise into the atmosphere.

iv) That the industry will not discharge any toxic/hazardous wastes and will not handle any toxic/hazardous chemical.

In case the industry is found to create conditions that generate any type of pollution or if there is any objection from the surrounding community and if on verification, it is found that such objection has some substance, the Board shall be at liberty to take legal action against the industry under the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 or Environment(Protection) Act, 1986 as considered appropriate.

Note No.2: -The industries which falls under white category of industries and have installed DG set of capacity more than 10 KVA and less than 1 MVA, such industries shall obtain consent only for the DG set under green category.

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IMPACTS OF CEMENT INDUSTRY ON ENVIRONMENT – AN OVERVIEW

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ABSTRACT

Climate change is considered as the major environmental challenge for the world. Technological advancement has resulted in Cement making companies being able to produce higher volumes compared to the past. However, the higher production levels have also been largely labelled as the leading cause of pollution (Zimwara et al., 2012). Building industry is one of the leaders in deterioration of environment by depleting resources and consuming energy or creation of waste (Stajanca and Estokova., 2012). Emissions from Cement manufacturing are one of the major contributors in global warming and climate change. Cement belongs to the most often used building materials and its production is increasing over the world. But the cement industry is an energy enormous intensive and products many emissions, odors and noise. It is a major source of emissions such as CO_2, NO_X, SO_X, VOCs, Particulate matter etc. The present paper is a review taken from literature, peer reviewed journals, industry sector reports etc.

Key Words: *Cement Production, Environmental and Health Impacts*

INTRODUCITON:

It is impossible to envisage a modern life without cement. Cement is an extremely important construction material used for housing and infrastructure development and a key to economic growth. Cement demand is directly associated to economic growth and many growing economies are striving for rapid infrastructure development which underlines the tremendous growth in cement production (Shraddha and Siddiqui., 2014). The cement industry plays a major role in improving living standard all over the world by creating direct employment and providing multiple cascading economic benefits to associated industries. Despite its popularity and profitability, the cement industry faces many challenges due to environmental concerns and sustainability issues (Shraddha and Siddiqui., 2014).

Concrete is the most common construction material used in building industry. Cement is a basic component of concrete used for building and civil engineering construction. On average approximately 1 ton of concrete is produced each year for every human being in the world. Therefore, concrete (i.e. cement) is one of the World's most significant manufactured materials. Because of its abundance in the world market, understanding the environmental implications of concrete and cement manufacturing are becoming increasingly important (Huntzinger and Eatmon
and Eatmon., 2009).

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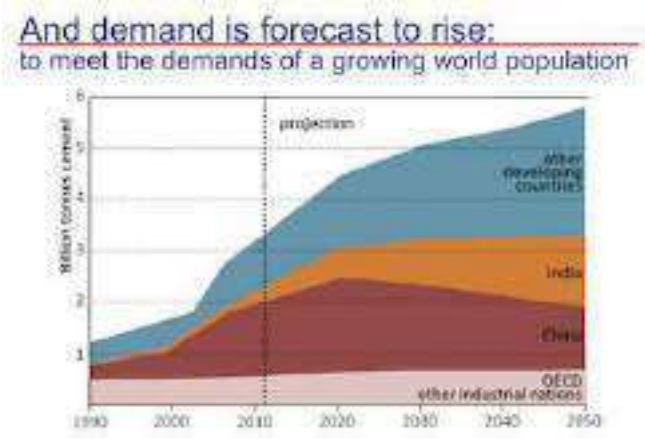

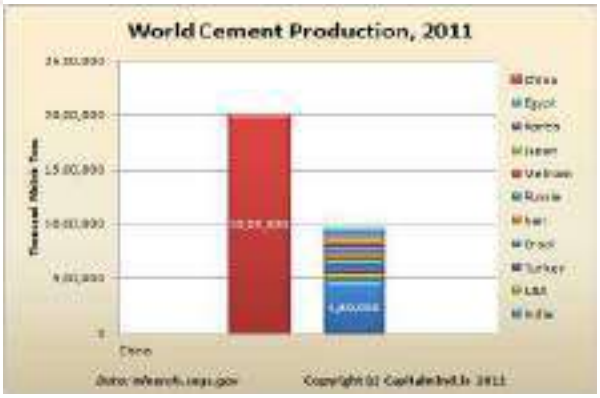

The cement industry has made significant progress in reducing CO2 emissions through improvements in process and efficiency, but further improvements are limited because CO2 production is inherent to the basic process of calcinating limestone.

The cement industry contributes significantly to the imbalances of the environment; in particular air quality. The key environmental emissions are nitrogen oxides (NOx), sulphur dioxide (SO2) and grey dust (Albeanu et al., 2004). Industrial plant smokestacks from cement and construction companies are some of the biggest contributors to poor air quality, especially in urban developments. The Portland cement manufacturing industry is under close scrutiny these days because of the large volumes of CO2 emitted. Actually this industrial sector is thought to represent 5–7% of the total CO2 anthropogenic emissions (Hendricks et al., 1998; Humphreys and Mahasenan, 2002). Therefore, numerous studies have been done to evaluate CO2 emissions and energy consumption (Capros et al., 2001; CIF, 2003; Gartner, 2004). Technological advancement has resulted in cement making companies being able to produce higher volumes compared to the past. However, the higher production levels have also been largely labelled as the leading cause of pollution. The main sources of air pollution in the industry include excavation activities, dumps, tips, conveyer belts, crushing mills and kiln emissions. As of 2007, the cement industry alone was reported to produced 5% of total greenhouse gases in the atmosphere (Air Quality Resources,2011).

Cement Production:

Cement is produced from raw materials such as limestone, chalk, shale, clay, and sand. These raw materials are quarried, crushed, finely ground, and blended to the correct chemical composition (US EPA, 2010).

After the mining, grinding and homogenization of raw materials, the process of calcination is followed by burning the resulting calcium oxide together with silica, alumina and ferrous oxide at high temperatures to form clinker; the clinker is then ground or milled together with other constituents (as gypsum, slag etc.) to produce cement. (Karstensen., 2006 & 2007).

The main stages in Cement Production:

A. Quarrying (Raw material acquisition):

Most of the raw materials used are extracted from the earth through mining and quarrying and can be divided into the following groups: lime, silica, alumina, and iron (Albeanu et al., 2004). Limestone (calcium carbonate – CaCO3) is the predominant raw material therefore most plants are situated near a limestone quarry or receive this material from a source via inexpensive transportation. The plant must minimize the transportation cost since one third of the limestone is converted to carbon dioxide (CO2) during the pyro-processing and is subsequently lost. Quarry operations consist of drilling, blasting, excavating, handling, loading, hauling, crushing, screening, stockpiling, and storing.

B. Raw Materials Preparation (Raw Milling And Fuels Preparation):

Raw milling involves mixing the extracted raw materials to obtain the correct chemical configuration, and grinding them to achieve the proper particle-size to ensure optimal fuel efficiency in the cement kiln and strength in the final concrete product (Karstensen., 2006 & 2007).

TYPES OF PROCESSESS:

The three important types of processes are

i) Dry Process
ii) Wet Process
iii) Semidry Process

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i) **Dry Process:**
In the dry process, the raw materials are dried using impact dryers, drum dryers, paddle-equipped rapid dryers, or air separators, before grinding, or in the grinding process itself.

ii) **Wet Process**
In the wet process, water is added during grinding.

iii) **Semidry Process**
In the semidry process the materials are formed into pellets with the addition of water in a pelletizing device.

C. Clinker Burning – Pyro Processing:

The raw mix is heated to produce cement clinkers. Clinkers are hard, grey, spherical nodules with diameters ranging from 0.32 - 5.0cm created from the chemical reactions (sintering) between the raw materials.

The raw mix is supplied to the system as a slurry (wet process), a powder (dry process), or as moist pellets (semidry process).

Steps in Pyro Processing:

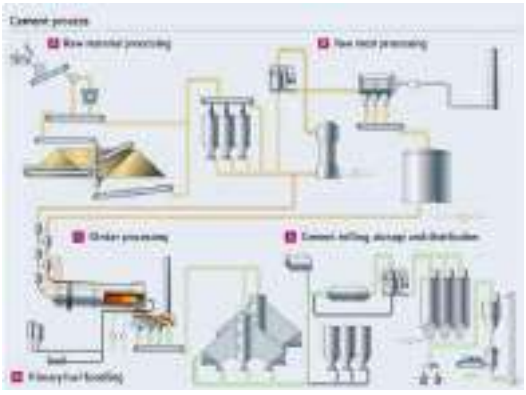
The pyro-processing system involves three steps: drying or preheating, calcining (a heating process in which calcium oxide is formed), and burning (sintering). The pyro-processing takes place in the burning/kiln department. The raw mix is supplied to the system as a slurry (wet process), a powder (dry process), or as moist pellets (semidry process). All systems use a rotary kiln and contain the burning stage and all or part of the calcining stage. All pyro-processing operations take place in the rotary kiln, while drying and preheating and some of the calcination is performed outside the kiln on moving grates supplied with hot kiln gases.

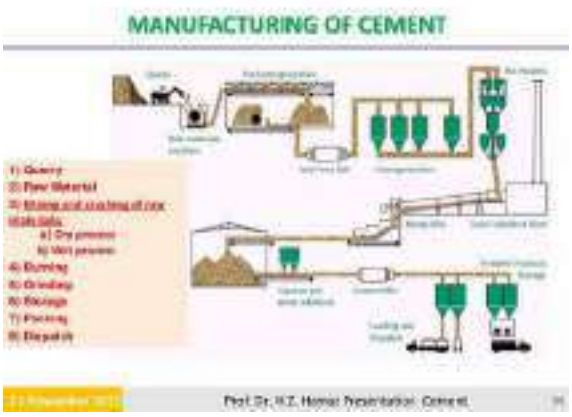
D. Cement Grinding:

This stage is also known as finish milling. Here the clinker is ground with other materials (which impart special characteristics to the finished product) into a fine powder. Gypsum and/or natural anhydrite are added to regulate the setting time of the cement.

D. Cement Packaging and Dispatch:

The finished product is transferred using bucket elevators and conveyors to storage silos. Most of the cement is transported to customers in bulk by railway, trucks, and in bags (normally 50kg bags). Cement is mostly used in mortar and concrete in the construction industry.





Emissions from Cement Industry:

Cement manufacturing is a "high volume process" and correspondingly requires adequate quantities of resources, that is, raw materials, thermal fuels and electrical power. The main environmental (air quality) impacts of the manufacture of cement in general are related to the categories as:

i) **Gases & VOCs:**
Gaseous atmospheric emissions of CO2, NOx, SO2, Volatile Organic Compounds (VOCs) and others Carbon dioxide is released during the production of clinker, a component of cement, in which calcium carbonate (CaCO3) is heated in a rotary kiln to induce a series of complex chemical reactions (Conneely et al., 2001). Specifically, CO2 is released as a by-product during calcination, which occurs in the upper, cooler end of the kiln, or a pre calciner, at temperatures of 600-900°C, and results in the conversion of carbonates to oxides.

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Sulphur oxides and nitrogen oxides generated from the kiln and drying processes. Sulphur dioxide is generated from the sulphur compounds in the ores and the combusted fuel and varies in amount produced from plant to plant. The efficiency of particulate control devices is inconclusive as the result of variables such as feed sulphur content, temperature, moisture, and feed chemical composition, in addition to alkali and sulphur content of the raw materials and fuel. The combustion of fuel in rotary cement kilns generates nitrogen oxides from the nitrogen in the fuel and incoming combustion air (Zimwara et al., 2012).

The amount emitted depends on several factors including fuel type, nitrogen content, and combustion temperature. Both sulphur dioxide and some of the nitrogen oxide react with the alkaline cement and are removed from the gas stream.

Volatile organic carbon compounds (VOCs) are a class of chemicals that are emitted directly to the air as a result of evaporation or another type of volatilization. Sources include stored gasoline, stored solvents and other industrial chemicals, and certain industrial processes. Incomplete combustion of fuels of many types is also an important source of VOC discharge to the ambient air (Zimwara et al., 2012).

ii) **Dust:**

Dust emissions originate mainly from the raw mills, the kiln system, the clinker cooler, and the cement mills. A general feature of these process steps is that hot exhaust gas or exhaust air is passing through pulverised material resulting in an intimately dispersed mixture of gas and particulates. The nature of the particulates generated is linked to the source material itself, that is, raw materials (partly calcined), clinker or cement (Karstensen., 2006 & 2007).

iii) **Noise:**

Noise emissions occur throughout the whole cement manufacturing process from preparing and processing raw materials, from the clinker burning and cement production process, from material storage as well as from the dispatch and shipping of the final products (Stajanca and Estokova., 2012).

The heavy machinery and large fans used in various parts of the cement manufacturing process can give rise to noise and/or vibration emissions, particularly from: chutes and hoppers, any operations involving fracture, crushing, milling and screening of raw material, fuels, clinker and cement; exhaust fans; blowers; duct vibration.

iv) Bad Odour:

Foul smell is sometimes a direct result of the gases emitted during cement manufacturing. Moreover, since cement manufacture has life threatening impacts to plants and animals, the manufacturing process then directly and indirectly gives rise to offensive smells as the dead plants and animals decay (Zimwara et al., 2012).

ENVIRONMENTAL & HEALTH IMPACTS:

Climate change effects can occur on atmospheric temperatures, precipitation levels and patterns, water resources, terrestrial and aquatic habitats, threatened and endangered species, agricultural productivity, and many other natural and man-made resources.

The cement industry is an energy intensive and significant contributor to climate change. The major environment health and safety issues associated with cement production are emissions to air and energy use. Cement manufacturing requires huge amount of non renewable resources like raw material and fossil fuels. It is estimated that 5-6% of all carbon dioxide greenhouse gases generated by human activities originates from cement production (Potgieter Johannes., 2012). Raw material and Energy consumption result in emissions to air which include dust and gases. The exhaust gases from a cement kiln contains are nitrogen oxides (NOx), carbon dioxide, water, oxygen and small quantities of dust, chlorides, fluorides, sulfur dioxide, carbon monoxide , and still smaller quantities of organic compounds and heavy metals (Ian and David., 2002). Toxic metals and organic compounds are released when industrial waste is burnt in cement kiln. Other sources of dust emissions include the clinker cooler, crushers, grinders, and materials-handling equipment (Mishra and Siddiqui., 2014).

These emissions are not only deteriorating air quality but also degrading human health. Emissions have local and global environment impact resulting in global warming, ozone depletion, acid rain, biodiversity loss, reduced crop productivity etc (Pariyar., 2013). Scientific evidence indicates that air pollution from the combustion of fossil fuels causes a spectrum of health effects from allergy to death . The results of several studies showed that these emissions are adversely affecting human health in a variety of ways, like itchy eyes, respiratory diseases like tuberculosis, chest discomfort, chronic bronchitis, asthma attacks, cardio-vascular diseases and even premature death (Pollution Prevention Handbook, 1998; Mehraj et al., 2013).

NOx causes a wide variety of health and environmental impacts because of various compounds and derivatives in the family of nitrogen oxides, including nitrogen dioxide, nitric acid, nitrous oxide, nitrates, and nitric oxide. Similar to sulphur dioxide, NOx react with water and other compounds to form various acidic compounds. When these acidic compounds that are deposited to the earth's surface, they can impair the water quality of different water bodies and acidify lakes and streams. Acidification (low pH) and the chemical changes result in making it difficult for some fish and other aquatic species to survive, grow, and reproduce. Acid rain can also harm forest ecosystems by directly damaging plant tissues (EPA Report, 2014). Nitrous oxide is a greenhouse gas and it accumulates in the atmosphere with other greenhouse gasses causing a gradual rise in the earth's temperature. This will lead to global

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warming and climate change. NOx and volatile organic compounds react in the atmosphere in the presence of sunlight to form ground-level ozone, which causes smog in cities and rural areas. This ground level ozone when breathed, it causes respiratory disease and other health problems (EPA Report, 2014). Nitrogen dioxide affects body functions such as difficulty in breathing, chronic lung diseases, such as chronic inflammation and irreversible structural changes in the lungs, which with repeated exposure, can lead to premature aging of the lungs and other respiratory illness.

The principal harmful effects of VOCs are toxicity, possible contribution to smog via photochemical reactions in the atmosphere, and possible contribution to the "greenhouse effect" and consequent global warming (Woodard). Dust emissions have been linked to respiratory problems such as Tuberculosis.

SUMMARY & CONCLUSION:

It is well known act that air pollution is hazardous to environment and human health. Due to infrastructure, developmental activities Cement industry is flourishing & resulting in environmental degradation and in the degradation of human health worldwide. The gaseous & particulate emissions from Cement plants are degrading air quality & thus creating considerable environmental pollution especially air pollution.

A current trend in the field of cement production is the focus on low-energy cements, utilization of waste in cement production and the associated reduction of CO2 emissions. Evaluation of cement impact to environment is a very important process.

Impacts related to global warming are due nearly exclusively to CO2, those for acidification are mainly due to SOx (34%), NH3 (30%), N20 (17%), SO2 (13%) and NOx (6%) and impacts for marine eco toxicity are essentially related to the emission of Fluorine and its inorganic compounds (54%), barite and Barium (34%) and many heavy metals such as Vanadium (3%).

Von Bahr and co-authors have studied the variability of three types of emissions (Dust, NOx, and SO2) from 1993 to 1999 in 6 different cement plants (von Bahr et al., 2003). They show an improvement of processes with time as well as a large variability between cement plants.

This review examines various impacts of Cement manufacturing companies on Environmental and Health aspects, by adoption of appropriate technology and computer modelling, industry will not only reduce production waste but also comply with legislation to do with environmental protection, control used for air and looks at how computer modelling can be adopted for the classification, quantification and control of particulate matter; and how efficient energy use can contribute to better air quality.

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CONCRETE TROUBLES

A report on the emissions from Cement Plants in India and a critique of the ongoing co-incineration of Hazardous Wastes in the Cement Industries

Global Anti Incineration Alliance (GAIA) – India
&
Community Environmental Monitoring, The Other Media

January 2014

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Introductions to the report:

In 2010, Indian Central Pollution Control Board (CPCB) released the "*Guidelines on Co-processing in Cement/Power/Steel Industry*"[1] which gave an official sanction for co-incineration of industrial and municipal wastes in cement plants. This directive will effectively allow cement plants across India to incinerate a range of hazardous, post-production waste from manufacturing and a variety of post consumer municipal waste.

We attribute this initiative of the CPCB to a global trend in cement kiln co-incineration. The primary proponents of cement kiln co-incineration globally are the cement industry led by Holcim, La-Farge and Cemex in association with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Germany. This consortium makes two key arguments on waste co-incineration:

a) Using alternate fuel or waste would reduce climate footprint of the rapidly growing cement industry

b) By diverting waste to cement manufacturing it provides a short-term fix to the growing menace of municipal and manufacturing waste being faced by the cities and industry.

The CPCB's proposal for co-incineration has been endorsed by GIZ across India. It is based on the certain assumptions about manufacturing and waste disposal methods in India:

- The existing operations of the cement plants are non-polluting.
- Toxic by-products resulting from burning of waste will be destroyed under high temperatures of the kiln.
- The current technologies for monitoring/incinerating are sufficiently advanced to allow hazardous waste burning with no additional pollution load; and that these technologies will be deployed wherever co-incineration is permitted.
- The existing monitoring/enforcement infrastructures are robust enough to detect and tackle violations.

The most important assumption is that CPCB had carried out due diligence to assess the state of existing plants for their ability to burn hazardous waste.

Indian cement plants have been known to pollute even without co-incineration of waste. A series of ambient dust samples taken prior to the commencement of this project in Himachal Pradesh and Tamil Nadu between 2008 and 2010 found high levels of fine particulate pollution and toxic heavy metal contamination around plants using conventional fuel like coal[2]. These findings not only proved that emissions from cement plants using coal were excessive but also the highlighted the poor regulatory mechanism, which allowed such a situation to persist for years. This exposes the poor state of affairs as far as regular monitoring of cement plants is concerned and also raised several questions about the capacity of the regulatory agencies especially the CPCB to ensure strict emission monitoring that was assured while sanctioning waste co-

[1]Guidelines on Co-Processing in Cement/Power/Steel Industry, February 2010

[2] Disease stalks villages around cement plants, March 6 2011. http://www.tribuneindia.com/2011/20110307/himachal.htm#2

incineration (refer CPCB guidelies document). It also raises several doubts on the due diligence carried out by the GIZ before collaborating and recommending co-incineration of waste in Indian cement kilns.

Further, a preliminary investigation into the due diligence followed by CPCB before sanctioning the practice revealed that it to be based on a few trial runs conducted with poor scientific rigour. The process was non-transparent and non-inclusive as it failed to seek comments from the public or conduct any consultation with communities living around cement plants. Trial runs with the most toxic and explosive chemicals were conducted without public and in some cases the without workers knowledge and in the absence of accident management plans.

The study is primarily targeted to verify the 3 main claims made by CPCB before granting approval to co-incineration in Cement plants.

1. Assess the nature of pollution from the cement plants using conventional fuel;
2. Assess the effectiveness of the monitoring mechanisms employed by the state pollution control agencies where these plants are located.
3. Assess the capabilities of the CPCB in monitoring and regulating the co-incineration of hazardous waste in the cement units in the long run.

The findings of earlier samples taken in Himachal Pradesh and Tamil Nadu between 2008 and 2010 had already provided an inkling of the state of affairs as far as regulation and monitoring was concerned but it was necessary to widen the study area to few more regions in order to establish a trend. Given that co-incineration of hazardous waste had begun on trial basis in some of the plants, efforts were also made to reach out to workers and communities in those localities to understand the nature of operations and impacts of pollution from those units.

Methodology of data collection:

Air samples and other information related to the operations of the cement plants were collected in two phases.

In the **phase 1**, samples of dust present in the ambient air were taken from the vicinity of the plant. The equipment used is a low volume air-sampling device called the MiniVol[3]. Most of the samples were taken continuously over a period of 24-hour while some were taken over 12 hour due to logistical constraints. The samples were sent for analysis to the Chester LabNet[4], a laboratory based in Oregon, USA. The laboratory tested the samplers for Particulate Matter ($PM_{2.5}$) using the Gravimetry technique[5] and used the X-ray Fluorsescence (XRF) technique (See Annexure 2) to detect the presence of heavy metals.

In **phase 2**, information specific to the plants and about co-incineration practices in general was collected from the State and the Central Pollution Control Boards/Committees using the Right to Information Act, 2005.

[3] http://www.airmetrics.com/index.html
[4] http://www.chesterlab.net/index.php
[5] http://www.chesterlab.net/service.php#gra

Rationale for the samples:

Most of the state PCBs lack basic equipment to monitor dust emissions, almost never test for the heavy metals in the cement dust, even though it is scientifically well documented that cement dust contains heavy metals[6] such as antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, thallium, and vanadium.

Due to resource constraints, the region of sampling could be extended to include only two more states (in addition to Tamil Nadu and Himachal Pradesh) where a total of 10 samples were taken around different cements plants.

Gujarat (Kutch region) – Sanghi Cement and JayPee Cements
Chhattisgarh (Jamul and Aresmetta) – ACC Holcim and LaFarge India
Tamil Nadu (Trichy) – Dalmia Cements
Himachal Pradesh (Bagheri and Bir Palasi) – JayPee Cements and Asian Cements

Selecting the sites in the various states and existing levels of pollution:

An important criterion for the selection of sampling locations was the presence of a community resistance against the pollution caused by the cement plants. All the 4 selected locations have an ongoing community struggle against pollution or worker struggle for better conditions at the plant. Some of the plants are also facing litigation on issues of causing pollution[7].

It was evident during interactions with community members and workers in all the selected locations that the cement plants and the allied mines were a major source of pollution. Testimonies from these communities during the sampling revealed the pattern of the dust emissions from the plants and mines, associated health problems (especially respiratory ailments) and the social implications of resulting environmental degradation.

Summary of Sample Results collected through a low volume air sampler:

Overall 10 air samples were collected and tested for parameters like $PM_{2.5}$ and heavy metals. The results revealed that:

PM2.5 Results: All ten samples were in violation of Indian short-term 24-hour standard for $PM_{2.5}$. In some cases the levels exceed the Indian standards by 6 to 7 times.

Particles less than 2.5 micrometers in diameter (PM2.5) are referred to as "fine" particles and are believed to pose the largest health risks. Because of their small size (less than one-seventh the average width of a human hair), fine particles can lodge deep into the lungs.

“Health studies have shown a significant association between exposure to fine particles

[6] http://www.epa.gov/osw/nonhaz/industrial/special/ckd/rtc/chap-3.pdf
[7] JAL thermal plant: The dust refuses to settle, June 2012 http://infochangeindia.org/environment/features/jal-thermal-plant-the-dust-refuses-to-settle.html

and premature mortality. Other important effects include aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days), lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems such as heart attacks and cardiac arrhythmia. Individuals particularly sensitive to fine particle exposure include older adults, people with heart and lung disease, and children."[8]

The Indian Ministry of Environment and Forests (MoEF), the U.S. EPA and the World Health Organization have all adopted health-based air quality standards for exposure to fine particulate matter. They have also adopted short-term (24-hour) and long-term (annual average) standards for exposure to fine particulate matter in order to prevent both acute and chronic effects of exposure to particulates.

Manganese Results: Levels of manganese in 9 out of 10 samples exceed the U.S. EPA Reference Concentration for exposure to manganese (0.05 µg/m3). However, these standards for manganese are for long-term exposures of one year (or longer). These results indicate unhealthy levels of manganese only if they reflect ambient levels of manganese that generally prevail at these locations.

Manganese is a neurotoxin with regards to its health impacts the U.S. EPA has observes:

"Chronic (long-term) exposure to high levels of manganese by inhalation in humans may result in central nervous system (CNS) effects. Visual reaction time, hand steadiness, and eye-hand coordination were affected in chronically-exposed workers. A syndrome named *manganism* may result from chronic exposure to higher levels; *manganism* is characterized by feelings of weakness and lethargy, tremors, a mask-like face, and psychological disturbances. …. The Reference Concentration (RfC) for manganese is 0.00005 mg/m3 based on impairment of neurobehavioral function in humans."[9]

Silicon Results: Levels of silicon in 7 out of 10 samples ranged from 8.9 to 53.4 µg/m3. The most prevalent environmental form of silicon is silicon dioxide (SiO_2), or silica. In the natural environment, crystalline forms of silica predominate over non-crystalline forms.

According to the California Office of Environmental Health Hazard Assessment (OEHHA), inhalation of crystalline silica initially causes respiratory irritation and an inflammatory reaction in the lungs and acute exposures to high concentrations cause cough, shortness of breath, and acute silicosis. It also refers to scientific reports that state that "chronic levels of silica dust that do not cause disabling silicosis may cause the development of chronic bronchitis, emphysema, and/or small airways disease that can lead to airflow obstruction, even in the absence of radiological silicosis."[10] The California OEHHA has established a health-based standard for crystalline silica of 3 µg/m3 on an annual basis.

Levels of crystalline silica in the samples were not determined. However, because levels of silicon in 7 out of 10 samples ranged from 8.9 to 53.4 µg/m3, levels of silica

[8] http://www.epa.gov/ttn/naaqs/pm/pm25_index.html
[9] http://www.epa.gov/ttn/atw/hlthef/manganes.html
[10] http://www.oehha.org/air/chronic_rels/pdf/silicacrel_final.pdf

ranged from 19 to 114 µg/m3. It is reasonably certain that levels of crystalline silica in these seven samples exceeded the California OEHHA annual standard for crystalline silica of 3 µg/m3.

Lead Results: Levels of lead in 5 out of 10 samples exceed the U.S. EPA 3-month health-based standard for lead of 0.15 ug/m3. However, these standards for lead are for long-term exposures (of three-months and one year, respectively). These results indicate unhealthy levels of lead only if these results reflect ambient levels of lead that generally prevail at these locations. According to the experts additional testing (over several months) would be necessary to determine long-term average ambient levels at these locations.

Lead is a neurotoxin with regards to its health impacts the U.S. EPA observes:

• EPA has revised the level of the primary (health-based) standard from 1.5 micrograms per cubic meter (µg/m3), to 0.15 µg /m3, measured as total suspended particles (TSP). EPA has revised the secondary (welfare-based) standard to be identical in all respects to the primary standard.

• Scientific evidence about lead and health has expanded dramatically since EPA issued the initial standard of 1.5 µg/m3in 1978. More than 6,000 new studies on lead health effects, environmental effects and lead in the air have been published since 1990. Evidence from health studies shows that adverse effects occur at much lower levels of lead in blood than previously thought.

• Children are particularly vulnerable to the effects of lead. Exposures to low levels of lead early in life have been linked to effects on IQ, learning, memory, and behavior. There is no known safe level of lead in the body."[11]

Mercury Results: Levels of mercury in 2 out of 10 samples exceed the California OEHHA annual standard for Mercury of 0.03 µg/m3.

We would like to point out here that the levels of mercury found in all 10 of the samples are likely to substantially underestimate actual mercury levels. This is because filtered air sampling is a method that is inherently incapable of accurately estimating levels of mercury in ambient air because, in air, mercury is predominantly in a gaseous form that will not be retained by the filter.

Mercury is a neurotoxin. With regard to mercury, according to the U.S. EPA:

"Mercury in the air eventually settles into water or onto land where it can be washed into water. Once deposited, certain microorganisms can change it into methylmercury, a highly toxic form that builds up in fish, shellfish and animals that eat fish. Fish and shellfish are the main sources of methylmercury exposure to humans. Methylmercury builds up more in some types of fish and shellfish than others. The levels of methylmercury in fish and shellfish depend on what they eat, how long they live and how high they are in the food chain. **Mercury exposure at high levels can harm the brain, heart, kidneys, lungs, and immune system of people of all ages.** Research shows

[11] http://www.epa.gov/air/lead/pdfs/20081015pbfactsheet.pdf

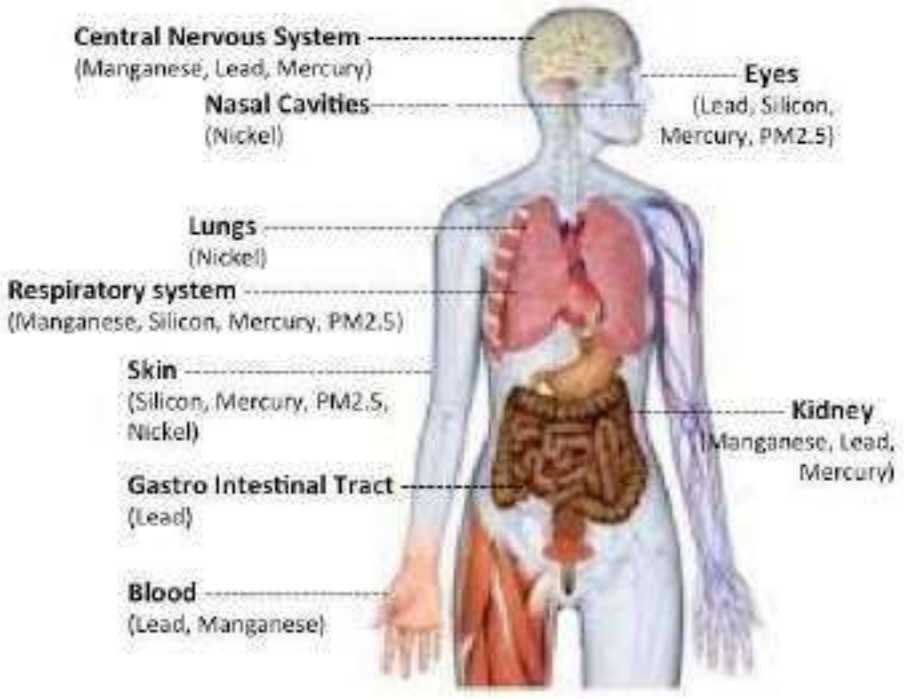
that most people's fish consumption does not cause a health concern. However, it has been demonstrated that high levels of methylmercury in the bloodstream of unborn babies and young children may harm the developing nervous system, making the child less able to think and learn."[12]

Nickel Results: Levels of Nickel in 2 out of 10 samples exceed the California Annual Standard for Nickel of 0.014 µg/m3.

Nickel is a human carcinogen. Based on human epidemiological studies, the World Health Organization has estimated that long-term exposure to 0.025 micrograms of nickel per cubic meter is associated with an excess 1:100,000 risk of cancer, and that the risk is linearly proportional to the dose.[13]

[12] http://www.epa.gov/hg/about.htm
[13] http://www.euro.who.int/__data/assets/pdf_file/0014/123080/AQG2ndEd_6_10Nickel.pdf

TARGET ORGANS IN THE HUMAN BODY FOR THE CHEMICALS FOUND IN THE SAMPLE RESULTS



Region wise sample results analysis:

Himachal Pradesh:

- The sample collected downwind of ACC Limited, approx 250 m west of the cement grinding and blending unit contained a $PM_{2.5}$ level of 311.7 µg/m^3, which is more than **five** times the Indian short-term 24-hour standard for $PM_{2.5}$.

- The sample collected at the top of the house approximately 250 m west of JayPee cement grinding and blending unit contained 346.1 µg/m^3 of $PM_{2.5}$, which is more than **five** times the Indian short-term 24-hour standard for $PM_{2.5}$.

- The findings also revealed unsafe levels of manganese, lead and nickel.

Chhattisgarh:

- Levels of **$PM_{2.5}$** were **430.7 micrograms per cubic meter (µg/m^3)** in an air sample collected from the terrace of a resident of Ghasidas Nagar at a distance approximately 300 meters from the ACC Jamul/Holcim Cement Plant. This level is more than **seven** times the Indian short-term 24-hour standard for $PM_{2.5}$.

- Levels of **$PM_{2.5}$** were **381.4 µg/m^3** in an air sample collected from the terrace of another resident of Ghasidas Nagar at a distance of approximately 400 meters west of the ACC Jamul/Holcim Cement Plant. This level is more than **six** times the Indian short-term 24-hour standard for $PM_{2.5}$.

- Levels of **$PM_{2.5}$** were **158.2 µg/m^3** in an air sample collected from the terrace of a house located in the southern side of Lafarge Cement plants and southwestern side of the limestone mines in Arasmetta Village. This level is more than **two and half** times the Indian short-term 24-hour standard for $PM_{2.5}$.

- Levels of **$PM_{2.5}$** were **131.0 µg/m^3** in an air sample collected from the terrace of a house at a distance of approximately 100 meters west of the Lafarge Cement Plant in Arasmetta. This level is more than **two** times the Indian short-term 24-hour standard for $PM_{2.5}$.

- These air samples also contained unsafe levels of silica, manganese, nickel, lead and mercury.

- It should also be noted that there were at least 8 hours of intermittent rains on the day the two samples in Arasmetta, downwind of Lafarge, were collected. Hence the final readings are a conservative estimate of pollution in the ambient air.

Gujarat:

- Levels of **$PM_{2.5}$** were **210.1 µg/m^3** in an air sample collected from the terrace of Village Sarpanch (Village Head) located about a kilometer east from Sanghi Cement plants and about 300 meters south of the limestone mines in Jadhua Village. This level is more than **three and half** times the Indian short-term 24-hour standard for $PM_{2.5}$.

- Levels of **$PM_{2.5}$** were **291.8 µg/m^3** in an air sample collected from the house of a resident in Jadhua village located about a 500 meters east from Sanghi Cement plants and about 400 meters south of the limestone mines. This level is more than **four and half** times the Indian short-term 24-hour standard for $PM_{2.5}$.

- Levels of **$PM_{2.5}$** were **89.7 µg/m^3** in an air sample collected from the top of the temple in Kharia village downwind of the mines of JayPee Cements. This level is more than **one and half** times the Indian short-term 24-hour standard for $PM_{2.5}$.

- These air samples also contained unsafe levels of silica, manganese, nickel and lead.

Tamil Nadu:

- Levels of **$PM_{2.5}$** were **66.1 µg/m^3** in an air sample collected from the house of a resident in Vadugarpettai village located about a 200 meters west from Dalmia Cement plants. This level is more than the Indian short-term 24-hour standard for $PM_{2.5}$. The plant was not operational on the day the sample was collected.

Detailed interpretation of all the results are provided in Annexure 1.

Relevance of high levels of $PM_{2.5}$ in results – Comparison with US EPA Air Quality Index (AQI):

The United States Environmental Protection Agency (U.S. EPA) categorizes air quality using an index based on 24-hour average levels of $PM_{2.5}$. This index was revised as recently as December 14th, 2012, and the $PM_{2.5}$ levels associated with air quality categories is presented below:[14]

AQI Category	Index Values	Previous Breakpoints (1999 AQI) (µg/m^3, 24-hour average)	Revised Breakpoints (µg/m^3, 24-hour average)
Good	0 - 50	0.0 - 15.0	0.0 – 12.0
Moderate	51 - 100	>15.0 - 40	12.1 – 35.4
Unhealthy for Sensitive Groups	101 – 150	>40 - 65	35.5 – 55.4
Unhealthy	151 – 200	> 65 – 150	55.5 – 150.4
Very Unhealthy	201 – 300	>150 – 250	150.5 – 250.4
Hazardous	301 – 400	>250 – 350	250.5 – 350.4
	401 – 500	>350 – 500	350.5 – 500

Comparing the sample results with the Air Quality Index (AQI), the levels of $PM_{2.5}$ in samples collected in the vicinity of the ACC Jamul/Holcim Cement Plant, Chhattisgarh

[14] EPA Revises the National Ambient Air Quality Standards for Particle Pollution (December 14th, 2012). http://www.epa.gov/pm/2012/decfsstandards.pdf

and ACC Cement and JayPee Cement plant in Himachal Pradesh, should be considered as “hazardous triggering health warnings of emergency conditions. The entire population is more likely to be affected".[15]

The levels of $PM_{2.5}$ in samples collected in the vicinity of the Lafarge Cement Plant, Arasmetta, Chhattisgarh should be considered as unhealthy - sample collected from the terrace of a house located in the southern side of Lafarge Cement plants where “everyone may begin to experience some adverse health effects, and members of the sensitive groups[16] may experience more serious effects”[17] and unhealthy for sensitive groups - sample from the house at a distance of approximately 100 meters west of the Lafarge Cement Plant in Arasmetta, where “although general public is not likely to be affected at this AQI range, people with lung disease, older adults and children are at a greater risk from exposure to ozone, whereas persons with heart and lung disease, older adults and children are at greater risk from the presence of particles in the air”.[18]

The levels of $PM_{2.5}$ in samples collected in the vicinity of the Sanghi Cement Plant, in Jadhua village, Gujarat should be considered as very unhealthy and “this would trigger a health alert signifying that everyone may experience more serious health effects”.[19] While the levels of $PM_{2.5}$ in samples collected in Kharia village, Gujarat and in the vicinity of Dalmia Cements, Tamil Nadu should be considered as moderate where “air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive to ozone may experience respiratory symptoms”.[20]

Data obtained by Regional Pollution Control Boards of Himachal Pradesh, Gujarat and Chhattisgarh of the emissions from cement units located in their region:

The findings of this study sufficiently establish that the emissions from the plants are in violation of the national and international standards. It was important to correlate our findings with that of the state pollution control boards. Right to Information requests were filed with the Himachal Pradesh, Gujarat, Tamil Nadu and Chhattisgarh State Pollution Control Boards to obtain their data on emissions from the cement plants within their jurisdiction where we carried out our samplings.

These are the findings of the data gathered from such agencies:

1. Levels of PM 2.5 in most of these results were above the permissible limits as per the Indian National Ambient Air Quality (NAAQ) Standards.
2. There were no analyses conducted for any of the heavy metals known to be usually present in the cement dust emissions.
3. The protocol of collecting the samples were not described and neither were the vital details like location of the samplers, wind direction, weather conditions etc., were mentioned in any of the results analysed, thus making the findings scientifically unreliable.

[15] http://www.airnow.gov/?action=aqibasics.aqi
[16] Elderly, women and children comprise of sensitive groups
[17] http://www.airnow.gov/?action=aqibasics.aqi
[18] http://www.airnow.gov/?action=aqibasics.aqi
[19] http://www.airnow.gov/?action=aqibasics.aqi
[20] http://www.airnow.gov/?action=aqibasics.aqi

4. The labs belonging to the State Pollution Control Boards of Gujarat, Himachal Pradesh, Tamil Nadu and Chhattisgarh have no valid recognition by the CPCB as mandated under the Environment (Protection) Act of 1986[21], hence severely compromising the scientific validity of all work carried out in these laboratories.

[21] http://cpcb.nic.in/14_StatewiseStatusRecognizedLabs.pdf

RTI Questions/ Response from CPCB and State PCBs on Co-incineration:

In the months of May 2012 Right to Information (RTI) requests were filed with the CPCB and the State PCBs to understand the nature and extent of the waste co-incineration exercise across the country. Table 1 is a summary of all the responses received to the following questions:

a) List of all cement plants authorized to co-incinerate various forms of waste in their process.
b) Copies of all emission and compliance monitoring data of these plants from the month they started co-incineration up to May 2012.
c) List of all the materials/ waste that has been approved by the board for co-incineration including the names of the companies where the waste originates.

Key observations of the responses received:

1. There are at least 11 states in the country that have permitted co-incineration of waste in cement kilns either on a trial or regular basis. These states are Rajasthan, Himachal Pradesh, Tamil Nadu, Andhra Pradesh, Karnataka, Odisha, Madhya Pradesh, Chhattisgarh, Jharkhand, Gujarat and Maharashtra.

2. At least 39 plants in the country (in these 11 states) are burning a combination of hazardous and other wastes in their kilns either on trial or on regular basis.

3. The nature of waste which is currently being co-incinerated belongs to automobile industries, rail coach factories, refineries, chemical plants, hazardous and municipal waste processing facilities, pesticide plants, Fast Moving Consumer Goods industries etc.

4. None of the 11 states permitting co-incineration had any systematic method of emission monitoring, recording and documentation.
    a) 7 states failed to provide records of any emission/environmental monitoring.
    b) 4 states provided some data on emissions testing conducted during the trial run but the regular monitoring records were not available.

5. In some cases, the emission data recorded from the trial runs revealed elevated levels of heavy metals like lead, manganese and copper. These metals were found to be above levels prescribed US EPA. It is not known as to what action has been taken by these authorities on the units. Legal action on such violations also becomes difficult especially when there are no national emission standards for these chemicals.

6. While CPCB is the nodal authority in monitoring and maintaining the records pertaining to co-incineration around the country, in at least 15 out of 39 plants where co-incineration is taking place, CPCB has admitted to have no knowledge or records of the quantum of wastes being incinerated or the way in which co-incineration was being carried out.

State and Central Infrastructure for Monitoring Cement Industries

When co-incineration was given an approval by the CPCB several concerns were raised about its ecological impacts on local communities living around cement facilities. These concerns were allayed by the CPCB and the GIZ who claimed that cement co-incineration was the safest method of waste disposal and that the CPCB and State PCBs are capable of monitoring the activities.

Nothing could be farther from truth than these claims. It is evident from our results and from the state PCB's own, albeit sparse emission data that there are unregulated emissions ongoing from the cement plants. Such a scenario raises a doubt that when the agencies cannot regulate emissions from a regular cement plant, would they be able to do so when the same plant is incinerating hazardous waste.

On the matter of CPCB's claim of the capability of the regulatory agencies to monitor emissions – cement dust or co-incineration – is again something that lacks credibility.

A RTI response revealed that there are only 10 Environmental laboratories (Govt. / Public Sector Undertakings / Educational Institutes / State or Central Pollution Control Board) recognized by the CPCB under Section 12 (1) b of the Environment (Protection) Act, 1986[22].

Out of these 10 recognized laboratories, 2 are Central Laboratories of CPCB located in Delhi and Kolkata, 4 are Regional Laboratories of Maharashtra Pollution Control Board located in Pune, Nashik, Aurngabad and Nagpur and one is a Central Laboratory of Punjab Pollution Control Board. Other 3 recognized laboratories are of Educational and Research Institutions.

This implies that barring Maharashtra, 10 out of the 11 states engaged in trial or full-time co-incineration of hazardous waste in cement plants do not even have a recognized laboratory in their Pollution Control Board. This state of affairs raises a serious doubt about the credibility of the monitoring data generated by these labs in case they were monitoring the emissions from the cement plants.

[22] http://cpcb.nic.in/13_ListRecognizedEnvironmentalLaboratories.pdf

Comparison of Co-incineration in Indian Cement Plants with Holcim-GIZ Guidelines:

In its guidelines on co-processing released under the Holcim-GIZ Public Private Partnership several principles are listed in its guide on co-incineration of wastes[23]. These "guidelines include specific principles and requirements for co-processing of waste in cement kilns including the observation of the compliance with all applicable laws and regulations, environmental aspects of cement production and AFR pre-processing, operational issues, occupational health and safety as well as communication and corporate social responsibility".

When compared to the situation on ground the co-incineration experiment in India fails several of these principles:

Principle 2 of the guidelines states that, **"baselines for traditional fuels and raw materials shall be defined"**. Indian standards on emissions are very poor and barely address the environmental challenges posed by the cement sector let alone defining the baselines. For example there are no legally prescribed standards for heavy metal emissions in air from cement plants in India, and in absence of such standards it is difficult to ensure compliance by the industries.

Principle 3 of the guidelines recommends, **"installing of community advisory panels"**. None of the cement plants carrying out trials of co-incineration had informed local communities. Regular co-incineration of waste continues without any community oversight or engagement. Fire accidents caused due to improper storage of waste reported at cement kilns also remain uninvestigated[24].

Principle 5 of the guidelines states that, **"emissions monitoring is obligatory"**. Information gathered under the RTI for this investigation has revealed that barely any state agencies have continued monitoring after regular co-incineration was sanctioned by the CPCB. Even if there was monitoring on one or two occasions this was conducted in an irregular manner and excluded heavy metal testing. Even CPCB, the nodal agency, does not have complete information of the quantum or the type of waste being co-incinerated in at least 15 cement plants in the country.

Principle 13 of the guidelines on site suitability **requires properly trained management and employees for handling and processing of AFRs**. It is a well known and documented fact that Indian cement plants primarily recruit contract labours for majority of their processing works. In Chhattisgarh the employees of the ACC plant informed the team that the company has employed more contract workers than permanent workers and it is they who carry out all the risky and hazardous tasks, they also informed us that though the company was burning waste regularly, the workers had no knowledge or training on handling such materials.

[23] http://www.holcim.com/holcimcms/uploads/CORP/SummaryGuidelines2_COPROCEM.pdf
[24] Fire at cement factory, 200 tonnes of waste material gutted http://articles.timesofindia.indiatimes.com/2012-10-04/coimbatore/34258951_1_fire-cement-factory-structure

Implications of Storage of Hazardous Waste inside Cement Plants, Interstate transport and Safety of Workers:

Licences and Permissions: A very concerning aspect of the co-incineration is with regards to the legality of storage of hazardous waste on plant site. Facilities set up for storage and handling of hazardous wastes require an Environmental Clearance (EC) under the Environmental Impact Assessment (EIA) Notification 2006. In order to obtain the EC, the facility has to conduct an EIA study, public consultation and be subjected to the scrutiny of the experts at the Ministry of Environment and Forests. All this steps are required and important for the facility given the toxic and dangerous nature of the wastes it handles. None of this scrutiny or procedure has been applied to the cement units prior to sanctioning co-processing.

CPCB's report tilted "Report On Co-incineration of Hazardous Waste in Cement Kilns in Central Zone[25]" observes "most of the units are instructed to co-incinerate the hazardous waste but they are not given permission by SPCBs in spite of repeated meetings/ clarifications and even after obtaining the trial run permission by CPCB". Such permissions from SPCB might also not be legally viable keeping in mind the provisions of EIA Notification 2006 and Hazardous Wastes (Management, Handling and Transboundary Movement) Rules 2008.

Transportation and Storage: Another major area of concern is the safe transportation and storage of the hazardous waste itself. Once again these aspects of the hazardous wastes are governed by the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules 2008 and the EIA Notification 2006. It is not clear how these provisions are being applied in the current scenario. The CPCB report makes very critical and concerning observation regarding the status of transportation and storage of hazardous wastes in the cement plants studied. It states:

- Most of the hazardous wastes are being transported by road only which is highly risky.
- The hazardous wastes are being transported by unauthorized vehicles due to non-availability of authorized transporters. Moreover the transporters will not agree for transporting small quantity of waste.
- Taking interstate transportation permission from SPCBs for transporting the hazardous waste from one state to other state is a big challenge for the industry, because there is lack of co- ordination between different SPCBs as a results industry is suffering and finally permission delayed.
- Storage, handling and feeding systems for using the hazardous waste in cement kiln need improvement. Manual handling of hazardous waste was observed in almost all the plants which may cause health problems to workers in future.

Safety of the Workers: Though the CPCB guidelines require the cement plant operators to train their workers to handle waste, there is absolutely no obligation by the operator or the regulators to share any information with the public. During our interactions with community members and workers in Jamul, Chhattisgarh, where ACC-Holcim facility has been co-incinerating waste, we were informed that no information was

[25] http://cpcb.nic.in/Co-incinHW.pdf

shared with the public. Workers reported storage of date expired cosmetics and beauty products, plastic wastes etc., in the factory premises but did not realize it was for co-incineration. They also reported incidents of pilferage of these products by workers on several instances and of resale of some of these materials in the second-hand markets. This raises critical questions about security of the premises where the waste is stored and implications on public health and safety in an event that the waste leaves the cement facility in an unauthorized manner.

CPCB has made similar observations too. In its report the board states, "It was observed that in most of the industries awareness about the safe handling & disposal of hazardous waste to the operator was not founded and found less in most of the industry and some places helpers were not wearing proper protective gadgets during the handling of the waste."

Monitoring: There is no environmental monitoring information available to explain the manner in which hazardous waste is being stored or burned inside the cement plants. No water, air or leachate monitoring data has been made available so far and hence there is a lot of ambiguity in the procedure of monitoring of emissions from storage and burning of hazardous waste. It is not certain if the cement plants even have the capacity to monitor emissions from co-incineration of hazardous waste.

While the CPCB has allowed co-incineration its Regional Office's observation clearly show the hasty manner in which co-incineration was approved. On the issue of the monitoring of emissions, the report notes, "The industries are not equipped for regular monitoring of environmental parameters as per the protocol given by CPCB, especially for micro pollutants in most of the cement units who were using hazardous waste on regular basis."

Co-incineration of hazardous waste in cement plants will cause harm to public health and the environment

Any claims of the benefits of co-incineration of hazardous waste in cement plants rests on several assumptions that require further inspection. For instance co-incineration of hazardous waste in cement plants is promoted by the cement industry on the basis that the raw materials for the manufacture of cement have a high affinity for toxic substances, such as dioxins/furans, resulting in the low concentrations of toxic substances in stack emissions.

First, compared to other industrial facilities, cement kilns emit very large volumes of exhaust (from 25,000 to 200,000 cubic meters per hour, depending on kiln size)[26]. What matters is the **total amount** of dioxins/furans and other toxic substances that cement plants emit. **For cement kilns, lower concentrations of toxic substances in stack emissions are offset by larger volumes of emissions.** Approval of individual projects involving co-incineration of hazardous waste in cement plants need to take into account the total quantities of emissions of dioxins/furans and other toxic substances over time,

[26] Department of the Environment, Water, Heritage and the Arts (April 2008) "Emission estimation technique manual for Cement manufacturing Version 2.1" http://www.npi.gov.au/publications/emission-estimation- technique/pubs/cement.pdf"

not simply their concentration in stack emissions.

Second, unlike many other toxic substances, incorporation into the food chain, not inhalation, is the prevailing pathway for human intake of dioxin.

Many recent studies including the 'Draft Health Reassessment of Dioxin-Like Compounds, Mercury Study Report to Congress, and Risk Assessment Support to the Development of Technical Standards for Emissions from Combustion Units Burning Hazardous Wastes: Background Information Document' indicate that there can be significant risks from indirect exposure pathways (e.g., pathways other than direct inhalation). The food chain pathway appears to be particularly important for bio-accumulative pollutants which may be emitted from hazardous waste combustion units. In many cases, risks from indirect exposure may constitute the majority of the risk from a hazardous waste combustor."[27]

Therefore, locations surrounded by agricultural lands, particularly those for the raising of livestock, should be "NO-GO" sites for the co-incineration of hazardous waste in cement plants.

Conclusion

It is quite evident that the cement plants in India are poorly regulated and highly polluting even with the use of conventional fuel like coal. Their impacts on local environment and public health are severe but in the absence of strict standards or regulatory oversight the industry has been able to get away with impunity.

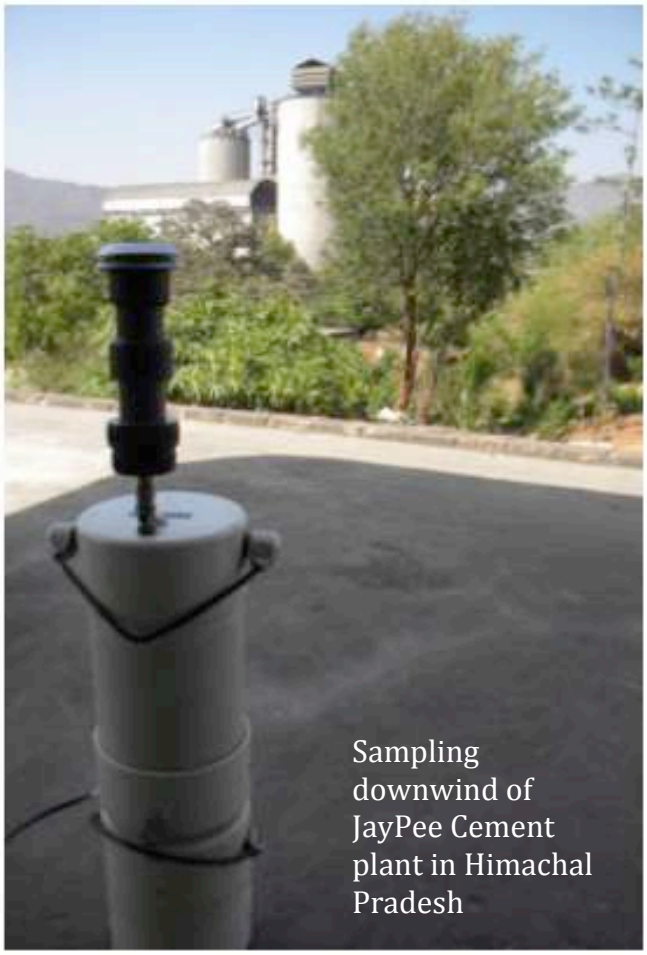
It is also clear that the regulatory agencies are themselves do not have adequate capacity to monitor and control the emissions from the cement plant. Our regulatory guidelines for air emissions from cement plants does not even mandate tests for heavy metals. In such circumstances decision to co-incinerate hazardous waste in cement plants is a hasty one. This decision has led the authorities to undermine scientific due diligence necessary for an exercise of this nature.

Waste from industrial and municipal sources is a big issue which needs to be addressed but end of pipeline options like co-incineration can never resolve it. An inquiry into the role of the agencies like CPCB and GIZ needs to be conducted on the due-diligence that was undertaken before recommending co-incineration. Ultimately, considering the environmental and safety track record of the cement industry in India coupled with a poor monitoring infrastructure, co-incineration of waste can never be safe.

[27] U.S. EPA (July 1998) "Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities." http://www.epa.gov/earth1r6/6pd/rcra_c/protocol/volume_1/chpt1-hh.pdf

View of Sanghi Cement plant from the road

JayPee Cement Plant, Himachal Pradesh



Sampling downwind of JayPee Cement plant in Himachal Pradesh

Left: Dust pollution from JayPee, Himachal Pradesh

Up: Sampling downwind of Cement Plants
Down: Community meeting in progress

Annexure 1 – Interpretation of Sample Results from Various States

Interpretation of Dust Sample results from Gujarat:

SAMPLE A:
Date of Sampling: 2 February 2013
Time of Sampling: 24 hour sample from 12.35 pm
Location: On top of the house of Jadhua village head; about 1 km east of the Sanghi Cement plant and about 300 mtrs south of the Sanghi limestone mines.
Conditions: The weather conditions were normal, with gentle shifty breeze mostly from North East to South West. The minivol sampler was set up and removed in the presence of the sarpanch and other community members.

SAMPLE B:
Date of Sampling: 2 February 2013
Time of Sampling: 24 hour sample from 1.50 pm
Location: On the window of the house of a resident of Jadhua village; about 500 mtrs east of the Sanghi Cement plant and about 400 mtrs south of the Sanghi limestone mines.
Conditions: The weather conditions were normal, with gentle shifty breeze mostly from North East to South West. The minivol sampler was set up and removed in the presence of the family members of the house and other community members.

SAMPLE C:
Date of Sampling: 3 February 2013
Time of Sampling: 12 hour sample from 4.05 pm
Location: On top of the temple of Kharia village; downwind of the limestone mines of JayPee Cements.
Conditions: The weather conditions were normal, with gentle shifty breeze. The minivol sampler was set up and removed in the presence of the temple caretaker and some of the prominent members of the community.

RESULTS (Gujarat):

1. PM 2.5, Silica and Manganese levels were found above limits in all the 3 results.
2. Lead was found high in two out of three samples.

Location	Date	PM2.5	Si	Fe	Mn	Ni	Hg**	Pb
Jadhua Village house head, Sample A	2/2/13	210.1	21.2	7.3	0.11	0.013	0.024	0.178
Jadhua Village close to factory, Sample B	2/2/13	291.8	20.1	6.6	0.11	0.0055	0.013	0.174
Temple of Kharia village, Sample C	2/3/13	89.7	8.9	4.3	0.057	0	0	0.117
Health-based standards	EPA Air Quality Index, 24-hour	>250.5	Hazardous - This would trigger a health warnings of emergency conditions. The entire population is more likely to be affected.					
	EPA Air Quality Index, 24-hour	150.5–250.4	Very Unhealthy - People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.					
	EPA Air Quality Index, 24-hour	55.5-150.4	Unhealthy - People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion					
	EPA Air Quality Index, 24-hour	35-5-55.4	Unhealthy for Sensitive Groups - People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.					
	WHO 24-hour	25	None	None	None	None	None	None
	WHO annual	10	None	None	0.15	0.0025	1.00	0.50
	EPA 24-hour	35	None	None	None	None	None	None
	EPA 3-month	None	None	None	None	None	None	0.15
	EPA annual	12	None	None	None	None	None	None
	India NAAQS 24-hour	**60**	**None**	**None**	**None**	**None**	**None**	**1.00**
	India NAAQS Annual	40	None	None	None	0.02	None	0.50
	California OEHHA 24-hour	None	None	None	None	0.2	0.60	None
	California OEHHA annual*	None	3	None	0.09	0.014	0.03	None
	EPA RfC	None	None	None	0.05	None	0.30	None
* Standard for								

crystalline silica								
Italic = conc < 3 times uncertainty								
underline = conc < 2 times uncertainty								
0.0 = conc < uncertainty = non-detect								
http://oehha.ca.gov/air/allrels.html								
	Sample level exceeds 24-hour standard (directly comparable)							
	Sample level exceeds annual standard (of significance if reflects generally prevailing air quality)							

Interpretation of Dust Sample results from Chhattisgarh:

SAMPLE 1:
Date of Sampling: 5 February 2013
Time of Sampling: 24 hour sample from 08.05 pm
Location: On top of the house of Mr. Mohanlal Sahu at Gharidas Nagar, at about 500 mts on the western side of ACC Holcim Cements, Jamul
Conditions: The weather conditions were normal, with gentle shifty breeze. The minivol sampler was set up and removed in the presence of the members of the household, trade union and other community members.

SAMPLE 2:
Date of Sampling: 5 February 2013
Time of Sampling: 24 hour sample from 08.40 pm
Location: On top of the house of Mr. Bhagibali Nishad at Masoria Talao, at about 500 mts on the north of ACC Holcim Cements, Jamul
Conditions: The weather conditions were normal, with gentle shifty breeze. The minivol sampler was set up and removed in the presence of the members of the household and trade union.

SAMPLE 3:
Date of Sampling: 7 February 2013
Time of Sampling: 24 hour sample from 01.25 pm
Location: On top of the house of Mr. Ganpat in Aresmetta village, south of Lafarge Cement plant and south west of limestone mines.
Conditions: The weather conditions were erratic, with gentle breeze and there were about 8 hours of intermittent rains during the sampling period. The minivol sampler was set up and removed in the presence of the members of the household and trade union.

SAMPLE 4:
Date of Sampling: 7 February 2013
Time of Sampling: 24 hour sample from 01.40 pm
Location: On top of the house of Mr. Pyarelal of Amora Colony on the western side of the Lafarge plant in Aresmetta village. The house is located about 100mts from the plant boundary.
Conditions: The weather conditions were erratic, with gentle breeze and there were about 8 hours of intermittent rains during the sampling period. The minivol sampler was set up and removed in the presence of the members of the household and trade union.

RESULTS (Chhattisgarh):

1. PM 2.5, Silica and Manganese levels were found above limits in all the 4 results.
2. Mercury and Lead was found high in two out of four samples.

Location	Date	PM2.5	Si	Fe	Mn	Ni	Hg**	Pb
Mohanlal Sahu At Ghasidas Nagar, Sample 1	2/5/13	430.7	51.1	42.4	1.945	0	0.053	0.649
Terrace Of Bhagibali Nishad, Sample 2	2/5/13	381.4	53.4	50.6	2.043	0	0.063	0.412
Terrace Of Mr. Ganpat, Sample 3	2/7/13	158.2	21.8	9.8	0.182	0.0025	0.016	0.032
Terrace Of Pyarelal, Sample 4	2/7/13	131.0	21.2	5.8	0.151	0.0019	0	0.034
Health-based standards	EPA Air Quality Index, 24-hour	>250.5	Hazardous - This would trigger a health warnings of emergency conditions. The entire population is more likely to be affected.					
	EPA Air Quality Index, 24-hour	150.5–250.4	Very Unhealthy - People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.					
	EPA Air Quality Index, 24-hour	55.5-150.4	Unhealthy - People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion					
	EPA Air Quality Index, 24-hour	35-5-55.4	Unhealthy for Sensitive Groups - People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.					
	WHO 24-hour	25	None	None	None	None	None	None
	WHO annual	10	None	None	0.15	0.0025	1.00	0.50
	EPA 24-hour	35	None	None	None	None	None	None
	EPA 3-month	None	None	None	None	None	None	0.15
	EPA annual	12	None	None	None	None	None	None
	India NAAQS 24-hour	60	None	None	None	None	None	1.00
	India NAAQS Annual	40	None	None	None	0.02	None	0.50
	California OEHHA 24-hour	None	None	None	None	0.2	0.60	None

	California OEHHA annual*	None	3	None	0.09	0.014	0.03	None
	EPA RfC	None	None	None	0.05	None	0.30	None
* Standard for crystalline silica								
Italic = conc < 3 times uncertainty								
underline = conc < 2 times uncertainty								
0.0 = conc < uncertainty = non-detect								
http://oehha.ca.gov/air/allrels.html								
	Sample level exceeds 24-hour standard (directly comparable)							
	Sample level exceeds annual standard (of significance if reflects generally prevailing air quality)							

Interpretation of Results form Tamil Nadu

Date of Sampling: 17 April 2012
Time of Sampling: 9.30 am
Location: Terrace of Benjamin's house, about 200 mts west of Dalmia Cements at Vadugarpetai, Keeltheru
Conditions: The weather conditions were normal, the monitors were informed that the factory was not in operation and they could not notice any visible smoke or dust from the unit. The minivol sampler was set up and removed in the presence of the members of the household and community.

RESULTS (Tamil Nadu):

1. PM 2.5 was above standards in the result.

Site	Sample Date		PM-2.5	Lead	Manganese	Nickel
Tamil Nadu - Dalmia Cement	4/17/12		66.1	0.007	0.039	0.004
Health-based standard	India NAAQS, 24-hr		60	1.0	none	none
	India NAAQS, annual		40	0.5	none	20
	WHO Guideline Value, 24-hr		25	none	none	none
	WHO Guideline Value, annual		10	0.5	0.15	0.025
	California standard, 24-hour		none	none	none	0.2
	California standard, annual		12	1.5	0.09	0.014
	U.S. EPA, 24-hour		35	none	none	none
	U.S. EPA, long-term		15	0.15	0.05	none

Interpretation of Results form Himachal Pradesh

Sample: Downwind of ACC Cement
Date of Sampling: 14 May 2012
Time of Sampling: 24 hour sample from 08.40 pm
Location: The terrace of
Conditions: The weather conditions were. The minivol sampler was set up and removed in the presence of the members of the household and community representatives.

Sample: Downwind of JayPee Cement
Date of Sampling: 15 May 2012
Time of Sampling: 12:15 pm
Location: On the top of the house of Mr. Pawan Kumar.
Conditions: The weather conditions were normal, with gentle breeze and visible dust from the unit. We were also informed that the unit had used water sprinklers intermittently as they had foreknowledge of our sampling exercise. The minivol sampler was set up and removed in the presence of the members of the household and trade union.

RESULTS (Himachal Pradesh):

1. PM 2.5, Nickel and Manganese levels were found above limits in all the 2 results.
2. Lead was found high in one of the samples.

Site	Sample Date		PM-2.5	Lead	Manganese	Nickel
Himachal Pradesh - ACC Cement	5/14/12		311.7	0.167	0.329	0.052
Himachal Pradesh - JayPee Cement	5/15/12		346.1	0.054	0.534	0.038
Health-based standard	India NAAQS, 24-hr		60	1.0	none	none
	India NAAQS, annual		40	0.5	none	20
	WHO Guideline Value, 24-hr		25	none	none	none
	WHO Guideline Value, annual		10	0.5	0.15	0.025
	California standard, 24-hour		none	none	none	0.2
	California standard, annual		12	1.5	0.09	0.014
	U.S. EPA, 24-hour		35	none	none	none
	U.S. EPA, long-term		15	0.15	0.05	none

Annexure 2 – Methodology for Analysing the Filters for PM2.5 and Heavy Metals

Gravimetry

Filters are purchased from commercial vendors are acceptance tested by visual inspection. Filters passing inspection are equilibrated in a temperature and humidity controlled environment, tare weighed, and either stored or shipped immediately to the client. Filters returned from the field are equilibrated in a temperature and humidity controlled environment for 24 hours prior to gross weighing.

CHESTER LabNet operates microbalances capable of measuring mass to one microgram used for smaller filters, as well as a balance that measures mass to a tenth of a milligram which is used for the larger filters. The balances are under computer control, and all weighing operations follow a strict QC program. All filters are weighed and data is recorded using a proprietary custom software program. This software automatically records analytical results. The software uses the information in the data file to calculate the net mass, as well as the difference in QA reweights. Tare and gross weights are electronically transferred to the laboratory information management system (LIMS).

CHESTER LabNet uses these gravimetric techniques for a wide variety of methods, including but not limited to NIOSH 0500, NIOSH 0600,CFR 50, Appendix B (TSP), J (PM10) and L (PM2.5) and IO 3.1.

X-ray Fluorescence (XRF)

XRF offers rapid analysis of over 35 elements (Na through Pb). XRF is an EPA approved (IO-3.3), non-destructive analytical method wherein a filter or section of filter ("punch") is loaded into the instrument, then bombarded with X-ray beams. The subsequent excitement of electrons can be measured when the electrons fall back to their valence state, releasing energy in the process. Each element has a "fingerprint" of electrical discharges which can then be measured to determine the quantity of each element being measured.

Since XRF is non-destructive, filter samples can then be used for subsequent analysis, or reanalyzed by XRF. Detection limits for XRF are dependent on the "count time" of each sample and the area of the X-ray beam, and are determined in units of µg/cm². Due to the unadulterated nature of the sample, CLP data packages cannot be generated as a true spike is not possible, and duplicates are not truly duplicates, rather replicates of the same sample. Most of the elements measured by XRF can also be measured by conventional metals analysis or Ion Chromatography.

ANNEXURE 3: Responses from State Pollution Control Boards to RTI

States	List of all cement plants authorized to co-incinerate various forms of waste in their process.	Copies of all emission and compliance monitoring data of these plants from the month they started co-incineration up to May 2012	Provide a list of all the materials/ waste that has been approved by the board for co-incineration including the names of the companies where the waste originates.
Rajasthan	- ACC Ltd, Lekhri, Dist Bundi - Aditya Cement Ltd, Sambhupura, Chittorgarh - Ultra Tech Cement Ltd, Kotputli, Dist Jaipur - Shree Cement Ltd (Ambuja Cements), Ras, Jaitaran Dist Pali - Shree Cement Ltd, Andheri Deori, Masuda Dist Ajmer - Trinetra Cement Ltd, Banswara	No monitoring data other than results of Particulate Matter provided by the PCB. It is also not clear from the reports if the Particulate Matter tested were PM 10 or PM 2.5	No data provided from State PCB **RTI from CPCB reveals:** - ETP Sludge from CETP Pali - ETP bio solids, spent carbon and WTP sludge from soft drink industry - Oily rags, phosphate sludge and chemical ETP sludge from Automobile Industry - Grinding dust from Rolling, Bearing and Seal industry - Paint Sludge from Rail Coach Factory Kapurthala, M/s Sigma Vibracoustics India Pvt Ltd and Punjab Tractors Ltd, Mohali. - Waste mix solid and liquid from Gujarat Eniro Protection & Infrastructure Ltd Surat
Himachal Pradesh	- ACC Ltd Gagal Cement Works - Ambuja Cements Ltd, Village Suli, Solan Dist	Some monitoring data for 2009 and 2010 provided by the State PCB. High quantities of toxic metals like lead and manganese were detected in the samples. Action taken on these units for these emissions is not known. It should also be noted that India does not have standards for many toxic metals such as lead, manganese, mercury etc in air.	- Non-hazardous damaged/ expired/ non moving consumer products from Hindustan Unilever Ltd. - Vicks Vaporub process waste from Sarvottam Remedies Ltd. - ETP Sludge and Cream waste from Colgate Palmolive India Ltd - Gelatin Waste from Unichem Laboratories - Paint Sludge from TVS Motors Company Ltd - Solid waste mix from Shivalik Solid Waste Management Ltd
Tamil Nadu	- ACC Madukarai Cement Works, Coimbatore (Tamil Nadu PCB has still not provided complete list of	No data provided	- Tarry residues - Oily sludge and emulsion (refinery sludge) - Waste and residues – paint

	industries where cement co-incineration in Tamil Nadu is taking place. The current information provided is a response to specific RTI on ACC Madukarai) - Utra Tech Cement, Reddipalayam, Ariyalur		sludge - Chemical sludge, activated sludge from waste water treatment - Tyre chips - Used/ Spent oil - Chemical sludge from waste water treatment – TANFAC Industries Cuddalore - ETP Chemical sludge, Phosphate sludge and Oily rags from Ford India Ltd. Chengalpettu - Poly residue from SRF India Ltd, Bhind, MP - FRP waste (green mesh with resin) from Suzlon Energy Ltd, Pondycherry - ETP sludge from BASF India Ltd Managalore - Tyre chips and paint sludge from anywhere available - Plastic waste from nearby areas - Refinery sludge from CPCL, Chennai
Andhra Pradesh	- Ultra Tech Cement Ltd Bhogasamudram, Anthapur Dist - India Cements, Wadapally, Nalgonda Dist - NCL Industries Ltd, Mattampally, Nalgonda Dist - Kesoram Cements, Basant Nagar, Karimnagar Dist - Bharati Cement Corporation Ltd, Kadappa Dist - My Home Industries Ltd. Srinagar, Nalgonda Dist - Sagar Cements Ltd, Mattampally, Nalgonda Dist - Zuari Cements Ltd, Krishna Nagar, Kadappa Dist - M/s Madras Cements Ltd. KSR Nagar, Krishna Dist - Penna Cements Industries Ltd, Belkatur, Rangareddy Dist	Data for Ultra Tech Cement Ltd for the period January to March 2013 provided. No data from any other units provided	These cement industries have co-processed about 41,155 tons of: - Spent Solvents - Spent Carbon - Organic residues etc
Karnataka	- M/s Ultra Tech Cement, Gulbera - ACC Ltd. Wadi Cement Works - M/s Vasavadatta Cement, Gulberga - Heidlelberg Cement (Mysore	Not Available	- Ink Sludge and paint sludge from Reserve Bank of India, Mysore - Cured resin & green mesh from M/s SE Composites, Udupi

	Cement Ltd) Tumkur		- Spent Wash (Non – HW) from M/s Renuka Sugars, Belgaum - Chemical sludge from ETP M/s Syngenta India Ltd, Goa - Plastic waste & other Non-recyclable combustible Waste Goa State - Benzofuran from M/s Kumar Organic Products Ltd. Bangalore & Vivimed Labs Ltd Bidar - Spent Wash (Non HW) from M/s Ugar Sugar Works Ltd, Belgaum - Reinforced Plastic (FRP) Waste from M/s Suzalan Se Composites Udupi - Grinding Muck from Kirloskar Toyota Textile Machinery Pvt Ltd Jigani - ETP bio solids, spent carbon and WTP sludge from Hindustan Coca Cola Pvt Ltd - FRP waste (green mesh with resin) from Suzlon Energy Ltd, Pondycherry - SEP sludge and n-Butanol salt from Jubiliant Organosis Ltd, Mysore -
Odisha	M/s ACC Limited, Bargarh Cement Works at Cement Nagar, PO Bardol, Dist Bargarh	Not Available	- Used Oil - Waste Containing Oil - Spent resin from DM plant - Chemical sludge, phosphate sludge, paint sludge, oily rags and grinding dust from automobile industry - Grinding muck from textile machine manufacturing industry - Grinding dust from rolling, bearing and steel industry - ETP bio solids, spent carbon, WTP sludge from soft drink industry - Plastic, expired consumer products and laminates from consumer goods industry - TDI tar and ETP sludge from Chemical industry - Petroleum refining sludge from petroleum refinery

			- Plastic waste from Municipality - Tyre chips from vendors/ trye manufacturers
Madhya Pradesh	- Samruddhi Cement Ltd (unit Vikram Cement Works) Neemuch, MP - ACC Ltd Keymore Cement Works, Katni Dist	Some monitoring data for 2011 and 2012 provided by the State PCB. High quantities of toxic metals like lead, cadmium, chromium and manganese were detected in the samples. Action taken on these units for these emissions is not known. It should also be noted that India does not have standards for many toxic metals such as lead, manganese, mercury etc in air.	- Paint sludge from Mahindra Two Wheelers Ltd. Pithampur, Dhar - Poly residue grinding muck from SRF Ltd Malanpur - ETP bio solids, spent carbon and WTP sludge from soft drink industry - Oily rags, phosphate sludge and chemical ETP sludge from Automobile Industry - Grinding dust from Rolling, Bearing and Seal industry
Chhattisgarh	- ACC Ltd. Jamul Cement Works, Distt Durg - Lafarge India Ltd, Sonadih Cement Plant, Dist Baloda Bazar - Lafarge India Ltd, Arasmetta Cement Plant, Dist Janjgir Champa - Ambuja Cement Eastern Ltd, Dist Baloda Bazar - Ultratech Cement, Hirmi, Dist Baloda Bazar	Trial run emission monitoring data for all the plants for the years 2009, 2010 and 2011 provided.	- Acid tar sludge from Bhilai Steel Plant - Waste mix solid, waste mix liquid, plastic and resin waste and low density waste mix solid from M/s Gujarat Enviro Protection Infrastructure Pvt Ltd, TSDF in Surat, Silvassa and Faridabad. - Non-Hazardous FMCG date expired and damaged materials, tyre chips and plastic waste from Open Market i.e. Emami, Godrej, HLL etc - TDI tar from M/s Narmada Chemture Petrochemicals Ltd, Bharuch - SPL from Balco, Korba - ETP Sludge, pesticides residues, off specified pesticides, PTA, Oily rags, Process sludge and Terephthalic acid from M/s MCC PTA India Corp Pvt Ltd, Haldia, West Bengal - Plastic waste, tyre and tyre chips from local municipal bodies and near by open market.
Jharkhand	- ACC Ltd Chaibasa Cement Works, West Singhbhum	Trial burn monitoring data for the year 2011	- Spent Catalyst and petroleum refining sludge from

	District	provided.	Petroleum refinery - Phosphate sludge, paint sludge, oily rags, chemical ETP sludge, chemical sludge and grinding dust from automobile industry. - Plastic waste from Municipalities and Industries - Tyre chips from suppliers and Tyre manufacturers - ETP bio solid, WTP sludge and spent carbon from soft drink industry - Grinding muck from Textile Machine Manufacturing industry - Used Oil from its own generation at the Chaibasa.
Gujarat (info based on RTI response from CPCB, the state PCB did not respond to the RTI request)	- Ultra Tech Cement Ltd, Gujarat Cement Works, Amreli, Gujarat - Ultra Tech Cement, Narmada Cement Works, Amreli, Gujarat - Ambuja Cement Ltd, Junagarh, Gujarat - Gaj Ambuja Cement Ltd, Junagarh, Gujarat	No data provided	- Waste mix solid and liquid from Gujarat Eniro Protection & Infrastructure Ltd Surat and Colortex Industries Ltd. Surat. - TDI tar from Narmada Chematur Petrochemicals Ltd Bharuch - Waste mix solid and liquid from Gujarat Enviro Protection & Infrastructure Ltd Surat - Waste mix liquid from Bharuch Enviro Protection & Infrastructure Ltd and Lupin Ltd, Ankaleshwar
Maharashtra	According to the response in the RTI dt September 2012: "The Board has not provided any permission to the cement industry for regular co-processing of waste in kilns. However M/s Ambuja Cements Ltd, Upparwahi Taluk, Chandarpur district has carried out some trial runs for co-processing of bio mass and other waste and carried emission monitoring by third party with the permission of the Board and monitoring reports are awaited. M/s ACC Ltd Chanda Cement Works, Ghugus, Chandrapur has not still started co-incineration of waste though permission of the same has been accorded by	Trial run data provided of the period between 2006 and 2010.	No list provided

	CPCB."		
West Bengal	There is no co-processing of waste in Cement Kiln in West Bengal	--	--
Bihar	There is no co-processing of waste in Cement Kiln in Bihar	--	--
Punjab	There is no co-processing of waste in Cement Kiln in Punjab	--	--
Haryana	There is no co-processing of waste in Cement Kiln in Haryana	--	--
Uttar Pradesh	There is no co-processing of waste in Cement Kiln in Uttar Pradesh	--	--
Assam	There is no co-processing of waste in Cement Kiln in Assam	--	--
Jammu & Kashmir	There is no co-processing of waste in Cement Kiln in J&K	--	--
Uttarakhand	There is no co-processing of waste in Cement Kiln in Uttarakhand	--	--

શ્રી ૧

"વિના સહકાર નહીં ઉદ્ધાર"

શિવરામપુર (જુનાગામ) ગ્રામ પંચાયત

મું.- શિવરામપુર (જુનાગામ), પો. - સુંવાલી
તા. - ચોર્યાસી, જિ.- સુરત, પીન. - ૩૯૪૫૧૦
ફોન નં.- (૦૨૬૧) ૨૮૬૦ ૩૧૭

SHIVRAMPUR (JUNAGAM) GRAM PANCHAYAT

At.- Shivrampur (Junagam), Po.- Suvali
Ta.- Choryasi, Dist.- Surat, Pin.-394510
Ph No. - (0261) 2860 317

જા.નં. : 2019/20

તારીખ : 06/05/2019

પ્રતિ શ્રી
સિનીયર વાઇસ પ્રેસિડેન્ટ સાહેબ
સેન્ટર સર્વિસ વિભાગ L&T કંપની હ.
શિવરામપુર (જુનાગામ),સુરત

વિષય :- મોજે જુનાગામ (શિવરામપુર) ગામે નીચે મુજબના વિકાસનાં કામો મંજુર કરવા બાબત.

મહેરબાન સાહેબ

ઉપરોક્ત વિષયનાં અનુસંધાને મોજે જુનાગામ (શિવરામપુર) ગામે આપની કંપની તરફથી પીવાના પાણી સંગ્રહ કરવા માટે અંદર ગ્રાઉન્ડ સંપ આશરે ૫ થી ૭ લાખ લિટર પાણી સંગ્રહની કેપેસીટી વાળુ અંદર ગ્રાઉન્ડ સંપ બનાવવાનું છે. કારણ કે જુનાગામ ગામ સમુદ્ર કિનારે આવેલ ગામ છે. ગામની ત્રણ બાજુ સમુદ્રની ભરતીના પાણી ભરાઇ છે. અને સિંચાઇ ની સુવિધા નથી. સૌથી વધારે લોકો પશુપાલનનો ધંધો કરે છે. અને જુનાગામમાં આશરે ૩૫૦૦ થી વધું ગાય ભેંસ (જાનવરો) પાળતું ગામ છે. માનવ વસ્તી આશરે 3000 થી ૫૦૦૦ સુધીની છે. વરસાદ ઓછો પડવાના કારણે પાણી નું સ્તર નીચું જવાથી પાણીમાં ખારાશ ધરાવે છે. આ બધા કારણો ને લીધે સરકાર શ્રી ના જળ વિભાગ તરફથી જે પીવાનું પાણી મળે છે. તેને સંગ્રહ કરવા માટે અંદર ગ્રાઉન્ડ (૨૫૦) સંપની જરૂરીયાત હોય આપની કંપની તરફથી બનાવવી આપવા માટે જુનાગામ નાં લોકો વતી નમ્ર અરજ કરુ છું

સરપંચ
ગ્રામ પંચાયત જુનાગામ
તા. ચોર્યાસી, જી. સુરત.

Shri 1!
"No emancipation without co-operation"

Shivrampur (Junagam) Gram Panchayat, Tal. Choryasi, District Surat

SHIVRAMPUR (JUNAGAM) GRAM PANCHAYAT
At : Shivrampur (Junagam), Po : Suvali,
Taluka Choryasi, District Surat, Pin.- 394510
Ph. No. (0261) 2860 317

==========

Outward No. 2019/ 20

Gram Panchayat Junagam, Tal. Choryasi, District Surat

Date : 06/05/2019

To,

Senior Vice President Saheb,
Center Service Department, L & T Co. Ltd.
Shivrampur (Jungam), Surat

Sub : Regarding approval of following development works at village moje Junagam (Shivrampur)

Respected Sir,

With reference to the subject noted above, an underground sump having the capacity of 5 to 7 lakh Liters water for preserving potable water is to be made by your company, because Junagam is situated at sea shore. The area of village is filled with tide waters of sea from three sides, and there is no facility of irrigation. Almost all the people are engaged in the business of cattle rearing. Junagam is the village of breeding cattle having about more than 3500 cows and buffaloes (cattles). Human population is about 3000 to 5000. On account of scanty rainfall, the water level has receded resulting into saline water.

On account of all these reasons, in order to preserve the potable water received from the Water Department of the Government, an underground sump (tank) is required for its preservation, and therefore, this is respectful submission on behalf of people of Junagam that the same may be constructed by your company.

Sd/- illeg
Sarpanch
Gram Panchayat Junagam,
Taluka Choryasi, Dist: Surat

નવચેતન વિકાસ મંડળ

શિવરામપુર, મુ. જુનાગામ, પો. સુવાલી, તા. ચોર્યાસી, જી. સુરત-૩૯૪ ૫૧૦

NAVCHETAN VIKAS MANDAL

Shivrampur, Junagam, Po. Suvali, Ta. Choryashi, Dist. Surat-394 510

R.G.N6. E-1367 Surat Dt. 23-05-1969

પ્રમુખશ્રી

રમણભાઈ બી. પટેલ

ફોન : ૦૨૬૧-૨૮૬૦૭૮

ઉપપ્રમુખશ્રી

ભગુભાઈ એમ. પટેલ

મો. : ૯૮૨૫૦ ૭૯૧૮૬

સેક્રેટરીશ્રી

રમેશચંદ્ર જે. પટેલ

મો. : ૭૩૦૪૭ ૧૦૨૫૩

ટ્રેઝરરશ્રી

ભગુભાઈ કે. પટેલ

મો. : ૯૮૨૫૭ ૯૪૮૪

નવચેતન વિદ્યાલય

શિવરામપુર, જુનાગામ, સુરત.

ફોન : ૨૮૬૨૮૩૬

તારીખ : 28/05/2019

જા.નં. 02/2019-20

પ્રતિ,

શ્રીમાન અનિક દેસાઈ સાહેબ,

સિનિયર વાઈસ પ્રેસિડેંટ (સેન્ટ્રલ સર્વિસ)

લાર્સન એન્ડ ટુબ્રો કંપની લી.

શિવરામપુર સુરત.

વિષય :- <u>નવચેતન વિદ્યાલય D.L.S.S. (ડિસ્ટ્રિક્ટ લેવલ સ્પોર્ટ્સ સ્કૂલ) માટે જરૂરી ભૌતિક સુવિધા પૂરી પાડવા બાબત</u>

સવિનય સહ જણાવવાનું કે નવચેતન વિકાસ મંડળ સંચાલિત નવચેતન વિદ્યાલય, જુનાગામ મુકામે હજીરા કાંઠા વિસ્તારમાં અધ્યતન શૈક્ષણિક સુવિધા હજીરા વિસ્તારના ઉદ્યોગ મૂલોની મદદથી પૂરી કરવા પ્રયત્નશીલ છે. જેમાં એક વધારાનો પ્રોજેક્ટ " સ્પોર્ટ્સ ઓથોરીટી ઓફ ગુજરાત" ના સહયોગથી નવચેતન વિદ્યાલય D.L.S.S. (ડિસ્ટ્રિક્ટ લેવલ સ્પોર્ટ્સ સ્કૂલ) અંગેનું MOU સરકારશ્રી સાથે કરવામા આવેલ છે. જે મુજબ ગુજરાતભરના 250 વિદ્યાર્થીઓ/ ખેલાડીઓને રહેવાની અને જમવાની સુવિધા પૂરી પાડવાની છે.

ઉપરોક્ત સુવિધાઓ પૈકી 125 બોયઝ અને 125 ગર્લ્સ માટેની હોસ્ટેલ સુવિધા ઉભી કરવા માટેનો પ્લાન તૈયાર કરી રજૂ કરીએ છીએ,જે પૈકી 125 ગર્લ્સ માટેની હોસ્ટેલ સુવિધા, અદાણી ફાઉન્ડેશન દ્વારા બનાવી આપવામાં આવનાર છે અને 125 બોયઝ માટેની હોસ્ટેલ સુવિધા એલ એન્ડ ટી કંપની પાસેથી બનાવી આપવામાં આવે તેવી અપેક્ષા રાખીએ છીએ. આ હોસ્ટેલ માટેનો અંદાજીત ખર્ચ રૂ. 4.50 કરોડ જેટલો થવા જાય છે.

અમારી સંસ્થામાં હજીરા કાંઠા વિસ્તારના પછાત વર્ગના બાળકો કોઈ પણ જાતના ભેદભાવ વગર અભ્યાસ કરે છે. હાલમાં અમારી સંસ્થામાં 1100 ઉપરાંત વિદ્યાર્થીઓ ગુજરાતી અને અંગ્રેજી માધ્યમમાં અભ્યાસ કરી રહ્યા છે.જેમાં 250 વિદ્યાર્થીઓ સ્પોર્ટ્સની પ્રવૃત્તિમાં જોડાયેલા છે. સુરત જીલ્લાની સ્પોર્ટ્સ સ્કૂલ સરકારશ્રી દ્વારા મંજૂર થવાથી હજીરા વિસ્તારના બાળકોને આ સ્પોર્ટ્સ પ્રવૃત્તિનો સીધો લાભ મળે છે. એ અમારા માટે ગૌરવરૂપ બાબત છે.

નવચેતન વિકાસ મંડળ

શિવરામપુર, મુ. જુનાગામ, પો. સુંવાલી, તા. ચોર્યાસી, જી. સુરત-૩૯૪ ૫૧૦

NAVCHETAN VIKAS MANDAL

Shivrampur, Junagam, Po. Suvali, Ta. Choryashi, Dist. Surat-394 510

R.G. No. E-1367 Surat Dt. 23-05-1969

પ્રમુખશ્રી

રમણભાઈ બી. પટેલ

ફોન : ૦૨૬૧-૨૮૬૦૭૨૮

ઉપપ્રમુખશ્રી

ભગુભાઈ એમ. પટેલ

મો. : ૯૮૨૫૦ ૯૯૧૮૬

મંત્રીશ્રી

રમેશચંદ્ર જે. પટેલ

મો. : ૯૩૭૪૭ ૧૦૨૫૩

ખજાનચી

પ્રભુભાઈ કે. પટેલ

મો. : ૯૮૨૫૭ ૮૩૮૩૪

નવચેતન વિદ્યાલય

શિવરામપુર, જુનાગામ, સુરત.

ફોન : ૨૮૬૦૮૨૯

હાલમાં અદાણી ફાઉન્ડેશન દ્વારા ગુજરાતી માધ્યમ 0 થી 8 સુધી ચલાવવામાં આવે છે, અને આ વિસ્તારના બાળકોને સારું શિક્ષણ આપવામાં આવે છે. આ ઉપરાંત અદાણી ફાઉન્ડેશન દ્વારા 125 ખેલાડીઓ માટેની ક્ષમતા વાળી હોસ્ટેલની સુવિધા પૂરી પાડવા સહમત થયેલ છે. રીલાયન્સ કંપનીએ પણ રૂ. 1 કરોડ ના ખર્ચે શાળાનું માધ્યમિક અને ઉચ્ચતર માધ્યમિક વિભાગનું મકાન બનાવી આપવામાં મદદરૂપ થયેલ છે.

આથી અમો એલ એન્ડ ટી કંપની પાસે પણ ઉમદા કાર્ય માટે અરજ કરીએ છીએ હાલમાં 100 વિદ્યાર્થીઓની રહેવા માટે આ સાથે જણાવેલ પાદી મુજબની સુવિધા એલ એન્ડ ટી કંપની દ્વારા જુન 10 સુધીમાં આપવામાં આવે તો અમો આભારી થઈશું.

આ સાથે આપ સાહેબને સરપંચશ્રી શિવરામપુર તરફથી અગાઉ તા. 20/11/2019 ના રોજ રજૂઆત થયેલ પત્ર સામેલ કરીએ છીએ.

આભાર સહ

આપનો વિશ્વાસુ,

પ્રમુખશ્રી/મંત્રીશ્રી
નવચેતન વિકાસ મંડળ,
જુનાગામ, પો. સુંવાલી,
સુરત

Logo

NAVCHETAN VIKAS MANDAL

Shivrampur, Junagam, Po: Suvali, Tal. Choryasi, District Surat – 394510

R. G. No. E- 1367 Surat Date 23-05-1969

Emblem of Idol

PRESIDENT
Satishbhai B. Patel
Mob. 9558819728

PRESIDENT
Ramanlal B. Patel
Mob. 8980133191

VICE PRESIDENT
Bhagubhai M. Patel
Mob. 9825099186

SECRETARY
Rameshbhai J. Patel

TREASURER
Bhagubhai K. Patel
Mob. 9825783834

Date : 28/05/2019

Outward No. 02/ 2019-20

To,
Shriman Atik Desai Saheb
Sr. Vice President (Central Service)
Larsen & Toubro Co. Ltd.
Shivrampur, Surat

Sub : Regarding making provision of material facilities necessary for Navchetan Vidhlaya D.L.S.S. (District Level Sports School).

This is to state with request that, Navchetan Vidhyalaya managed by Navchetan Vikas Mandal situated at Junagam has endeavour to provide modern educational facility to industrial units stationed in the coastal areas of Hazira. In that, a MOU in regard to one more project of Navchetan Vidhyalaya D.L.S.S. (District Level Sports School) with co-operation of "Sports Authority of Gujarat" has been entered into with the Government. According to the said MOU, facility of lodging and boarding for 250 students from all over Gujarat has to be provided.

Out of the aforesaid facilities paikee, a plan for setting up hostel facility for 125 boys and 125 girls is prepared and submitted herewith,

out of which the facility of hostel for 125 girls is to be constructed by Adani Foundation, and it is expected that the facility of hostel for 125 boys may be constructed from L & T Company . The expenses for setting up the said hostel is estimated at Rs. 4.50 Crores.

Children from backward class of Hazira Coastal areas are studying in our institution without any discrimination. At present, about more than 1100 students are studying in Gujarati and English medium of our Institution, out of which 250 students have joined the sports activities. As the Sports School of Surat District is approved by the Government, the children of Hazira area are getting direct benefit of this sports activities, which is a matter of proud for us.

At present, 0 to 8 classes are run in Gujarati Medium by Adani Foundation, and the children of this area are given good education. Besides this, Adani Foundation has also consented to provide the facility of hostel having capacity of 125 players. Reliance Company has also assisted in constructing the building for Secondary and Higher Secondary Division at the expenses of Rs. 1 Crore.

Hence, we also seek relief from L & T Company for a good cause. We will be grateful is L & T Company will provide the facilities as

mentioned in the List annexed hereto, upto June 10, for residence of 100 students.

Enclosed herewith please find the letter of submissions dated 20-11-2019 made on behalf of Sarpanch Shri, Shivrampur to You sir.

Thanking you,

Yours Faithfully,

Sd/- illeg.
PRESIDENT/ SECRETARY
Navchetan Vikas Mandal,
Junagam, Po. Suvali, Surat

ANNEXURE 7

SANGHI INDUSTRIES LIMITED

PRE FEASIBILITY REPORT

For

PROPOSED GREENFIELD PROJECT OF 2.0 MTPA STANDALONE GRINDING UNIT WITH BULK & BAG PACKING PLANT

At

Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3;
Village – Shivrampur, Tal. Chauriyasi, Dist.- Surat,
Gujarat - 394510

By
Sanghi Industries Limited
10th Floor, Kataria Arcade, Off SG Highway,
PO –Makarba, Ahmedabad, PIN Code: 370 511
Tele: 079-26838000 FAX: 079-26838111
E-mail: info@sanghicement.com, gjbhatt@sanghicement.com

December 2018

1. PROJECT AT A GLANCE

Company	:	Sanghi Industries Limited (SIL)
Project Concept	:	2.0 MTPA Standalone Grinding Unit with bulk & bag packing plant
Plant Location	:	Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+243 , Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat
Geographical details		

Points	Latitude	Longitude
A	21° 9'0.08"N	72°39'0.68"E
B	21° 8'59.46"N	72°39'1.09"E
C	21° 9'0.78"N	72°39'3.62"E
D	21° 9'0.12"N	72°39'4.09"E
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O	21° 8'54.57"N	72°39'10.56"E
P	21° 8'54.59"N	72°39'9.07"E
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S	21° 8'56.94"N	72°39'1.80"E
T	21° 8'57.07"N	72°39'0.75"E
U	21° 8'58.75"N	72°39'0.36"E

Toposheet No.	:	F43 M/12
Catagory of the Project	:	Project/Activity: 3 (b) –Cement Plant – Category B
Technology	:	Cement grinding process will be based on Vertical Roller Mill (VRM) technology with automatic packer and truck loading facilities
Land Area	:	4.856 Ha or 12.0 Acre
Water Requirement	:	200 m^3/Day (Source: Local Body / GIDC / Bore well)

		Material	Source	Distance in	Mode of Transport
Material transportation, Sources and Distances from site.	:	Clinker	In house from Sanghipuram plant	12 Km from Hazira port	Sea route / Road
		Gypsum	Open Market	200 Km	Road
		Fly Ash	Nearby power	80 Km	Road

			plant		
		Slag	Nearby steel plant	80 Km	Road
		Lignite/Coal/Petcoke	Open Market	200 Km	Road
Basis for assessment	:	Products: PPC , OPC , PSC			
		Product Mix	PPC	OPC	PSC
		Clinker	60%	95%	55%
		Fly ash	35%	-	-
		Gypsum	5%	5%	5%
		Slag	-	-	40%
Power Requirement	:	13.5 MW			
Man Power Requirement	:	Direct + Indirect - Construction: 500 Persons, Operation : 280 Persons			
Nearest Rly. Stn. / Airport	:	Railway Station : Surat (approx.20 Km in NE direction)			
		Airport : Surat (10.00 Km)			
Nearest town/city/DH	:	Surat (approx.16 Kms in ESE direction)			
Project implementation period	:	15 Months			
Cost of the Project	:	INR 28228 Lakhs			
Cost for Environment protection Measures	:	Capital Cost: INR 911 Lakhs		Recurring Cost: INR 21 Lakh/Annum	

2. PREAMBLE

2.1. Introduction

Sanghi Industries Limited (SIL) proposes to set up a green field Standalone Cement Grinding Unit with capacity of 2.0 MTPA with bulk and bag packing plant in the Hazira Industrial Zone, Village Shivrampur, Ta: Choryasi, District-Surat, Gujarat. The project is proposed to be executed in 15 months after granted environment clearance.

2.2. Background

Promotar

Sanghi Industries Limited is the flagship company of The Ravi Sanghi Group dealing in the production and distribution of Cement under the Brand Name "Sanghi Cement". Sanghi Cement was commissioned in 2002 with one of the world's largest single stream Cement Plant located at Sanghipuram in the Abdasa Taluka of Kutch District of Gujarat State. This plant is fully automatic with state-of-the-art technology from Fuller International, USA and having present capacity of 4.0 MTPA. The company produces superior quality 53 Grade OPC, PPC and PSC Cement and have revolutionized the way cement is produced and sold in India.

SIL intend to augment its cement plant capacity by putting up new cement manufacturing plant as per following.

S.No.	Plant / Facilities	Capacity	Location
1	Clinker plant	From 3.5 to 7.5 MTPA	Existing Location at PO:

2	Cement Plant	From 4 to 8.6 MTPA	Sanghipuram, Ta: abdasa, Dist: Kutch
3	Split Cement Grinding Unit	2.0 MTPA	New Location at Hazira Industrial Zone, Village Shivrampur, Ta: Choryasi, Dist: Surat

The company has obtained environment clearance from MoEF&CC, New Delhi for capacity expansion of existing plant located at Sanghipuram on 1st May 2018. Now, SIL intend to setup split cement grinding unit with packing plant in Surat. The project has been conceived on the basis of following considerations:

- ✓ Better customer satisfaction by reducing lead time
- ✓ Reduction in logistics cost & Utilization of Sea route transportation
- ✓ Regular, sustainable and reliable availability of additives like Slag, fly ash & Gypsum
- ✓ State of the art technology and using standard norms for investment.

Proposed Location

State Gujarat is located in the western part of India. The Capital is Gandhinagar and largest city is Ahmedabad. Gujarat is bordered by the Arabian Sea towards West, Pakistan to the North, Rajasthan to the east, Madhya Pradesh to the south-east and Maharashtra to the south.

On the west coast of India, the state of Gujarat has the longest coastline in India endowed with rich natural resources, a vast reservoir of skilled manpower and the most developed industrial infrastructure, the State contributes significantly to the economic development of the nation. Gujarat has become the most preferred destination for industrial investment.

Area	196,024 sq.km. (6 % of India)
Capital	Gandhinagar
Climate	Tropical
Population	6.04 Crore as per 2011 Census (4.99% of India)
Urbanization	43%
Population Density	308 persons per sq.km
Official Language	Gujarati
Net State Domestic Product	6,70,016 crore (US$ 114 bn)
Share of secondary sector in SDP	35.1% at current prices
Per capita income (in 2012-2013)	Rs. 96,976 = US$ 1622

Man Power

Gujarat is known for its enterprise and symbolizes the growth engine of India. Government of Gujarat has undertaken speedy reforms and continues to intensify estates, 60 approved Special Economic Zones, 21 registered Industrial Parks and 83 identified Industrial Clusters; Gujarat has generated vast scope for employment of technically competent manpower.

Industrial Development

The Industrial Policy aims at the comprehensive social and economic development of Gujarat. The Policy focuses on making Gujarat an attractive investment destination of choice, not only in India but also in the world. The primary policy objectives are (1) Facilitating investment in the state (2) Employment generation and employability enhancement (3) Adherence to high quality standards.

Industrial Infrastructure

Gujarat Industrial Policy lays emphasis on infrastructure development. The Industrial Policy seeks to create adequate provisions which aim at upgrading and improving the status of infrastructure in the State. In recent years, Gujarat Industrial Development Corporation (GIDC) has taken up many initiatives for upgrading the infrastructure of industrial estates and some of the measures taken up include categorization of existing estates, facelift of existing infrastructure, leveraging from critical infrastructure scheme and implementation of appropriate cost recovery mechanism.

Environment Protection Measure & Infrastructure

The Industrial Policy of State Government lays emphasis on inculcating systematic approach among the industries for holistic development that includes environment management as infrastructure. The earlier schemes for assistance to Environment Protection Measures and Infrastructure have emphasised upon setting up of common environment infrastructure plants viz. Common Effluent Treatment Plants (CETPs) and Treatment, Storage & Disposal Facilities (TSDFs).

Looking in to the potential market and industrial benefits, SIL has committed to contribute to enhance the cement capacity in the State of Gujarat while protecting ecology environment of the region.

2.3. Need for the project and its importance to the country and region

Industrialization is the better way for growth & employment & also it is a strategic location connecting Indian markets. The industrialization and infrastructure growth have to go hand in hand. Cement is major component in infrastructure growth. Total Cement production in the area and nearby state does not match the demand growth and hence new capacities have to come up concurrently. The proposed plant will ensure that the supply situation in Gujarat is comfortable in the coming times, as growth is expected to propel demand.

SIL is known for its environment friendly initiatives across sectors it operates in and strong reputation for sustainable growth. Disposal of fly ash is an environmental concern which is faced all coal based thermal power generating plants. Cement grinding can consume up to thirty five percent of fly ash produced in the power plants and thus reduce environmental concern.

The cement projects planned by SIL would also generate immense employment opportunities and significant contribution to the state & central exchequer., improvement of socio economics of the area by way of education, improving infrastructure facilities such as roads, transport, improvement in Drinking water supply, Medical facility etc. The company is committed to the development of the country and will put all efforts for comprehensive development of this area also as being practiced by us at other establishments.

2.4. Future Demand & Domestic / export Markets

The total cement market size of Gujarat is estimated at approximately 22.5 million tons in FY 17 with key demand centres at Surat, Bharuch, Vadodra and Ahmedabad. The key players operating in this region are Ultratech, Ambuja, J K Lakshmi and Birlaa cements. The demand in these markets is expected to growth at around 8% for the next decade.

Optimized logistics have been a key challenge for the players in this region and low cost logistics both in term of inbound for raw material and distribution cost will be the key success factor in this region. Leveraging on the existing railway infrastructure and utilization of low cost sea logistics is expected yield greater advantage.

2.5. Imports vs. Indigenous production

Cement additives will be sourced from the nearest markets available

Export Possibility

Currently there are no export plans from the project. Major production will be consumed in the state of Gujarat & Maharashtra.

Domestic/ Export Markets

The proposed cement production will cater to the cement demands in the state of Gujarat & Maharashtra.

3. RAW MATERIALS

The raw materials for production of Portland Pozzolana Cement (PPC)/ Ordinary Portland Cement (OPC) / Portland Slag Cement (PSC) are Clinker, Gypsum, Fly ash and Slag. Lignite/Coal/Petcoke is required to dry Slag from moisture.

3.1. Clinker

Clinker shall be sourced from in-house Clinker manufacturing unit at Sanghipuram, Kutch. Clinker shall be added in the range from @ 61 to 95% depending types of product mix. Clinker shall be transported by sea route to the Grinding Unit.

3.2. Gypsum

Gypsum shall be obtained from nearby market for grinding unit. Gypsum shall be added @ 5% in cement manufacturing process. Gypsum shall be transported in trucks. Marine as well as chemical gypsum shall be used in the process

3.3. Fly Ash

Fly Ash will be sourced from Thermal power plants in the vicinity. Fly Ash shall be added @ 35% in Portland Pozzolana Cement (PPC). Fly Ash shall be transported in Pneumatic/Belt/Pipe Conveyor/ Road from the nearby thermal power plant to cement grinding unit.

3.4. Fuel - Lignite/Coal/Petcoke

Lignite/Coal/Petcoke will be required as fuel in Hot Air Generator (HAG) for Slag drying while production of PSC and will be sourced from open market. The fuel will be required @3 % in the process. The appropriate storage, handling and grinding system will be installed separately for required fuel.

6. LOCATION AND INFRASTRUCTURE

This chapter covers aspects of plant location and requirements/ availability of infrastructural facilities such as land, access & approach, raw materials, utilities and communications for the proposed grinding unit at Hazira Industrial Zone, Shivrampur Village, S.No. 125/1, 125/2,126/1+2+3; Tal. Chauriyas: Dist.- Surat in Gujarat. Map showing Location, Google image, 10km radius area and plant layout of the proposed project is shown in Figure 1, 2, 3 & 4 respectively.

Site Selection Criteria

The selected plant site is located within the land which is purchased by the company for the purpose. The site has following facilities:

- Access to nearby port infrastructure for inward transport of raw material (clinker)
- Proximity to the sources of other raw materials such as Gypsum, fly ash & Slag
- Availability of infrastructure facilities / utilities (water / power etc.) in the area
- Availability of land, approach roads & accessibility (Land already under possession of SIL and hence no R&R issues)
- Suitable topography of land and geological aspects
- Proximity to rail head, sea port and transport logistics Safe from site flooding possibility
- No archeologically important heritage monuments are located within 10 km radius.
- No declared biodiversity parks/sanctuaries are in the surroundings of site.

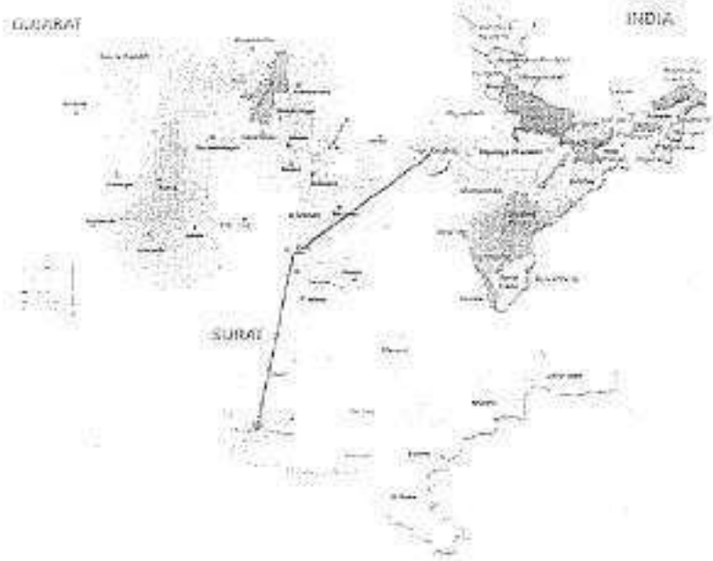

Figure 1: Site Location Map

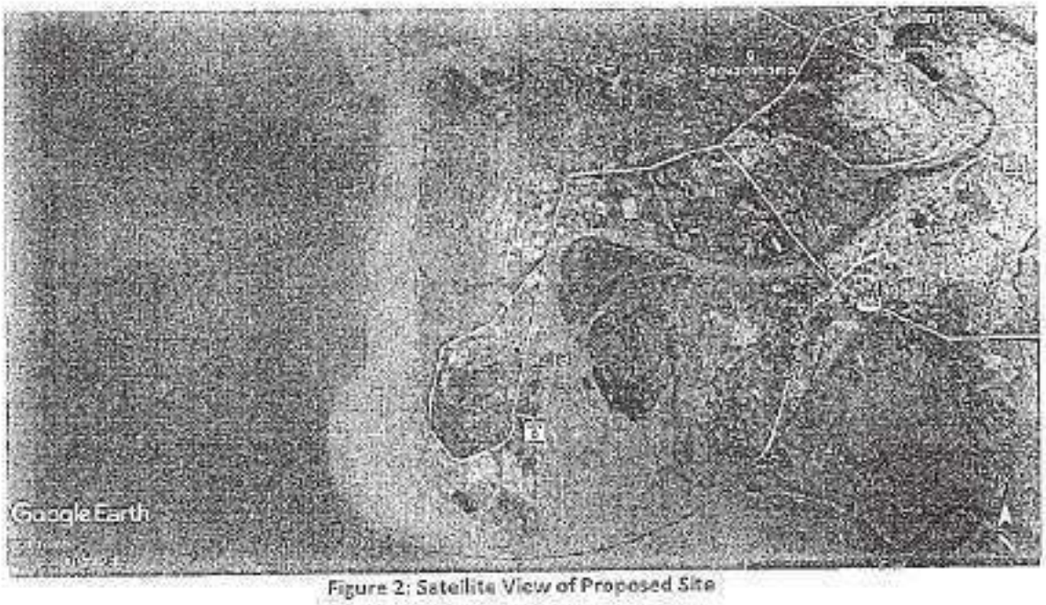

Figure 2: Satellite View of Proposed Site

Sangth Industries Ltd
S.No 125/1,
125/2, 126/1+2+3
Shivrampur
Choryasi, Surat
Gujarat- 394510
Study Area Map
10 km Radius

Location Map

Index Map

ECO CHEM SALES & SERVICE
Surat, Gujarat
Data : Survey of India Toposheet

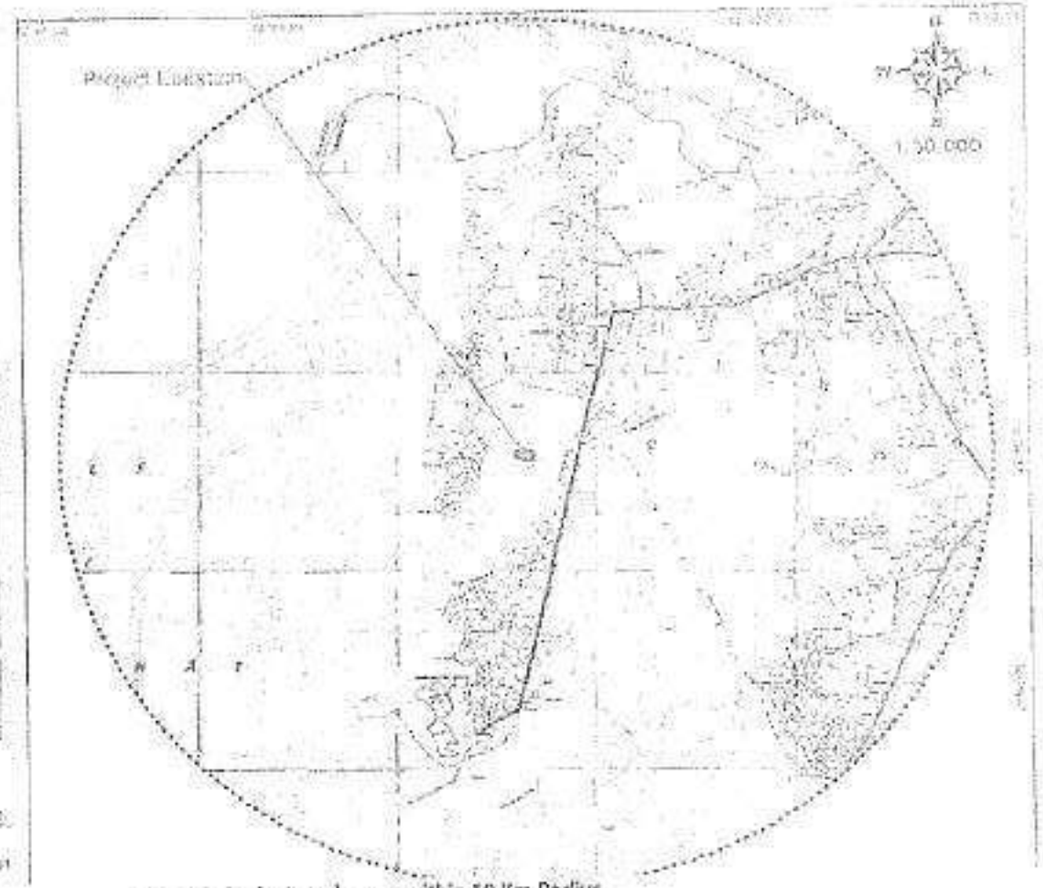

Figure 3: Project study area within 10 Km Radius

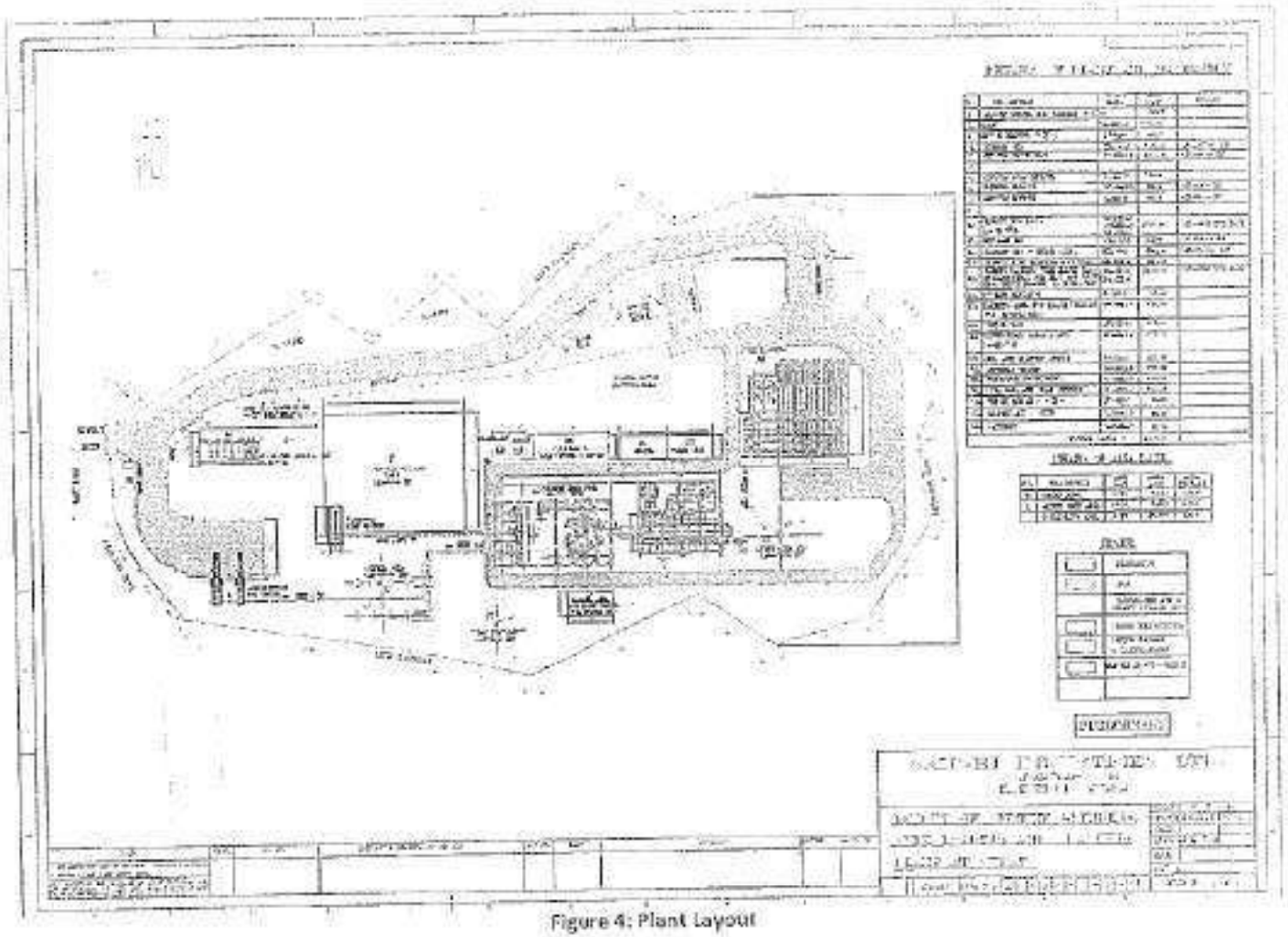

Figure 4: Plant Layout

4.1. Site Coordinates

Points	Latitude	Longitude
A	21° 9'0.08"N	72°39'0.58"E
B	21° 8'59.46"N	72°39'1.09"E
C	21° 9'0.78"N	72°39'3.62"E
D	21° 9'0.12"N	72°39'4.09"E
E	21° 9'0.81"N	72°39'5.20"E
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T	21° 8'57.07"N	72°39'0.75"E
U	21° 8'58.75"N	72°39'0.36"E

4.2. Plant location

The Cement Grinding unit is proposed to be located in the Hazira Industrial Zone, S.No. 125/1, 125/2,126/1+2+3; Village: Shivrampur, Ta: Choryasi, Dist: Surat of Gujarat, and is about 7.26 kms north east of Adani hazira Port. It is flanked by Surat Station of Western Railway on the east, local roads to village Mora on the north. The site falls under seismic zone III. The maximum ambient temperature is about 25°C and the annual mean relative humidity is 65.6%. The nearest airport is Surat airport.

4.3. Climatic Condition

Average Temperature	Relative Humidity	Average Rainfall
Max - 33.6 °C Min - 15.5 °C	67 % to 75 %	39 mm

4.4. Land Area Details

The total area for the unit is 48563 sq m.

S.No.	Unit	Area (Ha)	Area (Acre)
1.	Plant & Machinery, Roads, Parking Bay	3.256	8.050
2.	Green Belt	1.6000	3.950
Total		4.856	12.000

4.5. Input Materials

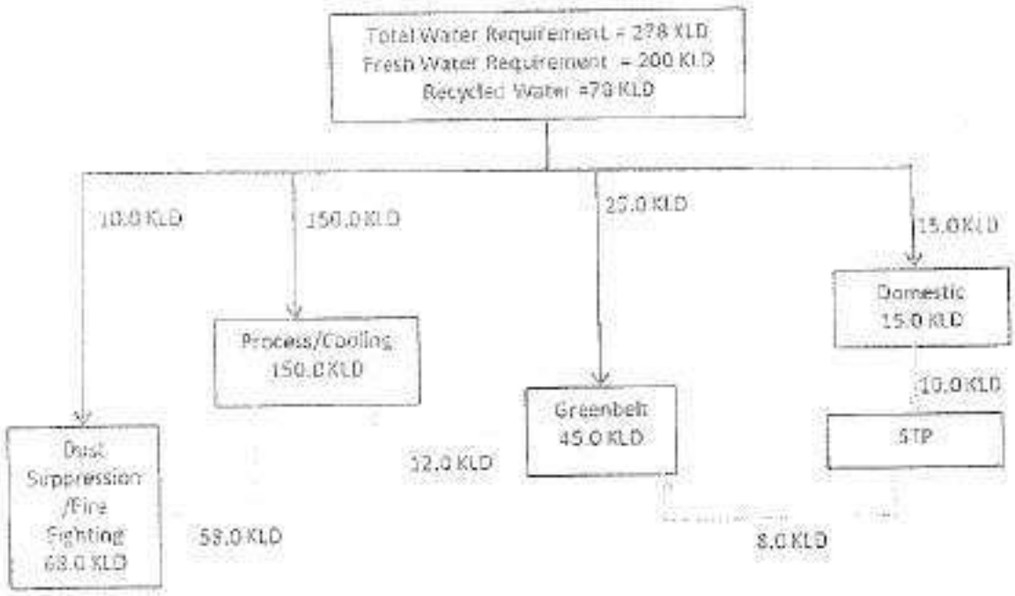
The details of the input materials required, their sources, transportation mode and their quantities for proposed cement plant are as given below.

S.No.	Material	Requirement per Annum - Million Ton/Annum				Source	Transportation Mode
		100% OPC	100% PPC	100% PSC	Max per Annum		
1.	Clinker - OPC	1.90	--	--	1.90	In house from Sanghipuram plant	Sea / Road
	Clinker - PPC	--	1.20	--			
	Clinker - PSC	--	--	1.10			
2.	Gypsum	0.10	0.10	0.10	0.10	Open Market	Road
3.	Fly Ash	--	0.70	--	0.70	Nearby Power Plant	Road
4.	Slag	--	--	0.80	0.80	Nearby Steel plants	Road
5.	Lignite / Coal / Petcoke	--	--	0.06	0.06	Open Market	Road

4.6. Utilities

Power- The maximum estimated power demand for the proposed grinding and packing plant is estimated as 13.5 MW. The power requirement for the grinding unit shall be met from dedicated connection from the State Grid may be taken based on economics. Suitable step down transformer or other infrastructure may be installed, if required.

Water- the water requirement is estimated as 200 m3/ day. Water is required for equipment cooling, drinking, sanitation, Dust Suppression, Green belt etc. Primarily, water requirements for the unit shall be met by local body / bore well. For plant equipment, water shall be re-circulated to avoid any wastage and only losses shall be making up from fresh water. The water balance diagram is given below:



Waste water =
Recycled Water =

Compressed air supply- Compressors and blowers have been envisaged for operation of process equipment. The compressed air is also used for various bag filters installed to minimise air pollution and diverting gates, valves, blasters etc. Blowers are mainly used for aeration of silos.

Central Control Room (CCR) - A CCR building is envisaged to be constructed at site. This building can be located near cement mill section. Operation of the cement mill & Packing Plant will be carried out from this control room.

Manpower Availability- Since, there are many industries operating in this belt and therefore the required skilled manpower can be sourced easily.

5. TECHNICAL CONCEPT

5.1. Introduction

This chapter covers the broad technical concept for the proposed Standalone cement grinding unit at Hazira Industrial Zone, Village – Shivrampur, Choryasi, Surat, Gujarat to produce 2 MTPA cement. In this part, the details of plant capacity, size and type of main machinery & storages, design of various systems and a suggested plant layout have been given for various sections. The coverage includes process, mechanical, civil, electrical & instrumentation engineering aspects. Based on the technical concept, plant layout is enclosed. For preparing the technical concept, the requirements of quality, pollution control, plant maintenance and utility services have also been considered.

5.2. Basic

5.2.1. Raw Materials

As described in Chapter 3, the raw materials of cement have clinker 60 %, Gypsum 5 %, Fly ash 35 % and Slag 40 %. These values have been used as a basis for this report. Moisture in gypsum 12% Moisture in Fly ash 1% Moisture in Clinker 1%

5.2.2. Main Machinery Sizing

S.No.	Section	Operating Hrs per day	Days operating per year	Safety Factor
1.	VRM	21	330	1.15
2.	Packing Plant	16	350	1.25

5.2.3. Main Storages

S.No.	Department	Stock in Days	SN	Department	Stock in Days
1.	Clinker Storage	07	4	Cement Storage	03
2.	Fly Ash Storage	01	5	Slag Storage	03
3.	Gypsum Storage	15	6	Fuel	07

5.3. System Detail

5.3.1. Clinker transport & storage-

Clinker shall be sourced from own captive production unit in Sanghipuram, Kutch Gujarat, transported by way of ships unloading at Adani Hazira Port. From port the clinker shall be transported by way of road to the cement grinding unit. The clinker will be unloaded through truck tipplers and a surface feeder, which is further conveyed to clinker storage silo of capacity approximately 25,000 Ton.

5.3.2. Gypsum transport & storage-

Gypsum can be sourced from nearby local market will be transported through road and unloaded by truck tippler and stacked in the covered gypsum stock yard (6000 Ton)

5.3.3. Fly ash / Slag transport & storage-

Fly ash / Slag can be sourced from nearby thermal power plants / Steel Plants through the Bulkers / trucks through road transport. The fly ash will be stored in Silo of 3000 MT capacity and the slag will be stored in stock yard (6000 Ton)

5.3.4. Fuel transport & storage-

Lignite/Coal/Petcoke can be sourced from open market will be transported through road and unloaded & stacked in the covered stock yard (500 Ton)

5.3.4. Cement grinding process & Process Flow Diagram –

Clinker and additives like Gypsum, Fly ash & Slag shall be filled in to the respective hoppers through suitable material handling system. SIL has proposed to install 1 x 335 TPH Vertical roller mills for cement Grinding. A arrangement for cement mill is considered for clinker storage, additive storages,

Cement storage and packing plant. Clinker unloading and bagged cement loading to trucks for road transport is proposed along with bulk cement loading facility in the plant.

The grinding, drying and classification of the grinding material is performed inside the mill. The horizontal grinding table is rotated by a gear box. Feed material falls onto the center of the grinding table and spreads outwards under the effect of centrifugal force. The material passes under the hydro pneumatically spring-loaded grinding rollers, which grind the material by the application of compressive force and shear force. As it is ground, the material flows over the dam ring and enters the fast moving hot gas stream rising from the louvre ring which surrounds the table. The rising hot gas stream carries the ground material upward through the mill body to the classifier, which is directly located on top of the mill body. Through contact with hot gas the moisture of the ground material evaporates. The classifier controls the size of particles permitted to leave the mill. Those particles which are coarser than required are rejected to the table for re-grinding via a grit cone below the classifier rotor. The particles which have reached the necessary fines pass the classifier.

Hot air required for the purpose of drying of moisture in Slag / Gypsum shall be generated by Hot Air Generator. HAG shall meet the drying heat requirement of Cement Grinding mill. Lignite/Coal/Petcoke will be required for such purpose is being sourced from open market. The fuel will be transported to the plant site by road. Solid fuel will be stored at closed yard. The fuel will be fed to a crusher of 20 TPH capacities through a belt conveyor. Crushed coal will be fed to HAG.

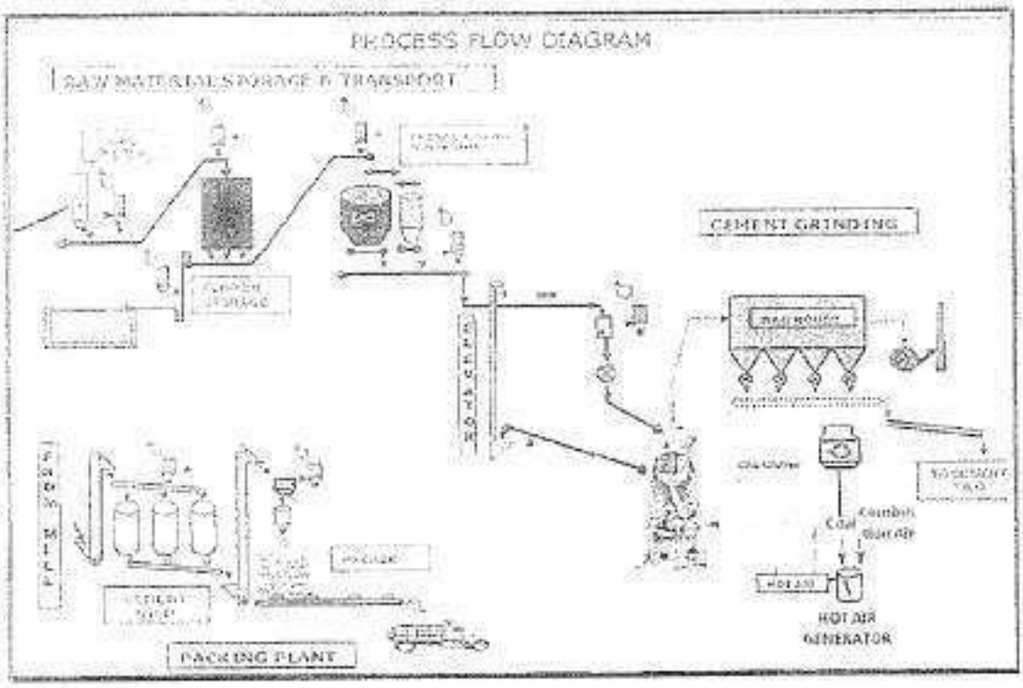
The exhaust of VRM fan will be connected with bag filter. Product collected at bag filter shall be transported to the cement silo through a set of air slides and bucket elevator.

5.3.5. Cement storage-

Multi compartment RCC silo of capacity 20000 ton shall be constructed for storage of cement.

5.3.6. Cement packing-

The cement from silos will be extracted and fed to the installed 2 no's of electronic packers, sixteen spout, double discharge with a capacity of 240 TPH each through air slides, bucket elevators and screens. Each packer will be connected with 6 nos. truck loaders for loading packed cement bags. The packed bags from packers will be transported to truck loading bays by suitable flat belts conveyors and diverters. A separate provision will be also available to load bulk cement through closed tankers / jumbo bags.



5.3.7. Quality control-

The quality control department at the proposed plant shall have the following facilities:

Chemical / Physical Analysis laboratory

Facilities for testing the physical properties like sieve analysis, setting time, soundness, fineness, CCS, Grindability, moisture content, drying shrinkage, etc. X-ray diffractometer (XRD) and conventional chemical analysis equipments are envisaged for the analysis. To determine the PSD of the clinker, cements, etc. a laser diffraction type PSD analyser will be installed having typical particle size range of 0.3 mm 400 micron.

Quality Control Plan

To produce good quality cement, it is imperative that sampling & testing of various raw materials like clinker, gypsum, fly ash, Slag and the final product is carried out regularly at the required intervals for taking corrective action timely as per standards. To ensure consistent product quality and to permit the trouble free and cost effective operation, the quality control plan for sampling & testing of various raw materials, in-process materials and the final product is suggested. While proposing the methods and procedures for quality control, the following aspects have been taken into account.

Requirements and norms, particularly in cement testing

- Corrective measures to be undertaken as quickly as possible in the process operation.
- Desired degree of automation.
- Available raw materials and process equipment.
- The main area of quality control has been envisaged as Before Cement Mill, After Cement Mill & Laboratory

The laboratory will be accommodated in the Central Control Room (CCR) building at the proposed plant site. The laboratory shall have the provision of chemical and physical testing facilities for raw materials, clinker, gypsum, fly ash, Slag and cement.

5.3.8. Maintenance

Workshop- A mechanical and an electrical workshop is envisaged to take care of the regular maintenance/ repair jobs in the plant.

Central stores- A store building needs to be constructed for storing tools, spare parts, consumables, etc. Open area to be earmarked for storing machinery and construction materials for the proposed grinding unit site.

Cranes, Monorails and Pulley blocks-Adequate sized maintenance cranes/ hoists, monorails and pulley blocks to be provided at all suitable locations at the plant site for ease of maintenance and operation.

5.3.9. Miscellaneous services

- Technical & Laboratory/QC office- A suitable technical office & laboratory / QC office shall be constructed for the project activities and operation phase.
- Administrative & Time and Security office- A suitable administrative, time & security office shall be constructed for the project activities and operation phase.
- Dispensary- A small dispensary with first aid facilities will be provided in the plant premises.
- Fire fighting system- Fire detection and extinguishing system shall be provided in all buildings.
- Weighbridge- Two nos. electronic weighbridges are envisaged to take care of the incoming and outgoing materials at site. These may be located near the main entrance of the plant sites.
- Bags Godown- Space shall be provided in the packing plant for the storage of empty bags.

5.3.10. Environment

- Plant landscape and green belt- Due care has to been taken to keep-up the natural settings/ greenery in and around the plant .A thick green belt shall be developed in and around the plant.
- Pollution control equipment / Measures- The installation of the following pollution control equipment / measures is foreseen:

- ✓ Provision pulse jet bag house of Cement mill
- ✓ Provision Closed sheds/silos for raw and finished materials.
- ✓ Provision of de-dusting Bag filters at all transfer points, water spraying etc.
- ✓ Provision of Regular monitoring of ambient air quality and ground water quality and suitable measures shall be planned time to time to minimise the impacts.

5.4. Civil Engineering Considerations

5.4.1. Introduction

This section covers the site condition and design criteria considered for designing the various plant structures.

5.4.2. Condition

Topography- Based on topography of the site area, no major work is envisaged towards grading and levelling of the site.

5.4.3. Civil Construction Criteria

- Excavation- Excavation levels shall be required specific as per design. Mechanized means for excavation shall be employed. Enough care shall be taken to avoid excess excavation.
- Back filling- Excavation products of soil can be used directly for back filling after boulders and other objectionable material have been removed. Back filling material should be free of organic materials, clay balls, and kind of constructional or non-constructional debris, and other objectionable inorganic matter. Back filling should be done in layer of not more than max. 300 mm and each layer should be well watered and compacted by mechanized and manual means. The boundary of any compacted back-fill material shall be extended at least 1.00 m (0.05 m from both sides) beyond the foundation footprint.
- Foundation- Isolated or strap foundation footings are envisaged at this stage for lighter structures. The dimensions of isolated footing at least be 300 mm more than that of RCC column

5.5. Electrical

5.5.1. Power distribution system

- Power source and power demand- The power demand for grinding unit has been estimated at about 13.5 MVA. The power requirement for the grinding unit shall be met by a dedicated supply line from state electricity board at 66 KV shall be stepped down to 11 KV / 6.6 KV with suitable step down transformer.
- Construction power- The construction power is envisaged to be made available from state electricity board.

5.5.2. Madium voltage (11 KV / 6.6 KV) power distribution and load centres

Distribution system 11 KV / 6.6 KV- SF6/ Vacuum circuit breakers shall be used for Incomers, Bus Couplers, outgoing distribution feeders, motor feeders and transformer feeders. Each circuit shall have the necessary metering and protection to suit the application. In case of vacuum switch gears, the motor feeders shall be provided with surge protection.

5.5.3. Low voltage (415 V) distribution and motor control centres

LT Distribution Board 415 V- 415 V LT Distribution boards have been suitably considered at the load centres. The LT switchboards are considered with fully draw out, motor operated air circuit breakers with necessary safety features to facilitate safe operation and easy maintenance.

Motor control centres (MCCs)- Functional MCCs i.e. MCC controlling a group of interconnected and simultaneously operated loads during the process are envisaged. All the MCCs considered shall be fully drawn out type. Each vertical panel of MCCs will incorporate related Input/ Output modules and communication modules. These shall be connected to the respective CPU through serial data.

5.5.4. Drives for the grinding unit

The type of drives considered is based on following requirements:

- Load Characteristics
- Starting Torque
- Operating characteristic i.e. high power factor and efficiency at operating points
- Accuracy and range of speed control required for specific applications.

All Motors, 200 kW and above shall be connected at 11 KV / 6.6 kV and motors below 200 kW at 415 V. Power saving equipment like variable frequency drives are taken into consideration for drives to have added economy in energy cost as well as to achieve precise speed control.

5.5.5. Power factor improvement for the grinding unit

For maintaining a high overall plant power factor (PF) and in order to reduce the demand charges, static power factor improving capacitors of suitable kVAR rating and voltage grade are considered.

In the envisaged scheme, suitable size capacitors have been considered for direct connection across stator switch terminals of respective 11 KV / 6.6 kV motors. For compensation of LT load, multi – step automatic controlled capacitor banks have been considered for connection at Main LT switchboards. The capacitor banks are sized to maintain the overall plant power factor of about 0.98 lag.

5.5.6. Earthing for the grinding unit

Adequate provision of sub-station earthing and earthing of high and low voltage equipment have been considered for the safety of operating personnel as well as for proper system operation as per requirements of Indian Electricity Rules and IS : 3043.

5.5.7. Illumination for the grinding unit

An efficient illumination scheme for inside and outside buildings shall be provided. Sufficient number of lighting boards and distribution boards are considered for lighting of various locations of the plant.

5.5.8. Fire detection and alarm system

For detection of fires in electrical buildings, ionization type dual chamber/dual source smoke detectors will be used where incipient fires are likely, e.g. in cable cellars, switch gear rooms, control rooms etc. Fixed temperature cum rate of rise type heat detectors will be installed in transformer rooms, battery rooms etc.

Multi zone type fire alarm panels will be installed in the electrical buildings. The fire detectors will be wired in zones. On detection of fire/fault in any zone, audio visual alarm will be sounded in control panel and also by electronic hooters fixed in various locations in the electrical buildings. The alarm shall also be sounded at the central position.

5.5.9. Cable & cable laying for the grinding unit

Following type of cables are proposed to be provided in the plant.

Power(HT)	:	11 KV / 6.6 KV, armoured, XLPE insulated aluminium cables
Power(LT)	:	1.1KV, armoured, PVC/Alternatively XLPE) insulated aluminium cables
Control	:	1.1 KV grade, unscreened, armoured, PVC insulated, copper 1.5 & 2.5 sq. mm
Instrumentation	:	1.1 KV grade, unscreened, armoured, PVC insulated, copper 0.5 & 1.0 sq. mm

5.6. Control & Instrumentation

For effective control of various process variables, integrated & distributed microprocessor based, control & instrumentation system has been considered keeping in view the following objectives:

- Dependable and rugged instrumentation network
- Maximum protection against dust and vibration
- Operational safety
- Easy maintenance and repairs
- Flexibility to adopt future development/modifications
- Optimum operational efficiency and good quality product
- Maximum standardization to keep the inventory low

The control and instrumentation system envisaged incorporates the following essential features for safe operation of the plant and machinery and provides necessary operating data to evaluate the operating performance and fault monitoring.

- Suitable programmable logic control (PLC) system for sequence interlocking and automatic closed loop control through PI and PID action.
- Control of electronic weigh feeders for desired proportioning and feed rate.
- Sequential start/ stop of plant sections through process level PC controls, when the local/ remote switch at individual drive of the sequence is in remote position.
- It shall be possible to stop any drive from the field for safety reasons, from the local push button station near the drive or through safety switches.
- Color graphic and alphanumeric display with equipment fault monitoring system.
- Log trends for selected process parameters.
- Display of important process data.
- Printers for event/ alarm list(s) and report generation.

- Hard copy printer for print out of display at VDU.

5.6.1. Central control system for the grinding unit

Integrated and distributed hierarchical digital controls for centralized monitoring and control from central control room (CCR) have been envisaged. The central control system is structured into 4 level hierarchical configurations as given below:

- Level —1 (Field Level) - At field level the instruments and sensors have been installed in accordance with P & I diagrams. For certain systems e.g. mills, silos, weighing systems etc. control systems are also located in the field.
- Level — 2 (Department Control Level) - Using the process stations with their process input/ output devices assuring the safe operation of machines and of the production process.
- Level — 3 (Supervisory Level)- Using operator station having supervisory processor with visual display unit, keyboards, mouse, printers & hard copier etc.
- Level — 4 (Optimization and Information Level- Future)- The Management Station shall be capable to handle monitoring functions for the plant management and to provide tools for the optimization and the strategic planning/ control of production. Management stations are envisaged such that the plant operations are maintained during shut down periods of these stations.

5.6.2. Programming terminal

One programming device with necessary VDU & keyboard for programming from operator level processor or process level PCs has been considered. Hand held terminals shall also be provided for word and bit examination and alteration and I / O bit forcing at process level.

5.6.3. Process/ Instrumentation

Necessary field sensors shall be installed to monitor process variables like pressure, temperature, flow, level, speed, etc. The sensors shall be linked to plant control system through field transmitters/ transducers to display the parameters on operator station and exercise the desired controls. The broad technical features of sensors and instruments are described as follows:

- Pyrometers- For temperature measurement in hot zones non-contact type radiation pyrometers are proposed to be used. Pyrometers would include air purging and water cooling arrangements.
- Level sensors- Specially designed level sensors will be deployed for monitoring and control of material level in clinker discharge hoppers. RF admittance type sensors would be used for point level control. For continuous level monitoring, ultrasonic/ electromechanical type of instruments would be used.
- Speed switches- These are proposed to be deployed for achieving zero speed protection for various equipment. The unit chosen would have built in initial by-pass time delay and designed to operate over a range of speeds. The primary sensor would be non-contact type designed to achieve unlimited number of operations. The unit as well as sensor would have a high degree of environmental protection.

- Dust monitor: A microprocessor based monitoring device would be deployed which will provide concentration of particles in each stack. The equipment would have a built in air purge system.

6. HUMAN RESOURCES

6.1. Introduction

The Human requirements have been separately provided for the following two phases:

- Project implementation phase.
- Plant operation phase.

6.2. Basic

The details recommendation for each phase has been taken into consideration the following:

- Project technical concept.
- Smooth and efficient plant operation,
- Optimum organization with well-defined job responsibility.
- Optimum utilization of different levels of workmen and supervisory staff.
- Training needs of the personnel, wherever required, will be undertaken at training and development cell.
- Manpower requirement in certain categories like fitters, welders, crew members, helpers, peons, canteen staff, guest house attendants, etc. can be met through contractor(s). Certain activities may be assigned to specialized agencies/ contractors. These may include loading-unloading, plant cleaning job, packing, and security for plant.

6.3. Project Implementation Phase

For the project implementation phase, the required resources will be sourced from concerned executing contractors.

6.4. Plant Operation Phase

For the plant operations the required resources will be sourced from concerned contractors or by our group units, further locals manpower will be utilized as per the skills.

6.5. Employment Generation (Direct and Indirect) due to the project

Direct and indirect employment will be generated due to the project. The total manpower requirement (Direct + Indirect) for the project is estimated as 500 persons during construction phase & 280 persons during operation phase. Unskilled/ semi-skilled manpower can be sourced from the local area and skilled manpower shall have to be sourced from outside/ local.

Particulars	Construction Phase			Operation Phase		
	Direct	Indirect	Total	Direct	Indirect	Total
Skilled	45	280	325	20	30	50
Semi – Skilled		100	100		125	125
Unskilled	5	70	75	5	100	105
Total	50	450	500	25	255	280

7. PLANNING & IMPLEMENTATION

7.1. Planning (Pre Project Activities)

It is proposed that pre project activities be taken up at first instance, immediately after investment decision is taken. The pre project activities include:

- Investment decision
- Appointment of technical consultants
- Preparation of tender documents
- Balance site studies viz geo technical, EIA, EMP etc
- Obtaining statuary

7.2. Implementation Schedule (Project Activities)

The implementation period has suggested 15 months for project execution activities after placement of main machinery order until the plant commissioning. The detailed time schedule for project execution after placement of main machinery order up to commissioning of the plant, in the form of bar charts is given below.

Sr	Project Activity	Period in Months	Period in Months
1	[illegible]	Zero Date	
2	[illegible]	2	
3	Contract finalization & work started	3	
4	Local civil GA for work by contractor	4	
5	Equipment GA drawings	3	
6	Foundation, civil & construction drawings	7	
7	Civil construction	10	
8	Imported machinery supply	4	
9	Indigenous machinery supply completion	10	
10	Electrical erection	7.5	
11	Piping erection	5	
12	Commissioning of plant	3.5	
13	Trial run and commercial production of plant	1.5	

7.3. Project Cost

The estimated capital cost of the project is Rs. 28228 Lakhs inclusive of capital expenditure estimated for Pollution Control Measures as Rs.911 Lakhs.

S.No.	Description	Rs. Lakhs	S.No.	Description	Rs. Lakhs
1	Land & Site Development	3819	6	Engineering & Know How	130
2	Civil works & Structures	7623	7	Lab equipment/set up	0.50
3	Plant & Machinery	13334	8	Expense on Training	10

4	E & I Installation	2390	9	Contingency	0.50
5	Env. Management system	911	Total		28228

8. ENVIRONMENTAL MANAGEMENT PLAN

8.1. AIR ENVIRONMENT

- All major sources of air pollution will be provided with Bag houses & Bag filters to maintain emissions within the prescribed norms i.e. 30 mg/Nm3 for particulate matter emission from the stacks.
- Bag filters will be provided at all loading /unloading points and transfer points.
- Raw materials will be transported through closed belt conveyors, bucket elevators, air slides etc.
- Clinker will be stored in closed clinker silo; Gypsum is stored in covered shed and cement in Cement Silo, Fly ash will be stored in silos and closed shed.
- Proper maintenance of vehicles will be done to reduce gaseous emissions.
- Operators will be provided with personal protective equipment like safety Goggles, dust mask, ear plugs, helmets etc.
- Periphery of plant and surrounding areas of office building will be covered by thick green belt to attenuate the pollutants emitted by the Plant.
- Ambient air quality and stack emissions will be regularly monitored to keep emission levels below the prescribed limits.
- Proposed air pollution control equipments is listed below:

S.No.	Location	Qty. Nos.	Capacity	Stack Details
A.	Main Process Bag house			
A1	Cement Mill (VRM)	01	9,00,000 m^3/hr	Height – 55 m Dia – 2.7 m
A2	Hot Air Generator	01	10,000 m^3/hr	Height – 30 m Dia – 1.8 m
B.	De-dusting Bag filters			
B1	Clinker unloading station	01	11,000 m^3/hr	--
B2	Clinker Silo top	03	5,000 m^3/hr (each)	--
B3	Cement Silo top	03	3,000 m^3/hr (each)	--
B4	Cement extraction under silo	03	3,000 m^3/hr (each)	--
B5	Packing plant top	01	45,000 m^3/hr	--
B6	Bulk cement loading	01	5,000 m^3/hr	--
B7	Fly ash silo top	01	1,000 m^3/hr	--

8.2. WASTE WATER GENERATION & TREATMENT

S.No.	Particulars	Fresh Water Consumption (KLD)	Total water requirement (KLD)	Effluent generation (KLD)	Recycled water (KLD)	Remarks
A.	Domestic	15.0	15.0	10.0	8.0	Recycled water will be used for greenbelt
B.	Industrial					
1.	Cooling Tower	150.0	150.0	-	70.0 Blow down	80.0 KLD evaporation loss, blow down water will be used for dust suppression and Greenbelt
2.	Dust suppression	10.0	68.0 (58.0 from blow down + 10 KLD fresh water)	-	-	-
	Total Industrial	160.0	218.0	-	-	-
C.	Gardening	25.0	45.0 (12.0 from blow down + 8.0 kld from STP)	-	-	-
	Total (A+B+C)	200.0	278.0	-	78.0	-

- No industrial waste water will be generated during cement manufacturing process.
- Domestic waste water generated from the office toilets will be treated in STP and utilized for greenbelt development.
- Rain water harvesting will be practiced at plant.

8.3. NOISE ENVIRONMENT

- Walls and ceilings of the concerned buildings will be lined with sound absorbing materials.
- Properly insulated enclosures will be provided for high noise generating plant machinery.
- Personal Protective Equipment like earplugs and earmuffs will be provided to the workers.
- Regular monitoring of noise level will be carried out and corrective measures in concerned.

8.4. SOLID WASTE GENERATION AND UTILIZATION

- No solid waste will be generated from the cement manufacturing process.
- Ash generated by the HAG will be 100% utilized in cement manufacturing process (PPC)
- Dust collected from air pollution control equipment will be totally recycled in process.

- A part of used oil will be utilized for lubrication purpose & remaining will be sent to own clinker unit located at Sanghipuram, Kutch

S.No.	Waste	Qty / Annum	End use / Disposal
1	Dust collected from APCM	--	Totally recycled in process
2	Ash generated from HGS	18000 MT	100 % recycled in the plant in PPC
3	Used Oil	60 MT	Secondary lubrication / send to Own Clinker plant under AFR

8.5. GREENBELT DEVELOPMENT/PLANTATION

Out of total land i.e. approximately 4.856 Ha of which 1.60 Ha will be developed as greenbelt area & plantation. A thick greenbelt all along the roads and plant will be developed.

- Plantation will be done in and around the plant premises.
- 80% survival rate will be maintained with all possible efforts.
- The trees have been planted at suitable grid spacing to encourage proper growth.
- Local plant species have been preferred.

9. CONCLUSION

Proposed project will result in growth of the surrounding areas by increased direct and indirect employment opportunities in the region including ancillary development and supporting infrastructure.

Special emphasis on financial and social benefits will be given to the local people in the area. Development of social amenities will be in the form of medical facilities, education to underprivileged and creation of self-help groups.

No adverse effect on environment is envisaged as proper mitigation measure will be taken up for the same.

ANNEXURE 8

FORM-I

TERMS OF REFERENCE

For
Environmental Clearance of

Proposed Project of 2.0 MTPA Grinding Unit with bulk & bag packing plant

AT

Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3; Shivrampur Village, Taluka-Choryasi, District- Surat 394510, Gujarat

APPLICANT

Sanghi Industries Limited
10th Floor, Kataria Arcade, Off SG Highway,
PO –Makarba, Ahmedabad, PIN Code: 370 511
Tele: 079-26838000 FAX: 079-26838111
E-mail: info@sanghicement.com, gjbhatt@sanghicement.com

December 2018

FORM 1

(I)	BASIC INFORMATION		
1.	Name of the Project	:	Environmental Clearance for Proposed project of 2.0 MTPA Standalone Grinding Unit with bulk & bag packing plant by Sanghi Industries Ltd.
2.	S. No. in the Schedule	:	Schedule 3(b)Category "B"
3.	Proposed capacity / area /length /tonnage to be handled/ command area /lease area/number of wells to be drilled	:	Proposed capacity: 2.0 Million TPA Standalone Grinding Unit with bulk and bag packing plant Total plot area: 12.0 acre or 48562.0 m^2.
4.	New / Expansion/Modernization	:	New Project
5.	Existing Capacity / Area etc.	:	Not applicable
6.	Category of Project i.e. 'A' or 'B'	:	Category of project "B"
7.	Dose it attract the general condition? If yes, please specify.	:	No.
8.	Dose it attract the specific condition? If yes, please specify.	:	No.
9.	Name &Location	:	**Sanghi Industries Limited (SIL)**
	Plot /Survey /khasra No.	:	Survey No 125/1, 125/2,126/1+2+3

Points	Latitude	Longitude
A	21° 9'0.08"N	72°39'0.68"E
B	21° 8'57.60"N	72°39'12.32"E
C	21° 8'55.54"N	72°39'11.61"E
D	21° 8'57.07"N	72°39'0.75"E

	Village	:	Shivrampur Village
	Taluka	:	Choryasi
	District	:	Surat, 394510
	State	:	Gujarat
10.	Nearest railway station/airport along with distance in kms.	:	Nearest Railway Station : Surat (~20.0 km in NE) Nearest Airport: Surat (10.1 km in SE)
11.	Nearest Town, City, District Headquarters along with distance in kms.	:	Nearest town: Surat (~16 km in ESE) Nearest District Head quarter: Surat (15.9 km)
12.	Village Panchayats, Zilla Parishad, Municipal corporation, Local body (complete postal addresses with telephone nos. to be given)	:	Village Shivrampur, Hazira Industrial Zone, Surat.
13.	Name of the applicant	:	**Sanghi Industries Limited**
14.	Registered Address	:	M/s. Sanghi Industries Limited P.O. Sanghinagar, Hayatnagar Mandal, R.R.District, Telengana-501511.
15.	Address for correspondence		Sanghi Industries Limited
	Name	:	Mr. Gaurang Bhatt

	Designation (Owner/Partner / CEO)	:	Sr. Vice President
	Address	:	Sanghi Industries Limited 10th Floor, Kataria Arcade, Off SG Highway, PO: Makarba, Ahmedabad-380051
	Pin Code	:	380051
	E-mail	:	gibhatt@sanghicement.com, info@sanghicement.com
	Telephone No.	:	079-26838000
	Fax No.	:	079-26838111
16.	Details of Alternative Sites examined , if any Location of these sits should be shown on a toposheet	:	Yes. Toposheet attached.
17.	Interlined Projects.	:	-No-
18.	Whether separate application of Interlined project has been submitted	:	Not applicable.
19.	If yes, data of submission	:	Not applicable.
20.	If no. reason	:	Not applicable.
21.	Whether the proposal involves approval/ clearance under: (a) The Forest (Conservation) Act , 1980 (b) The Wildlife (protection) Act, 1972 (c) The C.R.Z. Notification 1991	:	-No-
22.	Whether there is any Government Order/Policy relevant/relating to the site?	:	-No-
23.	Forest land involved (hectares)	:	-No-
24.	Whether there is any litigation pending against the project and / or land in which the project is propose to be set up (a) Name of the court (b) Case No. (c) Orders / directions of the court, if any and its relevance with the proposed project.	: : : :	No litigation pending against the project.

(II) ACTIVITY

1. **Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)**

S. No.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	Yes	Proposed project will be established on the land of 12.0 acre (48562.0 m^2) already in possession of SIL acquired for the purpose. The proposed land is in Hazira Industrial Zone. The proposed land was agricultural land will be converted for industrial purpose.
1.2	Clearance of existing land, vegetation and buildings?	No	Not applicable
1.3	Creation of new land uses?	No	Hazira Industrial Zone as per Urban Development and Urban Housing Department Notification dated 13th August 2013,
1.4	Pre-construction investigations e.g. bore houses, soil testing?	No	There will be no physical impacts on the locality due to the soil testing or other pre-construction investigations.
1.5	Construction works?	Yes	Anticipated Environmental Impacts on physical environment: • Increase in fugitive emissions during construction phase and operation phase; • Increase in traffic levels (construction & post construction phase); • Drainage; • Landscape & Visual considerations. The impact on physical environment will be temporary in terms of fugitive emissions. Best construction practices will be adhered to minimize the impacts.
1.6	Demolition works?	No	There will be no demolition, underground, reclamation or dredging work.
1.7	Temporary sites used for construction works or housing of construction workers?	No	Temporary store-rooms and site office will be built during construction phase, which will be removed later. The impact due to the same will be confined to the construction phase

			only and thus can be categorized as temporary. Provisions of temporary housing facility for construction workers have been provided. Adequate infrastructural facilities such as sanitation (including separate toilet (mobile) for male and female workers), drinking water, cooking fuel, cookers etc will be provided to construction labours
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	No	The project will involve earthwork which will be reused for filling. The top soil will be stored at earmarked places and will be subjected to temporary stabilization (mulching), while the other excessive soil will be used in the form of earthen berms near the project boundary, which will also help to curtail the noise levels. The same will be later taken by the contractors.
1.9	Underground works including mining or tunneling?	No	Not Applicable
1.10	Reclamation works?	No	Not Applicable
1.11	Dredging?	No	Not Applicable
1.12	Offshore structures?	No	Not Applicable
1.13	Production and manufacturing processes?	Yes	Standalone grinding unit (2.0 Million TPA) with bulk and bag packing plant.
1.14	Facilities for storage of goods or materials?	Yes	The raw materials, finished goods will be stored in separate closed storage area.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	No process effluents and solid wastes will be generated during cement manufacturing process. The process / cooling water will be recycled. The sewage water will be treated in STP & will be used in greenbelt development Ash generatec in HAG will be 100% recycled in PPC grade cement process Used oil & waste oil generating due to maintenance will be used in Kiln Firing (Main plant) – Sanghipuram, Kutch for burning purpose.
1.16	Facilities for long term housing of	No	There is no need to provide long term housing

	operational workers?		facility for operational workers. Workers are available in local/nearby area.
1.17	New road, rail or sea traffic during construction or operation?	No	No new road, rail or sea traffic during construction or operation
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No	Not applicable
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	Not applicable
1.20	New or diverted transmission lines or pipelines?	No	Not applicable
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	Not applicable
1.22	Stream crossings?	No	Not applicable
1.23	Abstraction or transfers of water form ground or surface waters?	No	Water requirement will be 200 KLD which will be met through local body / GIDC / bore well and applicable permissions will be obtained prior to implementation.
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	No effect and changes of drainage pattern of water body due to project activity.
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	We will hire personnel from local / nearby area only and the construction material will be obtained preferably from local traders and will be transported via roads. The sources of raw materials and machinery for operation will vary based on market driven forces, which will be transported via roads.
1.26	Long-term dismantling or decommissioning or restoration works?	No	Not applicable
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	Not applicable
1.28	Influx of people to an area in either temporarily or permanently?	No	Not applicable.
1.29	Introduction of alien species?	No	Not applicable
1.30	Loss of native species or genetic diversity?	No	Not applicable.

1.31	Any other actions?	No	Not applicable

2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):

S.No.	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)	No	No
2.2	Water (expected source & competing users) unit: KL/D	Yes	Water requirement will be 200 KLD which will be met through local body / GIDC / bore well and applicable permissions will be obtained prior to implementation.
2.3	Minerals (MT)	Yes	Gypsum will be obtained from local market and stored in yard of capacity 6000 MT capacity for adding @ 5% in Cement. Gypsum shall be transported in trucks.
2.4	Construction material – stone, aggregates, sand / soil (expected source – MT)	Yes	Source : from local traders
2.5	Forests and timber (source – MT)	No	Not Applicable
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	**Power:** Considering power demand of 13.5 MW. SIL plans to with draw power from DGVCL. A 11 KV / 66 KV HT vo.tage underground cable will be laid from nearest sub station. A transformer of 20 MVA 11 KV /66/6.6 KV will be installed in grinding Unit. **Fuel:** 0.06 Million Ton per Annum Lignite/Coal/Petcoke will be used in HAG to produce hot gas for material drying purpose.
2.7	Any other natural resources (use appropriate standard units)	No	Nil

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment	Yes	No hazardous waste will be generated during cement manufacturing process. Ash generated from HAG will be 100%

	(flora, fauna, and water supplies)		recycled in PPC grade cement. Used oil & waste oi generating due to maintenance will be used in Kiln Firing (Main plant) – Sanghipuram, Kutch for burning purpose.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	No such impact has been anticipated.
3.3	Affect the welfare of people e.g. by changing living conditions?	Yes	The Company's Corporate Social Responsibility initiatives will have positive impact on socio-economic fabric of the region. ➢ Direct & indirect employment opportunities ➢ Education facilities will be improved ➢ Communication & transport facilities will be improved ➢ Community health care programs provide better health and medical facilities
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	None
3.5	Any other causes	No	Not applicable.

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

S.No.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities / rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	No	Not applicable.
4.2	Municipal waste (domestic and or commercial wastes)	Yes	Municipal solid waste generated from plant will be segregated and disposed as per the Municipal Solid Waste Management, Handling Rules, 2000.
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	Used Oil, discarded containers will be generated from proposed project which will be used in Kiln Firing (Main plant) – Sanghipuram, Kutch for burning purpose.
4.4	Other industrial process wastes	No	No any
4.5	Surplus product	No	–
4.6	Sewage sludge or other sludge from effluent treatment	Yes	Domestic waste water will be treated in STP and used for greenbelt. No process effluents will be generated.

4.7	Construction or demolition wastes	No	Construction debris will be used within the premises for labeling.
4.8	Redundant machinery or equipment	No	There will be no redundant machinery or equipment.
4.9	Contaminated soils or other materials	No	There will be no contamination of soil or any other material.
4.10	Agricultural wastes	No	No Agriculture waste will be generated.
4.11	Other solid wastes	No	No other solid waste will be generated.

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

S. No.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities / rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	The identified sources of dust are unloading area of clinker, gypsum, fly ash and fly ash storage silo, clinker grinding mill, cements silos and packing machines. PM_{10} and $PM_{2.5}$ is considered as major air pollutants from this source. The emission from these sources, other than cement mill, would be fugitive in nature and the proposed Bag Filters would be adequate to control emission.
5.2	Emissions from production processes	Yes	SPM and others will be collected in bag filter.
5.3	Emissions from materials handling including storage or transport	Yes	The identified sources of dust are unloading area of clinker, gypsum, fly ash and fly ash storage silo, cements silos and packing machines. The emission from these sources would be fugitive in nature and the proposed Bag Filters would be adequate to control emission.
5.4	Emissions from construction activities including plant and equipment	Yes	Fugitive emission will be generated during construction activity only for short period. Utmost care will be taken during construction activity and water sprinklers will be utilized whenever necessary.
5.5	Dust or odors from handling of materials including construction materials, sewage and waste	No	No such impact has been anticipated.

5.6	Emissions from incineration of waste	No	No incinerator will be used.
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	Not applicable
5.8	Emissions from any other sources	No	No any.

6. Generation of Noise and Vibration, and Emissions of Light and Heat:

S. No.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities / rates, wherever possible) with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	Noise will generate from operation of equipments. Noise level is being / will be kept below the prescribed limit by CPCB. Proper noise abatement measures are being / will be taken and persons working just close to machines and machine operator are being / will be provided with personal protective equipment viz Ear plugs/Ear defenders etc. for further protection.
6.2	From industrial or similar processes	Yes	The noise level will not exceed than 75 dBA.
6.3	From construction or demolition	Yes	Noise will be generated during construction activity and vehicular movement. Proper mitigation measure will be adopted to check the noise pollution during construction work.
6.4	From blasting or piling	No	No blasting is involved as this is project of cement grinding unit.
6.5	From construction or operational traffic	Yes	Noise will be generated only for short period in construction period and due to vehicular movement. PUC certified vehicle will be used for loading the raw material and product during operation phase.
6.6	From lighting or cooling systems	No	Not applicable
6.7	From any other sources	No	Nil

7. **Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:**

S. No.	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities / rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	Yes	Used Oil, discarded containers will be generated from proposed project which will be used in Kiln Firing (Main plant) – Sanghipuram, Kutch for burning purpose. All Hazardous Waste will be treated as per The Hazardous Wastes (Management, Handling & Trans-boundary Movement) Rules, 2016
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place ofdischarge)	Yes	• Domestic effluent will be passed through septic tank/soak pit system. • No industrial effluent will be generated.
7.3	By deposition of pollutants emitted to air into the land or into water	Yes	The air emissions have been controlled by providing adequate pollution control equipments. The stacks height has been provided to a level for maximum dispersion of the pollutants in the environment. However, periodic monitoring is being / will be done to assure the level of emission within the prescribed limit.
7.4	From any other sources	No	Nil
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	No	There will be no long term build-up of pollutants in the environment, however periodic monitoring will be done for the air, water and soil in the plant premises and surroundings, so that timely mitigation measures can be undertaken.

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

S.No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities / rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	Yes	Used Oil, discarded containers will be generated from proposed project which will be used in Kiln Firing (Main plant) – Sanghipuram, Kutch for burning purpose.
8.2	From any other causes	No	Nil
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	No	Nil

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting, cities, ancillary development or development stimulated by the project which could have impact on the environment e.g.: • Supporting infrastructure (roads, power supply, waste or wastewater treatment, etc.) • Housing development • Extractive industries • Supply industries • Other	No	There have well supporting infrastructure like highways, power supply & underground effluent drainage line etc Hence there will be no need of extra development. Local people will be employed and no housing is required.
9.2	Lead to after-use of the site, which could have an impact on the environment	No	Not applicable
9.3	Set a precedent for later developments	No	Not applicable
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects.	No	Plant structure will be designed to withstand the severity of earthquake / cyclone etc.

(III) ENVIRONMENTAL SENSITIVITY

S. No.	Areas	Name/ Identity	Aerial distance (within 15 km.)Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	None	No any
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	None	Arabian Sea @ 3.62 in West direction Tapi River @ 0.89 in East direction
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	None	No
4	Inland, coastal, marine or underground waters	Coastal area of Arabian Sea	Arabian Sea @ 3.92 in West direction
5	State, National boundaries	None	--
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	NH-6 SH-168	0.9 km, East direction 8.5 km, NE direction
7	Defense installations	None	–
8	Densely populated or built-up area	Shivrampur village	Approx. 1.5 km, SW direction
9	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Hospitals, Schools, Places of Worship, Community facilities	• Essar International School – Hazira,– 2.16 km, SE direction • Mora ITI - Hazira – 3.76 km, , NNe direction • Reliance. – Hospital Hazira– 2.03 km, NNE direction • Care Nursing Hom –Nand Niketan Township , Hazira 2.73 km, , SSW direction • State Bank of India, Hazira Branch– 2.33 km, SSE direction
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	Surface water resources Tapi river, Arabian Sea	• River Tapi– Approx. 0.89 km, East direction. • Arabian Sea: Approx. 3.92 km, West direction.

11	Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)	None	-
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)	None	–

(IV) PROPOSED TERMS OF REFERENCE FOR EIA STUDIES

As the proposed project will be established considering all the aspects of Environment Protections and there is no major impact on environment due to proposed project with proper EMP However, as per the requirements the Draft TOR for proposed FIA study is given below:

S.No.	Parameters	Justification
	Standard ToR	
1.	Executive Summary	
2.	Introduction	• Details of the EIA Consultant including NABET accreditation. • Information about the project proponent. • Importance and benefits of the project.
3.	Project Description	• Cost of project and time of completion. • Products with capacities for the proposed project. • List of raw materials required and their source along with mode of transportation. • Other materials required with quantities and storage capacities. • Details of Emission, effluents, hazardous waste generation and their management. • Requirement of water, power, with source of supply, status of approval, water balance diagram, man power requirement (regular and contract). • Process description along with major equipments and machineries, process flow sheet (quantitative) from raw material to products to be provided. • Hazard identification and details of proposed safety systems.
4.	Site Details	• Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered. • A topo sheet of the study area of radius of 10 km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places) • Details w.r.t. option analysis for selection of site • Co ordinates (lat-long) of all four corners of the site. • Google Map-Earth downloaded of the project site. • Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate. • Photographs of the proposed plant site. • Land use break-up of total land of the project site (identified and acquired), government/ private - agricultural, forest, wasteland, water bodies, settlements, etc. shall be included. (not required for industrial area) • A list of major industries with name and type within study area

		(10km radius) shall be incorporated. Land use details of the study area • Geological features and Geo-hydrological status of the study area shall be included. • Details of Drainage of the project upto 5km radius of study area. • Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects) • Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land. • R&R details in respect of land in line with state Government policy (Not applicable).
5.	Forest and wildlife related issues (if applicable):	• Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (Not applicable). • Land Use map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (in case of projects involving forest land more than 40 ha). • Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted. • The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly • Authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon. • Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area. • Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife.
6.	Environmental Status	• Determination of atmospheric inversion level at the project site and site-specific micrometeorological data using temperature, relative humidity, hourly wind speed and direction and rainfall. • AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO_2, NO_x, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests. • Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAAQM Notification of Nov. 2009 along with – min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be

		provided as an annexure to the FIA Report. • Surface water quality of nearby River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines. • Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details. • Ground water monitoring at minimum at 8 locations shall be included. • Noise levels monitoring at 8 locations within the study area. • Soil Characteristic as per CPCB guidelines. • Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc. • Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished. • Socio-economic status of the study area.
7.	Impact and Environment Management Plan	• Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any. • Water Quality modelling - in case of discharge in water body. • Impact of the transport of the raw materials and end products on the surrounding environment hall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor cum- rail transport shall be examined. • A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules. • Details of stack emission and action plan for control of emissions to meet standards. • Measures for fugitive emission control. • Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding

		utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation. • Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided. • Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated. • Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources. • Total capital cost and recurring cost/annum for environmental pollution control measures shall be included. • Action plan for post-project environmental monitoring shall be submitted. • Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.
8.	Occupational health	• Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers. • Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre-placement and periodical examinations give the details of the same. Details regarding last month analyzed data of above mentioned parameters as per age, sex, duration of exposure and department wise.
9.	Corporate Environment Policy	• Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report. • Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA. • What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given. • Does the company have system of reporting of non-

		compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report.
10.	Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.	
11.	Enterprise Social Commitment (ESC)	Adequate funds shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan shall be included. Socio-economic development activities need to be elaborated upon.
12.	Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.	

(V) Undertaking

"I hereby given undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the project will be revoked at our risk and cost.

Date: 21/12/2018
Place: Ahmedabad, Gujarat

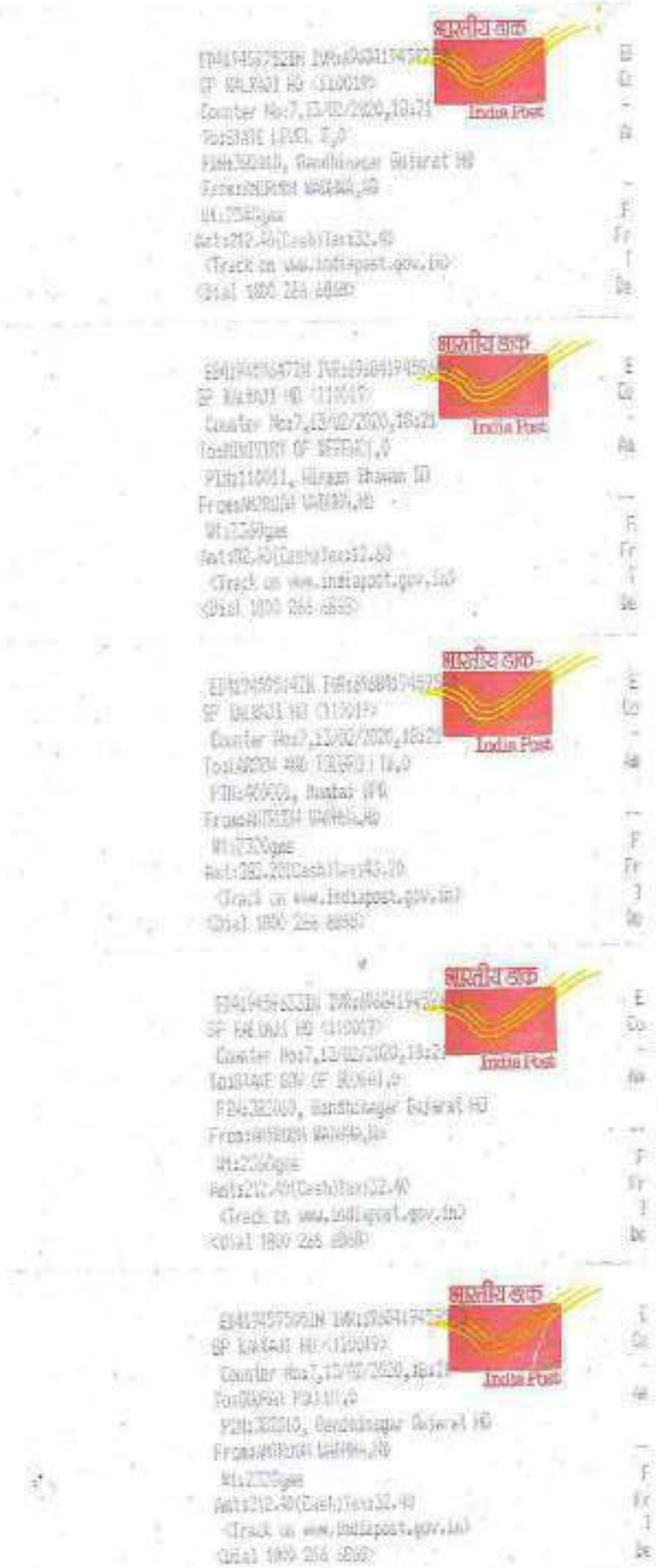
Signature of applicant:

Name: **Mr Gaurang Bhatt**

Designation : **Sr. Vice President**

Address: **Sanghi Industries Ltd. (SIL)**
Sanghi Industries Limited
10th Floor, Kataria Arcade, Off SG Highway,
PO: Makarba, Ahmedabad-380051

PROOF OF SERVICE



S. M. SAIYAD, IFS
MEMBER SECRETARY
SEIAA (GUJARAT)

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY GUJARAT

Government of Gujarat

By R P A D

No. SEIAA/GUJ/TOR/3(b)/223/2019 Date: 29 JAN 2019

Time Limit

Sub: Terms Of Reference to M/s. Sanghi Industries Limited for setting up of Standalone Grinding Unit (2.0 Million TPA) with bulk & bag packing plant at Survey No. 125/1, 126/2,126/1+2+3; Village – Shivrampur, Tal.: Choryasi, Dist.: Surat.

Ref: Your Proposal No: SIA/GJ/IND2/30448/2018.

Dear Sir,

This has reference to your online application dated 22/12/2018 along with Form-I submitted to SEIAA. The project activity is covered in 3(b) and is of 'B' Category

The SEAC, Gujarat vide their letter dated 16/01/2019 had recommended to the SEIAA, Gujarat, to grant the Terms Of Reference for the above-mentioned project based on its meeting held on 04/01/2019

The proposal was considered by SEIAA, Gujarat in its meeting held on 16/01/2019 at Gandhinagar. After careful consideration, the SEIAA hereby accords Terms Of Reference to above project under the provisions of EIA Notification dated 14th September, 2006. The copy of Terms Of Reference is attached herewith.

With regards,
Yours sincerely,

(S. M. SAIYAD)
Member Secretary

Encl: As Above

Issued to:
M/s. Sanghi Industries Limited
10th Floor, Kataria Arcade,
Off S G Highway, P.O. Makarba,
Ahmedabad.

Terms of Reference [ToR] to M/s: Sanghi Industries Limited for setting up Standalone Grinding Unit (2.0 Million TPA) with bulk & bag packing plant at Survey No. 125/1, 125/2,126/1+2+3; Village – Shivrampur, Tal.: Choryasi, Dist.: Surat.

Category of the unit 3(b)
Project status: New

I This is in reference to proposal no. SIA/GJ/IND/30448/2018 dated 22/12/2018 regarding grant of Terms of Reference [ToR] for preparation of EIA/EMP report.

II Project proponent (PP) has submitted Form-1, PFR and relevant details/information.

III This is Standalone Grinding Unit (2.0 Million TPA) with bulk & bag packing plant as tabulated below:

S. No.	Name of the Products	CAS no. /CI no.	Quantity MT/Month	End-use of product
1	Cement (PPC, OPC, PSC)	65997-15-1	1,67,000	For infrastructural growth

IV The project falls under Category B of project activity 3(b) as per the schedule of EIA Notification 2006.

V. PP was called for presentation in the SEAC meeting dated 04/01/2019.

VI The project proponent along with their expert /consultant ECO CHEM SALES & SERVICES, Surat attended the meeting and made presentation before the committee

VII Salient features of the project are as under:

S. no.	Particulars	Details
A	Total cost of Proposed Project (Rs. in Crores):	Rs. 282.29 Crores
B	Total Plot area (sq. meter)	4.856 Ha. (48,563 m²)
	Green belt area (sq. meter)	1.6 Ha.
C	Employment generation	Construction phase: 500 Nos. Operation Phase: 280 Nos.
D	Water	
i	Source of Water Supply (GIDC Bore well, Surface water, Tanker supply etc.)	Local Body/ Bore well/GIDC Local Source / Bore well/GIDC/Tanker Supply
	Status of permission from the concern authority.	-
ii	Water consumption (KLD)	

Category	Quantity, KLD	Remarks
(A) Domestic	15.0	-
(B) Gardening	45	(25 KLD fresh water + 20 KLD recycled= Total 45
(C) Industrial		
Process	0.0	
Washing	0.0	
Boiler	0.0	
Cooling	150	
Others (Dust Suppression)	68	58 KLD from blow down + 10 KLD Fresh water
Industrial Total	218	
Total (A + B + C)	278	200 KLD fresh water requirement

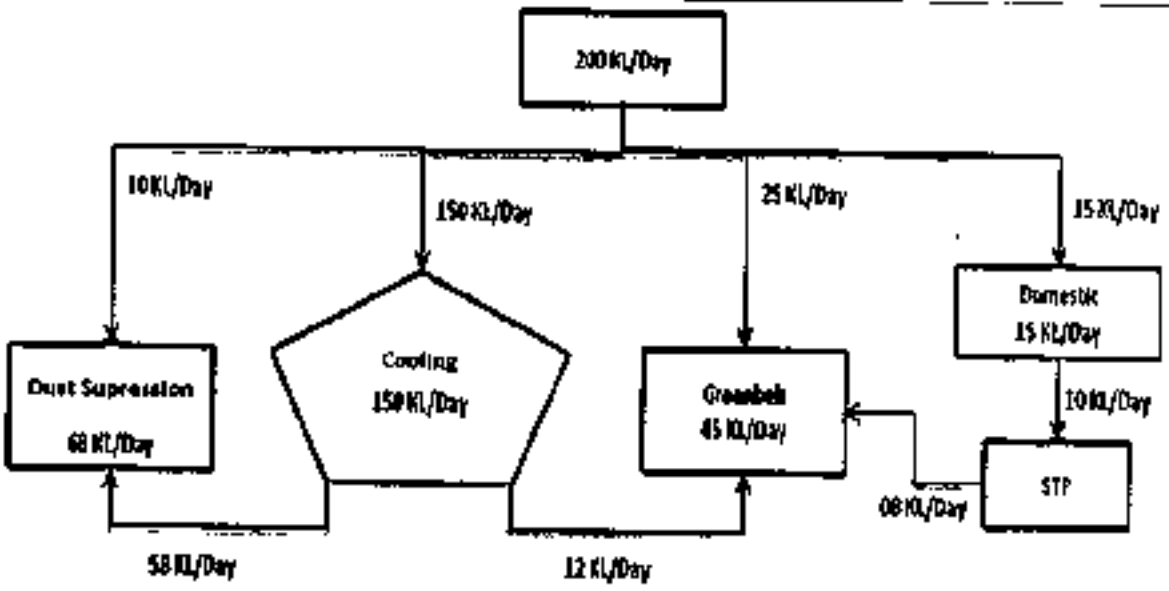
1) Total water requirement for the project: 278 KLD
2) Quantity to be recycled: 78 KLD
3) Total fresh water requirement: 200 KLD

iii Waste water generation (KLD)

Category	Waste water, KLD	Remarks
(A) Domestic	8	
(B) Industrial		
Process	0.0	
Washing	0.0	
Boiler	0.0	
Cooling	70.0 Blow down	80.0 KLD evaporation loss, blow down water will be used for dust suppression and Greenbelt
Others	-	
Total Industrial waste water	70	
Total (A + B)	78	No waste water will be generated. Blow down water will be used for dust suppression and greenbelt

SEIAA

	-
iv	Treatment facility within premises with capacity (In-house ETP (Primary, Secondary, Tertiary), MEE, Stripper, Spray Dryer, STP etc..
	No ETP will be required
v	Mode of Disposal & Final meeting point
	Domestic: Treated STP water will be reused for greenbelt
	Industrial: No effluent will be generated
vi	In case of Common facility (CF) like CETP, Common Spray dryer, Common MEE etc . Name of CF
	Not applicable
	Membership of Common facility (CF) (For waste water treatment)
	Not applicable
vii	Simplified water balance diagram with reuse / recycle of waste water



viii	Reuse/Recycle details (KLD)
	Total reuse 78 KLD

Source of waste water for reuse with quantity in KLD	Application area with quantity in KLD	Remarks regarding feasibility to reuse i.e. w/w characteristics (COD, BOD, TDS etc.)
Cooling tower blow down water	70.0	-
Domestic water after treatment	8.0	-

E	Air
i	Flue gas emission details No. of Boilers/TFH/Furnaces/DG sets etc. with capacities viz. TPH, Kcal/hr, MT/hr, KVA etc.

-

Sr. no.	Source of emission With Capacity	Stack Height (meter)	Type of Fuel	Quantity of Fuel MT/Day	Type of emissions i.e. Air Pollutants	Air Pollution Control Measures (APCM)
1	Cement Mill (9,00,000 m^3/hr) (In-built Hot Air Generator – HAG system)	55	Coal/ Lignite/ Pet coke	181.81	SPM, SO_2, NOx	1 Nos. Bag House and 7 Nos. of de-dusting bag filter

-

ii	Process gas i.e. Type of pollutant gases (SO_2, HCl, NH_3, Cl_2, NO_x etc.) Not Applicable as this is cement grinding unit
	-
iii	Fugitive emission details with its mitigation measures As below:
	Source: • PM10 and PM2.5 is considered as major air pollutants from this source. No process gas emission will be generated. • The unloading area of clinker, gypsum, fly ash and fly ash storage silo, clinker grinding mill, cements silos and packing machines are the main areas where dust is likely to be generated. Mitigation: • Vehicles with valid PUC will be used for the transportation of materials and equipment.

- The emission from these sources would be fugitive in nature and bag filters are proposed as APCM to control fugitive emission
- Concrete road has been/shall be developed.
- Regular water sprinkling is being/ will be done to avoid dust generation from transportation.
- Closed conveyer belt for limestone (from captive mine to plant) is being used to control the dust emission.
- Transportation vehicles will be covered with tarpaulin sheet while transporting materials.
- Proper loading/unloading procedures will be carried out
- Carry out regular sweeping of roads to minimize emissions.
- Provided paved roads and concrete flooring at Cement mills, packing plant and coal yard area

F **Hazardous wastes**
(as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016

i

Sr. no.	Type/Name of Hazardous waste	Specific Source of generation (Name of the Activity, Product etc.)	Category and Schedule as per HW Rules.	Quantity (MT/Annum)	Management of HW
1.	Used Oil*	From machinery and other equipment	1/5.1	60	Secondary lubrication / send to Own Clinker plant under AFR.

II Membership details of TSDF, CHWIF etc. (For HW management) — 100% recycle in process

iii Details of Non-Hazardous waste & its disposal (MSW and others)

S.No.	Waste	Qty in TPA	End use / Disposal
1.	Dust collected from APCM	450	Totally recycled in process.
2	Ash generated from HAG	18000	100 % recycled in the plant in PPC

Solvent management, VOC emissions etc.
Not applicable

Types of solvents, Details of Solvent recovery, % recovery, reuse of recovered Solvents
- Not applicable

h VOC emission sources and its mitigation measures
- Not applicable

VIII During the meeting dated 04/01/2019, technical presentation made by project proponent

IX This proposal is for new standalone cement grinding unit with bulk and bag packing unit.

X Nearest residential area of village Shivrampur is in SW direction at a distance @ 1.5 Km from project site.

XI Total water consumption will be 276 KLD. Total wastewater generation will be 70 KLD. Total industrial effluent will be completely reused back in process. Coal/lignite/pet coke will be used as fuel for proposed project. Bag house and dedusting bag filter as APCM will be provided. Hazardous waste management will be as per the HW Rules. The proposal is new for clinker grinding for production of 2 MMTPA. It is noted that bag house for clinker grinding unit and adequate pollution control measures are proposed by the unit. All transportation from point of landing of clinker and other bulk raw materials will be done through covered vehicles and will be stored in Silos.

XII Committee asked PP to explore to use ETP waste of chemical industries having gypsum as alternative raw materials. A detail of measures to curb fugitive emission due to storage of coal was discussed at length.

XIII **Terms of reference (ToR) are prescribed as below for the EIA study to be done covering 10 Km radial distance from the project boundary.**

1. Alternative site analysis and justification for selection of the present site based on the pros & cons of various alternatives with technical reasons including the likely impacts of the air pollution (both flue gas emission and fugitive emissions) vis-à-vis wind direction, noise impacts due to the proposed activities, etc. for the proposed project
2. Project site specific details and site suitability with respect to siting criteria / guidelines. The site specific details should include distance of the project site from the nearest (1) Village (2) Water Body, River / Creek / Nallah / Reservoir / Pond / Canal (3) National Highway (4) State Highway (5) Railway line(6) Heritage site (7) National Park / Wild Life Sanctuary / Biosphere Reserve / Conservation Reserve (8) Reserve Forest / Protected Forest (9) Any other eco-sensitive areas like wetland, mangroves, coral reefs, migratory route of wild animals, turtle nesting ground etc.
3. Land possession documents and NA order
4. Need for the proposed project along with justification for selecting the proposed product and unit size

5 PP shall furnish status of all the applicable Rules, Acts, Regulation, Clearances in a tabular form

6 Land requirement for the project including its break up for various purposes, its availability and optimization.

7. Layout plan clearly demarcating various units (plants / utilities), green belt and open path around the periphery / plants for easy movement of emergency vehicles.

8. Demarcation of proposed facilities for expansion in lay out of the existing premises.

9 Details of exact production capacity per month in terms of each kind of cement i.e. Ordinary Portland Cement [OPC] / Pozzolona Portland Cement [PPC] etc.

10 Detailed manufacturing operations along with mass balance, process flow diagram describing each unit, its processes / operations etc.

11 Strategy for the implementation of the Cleaner Production activities along with a write up on possibility of using high calorific hazardous wastes in kiln and commitment regarding use of hazardous waste in the process.

12. Explore possibilities of reuse / recycle and other cleaner production options for reduction of wastes & emissions along with commitment of the management on futuristic development / implementation for the same

13 Water requirement, its source and permission obtained from the concerned authority for supply of requisite quantity of water to the project. In case of ground water abstraction, status of permission from the CGWA along with study report on geo-hydrology of the area and impacts of ground water abstraction.

14 Explore the possibilities of getting surface water supply instead of depending on the ground water source for the proposed project.

15. Detailed report for storm water drainage, management & disposal, measures proposed to avoid contamination of the storm water as well as restricting and isolating the contaminated storm water not allowing it to flow out of the premises.

16. Water balance diagram (including reuse-recycle, if any). Efforts for water conservation

17. Details on raw materials, source, storage and handling within the premises. Mode of transportation of raw materials and products as well as measures proposed for preventing fugitive emission during transportation.

18. Type, quantity and quality of fuels required. A confirmed fuel linkage / copy of MoU for supply of fuel

19. List the sources of air pollution including process emissions as well as fugitive emissions along with the mitigation measures. Air pollution control measures (APCM) along with its design details, efficiency, inlet and outlet pollutant concentrations, etc. and stack height. The APCM shall be designed to achieve particulate matter emission below 50 mg/Nm3 at the stack outlet and it's design should be got approved by the reputed institute.

20. An action plan to control and monitor secondary fugitive emissions from all the sources.

21. Provision of the online monitoring system on stacks for monitoring of pollutants, with an arrangement to reflect monitored data on company's server that can be accessed by the GPCB on real time basis

22. In case, hazardous waste is proposed to be charged in kilns, details on type of waste, its characteristics and monitoring of emissions of gases, heavy metals, VOCs, dioxins and furans.

23 Details of solid / hazardous wastes generation, its composition, handling, storage, utilization, disposal etc.

24. Details of all possible sources of noise pollution, its magnitude and mitigation measures including engineering and other controls proposed tocontrol it.

25. Details of heat emission sources from the proposed project and proposed mitigation measures.

26 One season site-specific meteorological data including temperature, relative humidity, hourly wind speed and direction and rainfall shall be provided.

27. One season (except monsoon) ambient air quality monitoring at minimum 6 locations within the study area along with dates of monitoring. Parameters to be considered shall be in accordance with the revised national ambient air quality standards notified in November, 2009 and other project specific parameters. The monitoring stations shall take into account the predominant wind direction, population zone and sensitive receptors including reserved forests. There should be at least one monitoring station in the upwind direction and one monitoring station at / near the location where maximum ground level concentration is likely to occur.

28. Prediction of ground level concentration of pollutants by air quality modeling based on site-specific meteorological features. Details of the model used and the input parameters used for modelling shall be provided. The air quality contours shall be plotted on a location map showing location of project site, habitation, sensitive receptors, etc. The wind roses should also be shown on this map.

29 Location of the project site and nearest habitats with distances from the project site to be demarcated on a toposheet (1: 50000 scale).

30. Land use pattern of the study area based on satellite imagery / field investigation including location-specific sensitivities such as national parks / wildlife sanctuary, villages, industries, prime agricultural land etc., for the

study area. If any incompatible landuse attributes fall within the study area, proponent shall describe the sensitivity (distance, area and significance).

31. The baseline data shall also be collected for other components of environment viz. noise, water, land, and biology and socio-economic.
32. Ecological status (terrestrial and aquatic) of the study area such as habitat type and quality, species, diversity, rarity, fragmentation, ecological linkage, age, abundance, etc. In case of scheduled fauna, conservation measures should be proposed.
33. A detailed study to assess the wildlife habitats, their migration route, etc. and measures to mitigate impacts of the proposed activities.
34. While identifying the likely impacts, also include following for analysis of significance and required mitigation measures. (i) Impacts due to transportation of raw materials and end products on road network (ii) Impacts on surface water, soil and groundwater (iii) Impact on drainage of the area and the surroundings (iv) Impacts due to air pollution (v) Major sources of noise and its impacts (vi) Impacts due to fugitive emissions (viii) Impact on health of workers due to proposed project activities.
35. Proposal to construct approach road from the main road to the company premises and to maintain it in good condition for reducing fugitive emission due to transportation of vehicles
36. Details regarding infrastructure facilities such as sanitation, fuel storage, restroom, etc., to the workers during construction and operation phase.
37. Environmental Monitoring Program for operational phase of project including (i) Monitoring programme for pollution control at source, (ii) Monitoring pollutants at receiving environment for the relevant parameters – air quality, groundwater, surface water, etc. to assess impact during operational phase of the project. (iii) Specific programme for medical surveillance and monitoring of working environment (especially for cement / silica dust) as per Gujarat Factories Rules (iv) Details of in-house monitoring capabilities and details of outsourcing to other agencies if proposed for conducting monitoring
38. Environmental Management Plan including (i) Measures to mitigate adverse impacts along with item-wise cost of its implementation (capital and recurring costs) (ii) Administrative and technical organizational structure for implementation of mitigation measures and proposed post-project Environmental Monitoring Program, (iii) Allocation of resources and responsibilities for plan implementation.
39. **A tabular chart for the issues raised in public hearing/consultation and commitment of the project proponent to the same. An action plan addressing the issues raised and the necessary allocation of funds for the same.**
40. PP shall ensure participation of people during Public Hearing with equality in gender so as to encourage women participation in Public hearing & at the same time their issues shall also be given weightage.
41. Action plan for the greenbelt development in accordance to CPCB published guidelines. The details should include types &number of species, width of plantations, area under green belt development [with map], planning schedule, budgetary outlay, etc.
42. Risk assessment including prediction of the worst-case scenario and maximum credible accident scenario along with risk contours plotted on the plant layout clearly showing the activities that would be affected in case of an accident taking place.
43. Details on the proposed safeguard measures, fire control plan, and on-site and off-site emergency management plans
44. Proposal for CSR activities most useful in the area along with time bound action plan and cost.
45. Compliance of MoEFCC's OM dated 01/05/2018 regarding "Corporate Environment Responsibility" (CER). Fund allocation for Corporate Environment Responsibility (CER) shall be made as per MoEFCC's O.M. No. 22-65/2017-IA.III dated 01/05/2018 for various activities therein. The details of fund allocation and activities for CER shall be incorporated in EIA/EMP report.
46. Explore the use of renewable energy to the maximum extent possible. Details of provisions to make the project energy-efficient through energy efficient devices and adoption of modes of alternative eco-friendly sources of energy like solar water heater, solar lighting etc. Measures proposed for energy conservation
47. Detailed scheme for surface / roof top rain water harvesting and ground water recharge shall be incorporated. In case of ground water abstraction, annual abstraction quantity should be compensated by equal amount of ground water recharge. The details should include scientific calculations based on rainfall, catchment area, runoff / recharge coefficients, percolation rate, duration of recharge etc. Before recharging the surface run off, pre-

treatment must be done to remove suspended matter / oil & grease. Location of recharge percolation wells should be demarcated on layout plan.

48. Plan for compliance to the CREP guidelines.
49. (a) Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.
50. (b). Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions ? If so, it may be detailed in the EIA
51. What is the hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions. Details of this system may be given.
52. Does the company have a system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA Report.
53. Certificate of accreditation issued by the NABET, QCI to the environmental consultant should be incorporated in the EIA Report.
54. PP shall explore using gypsum as ARF (Alternative Raw Material/ Fuel) produced by chemical industries from process/ETP
55. A tabular chart with index for point-wise compliance of above TORs.

XIV. The TOR prescribed as above and the model ToRs available in the MoEFCC's sector specific EIA Manual for 'Cement Industry' shall be considered as generic TORs for preparation of the EIA report in addition to all the relevant information as per the generic structure of EIA given in Appendix III in the EIA Notification, 2006. The draft EIA report shall be submitted to the Gujarat Pollution Control Board for conducting the public consultation process as per the provisions of the EIA Notification, 2006. The project proponent shall have to apply for Environmental clearance through online portal http://environmentclearance.nic.in/ along with final EIA report.

Validity of ToR:

- The ToRs prescribed for the project will be valid for a period of three years for submission of EIA & EMP report. ToR will lapse after three years from the date of issue.
- The period of validity could be extended for a maximum period of one year provided on application is made by the applicant to the Regulatory Authority, at least three months before the expiry of valid period together with an updated Form-I, based on proper justification and also recommendation of the SEAC

EIA REPORT

For

GREENFIELD PROJECT OF 2.0 MTPA STANDALONE GRINDING UNIT WITH BULK AND BAG PACKING PLANT

At

Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3,
Shivrampur Village, Tal. Choryasi Dist.- Surat.

Land Area: 4.856 Ha. / 12.0 Acres / 48,563 m^2

Production Capacity: 2.0 Million TPA

[ToR letter No.: SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan. 2019]

[Public hearing Date/Time/Venue: 22/03/2019 at 11:00 hrs. at Project Site]

[Study Period: 1st Oct 2018 to 31st Dec 2018]

Schedule: 3 (b) Category – B as per EIA Notification 2006

APPLICANT	ENVIRONMENTAL CONSULTANT
SANGHI INDUSTRIES LIMITED. 10th Floor, Kataria Arcade, Opposite SG Highway Post Makarba, District- Ahmedabad–380054 Email: gjbhatt@sanghicement.com Phone: **07926838020**	**ECO CHEM SALES & SERVICES** Office Floor, Ashoka Pavilion, New Civil Road Surat (QCI/NABET ACCREDITED NO. NABET/EIA/1720/ RA 051) E-mail: eco@ecoshripad.com Contact No.: 0261-2231630

NABET CERTIFICATE

Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

Eco Chem Sales & Services (ECSS)
Office Floor, Ashoka Pavillion - A, Opp. Kapadia Health Club,
New Civil Road, Surat -395 001, Gujarat

are accredited as Category - A organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA/EMP reports in the following sectors:

Sl.No.	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals(Opencast only)	1	1 (a) (i)	A
2	Offshore and onshore oil and gas exploration, development & production	2	1 (b)	A
3	Thermal power plants	4	1 (d)	A
4	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
5	Cement plants	9	3 (b)	B
6	Chlor-alkali industry	13	4 (d)	A
7	Chemical fertilizers	16	5 (a)	A
8	Pesticides industry and pesticide specific intermediates	17	5 (b)	A
9	Manmade fibres manufacturing	19	5 (d)	A
10	Synthetic organic chemicals industry	21	5 (f)	A
11	Distilleries	22	5(g)	A
12	Integrated paint industry	23	5 (h)	A
13	Pulp & paper industry excluding manufacturing of paper	24	5 (i)	A
14	Oil & gas transportation pipeline	27	6 (a)	A
15	Isolated storage & handling of Hazardous chemicals	28	6 (b)	B
16	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	32	7 (i)	A
17	Ports, harbours, break waters and dredging	33	7 (a)	A
18	Highways	34	7 (f)	A
19	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
20	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
21	Building and construction projects	38	8 (a)	B
22	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RA AC minutes dated May 12, 2017 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/17/0334 dated 01 June 2017. The accreditation needs to be renewed before the expiry date by Eco Chem Sales & Services (ECSS), Surat following due process of assessment.

C.E.O	Certificate No.	Issue date	Expiry Date
NABET	NABET/ EIA/1720/ RA 051	Jun. 12, 2017	Feb. 03, 2020

For the updated list of Accredited Consultants with approved sectors please refer QCI-NABET website.

DECLARATION OF CONSULTANT

Declaration by Experts contributing to the EIA/EMP report for Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat by Sanghi Industries Limited (SIL). Schedule 3(b) Category–"B" as per EIA Notification 2006 and its amendment thereof.

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

Consultant	:	**Eco Chem Sales & Services, Surat**
EIA co-ordinator	:	**Dr. Ashok K. Rathoure**
Signature	:	
Date	:	**29/03/2019**
Period of Involvement	:	**Sept. 2018 to Apr. 2019**

Functional Area Experts

S.No.	Functional area/s	Name of Expert	Involvement (Period and Task)	Signature
1.	AP	Mrs. Rekha Shah	**Sept. 2018 to March 2019** Site visit followed by selection of monitoring locations, Supervision of air quality monitoring, Identification of probable impacts of different air emission from the plants/facilities proposed, suggesting most suitable control device and contribution to EIA documentation.	
2.	WP	Mrs. Rekha Shah	**Sept. 2018 to March 2019** Site visit; supervision & selection of sampling locations for surface water & Ground water samples & their analysis results and developing scheme for reuse of water, identification of impacts, finalization of mitigation measures.	
3.	SHW	Mrs. Rekha Shah	**Sept. 2018 to March 2019** Identification of waste generated from the site, confirming adequacy of mitigation measures for management of hazardous waste and contribution to EIA documentation.	
4.	SE	Mr. Ghanshayam Patel	**Sept. 2018 to Jan. 2019** Conducting baseline socio-economic surveys through interviews/questionnaire from the surrounding area/villages of the proposed project, impact identification and mitigation measures for incorporating to EIA documentation.	
5.	EB	Dr. Ashok K. Rathoure	**Sept. 2018 to March 2019** Site visit and conduct of ecological survey and preparation of status report for rare endangered and threatned species of animals and plants and also species protected under national laws, assessment of the impacts of proposed	

S.No.	Functional area/s	Name of Expert	Involvement (Period and Task)	Signature
			project activities on the biological environment and contribution to EIA documentation.	
6.	HG	Mr. Dhaval Shah	**Sept. 2018 to Jan. 2019** Understanding and representing groundwater conditions, supervision of groundwater sampling locations, finalization of survey findings, identification of impacts, suggestion of mitigation measures.	
7.	AQ	Priyanka Verma	**Sept. 2018 to Jan. 2019** AAQM for various parameters; Drawing isolplth and Calculation ground level concention.	
8.	NV	Mr. Dhaval Shah	**Sept. 2018 to Jan. 2019** Checking of noise sampling results, analysis of data, identification of impacts and mitigation measures.	
9.	LU	Mr. Joshua Anand	**March 2018 to May 2018** Generation and analysis of data related to landuse pattern. Development of landuse maps of study area using ArcGIS / related tools, site visit for ground truth survey, finalization of landuse maps.	
10.	RH	Mr. Vinay Patil	**Sept. 2018 to Jan. 2019** Identification of hazards and hazardous substances Preparation of impacts diagrams & mitigation measures, preparation of disaster management plan.	
11.	GEO	Mr. Ravikant Sharma	Not involved rationalized as per QCI Scheme for Accreditation Verson 3.	-
12.	SC	Dr. B.K. Patel		

Declaration by the Head of the Accredited Consultant Organization/ authorized person

I, **Rekha S. Shah**, hereby, confirm that our experts prepared the EIA report of Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.-Surat, Gujarat by Sanghi Industries Limited (SIL). I also confirm that I shall be fully accountable for any mis-leading information mentioned in this statement. It is certified that no unethical practice like 'copy and paste', and used external data/text without proper acknowledgement, while preparing this EIA report.

Signature :

Name : **Rekha S. Shah**
Designation : CEO
Name of the EIA Consultant Organization : **ECO CHEM SALES & SERVICES**
Office Floor, Ashoka Pavillion – A,
Opp. Kapadia Health Club, Surat 395001 (GJ)
NABET Certificate No. & Issue Date : **NABET/EIA/1720/ RA 051,**
Valid upto February 03, 2020

UNDERTAKING BY APPLICANT

Sanghi Industries Limited
Corporate Office : 10th Floor, Kataria Arcade,
Off. S. G. Highway, Post : Makarba, Dist : Ahmedabad - 380051
Tel. : 079-26838000 **Fax** : 079 - 26838111
E-mail : sanghicmo@sanghicement.com

UNDERTAKING LETTER FOR OWNING FINAL EIA & EMP REPORT

To,
The Member Secretary,
State Level Expert Appraisal Committee (SEAC)
Gujarat Pollution Control Board,
4th Floor, Sector – 10 A,
Paryavaran Bhavan, Gandhinagar.

Date:30/03/2019

Subject: Undertaking letter for ownership of Environmental Impact Assessment (EIA/EMP) report for Environmental Clearance as per EIA notification 2006.

Ref: 1) Terms of Reference awarded by SEIAA Gujarat vide letter no. SEIAA/GUJ/TOR /3(b)/ 223/2019 dated 29.01.2019
2) OM dated 05/10/2011 & 04/08/2009 issued by MoEF&CC

Sir,

We hereby give you an undertaking for owning the contents and information provided in EIA/EMP report submitted to SEAC Gandhinagar for Environmental Clearance of the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.-Surat, Gujarat.

Thanking you,
Yours Sincerely,

For, SANGHI INDUSTRIES LIMITED.

(AUTHORIZED SIGNATORY)

SANGHI INDUSTRIES LTD. AHMEDABAD

CIN No. : L18209TG1985PLC005581
Registered Office : P.O. Sanghinagar, Hayatnagar Mandal, R R District, Telangana - 501511
Tel. : 08415 - 242240 **E-mail** : companysecretary@sanghicement.com
Website : www.sanghicement.com

UNDERTAKING BY CONSULTANT

ECOCHEM SALES & SERVICES
POLLUTION CONTROL CONSULTANT, ENGINEERS & CONTRACTORS

To,

Dated: 30/03/2019

The Member Secretary,
State Level Expert Appraisal Committee (SEAC)
Gujarat Pollution Control Board,
4th Floor, Sector – 10 A,
Paryavaran Bhavan, Gandhinagar

Subject: Undertaking on the compliance of Terms of Reference issued by the SEIAA Gujarat for Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat by Sanghi Industries Limited (SIL).

Reference: 1) Terms of Reference awarded by SEIAA Gujarat vide letter no SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan. 2019
2) OM dated 05/10/2011 & 04/08/2009 issued by MoEF&CC

Sir,

We, **Eco Chem Sales & Services** are NABET accredited consultants and hereby give you an undertaking that we have prepared the EIA report based on the Terms of Reference (ToRs) issued by SEIAA Gujarat. All the studies have been undertaken with reference to the ToR points and we ensure that all the ToR points have been addressed in the EIA/EMP report for the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat by Sanghi Industries Limited (SIL).

Thanking You
Yours Sincerely,

ECO CHEM SALES & SERVICES

Place: Surat

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LIST OF ABBREVIATIONS

1.	APC	Air Pollution Control
2.	CRZ	Coastal Regulation zone
3.	CEMS	Continuous emission monitoring system
4.	CPCB	Central pollution control board.
5.	CER	Corporate Environmental responsibility
6.	CREP	Corporate responsibility for environment protection
7.	CPP	Captive power plant
8.	ETP	Effluent Treatment Plant
9.	EC	Environmental Clearance
10.	EMP	Environmental Management Plan
11.	EMS	Environmental Management System
12.	EIA	Environmental Impact Assessment
13.	EMC	Environmental management cell
14.	GMDC	Gujarat Mineral Development Corporation Limited
15.	HSD	High Speed Diesel
16.	KLD	Kilo Liter per day
17.	MW	Mega watt
18.	MTPM	Metric ton per Month
19.	MoEF&CC	Ministry of Environment, Forest and Climate Change
20.	PH	Public Hearing
21.	PM	Particulate Matter
22.	PPE	Personal Protective Equipment
23.	RO	Reverse Osmosis
24.	STP	Sewage Treatment Plant
25.	SEIAA	State Environmental impact assessment authority.
26.	SIL	Sanghi Industries Ltd.
27.	SH	Super Heaters
28.	TPA	Ton per annum
29.	ToR	Terms of Reference
30.	VECs	Valued Environmental Components

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Annexure II	Land Document
Annexure III	Layout Plan
Annexure IV	Application for Water Permission
Annexure V	LOI for supply of Coal/Gypsum
Annexure VI	Environmental Policy
Annexure VII	NABL Certificate

1 INTRODUCTION

1.1 PRELUDE

EIA studies help to the decision maker for approving the project about the impact on local and remote Environment, societal benefits and losses if any of the development in particular region. Cement Industries are important for the nation. The need to avoid adverse impacts and to ensure long term benefits has led to the concept of sustainability. This has become accepted as an essential feature of development, if the aim of increased well-being and greater equity in fulfilling basic needs is to be met for this and future generations. Mankind, as it is developed today, cannot live without taking up developmental activities for the food, security and other needs. Consequently, there is a need to harmonize developmental activities with the environmental concerns. Environmental Impact Assessment (EIA) is one of the tools available with the planners to achieve the above mentioned goals. An Environmental Impact Assessment (EIA) may be defined as:

EIA is an assessment of the possible impact—positive or negative—that a proposed or expansion project may have on the environment, together consisting of the natural, social and economic aspects. The purpose of the assessment is to ensure that decision makers to consider the environmental impacts along with mitigation measures when deciding whether to proceed with a project or not. EIA has three main functions:

- To predict problems (Impact Assessment),
- To find ways to avoid them (Mitigation Measures),
- To enhance positive impacts (Environmental Management Plan).

It is required that every project proponent must take Environmental Clearance from Ministry of Environment, Forest and Climate Change (MoEF&CC), New Delhi/SEIAA before starting up any project as per EIA legislation. The environmental clearance is also mandatory for the expansion, modernization; this is applicable as per the MoEF&CC guidelines and EIA notifications 2006 and amended from time to time.

1.2 PURPOSE OF THE REPORT

As per the Environment Impact Assessment (EIA) Notification dated 14th September 2006 and its amendment thereafter, the greenfield project of Standalone grinding unit with bulk and bag packing plant - falls in ‗Category B' under project activity 3(b). Application for prior Environmental Clearance for the proposal was submitted to the State Environmental Impact Assessment Authority, Gujarat vide Proposal No. SIA/GJ/IND/30448/2018 dated 22nd December, 2018 for approval of Terms of Reference (TOR) for the preparation of EIA/EMP Report for which the baseline data is collected during October to December 2018 as per OM 29th Aug. 2017. The present EIA Report has been prepared on the basis of EIA Notification, with special reference to the TOR conditions received from State Environment Impact Assessment Authority, Gujarat, vide letter SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan., 2019 the Greenfield project of grinding unit with bulk and bag packing plant. Copy of the said TOR letter is enclosed as **Annexure-I.**

1.3 IDENTIFICATION OF THE PROJECT AND PROJECT PROPONENT

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant. This project is based on state of art technology at Village Shivrampur, Survey No. 125/1, 125/2,126/1+2+3; Tal. Choryasi Dist.- Surat, Gujarat. The salient features in and around area is given in Table 1.1.

Table 1.1 Environmental Settings (Valued Environmental Components)

S.No.	Particulars	Description	Aerial Distance and Direction
1.	Latitude and Longitude of the site		

Points	Latitude	Longitude
A	21° 9'0.08"N	72°39'0.68"E
B	21° 8'59.46"N	72°39'1.09"E
C	21° 9'0.78"N	72°39'3.62"E
D	21° 9'0.12"N	72°39'4.09"E

	E	21° 9'0.81"N	72°39'5.20"E
	F	21° 9'0.29"N	72°39'5.47"E
	G	21° 9'1.18"N	72°39'6.90"E
	H	21° 9'0.93"N	72°39'7.90"E
	I	21° 9'0.86"N	72°39'9.24"E
	J	21° 9'0.46"N	72°39'11.28"E
	K	21° 8'59.84"N	72°39'11.93"E
	L	21° 8'58.72"N	72°39'11.71"E
	M	21° 8'57.60"N	72°39'12.32"E
	N	21° 8'55.54"N	72°39'11.61"E
	O	21° 8'54.57"N	72°39'10.56"E
	P	21° 8'54.59"N	72°39'9.07"E
	Q	21° 8'55.54"N	72°39'8.23"E
	R	21° 8'55.22"N	72°39'5.49"E
	S	21° 8'56.94"N	72°39'1.80"E
	T	21° 8'57.07"N	72°39'0.75"E
	U	21° 8'58.75"N	72°39'0.36"E
2.	Toposheet No. (SOI)	F43 M/12	
3.	Nearest Village (Human Settlement)	Shivrampur	@1.5 Km in SW direction
4.	Nearest Town/City	Surat	@ 16.0 Km in ESE
6.	Nearest National Highway	NH-6	@ 0.9 km in East
7.	Nearest State Highway	SH-168	@ 8.5 km in NE
8.	Nearest Railway station	Surat Railway Station	@ 17.0 km in NE
9.	Nearest Airport	Surat Airport	@ 10.1 km in SE
10.	State, National Boundaries	None within 10 Km of study area	-
11.	Nearest Water Body	Tapi River	@ 0.89 km in East
12.	Sea	Arabian Sea/Coastal Zone	@ 3.5 km in West
13.	Archaeological site	None	--
14	National Park/ Marine sanctuary, etc.	No National Park and Marine sanctuary are falls within 10 km radius of study area	--
16.	Mangrove	None within 10 Km radius of study area	--
17.	Nearest Industry	L&T, Reliance, Essar, etc.	Within 3 km radius

1.3.1 Project Background

Sanghi Industries Limited is the flagship company of The Ravi Sanghi Group dealing in the production and distribution of Cement under the Brand Name "Sanghi Cement". Sanghi Cement was commissioned in 2002 with one of the world's largest single stream Cement Plant located at Sanghipuram in the Abdasa Taluka of Kutch District of Gujarat State. This plant is fully automatic with state-of-the-art technology from Fuller International, USA and having present capacity of 4.0 MTPA. The company produces superior quality 53 Grade OPC, PPC and PSC Cement and have revolutionized the way cement is produced and sold in India. The company has obtained environment clearance from MoEF&CC, New Delhi for capacity expansion of existing plant located at Sanghipuram on 1st May 2018. Now, SIL intend to setup standalone cement grinding unit with packing plant in Surat. The project has been conceived on the basis of following considerations:

- Better customer satisfaction by reducing lead time for meeting the cement requirement of South Gujarat and some part of Maharashtra.
- Reduction in logistics cost and utilization of sea route transportation.
- Regular, sustainable and reliable availability of additives like slag, fly ash and gypsum.

1.3.2 Present Proposal

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat. The detailed feature of proposed plant is given in **Table 1.2.**

Table 1.2 Salient Features of Grinding Unit

Category of the Project	**:**	Project/Activity: 3 (b) – Category B (Standalone Grinding unit)
Plant Capacity		2.0 Million TPA
Technology	**:**	Standalone Cement grinding process will be based on Vertical Roller Mill (VRM) technology with automatic packer and truck loading facilities
Land Area	**:**	4.856 Ha. or 12.0 Acres or 48,563 m^2
Water Requirement	**:**	278 m^3/day **Source**: Local Body / Irrigation Department Surat
Products		Cement (PPC, OPC, PSC)
Power Requirement	**:**	13.5 MW from State Grid (Power will be willing from CPP at Kutch) No. of DG set during Power Failures:1 No. of 2.0 MW
Man Power Requirement	**:**	Direct + Indirect - Construction: 500 Persons, Operation: 280 Persons
Capital Investment	**:**	Rs. 28228 Lakhs or 282.28 Crores

Location: Survey No. 125/1, 125/2,126/1+2+3, Village – Shivrampur, Taluka- Choryasi - 394510, District-Surat, Gujarat India.

Corporate Addres s: 10th Floor, Kataria Arcade, Opposite SG Highway Post Makarba, District-Ahmedabad–380054 (Gujarat).

Project Proponent

Sanghi Industries Limited is the flagship company of –The Ravi Sanghi Group" dealing in the production and distribution of Cement under the Brand Name "Sanghi Cement". Sanghi Cement was commissioned in 2002 with one of the world's largest single stream Cement Plant located at Sanghipuram, Kutch, Gujarat. This plant is fully automatic with state-of-the-art technology from FL Smidth, USA and having present capacity of 4.0 MTPA. SIL are expanding cement plant capacity from 4 MTPA to 8.6 MTPA for which Environment Clearance has been obtained from the MOEF&CC, GOI in May 2018. Now, SIL intend to setup standalone cement grinding unit with packing plant in Surat. The company has several firsts to its credit:

- First plant in India to install cross belt analyzer for micro-analysis of limestone to ensure consistent superior quality of cement.

- First plant in the country to have 100% automatic control systems to ensure consistently superior strength and quality of operations.
- Only Indian Cement Company to achieve Export House status in the first 8 months of commencement of operations.
- Cement grade high quality captive limestone mines with mining through latest eco-friendly and state-of-the-art surface miners.
- First company in India to have full-fledged infrastructure, from day one, such as 100% captive power plant, own jetty to cater the needs of sea route transportation, desalination plant and road network.
- The only FIVE STAR certified organization in Indian Cement Industry conforming to-

➢ Quality Management System (ISO: 9001:2015),
➢ Environmental Management System (ISO: 14001:2015),
➢ Health & Safety Management System (OHSAS: 18001:2007),
➢ Testing & Calibration Management System (ISO: 17025:2005),
➢ Social Accountability Management System (SA: 8000:2014).

Promoter's Background

Sanghi Industries Limited is managed by professional. The key promoters are as below:

a) **Mr. Ravi Sanghi - Chairman and Managing Director:** Mr. Ravi Sanghi, is a first generation entrepreneur and the visionary behind the establishment of one of the world's largest cement plant - Sanghi Cement Plant in Kutch since its conception to completion of the commissioning and successful operations of the plant till date. He has vast experience in conceptualizing and directing projects of diverse industries and magnitudes.

b) **Mr. Aditya Sanghi - Whole Time Director:** Mr. Aditya Sanghi holds a Master Degree in Industrial Engineering from Rochester Institute, USA and has worked with leading American companies. He has rich experience in management of the clinker and cement operations, and the establishment and operation of thermal power plant. He has successfully implemented many best manufacturing practices and executed diverse projects for the company. He expertly guides the production, project and corporate strategy.

c) **Mr. Alok Sanghi - Whole Time Director:** Mr. Alok Sanghi, studied in Finance and Management from Kelley School of Business, Indiana University, Bloomington, USA, has worked with leading financial services companies. He has been instrumental in successfully launching the company's products in domestic and international markets. He possesses acumen in corporate, commercial, shipping and marketing strategies and corporate affairs of the company.

1.4 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION OF THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY, REGION

S. No.	Details	Description
1.	Nature	Standalone Grinding unit with Bulk and Bag Packing plant Category-B, under section 3(b)
2.	Size	2.0 Million TPA
3.	Location	Shivrampur Village, Tal- Choryasi, Surat – Gujarat
4.	Cost of the project	Rs.282.28 Crores

Importance to the Country and Region

Cement is an essential ingredient for the modern building construction. The new generation cement plant in India now employs the latest technology for better efficiency, energy conservation, pollution control and economics of large capacity production. The improved market conditions witnessed recently, after a grip of recession over a long period, are expected to continue due to high priority being given by the Government to Housing and Infrastructure. The housing sector is the biggest demand driver for the Cement Industry, accounting for about 67% of the total consumption in India. The other major consumers of cement include infrastructure at 13%, commercial construction at 11% and industrial construction at 9%. India's cement demand is expected to grow rapidly keeping in view the Government's thrust on infrastructure development and affordable housing.

India is expected to spend INR 22,407 Crores on ‗Housing for All', over INR 70,000 Crores in additional spending on infrastructure and INR 20,000 Crores on the ‗National Investment and Infrastructure Fund'. Apart from these, the Ministry of Urban Development is also planning big spends on future-proofing India's cities and smart cities especially Surat. In view of the massive investment proposed in by the government in Housing and infrastructure, industry and rural sectors, there is an urgent need to increase the production capacity in the country in spite of severe resource constraints. This project shall plan to supply cement to coastal locations through coastal shipping. Hence, the proposal of Grinding unit by Sanghi Industries Limited will cater the increased demand of cement in the country and region.

1.5 SCOPE OF THE STUDY

1.5.1 Regulatory framework

- Environmental Clearance under EIA Notification 2006.
- Consent to Establish and Consent to Operate as per Air and Water Act.
- E-waste (Management and Handling) Rules, 2011 as amended to date.
- Factory License
- Hazardous and Other Wastes (Management and Transboundary Movement) Amendment Rules, 2016
- Public Liability Insurance Act, 1991 and Rules, 1991 as amended to date.
- The Air (Prevention and Control of Pollution) Act, 1981 and Rules, 1982, as amended to date.
- The Bureau of Indian Standards Act, 1986
- The Custom Act, 1962
- The Environment (Protection) Act, 1986 and Rules, 1986, as amended to date
- The Factories Act, 1948
- The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, as amended to date.
- The Motor Vehicles Act, 1988 & The Central Motor Vehicle rules, 1989
- The Noise Pollution (Regulation and Control) Rules, 2000 as amended to date.
- The Petroleum Act, 1934 & Rules, 2002
- The Water (Prevention and Control of Pollution) Act, 1974 and Rules, 1975, as amended to date.

1.5.2 Scope of the Study

The EIA/EMP report has been prepared in line with approved ToR issued by SEAC, Gujarat, vide letter SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan. 2019 and as per generic structure given in EIA Notification – 2006 (Appendix III & IIIA). The EIA/EMP report includes collection of baseline data with respect to major environmental components, *viz.* Air, Noise, Water, Soil, Geology, Hydrology, Land use, Ecology & Biodiversity and Socio-economic components for one season (post Monsoon) *i.e*. from October to December 2018. The study area map covering 10 km radius of project site is given in Chapter – 3. The Compliance to the ToR condition has been provided under section 1.14

1.6 APPLICABILITY OF EIA NOTIFICATION, 200 6/ FOREST (CONSERVATION) ACT/WILDLIFE (PROTECTION) ACT, 1972/ CRZ NOTIFICATION 2011/2016

The proposed Greenfield Standalone Grinding Unit falls in Category-B, under section 3(b) as per the prevailing EIA Notification, dated 14th September 2006 and its amendments thereafter. The Forest (Conservation) Act/Wildlife (Protection) Act / CRZ Notification are not application to this project.

1.7 APPLICABILITY OF GC CONDITIONS A S PER EIA NOTIFICATION 2006 AND ITS AMENDMENT THEREAFTER

General condition are not applicable for Greenfield Standalone Grinding Unit with Bulk and Bag packing Plant as this project does not located in whole or in part within 5 km from the boundary of Protected Areas notified under the Wild Life (Protection) Act, 1972, Critically Polluted areas as notified by the Central Pollution Control Board, Notified Eco-sensitive areas and inter-State boundaries and international boundaries.

1.8 STATUS OF LITIGATIONS/COURT ORDERS

No litigation pending/court Case pending from SIL for this project.

1.9 EXISTING EC AND STATUS OF EC COMPLIANCE

Not Applicable as Proposed project is Greenfield project.

1.10 VALIDITY OF AIR/WATER CONSENT ORDERS AND HWA FOR EXISTING PROJECT

Not Applicable as Proposed project is Greenfield project.

1.11 COMPLIANCE ST ATUS TO STA NDARDS AND SPE CIFIC CONDTIONS ISS UED B Y SPCC/CPCB (CREP), ETC.

The Proposed project is Greenfield project. SIL will complied all statutory and regulatory requirement after getting EC from SEAC, Gujarat and consent to establish from GPCB, Gandhinagar

1.12 NOTICE ISSUED BY SPCB UNDER AIR/WATER/EP ACT (LAST YEAR)

None

1.13 STRUCTURE OF EIA REPORT

The entire EIA report is prepared based on the generic structure of EIA document given at appendix - III of the Notification No. S.O. 1533 dated 14th September, 2006 at MoEFCC, New Delhi.

1.14 COMPLIANCE WITH REFERENCE TO THE TOR IDENTIFIED BY PP AND ADDITIONAL TOR STIPULATED BY THE AUTHORITY

ToR Letter No. SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan. 2019 under Schedule 3(b) Category "B" for 2.0 Million TPA Standalone Grinding Unit with Bulk and Bag Packing Plant at Village Shivrampur, Choryasi Dist- Surat, Gujarat.

S.No	ToR Points	Reply	Citation
1.	Alternative site analysis and justification for selection of the present site based on the pros & cons of various alternatives with technical reasons including the likely impacts of the air pollution (both flue gas emission and fugitive emissions) vis-à-vis wind direction, noise impacts due to the proposed activities, etc. for the proposed project.	The two sites have been chosen for alternative site analysis and option 2 (Located at Shivrampur village) has been selected for the proposed project set up.	Page 110, Chapter 5
2.	Project site specific details and site suitability with respect to siting criteria / guidelines. The site specific details should include distance of the project site from the nearest (1) Village (2) Water Body: River / Creek / Nallah / Reservoir / Pond / Canal (3) National Highway (4) State Highway (5) Railway line(6) Heritage site (7) National Park / Wild Life Sanctuary / Biosphere Reserve / Conservation Reserve (8) Reserve Forest / Protected Forest (9) Any other eco-sensitive areas like wetland, mangroves, coral reefs, migratory route of wild animals, turtle nesting ground etc.	The project site specific details and site suitability with respect to siting criteria / guidelines have been mentioned in chapter 5 and the distance from project site covering all area as mentioned in the ToR is listed in chapter 2.	Page 2 and page 110, Chapter 2 & 5.

3.	Land possession documents and NA order.	The private land located in Industrial Zone at Shivrampur village, Tal-Choryasi is under possession will be utilized for cement grinding unit.	Page 27, Chapter 2
4.	Need for the proposed project along with justification for selecting the proposed product and unit size.	The need for the cement is basically for infrastructure which is increasing day by day.	Page 15, Chapter 2
5.	PP shall furnish status of all the applicable Rules, Acts, Regulation, Clearances in a tabular form.	The regulatory framework has been mentioned in chapter 2.	Page 5, Chapter 2
6.	Land requirement for the project including its break up for various purposes, its availability and optimization.	Total 48,563 m^2 area is required to set up the grinding unit. The bifurcation is presented as suggested in ToR.	Page 27, Chapter 2
7.	Layout plan clearly demarcating various units (plants / utilities), green belt and open path around the periphery / plants for easy movement of emergency vehicles.	Layout plan has been prepared clearly demarcating various units (plants / utilities), green belt and open path around the periphery / plants for easy movement of emergency vehicles.	Page 34, Chapter 2
8.	Demarcation of proposed facilities for expansion in lay out of the existing premises.	Not applicable	-
9.	Details of exact production capacity per month in terms of each kind of cement *i.e*. Ordinary Portland Cement [OPC] / Pozzolona Portland Cement [PPC] etc.	Details of exact production capacity (1,66,667 TPM or 2.0 Million TPA) of cement grinding unit is provided in chapter 2.	Page 18, Chapter 2
10.	Detailed manufacturing operations along with mass balance, process flow diagram describing each unit, its processes / operations etc.	The manufacturing operations along with mass balance, process flow diagram provided in chapter 2.	Page 23, Chapter 2
11.	Strategy for the implementation of the Cleaner Production activities along with a write up on possibility of using high calorific hazardous wastes in kiln and commitment regarding use of hazardous waste in the process.	The Cleaner Production activities are provided in chapter 10.	Page 157, Chapter 10
12.	Explore possibilities of reuse / recycle and other cleaner production options for reduction of wastes & emissions along with commitment of the management on futuristic development / implementation for the same.	We have proposed to recycle the water from cooling tower and STP. The detail is provided in chapter 2 &10.	Page 36, Chapter 2
13.	Water requirement, its source and permission obtained from the concerned authority for supply of requisite quantity of water to the project. In case of ground water	Water requirement, its source and permission from concerned authority is provided in chapter 2. No ground water will be utilized; hence CGWA	Page 28, Chapter 2 Annexure IV

	abstraction, status of permission from the CGWA along with study report on geo-hydrology of the area and impacts of ground water abstraction.	permission is not required.	
14.	Explore the possibilities of getting surface water supply instead of depending on the ground water source for the proposed project.	Yes, we have proposed to use surface water from Irrigation department Surat.	Page 28, Chapter 2. Annexure IV.
15.	Detailed report for storm water drainage, management & disposal, measures proposed to avoid contamination of the storm water as well as restricting and isolating the contaminated storm water not allowing it to flow out of the premises.	The rain water harvesting has been proposed in chapter 10. No contaminated storm water will be flow out from the premises.	Page 150, Chapter 10.
16.	Water balance diagram (including reuse-recycle, if any). Efforts for water conservation.	Water balance diagram has provided in chapter 2. We will recycle 78 KLD water within premises.	Page 29, Chapter 2
17.	Details on raw materials, source, storage and handling within the premises. Mode of transportation of raw materials and products as well as measures proposed for preventing fugitive emission during transportation.	The detail of raw material with quantity has been provided in chapter 2.	Page 18, Chapter 2
18.	Type, quantity and quality of fuels required. A confirmed fuel linkage / copy of MoU for supply of fuel.	Type, quantity and quality of fuels required for cement grinding unit has been mentioned in chapter 2.	Page 32, Chapter 2 Annexure V
19.	List the sources of air pollution including process emissions as well as fugitive emissions along with the mitigation measures. Air pollution control measures (APCM) along with its design details, efficiency, inlet and outlet pollutant concentrations, etc. and stack height. The APCM shall be designed to achieve particulate matter emission below 50 mg/Nm3 at the stack outlet and its design should be got approved by the reputed institute.	All the sources of air pollution including process emissions as well as fugitive emissions have been identified and the mitigation measures have been suggested.	Page 35, 91 and 105, Chapter 2 and chapter 4.
20.	An action plan to control and monitor secondary fugitive emissions from all the sources.	Regular water sprinkling is proposed to control the fugitive emission.	Page 152, Chapter 10
21.	Provision of the online monitoring system on stacks for monitoring of pollutants, with an arrangement to reflect monitored data on company‘s server that can be	CEMS will be installed as per direction of CPCB with an arrangement to reflect monitored data on company‘s server that can be accessed by the GPCB	Page 117, Chapter 6

	accessed by the GPCB on real time basis.	on real time basis.	
22.	In case, hazardous waste is proposed to be charged in kilns, details on type of waste, its characteristics and monitoring of emissions of gases, heavy metals, VOCs, dioxins and furans.	Not applicable	-
23.	Details of solid / hazardous wastes generation, its composition, handling, storage, utilization, disposal etc.	Details of solid/hazardous wastes generation, etc. is listed in chapter 2.	Page 36, Chapter 2
24.	Details of all possible sources of noise pollution, its magnitude and mitigation measures including engineering and other controls proposed to control it.	The all possible sources of noise pollution, its magnitude and mitigation measures including engineering and other controls has been identified and presented in EIA report.	Page 36 & 141, Chapter 2 & chapter 10
25.	Details of heat emission sources from the proposed project and proposed mitigation measures.	All the emission sources have been identified and presented.	Page 47, Chapter 3
26.	One season site-specific meteorological data including temperature, relative humidity, hourly wind speed and direction and rainfall shall be provided.	One season site-specific meteorological data including temperature, relative humidity, hourly wind speed and direction and rainfall has been provided.	Page 44, Chapter 3
27.	One season (except monsoon) ambient air quality monitoring at minimum 6 locations within the study area along with dates of monitoring. Parameters to be considered shall be in accordance with the revised national ambient air quality standards notified in November, 2009 and other project specific parameters. The monitoring stations shall take into account the predominant wind direction, population zone and sensitive receptors including reserved forests. There should be at least one monitoring station in the upwind direction and one monitoring station at / near the location where maximum ground level concentration is likely to occur.	Baseline monitoring for post monsoon season (1st Oct. 2018 to 31st Dec. 2018) has been utilized for the preparation of EIA. The 8 locations were selected considering predominant wind direction, population zone and sensitive receptors including reserved forests, etc. The sampling location map along with coordinates of site has been mentioned in chapter 3.	Page 48, Chapter 3
28.	Prediction of ground level concentration of pollutants by air quality modeling based on site specific meteorological features. Details of the model used and the input parameters used for	GLC has been predicted on the basis of AAQ modeling and presented in chapter 4. The wind roses map shown on GLC map.	Page 100, Chapter 4

	modeling shall be provided. The air quality contours shall be plotted on a location map showing location of project site, habitation, sensitive receptors, etc. The wind roses should also be shown on this map.		
29.	Location of the project site and nearest habitats with distances from the project site to be demarcated on a toposheet (1: 50000 scale).	Location of the project site and nearest habitats with distances from the project site has been mentioned in chapter 2 and Toposheet map on 1:50000 scale has been provided.	Page 16 & 39, Chapter 2 & 3
30.	Land use pattern of the study area based on satellite imagery / field investigation including location specific sensitivities such as national parks / wildlife sanctuary, villages, industries, prime agricultural land etc., for the study area. If any incompatible land use attributes fall within the study area, proponent shall describe the sensitivity (distance, area and significance).	The land use Patten of the study area has been presented.	Page 56, Chapter 3
31.	The baseline data shall also be collected for other components of environment viz. noise, water, land, and biology and socio-economic.	The baseline data has been collected for other components of environment viz. noise, water, land and socio-economic.	Page 52,65,55 and 81, Chapter 3
32.	Ecological status (terrestrial and aquatic) of the study area such as habitat type and quality, species, diversity, rarity, fragmentation, ecological linkage, age, abundance, etc. In case of scheduled fauna, conservation measures should be proposed.	Ecology and biodiversity of the area has been studies by EB expert covering all aspects.	Page 77, Chapter 3
33.	A detailed study to assess the wildlife habitats, their migration route, etc. and measures to mitigate impacts of the proposed activities.	Ecology and biodiversity of the area has been studies by EB expert and mitigation measures suggested accordingly.	Page 77, 94 and 108, Chapter 3 & chapter 4
34.	While identifying the likely impacts, also include following for analysis of significance and required mitigation measures: (i) Impacts due to transportation of raw materials and end products on road network (ii) Impacts on surface water, soil and groundwater (iii) Impact on drainage of the area and the surroundings (iv) Impacts due to air pollution (v) Major sources of noise and its impacts (vi) Impacts due to	The anticipated impact has been identified and mitigation measures have been presented.	Page 97, Chapter 4

	fugitive emissions (viii) Impact on health of workers due to proposed project activities.		
35.	Proposal to construct approach road from the main road to the company premises and to maintain it in good condition for reducing fugitive emission due to transportation of vehicles.	The asphalt road is already available connecting from National Highway to site. Regular water sprinkling will be done.	-
36.	Details regarding infrastructure facilities such as sanitation, fuel storage, restroom, etc., to the workers during construction and operation phase.	The amenities at site have been mentioned in chapter 2.	Page 32, Chapter 2
37.	Environmental Monitoring Program for operational phase of project including (i) Monitoring programme for pollution control at source, (ii) Monitoring pollutants at receiving environment for the relevant parameters – air quality, groundwater, surface water, etc. to assess impact during operational phase of the project, (iii) Specific programme for medical surveillance and monitoring of working environment (especially for cement / silica dust) as per Gujarat Factories Rules (iv) Details of in-house monitoring capabilities and details of outsourcing to other agencies if proposed for conducting monitoring.	Environmental Monitoring Program for operational phase has been included in chapter 6 for all the relevant parameters as suggested.	Page 113 and 164, Chapter 6 & Chapter 10
38.	Environmental Management Plan including (i) Measures to mitigate adverse impacts along with item-wise cost of its implementation (capital and recurring costs), (ii) Administrative and technical organizational structure for implementation of mitigation measures and proposed post-project Environmental Monitoring Program, (iii) Allocation of resources and responsibilities for plan implementation.	Environmental Management Plan including mitigation measures has been included in chapter 4 and budget mentioned in chapter 10.	Page 89 and 165, Chapter 4 & Chapter 10
39.	A tabular chart for the issues raised in public hearing/consultation and commitment of the project proponent to the same. An action plan addressing the issues raised and the necessary allocation of funds for the same.	The detail will be added after PH conducted.	-

40.	PP shall ensure participation of people during Public Hearing with equality in gender so as to encourage woman participation in Public hearing & at the same time their issues shall also be given weightage.	The public hearing will be done after submission of draft EIA to GPCB and participation of women will be ensured.	-
41.	Action plan for the greenbelt development in accordance to CPCB published guidelines. The details should include types &number of species, width of plantations, area under green belt development [with map], planning schedule, budgetary outlay, etc.	The action plan of green belt (16500 m^2) has been prepared and presented in the EIA.	Page 159, Chapter 10
42.	Risk assessment including prediction of the worst-case scenario and maximum credible accident scenario along with risk contours plotted on the plant layout clearly showing the activities that would be affected in case of an accident taking place.	Risk assessment including prediction of all the hazard anticipated has been included.	Page 129, Chapter 7
43.	Details on the proposed safeguard measures, fire control plan, and on-site and off-site emergency management plans.	The safeguard measures, fire control plan, and on-site and off-site emergency management plans, etc. has been presented in chapter 7.	Page 131, Chapter 7
44.	Proposal for CSR activities most useful in the area along with time bound action plan and cost.	CSR is not applicable for the new project. However, CER is covered under ToR 45.	-
45.	Compliance of MoEFCC"s OM dated 01/05/2018 regarding —Corporate Environment Responsibility" (CER). Fund allocation for Corporate Environment Responsibility (CER) shall be made as per MoEFCC's O.M. No. 22-65/2017-IA.III dated 01/05/2018 for various activities therein. The details of fund allocation and activities for CER shall be incorporated in EIA/EMP report.	The activities under CER has been listed as per need base assessment and as suggested in MoEFCC"s OM dated 01/05/2018 regarding —Corporate Environment Responsibility" (CER).	Page 163, Chapter 10
46.	Explore the use of renewable energy to the maximum extent possible. Details of provisions to make the project energy-efficient through energy efficient devices and adoption of modes of alternative eco-friendly sources of energy like solar water heater, solar lighting etc. Measures proposed for energy conservation.	We have planned to use energy efficient devise and solar panel to save the energy and electricity. The measures proposed for energy conservation has been provided in chapter 10.	Page 149, Chapter 10

47.	Detailed scheme for surface / roof top rain water harvesting and ground water recharge shall be incorporated. In case of ground water abstraction, annual abstraction quantity should be compensated by equal amount of ground water recharge. The details should include scientific calculations based on rainfall, catchment area, runoff / recharge coefficients, percolation rate, duration of recharge etc. Before recharging the surface run off, pre-treatment must be done to remove suspended matter / oil & grease. Location of recharge percolation wells should be demarcated on layout plan.	No ground water will be used, however, the rain water harvesting has been proposed.	Page 150, Chapter 10
48.	Plan for compliance to the CREP guidelines.	Complied	Page 166, Chapter 10
49. a	Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.	Yes	Annexure VI
50. b	Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.	Yes	Annexure VI
51.	What is the hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions? Details of this system may be given.	The organogram has been presented in chapter 10.	Page 164, Chapter 10
52.	Does the company have a system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA Report.	Yes	Page 164, Chapter 10
53.	Certificate of accreditation issued by the NABET, QCI to the environmental consultant should be incorporated in the EIA Report.	Certificate of accreditation issued by the NABET is enclosed with this EIA report in on second page.	ii

54.	PP shall explore using gypsum as ARF (Alternative Raw Material/ Fuel) produced by chemical industries from process/ETP.	Yes, we have the proposal of using gypsum (ARF) by chemical industries from process.	-
55.	A tabular chart with index for point-wise compliance of above TORs.	Complied	-

1.15 SUMMARY

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant. This project is based on state of art technology Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat. The proposed Greenfield Standalone Grinding Unit falls in Category-B, under section 3(b) as per the prevailing EIA Notification, dated 14th September 2006 and its amendments thereafter. Capital cost of this project is 282.28 Crores. There is no litigation pending against the project and/or land on which the project will proposed to be set up. EIA study has been conducted prior to commissioning Standalone grinding unit with bulk and bag packing plant and in accordance with letter SEIAA/GUJ/TOR/3(b)/223/2019 dated 29th Jan. 2019 issued by SEIAA Gujarat.

2 PROJECT DESCRIPTION

2.1 GENERAL

The aim of this chapter is to discuss about type, need, location, size or magnitude of project, operational activities, technology to be used and other related activities. It also provides a condensed description of the aspects which are likely to cause environmental damages to the surrounding environment.

2.2 TYPE OF PROJECT AND CAPACITY

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat. This activity falls in Category- B under Project/Activity 3(b) schedule as per EIA Notification dated 14th September, 2006, as subsequent amendments. The company has well defined vision, mission and values that the company follows on its path to success. It has a vision to be the business leader, delivering superior value to all our stakeholders with a mission to achieve profitable growth and customer delight through innovation, operational excellence, leadership and teamwork to add value for all stakeholders and society.

2.3 NEED OF THE PROJECT

Industrialization is the better way for growth and employment. Also it is a strategic location connecting Indian markets. Cement is major component in infrastructure growth. Total cement production in the area and nearby state does not match the demand growth and hence new capacities have to come up concurrently. The proposed plant will ensure that the supply situation in Gujarat is comfortable in the coming times, as growth is expected to propel demand. SIL is known for its environment friendly initiatives across sectors it operates in and strong reputation for sustainable growth. Disposal of fly ash is an environmental concern which is faced all coal based thermal power generating plants. Cement grinding can consume up to thirty five percent of fly ash produced in the power plants and thus reduce environmental concern. The cement projects planned by SIL would also generate immense employment opportunities and significant contribution to the Govt. exchequer, improvement of socio economics of the area. The company is committed to the development of the country and will put all efforts for comprehensive development of this area also as being practiced.

2.4 LOCATION (M APS SHOWING GENERAL LOCATION, SP ECIFIC LOCATION, PROJECT BOUNDARY & PROJECT SITE LAYOUT, LONGITUDE AND LATITUDE)

Proposed project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant located at Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat, India. Location map and long/short view of Google Earth is depicted as **Figure 2.1 to 2.3** respectively. Land document is enclosed as **Annexure–II**. Project boundary marked on Google Earth having following co-ordinate:

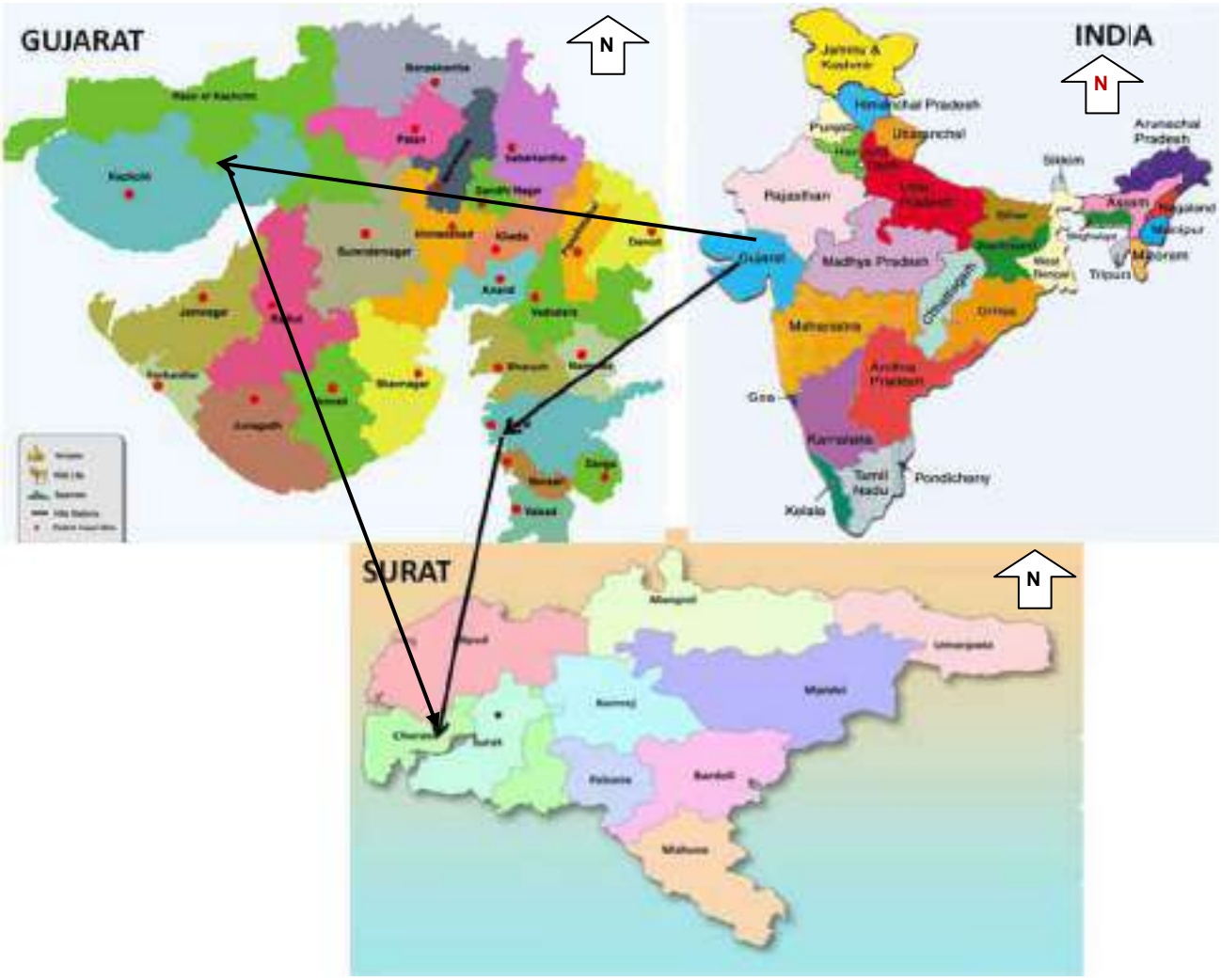


Figure 2.1 Location Map

Table 2.1: Coordinates of Project Site

Points	Latitude	Longitude
A	21° 9'0.08"N	72°39'0.68"E
B	21° 8'59.46"N	72°39'1.09"E
C	21° 9'0.78"N	72°39'3.62"E
D	21° 9'0.12"N	72°39'4.09"E
E	21° 9'0.81"N	72°39'5.20"E
F	21° 9'0.29"N	72°39'5.47"E
G	21° 9'1.18"N	72°39'6.90"E
H	21° 9'0.93"N	72°39'7.90"E
I	21° 9'0.86"N	72°39'9.24"E
J	21° 9'0.46"N	72°39'11.28"E
K	21° 8'59.84"N	72°39'11.93"E
L	21° 8'58.72"N	72°39'11.71"E
M	21° 8'57.60"N	72°39'12.32"E
N	21° 8'55.54"N	72°39'11.61"E
O	21° 8'54.57"N	72°39'10.56"E
P	21° 8'54.59"N	72°39'9.07"E
Q	21° 8'55.54"N	72°39'8.23"E

R	21° 8'55.22"N	72°39'5.49"E
S	21° 8'56.94"N	72°39'1.80"E
T	21° 8'57.07"N	72°39'0.75"E
U	21° 8'58.75"N	72°39'0.36"E

Figure 2.2 Long view of Project site

Figure 2.3 Short view of Project site

2.5 SIZE OR MAGNITUDE OF OPERATION

2.5.1 Products/Production Capacity

Proposed project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Village Shivrampur, Taluka- Choryasi, District Surat, Gujarat by Sanghi Industries Ltd.

2.5.2 Capital Cost

Estimated cost of this project is about Rs. 282.28 Crores. The anticipated capital expenditure for the pollution control measures is about Rs. 9.11 Crores.

2.6 ASSOCIATED ACTIVITIES REQUIRED BY OR FOR THE PROJECT

2.6.1 Raw Materials/Fuel and its Source

The major raw material is clinker, fly ash, gypsum and slag for the production of cement. The coal / lignite /pet coke will be used as fuel. The details of raw material, its quantity, the source and mode of transportation are provided in Table 2.2 and Table 2.3.

Table 2.2: Raw Material Requirement

S.No.	Material	Requirement per Annum - Million Ton/Annum			
		100% OPC	100% PPC	100% PSC	Max per Annum
1.	Clinker - OPC	1.90	--	--	1.90
	Clinker - PPC	--	1.20	--	
	Clinker - PSC	--	--	1.10	
2.	Gypsum	0.10	0.10	0.10	0.10
3.	Fly Ash	--	0.70	--	0.70
4.	Slag	--	--	0.80	0.80

5.	Lignite / Coal / Petcoke	--	--	0.06	0.06

Table 2.3: Sources of Raw Material

S.No	Material	Source	Source Locality	Mode of Transport
1.	Clinker	Captive	In house from Sanghipuram plant	Sea/Road
2	Coal	Purchase	Open Market	Road
3.	Fly ash	Purchase	Nearby Power Plant & Open market	Road
4.	Gypsum	Purchase	Open Market	Road
5.	Slag	Purchase	Nearby Steel plants & Open Market	Road

Table 2.4: Chemical Composition of Raw Materials

S.No.	Element	Composition				
		Clinker	Chemical Gypsum	Mineral Gypsum	Fly Ash	Slag
1.	SiO_2	19.80	2.87	-	60.24	35.10
2.	Al_2O_3	5.60	6.86	-	27.23	16.55
3.	Fe_2O_3	4.10	8.04	-	6.82	1.56
4.	CaO	63.70	23.88	-	-	35.96
5.	MgO	3.40	0.80	-	3.82	6.84
7.	Loss on ignition	0.32	19.37	0.76	0.67	0.85
8.	Free Lime	2.00	-	-	-	-
9.	LSF	98.26	-	-	-	-
10.	C_3S (Tri-calcium Silicate)	51.44	-	-	-	-
11.	C_2S (Di-calcium Silicate)	18.04	-	-	-	-
12.	C_3A (Tri-calcium Aluminate)	7.91	-	-	-	-
13.	Moisture	-	-	0.59	-	12.98
14.	Insoluble Residue (%)	0.28	1.72	-	-	1.6
15.	Na_2O	0.28	-	-	0.09	0.91
16.	K_2O	0.31	-	-	0.30	
17.	Cl	0.047	0.08	0.02	0.06	0.043
18.	SO_3	2.00	33.43	43.01	0.63	0.368
19.	Bulk Density (t /m^3)	1.5	-	-	-	-
20.	Purity (%)	-	66.64	92.48	-	Glass content≈ 92
21.	Heavy Metals: Arsenic, Chromium, Coppper, Iodine, Lead, Mercury, Molybdenum, nickel, Selenium & Zinc	ND	ND	ND	ND	ND

Source: Pollucon Laboratory Pvt. Ltd. Dtd. 05/03/2018

2.6.2 Quantity and Chemical Composition of Fuel

The quantity of fuel required at Surat GU is as follows:

Type of Fuel	Source	Max. Quantity (TPH)
Coal/Lignite/Petcoke	Open Market	12.00

Typical chemical analyses of the fuels are given in the **Table 2.5.**

Table 2.5 Quality Analysis Test Report of fuel

S.No.	Properties	Unit	Quality/Range		
			Imp. Coal	Lignite	Pet Coke
1.	Total Moisture	%	11.3	35.2	8.12
2.	Inherent Moisture	%	3.5	33.9	2.6
3.	Ash	%	10.2	33.4	0.92
4.	Volatile Matter	%	23.5	39.5	10.3
5.	Sulphur	%	0.6	4.46	6.9
6.	Gross/Net Calorific Value	Kcal/Kg	4200	3140	7700
7.	Heavy Metals: Arsenic, Chromium, Copper, Iodine, Lead, Mercury, Molybdenum, Nickel, Selenium and Zinc.	%	ND	ND	ND

Source: Pollucon Laboratory Pvt. Ltd. Dtd. 05/03/2018

2.6.3 Transportation & Storage of Raw Materials

The clinker shall be transported from Sanghipuram (IU) to Surat GU mainly by sea. Clinker shall be extracted from the Clinker load out silos at IU, transported to the captive Jetty of SIL by trucks and loaded on to the barges by grab cranes. Barges shall transport the Clinker to the ship stationed at high seas. At Surat, the Clinker shall be unloaded from the ship at nearest port and transported to the Surat GU site by trucks. The clinker received through self-tipping trucks shall be unloaded by into a box feeder and transported to clinker storage silo through conveyor and elevator. The clinker storage has been envisaged in RCC silos of capacity 50,000 Ton, adequate for about 10 day requirement of the plant. Clinker shall be extracted from the bottom of the clinker silos and fed to the clinker hoppers in the cement grinding section through a belt conveyors and elevator.

Additive & Fuel Crushing and Handling

The project envisages use of chemical gypsum and slag as additives and coal/lignite/petcoke as a fuel. Hence, additive crushing is not envisaged. The material shall be received in the plant by trucks, unloaded into a box feeder. The material is transported & stored with the help of sets of belt conveyor and stacker into covered stock pile. The material will be reclaimed by reclaimer and conveyed upto respective hopper through conveyor and elevator. The crusher will be provided for fuel crushing only for required sizing for HAG.

Additive Storage

Gypsum :

Total cement produced = 6,060 TPD (2.0 Million TPA)

Gypsum addition envisaged = 5%

Gypsum requirement per day = 6,060 x 5%

= 303 TPD

SIL proposes Gypsum storage of 1 x 3000 Ton, which is adequate for about 10 days of requirement. SIL shall have to ensure efficient logistics to ensure against stock out situation.

Slag

Total cement produced = 6,060 TPD (2.0 Million TPA)
Salg addition envisaged = 50%
Gypsum requirement per day = 6,060 x 50%
= 3030 TPD

SIL proposes slag storage of 1 x 4000 Ton, which is adequate for about 1.5 days of requirement. SIL shall have to ensure efficient logistics to ensure against stock out situation.

Fuel

Fuel requirement per day = 12 TPH x 21 hr
= 252 TPD

SIL proposes fuel storage of 1 x 2000 Ton, which is adequate for about 8 days of requirement. SIL shall have to ensure efficient logistics to ensure against stock out situation.

Fly Ash Handling & Storage

Total cement produced = 6,060 TPD (2.0 Million TPA)
Fly ash addition envisaged = 25%
Fly ash requirement per day = 6,060 x 25%
= 1,515 TPD

SIL proposes Fly ash storage of 1 x 5000 Ton, which is adequate for less than 3.3 days of requirement. SIL shall have to ensure efficient logistics to ensure against stock out situation. It is envisaged that the fly ash shall be brought through road bulk carriers and shall be unloaded pneumatically in the silo. From the silo, fly ash shall be transported to the hopper at cement mill by air slides and bucket elevator.

Cement Grinding System

Cement Mill capacity required = (6,060 x 1.15)/21
= 332 TPH

335 TPH (say) PPC @ 3,600 blaine

(Considering 21 hrs of operation per day and 15 % safety margin)

1.3.6. Cement Storage

Total cement produced per day = 2,000,000/ 330
= 6,060 Ton

SIL proposes cement storage of 3 x 7000 T, which is adequate for about 3 day of production. SIL shall have to ensure effective maintenance to ensure against stock out situation. Cement from the grinding system is transported to the silos with the help of air slides and bucket elevators. From the silos, cement shall be transported to the packer with the help of a set of air slides and bucket elevators.

2.6.4 Main Machinery/Equipment

2.6.4.1 Main Machinery Sizing

GRINDING UNIT CAPACITY		
S.No.	**Item**	**Grinding Unit Capacity**
1.	Cement Grinding	335 TPH PPC @ 3,600 Blaine
2.	Packers	2 x 240 TPH
3.	Truck Loaders	6 Nos.

GRINDING OPERATING CAPACITY				
S.No.	**Item**	**Operation Hrs/day**	**Days Operation per year**	**Safety Factor**
1.	VRM	21	330	1.15
2.	Packing Plant	15	360	1.25

2.6.4.2 Main Storage per ton

S.No.	Item	Grinding Unit Storage (Ton)
1.	Clinker Silo	50,000
2.	Fly Ash Silo	5,000
3.	Gypsum	3,000
4.	Slag	4,000
5.	Fuel	2,000
6.	Cement	3 x 7,000

2.6.4.3 Main Storage per day

S.No.	Item	Grinding Unit Storage (day)
1.	Clinker Storage	10
2.	Fly Ash Storage	3.3
3.	Gypsum Storage	10
4.	Cement Storage	3
5.	Slag Storage	1.5
6.	Fuel	8

2.6.4.4 Technical details Cement Grinding System

Based on the evaluation of parameters like power consumption, investment cost, proven performance, it is proposed to install VRM of capacity ~ 1 x 335 TPH.

The brief technical details of the cement drying & grinding system are as follows:

Cement Mill Bin(s): 2 Nos. hoppers for mill system comprising of 400 T capacity for clinker, 300 t each for gypsum & two additional for future material shall be installed.

Cement Mill Feeding: Weigh-feeders have been considered for extraction of clinker and gypsum in required proportion under the cement mill hoppers. Weigh feeders shall feed the material on a belt conveyor, which shall feed the material to mill circuit. Controlled/ measured quantities of fly ash will be drawn from fly ash silo through dozing valves and shall be fed to the dedicated solid flow meters through the weigh bin. Load cells will be provided for online check weighing and/or calibration of solid flow meters.

Vertical Roller Mill Circuit (VRM): Clinker with additives are grinded in Vertical Mill where material is discharge at the center of Rotating table and by centrifugal force material is distributed beneath the hydraulically operated rollers which apply pressure on the material bed to grind the material. The fly ash shall be added directly below the classifier in mill. Mill shall be considered open to sky i.e. without EOT crane. Maintenance shall be done through the mobile crane, shall be arrange as required on rent.

Product C ollection: The ground material is air swept to the high efficiency separator, where coarse material falls back on grinding table. Fines from separator will be collected in a bag filter. Fines collected in bag filter will be transported to cement storage silo by a system of air slides and bucket elevator.

Mill de dusting: The Mill is in negative suction and the product is collected in a bag filter which is designed as per Environmental norms. All auxiliary circuit shall be de dusted by means of bag filters. All Bag filters will be designed to meet the requirements of prevalent environmental norms.

Sampling: An auto sampler shall also be installed after the discharge of air slides taking product from bag house

Hot Gas Generator: In order to maintain the required gas flow through mill nozzle ring, hot gas may be required during mill startup. Hence, a suitably sized hot air generator (HAG) is envisaged. Diesel tank, pumps & transport line to HAG is considered. Cost of HAG, tank & transport system is considered in the project cost grinding package.

2.6.4.5 Cement Production

Total cement produced per day = 2,000,000/ 330 = 6,060 T

Cement storage of 3x 7,000 Ton silo is proposed, which is adequate for about 3 day of production. The silo is considered keeping in view that the different types of cement as per the market demand can be prepared and stored in future.

Cement from the grinding system is transported to the silos with the help of air slides and bucket elevators. From the silos, cement shall be transported to the packer with the help of a set of air slides and bucket elevators.

2.6.4.6 Cement Packing and Dispatch

Cement Sil os Extraction: The cement silos shall be capable of complete emptying by an appropriate design of the silo bottom and the aeration system. Silo extraction systems with multiple outlets and collecting hoppers shall be provided.

Cement Transport to packing Plant: Transport of cement from cement silo to packing machines by means of air slides and bucket elevators has been considered.

Cement Packing Plant: Total cement per day = 2,000,000/ 360 = 5,555 t (Considering 360 days of operation) Packer capacity required = 5,555 x 1.25/15 = 462 TPH, 2 x 240 TPH (say).

(As substantial portion of the dispatches will be through bulk, 2 packers are considered enough)

2 X 240 TPH, 16 spouts, double discharge packing machines has been considered. 6 Nos. semi-automatic truck loaders for loading of bags to road trucks have been considered. The rotary packer outlet up to loading of the packed bags, suitable system with flat transport belts and diverters has been considered. Also, installation of 2 Nos. of bulk loading system is considered.

2.7 SCHEDULE FOR APPROVAL AND IMPLEMENTATION

The implementation period has suggested 15 months for project execution activities after placement of main machinery order until the plant commissioning. The detailed time schedule for project execution after placement of main machinery order up to commissioning of the plant, in the form of bar charts is given below.

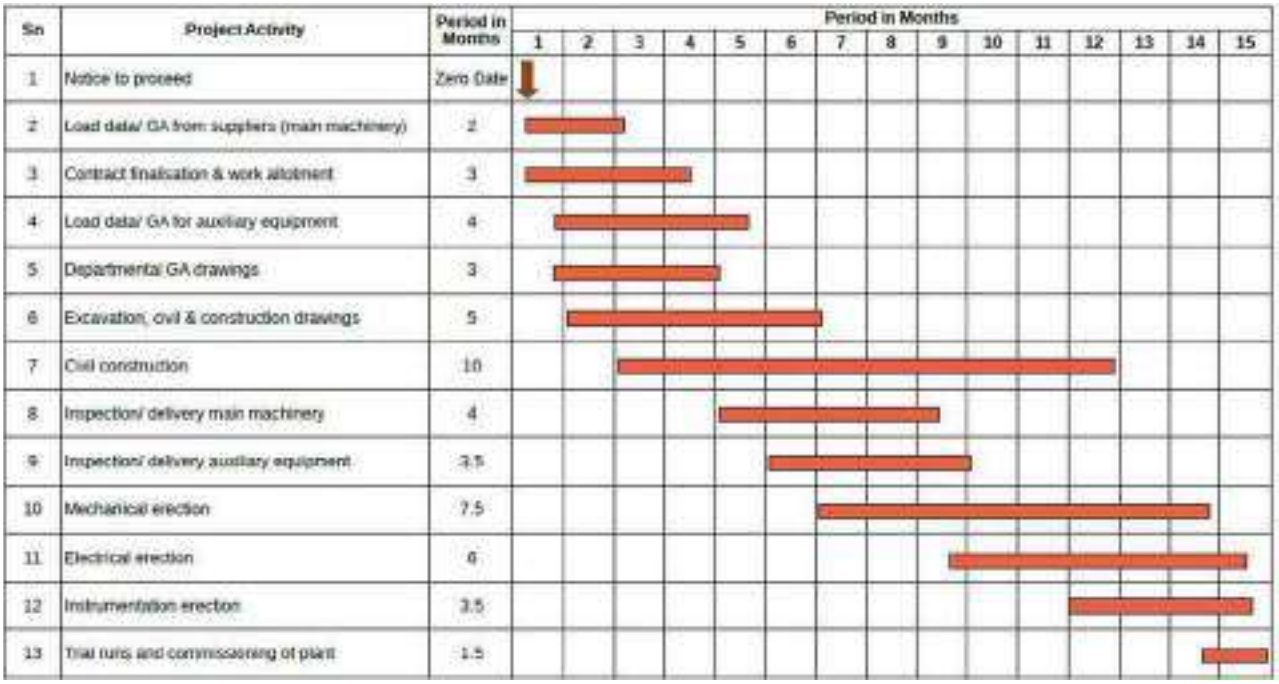


Figure 2.4 Project Implementation Schedule

2.8 TECHNOLOGY AND PROCESS DESCRIPTION

2.8.1 Cement Grinding Process

Clinker and additives like Gypsum, Fly ash & Slag shall be filled in to the respective hoppers through suitable material handling system. SIL has proposed to install 1 x 335 TPH Vertical roller mills for cement Grinding. A arrangement for cement mill is considered for clinker storage, additive

storages, Cement storage and packing plant. Clinker unloading and bagged cement loading to trucks for road transport is proposed along with bulk cement loading facility in the plant.

The grinding, drying and classification of the grinding material is performed inside the mill. The horizontal grinding table is rotated by a gear box. Feed material falls onto the center of the grinding table and spreads outwards under the effect of centrifugal force. The material passes under the hydro pneumatically spring-loaded grinding rollers, which grind the material by the application of compressive force and shear force. As it is ground, the material flows over the dam ring and enters the fast moving hot gas stream rising from the louvre ring which surrounds the table. The rising hot gas stream carries the ground material upward through the mill body to the classifier, which is directly located on top of the mill body. Through contact with hot gas the moisture of the ground material evaporates. The classifier controls the size of particles permitted to leave the mill. Those particles which are coarser than required are rejected to the table for regrinding via a grit cone below the classifier rotor. The particles which have reached the necessary fines pass the classifier.

Hot air required for the purpose of drying of moisture in Slag / Gypsum shall be generated by Hot Air Generator. HAG shall meet the drying heat requirement of Cement Grinding mill. Lignite/Coal/Petcoke will be required for such purpose and will be sourced from open market. The fuel will be transported to the plant site by road. Solid fuel will be stored at closed yard. The fuel will be fed to a crusher of 12 TPH capacities through a belt conveyer. Crushed fuel will be fed to HAG through bin.

The exhaust of VRM fan will be connected with bag filter. Product collected at bag filter shall be transported to the cement silo through a set of air slides and bucket elevator.

2.8.2 Cement storage

RCC silo of capacity 21000 ton (3 x 7000) shall be constructed for storage of cement.

2.8.3 Cement packing

The cement from silos will be extracted and fed to the installed 2 Nos. of electronic packers, sixteen spout, double discharge with a capacity of 240 TPH each through air slides, bucket elevators and screens. Each packer will be connected with 3 Nos. truck loaders for loading packed cement bags. The packed bags from packers will be transported to truck loading bays by suitable flat belts conveyors and diverters. A separate provision will be also available to load bulk cement through closed tankers / jumbo bags.

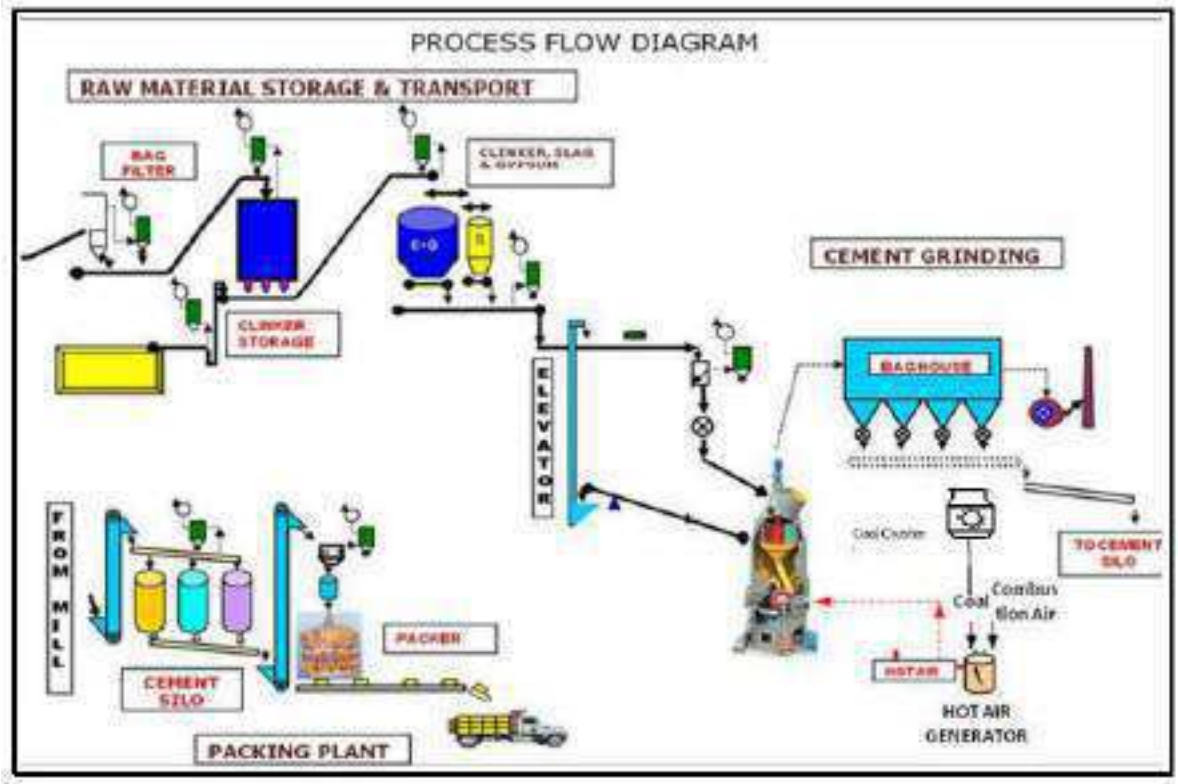


Figure 2.5: Process flow diagram of Cement grinding unit

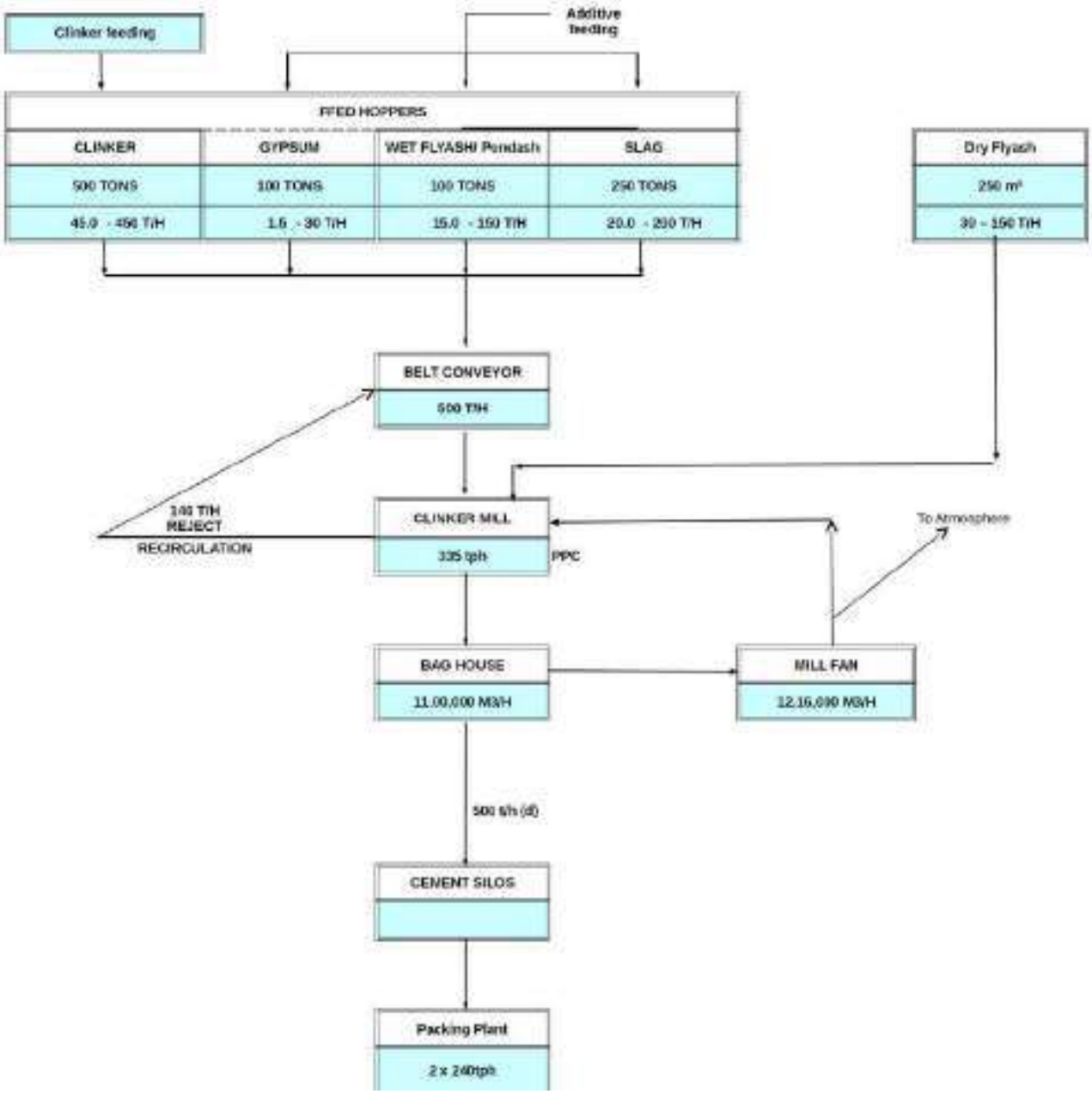


Figure 2.6: Mass balance of Cement Production

2.8.4 Quality control

The quality control department at the proposed plant shall have the following facilities:

Chemical / Physical Analysis laboratory

Facilities for testing the physical properties like sieve analysis, setting time, soundness, fineness, CCS, Grindability, moisture content, drying shrinkage, etc. X-ray diffractometer (XRD) and conventional chemical analysis equipments are envisaged for the analysis. To determine the PSD of the clinker, cements, etc. a laser diffraction type PSD analyser will be installed having typical particle size range of 0.3 mm 400 micron.

Quality Control Plan

To produce good quality cement, it is imperative that sampling & testing of various raw materials like clinker, gypsum, fly ash, Slag and the final product is carried out regularly at the required intervals for taking corrective action timely as per standards. To ensure consistent product quality and to permit the trouble free and cost effective operation, the quality control plan for sampling &

testing of various raw materials, in-process materials and the final product is suggested. While proposing the methods and procedures for quality control, the following aspects have been taken into account.

Requirements and norms, particularly in cement testing

- Corrective measures to be undertaken as quickly as possible in the process operation.
- Desired degree of automation.
- Available raw materials and process equipment.
- The main area of quality control has been envisaged as Before Cement Mill, After Cement Mill & Laboratory

The laboratory will be accommodated in the Central Control Room (CCR) building at the proposed plant site. The laboratory shall have the provision of chemical and physical testing facilities for raw materials, clinker, gypsum, fly ash, Slag and cement.

2.8.5 Maintenance

Workshop: A mechanical and an electrical workshop is envisaged to take care of the regular maintenance/ repair jobs in the plant.

Central st ores: A store building needs to be constructed for storing tools, spare parts, consumables, etc. Open area to be earmarked for storing machinery and construction materials for the proposed grinding unit site.

Cranes, Monorails and Pulley blocks-Adequate sized maintenance cranes/ hoists, monorails and pulley blocks to be provided at all suitable locations at the plant site for ease of maintenance and operation.

2.9 PROJECT COMPONENTS

Various resources like capital investment, land, utility, power, water, manpower etc. will be utilized for the proposed project. Each of the resources is briefly described in the following sections:

2.9.1 Capital Investment

The capital cost to set up the expansion is Rs. 282.28 Crores, which include land purchase cost, building and civil work, plant and machinery, utility/pollution Control and others. Capital cost including cost towards environmental management plan etc. is mentioned in table below.

Table 2.6 Project Cost Bifurcation

S.No.	Description	Amount (Rs. Lakhs)
1.	Land & Site Development	3819.0
2.	Civil works & Structures	7633.0
3.	Plant & Machinery	13334.0
4.	E & I Installation	2390.0
5.	Environment Management system	911.0
6.	Engineering	130.0
7.	Lab equipment/set up	0.50
8.	Expense on Training	10.0
9.	Contingency	0.50
	Total	**28228.0**

2.9.2 Land

Sanghi Industries Ltd. has procured 48,563.00 m^2 land to develop the standalone grinding unit. Land document is enclosed as Annexure II. Proposed project will be set at, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat. Out of 48,560 m^2 area

approx. 32,063 m^2 will be utilized for proposed project and remaining 16,500 m^2 area will be kept for greenbelt development. Construction of admin building, plant building, Raw material storage area, finished products storage area, utility area, treatment facility, parking, fire hydrant and other ancillary amenities shall be undertaken within the plot area. Proposed project will be developed in accordance with local development plan and used for industrial purpose. Bifurcation of plot area is mentioned in table below.

Table 2.7 Land Breakup of Cement Grinding Unit

#	Particulars	Total Area (in Ha.)	Area
1.	Production Plant	0.712	14.66%
2.	Office & Lab Area	0.022	0.46%
3.	Raw Materials Storage Area	0.632	13.01%
4.	Solid Waste Storage Area	0.005	0.10%
5.	Open Space	1.835	37.79%
6.	Green Belt	1.650	33.98%
	Total	**4.856**	**100.00%**

2.9.3 Water

The water requirement in operation phase including industrial and domestic purposes is about 278 KLD out of which 200 KLD is fresh. Water is required for equipment cooling, drinking, sanitation, Dust Suppression, Green belt etc. water shall be met through Local body/Irrigation Department, Surat. The application has been already submitted to Irrigation Department and attached as **Annexure-IV.** For plant equipment, water shall be re-circulated to avoid any wastage and only losses shall be making up from fresh water. Total water consumption is given in table below.

Table 2.8: Water Consumption in Cement Grinding Unit

S. No.	Particulars	Water Consumption, (KLD)
A.	**Domestic**	**15.0**
B.	**Industrial**	
1.	Processing/Cooling	150
2.	Dust suppression & Fire Fighting	10 KLD Fresh Water + 58 KLD from Blow down = 68 KLD
	Total Industrial	**160.0**
C.	**Gardening**	25 KLD Fresh water + 20 KLD recycled= Total 45
	Total Fresh water Requirement	**200.0**
	Total water Requirement	**278.0**

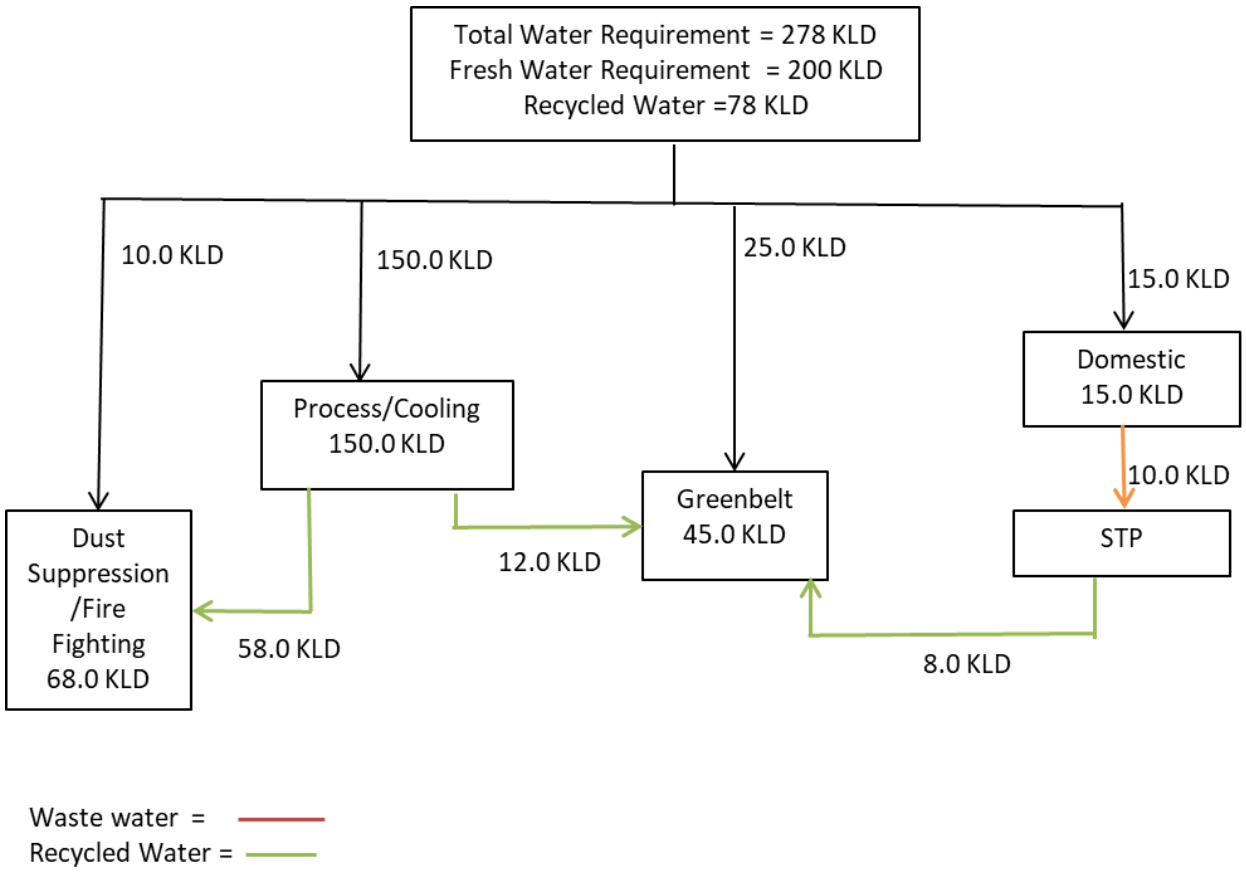


Figure 2.7: Water Balance Diagram

2.9.4 Electricity/Power Requirement

During Construction Phase: The construction power is envisaged to be made available from state electricity board.

During Operation Phase: The maximum estimated power demand for the proposed grinding and packing plant is estimated as 13.5 MW. The DG set of 2 MW will be installed for emergency power backup. The power requirement for the grinding unit shall be met from dedicated connection from the State Grid and/or SIL power plant Sanghipuram (CPP) shall be taken.

Drives for the grinding unit

The type of drives considered is based on following requirements:

- Load Characteristics
- Starting Torque
- Operating characteristic i.e. high power factor and efficiency at operating points
- Accuracy and range of speed control required for specific applications.

All Motors, 200 kW to 1200 kW shall be connected at 690 V and above 1200kW at 11 KV and motors below 200 kW at 415 V. Power saving equipment like variable frequency drives are taken into consideration for drives to have added economy in energy cost as well as to achieve precise speed control.

Power factor improvement for the grinding unit

For maintaining a high overall plant power factor (PF) and in order to reduce the demand charges, static power factor improving capacitors of suitable kVAR rating and voltage grade are considered. In the envisaged scheme, suitable size capacitors have been considered for direct connection across stator switch terminals of respective 11 KV motors. For compensation of LT

load, multi –step automatic controlled capacitor banks have been considered for connection at Main LT switchboards. The capacitor banks are sized to maintain the overall plant power factor of about 0.98 lag.

Earthing for the grinding unit

Adequate provision of sub-station earthing and earthing of high and low voltage equipment have been considered for the safety of operating personnel as well as for proper system operation as per requirements of Indian Electricity Rules and IS: 3043.

Illumination for the grinding unit

An efficient illumination scheme for inside and outside buildings shall be provided. Sufficient number of lighting boards and distribution boards are considered for lighting of various locations of the plant.

Fire detection and alarm system

For detection of fires in electrical buildings, Ionization type dual chamber/dual source smoke detectors will be used where incipient fires are likely, *e.g.* in cable cellars, switch gear rooms, control rooms etc. Fixed temperature cum rate of rise type heat detectors will be installed in transformer rooms, battery rooms etc. Multi zone type fire alarm panels will be installed in the electrical buildings. The fire detectors will be wired in zones. On detection of fire/fault in any zone, audio-visual alarm will be sounded in control panel and also by electronic hooters fixed in various locations in the electrical buildings. The alarm shall also be sounded at the central position.

Cable & Cable laying for the grinding unit

Following type of cables are proposed to be provided in the plant

Power(HT)	:	11 KV, armoured, XLPE insulated aluminium cables
Power(LT)	:	1.1KV, armoured, PVC(Alternatively XLPE) insulated aluminium cables
Control	:	1.1 KV grade, unscreened, armoured, PVC insulated, copper 1.5 & 2.5 sq. mm
Instrumentation	:	1.1 KV grade, unscreened, armoured, PVC insulated, copper 0.5 & 1.0 sq. mm

Control & Instrumentation

For effective control of various process variables, integrated & distributed microprocessor based, control & instrumentation system has been considered keeping in view the following objectives:

- Dependable and rugged instrumentation network
- Maximum protection against dust and vibration
- Operational safety
- Easy maintenance and repairs
- Flexibility to adopt future development/modifications
- Optimum operational efficiency and good quality product
- Maximum standardization to keep the inventory low

The control and instrumentation system envisaged incorporates the following essential features for safe operation of the plant and machinery and provides necessary operating data to evaluate the operating performance and fault monitoring.

- Suitable programmable logic control (PLC) system for sequence interlocking and automatic closed loop control through PI and PID action.
- Control of electronic weigh feeders for desired proportioning and feed rate.
- Sequential start/ stop of plant sections through process level PC controls, when the local/ remote switch at individual drive of the sequence is in remote position.
- It shall be possible to stop any drive from the field for safety reasons, from the local push button station near the drive or through safety switches.
- Color graphic and alphanumeric display with equipment fault monitoring system.
- Log trends for selected process parameters.
- Display of important process data.
- Printers for event/ alarm list(s) and report generation.
- Hard copy printer for print out of display at VDU.

Central control system for the grinding unit (GU)

Integrated and distributed hierarchical digital controls for centralized monitoring and control from central control room (CCR) have been envisaged. The central control system is structured into 4 level hierarchical configurations as given below:

- Level —1 (Field Level) - At field level the instruments and sensors have been installed in accordance with P & I diagrams. For certain systems e.g. mills, silos, weighing systems etc. control systems are also located in the field.
- Level — 2 (Department Control Level) - Using the process stations-with their process input/ output devices assuring the safe operation of machines and of the production process.
- Level — 3 (Supervisory Level)- Using operator station having supervisory processor with visual display unit, keyboards, mouse, printers & hard copier etc.
- Level — 4 (Optimization and Information Level- Future)- The Management Station shall be capable to handle monitoring functions for the plant management and to provide tools for the optimization and the strategic planning/ control of production. Management stations are envisaged such that the plant operations are maintained during shut down periods of these stations.

Programming terminal

One programming device with necessary VDU & keyboard for programming from operator level processor or process level PCs has been considered. Hand held terminals shall also be provided for word and bit examination and alteration and I / 0 bit forcing at process level.

Process/ instrumentation

Necessary field sensors shall be installed to monitor process variables like pressure, temperature, flow, level, speed, etc. The sensors shall be linked to plant control system through field transmitters/ transducers to display the parameters on operator station and exercise the desired controls. The broad technical features of sensors and instruments are described as follows:

- Pyrometers- For temperature measurement in hot zones non-contact type radiation pyrometers are proposed to be used. Pyrometers would include air purging and water cooling arrangements.
- Level sensors- Specially designed level sensors will be deployed for monitoring and control of material level in clinker discharge hoppers. RF admittance type sensors would be used for point level control. For continuous level monitoring, ultrasonic/ electromechanical type of instruments would be used.
- Speed switches- These are proposed to be deployed for achieving zero speed protection for various equipment. The unit chosen would have built in initial by-pass time delay and designed to operate over a range of speeds. The primary sensor would be non-contact type designed to achieve unlimited number of operations. The unit as well as sensor would have a high degree of environmental protection.
- Dust monitor- A microprocessor based monitoring device would be deployed which will provide concentration of particles in each stack. The equipment would have a built in air purge system.

2.9.5 Manpower

Direct and indirect employment will be generated due to the project. The total manpower requirement (Direct + Indirect) for the project is estimated as 500 persons during construction phase & 280 persons during operation phase. Unskilled/ semi-skilled manpower can be sourced from the local area and skilled manpower shall have to be sourced from outside/ local. The locals will be given preference on the basis of their qualification for the recruitment of manpower in cement grinding unit. The manpower requirement is given below:

Table 2.9: Manpower Requirement

Particulars	Construction Phase			Operation Phase		
	Direct	Indirect	Total	Direct	Indirect	Total
Skilled	45	280	325	20	30	50
Semi – Skilled	--	100	100	--	125	125
Unskilled	5	70	75	5	100	105
Total	**50**	**450**	**500**	**25**	**255**	**280**

2.9.6 Fuel

Approx. 12 TPH coal/lignite/petcoke will be required for the proposed project. Allocation letter for the same is being attached as **Annexure V.**

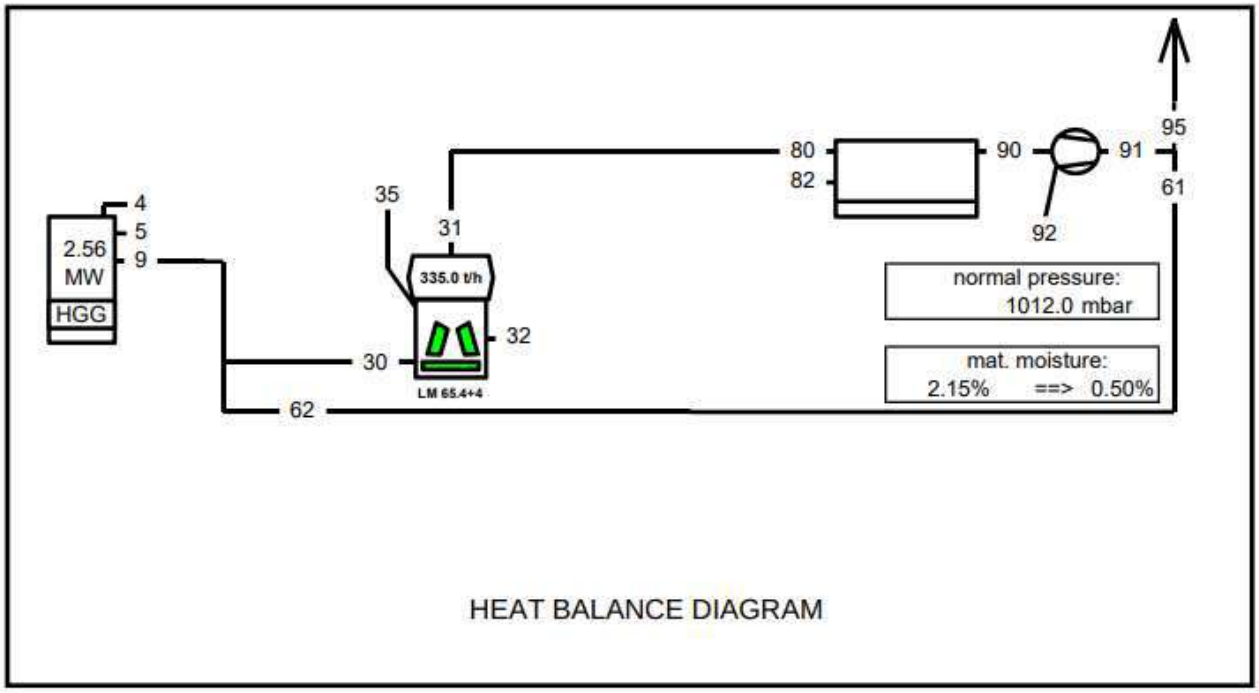


Figure 2.8: Energy Balance Flow diagram

2.10 PROJECT DR AWINGS SH OWING PROJECT LAYOUT, COMPONENTS OF PROJECT

Layout plan showing location of standalone cement grinding unit, storage area, water storage area, emergency vehicle location, greenbelt area, internal road, entry and exit gate, parking etc. is depicted as Figure 2.9 and the same is enclosed as **Annexure-III**. Construction of, plant building, raw material storage area, finished products storage area, utility area, treatment facility, parking, fire hydrant and other ancillary amenities will be undertaken within the plot area after obtaining statutory clearances from local authority. The layout will be planned considering the need of plant machinery, separate storage, administration and parking requirement prevailing wind direction, nearby

infrastructure facilities, requirement of approachable peripheral road for excavation and emergency purpose of vehicular movement etc.

2.11 NEIGHBOURING FACILITIES NEAR GRINDING UNIT

The infrastructure facilities near the site are well developed with approach road, State and National Highway (NH-6 & SH168). Proposed unit will be placed in , where all infrastructural facilities already available.

Additional Facilities Includes:

Technical & Laboratory/QC office- A suitable technical office & laboratory / QC office shall be constructed for the project activities and operation phase.

Administrative & Time and Security office- A suitable administrative, time & security office shall be constructed for the project activities and operation phase.

Fire-fighting system- Fire detection and extinguishing system shall be provided in all buildings.

Weighbridge- The electronic weighbridge shall installed to take care of the incoming and outgoing materials at site.

Bags Godown- Space shall be provided in the packing plant for the storage of empty bags.

Parking: Adequate parking space will be provided in the plant premises for the parking of vehicles.

Roads: All internal roads will be of concrete roads.

2.12 SCHEMATIC REPRESENTATIONS OF THE FEASIBILITY DRAWINGS

The drawing of the project will be designed considering the seismic zone III of the area, the civil structures will be earthquake proof.

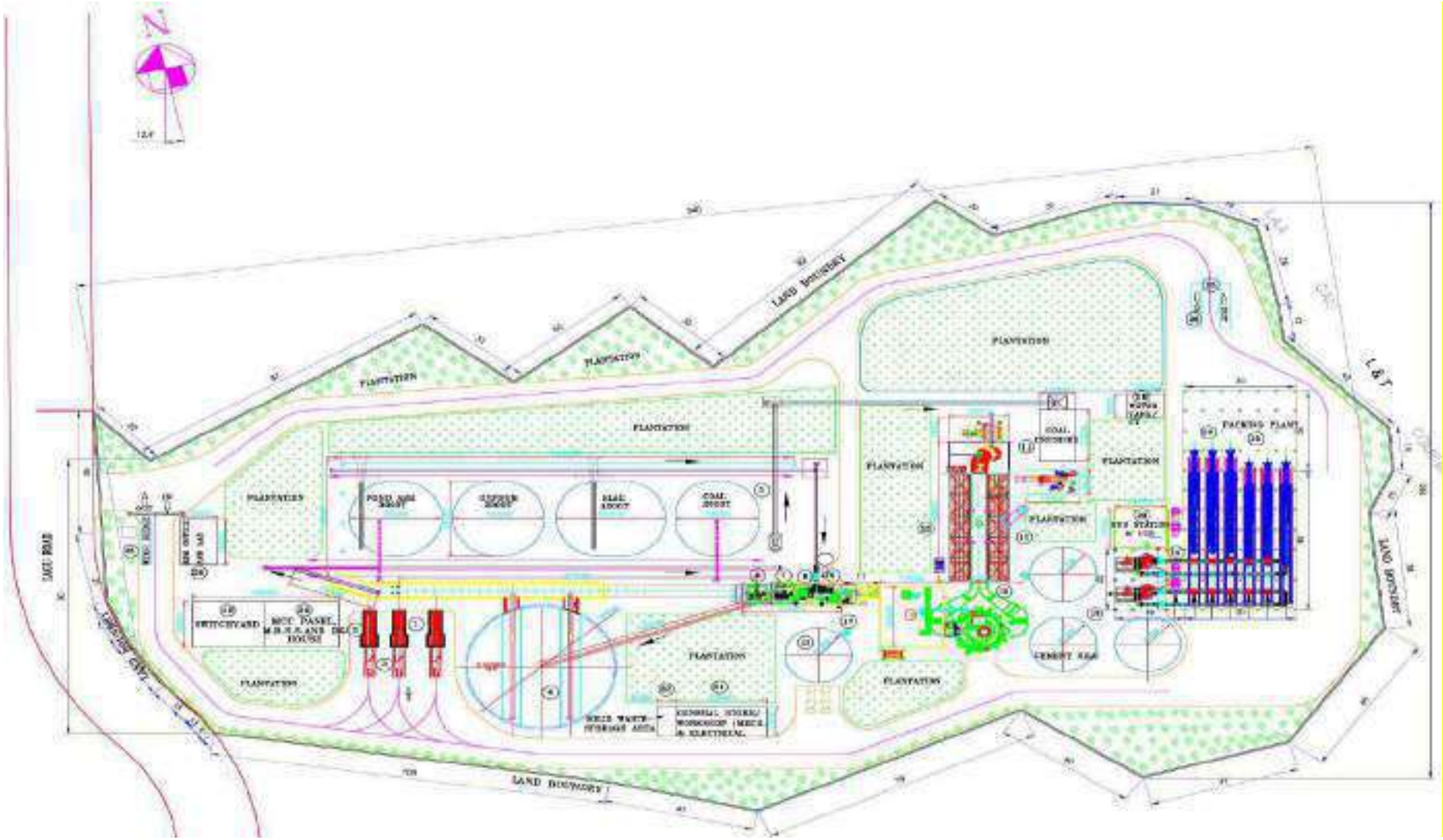


Figure 2.9. Layout showing Cement Grinding Unit

2.13 DESCRIPTION OF THE ASPECTS AND IMPACTS

2.13.1 Air Emission

In the plant, main sources of emissions will be from stacks attached to cement mill, Hot Air generator and packing of cement. The emissions of particulate matters from all the stacks is/will be limited to 30 mg/Nm^3.

PM10 and PM2.5 is considered as major air pollutants from this source. No process gas emission will be generated.

The unloading area of clinker, gypsum, fly ash and fly ash storage silo, clinker grinding mill, cements silos and packing machines are the main areas where dust is likely to be generated.

The emission from these sources would be fugitive in nature and bag filters are proposed as APCM to control fugitive emission. All other dust sources are considered as secondary sources since they are not process implied. These dust sources are likely to occur wherever relatively dry and dusty material is handled, conveyed, pumped or extracted. As such, for all these places high efficiency bag filters have been considered to minimize the fugitive emission.

- Unloading of coal from trucks will be carried out with proper care avoiding dropping of the materials from height. It is advisable to moist the material by sprinkling water while unloading.
- Dust suppression system will be installed in dust prone area.
- Fly ash will be handled in closed automated system and stored in covered silo
- Thick greenbelt will be developed around the plant to arrest the fugitive emissions.
- The online monitoring of air emission will be installed as per CPCB guidelines.

Table 2.10. Type of Emission and APC

S.No.	Location	Qty. Nos.	Capacity	Stack Details
A. Main Process Bag house				
A1	Cement Mill (VRM)	01	11,00,000 m^3/hr	Height – 55 m Dia – 3.2 m APC: Bag filters *Air emission:* PM 30 mg/Nm^3 SOx 100 ppm NOx 100 ppm
B. De-dusting Bag filters				
B1	Clinker & additive unloading station	02	11,000 m^3/hr	--
B2	Clinker Silo top	01	25,000 m^3/hr	--
B3	Cement Silo top	03	3,000 m^3/hr (each)	--
B4	Cement extraction under silo	03	3,000 m^3/hr (each)	--
B5	Packing plant top	01	45,000 m^3/hr	--
B6	Bulk cement loading	01	5,000 m^3/hr	--
B7	Fly ash silo top	01	3,000 m^3/hr	--
B8	Feed Hopper for HAG	01	5,000 m^3/hr	-

2.13.2 Wastewater Generation and Treatment

Total water requirement for the proposed plant is about 278 m^3/day. Primarily, water requirements for the unit shall be met by local body / irrigation department. The water balance of plant is presented in Figure 2.7. The waste water generation in proposed plant is given below.

Table 2.11: Waste Water Generation

#	Particulars	Fresh Wat er Consumption (KLD)	Total w ater requirement (KLD)	Effluent generation (KLD)	Recycled water (KLD)	Remarks

A.	**Domestic**	**15.0**	**15.0**	**10.0**	**8.0**	Recycled water will be used for greenbelt
B.	**Industrial**					
1.	Cooling Tower	150.0	150.0	-	70.0 Blow down	80.0 KLD evaporation loss, blow down water will be used for dust suppression and Greenbelt
2.	Dust suppression	10.0	68.0 (58.0 from blow down + 10 KLD fresh water)	-	-	-
	Total Industrial	**160.0**	**218.0**	**-**	**-**	**-**
C.	**Gardening**	25.0	45.0 (12.0 from blow down + 8.0 kld from STP)	-	-	-
	Total (A+B+C)	**200.0**	**278.0**	**-**	**78.0**	**-**

Wastewater Generation from industrial use: In operations phase, waste water will be generated from cooling tower.

Wastewater Generati on from Dome stic Uses: The sewage wastewater will be treated in STP having 15.00 KLD capacity. The treated sewage water will be used for greenbelt and dust suppression

2.13.3 Noise Generation

The heavy machinery and large fans equipped in various parts of the cement grinding unit can give rise to noise and/or vibration emissions. Any operations involving crushing, milling and screening of raw material, fuels, exhaust fans. Plants are required to comply with reduction standards in compliance with national legislation, and noise surveys will be conducted and evaluated. Natural noise barriers, such as office buildings, walls, trees or bushes will be used to reduce noise emissions. All the equipment will be designed to comply with the Factories Rules and Stipulations and will not exceed 90 dB (A) at 1 m distance from source of noise. Walls and ceilings of the concerned buildings will be lined with sound absorbing materials. Properly insulated enclosures will be provided for high noise generating plant machinery. Personal Protective Equipment like earplugs and earmuffs will be provided to the workers. Regular monitoring of noise level will be carried out to ensure that noise level is maintained as per the norms.

2.13.4 Solid/Hazardous Waste Generation and Utilization

The entire quantity of solid/hazardous waste will be handled and disposed as per Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules - 2008. No solid waste will be generated from the cement manufacturing process. Ash generated by the HAG will be 100% utilized in cement manufacturing process (PPC) Dust collected from air pollution control equipment will be

totally recycled in process. A part of used oil will be utilized for lubrication purpose & remaining will be sent to own clinker unit located at Sanghipuram, Kutch

Table 2.12 – Details of solid / hazardous waste

S.No.	Waste	Qty / Annum	End use / Disposal
1	Dust collected from APCM	--	Totally recycled in process
2	Ash generated from HAG	18000 MT	100 % recycled in the plant in PPC
3	Used Oil	60 MT	Secondary lubrication / send to Own Clinker plant under AFR

2.13.5 Occupational Health and Safety

The project proponent is committed towards the health and safety of workers. All the necessary measures will be planned for occupational maintaining good health of the employees. Routine medical examination of each person will be carried out as a systematic program on a regular basis. Medical surveillance for the workers working in risk zone will be carried out regularly and annual report of the health status of workers for the same will be maintained. Standard Operating Procedures (SOP) for different works/activities will be in place.

2.14 MITIGATION MEASURES

There will be impact due to proposed project activities of the cement production (standalone grinding unit). Based on type of activities, Impacts may be long or short term. Impacts due to generated pollutant may be significant on environmental parameters if it is not mitigated properly. Project activities and cause of impact along with its characteristics are mentioned in table below-

Table 2.13: Aspects & Impacts Analysis

Activity	Environmental Attribute	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Intensity a nd Significance
Vehicle Movement and utilities operation	Air Quality	Exhaust Emissions *i.e.* NO_x, SO_2 Fugitive emission	Negative	Short Term	Reversible	Low, due to movement of vehicle only for loading and unloading of raw material. Provision of APC's.
	Noise Levels	Noise Generation	Negative	Short Term	Reversible	Low, due to limited activity
	Risk & Hazards	Accidents, collision of transport vehicles	Negative	Short Term	Reversible	Medium due to loss of property and injury to manpower.
Process of cement production and raw material handling, storage	Noise Levels	Noise Generation from utilities, processing machineries and reaction vessels	Negative	Long Term	Reversible	Low, due to noise reduction measures
	Work Zone Air Quality	Flue gas generation	Negative	Long Term	Reversible	Medium, due to air pollution control devices (APC's)
	Risk & Hazards	Catch fire accidents	Negative	Short Term	Reversible	High, due to injury to manpower and loss of properties and

Activity	Environmental Attribute	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Intensity a nd Significance
						fatal accidents
Solid/ Hazardous Waste Disposal	Land and Soil	Generation of Solid Waste	Negative	Short Term	Reversible	Will be utilized in own cement plant.
Green Belt Development	Ecology	Planting of Trees	Positive	Long Term	Reversible	High, Positive Impact
	Air Quality	Dust barrier	Positive	Short Term	irreversible	Low, Positive Impact
	Noise	Noise barrier	Positive	Short Term	irreversible	Low, Positive Impact
	LU/LC	Conservation of Land	Positive	Long Term	irreversible	Medium, Positive Impact
	Soil	Increase in soil fertility	Positive	Long Term	Irreversible	Medium, Positive Impact
	Water	Water consumption	Negative	Long term	Irreversible	Low, due to water circulation
Employment Generation	Socio Economic Status	Direct and Indirect employment	Positive	Long term	Irreversible	High, the project will generate employment

2.15 ASSESSMENT OF NEW & UNTESTED TECHNOLOGY

No recommendation of assessment of New and untested technology as Worldwide tested technology for the cement product (OPC, PPC, PSC) shall be used.

2.16 CONCLUSION

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat. This activity falls in Category- B under Project/Activity 3(b) schedule as per EIA Notification dated 14th September, 2006, as subsequent amendments. Estimated cost of this project is about Rs. 282.28 Crores. The anticipated capital expenditure for the pollution control measures is about Rs. 9.11 Crores. The project envisages use of chemical gypsum and slag as additives and coal/lignite/petcoke as a fuel. The implementation period has suggested 15 months for project execution activities after placement of main machinery order until the plant commissioning. The water requirement in operation phase including industrial and domestic purposes is about 278 KLD out of which 200 KLD is fresh. The total manpower requirement is 280 persons during operation phase.

3 DESCRIPTION OF THE ENVIRONMENT

3.1 GENERAL

The baseline environmental quality is assessed through field studies within the probable impact zone for various components of the environment *viz*. Air, Noise, Water, Soil, Ecology & Bio diversity and Socio-economy. The baseline environmental study has been conducted for the study region within 10 km radius. An exhaustive attempt has been made in the current chapter to disclose all possible baseline status of environmental quality in the study area, which further serves as the basis for identification, prediction and evaluation of impacts. The study area map is shown in the **Figure 3.1.**

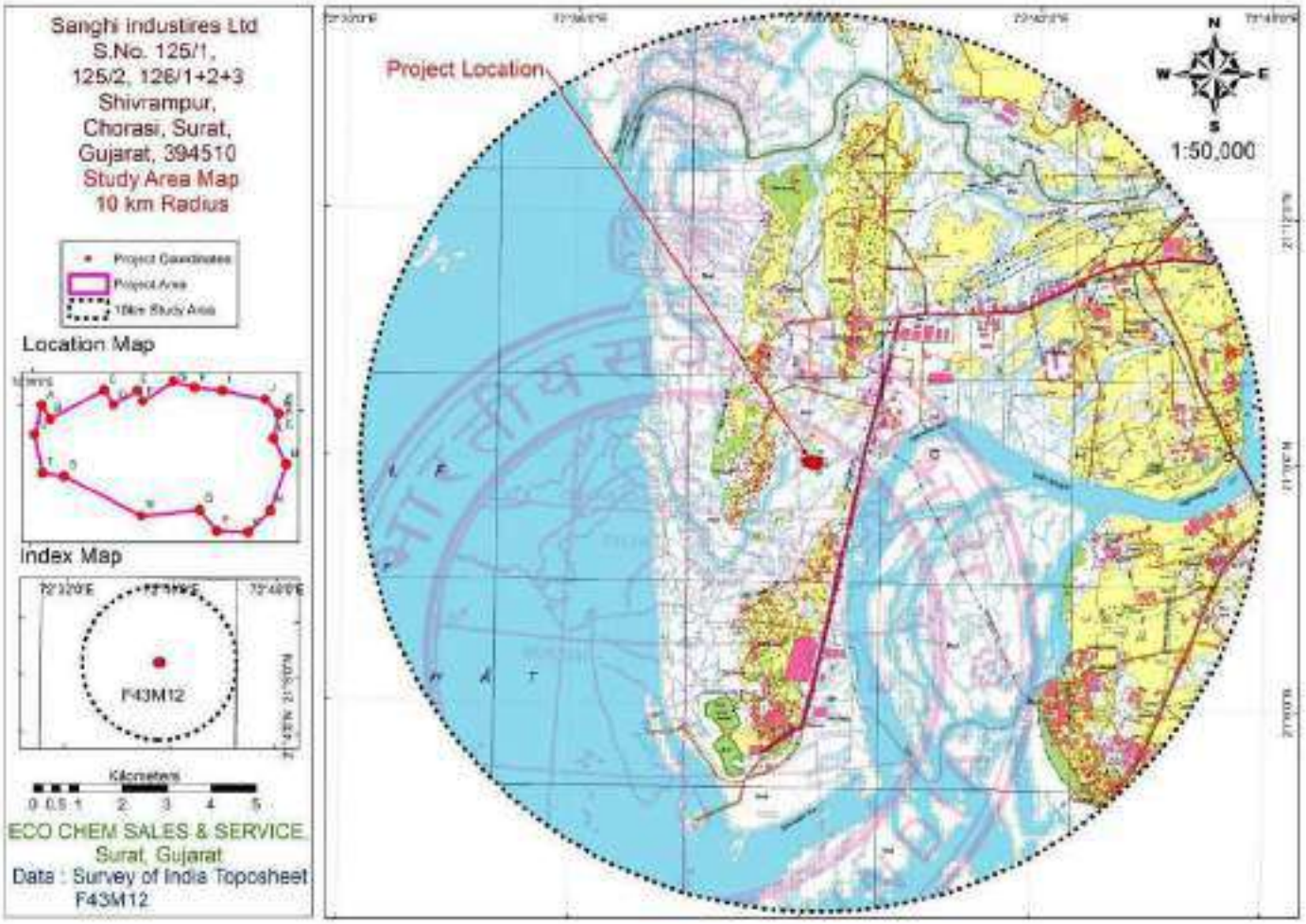


Figure 3.1: Study Area Map

3.2 BASELINE STUDY AREA AND PERIOD

The baseline environmental study has been conducted for the study region within 10 km radius of the project site for the period 1st Oct 2018 to 31st Dec 2018. An exhaustive attempt has been made in the current chapter to disclose all possible base line status of environmental quality in the vicinity of the project, which further serves as the basis for identification, prediction and evaluation of impacts.

3.3 VALUED ENVIRONMENTAL COMPONENTS (VECS)

The Valued Environmental Components (VECs) to be included in study area (10 km radius w.r.t. project site) including physical, biological and social component is provided in subsequent sections of this chapter.

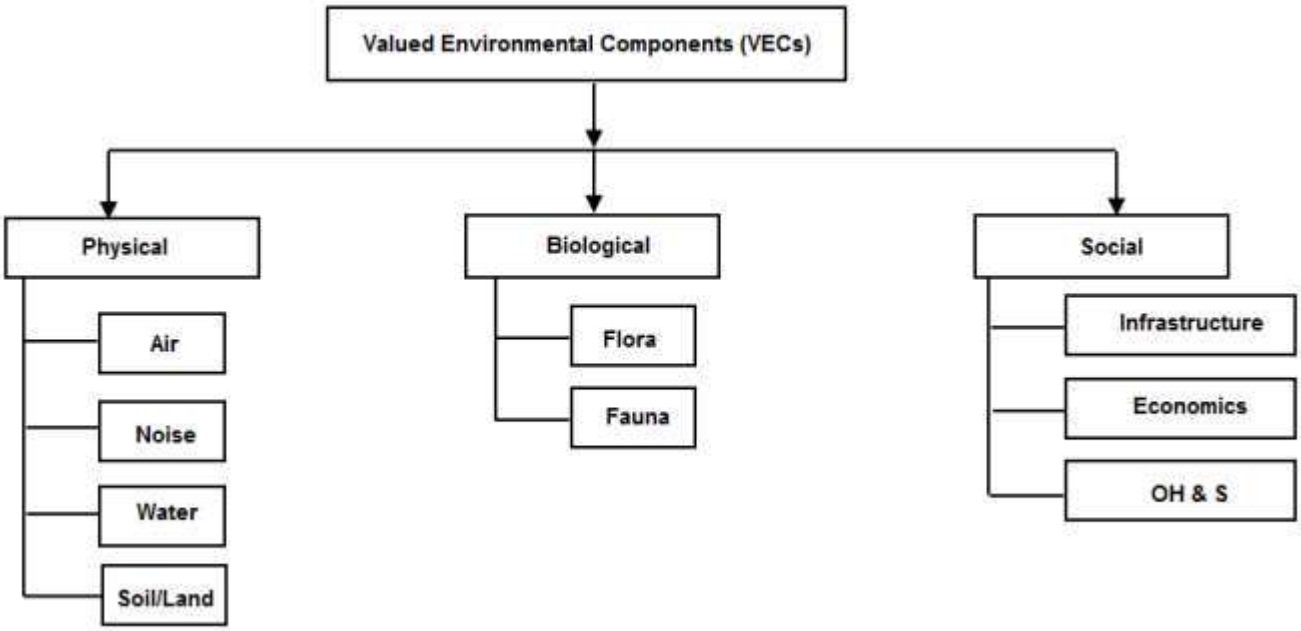


Figure 3.2: Schematic presentation of Valued Environmental Component

3.4 METHODOLOGY

The baseline environmental study was carried out for the various environmental components viz, Air, Water, Soil, Ecology and Biodiversity, Socio Economy and Noise. A desktop study was carried out to select the sampling locations and site visit was done by our field area experts. After the site visit, locations were finalized. During the submission of field area expert report and discussion looking to the extent of impact, 5 km radius was considered as core zone and rest 5 km radius was considered as buffer zone. All the locations have been selected within 10 km radius from the project site as per the requirement of TOR and environmental samples were collected from the selected locations of the study area. Before starting the survey activity for ecology and bio diversity, secondary data were used as reference during the desktop survey for listing the species of study zone and planning the survey. In case of socio economy, secondary data have also been used for deciding the parameters to be surveyed during socio economic data collection. As a secondary source of data, for Ecology and Biodiversity survey various publications by the government of India and literature available on internet site were used.

3.4.1 Frequency of Sampling

Details of frequency of environmental sampling considered for the study are illustrated in **Table 3.1.**

Table 3.1 Frequency of Environmental Monitoring

Attributes	Sampling		
	Locations	**Parameters**	**Frequency**
A. Air Environment			
Micro-meteorological Data	Nr. Project Site	Temperature, Relative Humidity, Precipitation Wind direction, Wind Speed.	Hourly data for the period 1st Oct 2018 to 31st Dec 2018.
Ambient Air Quality	8 numbers of locations in the study area of 10 km radius.	$PM_{2.5}$, PM_{10}, SO_2, NO_x, CO and Total VOC	24 hour basis, twice a week during study period.

B. Noise	8 numbers of locations in the study area of 10 km radius.	Noise Levels in dB (A).	Once in Study Period.
C. Water			
Ground Water	Samples from 7 numbers of locations within 10 km radius from the project site.	Physical, Chemical, Microbiological and Heavy Metal.	Once in Study Period.
Surface Water	Samples from 6 numbers of locations within 10 km radius from the project site.	Physical, Chemical, Microbiological and Heavy Metal.	Once in Study Period.
Marine Water	Samples from 1 number of location during high tide and low tide within 10 km radius from the project site.	Physical, Chemical, Microbiological, Zooplankton, Phytoplankton, Benthos, Sediment and Heavy Metal.	Once in Study Period.
D. Soil Quality	Samples from 4 numbers of locations within 10 km radius from the project site.	Physical, Chemical Characteristics, Soil Texture.	Once in Study Period.

3.4.2 Method of Environmental Sampling and Analysis

The methods adopted for environmental sampling and analysis are illustrated in following **Table 3.2**

Table 3.2 Method of Environmental Sampling and Analysis

Attributes	**Methods**	
	Sampling/Preservation	**Analysis/data analysis**
A. Air Environment		
Micro-meteorological Data	Data collected on hourly basis using wind monitor as per CPCB Guideline.	NA
Ambient air quality	As per IS: 5182, CPCB & AWMA.	As per IS:5182,CPCB & AWMA
B. Noise	Instrument : Sound level meter	Survey carried out as per CPCB guideline.
C. Water		
Ground Water	Standard Methods for Examination of Water and Wastewater, 23rd edition, APHA 2017.	IS 3025 & Standard Methods for Examination of Water and Wastewater, 23rd edition, APHA 2017.
Surface and Marine Water	Standard Methods for Examination of Water and Wastewater, 23rd edition, APHA 2017.	IS 3025 & Standard Methods for Examination of Water and Wastewater, 23rd edition, APHA 2017.

D. Soil Quality	IS 2720, Soil Testing in India (Department of Agriculture & Cooperation).	IS 2720, Laboratory developed Method as per NABL requirement and Book - Soil Testing in India (Department of Agriculture & Cooperation).

Ambient air – Damka Village

Ground water – Hazira village

Ambient air – Mora Village

Surface water – Mora Village

Traffic Study – NH 6

Project site – Noise

Project Site – Ambient air

Project Site –Soil

EB Survey	SE Survey

Figure 3.3 Photograph showing the sampling activity

3.5 MICROMETEOROLOGY

The study of micro meteorological data helps to understand the variations in the ambient air quality status in that region. The prevailing micrometeorological condition at project site plays a crucial role in transport and dispersion of air pollutants. The persistence of the predominant wind direction and wind speed at the project site decide the direction and extent of the air pollution impact zone. The principal variables which affect the micrometeorology are horizontal transport and dispersion, convective transport and vertical mixing and topography of the area towards local influences. Micrometeorological data were collected by using the wind monitor as per CPCB guideline which was installed near project site. All the micrometeorological data were collected on hourly basis. Meteorological conditions of the study area are presented in **Table 3.3.**

Table 3.3 Meteorological Condition of Study Area

Month	Temperature (°C)		Relative Humidity (%)		Wind Speed (km/hr)	
	Min.	Max.	Min.	Max.	Min.	Max.
Oct'18	21.7	38.1	22	93	0.1	8.0
Nov'18	18.1	37.1	23	91	0.1	7.0
Dec'18	13.1	33.0	22	95	0.1	10.0

3.5.1 Temperature

During the study period minimum temperature was recorded 13.1°C on 29th Dec 2018 and maximum temperature was recorded as 38.1°C on 02rd Oct 2018. Temperature data were collected on hourly basis during the study period. Variation of temperature is graphically presented in **Figure 3.4**.

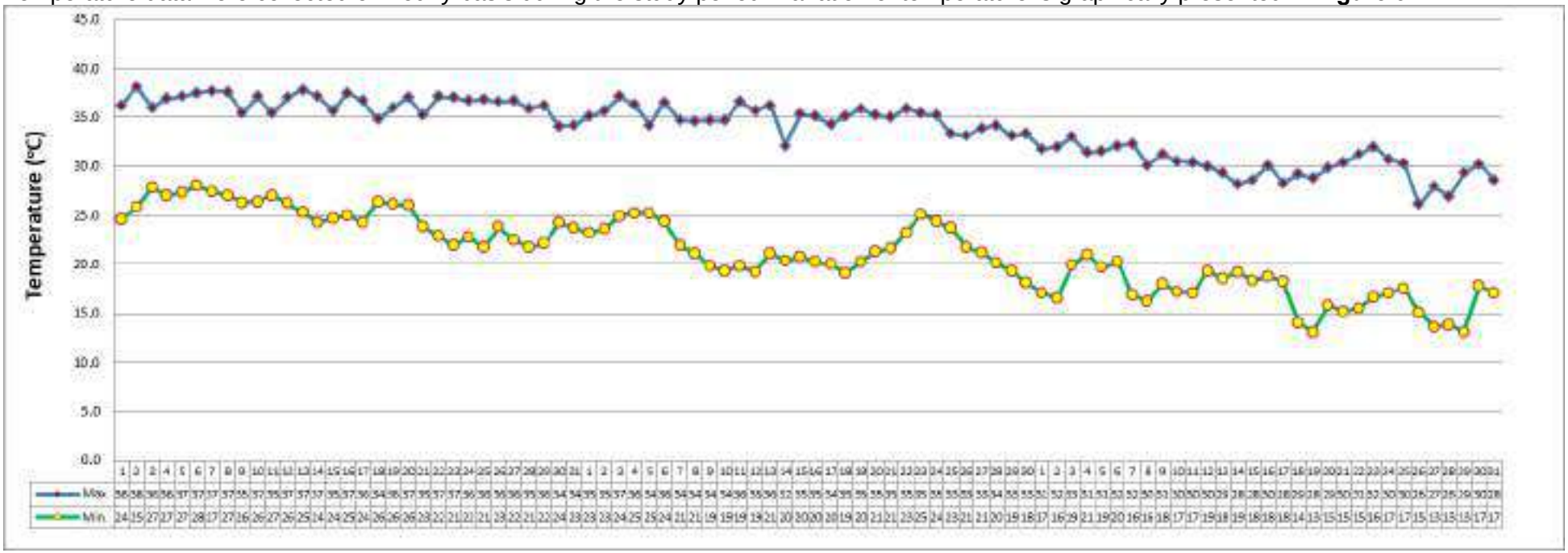


Figure 3.4 Graphical Presentation for the month wise Temperature Variation

3.5.2 Humidity

Humidity affects the nature and characteristics of pollutants in the atmosphere as it is the measure of amount of moisture in the atmosphere. Humidity helps suspended particulate matter to coalesce and grow in size to settle under the gaseous pollutants by providing them aqueous medium. During the study period minimum Humidity was recorded 22% on 22nd Oct 2018 and 19th Dec 2018 and maximum Humidity was recorded 95% on 11th Dec 2018. The variation in humidity is represented graphically in **Figure 3.5.**

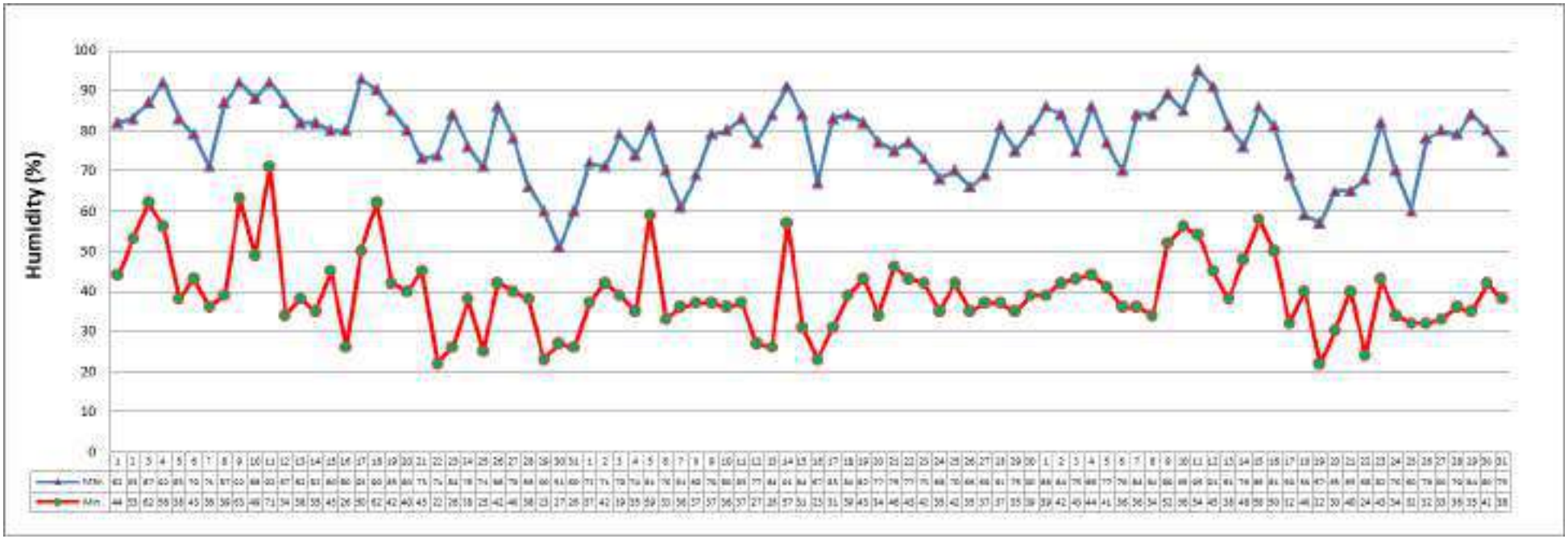


Figure 3.5 Graphical Presentation for the month wise Humidity Variation

3.5.3 Wind Speed and Wind Direction

Hourly wind speed data were collected for the period 1st Oct 2018 to 31st Dec 2018 with the help of wind monitor. The rate of dispersion, diffusion and transportation of pollutants in the atmosphere mainly depend on wind speed and its direction. Wind direction and velocity data have been collected during the study period. Dominant wind direction in the study period was from NE –SW during the study period. Wind speed was observed from 0.1 to 8.0 km/hr in the month of Oct 2018, from 0.1 to 7.0.0 km/hr in the month of Nov 2018 and from 0.1 to 10.0 km/hr in the Month of Dec 2018. Month-wise maximum and minimum wind speed data are tabulated in **Table 3.3.**

3.5.4 Wind Rose

Wind rose diagram is a graphical representation of the magnitude and direction of wind speed considering all the directions. From the knowledge of wind rose one can easily predict the direction and extent of spreading of the gaseous and particulate matter from the source. Wind rose diagram has been prepared by using hourly wind velocity and dominant wind direction data and is presented in **Figure 3.6**

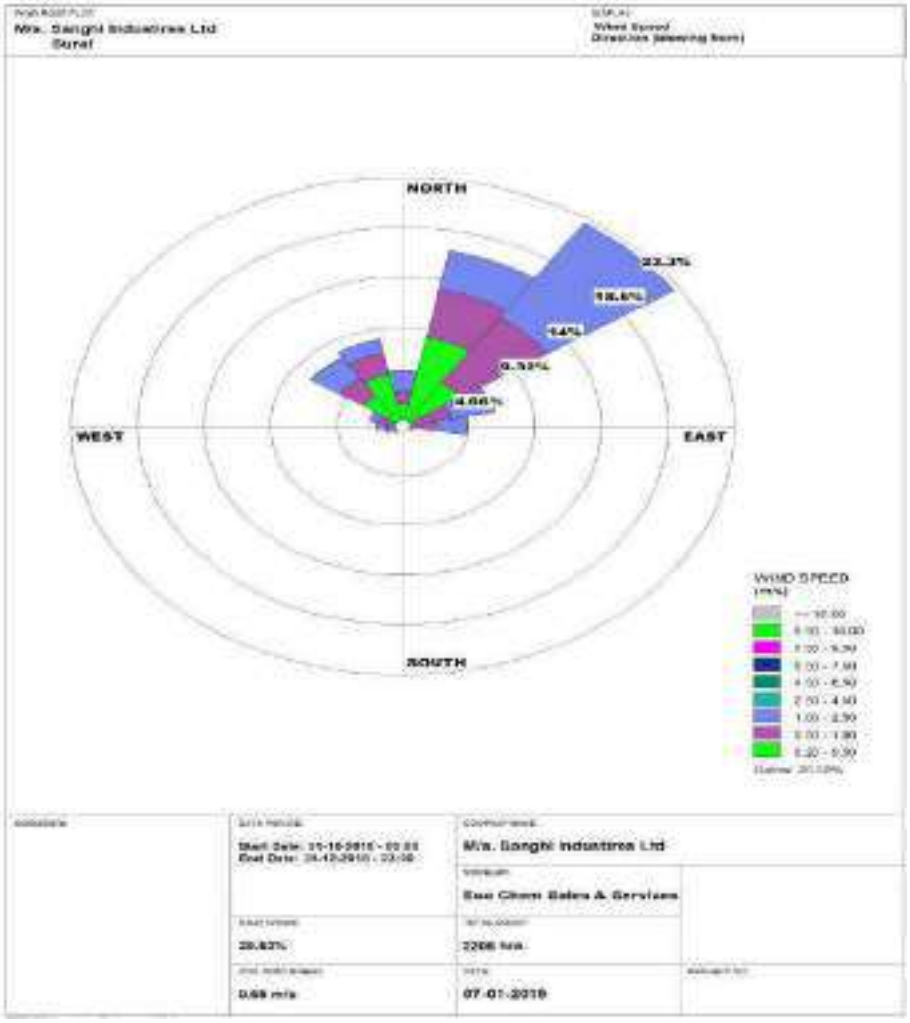


Figure 3.6 Wind Rose Diagram

3.5.5 Interpretation of Micrometeorological Data

Wind rose diagram indicate that the dominant wind direction can be considered NE to SW. Based on micrometeorological data, of wind direction and wind speed it is interpreted that chances of maximum dispersion of pollutants will be in SW direction due to upcoming project during the period Oct to Dec. 2018.

3.6 AIR ENVIRONMENT

Air is the Earth‘s atmosphere having the gases in which living organisms live and breathe but air is being deteriorated day by day due to the anthropogenic and natural sources. In present scenario Industrialization,

Energy production and the burning of fossil fuels has polluted the air environment. Ambient air quality monitoring was carried out for the assessment of the existing status of background air quality in the study area. This will be useful for assessing the conformity of the ambient air quality to the standards even after commencement of the proposed project.

3.6.1 Selection of Sampling Locations

Following points were considered during the selection of Ambient Air Quality Monitoring locations.

- Topography/terrain of the study area,
- Regional synoptic scale climatologically norm‘s,
- Densely populated areas within the region,
- Location of surrounding Industries,
- Representation of regional background,
- Facility for Ambient Air Monitoring,
- Representation of valid cross – sectional distribution in downwind direction,
- Avoidance of proximity of roads, construction activity or any other perturbing activity which may be temporary in nature, which may lead to some erroneous conclusions.
- Availability of manpower, electricity, approach, sturdy structure and protection of samplers.
- Dominant Wind Direction.

To establish the baseline status around the project site of the study region, monitoring was conducted for 8 numbers of locations during 1st Oct 2018 to 31st Dec 2018. At the time of location selection previous micrometeorological data was referred and general wind pattern in the study region was considered for the selection of location in such a way so that minimum one location in the downwind direction and one location in upwind direction. 1 location has been selected in WSW direction considering the chances of more dispersion. There is no village in SW direction as SW direction is covered with water body therefore location has not been selected in pre dominant downwind direction. However, ambient air monitoring locations were also selected in cross sectional wind direction looking towards the possibility of change in wind pattern during the study period. Ambient Air Quality monitoring locations are presented in Figure 3.7 and Table below.

Table 3.4 Ambient Air Quality Monitoring Locations in the Study area

Code	Location	Distance/Direction from the Project site	Latitude and Longitude	Selection Criteria
A1	Project Site	-	21°08'58.05"N 72°39'04.54"E	-
A2	Sunvali	1.2 km/WSW	21°08'46.44"N 72°38'19.73"E	Crosswind
A3	Mora	2.9 km/NNE	21°10'28.91"N 72°39'34.29"E	Upwind
A4	Damka	5.0 km/N	21°11'41.42"N 72°39'39.73"E	Crosswind
A5	Rajgari	3.8 km/NNW	21°11'05.08"N 72°38'39.66"E	Crosswind
A6	Kavas	7.4 km/NE	21°10'42.01"N 72°42'49.76"E	Upwind
A7	Hazira	5.7 km/S	21°05'51.08"N 72°38'55.54"E	Crosswind
A8	Dumas	7.9 km/SE	21°06'04.42"N 72°42'23.71"E	Crosswind

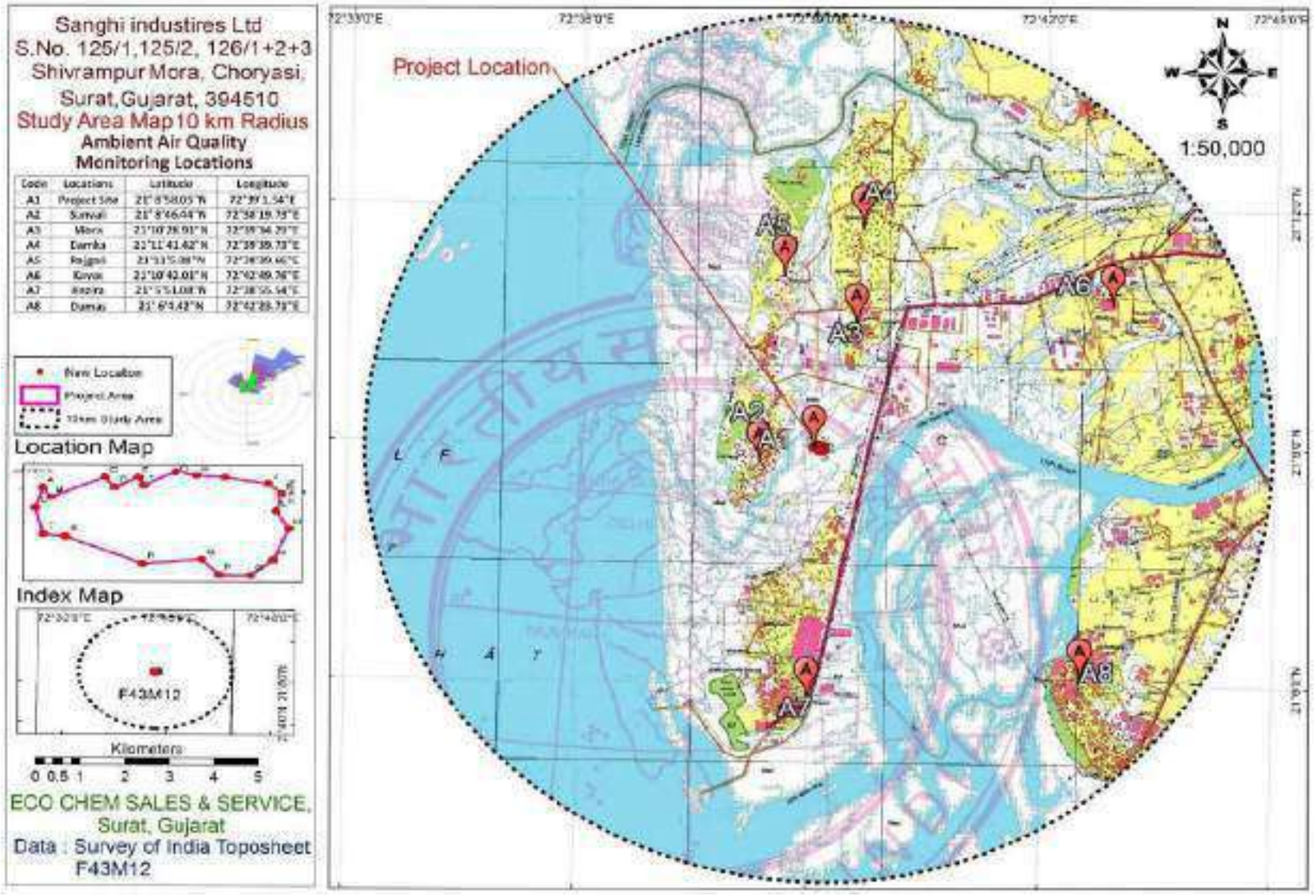


Figure 3.7 Map showing the Study area location of Ambient Air

3.6.2 Frequency and Parameters for Sampling

Sampling team was appointed with one FAE and Technical Assistant to carry out Ambient Air Quality Monitoring for 8 numbers of locations within 10 km radius from the project site. Sampling and analysis was carried out as per CPCB, IS 5182 & EPA and instrument operation manual for the parameters $PM_{2.5,}$ $PM_{10,}$ SO_2, NOx, CO and Total VOC. After the completion of sampling, samples were brought to the laboratory in Ice box and filter box for analysis. Frequency of sampling was twice a week during study period.

3.6.3 Methodology for Sampling and Analysis

Samples were collected by using the PM_{10} and $PM_{2.5}$ micron dust samplers at suitable height from obstruction free area as per the availability of the facility. Sampling and Analysis was carried out as per CPCB Guideline, instrument operational manual and National Environmental Engineering Research Institute. Detail of reference method is presented in table below.

Table 3.5 Details of Analysis Method

Sr. No.	Parameters	Test Method
I.	Particular matter ($PM_{2.5}$)	CPCB Guideline, SOP No. WI/5.4/02-B/03,Issue No.1 Date:01/01/2010
II.	Particulate Matter (PM_{10})	IS 5182 (Part 13):2006/Reaffirmed 2012
III.	Sulphur Dioxide (SO_2)	IS 5182 (Part 2):2001/Reaffirmed 2012
IV.	Oxide of Nitrogen (NO_x)	IS 5182 (Part 6):2006
V.	Carbon monoxide (CO)	Methods of Air Sampling & Analysis AWMA, APHA (CO Analyser)
VI.	Total VOC	Methods of Air Sampling & Analysis AWMA, APHA (Multi Gas Analyser)

3.6.4 Quality of Ambient Air

Minimum, maximum, average and percentile value for the parameters $PM_{2.5,}$ $PM_{10,}$ SO_2, NO_x, CO and Total VOC are tabulated in Table 3.6 to Table 3.8 to describe the quality of Ambient Air.

Table 3.6 Min, Max, 98th Percentile and Average Value of PM10 and PM2.5

Code	PM_{10} (µg/m^3)				$PM_{2.5}$ (µg/m^3)			
	Min.	Percentile 98th	Max.	Avg.	Min.	Percentile 98th	Max.	Avg.
A1	66.5	82.4	82.4	75.7	36.3	46.2	46.6	42.4
A2	70.2	84.6	86.4	77.0	37.6	46.6	47.6	42.0
A3	64.8	78.9	79.1	73.5	34.4	44.4	45.0	41.0
A4	68.6	84.4	84.5	76.9	35.5	44.6	45.5	41.6
A5	68.7	83.3	84.2	76.1	38.0	46.0	46.3	42.1
A6	66.5	80.9	81.6	73.7	35.4	43.4	43.6	40.3
A7	69.0	82.4	82.5	75.8	38.0	46.4	47.3	42.4
A8	61.8	75.8	77.8	69.6	31.6	42.5	42.6	38.9

NAAQ Standard limit	**100**	**60**

Table 3.7 Min, Max, 98th Percentile and Average Value of SO_2 and NOx

Code	SO_2 (µg/m^3)				NO_X (µg/m^3)			
	Min.	Percentile 98th	Max.	Avg.	Min.	Percentile 98th	Max.	Avg.
A1	9.9	14.9	14.9	13.1	14.8	20.3	20.3	18.9
A2	10.0	14.3	14.3	12.5	15.3	20.4	20.4	18.0
A3	9.6	13.4	13.7	11.6	15.3	20.0	20.8	17.5
A4	9.8	14.7	14.9	12.5	15.7	20.6	20.6	18.2
A5	9.4	15.1	15.3	12.2	15.6	20.8	21.0	18.4
A6	9.7	14.7	14.8	12.2	15.2	20.2	20.6	18.4
A7	10.1	15.2	15.9	12.4	16.3	22.0	22.8	18.8
A8	9.0	13.9	14.1	12.1	13.1	19.1	19.2	17.7
NAAQ Standard limit	**80**				**80**			

Table 3.8 Min, Max, 98th Percentile and Average Value of CO & Total VOC

Code	CO (µg/m^3)				Total VOC (ppm)			
	Min.	Percentile 98th	Max.	Avg.	Min.	Percentile 98th	Max.	Avg.
A1	456	580	584	523	1.4	2.8	2.8	2.1
A2	402	502	504	455	1.2	2.7	2.7	2.1
A3	414	524	528	458	1.3	2.9	2.9	2.1
A4	406	518	522	462	1.3	2.6	2.6	2.0
A5	456	521	524	484	1.2	2.5	2.5	1.9
A6	414	525	528	459	1.2	2.9	2.9	2.2
A7	436	541	544	492	1.9	3.1	3.1	2.5
A8	420	530	532	479	1.7	3.0	3.1	2.2
NAAQ Standard limit	**2000**				**-**			

3.6.5 Summary of Ambient Air Quality

- $PM_{2.5}$ was observed in the range of 31.6 – 47.6 µg/m^3. Maximum concentration of $PM_{2.5}$ was found at Suvali village and minimum concentration at Dumas during the study period.
- PM_{10} was observed in the range of 61.8 – 86.4 µg/m^3. Maximum concentration of PM_{10} was found at Suvali village and minimum concentration at Dumas during the study period.
- SO_2 concentration was observed in the range of 9.0 -15.9 µg/m^3, which is well within the standard limit.
- NO_x concentration in was observed in the range of 13.1- 22.8 µg/m^3, which is well within the standard limit.
- Sampling and analysis was also carried out for CO and Total VOC. All results were found well within the limit and desired range.

3.6.6 Interpretation of Ambient Air Quality Data

Based on comparison study of results with NAAQS for tested parameters, ambient air quality of studied locations can be considered good as all the results of tested parameters are well within the limit. Looking

towards the increasing pattern of PM_{10} and $PM_{2.5}$ concentration in ambient air, it is suggested that proper air pollution control measures must be adopted by the industry. This interpretation relate to the results found during the monitoring for particular location and date of monitoring.

3.7 NOISE ENVIRONMENT

The objective of the baseline noise survey was to identify existing noise sources and to measure background noise levels at the sensitive receptors within the study area. Peoples' perception of noise varies depending on number of factors including their natural sensitivity and hearing ability, past experience of sound, cultural factors and the time of day at which sound is experienced. Continuous sound is perceived quite differently from intermittent sound at the same level. High or continuous noise levels may cause permanent loss of hearing ranging from reduced perception at certain frequencies to total deafness. At comparatively lower levels noise may have psychological effects including disturbance of sleep, annoyance and irritation.

3.7.1 Sources of Noise Pollution

The sources of noise pollution in the study area are industrial noise, noise due to commercial activities, noise generated by Community, Vehicular traffic etc.

3.7.2 Noise Level in the Study Area

Noise level monitoring was carried out with the help of sound level meter at 8 different locations fall under residential, industrial and high noise generating source. Noise sampling locations are presented in **Figure 3.7** and **Table 3.9**. Analysis results are presented in **Table 3.10** and **Table 3.11**.

Table 3.9 Noise Monitoring Locations in the Study Area

Code	Location	Distance from project site/Direction	Latitude and Longitude	Selection Criteria
N1	Project Site	-	21°08'57.76"N 72°39'01.90"E	Industrial area
N2	Sunvali	1.3 km/WSW	21°08'45.80"N 72°38'20.29"E	Residential area
N3	Mora	2.9 km/NNE	21°10'29.42"N 72°39'33.42"E	Residential area
N4	Hazira	5.8 km/S	21°05'49.46"N 72°38'53.85"E	Residential area
N5	Damka	4.8 km/N	21°11'41.41"N 72°39'34.74"E	Residential area
N6	Rajgari	3.9 km/NNW	21°11'01.78"N 72°38'36.01"E	Residential area
N7	National Highway -6	1.1 km/E	21°08'52.07"N 72°39'39.29"E	Road
N8	State Highway -168	8.7 km/NW	21°11'05.23"N 72°43'33.02"E	Road

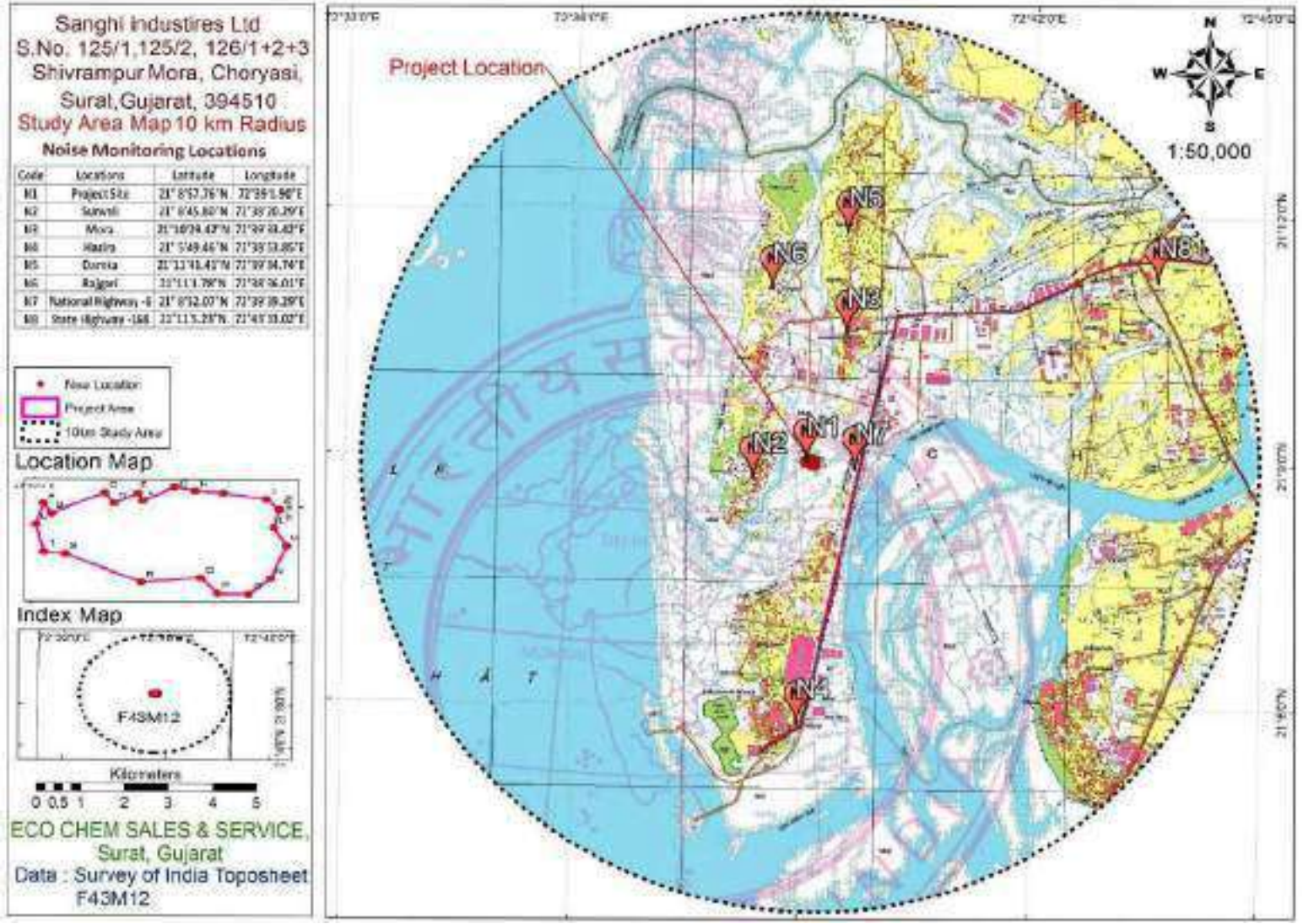


Figure 3.8 Map showing the study area location of Noise

Table 3.10 Noise Monitoring report during day time

Code	L_{min} dB	L_d dB(A)	L_{max} dB	Zone	Limit dB(A) as per Noise Pollution (Regulation and Control) Rules, 2000
N1	49.1	52.4	56.3	Industrial	**75**
N2	46.8	50.3	54.1	Residential	**55**
N3	46.2	50.7	54.4	Residential	**55**
N4	47.1	51.2	54.7	Residential	**55**
N5	46.6	50.3	53.8	Residential	**55**
N6	46.2	49.6	53.4	Residential	**55**
N7	72.4	77.4	81.2	Road	**-**
N8	68.1	73.2	77.4	Road	**-**

Table 3.11 Noise Monitoring report during night time

Code	L_{min} dB	L_n dB(A)	L_{max} dB	Zone	Limit dB(A) as per Noise Pollution (Regulation and Control) Rules, 2000
N1	45.2	48.8	52.4	Industrial	**70**
N2	39.4	42.1	44.3	Residential	**45**
N3	39.8	42.4	44.7	Residential	**45**
N4	40.3	42.9	44.9	Residential	**45**
N5	39.6	42.5	44.1	Residential	**45**
N6	40.1	42.1	44.4	Residential	**45**
N7	68.1	72.4	77.1	Road	**-**
N8	64.4	68.8	73.4	Road	**-**

Note: Day time –6.00 AM to 10.00 PM, Night time – 10.00 PM to 6.00 AM

Noise standards have been designated for different types of land use i.e. residential, commercial, industrial areas and silence zones, as per The Noise Pollution (Regulation and Control) Rules, 2000, Notified by Ministry of Environment and Forests, New Delhi, February 14, 2000. Different standards have been stipulated for day (6 AM to 10 PM) and night (10 PM to 6 AM). The noise level study shows that the noise levels are meeting the acceptable norms.

3.7.3 Summary of Noise Data

- Equivalent noise level was recorded 52.4 dB (A) at Project Site and it is 49.6 to 50.3 dB (A) in residential area during day time.
- Equivalent noise level was recorded 48.8 dB (A) at Project Site and it is 42.1 to 42.9 dB (A) in residential area during night time.
- Noise level monitoring was carried out 1 meter away from National Highway – 6 and equivalent noise level was recorded 77.4 dB (A) during day time and 72.4 dB (A) during night time as per factory act 1948 noise level exposure limit for 8 hrs. is 90 dB (A).
- Noise level monitoring was carried out 1 meter away from State Highway – 168 and equivalent noise level was recorded 73.2 dB (A) during day time and 68.8 dB (A) during night time as per factory act 1948 noise level exposure limit for 8 hrs. is 90 dB (A).

3.7.4 Interpretation of Noise Data

Based on noise level data obtained during the survey for residential area and industrial area, it is interpreted that noise levels are within the standard norms prescribed by MoEF & CC. Looking towards the increase in noise generating sources it is suggested that there is need to apply noise reducing devices at noise generating sources and generate public awareness.

3.8 LAND ENVIRONMENT

3.8.1 Land Use Pattern of the Study area

Studies on land use aspects of eco system play an important role to identify sensitive issues and to take appropriate action for maintaining ecological homeostasis in the region. The main objective of this section is to provide a baseline status of the area, so that temporal changes due to the proposed project on the surroundings can be assessed in future.

Data Used: United States Geological Survey (USGS) Satellite Data: Land sat 8 cloud free data has been used for Land use /Land cover analysis, Satellite Sensor–OLITIRS multi-spectral digital data has been used for the preparation of land use/ land cover map of present study. Survey of India reference map on 1:50,000 scales have been used for the preparation of base map and geometric correction of satellite data. Ground truthing has been carried out to validate the interpretation accuracy and reliability of remotely sensed data, by enabling verification of the interpreted details and by supplementing with the information, which cannot be obtained directly on satellite imagery.

Methodology: The methodology used for the study consists of following components.

Methodology Adopted for Thematic Data Extraction from the Satellite Imageries

ERDAS image processing 10.0 software and ARC/GIS 10.0 software were used for the project. ERDAS 10.0 image processing software was used for digital processing of the spatial data. Digital image processing techniques were applied for the mapping of the land use land cover classes of the provided area from the satellite data.

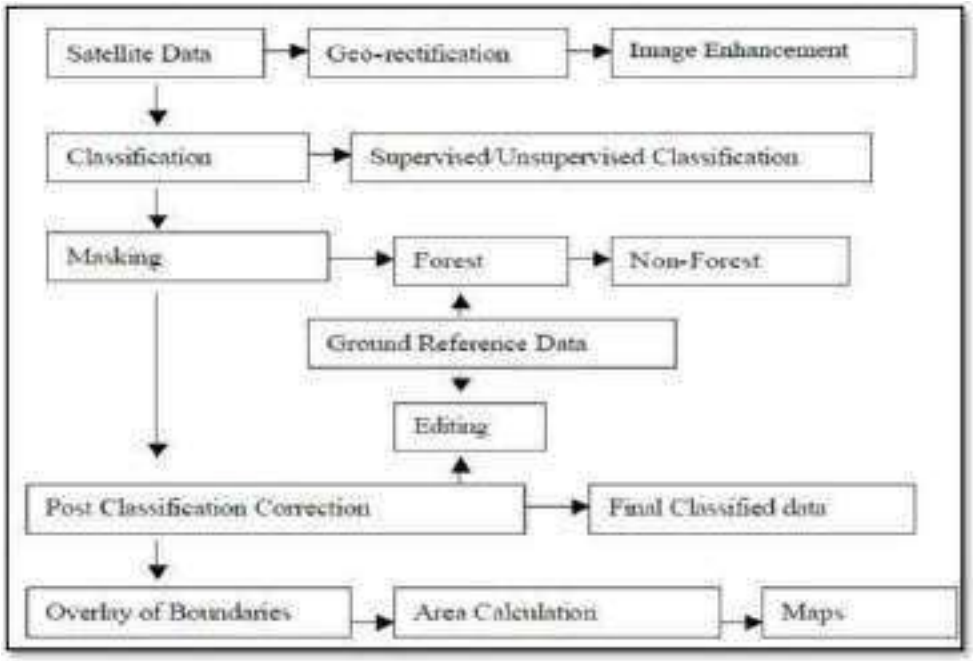


Figure 3.9 Methodology Used for Land use Classification

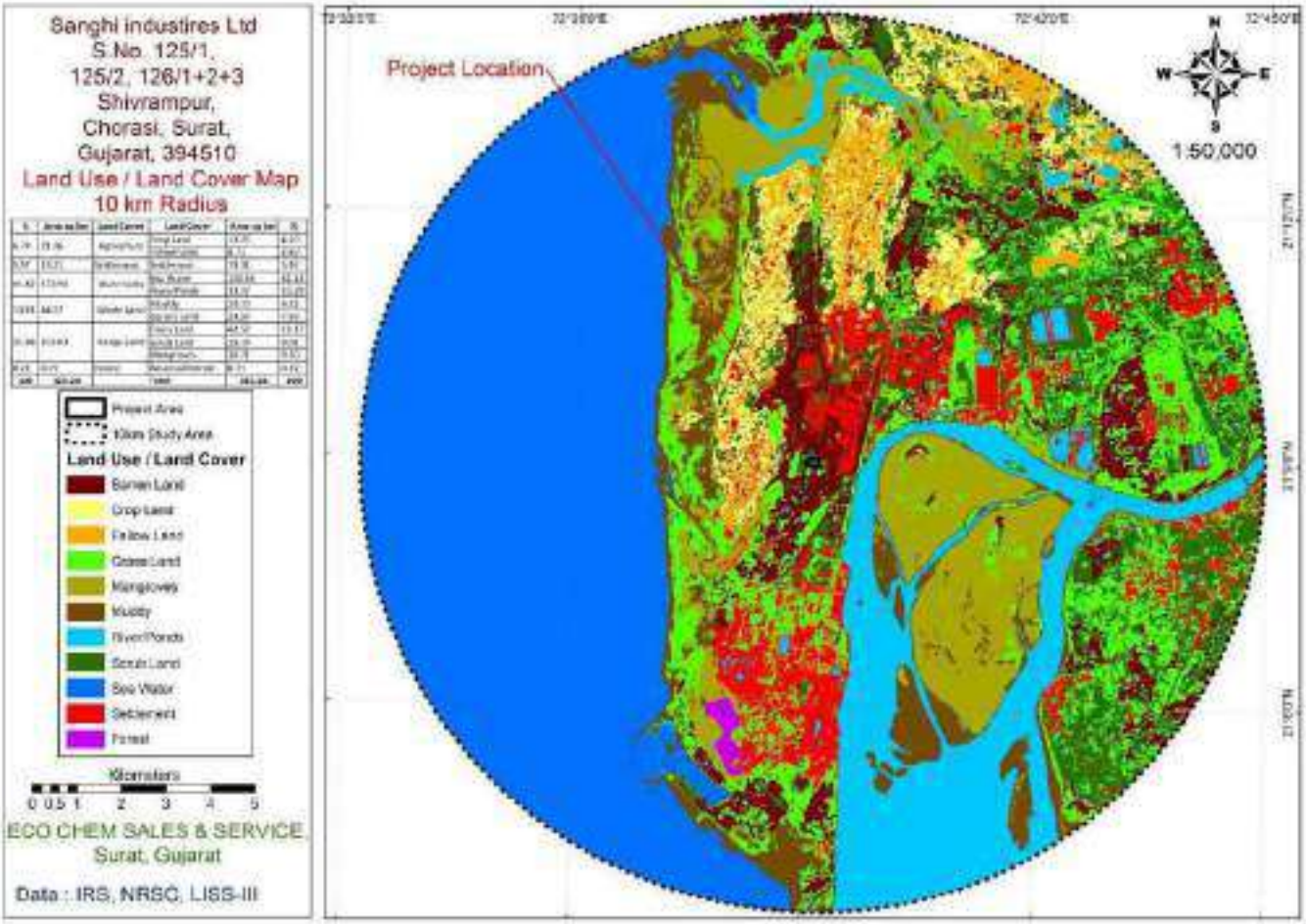


Figure 3.10 Land Use Map

Table 3.12 Land use Statistics (10 km)

(Source: Land use mapping and primary survey of the area)

%	Area sq km	Land Cover	Land Cover	Area sq km	%
6.79	21.96	Agriculture	Crop Land	13.25	4.10
			Fallow Land	8.71	2.69
5.97	19.31	Settlement	Settlement	19.31	5.97
41.42	133.92	Water body	Sea Water	100.65	31.13
			River/Ponds	33.27	10.29
13.91	44.97	Waste Land	Muddy	20.10	6.22
			Barren Land	24.87	7.69
31.68	102.43	Range Land	Grass Land	42.57	13.17
			Scrub Land	29.14	9.01
			Mangroves	30.71	9.50
0.22	0.71	Forest	Reserved Forest	0.71	0.22
100	**323.28**	**Total**		**323.28**	**100**

3.8.2 Summary and Interpretation

The area surrounding the project site is largely water body like sea water and River water are covering around 41.42% of the total study area. Settlement is covering around 5.97% of the total study area. Agriculture land is covering around 6.79% of the total study area. Range Land like Scrub land and Grass land are covering around 31.68 %. Proposed project will be set up in industrial zone therefore there will be no change in land use.

3.9 GEOLOGICAL AND GEO-HYDROLOGICAL STATUS

3.9.1 Physiography

Geographically, the district belongs to the western coastlands of the Deccan peninsula. The main Sahyadri scarp is a little outside the limits of the district towards east, but it gives the district its orientation, landscape features and drainage pattern. Distinct zones, viz., hilly areas, piedmont slopes, alluvial plains and coastal plains.

Hilly areas: The north-eastern parts of the district fall in this category. Here the general elevations are more than 100m amsl. The topography is rugged with low to moderate high hills and steep hill slopes. These parts are poorly populated and are infested by dense jungle of teak and bamboo.

Piedmont slopes: East-central parts of the district fall in this category. Here the elevations range between 60 and 100m.amsl. These parts show a gentle slope towards west. Topography is mainly plain with moderate to deep cutting river valleys and occasional hillocks.

Alluviual plains: Alluvial plains towards situated in the central parts of the district are characterized by flood plains of the Tapi, Kim and Purna rivers. Tapi has a meandering channel entrenched fairly deep and has cut deep terraces. The topography is generally plain with gentle slope towards west. The general elevations are below 60 m.amsl, the lowest elevation being 45m.amsl near Madhi.

Coastal Plains: The alluvial plains towards west merge into a dry barren sandy coastal plain fringed by marshy shore line. All the rivers form estuarine mouths. There are sand bars and spits near the shore.

3.9.2 Drainage

The Tapi is the major river which passes through the central parts of the district and flows towards the west. The river is perennial in nature. It originates in Madhya Pradesh near Betul and has about 62225 sq. Km. of catchment area. The average width of the river upstream of Kathor bridge in about 500m. Downstream of the bridge the average being about 700m. Pickup weir was constructed on the Tapi River in 1954 at Kakarapar about 56km west of Surat. Ukai dam, constructed in 1965, is situated about 25km upstream of Kakarapar weir. Other prominent rivers draining the district are Kim, and Purna.

3.9.3 Geology

Major geological formations exposed in the district are Quaternary alluvium, Tertiary limestone and sandstones and Deccan Trap basalt. Below table shows the geological succession of the district and the succession of geological formations in the district, as given by Geological survey of India.

Table 3.13: Geological Succession

Era	Period	Epoch/Series	Description
Cenozonic	Quaternary	Holocene	Soil, Younger alluvium Blown and Fluvio-marine deposits.
	Tertiary	Pleistocene	Older alluvium, conglomerate
		Miocene	Ferruginous sandstone (Gaj)
		Eocene	Numulitic limestone
		Palaeocene	Sub-Numulitic limestone, gypseous shale,Supra- Trappean sediments lateritised and having bauxite pockets.
Mesozoic	Lower Tertiary to Upper Cretaceous	Early Eocene To Upper	Deccan Trap basalt with dykes

3.9.4 Hydrogeology

Aquifer System

The hydrogeological frame work of the area is essentially governed by geological setting, distribution of rainfall and facilities of circulation and movement of water through inter connected primary and secondary porosity of the geological units forming the aquifers. The major aquifers in the district are formed by alluvium and Deccan Trap basalt with Tertiary formations occupying a small patch. The alluvium occurs in the western part of the district and along the streams whereas in eastern parts weathered and fractured basalt form aquifers. Hydrogeological units:

1. Fissure Formations,
2. Porous Formation.

- **Fissure Formations**

Deccan Traps from the aquifers in north-eastern, eastern and south eastern parts of the district comprising Mangrol, Mandvi, Vyara, Valod Mahuva, Songadh, Uchchhal and Nizar talukas. The ground water occurs in unconfined to semi-confined conditions. The occurrence and movement of ground water is governed by the thickness and extent of weathered zone and presence of fractures and joints. At places, dykes act as ground water barriers and restrict the flow of ground water. On the other, at places, the dykes themselves from good aquifers owing to deeper levels of weathering in them. Depths of dug wells in Deccan traps ranges from less than 2m to 25m with maximum number of wells, about 80%, being 5 to 15m deep. The depths to water levels in the dug wells range from 1 to 20m. However, in 90% of the wells, the water levels are less than 10m. bgl. Yields of the dug wells are low to moderate in central parts whereas they are low to very low on the hill slopes. The dug wells generally sustain pumping for 4 to 5 hours at the yields of 50 to 150 m^3/day. Recuperation of water levels is generally slow.

- **Alluvium**

The western and north western parts of the district comprising Choryasi, Olpad, Kamrej, Palsana and parts of Bardoli talukas is covered by Alluvium. This aquifer can broadly be demarcated into two zones namely newer alluvium and older alluvium. The newer alluvium is present along the river courses and comprises fine to coarse grained sand trap wash with cay intercalations. The sand is unconsolidated but shows some degree of cohesion at places. Water levels are in general deeper in newer alluvium. Older alluvium is present in inter river plains and comprises sand, clay, kankar, grave and silt. The ground water occurs mostly under unconfined conditions but at places semi-confined conditions are also observed, probably due to presence of clay lenses. The depths of the wells in alluvium generally range from 3.0 to 30.0m with some of the wells having bores down to 50m below bottom of the wells. The maximum number of wells, about 80% is 5 to 20m deep. Depths to water levels in the wells range from 0.5 to 15m bgl about 90% wells shows water levels less than 10m bgl. Yields of the dug wells and dug-cum- bored wells range between 100 and 450 m^3/day.

- **Aquifer Parameters**

In Alluvial areas the depth of the tube wells range from 36 to 169m with piezometric levels varying between 2 to 10m. The specific capacity of the wells ranges from 19 to 1658 m^3/day/m. The transmissivity values obtained at these tube wells ranges from 104 (Kosad) to 2965 m^2/day (Vihan).

- **Depth to Water Level**

The map depicting the depth to water level has been prepared based on water level data for May and November 2012 collected from NNHS.

- **Changes in Ground Water Scenario over the years**

Long term water level data is available for 24 NNHS since 2003 and data was analyzed for the period between January 2003 to November 2012. Pre-monsoon water level trend shows that 22% of the hydrograph stations indicate a rise of water level ranging from 0.0331 m/year to 0.338m/year where as 78% of the hydrograph stations indicate a decline of water level ranging from 0.0037 m/year to 0.4293 m/year. During post- monsoon period water level trend shows that 39% of the hydrograph stations indicate a rise of water level ranging from 0.0202 m/year to 0.447 m/year where as 61% of the hydrograph stations indicate a decline of water level ranging from 0.0058 m/year to 0.6439 m/year

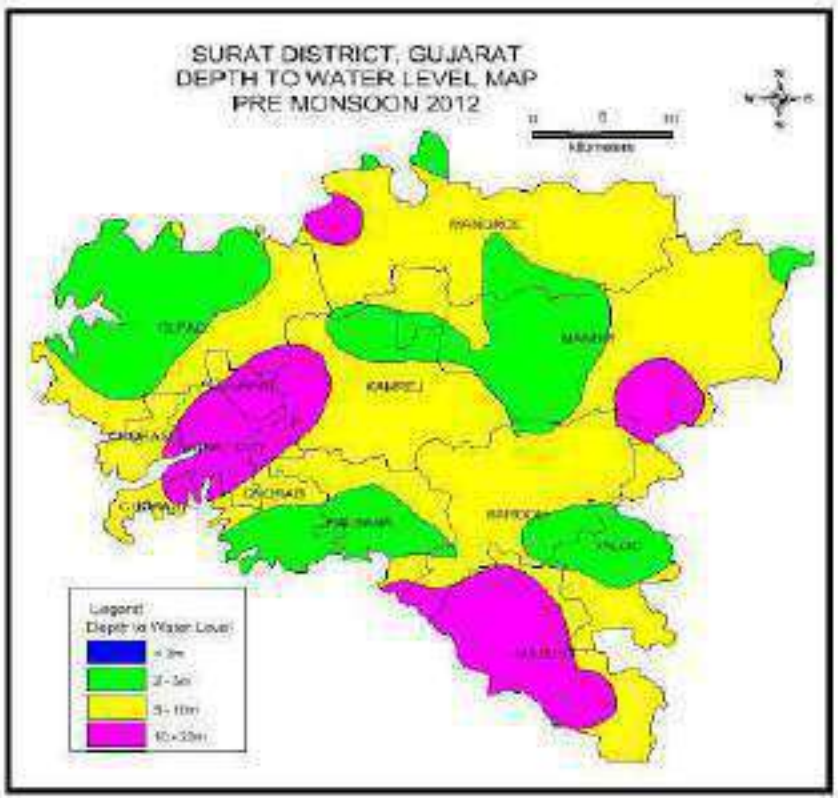


Figure 3.11: Ground water level during Pre Monsoon period

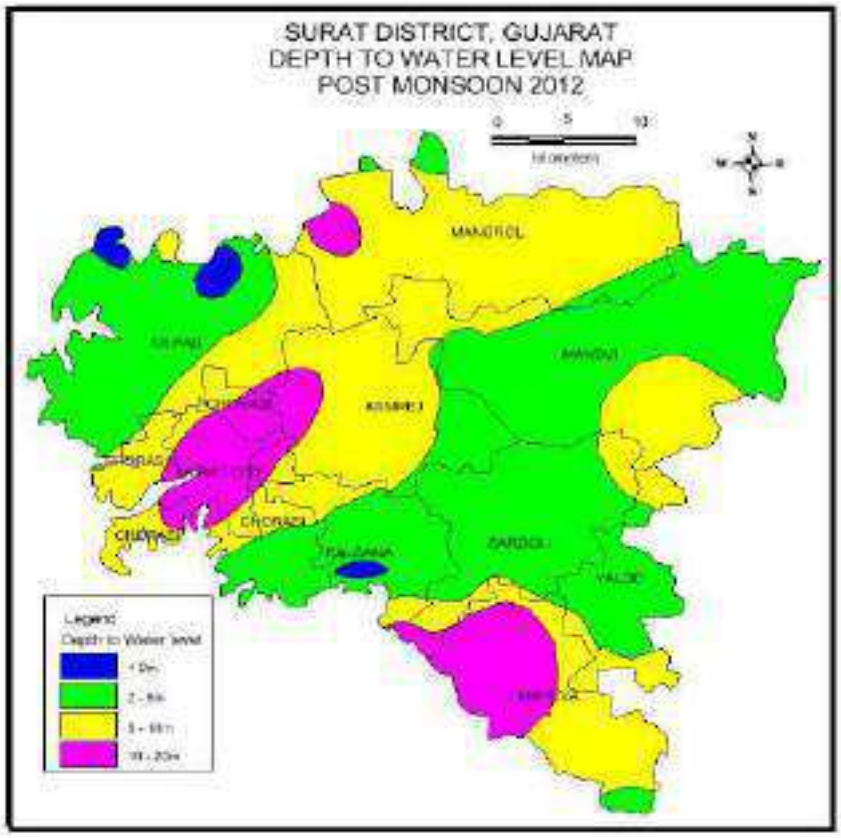


Figure 3.12: Ground water level during Post Monsoon period

3.10 TRAFFIC STUDY

Traffic study measurements were performed at National Highway 6 and State Highway 186. Proposed project will attract to commercial vehicles as a result traffic load will also increase on highways. Traffic load play a major role in polluting the air. To assess the traffic load, 4 no. of surveyors were appointed to survey for National Highway 6 & National Highway 186.

Traffic data collected continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined. Traffic study is conducted on National Highway 6 & National Highway 186 from 26th and 27th Dec 2018

Table 3.14(a) Traffic Study Report

S.No.	Vehicles Distribution	No. of Vehicles/Day		Passenger Car Unit (PCU)	Total No. of Vehicle in PCU		Total No. of Vehicle (PCU)/Hour	
		National Highway 6	State Highway 168		National Highway 6	State Highway 168	National Highway 6	State Highway 168
1.	Cars	20538	9087	1.0	20538	9087	856	379
2.	Buses	1080	754	3.0	3240	2262	135	94
3.	Trucks	2036	1256	3.0	6108	3768	255	157
4.	Two wheelers	5612	3845	0.5	2806	1923	117	80
5.	Three wheelers	1863	1056	0.75	1397	792	58	33
Total		**31129**	**15998**		**34089**	**17832**	**1421**	**743**

Table 3.14(b) Existing Traffic Scenario with respect to LOS

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
National Highway 6	1421	3000	0.47	C
State Highway 186	743	1250	0.59	C

V/C	LOS	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/Average/Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

3.10.1 Interpretation of Traffic Study

LOS values have been calculated based on traffic data on National Highway 6 & State Highway 168 and it has been found 0.47 and 0.59 respectively. LOS value indicates that the perf
ormances of NH-6 & SH-168 are good.

3.11 SOIL QUALITY

Four soil samples were collected from surrounding areas including the project site covering 10 km radius to assess the baseline status of soil quality. The soil samples were analysed for physical and chemical parameters. Soil samples were collected by using core cutter (0-15 cm depth) and brought to the laboratory in polythene bags. Standard procedures have been followed for soil sampling and analysis.

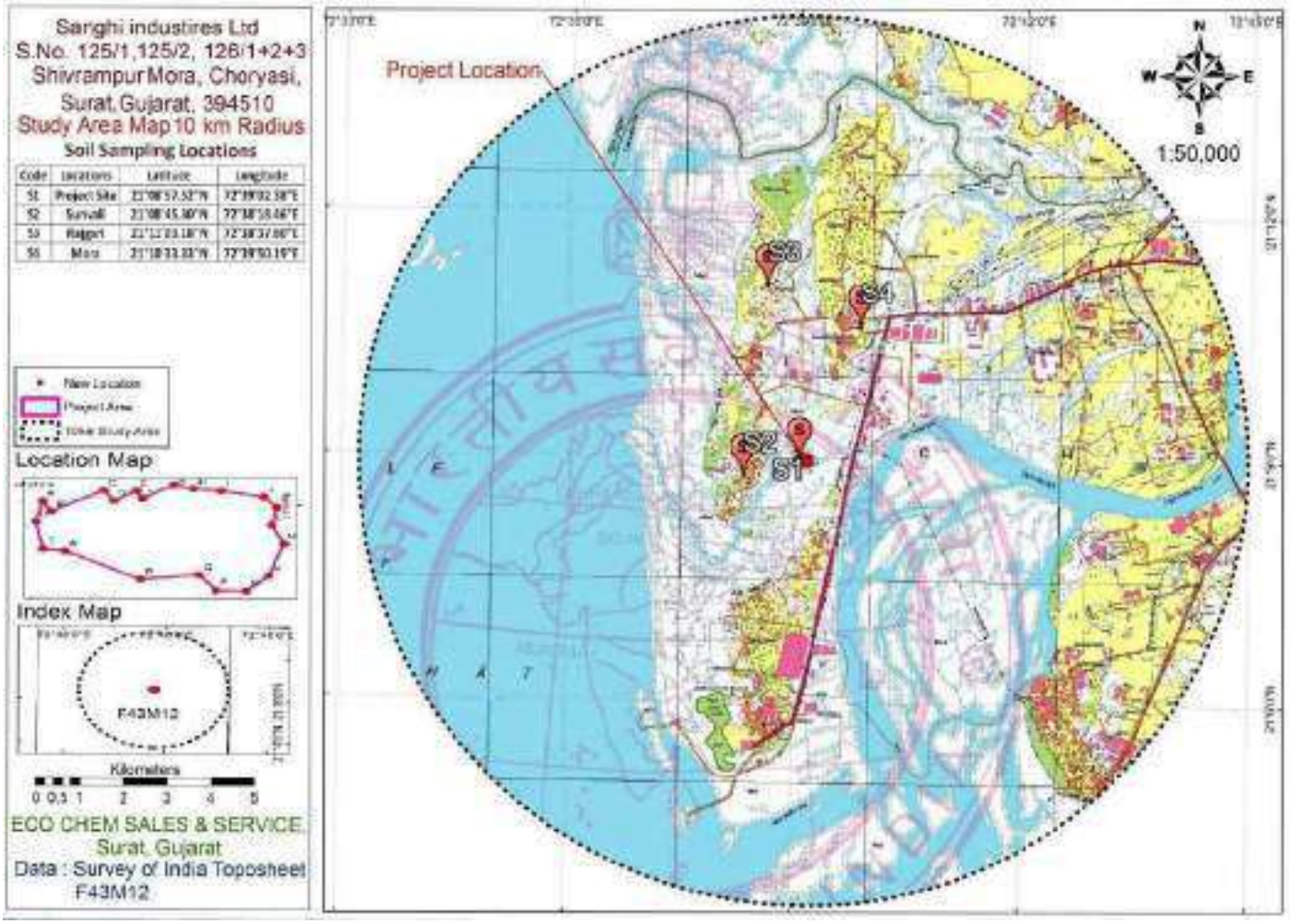


Figure 3.13 Map showing the study area location of Soil

Table 3.15a Details of Soil sampling location

Code	Location	Distance from the project site/Direction	Latitude and Longitude	Selection Criteria
S1	Project Site	-	21°08'57.52"N 72°39'02.38"E	Non Agriculture Land
S2	Sunvali	1.3 km/WSW	21°08'45.30"N 72°38'18.46"E	Agriculture Land
S3	Rajgari	3.9 km/WNW	21°11'03.18"N 72°38'37.80"E	Agriculture Land
S4	Mora	3.2 km/NNE	21°10'33.33"N 72°39'50.19"E	Agriculture Land

Table 3.15b Soil Sample Analysis Result

S. No	Parameters	Unit	S1	S2	S3	S4
1	Water Holding Capacity	%	44.42	37.41	36.32	35.14
2	Porosity	%	38.56	45.82	46.28	48.21
3	Bulk Density	g/cm^3	1.63	1.44	1.42	1.37
4	Particle Size Distribution					
a.	Sand	%	25.2	48.2	45.6	47.1
b.	Silt	%	30.1	20.6	19.6	22.5
c.	Clay	%	44.7	31.2	34.8	30.4
5	Texture	-	Clay	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
6	Cation Exchange Capacity	meq/100 g	47.1	38.9	36.7	34.4
7	pH	-	7.84	7.62	7.78	7.88
8	Electrical Conductivity	dS/m	1.4	1.0	1.0	0.9
9	Exchangeable Sodium	%	13.2	13.9	14.2	14.8
10	Exchangeable Calcium	meq/100g	25.1	20.4	18.8	17.4
11	Exchangeable Magnesium	meq/100g	14.4	12.1	11.6	10.8
12	Exchangeable Sodium	meq/100g	6.2	5.4	5.2	5.1
13	Exchangeable Potassium	meq/100g	1.4	1.0	1.1	1.1
14	Organic Carbon(OC)	%	0.84	0.60	0.57	0.63
15	Total Nitrogen	%	0.073	0.052	0.049	0.055
16	Nitrate N	kg/ha	138.9	233.0	241.9	250.9
17	Total Phosphorus	kg/ha	219.5	353.9	389.8	414.4
18	Total Iron	mg/100gm	78.5	85.4	80.5	86.8
19	Total Zinc	mg/100gm	3.1	3.6	2.8	3.3
20	Total Copper	mg/100gm	1.4	1.1	1.0	1.2
21	Total Boron	mg/100gm	3.36	2.62	3.14	3.16
22	Total Chromium	mg/100gm	1.60	1.72	1.88	1.83

3.11.1 Summary of Soil Data

The soils are categorized as sandy clay loam to clay based on different soil separates (sand, silt and clay).They have moderate good holding capacity (35.14 to 44.42 %) and porosity (38.56 to 48.21 %) but moderate drainage capacity as texture is sandy clay loam to clay having 50 to 70 % silt+ clay. The soil is categorized as deep black having >1m depth. The pH of the soil samples narrowly ranged from 7.62 to 7.88 during the study period, indicating that soils are normal (pH 6.5 to 7.8). The soil EC varied from 0.9 to 1.4 dS/m and ESP ranged from 13.2 to 14.8. These parameters indicate that soils are neutral to in reaction, saline (EC < 0.8 dS/m), but non-sodic as ESP in is not exceeding 15. Among exchangeable basic cations predominance of calcium (17.4 to 25.1 meq/100 g soil) was seen followed by Mg (10.8 to 14.4 meq/100 g soil),Na(5.1 to 6.2 meq/100 g soil) and K (1.0 to 1.4 meq/100 g soil). The loss on ignition (0.57 to 0.84 % OC) indicate that soils are medium (OC=0.50 to 0.75 %) to high (>0.75 %) in organic carbon status. This shows that soils are medium to high in nitrogen status. Considering only 2% available phosphorus based on total P, soils are classified as poor (>28 kg P2O5/ha) in available P and considering exchangeable potassium values, soils are rated as high in available potassium (>280 kg K2O/ha). The soils are medium to

high in nitrogen and low in available phosphorus, but rich in potassium. The results relating to total Fe, Cu, Cr, B and Zn do not show alarming concentrations in different soil samples.

3.11.2 Interpretation of Soil Data

Based on soil analysis data it is concluded that surface soils are neutral in reaction and saline (EC > 0.8 dS/m). However, looking to the ESP values soils are categorized as non-sodic as ESP in all samples is <15.0. The soils are medium to high in nitrogen as well as high in potassium (>280 kg K2O/ha) status and low in phosphorus. The levels of total Fe, Cu, Cr, B and Zn are within the limits. However, for successful greenbelt development liberal quantity of organic manure (50 tons/ha) and 20% less K fertilizer and double the recommended dose of P should be applied. The soil at the project site should be periodically monitored for EC, pH and ESP.

3.12 WATER ENVIRONMENT

Physical, Chemical and Microbiological factors influencing water quality are so interrelated that a change in any water quality parameter may trigger other changes in a complete network of interrelated variables. Selected water quality parameters for surface and ground water resources along with biological indicators within study region have been used for water environment and assessing the impact on it by proposed project. A study on water environment aspects of ecosystem plays an important role in environmental assessment to identify water related sensitive issues.

3.12.1 Reconnaissance

As a significant part of predefined framework of the present study water samples were collected from selected locations. The Reconnaissance survey was undertaken and monitoring locations were finalized based on:

- Presence, Location and uses of major water bodies in the region,
- Type and Location of Industrial/residential areas, their intake and effluent disposal locations,
- Likely areas that can represent baseline conditions.

3.12.2 Water Quality

With the start of water quality study, the water resources in the study area were divided into three categories for getting ideal upshot of baseline status of water quality of the region. These three categories as determined are:

- Ground water resources (tube well, open well, springs etc.)
- Surface water resources including ponds, river, canals.
- Marine water

3.12.3 Sampling and Analysis

All the water samples were collected and analyzed as per –Standard Methods for Examination of Water & Wastewater", APHA 23rd edition, 2017. Water Samples for the analysis of physico-chemical parameters were collected in plastic carboy and parameter wise preserved onsite as per the technique defined in the book of APHA, 23rd edition, 2017. Temperature, pH and DO were analyzed onsite and samples were brought to the laboratory for the analysis of remaining parameters.

3.12.4 Ground Water

To assess the quality of ground water, samples were collected from 7 numbers of locations for the analysis of physico-chemical and microbiological parameters. Ground water sampling locations are presented in **Table 3.16** and analysis results are presented in **Table 3.17.**

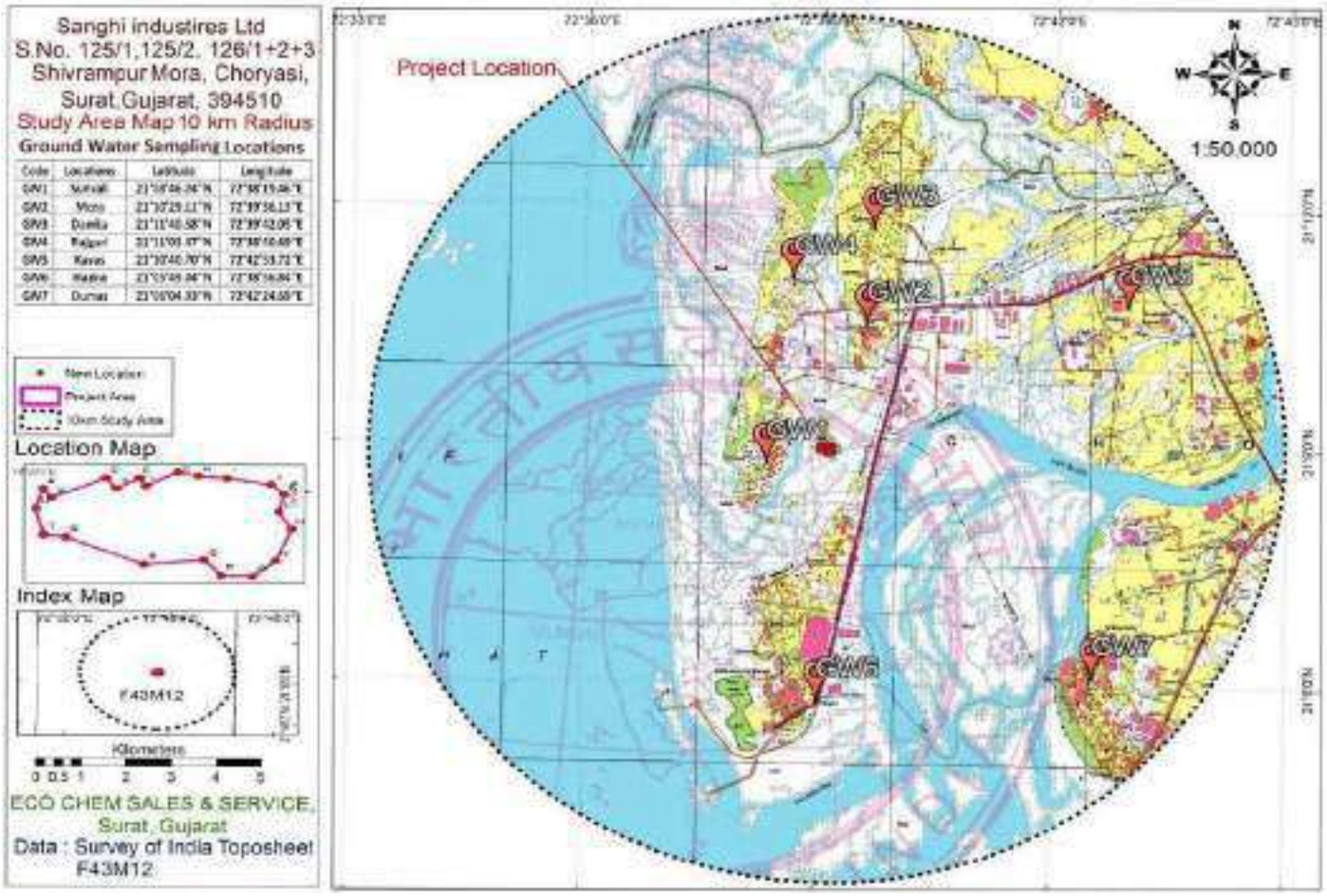


Figure 3.14 Map showing the study area with locations for Ground Water

Table 3.16 Details of Ground Water sampling locations

Code	Location	Distance from the project site/Direction	Latitude and Longitude	Source
GW1	Sunvali	1.3 km/WSW	21°08'46.24"N 72°38'19.46"E	Well
GW2	Mora	3.0 km/NNE	21°10'29.11"N 72°39'36.13"E	Well
GW3	Damka	5.0 km/N	21°11'40.58"N 72°39'42.05"E	Bore well
GW4	Rajgari	3.9 km/NNW	21°11'03.47"N 72°38'40.69"E	Well
GW5	Kavas	7.3 km/NE	21°10'40.70"N 72°42'53.72"E	Well
GW6	Hazira	3.9 km/S	21°05'49.04"N 72°38'56.84"E	Well
GW7	Dumas	7.9 km/SE	21°06'04.93"N 72°42'24.69"E	Well

Table 3.17 Ground water Analysis Results

S. No.	Parameters	Unit	GW1	GW2	GW3	GW4	GW5	GW6	GW7	Drinking Water Specification IS 10500: 1992 (Reaffirmed 2012)	
										Desirable Limit	Permissible Limit
1.	Temperature	^{0}C	25.5	25.0	25.5	24.5	25.0	25.0	24.5	--	--
2.	pH @ 25^{0}C	pH Unit	7.75	7.30	8.41	8.01	8.12	7.40	7.68	6.5 – 8.5	No Relaxation
3.	Colour	Hazen	<5	<5	<5	<5	<5	<5	<5	5	15
4.	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	--
5.	TDS @ 180^{0}C	mg/L	806	6722	1600	1220	815	950	992	500	2000
6.	Conductivity	µmho/cm	1279	10670	2540	1936	1294	1508	1575	--	--
7.	TSS	mg/L	<2	<2	<2	<2	<2	<2	<2	--	--
8.	Turbidity	NTU	1.7	4.8	2.8	1.8	1.4	2.0	2.2	1	5
9.	Total Hardness as $CaCO_3$	mg/L	478	1500	356	472	314	522	582	200	600
10.	Calcium	mg/L	66	160	62	119	58	88	72	75	200
11.	Total Alkalinity as $CaCO_3$	mg/L	400	756	584	532	432	492	528	200	600
12.	Chloride	mg/L	153	3194	506	274	162	204	194	250	1000
13.	Magnesium	mg/L	76	267	49	43	41	73	98	30	100
14.	Sulphate	mg/L	102	478	78	142	61	79	110	200	400
15.	Total Phosphorus	mg/L	1.5	4.8	3.4	3.1	1.8	2.1	2.6	--	--

	(PO_4-P)										
16.	Sodium	mg/L	90	1850	480	260	180	140	150	--	--
17.	Potassium	mg/L	52	230	30	38	22	41	19	--	--
18.	Fluoride	mg/L	0.5	0.7	0.6	0.6	0.6	0.5	0.6	1.0	1.5
19.	Phenolic Compound	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.001	0.002
20.	Oil and Grease	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--	--
21.	Dissolved Oxygen	mg/L	5.3	4.8	4.9	5.0	5.3	5.1	5.0	--	--
22.	Nitrate	mg/L	0.5	0.8	0.7	0.6	0.5	0.6	0.6	45	No Relaxation
23.	Total Nitrogen	mg/L	1.1	1.9	1.4	1.3	1.1	1.2	1.3	-	-
24.	Iron	mg/L	0.10	0.09	0.08	0.04	0.16	0.66	0.05	0.3	No Relaxation
25.	Copper	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1.5
26.	Boron	mg/L	0.06	0.14	0.1	0.08	0.05	0.07	0.09	0.5	1.0
27.	Chromium	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	No Relaxation
28.	Zinc	mg/L	0.12	0.21	0.17	0.14	0.1	0.12	0.15	5	15
29.	Total Coliform	Present/Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Shall not be detectable in any100 ml of sample	

3.12.5 Summary of Ground Water Quality

The test results were compared with the Drinking Water Specification: IS: 10500, 1992 (Reaffirmed 2012) and it is summarized as under.

- The pH was observed in the range of 7.30 – 8.41, which meets with drinking water norms.
- Turbidity was found in the range of 1.4 – 4.8 NTU.
- Total Dissolved Solid (TDS) were recorded in the range of 806 - 6722 mg/L with minimum at Suvali village and maximum at Mora village.
- Conductivity varies from 1279 to 10670 µmho/cm. The ratio of TDS to conductivity was observed in the range of 0.6 to 0.65 which is within the desired range.
- Total Hardness was in the range of 314 - 1500 mg/L with minimum at Kavas village and maximum at Mora village.
- Total Alkalinity was found in the range of 400 - 756 mg/L with minimum at Suvali village and maximum at Mora village.
- Chloride was found in the range of 153 to 3194 mg/L and Sulphate varies from 61 to 478 mg/L.
- Iron was found in the range of 0.04- 0.66 mg/L with minimum at Rajgari village and maximum at Hazira village.
- As microbiological parameters MPN analysis was also carried out and it was found absent.

3.12.6 Interpretation of Ground Water Quality Data

Based on comparison study of results of tested parameters with drinking water norms, it is interpreted that water qualities of the studied locations can be considered portable/drinkable as results are within the drinking water norms except Hazira village. Iron content was found 0.66 mg/L in the ground water sample collected from Hazira village, which is more than prescribed limit and in case of the ground water sample collected from Mora village TDS, Hardness, Chloride and Alkalinity value was found higher side. Reason of high TDS in ground water sample in Mora village may be due to ingress of salinity as sea is very near to this village. To save the ground water from contamination and improving the quality, rainwater harvesting and ground water recharging may be helpful.

3.12.7 Surface Water

To assess the quality of Surface water, samples were collected from 6 numbers of locations for the analysis of physico-chemical and microbiological parameters. Frequency of sampling was once during the study period. Sampling and analysis was carried out as per —Standard Methods for Examination of Water and Wastewater APHA 23rd edition, 2017. Surface water sampling locations are presented in the **Table 3.18.** Analysis results are presented in **Table 3.19 & 3.20.**

Table 3.18 Details of Surface Water Sampling Locations

Code	Location	Distance from the project Site/Direction	Latitude and Longitude	Source
SW1	Sunvali	1.2 km/WSW	21°08'30.86"N 72°38'30.41"E	Pond
SW2	Mora	3.2 km/NNE	21°10'30.53"N 72°39'52.70"E	Pond
SW3	Damka	6.9 km/NNE	21°12'34.08"N 72°40'16.24"E	Pond
SW4	Rajgari	3.4 km/N	21°10'51.21"N 72°38'50.21"E	Pond
SW5	Hazira	5.8 km/S	21°05'50.92"N 72°38'52.44"E	Pond
SW6	Tapi River	6.7 km/E	21°08'43.06"N 72°42'50.50"E	River

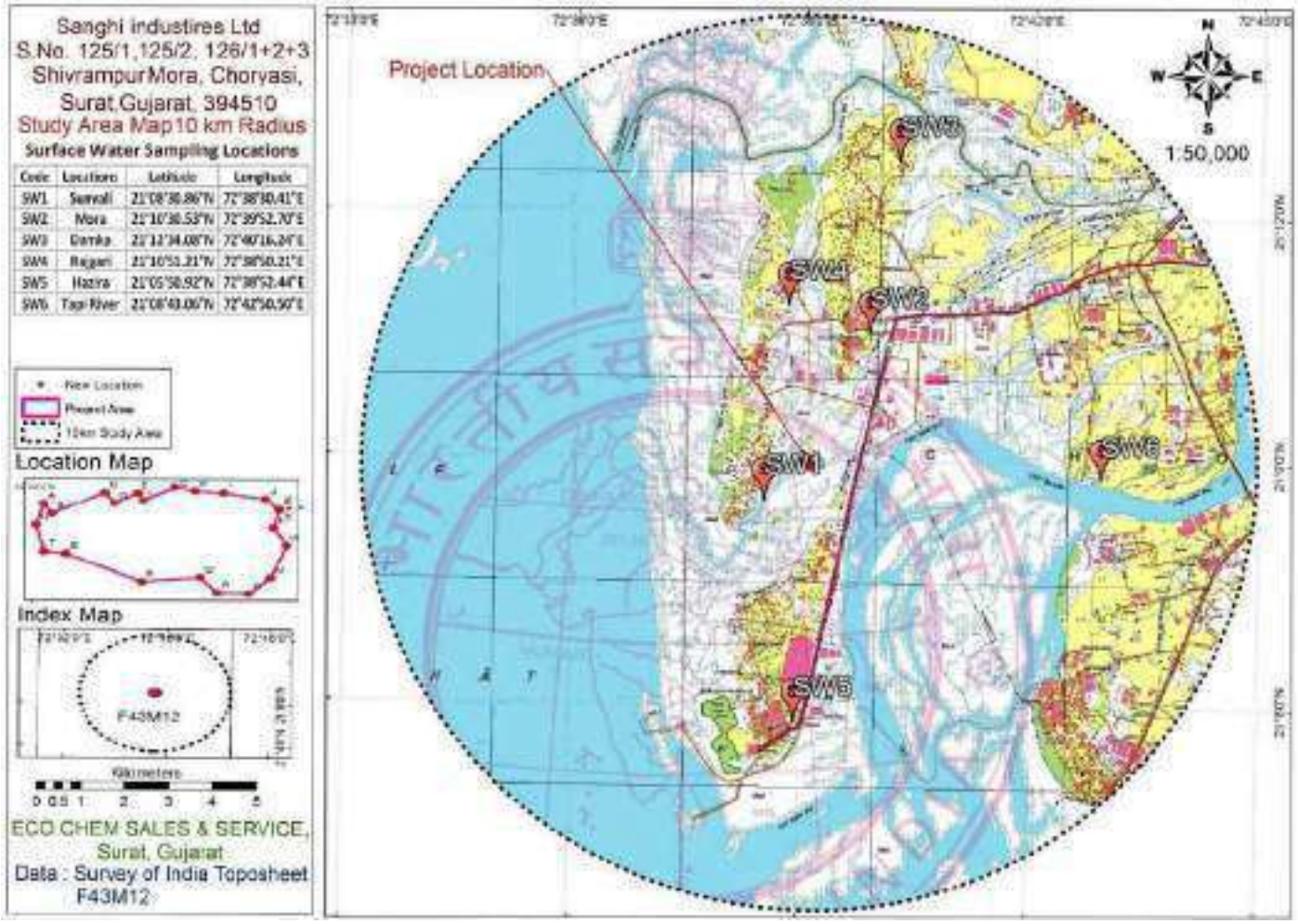


Figure 3.15 Map showing the locations for Surface water

Table 3.19 Surface water Analysis Results

#	Parameters	Unit	SW1	SW2	SW3	SW4	SW5	SW6	Drinking Water Specification IS 10500: 1992/(Reaffirmed 2012)	
									Desirable Limit	Permissible Limit
1.	Temperature	^{0}C	23.5	24.0	24.5	23.0	23.5	24.0	-	-
2.	pH @ 25^{0}C	pH Unit	7.84	8.07	7.60	7.98	8.36	6.85	6.5 – 8.5	NR
3.	Colour	Hazen	8	8	6	14	10	10	5	15
4.	Odour	-	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Agreeable	-
5.	TDS @ 180^{0}C	mg/L	2007	1037	1053	15940	3066	26863	500	2000
6.	Conductivity	µmho/cm	3245	1646	1672	25860	5028	42640	-	-
7.	TSS	mg/L	8	10	12	14	8	18	-	-
8.	Total Hardness as $CaCO_3$	mg/L	452	224	188	2340	482	6100	200	600
9.	Calcium	mg/L	58	28	29	200	62	582	75	200
10.	Total Alkalinity as $CaCO_3$	mg/L	348	380	356	208	406	212	200	600
11.	Chloride	mg/L	788	258	245	9050	1088	15280	250	1000
12.	Magnesium	mg/L	75	37	28	447	79	1129	30	100
13.	Sulphate	mg/L	196	132	167	490	538	1444	200	400
14.	Total Phosphorus	mg/L	2.6	1.8	2.1	5.4	3.2	6.8	-	-
15.	Sodium	mg/L	550	290	300	5100	900	7600	-	-
16.	Potassium	mg/L	29	30	31	210	54	360	-	-
17.	Fluoride	mg/L	0.5	0.7	0.7	0.6	0.7	0.9	1.0	1.5
18.	Phenolic Comp.	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.001	0.002
19.	Oil and Grease	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-
20.	Dissolved Oxygen	mg/L	4.9	5.0	5.0	4.6	4.8	4.8	-	-
21.	COD	mg/L	14	12	12	24	18	18	-	-
22.	BOD(3 days at 27 ^{0}C)	mg/L	5	4	4	8	5	5	-	-
23.	Nitrate	mg/L	0.8	0.7	0.6	1.1	0.8	1.2	45	NR
24.	Total Nitrogen	mg/L	1.7	1.5	1.3	2.6	1.7	2.8	-	-
25.	Iron	mg/L	0.08	0.52	0.15	0.12	0.66	0.88	0.3	NR
26.	Copper	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1.5
27.	Boron	mg/L	0.08	0.05	0.06	0.16	0.09	0.22	0.5	1.0
28.	Chromium	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	NR
29.	Zinc	mg/L	0.14	0.11	0.12	0.25	0.18	0.32	Nil	15

Table 3.20 Bacteriological Analysis of surface Water

Code	Total coliform	Faecal coliform	*Escherichia coli*	Faecal Streptococci
	Most Probable No (MPN): No/100 mL			
SW1	26	22	<1.8	<1.8
SW2	22	18	<1.8	<1.8
SW3	20	16	<1.8	<1.8
SW4	32	28	2.0	<1.8
SW5	24	20	<1.8	<1.8
SW6	22	18	<1.8	<1.8

Table 3.21 Standard limit as per IS 10500:2012 for Microbiological parameters

S.No.	Organisams	Requirements
1.	All water intended for drinking: a) *E. coli* or thermo tolerant coliform bacteria	Shall not be detectable in 100 ml sample
2.	Treated water entering the distribution system: a) *E. coli* or thermo tolerant coliform bacteria b) Total coliform bacteria	 Shall not be detectable in 100 ml sample Shall not be detectable in 100 ml sample
3.	Treated water in the distribution system: a) *E. coli* or thermo tolerant coliform bacteria b) Total coliform bacteria	 Shall not be detectable in 100 ml sample Shall not be detectable in 100 ml sample

1) Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.
2) Although, *E.coli* is the more precise indicator of fecal pollution, the count of thermo tolerant coli form bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.
3) It is recognized that, in the great majority of rural water supplies in developing countries, fecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

3.12.8 Summary of Surface Water Quality

The following description is based on the analysis of the samples:

- During the analysis pH of the samples was found in the range of 6.85 – 8.36.
- TDS analysis was also carried out for surface water sample and it was found in the range of 1037-26863 mg/L.
- TSS was found in the range of 8 – 18 mg/L.
- Total Hardness ranges from 188– 6100 mg/L with maximum in the water sample of Tapi River and minimum in Damka Lake.
- DO is one of the important parameter to indicate towards the contamination of organic matter. DO level decreases as soon as organic contamination increases. During analysis DO was found in the range of 4.6-5.0 mg/L.
- COD and BOD analysis was also carried out during the study period and results were found more than the expected value. Various literatures show that BOD should be less than 4.0 mg/L for the better survival of aquatic life.
- Total Nitrogen was found in the range of 1.3 – 2.8 mg/L.
- Heavy metal analysis was also carried out and the Iron content was found in the range of 0.08- 0.88 mg/L.

- MPN test was also carried out for this surface water sample and it was found positive. It indicates towards the faecal contamination in surface water body.

3.12.9 Interpretation of Surface Water Quality Data

TDS value was found more than the drinking water norms in surface water sample of Sunvali, Rajgari, Hazira and Tapi River. The reason of high TDS is salinity ingress from sea. Based on test result data comparison study, it is interpreted that surface water cannot be directly used in drinking as surface water of the studied locations is contaminated with organic matter and microbes. Surface water of village Suvali, Mora and Damka can be used in irrigation as well as in other domestic purposes except drinking and bathing.

3.12.10 Marine Water

To assess the quality of Marine water sample was collected during low tide and high tide for the analysis of physico chemical, nutrient, heavy metal, demand analysis, microbiological and biological parameters. Frequency of sampling was once during the study period and samples were collected as per standard method for the examination of water & wastewater APHA 23rd Edition, 2017. Sediment sample was also collected for the analysis of nutrient and heavy metal parameter.

Table 3.22 Details of Marine and Sediment Sampling Locations

Code	Sampling Location	Distance from the project Site/Direction	Latitude and Longitude	Source
M1	High Tide	7.1 km/W	21°09'03.90"N 72°34'58.77"E	Marine
M2	Low Tide	7.1 km/W	21°08'44.39"N 72°34'58.57"E	Marine
Sd	Sediment	7.1 km/W	21°08'55.30"N 72°35'09.70"E	Sediment

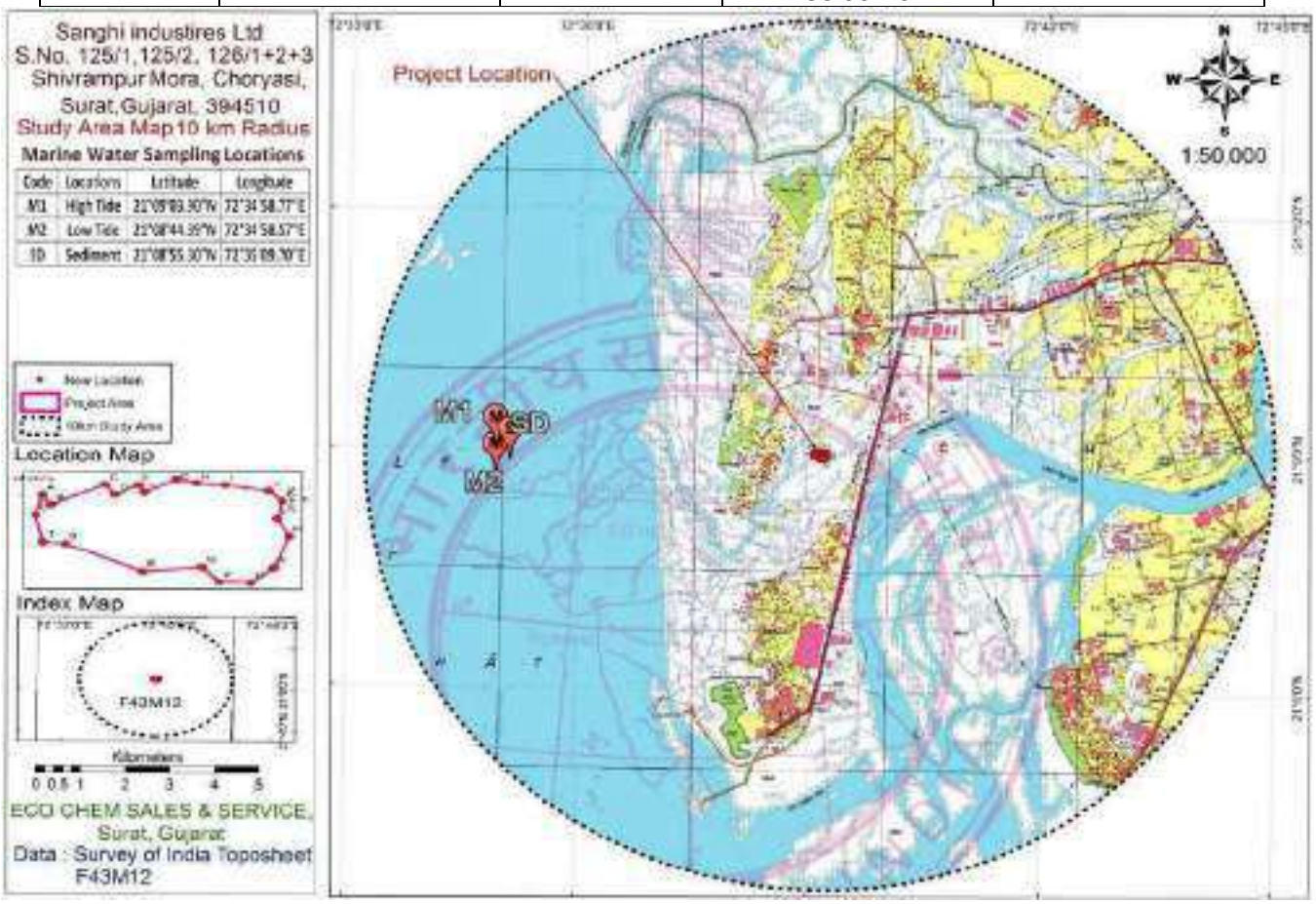


Figure 3.16 Map showing the locations for Marine water sampling

Table 3.23 Marine Water Analysis Result during low tide

S.No.	Parameters	Unit	M1	M2
1.	pH	-	8.02	7.85
2.	Temperature	^{o}C	23.5	24.0
3.	TSS	mg/L	456	402
4.	Total Hardness	mg/L	7200	6500
5.	Total Alkalinity	mg/L	172	184
6.	Salinity as NaCl	ppt	32.2	31.0
7.	Sulphate	mg/L	2473	2968
8.	Total Nitrogen	mg/L	1.3	1.5
9.	Total Phosphorous	mg/L	1.2	1.8
10.	Oil & Grease	mg/L	<1.0	<1.0
11.	DO	mg/L	5.4	5.1
12.	BOD	mg/L	<4	<4
13.	Iron	mg/L	0.25	0.31
14.	Copper	mg/L	<0.05	<0.05
15.	Zinc	mg/L	0.3	0.5
16.	Boron	mg/L	<0.01	<0.01
17.	Chromium	mg/L	<0.03	<0.03

Table 3.24 Microbiological Analysis Result for Marine Water Sample

S. No.	Location Code	Total coliform	Faecal coliform	*Escherichia Coli*	Faecal Streptococci
		Most Probable No (MPN): No./100 Ml			
1.	M1	18	16	<1.8	<1.8
2.	M2	20	18	<1.8	<1.8

Table 3.25 Zooplankton Analysis Result for Marine Water Sample

S. No.	Location Code	Total Count per m^3	Percentage of Organism in each group		
			Protozoa (%)	Rotifera (%)	Copepoda (%)
1.	M1	6200	78	12	10
2.	M2	5800	74	16	10

Table 3.26 Pigment Analysis and Phytoplankton cell Result for Marine Water Sample

S. No.	Location Code	Chlorophyll-a (mg/m^3)	Pheophytin (mg/m^3)	Cell count (Unit/L)
1.	M1	0.72	0.18	180
2.	M2	0.65	0.21	210

Table 3.27 Benthos Detail

Systematic Group	Results
Polychaetes	+
Mysides	-
Ostracodes	+
Isopodes	+
Amphipodes	+
Brachyurans	+
Insects	+
Gastropodes	-
Pelecypodes	-
Copepode	+
Fishlarvae	+

Note: + denotes present and – denotes absent

Dominant groups are Polychaetes, Ostracodes and Brachyurans.

Table 3.28 Sediment Quality Analysis

Sampling Location	Sediment Texture class	Sand (%)	Clay (%)	Silt (%)	Total Phosphorous mg/kg	Cr mg/kg	Mn mg/kg	Fe mg/kg	Zn mg/kg	Cu mg/kg	Organic Carbon %	Total Nitrogen mg/kg
Sd	Sandy clay	48.2	35.6	16.2	90	7.5	13.2	694	28	12	0.7	162

3.12.11 Summary of Marine Water Quality

- Temperature was found in the range of 24.5 to 25.0°C.
- The pH was found in the rage of 7.85 to 8.02.
- Salinity was found in the range of 31.0 to 32.2 ppt.
- Total Phosphorous was found in the range of 1.2 to 1.8 mg/L.
- TSS was found in the range of 456 to 402 mg/L.
- Oil & Grease was found below detection limit i.e. almost nil.
- DO was found in the range of 5.1 to 5.4 mg/L.
- BOD was found below detection limit.

3.12.12 Interpretation of Marine Water Quality Data

During the analysis it was found that temperature of the marine water was below the ambient temperature it indicates that there is no exothermic reactions take place. pH of the water sample for different locations was found near 8.0. Some marine organism can survive at the DO level of >4 mg/L and certain microorganism can survive up to DO level 0.2mg/L. During testing it was found that DO of the marine sample was >5 mg/L. Based on the test results it is interpreted that the water quality of marine is good and suitable for the survival of fishes and other aquatic life. High DO and less BOD indicate that contamination of organic matter in marine water body is not more than its self-purification capacity and probability of organic matter in the sample is almost negligible.

3.13 ECOLOGY AND BIODIVERSITY

Mainly two types of Vegetation cover are on the earth surface. One is self-growing and another is cultivated. Plants are renewable resource and useful to living organism in many ways. It is therefore the role of man in manipulating and changing vegetation population. Due to lack of awareness deforestation is occurring which in turn is responsible for imbalance of ecosystem. The main objective of the ecological survey is aimed to find out baseline status of flora and fauna of the study region. An ecological survey of the study area was conducted particularly with reference to listing of species and assessment of the existing baseline ecological (terrestrial and marine ecosystem) conditions in the study area.

Methodology Adopted for the Study of Flora and Fauna

The EB surveys have been conducted as per our QMS Quality Procedure for Ecology and Biodiversity for conducting ecology and biodiversity study.
Core Zone: Projects site and 3 km radii w.r.t. project site.
Buffer Zone: 10 km radii w.r.t. project site.
Study Period: 1st Oct 2018 to 31st Dec 2018

Floral Diversity of the Study Area

The objective of this floral inventory of the study area is to provide necessary information on floristic structure in the study area for formulating effective management and conservation measures. The climatic, edaphic and biotic variations with their complex interrelationship and composition of species, which are adapted to these variations, have resulted in different vegetation cover, characteristic of each region (Ohasi, 1975). The tree species, herbs, shrubs, climbers and major crops, were documented during this base line study.

Table 3.29: List of Trees in the Study area

S. No.	Family and Scientific Name	Vernacular Name
1.	**Fabaceae**	
1/1	*Acacia auriculiformis*	Bengali Baval
2/2	*Acacia nilotica*	Desi Baval
3/3	*Albizzia odoratissima*	Kalo Siras
4/4	*Albizzia procera*	Killai (kelvo)
5/5	*Cassia fistula*	Garmalo
6/6	*Dalbergia sissoo*	Sissoo
7/7	*Pithecellobium dulce*	Mithi Amli (Goras Amli)
8/8	*Pongomia pinnata*	Karanj
9/9	*Prosopis juliflora*	Gando Baval
10/10	*Tamarindus indica*	Amli
2.	**Simaroubaceae**	
11/1	*Ailanthas excels*	Ardusa
3.	**Cornaceae**	
12/1	*Alangium salvifolium*	Ankol
4.	**Meliaceae**	
13/1	*Azadirachta indica*	Limdo

5.	**Leguminosae**	
14/1	*Bauhinia purpurea*	Kachnar
6.	**Casuarinaceae**	
15/1	*Casuarina equisetifolia*	Sharu
7.	**Boraginaceae**	
16/1	*Cordia gharaf*	Gundi
8.	**Myrtaceae**	
17/1	*Eucalyptus species*	Nilgiri
18/4	*Ficus glomerata*	Umero
19/5	*Ficus religiosa*	Pipdo
20/6	*Morus alba*	Shetur
9.	**Arecaceae**	
21/1	*Phoenix sylvestris*	Khajuri

Table 3.30: List of Shrub in the Study area

S. No.	Family and Scientific Name	Vernacular Name
1.	**Rosaceae**	
1/1	*Rosa damascena*	Rose
2.	**Apocynaceae**	
2/1	*Calotropis procera*	Akdo
3/2	*Carissa conjesta*	Karmada
4/3	*Nerium indicum*	Karen
3.	**Rutaceae**	
5/1	*Cirtus limon*	Limbu
4.	**Fabaceae**	
6/1	*Clerodendro nincerne*	Vilayati Mendi
7/2	*Tephrosia purpurea*	Sartankho
5.	**Solanaceae**	
8/1	*Datura metel*	Dhanturo
6.	**Loranthacea**	
9/1	*Dendrophthoe falcate*	Vando
7.	**Malvaceae**	
10/1	*Hibiscus rosa-sinensis*	Jasud
11/2	*Thespesia lampas*	Paras Piplo
8.	**Lythraceae**	
12/1	*Lawsonia inermis*	Mendi
9.	**Oleaceae**	
13/1	*Nyctanthus arbortristis*	Parijatak

Table 3.31: List of Herbs in the Study Area

S. No.	Family and Scientific Name	Vernacular Name
1.	**Papaveraceae**	
1/1	*Argemone mexicana*	Darudi
2.	**Amaranthaceae**	
2/1	*Aerva sanguinolenta*	Karadia
3/2	*Achyranthes aspera*	Anghedi
3.	**Apocynaceae**	
4/1	*Catharanthus roseus*	Barmasi
4.	**Solanaceae**	
5/1	*Capsicum annum*	Marchi
6/2	*Datura metel*	Ganthovalo Dhanturo
5.	**Apiaceae**	
7/1	*Centella asiatica*	Bhrami
6.	**Malvaceae**	

8/1	*Hibiscus lobatus*	Tali
7.	**Convolvulaceae**	
9/1	*Ipomoea aquatic Forsk*	Mali Ni Bhaji
8.	**Fabaceae**	
10/1	*Trigonella foenum-graecum*	Methi
9.	**Musaceae**	
11/1	*Musa paradisiacal*	Kela
10.	**Lamiaceae**	
12/1	*Ocimum sanctum*	Tulsi
11.	**Phyllanthaceae**	
13/1	*Phyllanthus fraternus*	Bhonya Amli

Table 3.32: List of Climbers in the Study Area

S. No.	Family and Scientific Name	Vernacular Name
1.	**Vitaceae**	
1/1	*Ampelocissus latfolia*	Jungli
2.	**Nyctaginaceae**	
2/1	*Bougainvillea spectabilis*	Bougainvelia
3.	**Cucurbitaceae**	
3/1	*Cucurbita maxima*	Kolu
4.	**Menispermaceae**	
4/1	*Tinospora cordifolia*	Gulvel

Table 3.33: List of Mammals in the Study Area

S. No.	Scientific Name	Common Name	Schedule as per WPA 1972
1.	*Rattus rattus*	Rat	Schedule V
2.	*Mus musculus*	Mouse	Schedule V
3.	*Chiroptera*	Bat	Schedule V

Table 3.34: List of Birds in the Study Area

S. No.	*Scientific Name*	Common Name	Local Name	Schedule and Status	Mig. Status
1.	*Ardeola grayii*	Indian pond heron	Kani Bagli	Schedule IV	R
2.	*Bubulcus ibis*	Cattle egret	Baglo	Schedule IV	R
3.	*Egretta garzetta*	Little egret	Dhodo Baglo	Schedule IV	R
4.	*Phalacrocorax fuscicollis*	Indian cormorant	Pani Kagdo	Schedule IV	R
5.	*Pseudibis papillosa*	Black ibis	-	Schedule IV	R
6.	*Elanus caeruleus*	Blackwinged kite	-	LC	R
7.	*Vanellus indicus*	Red-wattled lapwing	Titodi	Schedule IV	R
8.	*Vanellus malabaricus*	Yellow-wattled lapwing	Titodi	Schedule IV	R
9.	*Charadrius dubius*	Little ringed plover	Titodi	Schedule IV	R
10.	*Tringa ochropus*	Green sandpiper	Leelitutvari	LC	R
11.	*Himantopus himantopus*	Blackwinged stilt	-	LC	R

12.	*Sterna aurantia*	Indian river tern	Kenchi Punch	LC	R
13.	*Columba livia*	Blue rock pigeon	Parevun	Schedule IV	R
14.	*Streptopelia decaocto*	Indian ring dove	Dhol	LC	R
15.	*Streptopelia chinensis*	Spotted dove	Vanaholi	LC	R
16.	*Psittacula krameri*	Rose ringed parakeet	Sudo, Popat	LC	R
17.	*Psittacula cyanocephala*	Blossom headed parakeet	Tui, Popat	Not listed	R
18.	*Eudynamys scolopacea*	Koel	Koyal	LC	R
19.	*Caprimulgus asiaticus*	Common Indian nightjar	Deshi chhapo	LC	R
20.	*Alcedo atthis*	Common kingfisher	Lagothi	Schedule IV	R
21.	*Halcyon smyrnensis*	White breasted kingfisher	Kalkaliyo	Schedule IV	R
22.	*Coracias benghalensis*	Indian roller	Nilkant	Schedule IV	R
23.	*Hirundo daurica*	Redrumped swallow	Kenchiababil	LC	R
24.	*Dicrurus adsimilis*	Black drongo	Kalokoshi	Schedule IV	R
25.	*Sturnus pagodarum*	Brahminy myna	-	Schedule IV	R
26.	*Acridotheres tristis*	Indian myna	Kabar	Schedule IV	R
27.	*Pycnonotus cafer*	Red vented bulbul	Bulbul	Schedule IV	R
28.	*Turdoides caudatus*	Common babbler	Sheradi	Schedule IV	R
29.	*Megalurus palustris*	Striated marsh warbler	-	LC	R
30.	*Copsychus saularis*	Magpie robin	Daiyad	LC	R
31.	*Saxicoloides fulicata*	Indian robin	Deoli	LC	R
32.	*Parusx anthogenys*	Yellow cheeked tit	-	Schedule IV	R
33.	*Motacilla flava melanogrisea*	Yellow wagtail	Matanopilakya	LC	R
34.	*Nectarinia asiatica*	Purple sunbird	Phul chakli	LC	R
35.	*Aethopyga siparaja*	Yellow backed sunbird	-	LC	R
36.	*Ploceus philippinus*	Baya	Sughari	Schedule IV	R

Table 3.35: List of Reptiles in the Study Area

S. No.	Scientific Name	Common Name	Schedule as per WPA 1972
1.	*Calotes versicolor*	Common garden lizard	Not listed
2.	*Calotes rouxi*	Roux's forest lizard	Not listed
3.	*Sitana ponticeriana*	Fan-throated lizard	Not listed
4.	*Chameleon zeylanicus*	Indian chameleon	Not listed

Source: Primary Survey and Forest Department, Surat District.

Table 3.36: Details of Marine Fishes

S. No.	Species	S. No.	Species
1.	White Pomfret	6.	Levta
2.	Black Pomfret	7.	Mullet
3.	Bombay Duck	8.	Ribbon Fish
4.	Thread Fin	9.	Cat Fish
5.	Leather Jacket	10.	Crab

Source: Primary Survey and Fisheries Department, Surat District.

Interpretation of Ecology and Biodiversity

Dominant flora of the study region is bangali baval, gando baval and desi babool. Area is not rich with floral diversity. Natural vegetation of study area is in degraded condition and wild mammal's density is also very low. There is no threatened or endangered species in study region.

3.14 SOCIO-ECONOMIC ENVIRONMENT

The rapid industrialization of the study region has greatly influenced the socio economic and health environment in the villages. Increasing industrialization and population density has increased pressure on resources, civic amenities and public infrastructure. Economic conditions of the local people have improved with the increasing industrialization and greater employment opportunities. The socio-economic environment includes demography structure, population density, literacy level, and employment levels. The data establish a baseline for the prediction of likely impacts of the proposed activity on the socio-economic environment. Secondary information pertaining to the study area villages was collected from Government Agencies, Census data for the year 2011, and statistical abstracts to compile the socio-economic data.

3.14.1 Socio-Economic Survey Methodology

Socio-economic survey tools provide a means of improving understanding of local resource management systems, resource use and the relative importance of resources for households and villages. They can also be used to elicit insights on interaction with government decision-making systems, community perceptions of trends and priority issues, and community-based institutions and their role in the sustainable use and conservation of natural resources.

Data Collection: Following steps were considered for the collection of primary data:

1. Identification of Study Area: The study area was identified before carrying out the survey. All the related information which could affect the prosperity, development & literacy were also collected.

2. Site Visit: Location wise survey plan & format for data collection were prepared for site visit. Data regarding Land Characteristics, Population, Literacy, Workers and Amenities were collected during the survey.

3. Analysis of Data: The data collected by primary survey were verified with secondary data collected from sources like Government Agencies, Census data for the year 2011, and statistical abstracts.

3.14.2 Demography

Almost all villages in the study area are experiencing a rapid growth of population due to industrialization. The total population of study region is summarized in table below.

3.14.3 Population Density

Population density in the study area is given in the table below:

Table 3.37 Details of Population in Study Area

Villages	No. of Household	Total Population	Total area (sq.km)	Population density Person/sq.km

Tena	470	1976	7.57	261
Damka	1331	5604	10.51	533
Mora (CT)	11115	2809	13924	253
Rajgari	318	1300	3.51	370
Vansva	584	2498	4.97	503
Bhatlai	1144	4066	1.93	2107
Sunvali	975	4165	13.05	319
Hajira (INA)	1775	5562	10	556
Kavas (OG) WARD NO.-0102	1602	6500	10	650
Limla (CT)	926	3683	10	368
Bhatpor (OG) WARD NO.-0103	792	3449	10	345
Total	21032	41612	-	-

3.14.4 Sex Ratio

The sex ratio i.e. the number of females per 1000 males is in range of 0 – 1021 with lowest in Bhatlai and highest in Bhatlai village. The Sex ratio i.e. the number of females per 1000 males indirectly reveals certain sociological aspect in relation to female births, infant mortality among female children. Details of the same are tabulated in table below.

Table 3.38 Details of Sex Ratio in Study Area

Zone of Study	Male Population	Female Population	Total Population	Sex Ratio (Female to 1000 Male)
Tena	1075	901	1976	838
Damka	3118	2486	5604	797
Mora CT	11115	2809	13924	253
Rajgari	716	584	1300	816
Sunvali	2308	1857	4165	805
Vansva	1270	1228	2498	967
Bhatlai	2786	1280	4066	459
Limla (CT)	1922	1761	3683	916
Bhatpor (OG) WARD NO.-0103	1855	1594	3449	859
Kavas (OG) WARD NO.-0102	4108	2392	6500	582
Hajira (INA)	3375	2187	5562	648
Total	**33648**	**19079**	**52727**	**7940**

3.14.5 Literacy Rate

Table 3.39 Details of Literacy Rate in Study Area

Zone of Study	Literate			Literacy (%)		
	Male	Female	Total	Male	Female	Total
Tena	895	667	1562	57	43	79
Damka	2604	1890	4494	58	42	80
Mora CT	10271	2210	12481	92.41	78.68	89.64
Rajgari	625	458	1083	58	42	83

Sunvali	1966	1365	3331	59	41	80
Vansva	1070	930	2000	54	46	80
Bhatlai	2458	898	3356	73	27	83
Limla (CT)	1805	1620	3425	53	47	93
Bhatpor (OG) WARD NO.-0103	1421	1120	2541	56	44	74
Kavas (OG) WARD NO.-0102	3385	1638	5023	67	33	77
Hajira (INA)	2774	1643	4417	63	37	79
Total	**29274**	**14439**	**43713**	**60**	**40**	**80**

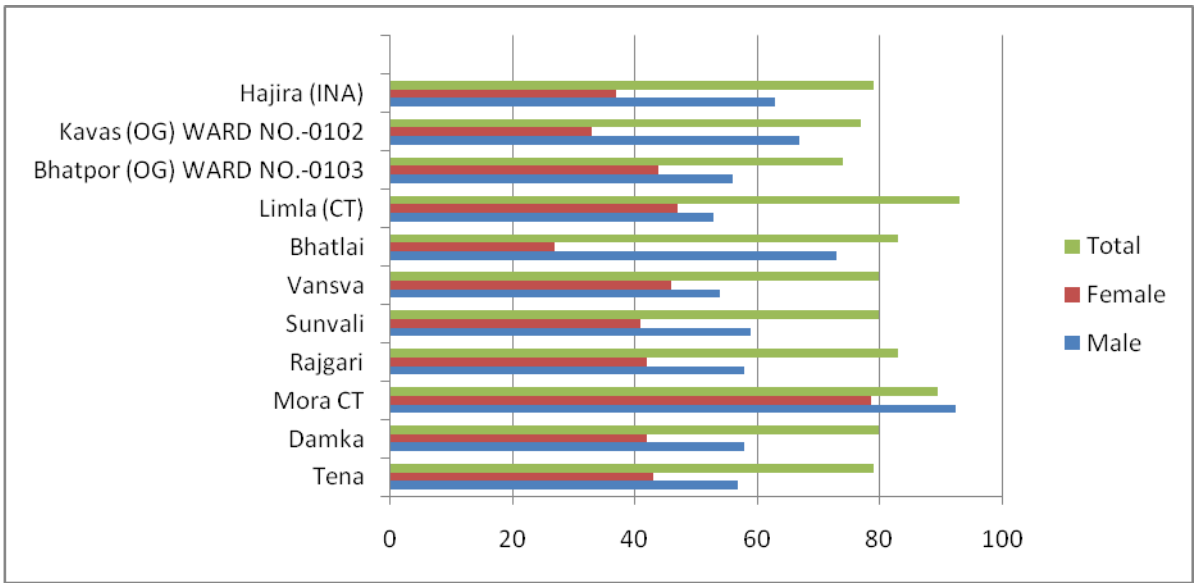


Figure 3.17 Literacy Rate of the Study Area

Among all the villages of study area Limla (CT) is having high literacy rate i.e. 93%. There is not much difference between female literacy rate and male literacy rate in the study region. Female literacy rate is an important indicator for social change.

3.14.6 Economic Aspects

Economic aspects of the study area include the economic structure of the people of the surrounding area. It can be predicted that economic structure of the study area will be improved with time, because it consists large industrial estate and hence there are more employment opportunities.
According to working status, whole population of the study area is divided into,

- Marginal workers
- Non workers
- Main workers

Census department has defined 10 categories of workers in Main workers. It consists of cultivators, agricultural, labourer those engaged in livestock, forestry, fishing, mining and quarrying, manufacturing, processing and repairs in household industries and other services. Workers engaged in the work for a period less than 6 month during the reference year falls under marginal workers. Workers engaged in unpaid household duties e.g. students, retired person, dependents etc. falls under non-workers. Detail of occupational structure is shown in table below.

Table 3.40 Details of Occupational Structure

Zone of Study	Non-Workers (%)	Total Workers	
		Main Workers (%)	Marginal Workers (%)
Tena	61	37	2

Damka	60	39	1
Mora CT	27	69	4
Rajgari	51	47	2
Sunvali	52	43	5
Vansva	63	35	2
Bhatlai	42	55	3
Limla (CT)	66	33	1
Bhatpor (OG) WARD NO.-0103	56	40	4
Kavas (OG) WARD NO.-0102	51	43	6
Hajira (INA)	49	49	2
Total	**54**	**42**	**4**

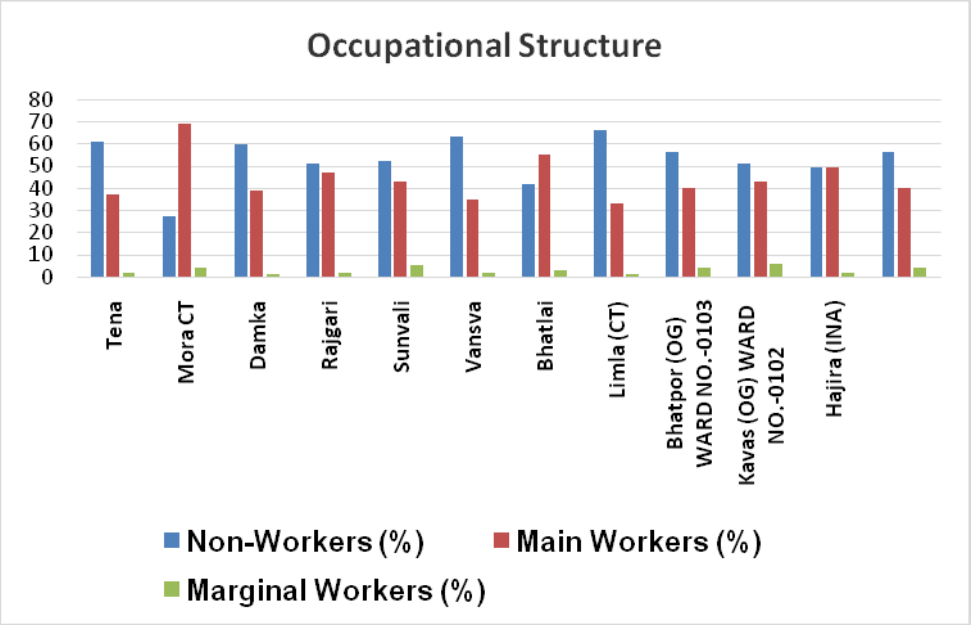


Figure 3.18: Occupational Structure of the study area

Almost all the villages have more than 50% people as non-workers. Rapid industrialization in the last two decades has resulted in significant changes in the occupational profile of the local people. There is an overall trend among the youth to opt for employment in service sector and move away from traditional occupation.

3.14.7 Infrastructures Resource base

The infrastructure resources base of the eleven study areas with reference to education, medical facility, water supply, post and telegraph, transportation, communication facility, power supply and existence of nearest town etc. according to the Village Directory Census CD 2011 of Gujarat State.
The significant features of these important parameters for each study area are discussed as follows:

Education

As per 2011 village directory record, almost all villages having education facility in the form of primary schools, and middle school are as follows.

Table 3.41 Infrastructures Resource Base

Private Pre - Primary School (Nursery/LKG/UKG) (Status A(1)/NA(2))	Govt. Primary School (Numbers)	Private Primary School (Numbers)	Govt. Secondary School (Numbers)	Govt. Senior Secondary School (Numbers)	Private Senior Secondary School (Numbers)
-	2	-	2	1	-

Medical/Primary Health Care

Medical facilities in terms of community health workers are available in some of the villages. Primary health center and primary health sub centers are available in few villages.

Primary Health Centre (Numbers)	Primary Health Sub Centre (Numbers)	Maternity And Child Welfare Centre (Numbers)	Veterinary Hospital (Numbers)
1	1	-	-

Drinking Water

The water supply in the area is through dug wells, hand pumps, taps and other allied sources.

Tap Water Untreated	Covered Well	Uncovered Well	Hand Pump	Tube Wells/Borehole	River/Canal
4	1	6	2	4	2

Drainage and Sanitation Facilities

Drainage and sanitation facilities were not adequate in the study area. Mostly Open drainage, and open kuccha drainage observed in the village.

Open Drainage	No Drainage	Open Pucca Drainage Uncovered	Open Kuccha Drainage
5	4	2	4

Communication

Communication facility is fairly good in this region. Most of villages having telephone connectivity and having post office.

Sub Post Office	Post And Telegraph Office	Telephone (landlines)	Public Call Office /Mobile (PCO)
2	0	6	4

Transportation

A well planned and efficient network of transport is an essential component for a developing country. In the absence of efficient network of transport, a State‘s economy would suffer from major grid lock in terms of overall growth potential of that area. In village public bus facility was availed and other facilities were private bus.

Public Bus Service	Railway Station	Auto/Modified Autos	Vans	Tractors	Carts Drivens by Animals
6	-	4	-	DNA	DNA

DNA= Data not available

Road Approach Facilities

Road condition facility was found in village from following.

Black Topped (pucca) Road	Gravel (kuchha) Roads	Water Bounded Macadam	All Weather Road	Foothpath
6	6	2	-	6

Bank Facilities

Banking and credit society facility was found in village. Self-help group activities were performed by the women groups

Commercial Bank	Cooperative Bank	Agricultural Credit Societies	Self - Help Group (SHG)
1	0	0	6

Power Supply

Almost all villages are electrified in the region and electricity is available for both domestic and agriculture.

Power Supply For Domestic Use	Power Supply For Agriculture Use	Power Supply For Commercial Use	Power Supply For All Users
6	6	6	6

Source: DCHB 2011, Gujarat

3.14.8 Interpretation of Socio Economic Data

During the primary survey it was observed that almost pakka road facility is available in all villages within 10 km radius. Literacy rate of the study region is from 72% to 93%. On the basis of survey for literacy rate data it is interpreted that there is need to promote education among more and more people. Almost all the villages have more than 50% people as non-workers. It indicates that the problem of unemployment can be solved by providing proper training and education. There is also need to establish more industries so that maximum number of employment can be generated.

3.15 SUMMARY

Ambient air quality monitoring						
S.No.	**Criteria Pollutants**	**Unit**	**Maximum Value**	**Minimum Value**	**98th percentile value**	**Prescribed standard**
1.	PM10	µg/m3	86.4	61.8	84.6	100
2.	PM2.5	µg/m3	47.6	31.6	46.4	60
3.	SO2	µg/m3	15.9	9.0	15.2	80
4.	NOX	µg/m3	22.8	13.1	22.0	80
Based on comparison study of results with NAAQS for tested parameters, ambient air quality of studied locations can be considered good as all the results of tested parameters are well within the limit. Looking towards the increasing pattern of PM10 and PM2.5 concentration in ambient air, it is suggested that proper air pollution control measures must be adopted by the industry. This interpretation relate to the results found during the monitoring for particular location and date of monitoring.						

Noise Monitoring				
S.No.	**Parameter**	**Unit**	**Maximum Value**	**Minimum Value**
1.	Leq (Day)	dB(a)	77.4	49.6
2.	Leq(Night)	db(a)	72.4	42.1
Based on noise level data obtained during the survey for residential area and industrial area, it is interpreted that noise levels are within the standard norms prescribed by MoEF&CC. Looking towards the increase in noise generating sources it is suggested that there is need to apply noise reducing devices at noise generating sources and generate public awareness.				

Soil Quality and Characteristics				
S.No.	**Parameter**	**Unit**	**Maximum Value**	**Minimum Value**
1.	pH	-	7.88	7.62
2.	electrical Conductivity	dS/m	1.4	0.9
3.	Exchangeable Sodium	meq/100gm	6.2	5.1

4.	Exchangeable Potassium	meq/100gm	1.4	1.0
5.	Phosphorous	kg/ha	414.4	219.5
6.	Total Nitrogen	%	0.073	0.049

Ground water

S.No.	Parameter	Unit	Maximum Value	Minimum Value	Desirable Limit	Permissible Limit
1.	pH	-	8.41	7.30	6.5-8.5	No Relaxation
2.	tds	mg/L	6722	806	500	2000
3.	tss	mg/L	<2	<2	-	-
4.	Total hardness	mg/L	1500	314	200	600
5.	Chloride	mg/L	3194	153	250	1000
6.	Total Alkalinity	mg/L	756	400	200	600
7.	Fluoride	mg/L	0.7	0.5	1.0	1.5
8.	Iron	mg/L	0.66	0.04	0.3	No Relaxation

Based on comparison study of results of tested parameters with drinking water norms, it is interpreted that water qualities of the studied locations can be considered portable/drinkable as results are within the drinking water norms except Hazira and Mora village. Iron content was found 0.66 mg/L in the ground water sample collected from Hazira village, which is more than prescribed limit and in case of the ground water sample collected from Mora village TDS, Hardness, Chloride and Alkalinity value was found higher side. Reason of high TDS in ground water sample in Mora village may be due to ingress of salinity as sea is very near to this village. To save the ground water from contamination and improving the quality, rainwater harvesting and ground water recharging may be helpful.

Surface water

S. No.	Parameter	Unit	Maximum Value	Minimum Value	Desirable Limit	Permissible Limit
1.	ph	-	8.36	6.85	6.5-8.5	No Relaxation
2.	tds	mg/L	26863	1037	500	2000
3.	DO	mg/L	5.0	4.6	-	-
4.	COD	mg/L	24	12	-	-
5.	BOD	mg/L	8	4	-	-

TDS value was found more than the drinking water norms in surface water sample of Sunvali, Rajgari, Hazira and Tapi River. The reason of high TDS is salinity ingress from sea. Based on test result data comparison study, it is interpreted that surface water cannot be directly used in drinking as surface water of the studied locations are contaminated with organic matter and microbes. Surface water of village Sunvali, Mora and Damka can be used in irrigation as well as in other domestic purposes except drinking and bathing.

Marine water

During the analysis it was found that temperature of the marine water was below the ambient temperature it indicates that there is no exothermic reactions take place. pH of the water sample for different locations was found near 8.0. Some marine organism can survive at the

DO level of >4 mg/L and certain microorganism can survive up to DO level 0.2mg/L. During testing it was found that DO of the marine sample was >5 mg/L. Based on the test results it is interpreted that the water quality of marine is good and suitable for the survival of fishes and other aquatic life. High DO and less BOD indicate that contamination of organic matter in marine water body is not more than its self-purification capacity and probability of organic matter in the sample is almost negligible.
Ecology and Biodiversity
Dominant flora of the study region is bangali baval, gando baval and desi babool. Area is not rich with floral diversity. Natural vegetation of study area is in degraded condition and wild mammal‘s density is also very low. There is no threatened or endangered species in study region.
Socio economic
During the primary survey it was observed that almost pakka road facility is available in all villages within 10 km radius. Literacy rate of the study region is from 72% to 93%. On the basis of survey for literacy rate data it is interpreted that there is need to promote education among more and more people. Almost all the villages have more than 50% people as non-workers. It indicates that the problem of unemployment can be solved by providing proper training and education. There is also need to establish more industries so that maximum number of employment can be generated.

4. IMPACT PREDICTION AND MITIGATION MEASURES

4.1 GENERAL

This chapter provides the information on anticipated impact due the proposed activities and its mitigation measures to negate the impact on environmental as well as social life.

4.2 ANTICIPATED ENVIRONMENTAL IMPACTS DURING CONSTRUCTION PHASE

The construction phase involves the activities like erection of civil units, new equipment and machinery installation, green belt development *etc.* Different components of environment are likely to be effected by the activities. But the impacts will be marginal and for short term only. The green belt (33%) development will have positive impacts.

4.2.1 Matrix Representation

Table 4.1 Impact Identification Matrix (Construction Phase)

Activities	Environmental Attributes										
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Occupational Hazardous	Ecology and Biodiversity	Socio Economic
Transportation and Movement/Operation of materials & machinery	✔	-	✔	✔	-	-	-	-	✔	✔	✔
Storage and Handling of Construction Material	✔	–	✔	✔	-	-	-	-	✔	-	-
Civil Construction Activity	✔	✔	✔	✔	✔	-	✔	✔	✔	-	✔
Generation of Construction waste	✔	-	✔	–	-	-	-	✔	–	-	–
Waste water/Sewage disposal	–	✔	✔	–	–	-	–	✔	–	✔	–
Employment	–	✔	–	-	-	-		✔	-	–	✔
Green belt Development	✔	✔	✔	✔	✔	✔	✔	-	-	✔	✔

Table 4.2: Severity Criteria for Magnitude of Impacts

S. No.	Category	Description of category	Impact	
			Adverse	Beneficial
1.	No impact	-	0	0
2.	No appreciable impact	Short term reversible	-1	1
3.	Significant impact	Long term reversible	-2	2
4.	Major impact	Irreversible but of lesser extent	-3	3
5.	High impact	Irreversible but of medium extent	-4	4
6.	Permanent impact	Severe irreversible impact	-5	5

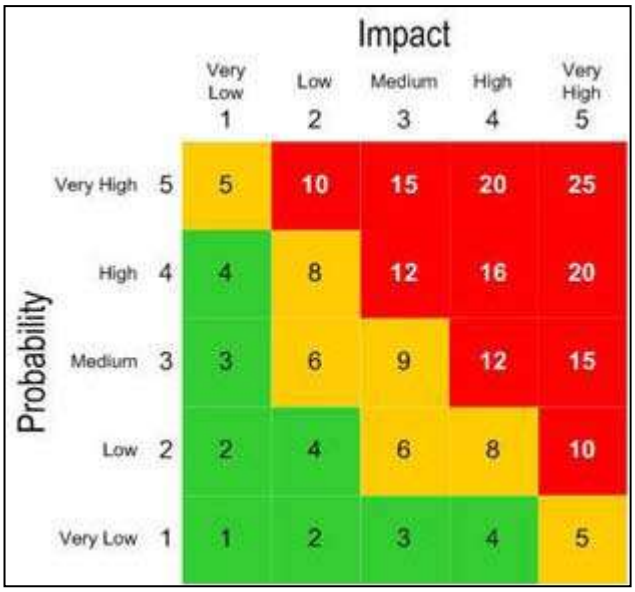


Figure 4.1 Probability vs. Impact Chart

Table 4.3: Cumulative Score range for beneficial and adverse impacts

S. No	Total score	Outcome
1.	+ve / -ve	Beneficial impact / adverse impact
2.	0-150	No appreciable Beneficial impact / adverse impact
3.`	151-300	Appreciable but reversible adverse impact-mitigation measures are needed
4.	301-450	Significant adverse impacts: most of the impacts are reversible. Mitigation measures are crucial.
5.	451-600	Major adverse impacts; most of the impacts are reversible. Alternative site selection to be considered.
6.	>600	Permanent irreversible impact; alternatives to the project need to be explored

Table 4.4 Environmental Impact Matrix without Mitigation Measures (Construction Phase)

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Hazard	Ecology and Biodiversity	Socio Economic	Total
Transportation and Movement/Operation of materials & machinery	-12	-	-4	-16	-	-	-	-	-16	-4	9	-43
Storage and Handl ing of C onstruction Material	-6	-	-4	-4	-	-	-	-	-4	-	-	-18
Civil C onstruction Activity	-12	-12	-12	-12	-6	-	-	-9	-6	-	9	-60
Disposal of construction Debris	-4	-	-6	-	-	-	-	-6	-	-	-	-16
Waste w ater/Sewage disposal	-	-6	-4	-	-	-	-	-2	-	-4	-	-16
Employment/Manpower	-	-12	-	-	-	-	-	-9	-	-	9	-12
Green belt Development	9	-4	6	9	6	-2	-2	-	-	12	2	36
Cumulative score	-25	-34	-24	-23	0	-2	-2	-26	-26	4	29	-129

Total cumulative score for various environmental parameters without mitigation measures is -129 which means no appreciable adverse impact during construction phase will be envisaged.

4.2.2 Air Environment

Table 4.5: Impact and Mitigation Measures on Air Environment

Project Activity	Aspect and Probable Impact	Mitigation Measures
Transportation an d movement/operation of machineries	• Fugitive Dust Emissions due to vehicle Movement. • Exhaust emissions from vehicles and equipment deployed during the construction phase is also likely to result in marginal increase in the levels of SO_2, NOx and PM which leads to respiratory ailments like asthama and other dust related problems to the human health.	• Regular water sprinkling will be done to avoid dust generation from transportation. • Trucks used for transportation of construction materials shall be covered with tarpaulin sheet to avoid dust dispersion at site. • Only valid PUC vehicle will be used for the transportation of materials and equipment. • Construction site will be barricaded with sheet to avoid dust emission due to wind from project site.
Civil C onstruction Activities	• Increase of dust and airborne particulates. • Dust generation during material handling. • Air emission during construction activities.	• Regular water sprinkling will be done to control dust emission. • Personnel Protective Equipment for construction workers (PPEs) will be provided to the construction workers. Hence there will be no significant impacts on their health due to the dust particle. • Barrier will be provided around the project site
Disposal of Construction Debri s and domestic garbage.	The construction debris/construction waste (200 Tons) will be generated which have negative impact.	The construction debris and construction waste will be utilized in internal road and land leveling.

Project Activity	Aspect and Probable Impact	Mitigation Measures
Wastewater-sewage disposal	• Odour generation due to sewage disposal.	• Sanitation facilities/Mobile toilet will be made available for construction workers.
Greenbelt Development	• It will act natural barrier for dust and noise emission.	• More than 33% will be utilize for Greenbelt development and 4125 tress will be planted.

4.2.3 Water Environment

Table 4.6: Impact and Mitigation Measures on Water Environment

Project Activity	Aspect and Probable Impact	Mitigation Measures
Civil Construction Activity	• The water will be sourced from the local body/Irrigation department (surface); hence no impact on ground water quality.	• Regular monitoring will be done to check the incoming water supply for construction purpose. The ground water will not be used.
Storage and Ha ndling of Construction material	• Run-off from storage areas of construction material.	• Proper storm water drainage system will be made available for rain.
Wastewater/ Se wage Disposal	• Untreated sewage from construction area may have negative impact.	• Sanitation facility will be made available for construction workers.

3.15.1 Soil Environment

Table 4.7: Impact and Mitigation Measures on Soil Environment

Project Activity	Aspect and Probable Impact	Mitigation Measures
Transportation and movement/operation of machineries	• Compaction of soil due to vehicular movement. • Soil degradation due to spillage/leakage of oil and grease from vehicles and machineries.	• RCC roads and pavements of working area for prevention of oil & grease getting mixed with soil.
Civil construction activities	• Generated Construction waste will contaminate the soil quality. • Spillage of oil during construction activities. • Soil erosion due to construction and runoff during monsoon season. • Loss of Top fertile soil.	• Construction waste will be categorized in to recyclable and non-recyclable and stored separately. • Designated construction area for prevention of oil & grease getting mixed with soil. • A well designed storm water drainage network and sewerage network will be provided for the proposed project for carry away of rainwater runoff.
Storage and handling of construction material	• Soil contamination due to handling and storage of construction material. • Oil spillage can affect physical and chemical properties of the soils.	• The construction material & diesel /oil to be used for various construction activities shall be stored in designated storage yards to reduce the spills into unwarranted areas. • Good practices of storage and material handling will be carried out. • Spillage control will be carried out by disposing the affected soil at adequate place
Transportation and Disposal of Construction Debris	• Contamination of the soils of surrounding area due to construction materials such as	• The construction wastes shall be utilized for PCC works, road construction and other filling

Project Activity	Aspect and Probable Impact	Mitigation Measures
	cement, sand, oils, etc.	requirement etc. • Construction waste will be categorized in to recyclable and non-recyclable and stored separately.
Wastewater-sewage Disposal	• Contamination of soil due to discharge of waste water.	• No wastewater from construction site will be allowed to disposed-off on land. • Adequate sanitation facilities for labors will be provided. • Regular monitoring/ checking/ inspection of the sewage network system.
Green belt Development	• The improvement in soil texture due to binding of top soil materials and root structure.	• The greenbelt (33%) will be developed and this will control the soil erosion due to wind and runoff water, Regular maintenance of greenbelt will be done.

4.2.4 Noise Environment

Table 4.8: Impact and Mitigation Measures on Noise Environment

Project Activity	Aspect and Probable Impact	Mitigation Measures
Transportation and movement/operation of machineries **Civil Construction Activities** **Storage and handling of construction material**	• Continuous Noise pollution affects the human working efficiency. • Chances of hearing loss due to continue noise emission.	• Provision of ear muffs and ear plugs to prevent continuous noise exposure risk to laborers working on site. • Avoid high noise generating activity during night-time and their frequency to be minimized to avoid continuous noise exposure. • Tree plantation beside the road area will be carried out. • Traffic management plan within and outside the factory premises will be followed. • Unnecessary horn honking will be avoided and strictly prevented.
Green belt Development	• Reduction in noise waves to receptors serving as a noise barrier.	Development of greenbelt (33%) will create aesthetic view as well as act as a barrier for noise.

4.2.6Land Use/Land Cover/ Hydrology/Geology

The project will set up on industrial zone hence no land use will be changed, there will be changes in hydrology and geological structure of the area due to construction of building and other amenities.

3.15.2 Solid/Hazardous Waste

Table 4.9: Impact due to generation of Solid/ Hazardous Waste and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Civil Construction Activities	• The excavated earth material if stacked loosely may result into runoff during rainy season resulting in loss of top soil. The 200 tons construction debris will be generated from construction.	• Excavated earth shall be stored in stockpiles and covered with plastic/tarpaulin sheets or stored in closed room and reused for landscape development along the corridor. The construction wastes/debris shall be utilized for leveling of land etc.

Project Activity	Impact	Mitigation Measures
Transportation and Disposal of Construction Debris	Fuel leakage/ spillage used for construction equipment or vehicles may cause land contamination.	• Fuel leakage/spillage shall be mitigated by providing properly lined storage area.
Wastewater-sewage Disposal	• The wastewater generated from the domestic activities of construction workforce may cause land contamination.	• Proper sanitation and drinking water facilities shall be provided for construction workers. Sewage generated will be disposed through soak pit to avoid any adverse impacts on land.
Green Belt Development	• Plant shed out materials like leaves, roots, branches etc. from the environment for growth and other processes.	• Daily collection of municipal waste will be carried out and composting of this waste will used as manure for greenbelt.

4.2.7Risk & Hazards

Table 4.10: Risk and its Mitigation Measures

Project Activity	Aspect and Probable Impact	Mitigation Measures
Transportation and movement/operation of machineries **Civil Construction Activities** **Storage and handling of construction material**	• Chances of accident during transportation of material. • Fall from height, cut injury and fall injury due to construction activities.	All transportation within the main working will be carried out directly under the supervision and control of the management. The vehicles must be maintained in good repairs and checked thoroughly at least once a week by the competent person authorized for the purpose by the Management. Safe construction practices will be followed under supervisor‘s direction.

4.2.8Ecology and Biodiversity

Table 4.11: Impact and Mitigation Measures on Ecology and Biodiversity

Project Activity	Aspect and Probable Impact	Mitigation Measures
Transportation and movement/operation of machineries **Civil Structure**	• Construction works, construction machineries and equipment noise will create stress on avifauna and may disturb their activities.	Speed limit of vehicles will be maintained. • Loud horn in the vehicles will not be allowed. Acoustic -enclosure will be provided to construction machineries and equipment.
Greenbelt Development	• Greenbelt development may cause positive impacts on the flora by enhancement of green spaces.	• Efficient management of greenbelt and their conservation. • Regular watering and maintenance of the greenbelt for sustained plant growth.

4.2.9Socio-Economic

Table 4.12: Impact and Mitigation Measures on Socio Economic conditions

Potential Aspects	Aspect and Probable Impact	Mitigation Measures

Transportation and movement/operation of machineries	• The construction phase will generate employment opportunity (500 Nos) of in the skilled as well as unskilled categories. Although the workforce requirement will be temporary in nature, it will be met from the local populace hence there will be positive impact. • Construction workers will require essential basic infrastructure facilities *viz*. safe drinking water, adequate sanitation, etc. will have temporary impact on the existing facilities.	Local agencies will be appointed for the transportation of materials and machinery.
Civil Construction Activities		Preference will be given to local labor in terms of providing employment for construction phase.
Employment		
Green belt Development		Construction wastes will be disposed-off adequately. Solid wastes/construction debris will be handled/disposed according to the C&D Rules, 2016.

Table 4.13 Environmental Impact Matrix with Mitigation Measures (Construction Phase)

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Hazards	Ecology and Biodiversity	Socio Economic	Total
Transportation and movement/operation of machineries	-2	-	-	-2	-	-	-	-	-2	-2	+9	+1
Storage and handling of construction material	-2	-	-	-	-	-	-	-	-	--	-	-2
Civil Construction Activities	-2	-4	-2	-2	-	-	-	-2	-2	-2	+9	-7
Disposal of Construction Debris	-	-	-2	-	-	-	-	-2	-2	-	-	-6
Wastewater-sewage Disposal	-	-2	-2	-	-	-	-	-	-2	-	-	-6
Employment Generation	-	-2	-	-	-	-	-	-	-	-	+9	+7
Greenbelt Development	+9	+4	+6	+9	+2	+2	-	-4	-	+12	+2	+43
Cumulative score	+3	-4	-	+5	+2	+2	-	-8	-8	+8	+29	+30

After taking mitigation measures as suggested, the score cumulative score of impact on environment after taking mitigation measures is +30 during construction phase which represent appreciable beneficial/adverse impact.

4.3 ANTICIPATED ENVIRONMENTAL IMPACTS DURING OPERATION PHASE

This phase of the project is important because it generates long-term impacts as the project implementation phase starts. The impacts during operation phase are anticipated as the commissioning of project require natural resources *viz.* fuel, energy, manpower, water, etc. Identification of impacts during operation phase is described - in sub-section 4.3.1.

4.3.1 Matrix Representation

The identification of impacts during operation phase is presented in the form of a matrix in table 4.16. The scores for various parameters and activities are presented in table below:

Table 4.14 Impact Identification Matrix (Operation Phase)

Activities	Environmental Attributes										
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk Hazardous	Ecology and Biodiversity	SE
Vehicle Movement	✔	-	-	✔	-	-	-	-	✔	✔	✔
Raw material handling, storage etc.	✔	✔	✔	✔	-	-	-	✔	✔	✔	✔
Process stage/Operation	✔	✔	✔	✔	-	-	-	✔	✔	✔	✔
Employment	-	✔	-	-	-	-	-	✔	-	-	✔
Green Belt Development	✔	✔	✔	–	–	✔	✔	–	-	✔	✔

Table 4.15 Environmental Impact Matrix without Mitigation (Operation Phase)

Activities		Environmental Attributes										
		Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Hazard	Ecology and Biodiversity	SE	Total
Vehicle Movement		-16	-	-	-16	-	-	-	-	-16	-16	-2	-66
Raw material handling, storage etc.		-25	-9	-9	-12	-	-	-	-16	-9	-9	+9	-80
Process stage/ operation	Fuel storage & processing	-25	-20	-6	-20	-	-	-	-20	-16	-16	-9	-132
	Combustion of fuel												
	Flue gas Cleaning												
	Grinding and Packing												
	Cooling system												
Employment		-	-6	-	-	-	-	-	-6	-	-	+9	-13
Green Belt Development		+16	-16	-4	+4	+6	-6	-6	-	-	+12	-	-3
Cumulative score		-41	-51	-19	-44	+6	-6	-6	-42	-41	-29	+7	-294

The cumulative scoring of impact occurred during plant operation is -294 which represent reversible adverse impact due to proposed activities, hence proper mitigation measures are required to address and implement during entire life of unit.

4.3.2 Air Environment

Impact Due to Transport: The sources likely to be affecting the pollutant concentrations in project area would be vehicular emission due to transportation of raw material and fuel. On account of various associated activities, there will be increased vehicular traffic on connecting roads. Generation of gaseous emissions is therefore, of primary concern. Mode of transportation of each incoming and outgoing material is presented in table below and for computation of traffic modeling studies frequency of vehicles has been calculated.

Table 4.16: Recommendations on Traffic Capacity as per IRC 2010

S.No.	Category of Road	Maximum PCU/hr	Dispatch Ratio (%)
1.	**National Highway 6**	3000	60
2.	**State Highway 186**	1250	40

Source: ***IRC:SP:37:2010***

Table-4.17: Incoming & Outgoing Transportation

Incoming Raw Material Transportation							
S.No	**Raw Material**		**Quantity TPA**	**Quantity TPD**	**Source**	**Mode of Transport**	**No. of Vehicles (Truck/day)**
1.	Clinker		2000000	6061	Captive	Sea	184
2.	Additives like Gypsum, Fly Ash, Slag				Purchase	Road	
	Fuel		60000	182	Purchase	Road	
Total No. of Trucks deployed / day will be							**184**
Outgoing Product Transportation							
S.No	**Product**	**Quantity Million TPA**	**Quantity TPA**	**Quantity TPD**	**Source**	**Mode of Transport**	**No. of Vehicles (Truck/day)**
1.	Cement	2.0	2000000	6061	Captive	Road/Sea	179
Total No. of Trucks deployed / day will be							**363**

Frequency of Vehicles:

Total Capacity (Fuel, Clinker, Fly ash)	40, 60,000 TPA
No. of working days	330
Transportation of incoming and outgoing material	12303 Tons/day
Working hours per day	24 hour (3 shifts)
Truck/Tanker Capacity	34 Tons
Frequency of trucks/day (91 No.x 4 trips/day x 2 (up/down)	363 x 2
Frequency of trucks deployed/hr	16
Increase in PCU/hr	16 x 3= 48

Table 4.18: Modified Traffic Scenario and LOS

S.No	Road	Increased PCUs	Modified V	C	Modified V/C Ratio	Modified V/C Ratio
1.	**National Highway 6**	48*60%= 29	1421+29= 1450	3000	0.48	C
2.	**State Highway 186**	48*40%= 19	743+19= 762	1250	0.61	D

Minimum impact on local transport as only 91 Nos. [4 trips/day x 2 (up/down)] Trucks will be required for transport of cement and raw material. The LOS value from the proposed project will be the almost

same as before *i.e.* **"C" "Good"** for the National highways falling in the study area. So, the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse effect. The company has planned Coastal Shipping of Cement, accordingly cement terminals have been developed at various locations. This will reduce the load on rail/road network / transportation.

4.3.3 Air Quality Index

Air Quality Index (AQI) is one such tool for effective dissemination of air quality information to people. There are six AQI categories, namely Good, Satisfactory, Moderately polluted, Poor, Very Poor, and Severe. The proposed AQI will consider eight pollutants (PM_{10}, $PM_{2.5}$, NO_2, and SO_2,) for which short-term (up to 24-hourly averaging period) National Ambient Air Quality Standards are prescribed. Based on the measured ambient concentrations, corresponding standards and likely health impact, a sub-index is calculated for each of these pollutants. The worst sub-index reflects overall AQI. AQI to be calculated by using the pollutant concentration data, the following table, and the following equation (linear interpolation):

$$I_p = \frac{I_{Hi} - I_{Lo}}{BP_{Hi} - BP_{Lo}}(C_p - BP_{Lo}) + I_{Lo}$$

Where,
Ip = the index for pollutant p
Cp = the rounded concentration of pollutant p
BPHi = the breakpoint that is greater than or equal to Cp
BPLo = the breakpoint that is less than or equal to Cp
BPHi = the breakpoint that is greater than or equal to Cp
IHi = the AQI value corresponding to BPHi
ILo = the AQI value corresponding to BPLo

Table 4.19: AQI Categories

Air Quality index (AQI) values	Levels of health concern	Description	Color
0 – 50	Good	Minimal Impact	Dark Green
51 - 100	Satisfactory	Minor breathing discomfort to sensitive people	Light Green
101 – 150	Moderate	Breathing discomfort to the people with Lung, heart disease, children and other adults.	Lemon Yellow
151- 200	Poor	Breathing discomfort to people on prolonged exposure	Yellow
201 – 300	Very Poor	Respiratory illness to the people on prolonged exposure	Red
301 - 500	Severe	Respiratory effects even on healthy people.	Brown

Source: Central Pollution control board series CUPS/8z/2014-15

S.No.	Locations	SUB INDEX				AQI
		PM_{10}	$PM_{2.5}$	SO_2	NO_2	
1.	Project Site	76	71	16	24	76
2.	Sunvali	77	70	16	23	77
3.	Mora	74	68	15	22	74
4.	Damka	77	69	16	23	77
5.	Rajgari	76	70	15	23	76
6.	Kavas	74	67	15	23	74
7.	Hazira	76	71	16	24	76
8.	Dumas	70	65	15	22	70

- The AQI for 4 parameters has been calculated for running 24-hr averages. It can be seen that for pollutants air quality is satisfactory.
- From the above representative table of air quality index for 10 km radius of project site, responsible parameter for pollution is PM_{10} and $PM_{2.5}$. Maximum AQI and responsible parameter for pollution are recorded in project area are PM_{10} with satisfactory impact.

4.3.4 Air Quality Modeling Study

Atmospheric dispersion modeling is the mathematical simulation of how air pollutants disperse in the ambient atmosphere. It is performed with computer programs that solve the mathematical equations and algorithms which simulate the pollutant dispersion. The dispersion models are used to estimate or to predict the concentration of air pollutants by using various inputs such as meteorological parameters *viz.* temperature, wind speed and direction, mixing depths, inversion level, *etc.* and source emissions emitted from sources on the desired area. Such models are helpful to the government agencies for protecting and managing the ambient air quality. The models are typically employed to determine whether the ambient air quality level due to proposed project will comply with the National Ambient Air Quality Standards (NAAQS) or not. Over and above the prediction of the concentration of pollutant at a particular area / locations, it also assists in the designing of effective control measures / strategies to reduce emissions of harmful air pollutants during operation. It also guide on the required pollution control equipment. For the proposed atmospheric dispersion modeling study, United States Environmental Protection Agency (USEPA) approved and also recommended by the Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India, regulatory air quality model *i.e*. Industrial Source Complex Short Term (ISCST3-version 3) is applied to predict ground level incremental concentrations (GLCs) of concerned critical pollutants. Prior to air quality modeling exercise, meteorological condition during one season over project site is extensively studied and were also compared with secondary data from the government sources. Concentrations are estimated for the critical pollutants assessed over appropriate averaging times (*i.e.* 8 hours and 24 hours) based on the applicability of the National Ambient Air Quality Standards (NAAQS).

To assess the impact of air emissions from various continuous point sources, air dispersion modeling study has been conducted with the help of Industrial Source Complex Short Term Model (ISCST3) version 5.0 model of AermodCloud™ developed by Envitrans Infosolution Pvt. Ltd.

Model Setup

Detailed model set up is given in the following table**:**

Table 4.20: Parameters for ISCST3

S.No.	Parameter	Details
1.	Model Name	ISCST3
2.	Software Name	AermodCloud™
3.	Model Type	Steady state Gaussian plume air dispersion model
4.	Topography	Rural, Plain terrain
5.	Average Time	24 hours
6.	Source Type	Point source
7.	Boundary Limits	10 km X 10 km
8.	Co-Ordinates System	Polar grid
9.	Anemometer	10 m
10.	Surface Meteorology Data	Site specific data processed by AERMET

Model Input Data

The air pollution caused by the gaseous emissions from a stack is a local phenomenon. Its impact will occur at a distance ranging from within the immediate vicinity of the stack to 1 km away from the stack. To evaluate the impact on air quality following data is required to input in simulation.

- Co-ordinates (X and Y) of sampling location within study area

- Micro-metrological data such as Cloud Cover, Temp (°C), Relative Humidity (%), Wind Direction(deg), Wind Speed(km/h), mixing height for study period (Oct.– 2018 to Dec.– 2018)

Table 4.21: Data Considered for Air Modelling for proposed project

#	Plant	Diameter of Stack (in mm)	Height of Stack (m)	Flue G as Temperature	Exit Velocity (m/s)	Gas relea sed from Stack
1.	Cement Mill	2700 mm	55 m	50 – 70◦C	6.8	SO_2, NOx, PM

The predicted incremental Ground Level Concentrations (GLCs) for PM, SO_2 and NOx likely to be contributed by the proposed project are given below:

Table 4.22: Ground Level Concentration value

Location	Incremental GLC (µg/m^3)	X Coordinate	Y Coordinate	Distance (m)	Direction
Particulate Matter					
Sunvali	0.77	254793.00	2340155.00	1341.00	WSW
Mora	0.05	256991.00	2343276.00	2925.00	NNE
Damka	0.01	257181.00	2345504.00	5128.00	NNE
Rajgari	0.13	255431.00	2344412.00	3974.00	N
Kavas	0.07	262637.00	2343596.00	7244.00	ENE
Hazira	0.21	255746.00	2334746.00	5757.00	S
Dumas	0.31	261762.00	2335068.00	7848.00	SE
Sulfur di oxide					
Sunvali	0.53	254793.00	2340155.00	1341.00	WSW
Mora	0.03	256991.00	2343276.00	2925.00	NNE
Damka	0.00	257181.00	2345504.00	5128.00	NNE
Rajgari	0.09	255431.00	2344412.00	3974.00	N
Kavas	0.05	262637.00	2343596.00	7244.00	ENE
Hazira	0.17	255746.00	2334746.00	5757.00	S
Dumas	0.22	261762.00	2335068.00	7848.00	SE
Oxide of Nitrogen					
Sunvali	0.61	254793.00	2340155.00	1341.00	WSW
Mora	0.04	256991.00	2343276.00	2925.00	NNE
Damka	0.01	257181.00	2345504.00	5128.00	NNE
Rajgari	0.10	255431.00	2344412.00	3974.00	N
Kavas	0.06	262637.00	2343596.00	7244.00	ENE
Hazira	0.19	255746.00	2334746.00	5757.00	S
Dumas	0.25	261762.00	2335068.00	7848.00	SE

It may be noted from the computed results for the proposed scenario that the maximum 24 hourly average GLC value for the proposed scenario is 0.77 µg/m^3 for SO_2, 0.53 µg/m^3 for NOx, 0.61µg/m^3 for PM and 0.18 µg/m^3 for Fluorine.

Table 4.23: Resultant Concentrations Value

Location	Background Maximum Conc. (µg/m^3)	Incremental Conc. (µg/m^3)	Resultant Conc. (µg/m^3)
PM_{10} µg/m^3 (Permissible Limit :100 µg/m^3)			
Project site	82.4	0.00	82.40
Sunvali	86.4	0.77	87.17
Mora	79.1	0.05	79.15
Damka	84.5	0.01	84.51
Rajgari	84.2	0.13	84.33
Kavas	81.6	0.07	81.67

Location	Background Maximum Conc. (µg/m^3)	Incremental Conc. (µg/m^3)	Resultant Conc. (µg/m^3)
Hazira	82.5	0.21	82.71
Dumas	77.8	0.31	78.11
SO_2 µg/m^3 (Permissible Limit :80 µg/m^3)			
Project site	14.9	0.00	14.90
Sunvali	14.3	0.53	14.83
Mora	13.7	0.03	13.73
Damka	14.9	0.00	14.90
Rajgari	15.3	0.09	15.39
Kavas	14.8	0.05	14.85
Hazira	15.9	0.17	16.07
Dumas	14.1	0.22	14.32
NO_X µg/m^3 (Permissible Limit :80 µg/m^3)			
Project site	20.3	0.00	20.30
Sunvali	20.4	0.61	21.01
Mora	20.8	0.04	20.84
Damka	20.6	0.01	20.61
Rajgari	21.0	0.10	21.1
Kavas	20.6	0.06	20.66
Hazira	22.8	0.19	22.99
Dumas	19.2	0.25	19.45

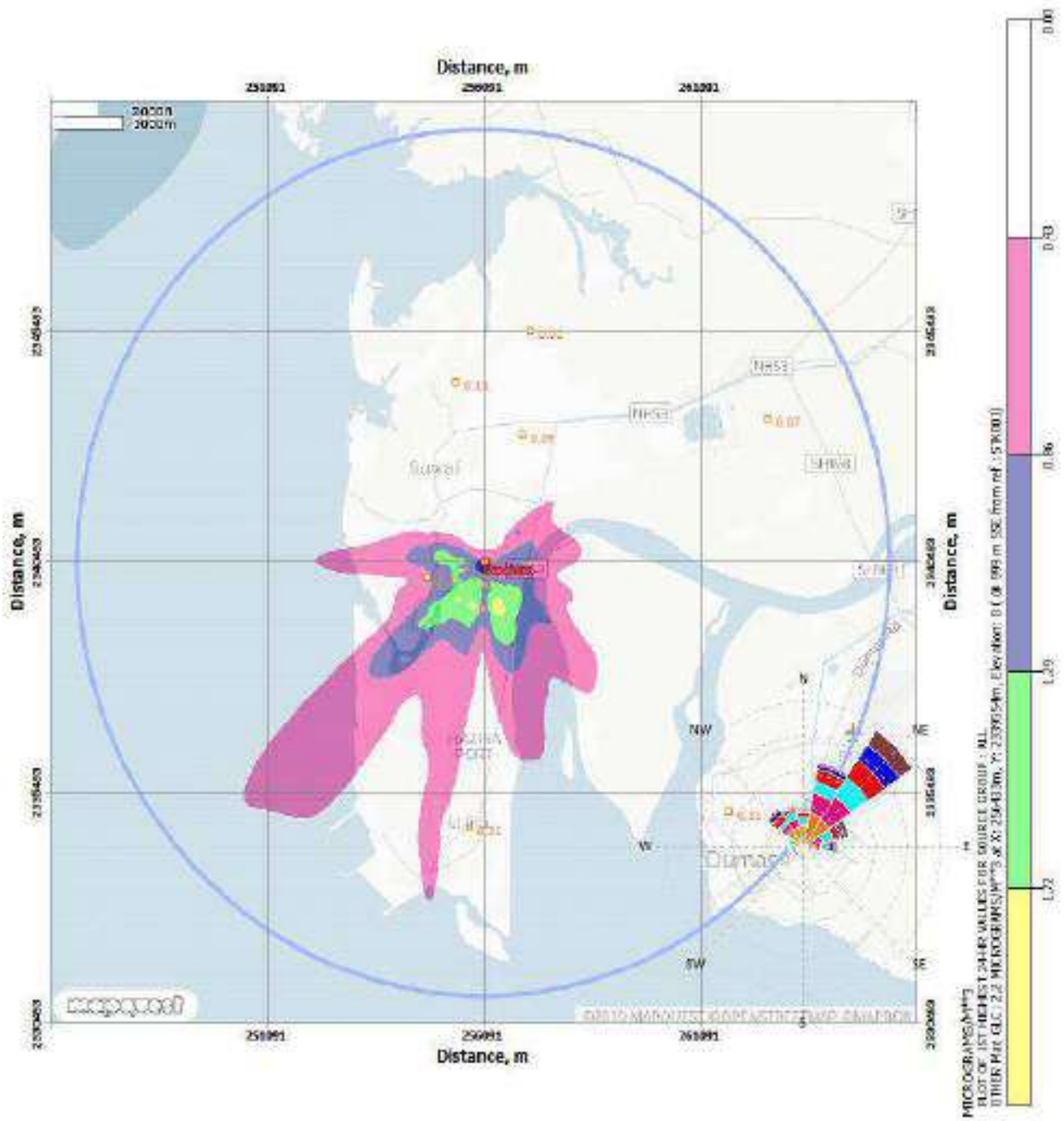


Figure 4.2: Isopleths of PM

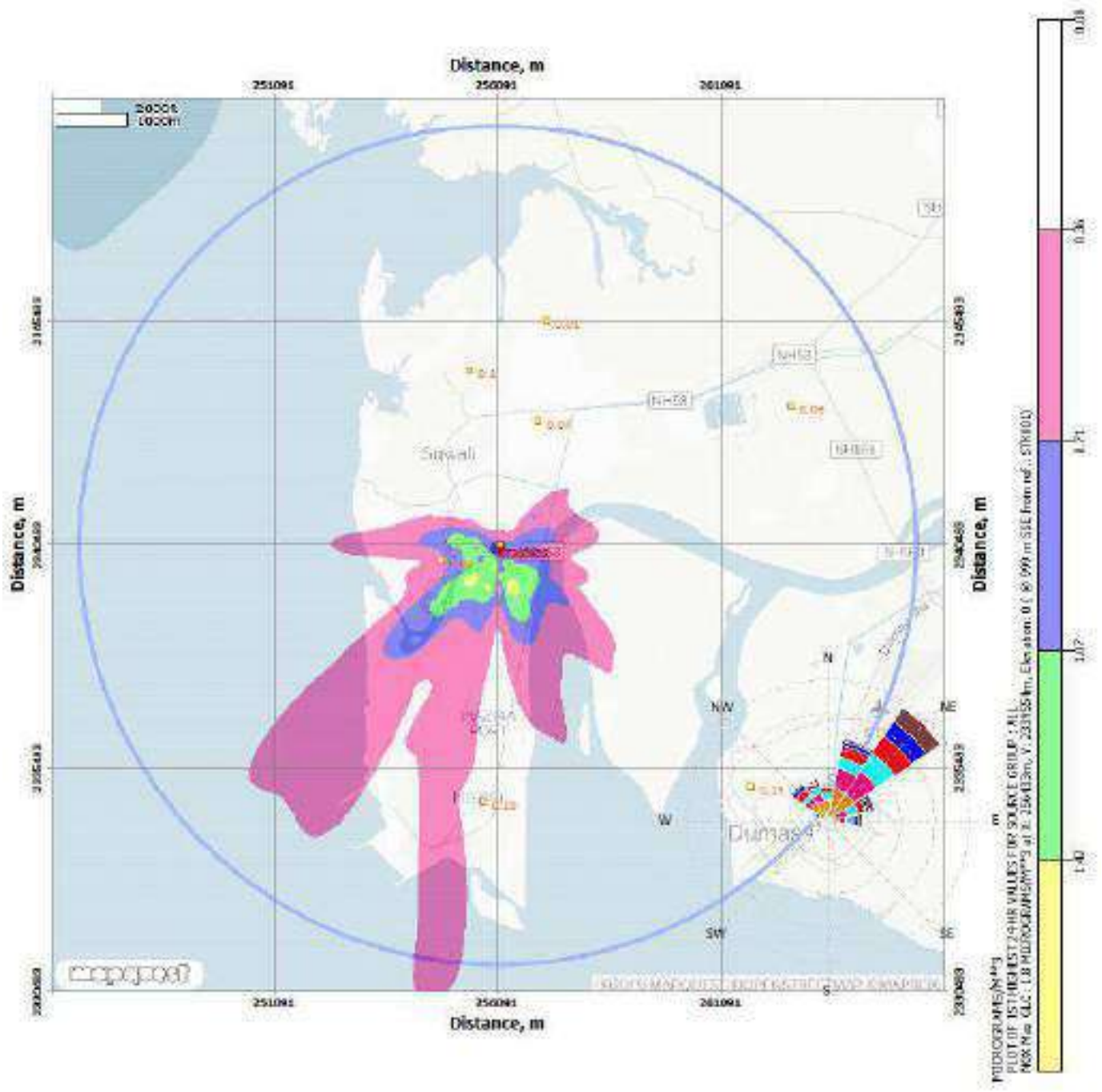


Figure 4.3: Isopleths of NOx

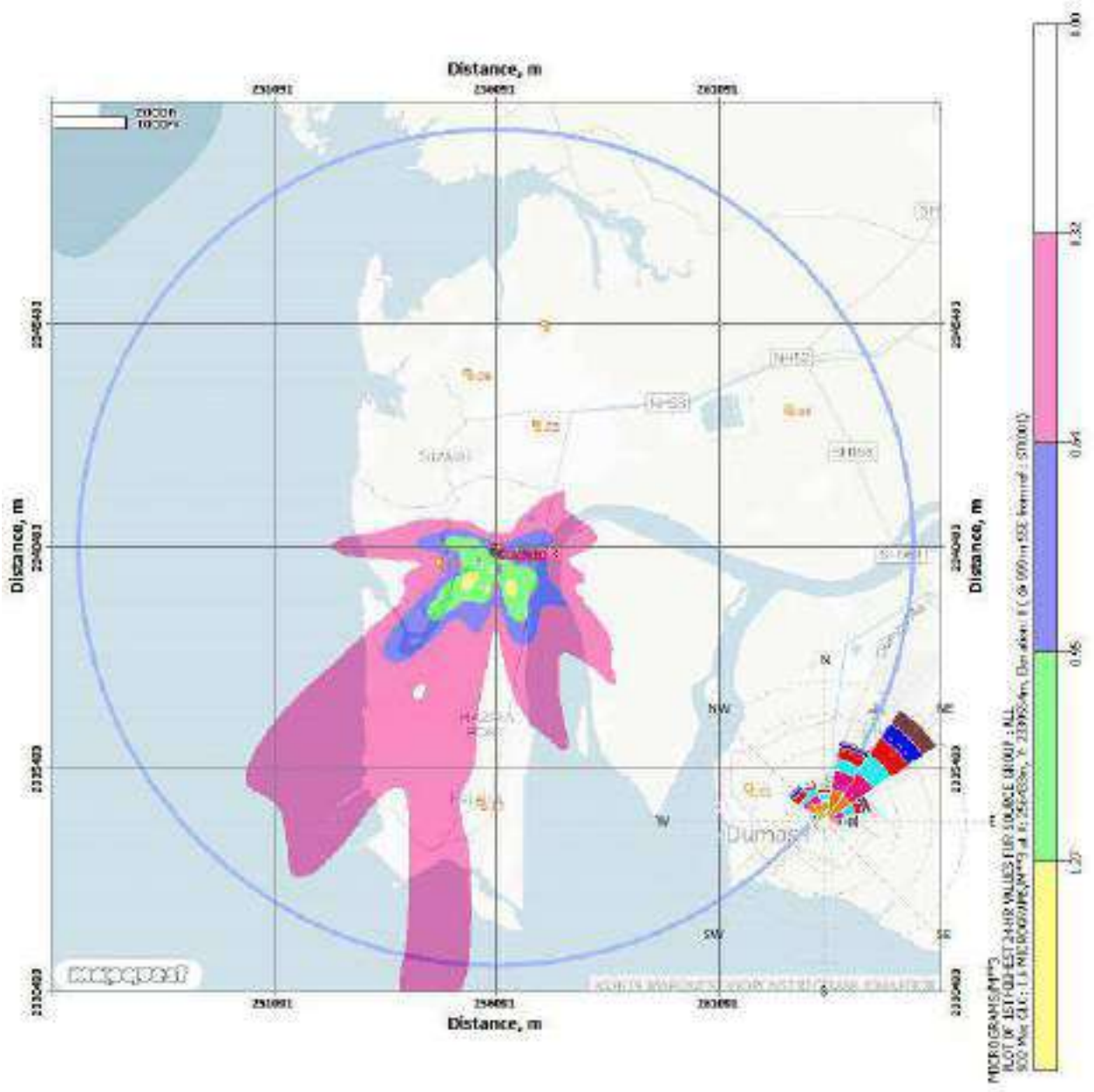


Figure 4.3: Isopleths of SO_2

When predicted 24 hourly ground level concentrations of PM, SO_2, and NO_x, emissions from the source is added to background maximum monitored values, resultant values remain well below the prescribed National Ambient Air Quality Standards at all the location. Hence, there is no significant impact is anticipated on the ambient air quality of the area due to the proposed project. Maximum GLC found at the distance of 1.3km. As part of precautionary measure, to minimize the likely environmental impacts on air environment due to the proposed cement grinding project, necessary mitigation measures are suggested along with APC to negate the air pollution.

Air Environment

Table 4.24: Impact on Air Environment and Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicle Movement	• Release of flue gas emission like PM, SO_2 and NOx from diesel operated vehicles. • Generation of fugitive dust due to vehicle movement for transportation of raw material and finished goods.	• Vehicles with valid PUC will be used for the transportation of materials and equipment. • Regular water sprinkling will be done to avoid dust generation from transportation.

Project Activity	Impact	Mitigation Measures
		• Transportation vehicles will be covered with tarpaulin sheet while transporting materials. • Provided paved roads and concrete flooring at activity area.
Raw Material Handling & Storage	• Release of fugitive emission during handling may cause asthma. • Ultimately in respiratory ailments like asthma, Bronchitis, lung cancer to workers.	• Water sprinkling shall be done on the paved/road prior and during unloading. All transfer point locations would be fully enclosed. • Fuel will be transported up to the storage bunkers through conveyor belts. The closed belt conveyor system and provision of de-dusting bag filters. • Airborne dust at all transfer operations/points would be controlled either by spraying water or by extracting to bag filter • Accumulated dust shall be removed/swept regularly and watering the area after sweeping.
Process Stage/Operation	Emission of particulates, sulphur oxides, nitrous oxides and other hazardous chemicals and toxic metals like Hg, As, *etc.* due to coal burning.	• Pulse jet bag filter will be installed as APC. • Regular water sprinkling will be carried out to control the dust generation. • Regular health check-up will be carried out for workers. • Dust masks will be provided to workers. • CEMS is recommended for online monitoring of air pollution.

4.3.5 Water Environment

Table 4.25: Impact on Water Environment and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Raw material han dling, storage **Process Stage/Operation**	• Contamination of surface water body due to discharge of untreated process water. • Contamination of surface water due to disposal of untreated sewage/effluent water.	• Provision of well-designed internal drainage system with adequate slope and to control the slippage. • Pucca Floor will be provided at stock yard. • Sewage will be disposed through STP and treated water (8KLD) will be used in green belt.
Greenbelt Development	• The water requirement of green belt should be minimized.	• Treated water (8KLD) will also be used for green belt development. • No ground water shall be used for green belt or any other purpose.

4.3.6 Soil Environment

Table 4.26: Impact on Soil Environment and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicle movement	Contamination of soil due to spillage	-Raw material will be handled, stored and

Storage and Handling of Raw materials **Process stage/Operation**	of fuel/oil from vehicle or utility. Fugitive dust will contaminate the soil quality.	transported as per manufacture, storage and import as per Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2016. -Generated used oil will be collected and utilized as alternative fuel in kiln at Sanghipuram.
Green Belt Development	Improvement in soil texture due to binding of top soil materials due to root structure.	Regular maintenance of greenbelt (more than 33%) will be done.

4.3.7 Noise Environment

Table 4.27: Impact on Noise Environment and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicular Movement **Raw ma terial handling, storage** **Process Stage/Operation**	• Decreases the efficiency of workman. • Occupational health issue due to continuous noise exposer. • Loud noise creates waves which struck the walls and weakens the buildings.	• PUC Certified vehicles will be used. • Regular maintenance & lubrication of utilities, equipment and vehicles will be carried out. • Acoustic enclose will be provided wherever applicable. • Noise monitoring will be carried out regularly. • Adequate protective measures in the form of ear muffs/ear plugs will be provided to the workers working in high noise areas. All the necessary noise protective equipment will be supplied to workmen operating near high noise generating sources. In addition, reduction in noise levels in the high noise machinery areas could be achieved by adoption of suitable preventive measures.

4.3.8 Land Use/Land Cover, Hydrogeology and Geology

Table 4.28: Impact on Land Cover/ Land Use Environment and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
This land falls under industrial zone, hence there will no significant impact on Land Use/Land Cover, Hydrogeology and Geology due to project activity.		

4.3.9 Solid/Hazardous Wastes

Table 4.29: Impact due to Solid/ Hazardous Wastes and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Raw ma terial handling, storage **Process Stage/Operation**	• Improper handling and disposal of solid/hazardous waste like fly ash, diesel oil etc. may contaminate the soil fertility. • Impact on the worker's health.	• Solid/ Hazardous waste will be collected, stored, transported and disposed as per the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2016. • Dust collected from air pollution control equipment will be 100% recycled in system. • Generated used oil from plant machinery will be utilized as alternative fuel to burn in existing cement plant at Sanghipuram.
Green Belt Development	Plant shed out materials like leaves,	Daily collection of waste will be carried

Project Activity	Impact	Mitigation Measures
	roots, branches etc.) from the environment for growth and other processes.	out and composting of this waste used as manure for greenbelt.

4.3.10 Risk and Hazards

Table 4.30: Risk & Hazards in GU and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicle Movement	• Chances of vehicle collision due to vehicle failure. • Tilting of moving vehicle due to overloading. • Chances of fatal incident, severe injury and loss of property.	• Well trained, licensed and certified motor vehicle driver will be given job for transportation of raw material and fly ash. • Transport vehicle will be properly examined before transportation. • Concern officer will ensure the raw material loading as per its capacity before transportation.
Raw ma terial handling, storage **Process stage/operation**	• Dust emission due to storage and handling of raw materials and fly ash. • Chances of accident to workers due to spillage, during handling. • Risk of fire within raw material storage area. • Continuous noise exposure to workers in working area • Fire hazards in working area. • Occupational health hazard due to handling of solid/ hazardous waste. • The risk of fall hazard during working. • Accident due to electric shock may cause injury the workers.	• PPE‘s will be provided to workers. • Standard operating procedure is in place and will be strictly followed by workers. • Preventive maintenance of mechanical equipments will be done periodically. • Padding will be done to pumps and blowers. • Safety training will be provided to workers. • Electrically tested electrical resistance Hand Gloves (IS:4770-1968) and rubber mats will be used for safety during electrical purpose. • Industrial safety nets will be provided for workers to avoid fall hazard.

4.3.11 Ecology and Biodiversity

Table 4.31: Impact on Ecology and Biodiversity and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicular Movement	• Settling of fugitive dust on leaves of tree reduces the gaseous exchange process. • Ultimately reduce the plant growth. • Chance of vehicle collisions with wild animal crossing the road.	• Transportation vehicles will be provided with power brakes and power steering. • No pressure horn will be allowed. • Speed limit and PUC certified vehicle will be allowed for the transportation.
Raw ma terial handling, storage Process Stage/Operation	• Flue gas emission will lead to acid rain which will have direct or indirect impact on humans and animals.	• Pulse jet Bag filter will be provided to control/abate the fugitive emission, the dust will be utilized back into the process.
Green Belt Development	• The scenic beauty, aesthetic environment, habitat for avifuana, air quality as a dust barrier, soil fertility and noise barrier.	• Local species will be planed as per soil conditions; regular maintenance of greenbelt will be done.

4.3.12 Socio-Economic

Table 4.32: Impact on Socio-Economic Environment and its Mitigation Measures

Project Activity	Impact	Mitigation Measures
Vehicular Movement	• Positive as well as negative impact due to transportation during operation phase: ➢ Positive: Employment Generation ➢ Negative: Loss of human life in case of accident.	• Preference will be given to local population of surrounding villages for employment. Trained driver will be employed to avoid the occurrence of accidents • Limiting the speed of vehicle to 30 km/h for heavy vehicles. Transportation vehicles will be provided with power brakes and power steering.
Raw mat erial handling, storage processing	• Release of SO_2, NO_x, PM from operation of cement mill will have negative effect on health of surrounding village population. • Generation of high noise from plants will have negative effect on hearing, mental status and digestion of surrounding village population.	• Pulse jet bag filter as APC will be installed for control the process emission with 55 m of stack height. • Padding and enclosing will be done to high noise generating machineries and equipment. • Greenbelt will be developed as per guideline to abate the fugitive emission. • Regular health camps will be carried out.
Employment	Positive impact due to employment generation in the area.	• Local people will be given preference.

Table 4.33. Environmental Impact Matrix with Mitigation measures in Operation Phase

Activities	Environmental Attributes											
	Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Hazard	Ecology and Biodiversity	SE	Total
Vehicle Movement	-4	-	-	-4	-	-	-	-	-9	-4	+4	-17
Raw material handling, storage etc.	-4	-4	-2	-4	-	-	-	-4	-6	-4	+9	-19

Activities		Environmental Attributes											
		Air	Water	Soil	Noise	LU/LC	Hydro geology	Geology	SHW	Risk & Hazard	Ecology and Biodiversity	SE	Total
Process stage/ operation	-2 Combustion of fuel Flue gas Cleaning Grinding & Packing Cooling system	-4	-	-4	-	-	-	-	-2	-2	-2	-4	-18
Employment		-	-4	-	-	-	-	-	-	-	-	+9	+5
Green Belt Development		+16	-2	+8	+16	+6	-	-	-	-	+16	-	+60
Cumulative score		**+4**	**-10**	**+2**	**+8**	**+6**	**0**	**0**	**-6**	**-17**	**+6**	**+18**	**+11**

The cumulative score for various environmental parameters with mitigation measure is +11 which changed from -294 after taking proper mitigation measures.

4.4 SUMMARY

Impacts on land environment, air environment, water environment, noise environment, biological environment, socioeconomic environment and risk and hazard is been introduced in the chapter with their mitigation measures for both during construction as well as operation phase. The cumulative score for various environmental parameters without mitigation measures is -294 during Operation phase and after taking suggested mitigation measures the score will be +11, hence the adverse impact can be negate after taking adequate mitigation measures. The major impact on air and water due to proposed cement grinding. Air modeling study is also been introduced in the chapter showing maximum and minimum GLC in the surrounding areas. The pulse jet bag filter will be installed to control the furtive emission with stack height of 55 m. SIL Grinding Unit has planned to develop more than 33% of greenbelt within the premises.

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

5.1 GENERAL

The aim of this chapter is to provide the information on alternative site and technology to be utilized by a developmental activity. The site analysis has been done for the proposed grinding unit. Two option were analyzed.

5.2 SITE ALTERNATIVES

Two sites have been examined to set up the Greenfield Project of 2.0 Million TPA Standalone Grinding Unit with bulk & bag packing plant. The details of two sites given below-

Option 1. Survey No. 153, 154, Village – Mora, Taluka – Choryasi, District-Surat, GUJARAT – 394510.

Option 2. Hazira Industrial Zone, Survey No. 125/1, 125/2,126/1+2+3; Shivrampur Village,Taluka-Choryasi, District- Surat 394510.

After detailed observation, we have selected most suitable site (option 2) i.e. village Shivrampur, S.No. 125/1, 125/2,126/1+2+3) for the same which is located in SSW direction from the Mora village location and also fulfills siting criteria as per technical guidelines of MoEF&CC. The details and environmental settings surround the selected project site is given below-

S.No.	Particulars	Option 1	Option 2
1.	Latitude and Longitude of the site	# Latitude Longitude A. 21°11'11.70"N 72°40'44.15"E B. 21°11'11.23"N 72°40'47.14"E C. 21°11'1.10"N 72°40'42.02"E D. 21°11'1.93"N 72°40'33.03"E	**# Latitude Longitude** A. 21° 9'0.08"N 72°39'0.68"E B. 21° 8'57.60"N 72°39'12.32"E C. 21° 8'55.54"N 72°39'11.61"E D. 21° 8'57.07"N 72°39'0.75"E
2.	Location with S.No.	S.No.153, 154 Village - Mora	S.No. 125/1, 125/2,126/1+2+3 Village - Shivrampur
3.	Plot Area	13.10 Acres / 53000 m^2	12.00 Acres / 48562 m^2
4.	Nearest Village (Human Settlement)	Mora (~1.5 Km in South)	Shivrampur (~1.5 Km in SW) Mora (~3.0 Km in NE direction)
6.	Nearest Town/City	Surat (~10.87 Km in ESE)	Surat (~16 Km in ESE)
7.	Nearest National Highway	NH-6 (0.5 km in South)	NH-6 (0.9 km in East)
8.	Nearest State Highway	SH-168 (4.8 km in East)	SH-168 (8.5 km in North East)
9.	Nearest Railway station	Surat Railway Station (17 km in E)	Surat Railway Station (20 km in NE)
10.	Nearest Airport	Surat Airport (9.86 km in SE)	Surat Airport (10.1 km in SE)
12.	State, National Boundaries	None within 10 Km of study area	None within 10 Km of study area
13.	Sea	Arabian Sea (7.44 km in West)	Arabian Sea (3.92 km in West)
14	Archaeological site	None in 10 km radius	None in 10 km radius
15.	National Park/ Marine sanctuary, etc.	None in 10 km radius	None in 10 km radius

16.	Nearest Industry	Hazira Industrial Area (~ 8 km in SW)	Hazira Industrial Area in adjoining

The selected location (option 2) is located in Industrial Zone of Hazira having good infrastructure and connectivity. Moreover, infrastructure facilities near the site are well developed with approach road, State and National Highway (NH-6 & SH168) and no human settlement within 1 km radius. The selected site is nearer to sea port. Also, this location is most suitable as per the site selection criteria for cement plant. No land use pattern will be changed on this location as this land has converted into industrial use under NA.

5.3 ALTERNATIVE FOR TECHNOLOGY AND OTHER PARAMETERS

During EIA study some alternatives for technology and other parameters were considered and are discussed below:

Table 5.1 Alternative for Technology and other Parameters

S.No.	Site Particular	Alternative Option 1	Alternative Option 2	Remarks
1.	Site Location	Govt. Land	Private Land	Private land for proposed set up of cement grinding unit. **Benefits**: • The proposed activity will be located in Industrial zone, hence easy availability of infrastructure facilities. • No rehabilitation and resettlement • No change in land use pattern. • No forest land is involved and no tree cutting is required. • Proximity to road network.
2.	Manufacturing technology	Automated Machineries	Manual/ Semi - automatic	Preferred automated machineries. **Benefits:** • Increased productivity. • Reduce human error. • Reduce chances of accidents. • Improved quality or increased predictability of quality. • Improved robustness (consistency), of process or product. • Reduced direct human labour cost and expenses • Reduce air and noise pollution.
3.	Employment	Local employment	Outsource employment	Local employment for unskilled / semi-skilled manpower as availability in the area.Technical staff will be outsourced if not available locally. **Benefits:** • Provides employment to local people to enhance livelihood of villagers. • To increase per capita income of villagers.
4.	Manpower transportation	Public transport	Private transport	Local labour will be deployed so they will reach by private transport, bicycle or by foot. **Benefits:** • Cost of transportation will be

				negligible.
5.	Raw material and product transportation	Private transport/ sea route	Public transport	Material will be transported through private trucks or by ships. **Benefits:** • It will give indirect employment. • Cost effective
6.	Water Requirement	Local body/Irrigation Dept.	Bore well	Water supply from nearby area through local body/irrigation department will be preferred. **Benefits:** • No change in the ground water
7.	Road	Metallic road	Kachcha Road	The road is well furnished. Most of the raw material and fuel will be transported through ships (sea route)
8.	Fuel	Coal/Lignite/Petcoke	F.Oil/ Natural Gas	Coal/Lignite/Petcoke will be used as major fuel for cement grinding unit. **Benefits:** • Easy availability of high quality coal from open market.

SIL is experience in the manufacturing and trading of cement. SIL identified opportunity in cement based on market demand and proposes to set up plant in Surat. Within western India, Hazira (Surat) is considered an excellent location since it is an industrial zone, has excellent infrastructure including infrastructure required for management of environment developed by Government authority. Project proponent has been checked viability of various plot within area places and finalize the proposed area i.e. Survey No. 125/1, 125/2,126/1+2+3 , Shivrampur Village, Tal. Choryasi Dist.- Surat, Gujarat.

5.4 SUMMARY

The Greenfield Project of Standalone Grinding Unit with Bulk & Bag Packing Plant with 2.0 Million TPA Cement (PPC, OPC, PSC) production capacity is situated in Industrial Zone (as per Gazette Notification No. GH/V/156 of 2013/DVP-1412-3759-L dated 13th August 2013), Survey No. 125/1, 125/2,126/1+2+3; Village – Shivrampur, Tal. Chauriyasi, Dist.- Surat- 394510, Gujarat by Sanghi Industries Limited. Hence no R&R is applicable.

6 ENVIRONMENTAL MONITORING PROGRAM

6.1 Post Project Environmental Monitoring

Environmental monitoring describes the processes and activities that need to take place to characterize and monitor the quality of the environment. It is an essential tool for sustainable development and ensuring effective implementation of environmental management plan and mitigation measures adopted. It also updates the environmental management system for effective conservation of environment in-line with the ongoing project activities/operation. Hence, monitoring of critical parameters of environmental quality is very essential in the routine activity schedule of the project operation. The specific aspects of the environment to be studied are determined by environmental objectives and environmental legislation. The purpose of environmental monitoring is to assess the progress made to achieve given environmental objectives and to help detect new environmental issues.

6.2 IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

The mitigation measures suggested in Chapter 4 shall be implemented so as to reduce the impact on environment due to the operation of the proposed project. In order to facilitate easy implementation of mitigation measures, these are phased as per the priority implementation as given in **Table 6.1**.

Table 6.1: Implementation Schedule for Monitoring Program

S.No.	Recommendations	Time Requirement	Schedule
1.	Air Pollution Control Measures	Before commissioning of the Grinding Unit.	Immediate
2.	Water Pollution Control Measures	Before commissioning of Grinding Unit.	Immediate
3.	Noise Control Measures	Along with the commissioning of Grinding Unit.	Immediate
4.	Soil Conservation	Before commissioning of Grinding Unit.	Immediate & Progressive
5.	Work Zone	Working environment of Employee during operation.	Immediate & Progressive
6.	CER/CSR	For welfare of nearby community.	Immediate/ Progressive
7.	Occupational Health Surveillance	Along with commissioning of Plant	Immediate
8.	Ecological Change Detection	After commissioning of Grinding Unit.	Progressive

6.3 ENVIRONMENTAL MONITORING

The environment monitoring during operation of standalone Grinding Unit shall be conducted as follows:

- Ambient Air quality;
- Water and wastewater quality;
- Ambient Noise levels;
- Soil Quality;
- Greenbelt Development;
- Corporate Environmental Responsibility;
- Occupational Health Surveillance.

A centralized environment monitoring cell will be established for this unit. Monitoring of important and crucial environment parameters is of immense importance to assess the status of environment during operation of Grinding Unit. With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environment conditions due to operation unit and suitable steps could be taken due in time to protect the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring.

6.3.1 Ambient Air Quality

Monitoring of ambient air quality within the plant premises will be carried at selected location as per guideline. Ambient air quality monitoring (AAQM) will be carried out for $PM_{2.5}$, PM_{10}, NO_x, SO_2 *etc.* for compliance with prescribed limits of CPCB / GPCB. Meteorological parameters like wind speed, wind direction, temperature, relative humidity and rainfall will be recorded continuously to check the weather condition.

6.3.2 Emission from Plant

Periodical monitoring of stack attached to the cement mill will be carried out after the project commissioning. PM, NOx, SO_2 etc. will be generated in stack and monitoring for the same will carried out to assess the performance of pollution control equipment installed. Air pollution parameters of process stacks will be undertaken on a regular basis as per the GPCB/CPCB. Continuous emission monitoring system will be installed as per CPCB norms. It will be ensured that these parameters are within the permissible limits specified by GPCB. Preventive and corrective action will be taken if parameters are exceeded in any case. In case emissions will be found to exceed the norms, the **'on duty'** personnel will check the relevant parameters and take appropriate corrective actions. Along with the performance test of main plant, equipment performance test and calibration of pollution control equipment will be made on a regular basis. A detailed maintenance schedule will be prepared for all pollution control systems. The maintenance will be done strictly as per the schedule.

6.3.3 Noise Levels

Noise levels in the work zone environment and ambient will be monitored regularly. The frequency of noise monitoring will be once in a month in the work zone. The ambient noise levels in the surrounding villages will be monitored fortnightly basis.

6.3.4 Soil Sampling

The environment monitoring cell will be co-ordinate all monitoring programs at site and data generated will be regularly furnished to the regulatory agencies.

6.3.5 Wastewater Quality

In grinding unit operations, waste water will be generated from cooling tower operations and domestic waste water. The cooling water blow down will be treated and utilized for greenbelt, dust suppression and fire fighting. Regular monthly monitoring will be carried out as per standard method.

6.3.6 Solid / Hazardous Waste Generation & Utilization

Management of wastes shall be done as per Hazardous and other waste (Management and Trans-boundary Movement), Rules 2016 of Environment Protection Act, 1986.The EMC will monitor and keep a record of the following:

- Generation of hazardous wastes
- Disposal of hazardous waste.

6.3.7 Green belt development

SIL will developed greenbelt area as per CPCB guidelines. Approx. 1.6500 Ha. (more than 33.00%) area within the plant premises as greenbelt area.

Following activities will be carried out for maintaining the greenbelt area,

- Annual planning for tree plantation with specific number of trees to be planted shall be made. The fulfillment of the plan will be monitored by the EMC every six months
- A plan for post plantation care will be reviewed in the monthly meetings. Any abnormal death rate of planted trees shall be investigated and acted upon immediately
- Watering of the plants, weeding, hoeing will be carried out.

6.3.8 Housekeeping and Work Place Monitoring

The EMC cell will keep a very close monitoring of the housekeeping activities and organize regular meetings with plant personnel and management. Workplace monitoring shall be carried out as per statutory requirement.

6.3.9 Occupational Health & Safety

Routine medical examination of personnel will be carried out at regular intervals of all workers to determine any changes in health condition due to the working conditions. Pre-medical check-up will be carried out at the time of employment. Records related to occupational health check-up will be maintained regularly.

Table 6.2: Monitoring Schedule for Environmental Parameter

S.No.	Particulars		Monitoring Frequency	Duration of Sampling	Important Monitoring Parameters
1.	**Air Pollution**				
	i.	Selected 4 locations in and around plant site specified by GPCB	Twice in a week for 3 seasons	24 hr continuously	PM, SO_2, NOx
	ii.	Stack gas analysis in all stacks.	Once in a month	One time	As per GPCB
	ii.	Fugitive dust sampling (if any) at work zone as per CPCB or GPCB.	Twice in a week	24 hr continuously	PM, RSPM
2.	**Water and Wastewater Quality**				
	A.	Industrial/Domestic			
		Waste water from operational activity	Daily	24 hr	As per CPCB/ GPCB norms
	B.	Water quality in the study area			
	i.	Surface Water	Half yearly	Grab	Parameters specified under IS:10500
	ii.	Water level studies in well or bore wells in plant and surrounding areas	Yearly	Once	Water levels and chemistry of water
	iii.	Marine water	Yearly	Once	As per norms
3	**Industrial Noise Levels**				
	1.	Major noise generating sources at plant site	Every fortnight	24 hr. continuous with 1 hr. interval	As per CPCB/ GPCB norms
	2.	Along Road for transportation noise	Fortnight	24 hr. continuous with 1 hr. interval	As per CPCB/ GPCB norms
	Ambient Noise Levels				
		4 Locations as presented in Chapter 3	Fortnight	24 hr continuous with 1 hr interval	Noise level in dB(A)
4.	**Soil Characteristics**				
	1	Selected 4 locations in core and buffer zone in nearby area	Half Yearly	One Grab sample	As per CPCB/ GPCB norms
5.	Work zone	At plant site	Yearly	Once in work place	Dust, Noise, etc.
6.	Corporate Environmental Responsibility	In core and buffer zone in nearby villages	Half yearly	Once	Activities done by Client

7.	Occupational Health Surveillance	At plant premises	Half yearly	Once	Employee Health Register
8.	Greenbelt Development	Number of plantation (Units), Number of Survived Plants/ Trees, Number of Poor Plant/ Trees	Yearly	Once	Tress, survival rate, landscape area.
9.	Ecological Change detection	Study area	Decadal	Every 10 years	Land cover, forest cover, vegetation, human settlement, concrete, crop etc.
10.	Environmental Audit	As per Directions of Honorary High Court,	Yearly	Once	As per GPCB
11.	Consents and Authorization	Consent to Operate under applicable acts	Renewing 90 days before expiry of validity	Once	Before 90 days of expiry
12.	Compliance of EC Conditions	Submission of 6 monthly Compliance Reports	June and December	Twice in a year	As per EC conditions

6.4 MONITORING METHODOLOGIES

Sample for environment monitoring will be collected as per the guidelines provided by MoEF&CC/CPCB/GPCB. The method followed will be recommended/standard method approved/recommended by MoEF&CC/CPCB.

Table 6.3: Method of Environmental Sampling and Analysis

Attributes	Methods	
	Sampling/Preservation	Analysis/data analysis
Air Environment		
Ambient air quality	As per IS: 5182, CPCB & AWMA.	As per IS:5182,CPCB & AWMA
Noise	As per CPCB Guidelines	Survey carried out as per CPCB guideline.
Water		
Ground Water Surface Water / Marine Water	Standard Methods for Examination of Water and Wastewater, 22nd edition, APHA 2012.	IS 3025 & Standard Methods for Examination of Water and Wastewater, 22nd edition, APHA 2012.
Soil Quality	IS 2720, Soil Testing in India (Department of Agriculture & Cooperation).	IS 2720, Laboratory developed Method as per NABL requirement and Book - Soil Testing in India (Department of Agriculture & Cooperation).

6.5 OCCUPATIONAL HEALTH AND SAFETY

Occupational health and safety is closely related to productivity and good employer-employee relationship. The main factors of occupational health in grinding unit are fugitive dust and noise.

- Provision of rest shelters for workers with amenities like drinking water, toilets etc.
- Provision of personal protective equipment to the workers;
- Rotation of workers exposed to noise premises;
- Dust suppression; and
- First-aid facilities in the plant premises.

Occupational Health Survey of the employees will be carried out at regular intervals.

6.7 DOCUMENTATION & RECORDS

The environmental department in respect of operation of pollution control facility will be maintain following records:

- Instruction manual for operation and maintenance of pollution control,
- Log sheet for self-monitoring of pollution control,
- Instruction manual for monitoring of gaseous parameters and hazardous waste management,
- Monthly, quarterly and annual progress reports,
- Medical checkup reports of employees.

6.8 BUDGETARY FOR ENVIRONMENTAL MONITORING PROGRAMME

On regular basis, environment management cell shall inspect the necessity and availability of the materials, technologies, services and maintenance works. The EMC shall make appropriate budget for this purpose. Regular record review for change in financial requirement of environment management will be done and appropriate budgetary provisions shall be made. With other budget, budget for environmental management will be prepared and revised regularly as per the requirement. The budgetary allocation for the pollution control and monitoring equipment is given below:

Table 6.4: Budgetary Allocation for Environmental Monitoring Program

S.No.	Particulars	Cost (Rs. Lakhs)	
		Capital	Recurring
1.	Air, Water, Soil & Noise Monitoring	32.00	15.81
2.	Ecological Change Detection and Monitoring	12.00	5.00
3.	Legal compliance / CSR/ESC Monitoring	10.00	7.00
	Total	**54.00**	**27.81**

6.9 SUMMARY

The environment monitoring for the grinding unit during operation will be conducted as follows:

- Ambient Air quality;
- Water and wastewater quality;
- Ambient Noise levels;
- Soil Quality;
- Ecological Change detection
- CSR/CER;
- Occupational Health Surveillance.

Monitoring of important and crucial environment parameters is of immense importance to assess the status of environment during operation of grinding unit. All environment monitoring and relevant operational data will be stored in a relational database. Regular data extracts and interpretive reports will be sent to the regulator. The capital cost of Environmental Monitoring Program for Air, Water Soil and Noise will be Rs. 54.0 Lakhs to procure online system (CEMS) and other equipments and the recurring cost for the same will be Rs. 27.81 Lakhs.

7 ADDITIONAL STUDY

7.1 GENERAL

This chapter deals with additional studies such as public consultation, risk assessment and other related studies. Cement grinding unit is associated with potential hazards that effect to the man and natural environment. It would normally require the assistance of emergency services to handle it effectively. The operation shall be taken out under the well management and control by the qualified safety manager. Disaster management plan has to be formulated with an aim of taking precautionary steps to avert disasters and also to take such action after the disaster which limits the damage to the minimum.

7.2 PUBLIC HEARING

As per the provisions of Notification No. S.O. 1533(E) dated 14/09/2006 and its subsequent amendment S.O. 3067(E) dated 01/12/2009, Ministry of Environment, Forest & Climate Change, Government of India, New Delhi, public hearing is conducted for M/s. Sanghi Industries Ltd., for Setting up Standalone Grinding Unit (2.0 Million TPA) with Bulk & Bag Packing Plant, at Survey No. 125/1, 125/2, 126/1+2+3, Vill: Shivrampur, Ta: Choryasi, Dist: Surat (Gujarat). The Public Hearing held on 22-03-2019 at 11:00 hrs. at Project Site, Survey No. 125/1, 125/2, 126/1+2+3, Vill: Shivrampur, Ta: Choryasi, Dist: Surat (Gujarat). This project is covered under Schedule-3(b), Category –B" of above referred Notifications. Public Hearing is conducted under the chairmanship of Shri Dhaval Patel (IAS), Collector & District Magistrate, Surat. Total 118 Nos. of peoples had attended the public hearing. The copy of public hearing proceedings attached as Annexure. Time bound action plan of the issues raised during public hearing is given in Table 7.1.

7.2.1 Advertisement and Photographs

The public notice was advertised as per notification in two newspapers —Times of India" (National) dated 16/02/2019 and –Gujarat Mitra" (Local) dated 16/02/2019 figure 7.1. The photographs of public hearing are shown in figure 7.2 showing Collector and District Magistrate, RO and Public (audience).

ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડ

જાહેર સૂચના

Gujarat Pollution Control Board

Public Notice

Gujarat Mitra (16/02/2019) Saturday	Times of India (16/02/2019) Saturday

Figure 7.1 Advertisement in News Papers for Public notice

Public attended the PH meeting	Collector and District Magistrate & Regional officer

Surat Resident raising Question	**SIL Representative Replying the Question**

Figure 7.2 Public Hearing Photographs

Encapsulation of Public Hearing

Shri P.U.Dave, Regional officer, Gujarat Pollution Control Board, Surat, representative of Member Secretary GPCB; welcomed all the participants who remained present in the Public Hearing. He outlined the various provisions of the Notification and briefed about the procedural details for conducting this Public Hearing, including actions taken by GPCB for wide publicity of this Public Hearing and the advertisement published earlier in the local daily newspaper. He announced that as per the provision of Notification, only affected persons will be allowed to make their representation in the Public Hearing while others having plausible stake may submit their representation in writing which would be included in proceedings. He also made it clear to the gathering that the Committee is responsible only for preparation of proceedings of the meeting covering all the concerns raised during the Public Hearing.

He then opened the forum for public hearing with due permission of Chairman of Public Hearing and invited the Project Proponent to make the presentation of their project in local language.

After the presentation made by project proponent, Regional Officer, GPCB with due permission of Chairman of Public Hearing opened the forum for representations/suggestion/objections/ questions from the locally affected people. Following discussion/ questions - answers took place has been given below in Table 7.1.

#	Respondent and Address	Point Represented and/or written submission	Reply by PP/Representative	Fund
1.	Shri Bhagubhai Manibhai Patel, Sarpanch, Vill :Shivrampura, Ta: Choryasi, Dist.: Surat	• He represented by stating that the project is going to be established in between L&T compound in private land. Which method will be adopted for Storage of raw material like coal, gypsum, clinker so that surrounding people and the employees of the company will not get affected by the dust?	• Raw material of the proposed project will be stored in closed yard and will be sent to the mill through closed belt conveyor. Hence, whole material handling system will be closed so there will be no issue of dusting.	Allocated under capital cost.
		• How coal will be stored? • As closed material handling system is proper because there is a possibility of fire.	• Sprinkler System and Firefighting System will be installed in coal yard.	15 Lakhs
		• Dust emission from stack or silo will be 5% to 10% up to how many kilometer will it effect?	• Air Pollution Control Equipment will be installed to control dust emission and it will be limited to company premises. Moreover, greenbelt will be developed so that no dust will be spread outside the premises.	752.15 Lakhs has been allocated as capital cost and 85.00 Lakhs/annum as recurring cost for Air Pollution Control Devices.
		• What actions will be taken for dust emission from packing plant? • What actions will be taken for deposition of dust in cement plant, on the road and surrounding area?	• Packing Plant of the proposed project will be totally automatic. Bag Filter will be installed for Material Handling System of packing plant as mentioned in the table which will cover transfer point. Dusting will be terminated due to installation of bag filter.	752.15 Lakhs has been allocated as capital cost and 85.00 Lakhs/annum as recurring cost for Air Pollution Control Devices.
		• There is grinding furnace in the plant which will generate noise. How will • It affect health of the surrounding people and employees of the plant?	• Cement grinding process is being carried with two technologies. One of the technology is Ball Mill technology in which grinding media remains in the mill which generates much noise. Cement grinding mill of the proposed project is based on Vertical Roller Technology in which no grinding media is used. Table	Cost is considered under the capital cost.

			centrally rotates and grinding is carried out with three rollers' press. Due to this new technology level of noise pollution will be negligible.	
		• How many percentage of local people will be employed in the proposed project? Give in writing. Give priority to local people as technician, welder, fitter, operator or any other job.	• Your suggestion is welcomed. Our approach will be of giving priority to locals for employment and priority will be given to skilled and semi-skilled workers as per their qualification. Utmost preference will be given to locals for employment.	Considered under the operational Cost.
		• This company will bring its raw material from Adani Port. At present 700-800 trailers are running on 20-30 feet road. There is only one approach road for L&T companies which don't have a traffic circle. So there is possibility of accident. Road should be extended and circle should be made from Hajira Highway to L&T Company. 2 million ton material will be brought to this plant and roads are not sufficient for the same. What action company will initiate?	• Our requirement is of 2 Million Ton per annum and it will be transported once in a month. So it will not create any effect. Though we will follow speed limit, road site and traffic rules.	Considered under the operational Cost.
		• If any employee recruited from outside in future, please be precautious and take care that no antisocial activity being carried out.	-	-
		• Development of greenbelt is shown only within company premises and pollution spreads outside the campus as well. What action company will initiate for conservation of environment of surrounding villages?	• We will carry out plantation in our internal premises and budget is also allocated for avenue plantation in CER for the same. We will clean our internal roads with the help of sweeper machine.	55.00 Lakhs has been proposed for the Plantation under CER.
		• Nav Chetan Sports Academy has been approved by the Government of Gujarat in Shivrampur and hostel facility has to be augmented in the said Academy. How much fund will be allocated in CSR for the same?	• It will be worked out in coordination and discussion with villagers.	Already allocated Rs. 70.00 Lakhs under CER

2.	Shri Pravinbhai Patel, Member Taluka Panchayat, Village : Bhatlai, Dist. : Surat	• He represented by stating that he has been president of Hajira Kaantha Vistar Samiti for the last 15 years and I have welcomed many industries in Hajira and have experienced many positive and negative incidences. • There is a cement project beside Reliance Company. They stated that their conveyor belt will be close system. But it is not shown whether the same is open or close in the proposed project? • Company reported that they will plant 4000-5000 trees. But they have not planted even 10 to 50 trees till date. It is company's responsibility to take care of humans as well. • We should be compensated because we sacrifice, we suffer pollution, we suffer accident. We are benefited from Reliance Company. We welcomed CPP plant. There is not pollution from CPP Plant • Cement factory have recruited 85 persons from outside and not even our 4 persons recruited. So we request the company to adhere to their commitment. Country will progress due to the industries but basic needs of the people should be satisfied. • We welcome that company will use recycled water. So no water will be discharged outside the premises. As per your statement Rs.482 Lakh per year will be spent in CER activities. Will it be carried out? • I request Hon'ble Collector that plantation should be carried out in fallow land around Notified Area. Because it is necessary to reduce the pollution. • We asked tree guards from office of	• We welcome your suggestion of greenbelt development. It is responsibility of all of us conserving environment along with industrial development. We are new to this area and we are committed to develop the greenbelt with your suggestions.	Rs. 55.00 Lakhs has been allocated under CER.

		Notified Area for planting trees in the villages. But they insisted to contact SUDA as it does not falls under their scope. It is the responsibility of Notified Area Committee. • NTPC have grown trees in 10 acre of land. • Navsari receives much rain which is at the distance of 40 Kms. and rainfall in Hajira is much lesser. What is the reason for the same? Company should do something.		
3.	Shri Dharmendra Bhikhubhai Patel Hajira Gaam Sarpanch District: Surat	• He represented that we welcome this plant and we have also welcomed many large companies. But as time passes, all the companies do not adhere to their commitments. • Company should take care of local issues such as water, pollution, education and employment.	• People in the vicinity of the company will be preferred for employment according to their qualification and skill.	Cost considered under the operational cost.
4.	Shri Dhansukhbhai Kantibhai Patel Village: Kawas, Ta: Choryasi, District: Surat	• He introduced him and represented that company is established after the public hearing and then it has to be inspected by GPCB. There are 10 to 12 large companies in the Hazira area. The equipment which has installed by the company, the report for the same should be sent to the village panchayat. So that people know that in which air and ground they are living. • I like the hospitality of this company and it is sad that there is such a big company in our area that has millions of turn overs. And the Government of Gujarat gets income from the ESIC Hazira Industries, but even there is no	• We will cooperate fully according to planning of our Budget for medical facilities.	Already covered under operation cost.

		small hospital in our area. Due to which 10 to 12 people die every year and there is no facility of 108 in our area. So we request that 108 ambulances should be placed by the Sanghi Charitable Trust so that people get immediate treatment. • Dhulia to Hajira Highway has been fixed as but the route from ONGC cross Road to Kawas is more important which has not been built yet. It has been stopped by petition and stay so I request you to take necessary steps for the same.		
5.	Shri Chhotubhai Ramubhai Patel, Sarpanch Vatlai, President Hazira Katha Vistar, Vill.: Vatlai, Ta.: Choryasi, Dist.: Surat.	• He represented that, rules of pollution are not followed properly, which should be taken care off. Regarding employment, give us in writing. In Hazira, Shivrampura water problem is very high. It is our demand to provide water facility through canal to Junagam, Rajgiri and Suvali by the company or any other.	• Regional Officer replied that, I assure you that if I will get the complaint regarding the non-compliance of the rules for prevention of pollution I will take immediate action against the responsible company as per the environmental laws. • Company's representative replied that, air pollution control equipment is to be installed for the operation phase will control the pollution and monitoring report will be forwarded to the competent authority. Planning has been made for control of pollution by project, its regular monitoring will be carried out and report will be forwarded to the authority.	Cost considered under the operational Cost.
6.	Ku. Avani Joshi Environmental Engineer, Representative of L&T Company, Dist.: Surat	• She represented that, beside this company near gate no. 20, under the project of Government of India there is armor system project in which A.S.C. K-9 Vajra, self-propelled gun is manufacturing is in process and the same will be in process for further more years. What will be company's provision if the issue regarding the quality of the abovementioned project arise due to the dust particle spreading out of company	• Regarding the issue, as mentioned in E.M.P. prevention and dust pollution control steps which is required to be taken will be taken. Continuous monitoring will be carried out to prevent the pollutants to spread beyond company's boundary. •	54.00 Lakhs has been allocated as capital cost for Environmental Monitoring Program

		or due to air pollution by the grinding unit along with E.M.S. system.		
		• It is mentioned that transportation of the fly ash and slug will be carried out by road. So from which thermal power plant will you bring the same.	• Fly ash will be taken from nearby company's captive power plant and Ukai thermal power plant. Slag will be sourced from nearby steel company. •	Cost considered under the operational Cost.
		• As a fuel pet-coal, coal and lignite is mentioned, so out of that which fuel will be used more?	• We will use mix fuel in which there will be 10% pet-coal, 40% lignite and remaining important coal.	Cost considered under the operational Cost.
7.	Shri Dipakkumar Dhansukhbhai Patel, Vill.: Damka, Ta.: Choryasi, Dist.: Surat	• He represented that, as per the law of Gujarat government there is a rule to provided 80% employment to local people. In that 80% whole Gujarat is considered. Out of those 80% some percentage should be reserved by the company for the employment for the people of 10 k.m. radius.	• We will give priority to the local people in employment in the company as per rules and regulations.	Cost considered under the operational Cost.
8.	Shri Kalpesh Raghubhai Patel, Vill.: Junagam, Ta.: Choryasi, Dist.: Surat.	• He represented that, we are welcoming the plant to be established here by the Sanghi Industries. But there is problem of employment over here since many times. So, I hope that employment to the local people will be given. Priority to the local people will be given for transportation and contract works. • It is small plant and around 150 to 200 workers will be employed in it. We hope that, no obstacle will arise to the people residing nearby, there will be conservation of the environment and local people get the employment.	Company's representative replied that, your suggestion is welcome and priority will be given to the local in employment.	Cost considered under the operational Cost.
9.	Shri Dhansukh B. Patel, Vice-Sarpanch, Vill.: Rajgari, Ta.: Choryasi, Dist.: Surat.	• He represented that, company gives priority to the village in which it establish. There are 11 villages within the radius of 10 km from the company, it is our request to cover all those villages under the CSR activity and give priority to them.	• All the villages are covered under the CER activity of the company.	

S.No.	CER Activities	Cost (Lakhs)
1.	Drinking water facility in nearby village	75.00
2.	Up-gradation and hygiene facilities in nearby village	149.00
3.	Plantation in	55.00

				community areas	
				4.	Training and Awareness Program	75.00
				5.	Education/Sports & Farming related activities	70.00
				Total		**424.00**
10.	Shri M.H.Sheikh Ta.: Olpad, Dist.: Surat.	• He suggested that, CZMP are built on coastal belt. In Surat city there are 3% of trees of Gujarat state. Which is very low and the same condition is in SUDA too. Waste land in the Shivrampur should be allotted to any organization or Panchayat by the collector for development as a forest or selecting 10 to 15 hector land in any village and allot it legally for toddy plantation which have been lost these days.	-	-
11.	Shri Ramesh J. Patel, Hazira Katha Vistar Mahamantri, Vill.: Shivrampur, Ta.: Choryasi, Dist.: Surat	• He represented that, this is cement factory and our residence is near to this plant. Proper steps to be taken to prevent the situation of this area to turn in future alike situation in Hazira due to establishment of plant over there. There should be solution of the pollution in the area. Junagam, Shivrampur, Suvali and Rajgari village didn't get canal water. Farming or animal husbandry which is main occupation over here can be carried out in this village only if the water is available in lake of village. Those occupations are destroying. Animal fodders are not available here. Employment is not provided to local. Application to declare our village as Gamtal is pending since many year which is not taken into consideration. So, it should be taken into consideration and our village to be declared as Gamtal and inhabitant.	• Regional Officer informed that, complaint us regarding the pollution, action will be taken on the same. This is not proper forum for representation regarding SUDA but it will covered under public hearing proceedings. • Company's representative replied that, high efficiency APCM will be installed and will be operated with regular maintenance. Even then whatever new technology will be available, company will upgrade and care will be taken to prevent pollution.	752.15 Lakhs has been proposed as capital cost and 85.00 Lakhs/annum for Air Pollution Control Devices.

12.	Shri Pravinbhai Patel, Member of Taluka Panchayat, Vill.: Vatlai, Dist.: Surat.	• He represented that, there are many industries in this area but if ESIC facility will be provided it will be better. ESIC have authorized some hospital accordingly hospital near to this area should also be authorized so that people can get immediate medical treatment.	• Regional Officer informed that, this is not proper forum for your representation but it will be covered under public hearing proceedings.	-
13.	Shri Kalpesh Raghubhai Patel, Vill.: Junagam, Ta.: Choryasi, Dist.: Surat.	• He represented that, ESIC file is pending since 11 year. We have demanded for allot the same in Suvali village. It is our request to construct fire safety station and big hospital.	-	-
14.	Shri Deven Patel, Farmer of Shivrampur, Suvali and Vatlai, Dist.: Surat.	• He represented that, we are welcoming Sanghi cement in this area. Employment opportunity should arise through this company and there should be financial and social development of this area.	-	-

After the discussion the public hearing was ended with vote of thanks to the chairperson and the public.

7.3 RISK AND HAZARD MANAGEMENT

It is presumed that the standalone grinding unit at Shivrampur, Surat will design and engineered with all possible safety measures and standard code of practices of engineering. In spite of this, some design deficiency or operation and maintenance fault may lead to accidental events causing damage to the life and property. This chapter presents an overview of risks associated with the production facilities, suggested remedial measures and a model outline of the emergency preparedness plan. The objectives of environmental risk assessment are governed by the following, which excludes natural calamities:

• To identify the potential hazardous areas so that necessary design safety measures can be adopted to minimize the probability of accidental events.

• To manage the emergency situation or a disastrous event, if any, from the plant operation.

Managing a disastrous event will obviously require prompt action by the operators and the crisis management personnel using all their available resources like alerting the people and other plant personnel remaining inside, deployment of firefighting equipment, operation of emergency shut off valves, opening of the escape doors, rescue etc. Minimizing the immediate consequences of a hazardous event include cordoning off, evacuation, medical assistance and giving correct information to the families of the affected persons and local public for avoiding rumors and panic. Lastly, an expert committee is required to probe the cause of such events and the losses encountered and suggest remedial measures for implementation so that in future such events or similar events do not recur.

7.3.1 Identification of Hazards

The hazards are attributable due to raw materials used in cement making and the plant operation. A list of major raw materials used in the plant and the process units with their hazard potential is presented in **Table 7.1.**

Table 7.1 Hazard Identification of the Proposed Grinding Unit

S.No.	Group	Item	Hazard Potential	Remarks
1.	Raw materials and products	Clinker, Chemical Gypsum, Mineral Gypsum, Coal, Slag	None Moderate None Major Moderate	- Fire - - -
2.	Processing			
ii	Raw material Grinding	Dust	Moderate	Environmental Pollution
iii	Cement Grinding	Dust	Moderate	Environmental Pollution
3	Utilities			
	Electric power Supply	Short circuit	Major	Fire

From the Table, it may be observed that the major on-site emergency situation may occur from the raw material storage and handling, fuel gas handling and electrical short-circuit. The off-site environmental disaster may occur if large-scale fire and explosion occurs, the effect of which extends beyond the plant boundary. The off-site environmental disaster may occur due to significant environmental degradation for a sustained period.

7.3.2 Environmental Risk Evaluation

From environmental hazards point of view for the raw materials and processing of the same in various production units, relative risk potential analysis is made on the following three factors:

• Likelihood of occurrence
• Likelihood of detection
• Severity of consequences

Each of these factors is graded and compiled to determine the risk potential. The factors governing the determination of relative risk potentials are presented in the **Table 7.2.**

Table 7.2 Determination of Risk Potential

Likely hood of occurrence (A)		Likelihood of detection (B)		Severity of consequences (C)	
Criteria	**Rank**	**Criteria**	**Rank**	**Criteria**	**Rank**
Very High	5	Very High	1	None	2
High	4	High	2	Minor	4
Moderate	3	Moderate	3	Low	6
Low	2	Low	4	Moderate	8
Very low	1	Very low	5	High	10

Risk Potential (RP) = (A+B) X C

Based on the above stated criteria for assessing the risk, each probable event has been evaluated by addressing several questions on the probability of event occurrence in the view of the in-built design features detection response, operational practice and its likely consequence. A summarized list of environmental risk potential for the likely events is presented in **Table 7.3**. This evaluation has been done with the presumption of common events as observed from the past experience in the operation of different industries and best practicable designs for the proposed project. The present risk potential evaluation is primarily based on human errors or faulty operation or failure of the control systems.

Table 7.3: Environmental Risk Potential Evaluation

S. No.	Event	Likelihood of Occurrence	Likelihood of Detection	Severity of Consequence	Risk Potential
1.	Fire at the coal Stockyard	Very low (1)	High (2)	High (10)	30
2.	Uncontrolled dust emissions/ failure of Emission control System	High (4)	High (4)	Moderate (8)	64
3.	Occurrence of static Electricity/electric spark in the preheater/Kiln	Very low (1)	Very Low (5)	High (10)	60
4.	Machinery Movement	Low (2)	Moderate (3)	High (10)	50

From the table above, it appears that some events carry risk potential above 50. These events will be considered as risk prone and hazardous events and need adequate safe design operation and maintenance in order to reduce the risk. Emergency Electrical Switch shall be provided in Emergency control room for electrical supply cutoff of entire plant in case of emergency.

7.3.3 Risk Management Measures

The Risk management measures for the project activities require adoption of best safety practice at the respective construction zones within the Works boundary. In addition, the design and engineering of the proposed facilities would take into consideration of the proposed protection measures for air and water environment.

7.3.4 Nature of Hazard

After going through the different process, it was observed that fire hazard is considered as high risk and most probable reason for emergency. The onsite emergency plan shall prepared to deal with fire hazard inside the plant in order to save the life and property.

Causes of Fire

Short circuit, Welding operation, Lightening and ignition due to the inherent heat in coal stack yard during summer are the probable causes of fire disaster.

7.3.5 Electrical Safety

Adequately rated and quick response circuit breakers, aided by reliable and selectively digital would be incorporated in the electrical system design for the proposed project. The metering and instruments would be of proper accuracy class and scale dimensions.

7.4 DISASTER MANAGEMENT PLAN

In a plant like this one, it is imperative that accidents occurring due to unforeseen acts and events will not affect the surrounding areas. Therefore an onsite emergency plan for prevention and mitigations of accidents will be enough to cater for unforeseen acts and events that may occur. Apart from onsite, off-site emergency plan is also required to prevent any mis-happening.

Industrial Safety and Fire Fighting

For protection of working personnel, equipment and machineries from any damage or loss and to ensure uninterrupted production, adequate safety and firefighting measures will be planned for this project. Important provisions are as follows:

- Provision of adequate personal safety appliances to workers engaged in hazardous installations
- Provision of detection and alarm system to allow a developing fire to be detected at an early stage.
- Provision of water spray fire extinguishing system and portable extinguishers using carbon dioxide or chemical powder.

Portable Fire Extin guishers: All plant units, office, buildings, stores, etc. will be provided with adequate number of portable fire extinguishers. The distribution and selection of extinguishers will be done in accordance with the requirement of fire protection manual.

Fire Hydrant System: Internal hydrants will be provided at suitable locations and in different levels inside the plant buildings. Yard hydrants will be provided in the vicinity of plant unit, normally along the road to meet the additional requirement of water to extinguish fire. The proper pressure of water in the hydrant network of the road level will be maintained.

Fire Statio n: One fire station in Hazira, which provide the necessary assistance required for fighting fire in any of the plant units and associate premises with requisite augmentation. The equipment like water tender, portable pump, Wireless set, Hoses will be provided in fire station. The safety appliances like, Industrial safety boots, Industrial helmets, Hand gloves, Ear muffs, Welders screens and aprons etc. will be provided for the personnel exposed to the different types of hazards in various plant units.

7.4.1 On Site Emergency Preparedness Plan

This plan will be specific to the needs of the plants *i.e.* size, complexity, nature and quantum of hazard. Instruction and information will be inculcated among SIL employees to be strictly followed during emergencies as per the situational demand.

Objective of Onsite Emergency Plan

The main objective of the plan is to take immediate actions to meet any emergency situation for speedy and efficient rescue and relief operations. The major steps during an onsite emergency plan are described below:

i. To define the hazards and assess the risk and identify the Maximum Credible Loss Scenario (MCLS);
ii. To outline facilities provided and the organizational response to control and containment risks arising out of loss of containment of flammable liquids and resultant fire;
iii. To outline the responsibilities and functions of the key members of the emergency response team, to safeguard other employees, the people living in the surrounding area and environment.

iv. To conduct regular emergency response drills to train employees as per the responsibilities assigned to them to ensure prompt emergency response.
v. Rescue and treatment of the casualty;
vi. Safeguard people; (both at site and neighborhood);
vii. Rehabilitate the areas affected;
viii. Provide information to media and government agencies;
ix. Preserve records/equipment for subsequent inquiry;
x. Ensure rapid return to normal operation after emergency.

Alarm and Communication S ystem: In case of emergency, the Plant Manager shall declare emergency after assessing the situation. The evacuation, head count and other necessary arrangements will be performed under the guidance of safety Officer. Alarm (Sirens) will be raised by the Security personnel on the main gate of each site after receiving instructions from Plant Manager.

Table 7.4: Alarming System at Plant Site

S.No.	Type	Duration
1.	Normal Plant Siren (Shift Siren)	Continuous 30 Seconds
2.	In case of Fire and Other Emergency	15 Seconds ON 5 Seconds OFF, same shall be repeated for a continuous period of 3 minutes. Thus, 9 times ON and 8 times.
3.	All Clear Signal	Continuous 1 Minute

Besides, to alert other people during the emergency and also during situation of power failure, people have been instructed to run to / send messengers to various departments shouting emergency. A reliable and prompt communication system is extremely important in controlling a major emergency. Corrective action can be initiated in time only, if information can be passed on to key personnel quickly.

Equipment Checks: All firefighting equipment like valves, fire hydrants, pumps, monitors, etc., will be checked weekly to detect defective parts and such parts would be immediately replaced.

Mock Drills and Rehearsing: Emergency plan will regularly communicated to all personnel in order to clarify ones roles and responsibility during emergency and accident situations. The plan will be tested by simulating probable emergency situations, wherever practicable; the Frequency of carrying out the mock drills shall at least once in a quarter. These mock drills bring out improvement opportunities in the plan and ensure that appropriate actions shall be taken in real life situation. Observers will posted at different sites who verify the effectiveness of the emergency preparedness like communication, response actions, roll call, mitigation etc. Records pertaining to the same will be maintained.

Emergency Plann ing for Disas ter due to Fire: Coal storage, cable rooms, transformer unit, auxiliary transformers, etc., within the plant are the likely area for which plan will outlined to deal with any eventuality of fire. Stores, workshop, dining area and administration building will have also been included.

Classification of Fires

i. **Class A -** Fire due to combustible materials such as wood, textiles, paper, rubbish and the like.
ii. **Class B -** Fire in flammable liquids like oil, elements, paint etc.
iii. **Class C -** Fire arising out of gaseous substances.
iv. **Class D -** Fire from reactive chemicals, active metals and the like.
v. **Class E -** Fire involving electrical equipment and delicate machinery and the like.

Fire Fighting Methods: To deal with fires - other than carbonaceous fires, which can be dealt with by water-suitable fire extinguishers is required to do the job effectively. Adequate number of fire stations is to be established with the following types of equipment and arrangements:

- CO_2 Extinguishers,
- Dry chemical powdered type,
- Foam type extinguishers,

- Fire buckets,
- Fire hydrant hoses.

Fire Fighting System

A state of the art fire-fighting system is proposed for the project to prevent and control fire outbreaks. The firefighting system will consist of portable fire extinguishers, hose reel, wet riser, yard hydrant, automatic sprinkler system, and manual fire alarm system. The proposed buildings will also be provided with automatic fire detection and alarm system.

The fire and safety consideration will be as per the applicable National Building Code 2005 and stand industry practices. Important component are mentioned below.

- Provision of hose reels, external hydrants and wet risers
- Provision of firefighting water storage tank
- Provision of overhead water storage tank on buildings
- Provision of firefighting pumps with hydrant lines.
- HT and LT panels will be protected with manually operated CO_2 protection system.
- Automatic sprinklers will be installed in fuel handling system
- Portable fire extinguishers shall be provided at strategic locations
- Automatic fire detection system *i.e.* smoke/ heat detection system shall be provided in the buildings at appropriate places. The system will be connected to the fire alarm system

The proposed fire hydrant layout is attached herewith and firefighting equipments are given in below table:

S.No.	Firefighting equipment's	Qty	Remarks
1.	Single outlet hydrant points	27 Nos.	Plant and RMH area
2.	Water Monitor risers points	04 Nos.	Fuel storage yard & HAG
3.	Hose reels – 60 meters	10 Nos.	Fire prone area
4.	Fire extinguisher – CO2	63 Nos.	Strategic locations
5.	Fire extinguisher – DCP	85 Nos.	Strategic locations
6.	Fire extinguisher – Foam	25 Nos.	Strategic locations
7.	Fire buckets	12 Nos.	Strategic locations
8.	Automated sprinkling system	02 Nos.	Fuel handling conveyors
9.	Smoke / heat detection system	03 Nos.	PP bag godown, CCR & Admin buildings
10.	Manual system- CO2 protection	01 Nos.	Electrical panel room
11.	Emergency response station	01 Nos.	With trained firemen staff

SIL will be provided below mentioned firefighting equipment and fire hydrant system for the expansion and Fire Layout plan is mentioned in **Figure 7.1.**

Table 7.5: Proposed Fire Hydrant Points and Risers

Particulars	Units
Single outlet Hydrant valve	27 Nos.
Water Monitor	4 Nos.
Hose Box	25 Nos.

Table 7.6: Fire Extinguisher Statement

Summary for Fire Extinguishers	
Type	**Grinding Unit**
CO_2	20
DCP	90
Foam	11
Total Result	**121**

Table 7.7: List of PPEs

S.No.	Personal Protective equipment	Parts to be protected	Proposed Qty
1.	Industrial safety Helmet (IS 2925-1975)	Head	150 Nos.
2.	Face Shield with replaceable acrylic visor (IS:8521-1977)	Face	15 Nos.
3.	Zero Power Plain goggles with cup type filters on both ends (IS:2553-1977)	Eyes	80 Nos.
4.	Zero Power goggles with cup type filters on both sides and blue color glasses (IS: 2553-1977), Welders equipment for eye and face (IS: 1179-1967).	Eye	50 Nos.
5.	Cylindrical type earplug (made from foam) Ear muffs (IS:9167)	Ear	150 Nos.
6.	Dust Respirator with Filter Canister Gasmask (IS:8523)	Respiratory	90 Nos.
7.	Safety Belt/Line man's safety Belt (IS:3521)	Body	50 Nos.
8.	Leather Hand Gloves (IS:6994-Part-1-1973) Asbestos Hand Gloves Lead Hand Glove Electrically tested electrical resistance Hand Gloves (IS:4770-1968)	Hand	35 Each
9.	Industrial safety shoes with steel toe (IS:5852)	Foot	150 Nos.

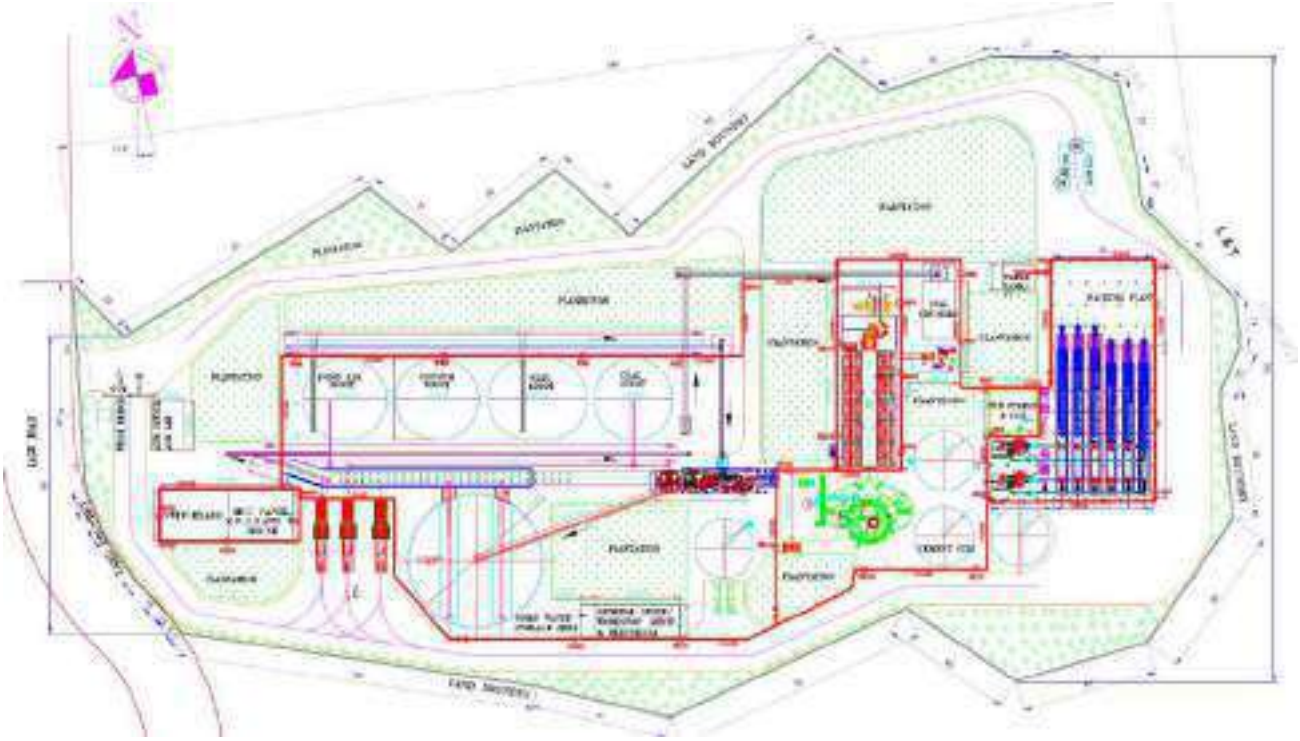


Figure: 7.1 Fire Layout Plan

Key perso nnel and Responsibilities: These are individuals nominated to take specific responsibilities during an emergency:

Emergency coordinator: Takes full charge at the site of the incident and directs all the efforts. His main responsibilities during an emergency shall be to:

- Assess the situation, decide and activate the emergency procedure;
- Take actions for controlling the incident, securing the safety of personnel and minimizing damage to environment, plant and material;
- Direct the rescue and firefighting operations at site;
- Co-ordinate with emergency services at site;
- Search for causalities and arrange for proper first aid for them;
- Evacuate non-essential persons from site to safe location;
- Ensure good communication with Emergency Control Centre;
- Preserve evidence for inquiry.

Rescue Operations coordinator: Takes decisions affecting the whole works. Overall responsibility of directing emergency actions from the Emergency Control Centre.

Main responsibilities include:

- Assess situation and decide and initiate actions if not done already;
- Ensure proper communication to inside and outside emergency services including
- Fire services and Ambulance;
- Take direct operational control of works area not affected by the incident;
- Determine probable course of events and review the situation to initiate actions accordingly;
- Direct shutting down of plants and evacuation of personnel;
- Control traffic movement;
- Arrange to keep a record of incidents;
- Arrange communication with media and government agencies;

Other Key personnel and Essential workers nominated to play an active role during an emergency.

- **Senior Exe cutives -** To assist rescue operation coordinator in his various responsibilities and report to the Emergency Control Centre.
- **Operators** required for shutting the plants safely within stipulated time
- **Emergency Engineering Staff** including Safety Executives

- **Public relations staff**
- **Roll call leaders**
- **Traffic controllers**
- **Running messengers**

Emergency Control Center: The separate unit in admin building will designated as the Central Control Room and it will be a safe place from where the Rescue Operation Coordinator directs emergency actions. The Main Center Following facilities will be provided in the emergency control center:

- Important external and internal telephones numbers and address;
- Wireless sets;
- Nearby area location map;
- A detailed plan of the works showing hazardous area,
- Location of safety equipment, layout of firefighting system, assembly points, possible escape routes.
- Adequate writing pad, paper and pen;
- List of key personnel, first aiders, fire fighters and other essential personnel;
- Shift schedule of employees;
- Action and co-ordination plan on site.

To control and contain an incident it is necessary to take appropriate decisions at site and act accordingly. Following aspects will be considered for this purpose:

7.4.2 Action and Coordination at Site

Evacuation: In order to evacuate non-essential personnel, assembly points will be made in safe areas. A final decision on evacuation will be taken depending on type and location of the incident. Necessary safety communication system will be available at these points. Persons will be designated in the plan to take roll call in these assembly points, keep in touch with the Rescue Operation Controller to decide course of action and guide personnel at the point accordingly. Emergency Evacuation plan is shown in **Figure 7.2.**

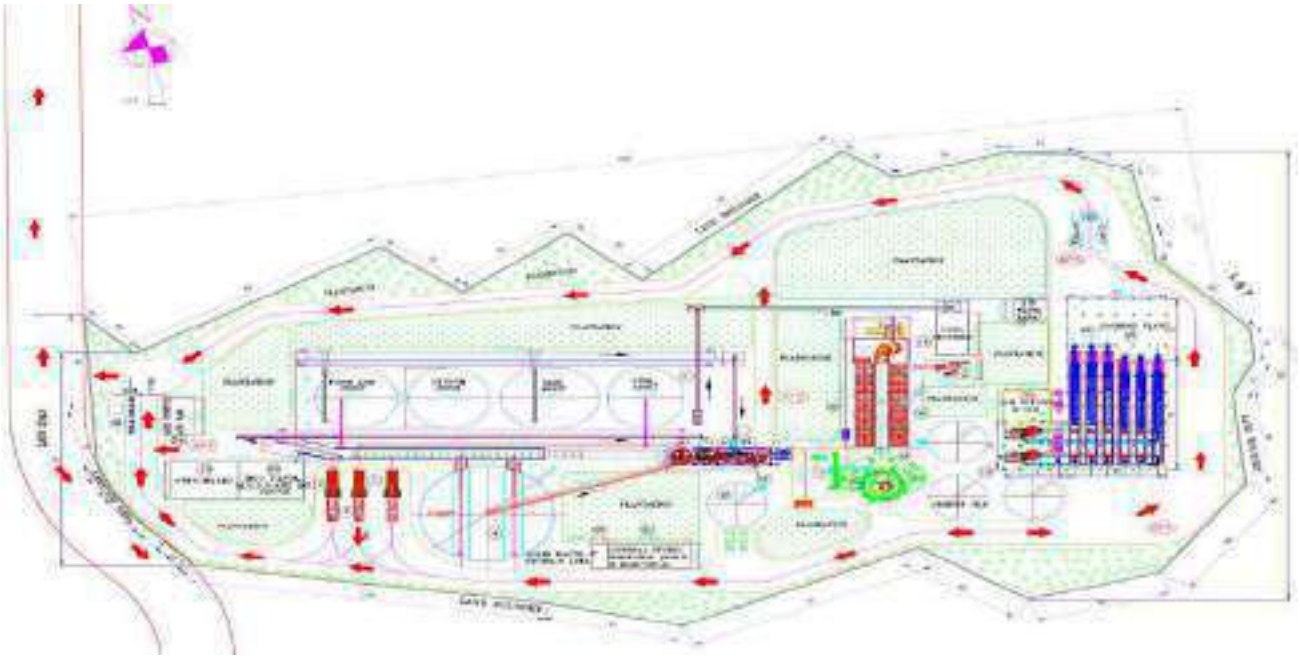


Figure 7.2: Emergency Evacuation Plan

Accounting for personnel: Though is a difficult task in large installations, it is important to ensure safety of people inside works. A key person at the Emergency Control Center shall be responsible to contact various Assembly points and account for all the people in the works.

Rehabilitation: After bringing the incident under total control, care is required while recentering the affected area. Government agencies also may require that nothing be disturbed till they have done their inquiry. Safety committee members will take a leading role in the above areas.

7.4.3 Post Disaster Management

In case of Fire emergency, the same shall be extinguished using the appropriate type of fire extinguisher and the debris shall be collected and buried at a safe site. In case water is used, then the firewater will be re-used after necessary treatment e.g. diverting to soak-pits etc. The people in the assembly area shall also be informed for resuming work and normal operation. Besides, a meeting of the Management and Safety Committee, the outcomes will be convened to analyze the actions taken and loss encountered, suggesting/ incorporating any corrective and preventive mechanisms and for modifying the Emergency Plan.

7.4.4 Mutual aid and Communication with External Agencies

In a major emergency situation the resources available at the internal source may not be sufficient and external help may be required. The resources, with the emergency services like fire department, hospitals *etc*. are also generally limited. These services may not have enough special equipment like breathing apparatus, special foams, etc. to fight emergency. This constrain on resources, can be overcome in an area where other industries are situated, by a mutual aid scheme. These industries can set up a good communication system among them and assist each other during an emergency. Resources available with external agencies like fire services, hospitals and police, local administration, voluntary service agencies *etc*. could also be availed of proper liaison will maintained to obtain the resources available with external agencies like fire services, hospitals and police, local administration, voluntary service agencies etc.

7.4.5 Rescue Operation Coordinator

Plant Manager on hearing the information will come to clinic and take charge from shift in-charge. He will assess the situation in consultation with medical officer decide and order for shifting of victims to outside hospitals for immediate treatment or call outside Doctors for help. He will also inform the situation to at least one safety Committee Executive Member. To liaise with outside hospitals, police and district authorities for necessary immediate help and to inform statute authorities like inspector of factories and inspector of police in case of serious incidents.

Plant Medical Officer: Medical Officer on arrival to clinic discuss with canteen supervisor about the food served and asses the condition of victims with para medical team and if necessary give immediate correction of dehydration either by oral dehydration fluid or by intravenous fluids. Antibiotics therapy if the poisoning is due to inactive food material. He will also alert Doctors in nearly hospitals for keeping beds and medicines ready for immediate treatment. He will also appraise the conditions to Rescue Operation Coordinator and advice for shifting of victims to different hospitals or call other doctors to extend help.

Security Officer: To control traffic and see that the rail gate is kept open for traffic till the situation comes under control. He will control all unwanted elements entering the plant during the emergency.

Safety Engineer: Co-ordinate with Welfare Officer and supervisor to search for possible evidences and to collect samples of food and raw material for further analysis if required.

All Other Staff: Will assemble near clinic along with first aiders to help site controller for shifting victims to hospitals and informing the family members of victims.

Medical Management: Immediate correction of dehydration either by oral dehydration fluids or by intravenous fluids. Antibiotic therapy if the poisoning is due to inactive material.

7.4.6 Instructions for Handling Emergencies

Shock

- Lay the patient on his back
- Stop bleeding, if any
- Relieve pain by supporting injured part
- Keep the patient comfortable, but not hot. Do not cause sweating

- Fluids may be given in small amounts unless the patient is nauseated, unconscious,
- likely to be operated on, or has an abdominal wound
- Reassure and cheer up the patient

Wounds

Stop the bleeding by any one of the following method:

- direct pressure
- direct finger pressure into the wound in cases of large bleeding wounds
- tourniquet (seldom needed) use only as a last resort
- Avoid touching the wound with hands or unsterile material
- Clear the wound with running water and surrounding area with soap or spirit with clean gauze washing away from the wound. Apply readymade adhesive gauze bandage or sterile gauze and roller bandage as needed
- Keep the patient quiet, raising the extremity if it is the bleeding part. Give no stimulants
- Never apply antiseptic ointment, lotion or iodine or germicide to the wound.

Abdominal Wounds

- No time must be lost in sending the patient to the hospital,
- Keep the patient flat,
- Maintain warmth,
- Give nothing by mouth,
- If intestine protrude from the wound, do not attempt to touch or replace them,
- Apply sterile dressing and binder on the wounds,
- Provide careful, immediate transportation to the hospital.

Eye Wounds

- Removal may be attempted if foreign body is not embedded.
- Do not apply oil or ointment.
- If there is a foreign body embedded in the eye ball, send the worker immediately to the doctor after applying pad and loose bandage.

Suffocation

- Remove the patient from the source of danger.
- Make a rapid examination to ensure that the air passages are free and to clean then if necessary.
- Restore natural breathing by artificial respiration, if breathing has ceased.

Electric Shock

- Remove the patient from the source of danger.
- Make a rapid examination to ensure that the air passages are free (clean them as necessary).
- Restore natural breathing by artificial respiration, if breathing has ceased.

Insensibility

- Send a doctor if possible, pending his arrival.
- Where the patients face is pale, lay him flat and face downwards with hid head turned to one side. If his face is flushed or blue, raise and support the head and shoulders.
- Control any serious bleeding.
- Loosen any tight clothing and let him have plenty of air.
- Do not give anything by mouth.
- If doctor is not available send the casualty to hospital.

Back Bone (Spinal) Fracture

- Transport on a rigid frame. This frame may be improvised by using boards on a door
- The rigid frame may be placed on a stretcher for transportation.
- If a frame cannot be improvised, transport patient on abdomen on a stretcher made of canvas or blanket.
- In neck fracture cases try to get a doctor to the scene, as the danger is high.

Bruises

- Cold applications at first, 24-48 hours, Later hot, after 24-48 hours.

Burns

- Act quickly.
- Put the affected part in cold water.
- Pour the water over burns that can‘t be immersed (Cold water relieves pain, reduces fluid loss).
- Cover with a sterilized dressing.

Snake Bite

- Calm and reassure the patient.
- Immobilize the bitten limb by splinting it.
- Wash and cool the wound with soap and water.
- Do not cut, rub or suck the bite.
- Take to a doctor.
- Press hard over the wound for up to 15 minutes.
- Do not remove cloth if it has been placed.

7.4.7 Off-Site Emergency Preparedness Plan

If an accident takes place in an industry and its effects are outside the plant area, the situation thus generated is called an Off -Site Emergency. A major emergency may affect areas outside the works also and hence off-site emergency plan is an essential part of a major hazard control system. In case of an offsite emergency, The Emergency coordinator will report to the Collector of the District who is chairman of the District Emergency Committee.

An off-site plan must clearly identify an Emergency coordinating Officer as overall in-charge of all off-site actions. Well-equipped Emergency Control Centers are an essential feature of a plan. The Emergency Control Center of SIL will well equipped with the following essential documents and procedures to combat with any eventualities. These will be:

- Organization Structure,
- Command system,
- Warning procedure,
- Operational Emergency control center,
- Communication system,
- List of specialized equipment,
- List of organization and people concerned,
- Detail list of Emergency Services available nearby,
- Assembly point with evacuation plan & safe route,
- List and contact address of Medical & rehabilitation facilities available,
- System to inform public media,
- Education & Rehearsal schedule

7.4.8 Aspects Proposed to be considered in the Off-Site Emergency Plan

The main aspects, which shall be included in the emergency plan, are:

• **Organization**

Names and appointments of incident controller, site main controller, their deputies and other key personnel.

• **Communications**

Identification of personnel involved, communication center, call signs, network, lists of telephone numbers.

• **Voluntary organizations**

Details of organizers, telephone numbers, resources etc.

- **Meteorological information**

Arrangements for obtaining details of weather conditions prevailing at the time and its forecasts.

• **Humanitarian arrangements**

Transport, evacuation centers, emergency feeding treatment of injured, first aid, ambulances, temporary mortuaries.

• **Public information**

Arrangements for dealing with the media press office; and informing relatives, etc.

• **Assessment of emergency plan**

Arrangements for:

(a) Collecting information on the causes of the emergency;

(b) Reviewing the efficiency and effectiveness of all aspects of the emergency plan.

7.4.9 Role of the Emergency Co-coordinating Officer

The various emergency services will be coordinated by an emergency coordinating officer (ECO), who will designated by the district collector. The ECO shall liaise closely with the site main controller. Again depending on local arrangements, for very severe incidents with major or prolonged off-site consequences, the external control shall be passed to a senior local authority administrator or even an administrator appointed by the central or state government.

7.4.10 Role of the Local Authority

The duty to prepare the off-site plan lies with the local authorities. The Emergency Planning Officer (EPO) will appointed to do his duty in preparing for a whole range of different emergencies within the local authority area. Rehearsals for off-site plans will be organized by the EPO.

7.4.11 Role of Police

Formal duties of the police during an emergency include protecting life and property and controlling traffic movements. Their functions shall include controlling bystanders evacuating the public, identifying the dead and dealing with casualties, and informing relatives of dead or injured.

7.4.12 Role of Fire Authorities

The control of fire shall be normally the responsibility of the senior fire brigade officer who would take over the handling of the fire from the site incident controller on arrival at the site. The senior fire brigade officer shall also have a similar responsibility for other events, such as explosions and toxic release. Fire authorities in the region shall be apprised about the location of all stores of flammable materials, water and foam supply points, and fire-fighting equipment. They shall be involved in on-site emergency rehearsals both as participants and, on occasion, as observers of exercises involving only site personnel.

7.4.13 Role of Health Authorities

Health authorities, including doctors, surgeons, hospitals, ambulances, and so on, shall have a vital part to play following a major accident, and they shall form an integral part of the emergency plan. For major fires, injuries shall be the result of the effects of thermal radiation to a varying degree, and the knowledge and experience to handle this in all but extreme cases may be generally be available in most hospitals. Major off-site incidents are likely to require medical equipment and facilities additional to those available locally, and a medical mutual aid scheme shall exist to enable the assistance of neighboring authorities to be obtained in the event of an emergency.

7.4.14 Role of Government Safety Authority

There will be the plant inspectorate available in the region. Inspectors are likely to want to satisfy themselves that the organization responsible for producing the offsite plan has made adequate arrangements for handling emergencies of all types including major emergencies. They may wish to see well documented procedures and evidence of exercise undertaken to test the plan. In the event of an accident, local arrangements regarding the role of the plant inspector will apply. These may vary from keeping a watching brief to a close involvement in advising on operations in case of involvement in advising on operations.

7.5 NATURAL DISASTERS

A disaster is a catastrophic situation in which suddenly, people are plunged into helplessness and suffering, as a result, need protection, clothing, shelter, medical and social care and other necessities of life. Disasters can be divided into two main groups. In the first, disasters resulting from natural phenomena like earthquakes, volcanic eruptions, storm surges, cyclones, tropical

storms, floods, avalanches, landslides, forest fires etc. Natural Hazard identification map of Gujarat is shown in **Figure 7 .3, 7.4** and **7.5** below. The second group includes disastrous events occasioned by man or mans impact upon the environment. All disaster brings in their wake similar consequences that call for immediate action, whether at the local, national or international level, for the rescue and relief of the victims. This includes the search for the dead and injured and removal of debris and social care, the provision of temporary shelter to the homeless food, clothing and medical supplies, and the rapid re-establishment of essential services.

The objective of the industrial disaster management plan is to make use of the combined resources of the plant and the outside services to achieve the following:

- Effect the rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Identify any dead;
- Provide for needs of relatives;
- Provide authoritative information to the news media;
- Secure the safe rehabilitation of affected area;
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

In effect, it is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy.

There are no records of cyclone hazard since last 10 years in the study area .There are no any records of flood hazard in the study area found date back to 10 years.

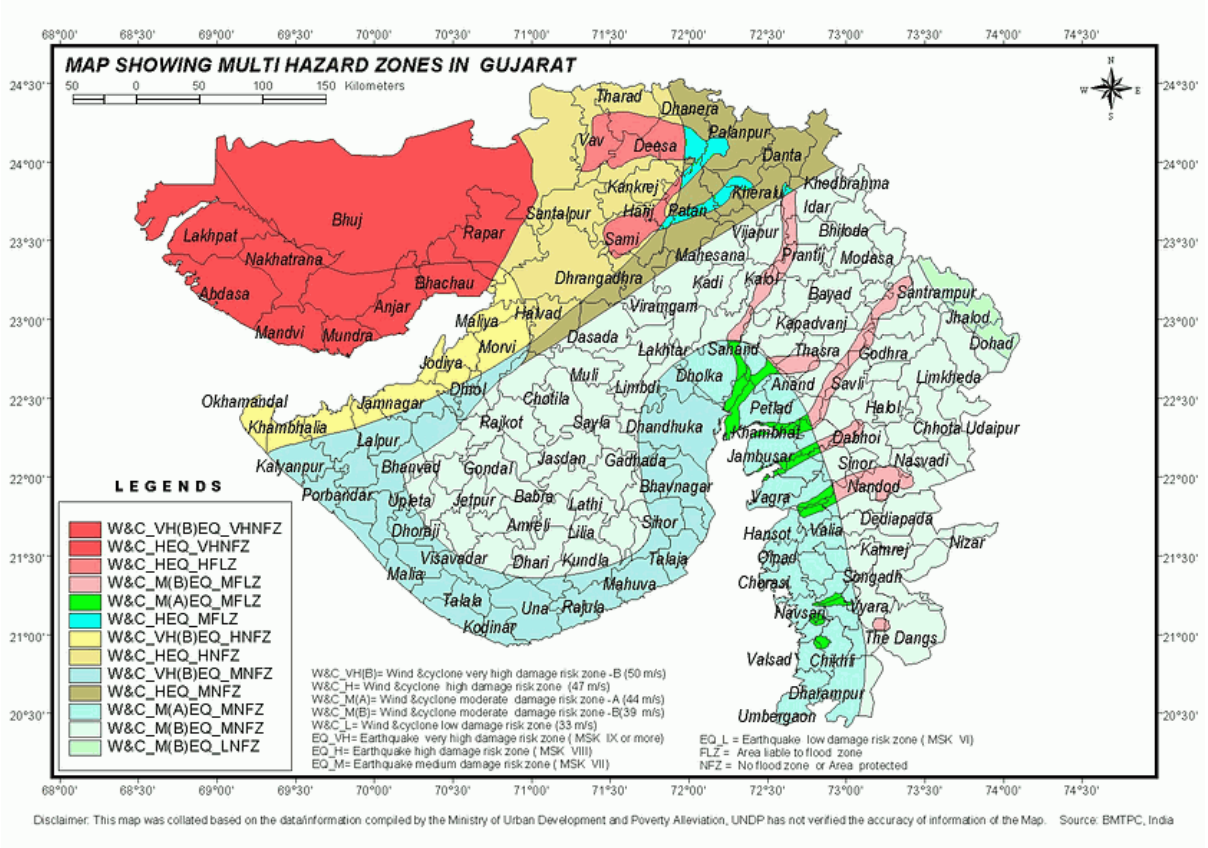


Figure: 7.3 Multi Hazard Zones in Gujarat

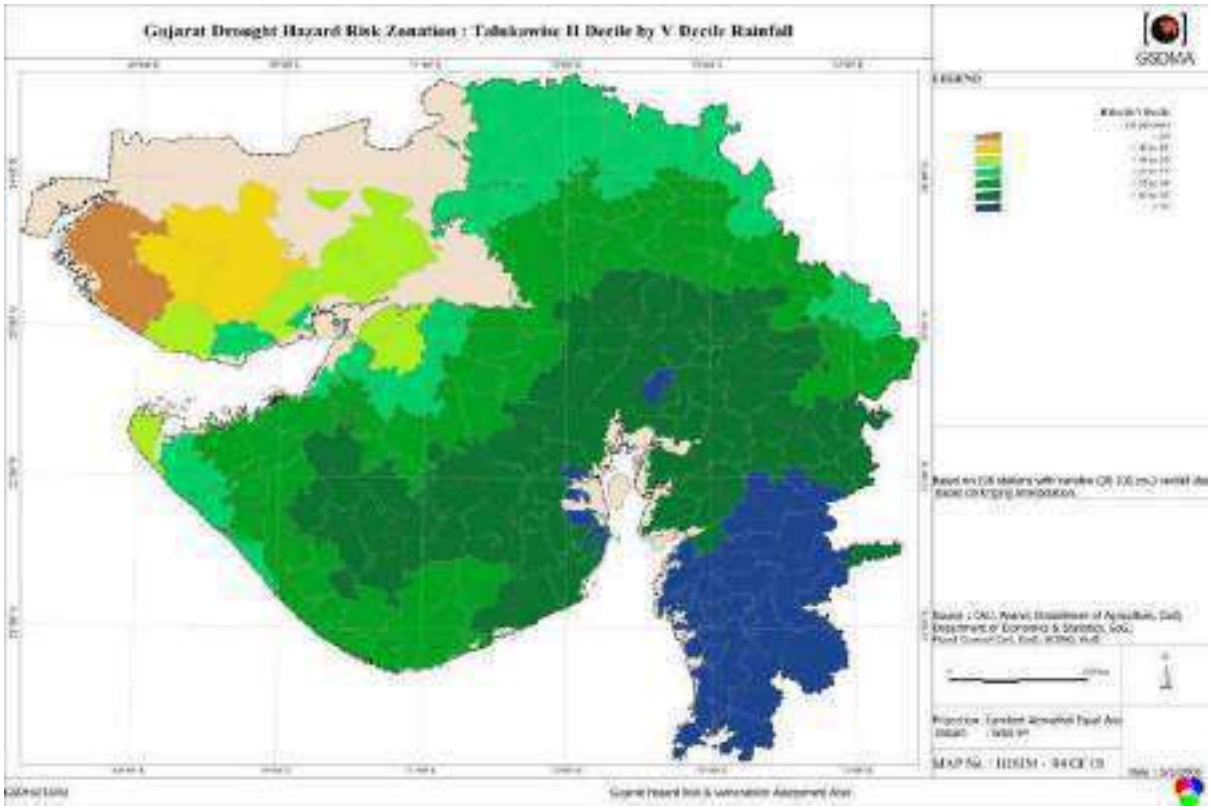


Figure: 7.4 Drought Map of Gujarat

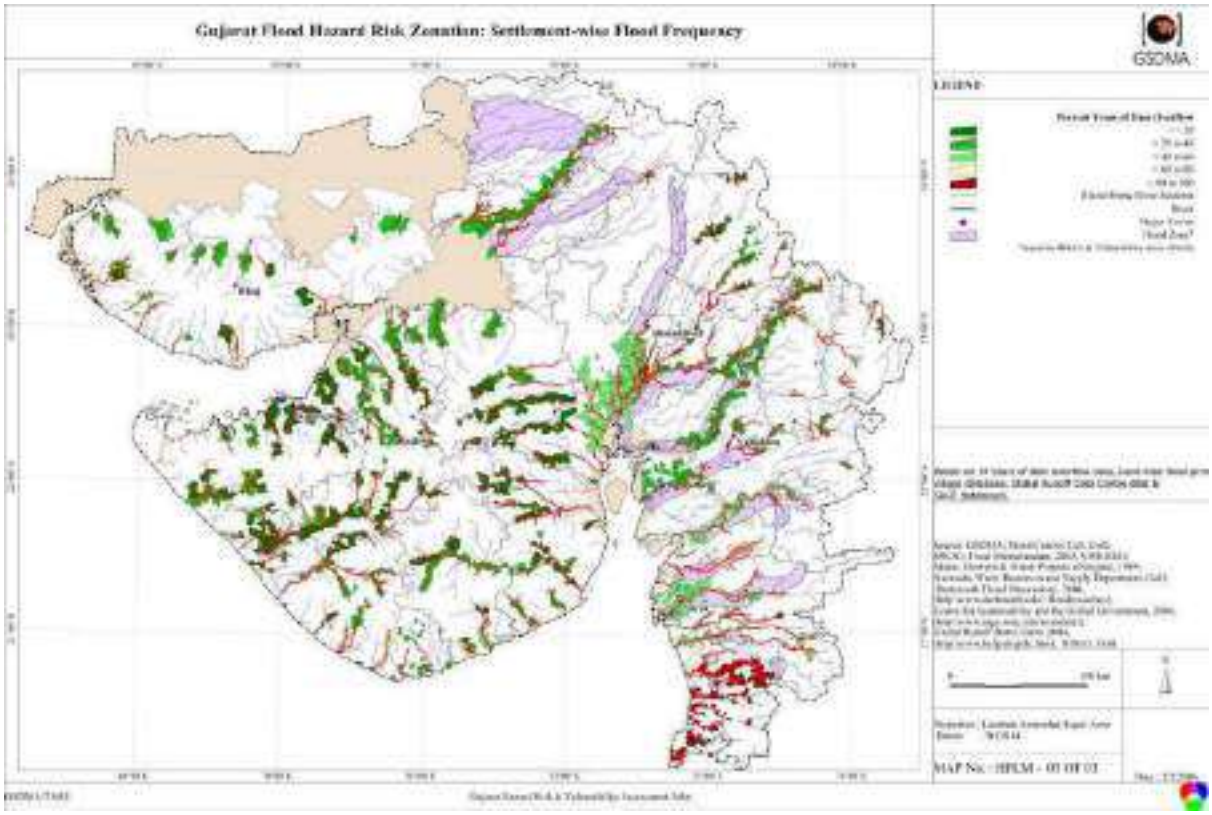


Figure 7.5: Flood Map of Gujarat

7.6 OCCUPATIONAL HEALTH AND SAFETY

Large industries, in general where multifarious activities are involved during construction, erection, testing, commissioning, operation and maintenance, the men, materials and machines are the basic inputs. Along with the boons, the industrialization generally brings several problems like occupational health and safety. The industrial planner, therefore, has to properly plan and take the steps to minimize the impacts of industrialization and to ensure appropriate occupational health, safety including fire plans. All these activities again may be classified under construction and erection, and operation and maintenance. The proposed safety plan is given below:

7.6.1 Occupational Health

Occupational health needs attention both during construction and erection and operation and maintenance phases. However, the problem varies both in magnitude and variety in the above phases.

Sanghi Cement Industries (SIL) will provide free medical consultation in OHC and round-the-clock medicinal disbursement with emergency management at nearby Health Center to all employees

• Construction and Erection

The occupational health problems envisaged at this stage can mainly be due to constructional accident and noise. To overcome these hazards, in addition to arrangements to reduce it within TLVs, personal protective equipment shall also be supplied to workers.

• Operation and Maintenance

The problem of occupational health, in the operation and maintenance phase is due to noise hearing losses. Suitable personnel protective equipment shall be given to employees. The working personnel shall be given the following appropriate personnel protective equipment.

Table 7.8 Usage of PPE with IS Code

Parts to be protected	Personal Protective equipment	Protection against
Head	Industrial safety Helmet (IS 2925-1975) Crash Helmets (IS: 4151:1976) (Red Color) Firemens Helmet (IS: 2745: 1969)	Failing Objects Head Injuries Head injuries
Face	Face Shield with replaceable acrylic visor (IS:8521-1977)	Frontal hazards against splash of chemicals
Eyes	Zero Power Plain goggles with cup type filters on both ends (IS:2553-1977)	Eye injuries due to flying objects
	Zero Power goggles with cup type filters on both sides and blue color glasses (IS: 2553-1977), Welders equipment for eye and face (IS: 1179-1967).	Radiation due to sparks/flames Radiation
Ear	Cylindrical type earplug (made from foam) Ear muffs (IS:9167)	Hearing losses (if noise level is above 85 dB)
Respiratory	Dust Respirator with Filter Canister Gasmask (IS:8523)	Inhalation of harmful dust Inhalation offensive and harmful fumes vapors & gases
	Self-contained breathing apparatus (IS:1910-1961)	Hazards of oxygen deficiency and toxic gases.
Body	Leather apron Asbestos apron Rubberized apron Acid/KPD Proof (IS:4501-1967) Lead apron Aluminized fiber glass fix proximity suit with hood and gloves Safety Belt/Line man's safety Belt (IS:3521)	Flying particles chips, hot slags etc. Heat Radiations & Contacts Contact with corrosive chemicals Radiation due to radioactivity Heat Radiation & contact with hot objects Fall from height
Hand	Leather Hand Gloves (IS:6994-Part-1-1973) Asbestos Hand Gloves Acid/KPD Proof rubbensed hand gloves	Contact with moderately hot substances/uneven surfaces Contact with hot materials.

	Canvas cum leather Hand Gloves with leather palm (IS:6994) Lead Hand Glove Electrically tested electrical resistance Hand Gloves (IS:4770-1968) – (to be purchased with the certificate)	Contact with corrosive chemicals Contact with oily greasy objects/uneven surfaces Radiation Electric shock
Foot	Industrial safety shoes with steel toe (IS:5852) Electrical safety shoes without steel toe Hunter Shoes Gum Boots Firemans leather safety boots (IS:4218 with steel toe as per IS:5052)	Crushing injuries to foot fingers Electric shock Hazards of insects etc. Injuries due to corrosive chemicals etc. Crushing injuries

Full fledge hospital facilities shall be made available round the clock for attending emergency arising out of accidents, if any.

Budget for Occupational Health & Safety

A capital Budget of **Rs. 49. 85 Lakhs** and **Rs. 18. 30 Lakhs/Annum** as recurring cost has been allocated for Occupational Health and Safety.

7.6.2 Safety Plan

Safety of both men and materials during construction and operation phases is of concern. The preparedness of an industry for the occurrence of possible disasters is known as emergency plan. The disaster in proposed plant is possible due to leakage of fuels, collapse of structures and fire/explosion etc.

Keeping in view the safety requirement during construction, operation and maintenance phases, the plant will formulated safety policy with the following regulations:

- To allocate sufficient resources to maintain safe and healthy conditions of working environment.
- To take steps to ensure that all known safety factors are taken into account in the design, construction, operation and maintenance of plants, machinery and equipment.
- To ensure that adequate safety instructions are given to all employees.
- To provide wherever necessary protective equipment, safety appliances and clothing and to ensure their proper use.
- To inform employees about materials, equipment or processes used in their work which are known to be potentially hazardous to health or safety.
- To keep all operations and methods of work under regular review for making necessary changes from the point of view of safety in the light of experience and upto date knowledge.
- To provide appropriate facilities for first aid and prompt treatment of injuries and illness at work.
- To provide appropriate instruction, training, retraining and supervision to employees in health and safety, first aid and to ensure that adequate publicity is given to these matters.
- To ensure proper implementation of fire prevention methods and an appropriate firefighting service together with training facilities for personnel involved in this service.
- To organize collection, analysis and presentation of data on accident, sickness and incident involving personal injury or injury to health with a view to taking corrective, remedial and preventive action.
- To promote through the established machinery, joint consultation in health and safety matters to ensure effective participation by all employees.

7.6.3 Safety Training

A full-fledged training center will be provided at the plant. Safety training will be provided by the Safety Officers with the assistance of faculty members called from Corporate Center. In addition to regular employees, limited contractor labors will also be provided safety training. To create safety awareness safety films shall be shown to workers and leaflets etc. Some precautions and remedial measures proposed to be adopted to prevent fires will be:

- Compartmentation of cable galleries, use of proper sealing techniques of cable passages and crevices in all directions would help in localizing and identifying the area of occurrence of fire as well as ensure effective automatic and manual firefighting operations;
- Spread of fire in horizontal direction would be checked by providing fire stops for cable shafts;
- Reliable and dependable type of fire detection system with proper zoning and interlocks for alarms are effective protection methods for conveyor galleries.
- Housekeeping of high standard helps in eliminating the causes of fire and regular fire watching system strengthens fire prevention and firefighting;
- Proper fire watching by all concerned would be ensured.

7.7 SUMMARY

Public hearing shall be conducted after submitting draft EIA report and the action plan will be prepared accordingly. SIL has developed Emergency preparedness plan and Disaster Management Plan. Fire alarm panel (electrical) will cover the entire plant. The Environmental Management Cell (EMC) will handle of all the related activities such as collection of statistics of health of workers and population of the region, afforestation and green belt development. The fire protection system for the unit is to provide for early detection, alarm, containment and suppression of fires. The Occupational Health Centre with adequate facilities will be developed at plant site. It will be maintained round the clock by a compounder cum dresser and a doctor. Medical Personnel/ Medical Doctor will be available at site for emergency relief. First aid kit will be provided. Appropriate personal protective equipment will be provided to all workmen as and when required. All records of On-Site and Off-Site Emergency Plan shall be well maintained and preserved. A capital Budget of Rs. 49.85 Lakhs and Rs. 18.30 Lakhs/Annum as recurring cost has been allocated for Occupational Health and Safety.

8 PROJECT BENEFITS

8.0 GENERAL

This chapter gives information on direct and indirect benefits to the environment, nation and proponent. Proposed project will result in growth of the surrounding areas by increased direct and indirect employment opportunities in the region including ancillary development and supporting infrastructure. Special emphasis on financial and social benefits will be given to the local people in the area. Development of social amenities will be in the form of medical facilities, education to underprivileged and creation of self-help groups, Socio-economic status of the region will definitely improve due to flow of money to nearby villages.

8.1 PHYSICAL BENEFITS

Infrastructure: Creation of community assets (infrastructure) like drinking water facilities in nearby villages as a part of corporate environment responsibility will be developed. Rain water harvesting will be implemented at the project site to conserve the environment.

Enhancement of Green Cover: Plantation of trees on road side and development of nursery will be done as a part of corporate social responsibility.

Green Belt Development: 16,500 m^2 Green belt area 33.98% of plot area will be developed by proponent.

8.2 SOCIAL BENEFITS

- **Employment Potential:** The employment of local people in primary and secondary sectors of project shall upgrade the prosperity of the region. This in-turn will improve the socio-economic conditions of the area. During construction phase of the project approx. 500 people will be required; thus, this project will provide temporary employment to many unskilled and semi-skilled laborers in nearby villages. During Operation phase of the project approx. 280 nos. people will be required. This project will also help in generation of indirect employment to those people who render their services for the personnel directly working in the project and during operational phase, considerable number of people will be benefited by provision of various services, such as transportation, technical services, skilled and semi-skilled services and indirectly it will flourish various business activities. Thus, the direct and indirect employment generation by this project will be highly significant.
- **Enterprise Social Commitment:** SIL have regularly contributed their part for improving the socio-economic conditions of the surrounding area. The unit will take part for the eco-development measures including community welfare measures in the project area for the overall improvement of the environment through Hazira Industrial Association and GPCB. The proponent has planned extensive pollution control and environmental conservation measures with CER.
- **Sustainable Livelihood Options and Women Empowerment**
- **Education Initiatives** such as Scholarship for education excellence; Promotion of girl child education; Incorporation of extracurricular activities etc.
- **Health Initiatives such as** Support to the nutritional program of mother, child and school goers, Support the district health administration in the community health activities; Knowledge enhancement on preventive health care etc.
- **Community Infrastructure and Facilities such as** Enhancement of green coverage, Promotion of renewal energy etc.

Sanghi Industries Ltd will spent **Rs. 4.24 Cr** under CER activities and the budget allocated for the next five year CER Plan in given in Chapter 10.

8.4 OTHER TANGIBLE BENEFITS

- Project will encourage industrial growth of this sector specifically in cement industries in the region;
- The company will have market growth of its own brands name in various overseas countries;
- The company will cater needs of the domestic market also.

- Project will gain income and upsurge the turnover of SIL directly or indirectly.
- Employment opportunities would increase directly.
- More infrastructure will develop in the region due to proposed project.
- Migration of the local people will decrease in search of employment.
- Medical facility will be increased and chances to save life.
- Government will earn huge revenue by way of various taxes and levies and transportation through sea route.

8.5 SUMMARY

The project activity and the management will support the local villagers and provide other forms of assistance for the development of public amenities in this region. The management will recruit skilled and unskilled workers from the nearby villages. Local construction workers will be employed from surrounding area. It is estimated that 500 Nos. of Local workers (skilled and semiskilled) will get direct employment during construction phase. It is estimated that 280 nos. technical people will get direct and other contractor worker will get indirect employment during operation phase. Sanghi Industries Ltd. has allotted Rs. 4.24 Cr for corporate environmental responsibility (CER) for next 5 years.

9 ENVIRONMENTAL COST BENEFIT ANALYSIS

9.1 GENERAL

Environmental Cost Benefit Analysis (CBA) is an analytical way to make an educated decision regarding the commencement of an industrial activity or similar trade/commercial/infrastructure activity. This involves a comparison of the costs of an action with considerations of the benefits associated with that action. CBA assists the regulators to evaluate the benefits and challenges imposed by the upcoming activity in commercial terms with respective to the impact on the environmental scenario such as human wellbeing, quality of life and environmental wellbeing.

An important component of a CBA is a base situation which is a situation when no changes take place. All decisions are then compared to the base situation. Once the base and a relevant time period are established, benefits and costs can be calculated in terms of human and environmental well-being. In this case, a benefit is defined as anything that increases human well-being, and a cost is anything that decreases it. CBA aims to maximize economic efficiency at a point where marginal benefits and marginal costs are equal.

9.2 APPLICABILITY OF CBA AND SUMMARY

During the scoping/ToR stage, no recommendation of environmental cost benefit analysis was suggested by the appraisal committee. Hence, conducting a detailed CBA is deemed not necessary for this particular project.

10 ENVIRONMENTAL MANAGEMENT PLAN

10.1 General

The Environmental Management Plan (EMP) constitutes an important part of the EIA report. The main purpose of EMP is to minimize the identified potential environmental impacts to be generated from the proposed project and to mitigate the consequences. SIL, on basis of the impacts identified, sets targets to reduce the negative impacts, plans and decides action plan to achieve the target effectively and efficiently. EMP ensures an effective implementation methodology and alternatives for mitigation measures planned/recommended to reduce or eliminate the adverse impacts to maximum possible extent during the operation of the proposed project.

10.2 OBJECTIVES OF ENVIRONMENTAL MANAGEMENT PLAN (EMP)

As mentioned in earlier section, EMP is a system to address potential adverse impacts, to instruct project proponent to introduce standards of good practice to be adopted for all project activities.

Following are long-term objectives of the Environmental Management Plan for all the environmental attributes:

- To comply with all the regulations stipulated by Central/State Pollution Control Board related to applicable laws.
- To create good working conditions.
- To encourage support and conduct developmental works for the purpose of achieving environment standards and to improve methods of environment management.
- Streamline environmental activities to add value to efficiency and effectiveness.
- To encourage and achieve highest performance and response from individual employees and contractors.
- To plan out the complete strategy to take care of stakeholder engagement.
- To contribute significantly for sustainable development

10.3 Concept of Waste Minimization (Reuse, Recycle & Minimization Techniques), Energy and Natural Resource Conservation Measures

Waste Minimization - 3RS

Reuse: Fly Ash generated from CPP and slag generated from nearby steel plant will be totally reused as raw material in cement grinding process.

Waste generated from construction activity will be utilized in leveling of land.

Recycle: Treated water from STP will be reused for cooling and greenbelt development.

The dust collected from pollution control equipment will be recycled in the process.

Recovery: The sludge generated from the STP will be used as manure for Green Belt Development / plantation.

10.3.1 Energy Conservation

Cement grinding process are energy intensive industries. Electric energy and fuel cost represent 40–50% of total production costs. To conserve energy and fuel various measures are taken in proposed project. Following measures will be implemented to make the project energy efficient. Process wise energy required per metric ton of product is listed below:

Feeding Raw Material: 0.65 kWh/MT

Cement Grinding: 34.00 kWH/MT for PPC & PSC & 31 kWH/MT for OPC

Bag Packing: 1.9 kWH/MT

i. Use of energy saving light fittings (LED).

ii. Manufacture of PPC and PSC along with OPC.

Possible Savings: Solar light system shall be installed in common areas, street lights, parking and the same shall be maintained properly.

Energy saving in raw material preparation

- Efficient transport systems for raw material preparation (Dry process)
- Raw meal blending system (Dry process)
- Raw meal process control for vertical mills (Dry Process)
- Use of roller mills for grinding (Dry Process)
- High efficiency classifiers /separators (Dry Process)

Energy saving in Finish Grinding

- Use Vertical roller mills for finish grinding
- Expert Process control and management in grinding mills for finish grinding
- High efficiency classifiers and fans
- High efficiency motors and adjustable or variable speed drivers
- Reduce leaks in compressed air systems
- Reducing the inlet air temperatures in compressed air systems
- Sizing pipe diameter correctly in compressed air systems
- Using LED lights and good lighting control for plant wide lighting

10.3.2 Natural Resource Conservation

i. Fly ash generated from the various local power plant/industries will be blended with clinker to produce cement. This practice will conserve large amount of Limestone reserves and the land which otherwise would be used for land filling of fly ash generated from the process.
ii. Use dry process based technology to reduce the water consumption by almost 90%.
iv. Recycle and reuse of the domestic waste water to conserve water resources.
vi. Surface rainwater runoff available from paved area, green area and open land shall be harvested.
vii. Rain water harvesting system will be installed to conserve rain water and to replenish ground water resources of the area for long term sustenance of the industry.
Also equipment will be selected considering Environmental protection measures in accordance with applicable Indian norms and standards.

10.3.3 Environmental Protection Measures

- Use of a simple, linear layout for materials handling operations to reduce the need for multiple transfer points
- Storage of pulverized coal in bunker.
- Storage of clinker in covered / closed bays or silos with mechanized extraction.
- Storage of cements in silos with automatic reclaiming and loading of bulk tankers. Implementation of automatic bag filling and handling systems to the extent possible, including using a rotary bag filling machine with fugitive emission control. Using automatic weight control for each bag during discharge.
- Conduct material handling (e.g. crushing operations, raw milling, and clinker grinding) in enclosed systems maintained under negative pressure by exhaust fans. Collecting ventilation air and removing dust using cyclones and bag filters.

10.3.4 Water Conservation

Rain Water Harvesting (RWH)

Rain Water can be harvested either storing in containers for ready use or charged into soil for withdrawal later *i.e.* ground water recharging. SIL has decided to installed Rain Water Harvesting system to prevent runoff and to help resource conservation. Storm water network will be designed

throughout the site for collection of roof top as well as internal runoff during the monsoon season. Pipeline and storm water drainage will be connected/ diverted to water harvesting area without any contamination or after removing impurities *i.e.* leaves, floating materials etc. The main elements of rain water harvesting systems are catchments, conduits and storage facility either above the ground or under the ground. During rainy season, the rain water will be collected from roofs in collection tank having adequate capacity and the collected water will be used for industrial activities. During rainy season, the rain water will be collected from roofs through closed pipes or separate drain channel. Typical rain water harvesting pit diagram is given in **Figure 10.1.**

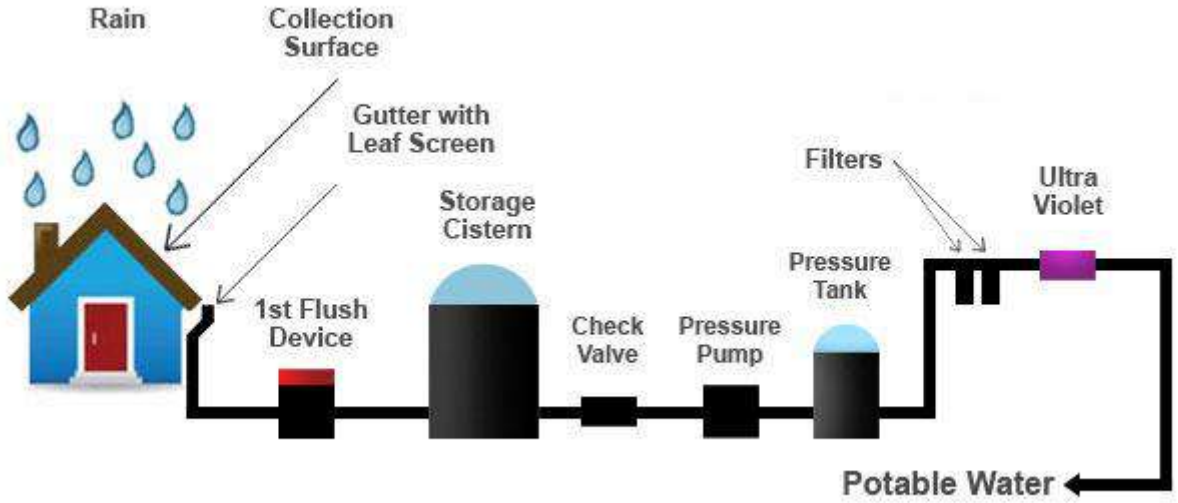


Figure 10.1: Typical Rain Water Harvesting diagram

Average Rainfall: 1192 mm

a. Roof top area available for RWH: 13710 m^2
   Rain Water that can be harvested: (13710) * (1.192) * (0.8) = 13074 m^3

b. Open & Greenbelt area available for rain water harvesting: 34850 m^2
   Rain Water that can be harvested: (34850) * (1.192) * (0.3) = 12462 m^3

Total Rain Water that can be harvested in Monsoon season = 25536 m^3

The 25536 m^3 rain water will be available in one season of 120 days; hence 213 per day rain water will be collected. Looking to 2- 3 days of storage; approx. 3 No. of 200 KL each storage tank will be provided at site for rain water harvesting, the collected rain water will be used for dust suppression and green belt development.

The effectiveness of the drainage system depends on proper cleaning of drainage pipes/channels *etc.* Regular checking before and during the monsoon will be done to see that none of the drains/drainage facilities are clogged and are efficient to collect the rainwater under rain water harvesting program. The clogged drains will be cleaned up immediately on report of any clogging or blockage. This checking and cleaning will be meticulous during the monsoon season, especially if heavy rains are forecasted.

10.4 ENVIRONMENT MANAGEMENT DURING CONSTRUCTION PHASE

There will be construction of Production plant, Office & laboratory area, Storage rooms, Utility buildings, etc. Anticipated environmental impacts due to proposed project during construction phase are already discussed in chapter – 4 of EIA report. Following environmental management plan will be implemented to mitigate any adverse impact or reduce the magnitude of impact. There will be no

long-term impact during construction phase. The project proponents, in order to minimize these impacts would undertake adequate preventive and remedial measures as outlined below:

10.4.1 Air Pollution Management

Potential sources of air pollution during construction phase are (i) dust emissions due to vehicle movement and (ii) exhaust emissions from diesel generators, construction equipment and vehicles. Moreover, Construction phase will be for a short period and hence the impacts will also be for a short and temporary period. The impact on air quality during construction phase will be minimized by adopting following mitigation measures:

- Dust suppression by regularly spraying water on roads and work sites shall be practiced.
- Wetting or covering stockpiles, the proper location of material stockpiles and covering loaded trucks during the transportation of material shall be ensured.
- Separate civil construction material storage yard will be created within the site and it will be enclosed.
- Use of low-emission vehicles and, wherever feasible, construction equipment powered by electricity shall be preferred.
- Maintenance of engines and use of vehicles with PUC Certificates. Contractors will be required to strictly implement these measures.
- Engines of idle vehicle machineries/equipment not in use, shall be turned off.
- All construction workers will be provided appropriate Personal Protective Equipment (PPEs) like dust mask, ear plug, helmet, safety belt etc. and made to wear them during working hours.
- Regular inspection for proper implementation of mitigation measures shall be done.

10.4.2 Noise Environment

Noise generation during construction phase is due to the operation of heavy equipment and increased frequency of vehicular traffic in the area. However, these impacts are short term, intermittent and temporary in nature. The effect of noise on the nearest inhabitants during the construction activity will be negligible. Following is the management plan to minimize/eliminate any noise impacts:

- Noise generation due to movement/operation of vehicles and equipment/ machineries shall be well managed by restricting the movement/operation during night hours.
- Management will ensure effective set up of traffic management system in order to minimize the usage of horns and other such equipment which may add to noise generation. Further the management will restrict the movement of heavy vehicles during night.
- All machineries to be used for construction purpose will be of highest standard of reputed make and compliance of noise pollution control norms by this equipment will be emphasized by company.
- Further, it will also ensure to carry out periodic and regular maintenance of the equipment, machines and spare parts which shall include lubrication, replacement of defective parts etc. in order to bring down the decibel of noise to maximum possible extent.
- Feasibility of putting up acoustic enclosure / temporary barrier around areas with high noise levels will also be explored.
- Management will ensure that no hazard is caused due to noise generation during the course of work. For this purpose the management shall ensure that the workers are provided with individual protective equipment like ear muffs or ear plugs in areas with high exposure to noise.

10.4.3 Water Environment

The water environment is likely to change due to the construction activity because of the effluents from sanitary facilities for the construction workers, washing of vehicles and spillage of fuels. Unauthorized dumping of waste oil shall be prohibited. Proper sanitation facility will be developed at the plant site. Mobile toilet facility will be provided for construction workers. Further the proponent

shall ensure to implement good operation practices to minimize the use of water, so as to reduce the depletion of water resource to maximum possible extent. Proper drinking water facility will be made available to the construction workers. The management will ensure proper management to avoid spillage of effluent which may cause seepage and contaminate ground water. Due care will be taken to avoid formation of stagnant pools, which may cause damage to the aesthetic condition as well as other environmental & socioeconomic factors.

10.4.4 Land Environment

As soon as the construction is over, the surplus earth has to be utilized to fill up low-lying areas, the rubbish is to be cleared and all un-built surfaces reinstated. The site will covered by shrubs and is devoid of trees. Thus, it does not involve any cutting of trees. Appropriate vegetation shall be planted after construction activity and all areas shall be landscaped.

10.4.5 Flora and Fauna

The measures required to be undertaken to minimize the impact on the ecology are:

- No vegetation clearance required and no trees in existence on land/site.
- No felling of trees will be done at site;
- The greenbelt having vegetation density of 1000 trees/ha will be developed.

10.4.6 Socio-Economics and Demography

Normally, the construction activity will benefit the local people in a number of ways such as supply of construction labourers-skilled, semi-skilled and untrained, secondary sector employment and provision of goods and services for daily needs including transport.

10.4.7 Storage of Hazardous Material

The hazardous materials anticipated to be stored at the site during construction include petrol and diesel, gas for welding purpose, paints and solvents. These materials shall be stored as per the international safety norms in ventilated enclosures. Site has to be identified for the storage of diesel away from the construction site. The major problem will be disposal of excess excavated earth generated during construction phase which shall be well handled by landfills to level the low lying areas.

- Construction waste shall be reused for PCC works, development of roads and misc. filling for construction works.
- Excavated soil shall be used for landscaping & gardening/greenbelt development
- Storage & handling of construction materials shall be done properly to avoid spillage or leakage.

10.5 ENVIRONMENT MANAGEMENT DURING OPERATION PHASE

10.5.1 Air Pollution

In the plant, main sources of emissions will be from stack attached to cement mill. The emissions of particulate matters from the stack will be limited to 30 mg/Nm^3. PM_{10} and $PM_{2.5}$ is considered as major air pollutants from this source. This is due to the handling of fine powders at each stage of manufacturing. The sources of air pollution from the grinding unit will be stack emissions and fugitive emissions. No process gas emission will be generated. The details of stack design, emission details, and control equipment for the proposed plant are given in **Chapter-2** and **Chapter-4**.

The maximum short-term 24 hourly incremental ground level concentration due to the operation of the plant are likely to be well within the NAAQ standards. Therefore, the proposed activity is not likely to have any significant adverse impact on the air environment.

Air Pollution Control Schemes

Adequate and efficient control equipment will be installed in plant. Major pollution control system and other ventilation systems will be installed in the cement grinding unit to keep the dust emission at a minimum. The details of the control equipment are given in **Table 2.10**. A suitably designed bag

house and Bag-filter will collect more than 98% of the incoming dust in flue gas and limit the dust concentration at its outlet to well within 30 mg/m^3.

- Unloading of coal from trucks will be carried out with proper care avoiding dropping of the materials from height. It is advisable to moist the material by sprinkling water while unloading.
- Dust suppression system will be installed in dust prone area.
- Fly ash will be handled in closed automated system and stored in covered silo.
- Thick greenbelt developed around the plant to arrest the fugitive emissions.
- The online monitoring of air emission will be installed as per CPCB guidelines.

Table: 10.1 Technical Description of Bag House

Item	Details	Unit	Cement Mill Bag House
General	Gas Volume	m^3/hr	1100000
	Dust Concentration	gm/m^3	400
	Inlet temperature	^oC	80-120
	Installed fan pressure	mbar	89
	Pressure drop	^oC	by supplier
	Dew point temperature	%	by supplier
	Inlet moisture	mg/Nm^3	by supplier
	Outlet emission	-	25
	Type of bag house cleaning	-	Pulse Jet type
Mechanical design condition	Temperature	^oC	150
	Pressure	Pa	by supplier
Material transport	Inlet temperature	^oC	120
	Capacity	TPH	500
	Type of dust	-	Fine cement dust
Dilution air fan specification	Ambient temperature	^oC	-
	Flow	m^3/hr	-
	Static pressure at rated capacity	mmWg	-

Fugitive Emissions

To control the fugitive emissions, the following measures are proposed:

- High efficiency pulse air jet type bag filters will be considered to arrest the air borne dust at all the locations where transfer of material are takes place;
- The automatic bagging machine with bag filters will be installed for packing plant;
- Unloading of coal trucks will be carried out with proper care avoiding dropping of the materials from height. It is advisable to moist the material by sprinkling water while unloading;
- The sprinkling of water will be done along the internal roads in the plant in order to control the dust arising due to the movement of vehicular traffic;
- All the workers inside the plant will be provided with disposable dust masks; and
- Thick greenbelt will be developed around the plant to arrest the fugitive emissions.

10.5.2 Noise Pollution Management

Noise generation from production activities and plant equipments/machineries will be confined within plant boundary. The greenbelt developed around the boundary of the plant will further attenuate the noise emitted by the various sources in the plant. Other than the regular maintenance of the equipment, earplugs will be provided for the personnel working close to the noise generating units as a part of the safety policy. Apart from this, some of the design features provided to ensure low noise levels are as follows:

- All rotating machinery are well lubricated and provided with enclosures as far as possible to reduce noise transmission;
- Provision of silencers will be made wherever possible;

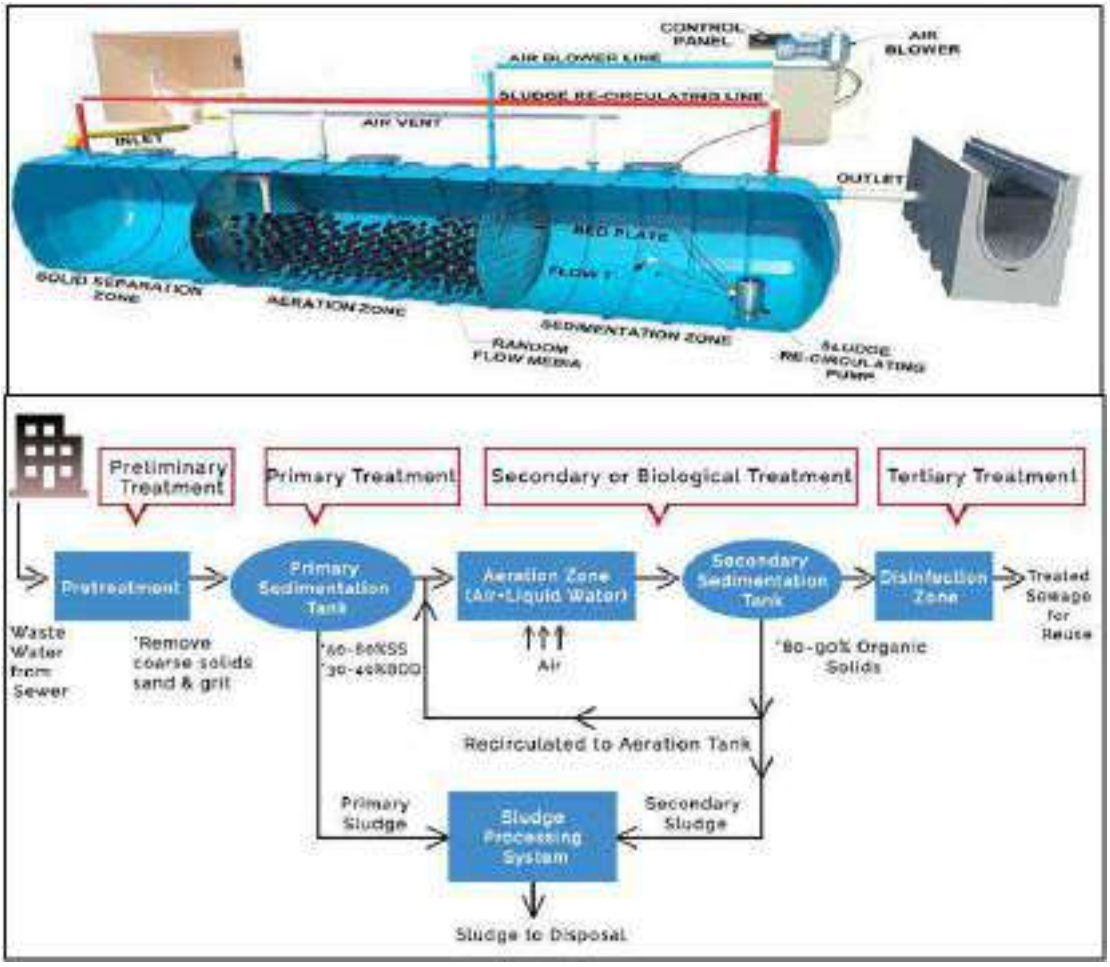
- The insulation provided for prevention of loss of heat and personnel safety also act as noise reducers;
- Layouts, equipment foundations and structures will be designed keeping the requirement of noise abatement in view.
- Necessary enclosures will also be provided on the working platforms/areas to provide local protection in high noise level areas;
- All equipment will be kept in a well maintained condition with proper lubrication and housekeeping to avoid excessive noise generation.
- The workers will be provided with ear plugs.
- Strict instruction to all the vehicles entering in plant premises not to blow horn unnecessarily and exceed the speed limit.

10.5.3 Water Pollution Management

The generated sewage will be treated in the sewage treatment plant having capacity of 15 KLD. Treated sewage water will be used for watering the greenbelt. In operations phase, waste water will be generated from cooling tower. The cooling tower blow down water will be recycled in dust suppression.

Wastewater Treatment -Sewage Treatment Plant (STP)

The Package Sewage Treatment Plant of capacity of 15 KLD will be proposed for the treatment of domestic sewage. This is a time tested system called the world over as the 'Activated Sludge Process (ASP)'. It is the oldest system worldwide and is the most used process world over. Treatment of sewage is based on a method provided by nature, i.e. by using microbial action. When a steady consistent supply of air is pumped into a tank containing sewage which has been screened to remove all floating debris and non-soluble contents in sewage, microbes which are present in it get activated. These microbes are present in the sludge which makes up a substantial part of sewage, and they consume the pollutants in the sewage while the air supply brings them to life and keeps them alive and multiplying. The flow diagram of the process is given below:



Basic treatment steps involved in sewage treatment plant are as follows:

Pretreatment: This treatment is the first step in processing waste water which is also called as mechanical/physical treatment process which needs to be done previous to primary treatment. During this stage, solids are removed through screening, sedimentation and skimming. Its major objective is to remove coarse solids through screening. Incoming wastewater called influent passes through mechanical screens consisting of bars where rags, sticks, papers, drinking cans and other similar items will get removed. It involves grit chamber to remove sand and grit. This treatment also removes excessive amount of oils and greases.

Primary Treatment: It is also known as physical-chemical treatment which is to be done prior to biological treatment called secondary treatment. It aims at removing organic and inorganic solids by the processes of sedimentation and floatation. Partially treated wastewater from preliminary treatment is allowed to pass through tanks called primary clarifier or sedimentation tank. During this treatment flow of wastewater is reduced to encourage sedimentation and thereby allowing the heavier solids to settle at the bottom and significant amount of floating material such as grease and oil will rise to the surface and be skimmed off. The settled solid is called as primary sludge which will be used as manure in greenbelt development. This particular treatment removes about 50-60% of influent suspended solids and reduces BOD level up to 30-40%. The clarified water flows on to the next step of treatment.

Secondary Treatment: This treatment is referred as biological treatment process which generally uses one of the biological aerobic processes called —Activated sludge process" to degrade organic matter. During this process, primary effluent enters into aeration tanks, where it is mixed with microorganisms. Air is pumped into aeration tanks and hence bacteria growth will get increase to breakdown the organic matter that still present in the effluent. Now aerated wastewater flows into secondary clarifier where heavier particles and other solids settle to the bottom as secondary sludge. Some of the sludge will be re-circulated back to aeration tank to stimulate activated sludge process

to remove as many pollutants as possible. The remaining sludge is removed from the tank and mixed with primary sludge in sludge processing system will be used as manure in greenbelt development. This stage removes about 80-90% of organic solids. Once the water moves out of this stage, it enters into last stage called tertiary stage or disinfection stage.

Tertiary Tr eatment: It is the final stage in packaged sewage treatment plant which involves physical, chemical or biological processes to remove any residual or remaining suspended solids and dissolved solids. Even after primary and secondary treatment, treated wastewater may contain some disease causing microorganisms and that is why disinfection is required. Disinfection disinfects and kills harmful microorganisms from the effluent and it is done by using disinfectants like chlorine, UV light or other chemical disinfectants. Tertiary treatment is also called as disinfection treatment which is an essential step because it protects humans' health. The treated water coming through entire process will be reused for greenbelt development, firefighting and dust suppression in the plant.

Salient Features of Packaged Sewage Treatment Plant:

- Treated water quality within permissible limit by SPCB / CPCB
- Underground structure with compact design and completely covered plant.
- No foul odor around the STP area or in the receiving environment.
- Does not require continuous monitoring and operation.
- Works well with inconsistent grey water flow.
- Minimal sludge generation and extremely low Maintenance.
- 50 – 70% less power consumption compared to other treatment

Waste water Disposal

The treated water will be used for dust suppression and plantation. there will not be any adverse impact on the water quality as no waste water will be discharged outside the plant premises.

10.5.4 Solid Waste Management

Dust collected from air pollution control equipment will be 100% recycled in process and thus there will be no solid wastes in cement grinding process. There is no any hazardous waste will be generated from the project. Ash generated by the HAG will be 100% utilized in cement manufacturing process (PPC) Dust collected from air pollution control equipment will be totally recycled in process. A part of used oil (60 MT/annum) will be utilized for lubrication purpose & remaining will be sent to own clinker unit located at Sanghipuram, Kutch.

Cleaner Production Activities:

The project proponent is committed to implement strategy of cleaner production activities since equipments / machineries selection / designing stage and considered various technology alternatives. Following strategy is implemented for cleaner production activities.

- Installation of Vertical Roller Mill – Following are the benefits of selecting the technology.
  - ✓ Energy efficiency - Consume less electrical energy compared to ball mill system
  - ✓ Simple with a compact layout - Requires about 70% of the ball mill system area and about 60 percent of building space.
  - ✓ Product quality is stable and easy to detect
  - ✓ Generate less noise compared to ball mill system
- Installation of new age bag filter with membrane filter bags as a mitigation measures of air pollution
- Cement will be manufactured by dry process technology. No waste water will be generated from the process.
- The domestic sewage will be treated in STP and utilized for greenbelt development
- Slug generated from STP will be utilized as manure in greenbelt development
- Blended cement will be manufactured from the proposed plant hence fly ash and slag generated from other industries will be recycled under alternative fuel and Raw material (AFR Scheme).

Table 10.2: Environmental Management Plan

#	Aspects due to proposed activity	Impact zones	Management plan	Responsibility
Air Environment				
1.	Dust generation	Near storage area	➢ Dust collection system will be provided ➢ De-dusting bag filter will be provided.	EHS In-charge/ EHS team
2.	Dust generation due to grinding of Clinker with other materials.	Near grinding area	➢ Dust collection system will be provided ➢ Ensured continuous monitoring SPM concentration as per consent norms. ➢ Bag filters are proposed as APCM to control fugitive emission	EHS In-charge/ EHS team
3.	PM_{10} emission due to operation of Hot Air generator and operation of drying and cooling section in process	--	➢ Stack of 55m will be provided. ➢ Ensure monitoring of stack for SPM concentrations as per regulatory norms	EHS In-charge/ EHS team
4.	Transportation activities during construction and operation phase	nearby highway/Sea route	➢ Transportation of raw materials and finished goods will be carried out in well covered trucks ➢ Traffic Management Plan will be made and followed ➢ Records will be maintained for entry and exit of vehicles	EHS In-charge/ EHS team
Water Environment				
1.	Sewage generation due to Influx of workers during construction and Operation phase	Within plant premises	➢ Sewage will be treated into Sewage treatment plant.	Design Head
2.	Consumption of water for operation of plant	Fresh water reservoir	➢ Online flow meters shall be installed at each of raw water consumption point. ➢ The fresh water demand will be reduced by recycling and reuse of waste water	EHS In-charge/ EHS team
Land Environment				
1.	Soil Contamination due to Settling of particulate matter on nearby vegetation field		➢ Highly efficient bag filter shall be installed to collect particulate matter. ➢ Plant load will be lowered during monsoon season ➢ Green belt will be developed around the plant area	Design Head/ EHS In-charge/ EHS team
2.	Generation of ash from operation of Hot Air generator	Within plant premise	➢ Ash generated by the HAG will be 100%	EHS In-charge/ EHS team

			utilized in cement manufacturing process (PPC) Dust collected from air pollution control equipment will be totally recycled in process.	
3.	Generation of scraps during construction and operation phase	Within plant premise	➢ Ensuring that solid waste are handled as per Solid Waste Management Rule, 2016 and sold to registered and authorized vendors	EHS In-charge/ EHS team
Noise Environment				
1	Noise from operation of crushing and grinding units in plant	Within plant premise	➢ Green belt will be developed around the site with noise absorbing trees ➢ Proper maintenance of equipment will be done ➢ Proper PPE like Ear Plugs & ear muffs will be provided	Plant In-charge/ EHS In-charge/ EHS team
2	Noise from operation of D.G set etc.	Near utility area	➢ Proper maintenance of equipment will be done ➢ Inbuilt acoustic enclosures will be ensured	Plant In-charge
3	Noise due to Transportation of raw material and finished goods	Within site and transport route	➢ Valid PUC vehicles will be ensured during construction and operation phase.	EHS In-charge/ EHS team
Risk and Hazard				
1	Emergency preparedness	Within site	➢ Fire protection and safety measures to be taken ➢ Safety training to avoid accidents ➢ Mock drill records, on site emergency and evacuation plan	EHS In-charge/ EHS team

10.6 ECOLOGICAL GREEN BELT DEVELOPMENT

Greenbelt areas have been proved to be an ideal place for diversified flora and fauna and it will improve air quality within premises, act as barrier for noise propagation and also add aesthetic beauty of the industrial area. SIL proposes to develop 16500 m^2 (>33%) greenbelt area of total land *i.e.* 48563.0 m^2. The company will develop green belt along the periphery of the plant site and in common premises available outside the company premises after consultation with horticulture expert. Domestic species suitable for the local climatic conditions, perennial and evergreen trees, Air pollution resistive plants will be considered to be planted in the proposed greenbelt area.

The following points will be considered for selection of plants species to be grown:

- Greenbelt absorbs both gaseous as well as particulate pollutants to a great extent. Thus, removes/reduce pollutant from the atmosphere. For absorbance of gases, the duration of the foliage should be longer.
- Characteristics of tree/plants including shapes of crowns considered necessary for effective removal of dust particles.

- Greenbelt/Plant species having good root system will be selected, so that soil erosion rates can be controlled significantly.

The greenbelt will provide benefits to improve beautification of plant. It will also result in the prevention of land degradation due to industrial activities; enhancing the canopy cover as a wind breaker wall and restrict the carry away dust outside the premises as well as act as noise barrier. Proposed green belt area will comprise of rows of varying height of trees of native species with thick foliage, along the periphery of the unit. Approx. 4125 Nos. of trees and varieties of local shrubs will be planted within next five years. The proposed greenbelt will be developed in three tier manner which is mentioned below:

Table 10.3: Greenbelt Development in Three Tier

S. No.	Tire	Habit	Height (m)	Rows
1.	1st Tier (Towards Boundary)	Trees	10-20	4
2.	2nd Tier (Middle layer)	Small Trees	5-10	6
3.	3rd Tier (Towards Plant)	Shrubs	1-5	Thick Pattern

Roadside Plantation: Separate list of herbs/shrubs/trees should be given for roadside plantation and for Lawn also. The Green belt should not be inclusive of lawn, etc.

For the Calculation of Cost for Green belt Development, following parameters has been considered.

For Capital Cost

a) Cost of Sapling (Trees)
b) Shrub/Herbs
c) Transportation Charges
d) Planting cost (Including soil workings, pits etc.)
e) Fencing Cost

For Recurring Cost:

a) Cost of drip irrigation
b) Annual weeding and soil working
c) Req. of water for irrigation
d) Fertilization Cost
e) Security and Vigilance

A budget of **Rs. 20.00 Lakhs** as a capital cost and **Rs. 12.00 Lakhs per Annum** as a recurring cost has been allocated for green belt development.

Table 10.4: Year wise Greenbelt Development Program

S.No.	Year	No. of Trees	Remarks
1.	Ist	1200	The green belt will be developed in 3 tier plantation as per guideline. The heighted tree with 10-15 m will be planted in the first row from the boundary and then gradually smaller tree will be planted to make green belt and to arrest maximum fugitive emission from the unit.
2.	IInd	1000	
3.	IIIrd	825	
4.	IVth	700	
5.	Vth	400	
Total		4125	

Table 10.5: List of Trees and shrubs to be planted

S.No.	Name of Species	Common Name	Ecological Performance	Place/s to Plant tree/s as per MoEFCC/CPCB
1.	*Acacia auriculiformis*	*Earleaf* Acacia	CN, DC	Periphery GB, RWH tank
2.	*Acacia nilotica*	Desi Babool	CN, DC	Periphery GB, Agriculture hedges
3.	*Acrus sapota*	Chikoo	CN, DC, OG	Orchard P, Agriculture hedges
4.	*Adina cordifolia*	Kadam	CN, DC, OG	Periphery GB, Public Place
5.	*Aegle marmelos*	Bel	CN,DC	Periphery GB, Public Place
6.	*Annona squamosa*	Custard apple	CN, DC, OG	Orchard P, Agriculture hedges

7.	*Azardirachta indica*	Neem	CN, DC, OG	Periphery GB, Agriculture hedges
8.	*Bombax ceiba*	Silk Cotton tree	CN, DC, OG	Periphery GB, RWH tank
9.	*Casuarina equisetifolia*	Jungli saru	CN	Road Side P, Water Body, Public Place
10.	*Cocos nucifera*	Coconut	DC	Road Side P, Agriculture hedges
11.	*Delonix regia*	Gulmohar	DC	Periphery GB, Road side P, Agriculture hedges
12.	*Ficus bengalensis*	Vad	CN,DC	Periphery GB, Public Place
13.	*Ficus reeimosa*	Fig	CN, DC, OG	Periphery GB, Agriculture hedges
14.	*Ficus religiosa*	Peepal	CN, DC, OG	Periphery GB, Public Place
15.	*Leucaena leucocephala*	*Lead tree*	CN, DC	Road Side P, Water Body, Agriculture hedges
16.	*Mangifera indica*	Aam	CN, DC, OG	Orchard P, Agriculture hedges
17.	*Millettia pinnata*	Karanj	CN, DC, OG	Orchard P, Water Body
18.	*Moringa oleifera*	Drum stick	CN, DC	Road Side P, Public Place
19.	*Pithecellobium dulce*	Sweet Tamarind	CN, DC	Orchard P, Agriculture hedges
20.	*Psidium guajav*	Guava	CN, DC, OG	Orchard P, Agriculture hedges
21.	*Saraca asoca*	Ashoka Tree	CN, DC	Road Side P, Admin
22.	*Tamarindus indica*	Imli	CN, DC, OG	Orchard P, Public Place
23.	*Tectona grandis*	Teak	CN, DC	Periphery GB, Water Body
24.	*Terminalia arjuna*	Arjun	CN, DC, OG	Road Side P, Public Place
25.	*Terminalia catappa*	Badam	CN, DC, OG	Orchard P, Public Place

Ecological Performance: CN –Control Noise level, OG – Absorb Gas Emission, DC - Dust Controller Places- 1. Project area: Periphery, Road side and Orchard Plantation. 2. Road side Plantation, Agriculture hedges, Water body, public place like school, Panchayat, forest land etc.

Regular monitoring and care will be taken with all necessary works like thick plantation, irrigation, fertilization, re-plantation (if required), pest control and other allied factors to achieve adequate growth of greenbelt. Records of the greenbelt development as suggested in environmental monitoring plan shall be maintained and protection of greenbelt area shall be ensured by the project proponent.

10.7 OCCUPATIONAL HEALTH AND SAFETY

The proponent is very much concerned in terms of health, safety and environment protection. The company shall engage a qualified safety Manager and a doctor for regularly checking health of the employees. Additionally, medical aid will be arranged with the help of local hospital. Annual health check of the employees shall also be carried out and records will be maintained. Regular training to plant personnel in safety, firefighting and first aid shall be provided. The following key safety measures shall be implemented in the proposed project:

Construction Phase

The management shall ensure that all workers/employees are provided with basic PPEs like ear plug/muff, safety helmet, face mask, safety gloves, safety goggles, safety shoes etc. PPEs will be properly checked before providing to the workers. It shall also be ensured that all the safety equipments are placed properly and are available instantaneously when required. Safety and first aid facility will be provided to the workers/employees engaged in construction activities. Necessary safety training will be imparted to unskilled workers/ trainee employees in various aspects, viz. handling of the materials, precautionary measures to be taken while working, how to use the safety equipments, etc. to minimize the chances of any accidental mishaps. Adequate and basic sanitary facilities like drinking water, toilet, etc. will be provided to laborers. Arrangements for medical facilities will also be made in case of any disturbance in health/accident during the course of construction work

Operation Phase

The company is very much concerned in terms of health, safety and environment protection. They shall arrange doctor for regular checking health of the employees and medical aid with the help of local hospital. Regular training to plant personnel in safety, firefighting and first aid shall be imparted. To maintain high standards in health, safety and environment; various activities will be undertaken at the site. The following key safety measures will be implemented for proposed project:

- Safety training will be provided to the employees
- Safety sirens with alarm system in case of emergency will be provided
- Emergency control room will be established
- Firefighting network including fire extinguishers, fire hydrant system etc. covering entire plant will be provided
- First aid boxes at appropriate place and safety training will be provided
- Personal protective gears and equipment will be provided to the employees
- Health checkups will be organized at regular intervals
- Proponent will make provision of industrial hygienist and monitoring of the occupational injury and maintain the record of the same as per requirement of Gujarat Factories Rules
- All firefighting equipment and warning devices will be kept in perfect working conditions at all the times. It will be seen that all personnel are aware of the implications of environmental pollution and simple practices to avoid pollution

List of Personal protective equipment is listed in chapter 7 and will be made available easily to all workers and visitors as per requirement. A capital Budget of Rs. 49.85 Lakhs and Rs. 18.30 Lakhs/Annum as recurring cost has been allocated for Occupational Health and Safety.

Table 10.6 Budget for Fire, Safety & Health

S.No.	Particulars	Estimated Cost (Rs. Lakhs)	
		Capital	Recurring
1.	Installation of advance fire frightening system	38.65	6.50
2.	Health Checkup camp	0.00	5.20
3.	PPE and safety aids	1.20	5.10
4.	Training and awareness programs	10.00	1.50
	Total	**49.85**	**18.30**

Housekeeping

Proper housekeeping is an essential part of sound environmental management. It will be rigorously seen that there is no accumulation of wastes, especially combustible wastes inside the plant area. Regular maintenance of greenbelt area will help to reduce to dusting and noise level around the plant.

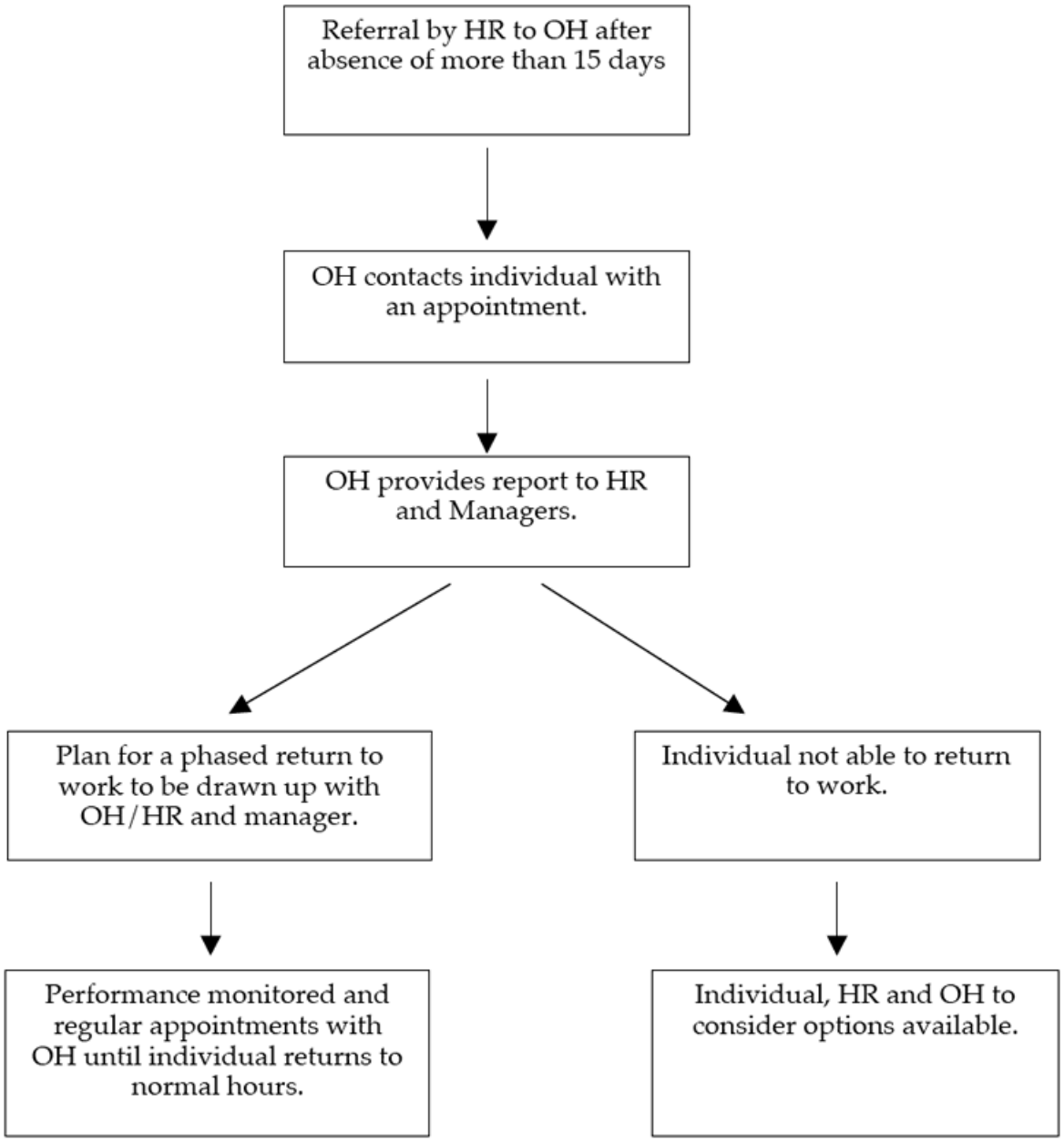


Figure 10.2: Process flow for occupation Health Surveillance

10.8 Enterprise Social Commitment

CER is linked to sustainability and mainly based on the social and environmental consequences. SIL will focus on education, health care, environment area and following activities will be covered in CER plan. Approximately Rs. 424.00 Lakhs (~1.5%) is been allocated for following CER activities for next five years.

Table 10.7 Planned Activities under CER

S.No.	CER Activities	Cost (Lakhs)
1.	Drinking water facility in nearby village	75.00
2.	Up-gradation and hygiene facilities in nearby village	149.00
3.	Plantation in community areas	55.00
4.	Training and Awareness Program	75.00
5.	Education & Farming related activities	70.00
Total		**424.00**

These activities are tentative and can be modified as per actual need time to time on implementation along with budget. The annual budget is fixed as per given in last column.

10.9 ENVIRONMENTAL POLICY

10.9.1 Corporate Environmental Policy (CEP)

Sanghi Industries Limited (SIL) has a well laid down Corporate Environmental Policy (CEP) that includes the standard operating procedures (SOP) for reporting on the performance of environmental management system for improvement further, the administrative order of company to deal with the environmental issues and the reporting mechanism of non-compliance /violation of environmental norms. Environmental Policy is attached as **Annexure VI.**

Corporate Environmental policy of SIL comprises of the following:

1. Creating awareness among its personal on the impact of their actions on the environment and encouraging sound environmental management practices in their day to day activity.
2. Adoption of State of Art Technology for Prevention and Control of Environmental impacts.
3. Conduct the operations in compliance with applicable environmental laws, regulations and standards.
4. According the highest importance to continual improvement and prevention of pollution by instituting the practices and procedures which would reduce wastage and reduce energy to conserve natural resources. Review facilities and programs on regular basis and establish monitorable targets, quantified as appropriate for continuous improvement of our environmental performance.
5. Conversion of waste into wealth and optimum utilization of natural resources helps in reducing carbon footprints.
6. Identification and Evaluation of Non-Conformance and/or Non-Compliances to determine specific corrective and preventive actions. Management review of corrective actions to ensure the status and effectiveness of the actions.

10.9.2 Environmental Management Cell (EMC)

An Environment Management Cell will be developed by an effective mixing of a group of technical experts from various departments of the project to look after the all obligatory requirements and shall be responsible for the effective implementation of all environmental pollution control measures. The organizational set-up for the environment management cell proposed for the project is given in below figure. The cell shall be headed by the General Manager, who will be reporting to the higher authority.

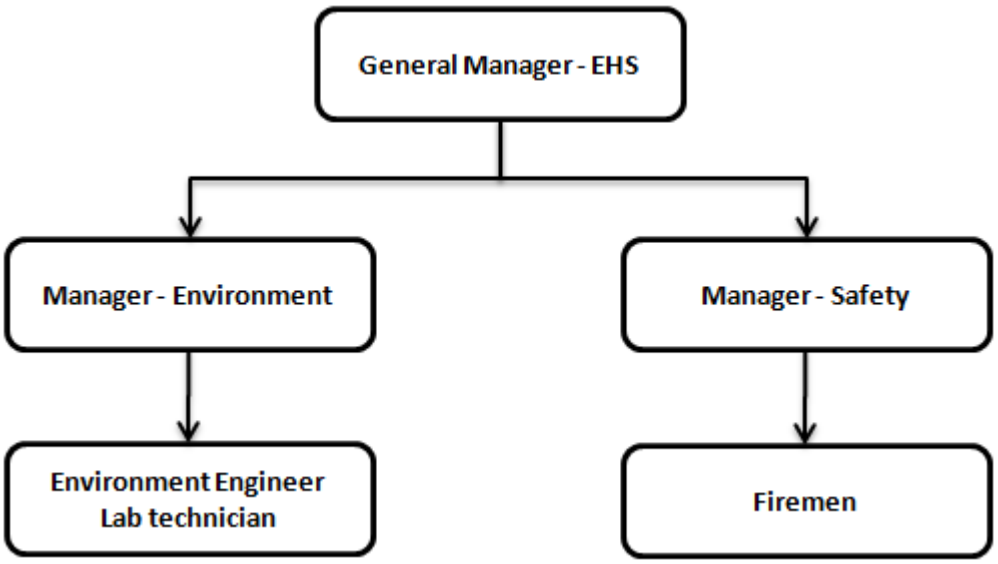


Figure 10.3 Organization Chart

10.9.3 Role and Responsibility of EMC

The major duties and responsibilities of EMC are:

- To implement the EMP.
- To assure regulatory compliance with all relevant rules and regulations stipulated by SPCB/CPCB/MoEF&CC
- To treat the sewage and effluent to be generated from the proposed project in a full-fledged STP for adequate treatment.
- To ensure regular operation and maintenance of air pollution control devices
- To minimize environmental impacts of operations as by strict adherence to the EMP
- To initiate environmental monitoring as per approved schedule
- Review and interpretation of monitoring as per approved schedule
- Review and interpretation of monitoring results and corrective measures in case monitored results are above the specified limit
- To plan and schedule environmental conservation and protection activities for the purpose of achieving environmental standards and to improve methods of environmental management practices.
- To improve working environment for employees by implementing mitigation/control measures for Occupational Health and Safety and by improving condition of workplace environment.
- To make budgetary provision and allocate funds for environment management system and to ensure timely revision of budgetary provisions.
- To implement and ensure effective implementation of planned mitigations including R&D program for innovative technologies for better environment, resource conservation / recovery / recycling / reuse especially to promote waste utilization.
- To encourage and inspire employees and contractor for highest performance and attentive response for environmental conservation, protection and improvement.
- Maintain documentation of good environmental practices and applicable environmental laws as ready reference
- Maintain environment related records
- Coordination with regulatory agencies, external consultant, monitoring laboratories
- Maintain log of public complain and the action taken

10.10 BUDGETARY PROVISION FOR ENVIRONMENTAL MEASURES (EMP)

Proposed project cost is estimated to be **Rs. 282.28 Cro res** which includes cost towards land, construction, machinery purchase and other facilities to be provided for environment management plan. Capital cost of EMP estimates based on cost of wastewater treatment facility, air pollution control equipments, waste management facility, greenbelt development & management plan, safety measures and other components of the EMP shall be implemented along with the commissioning of the proposed project. Total Rs. 911.0 Lakhs is allocated for Environmental control measures/Environmental management plan. To achieve the prescribed norms for water, air and waste it is necessary to operate the EMP regularly. The budgetary provision made for environmental management is briefly illustrated in table below.

Table 10.8: Budgetary Provision for Environmental Management Plan

S. No.	Particulars	Capital Cost (Lakhs)	Recusing Cost (Lakhs/annum)
1.	Air Pollution Control Devices	752.15	85.00
2.	Water Pollution & Reclamation	35.00	5.60
3.	Occupational Health and Safety	49.85	18.30
4.	Environmental Monitoring	54.00	27.81
5.	Green Belt Development	20.00	12.00
	Total	**911.00**	**148.71**

10.11 COMPLIANCE WIT H CORPORATE RE SPONSIBILITY FOR ENVIRONMENTAL PROTECTION (CREP) GUIDELINES

Sanghi Industries Ltd shall ensure to protect the environment in the following manner which is described below:

- Conservation of water
- Conservation of natural resources
- Elimination of toxic substances
- Waste water treatment
- Emission control
- Solid Waste Management
- Monitoring of Effluent, Emission and Ambient Air Quality
- Creation of Environmental Cell

10.12 SUMMARY

The main purpose of EMP is to minimize the identified potential environmental impacts to be generated from the proposed project and to mitigate the consequences. During operation phase the industry will maintain comprehensive environment management plan in place for the proposed project which shall covers all the environment protection measures to mitigate improvised environmental impact. Cement grinding unit (GU) will be operated on the dry process technology; water will be used for mainly cooling and domestic purpose. The sewage wastewater treated in the proposed sewage treatment plant of 15 KLD. Treated sewage water is will be used for watering the greenbelt and dust suppression. Adequate and efficient control equipment will be installed and will meet the prescribed emission. Major pollution control system and other ventilation systems will be installed in the proposed cement plant to keep the dust emission at a minimum. Approximately Rs. 4.24 Crores has been allocated for CER for next five years. Approx. 4125 Nos. trees will be planted within next five years. SIL will formulate an Environmental and Safety Management Cell (EMC) as an integrated managerial body from various disciplines to co-ordinate the project activities concerned with implementation of environment control measures and management.

11 SUMMARY & CONCLUSION

11.1 PROJECT DESCRIPTION

Sanghi Industries Limited (SIL) proposed the Greenfield project of 2.0 MTPA Standalone grinding unit with bulk and bag packing plant at at, Survey No. 125/1, 125/2,126/1+2+3, Shivrampur Village, Tal. Choryasi, Dist.- Surat, Gujarat. This activity falls in Category- B under Project/Activity 3(b) schedule as per EIA Notification dated 14th September, 2006, as subsequent amendments. The company has well defined vision, mission and values that the company follows on its path to success. It has a vision to be the business leader, delivering superior value to all our stakeholders with a mission to achieve profitable growth and customer delight through innovation, operational excellence, leadership and teamwork to add value for all stakeholders and society. The coordinates of the site presented below as:

Latitude	Longitude
21° 9'0.78"N	72°39'3.62"E
21° 9'0.29"N	72°39'5.47"E
21° 9'0.46"N	72°39'11.28"E
21° 8'55.54"N	72°39'11.61"E

Table 11.1 Environmental Sensitivity

Particulars	Description
Nearest Village	Shivrampur @.1.5 Km in SW direction
Nearest City/ District	Surat @ 16.0 Km in ESE
Nearest Highway	NH-6 @ 0.9 km in East
Stream / Rivers	Tapi River @ 0.89 km in East
Nearest Industry	L&T, Reliance, Essar etc.
Nearest Sea	Arabian sea
Nearest Historical, religious and other important cultural places	None in 10 km radius
Forest & Wildlife Sanctuary/National Parks, Biosphere Reserves	
Nearest Hill/Mountain	
Defense Installation	

Table 11.2. Project cost - Rs. in Lakhs

S.No.	Description	Amount (Rs. Lakhs)
1.	Land & Site Development	3819.0
2.	Civil works & Structures	7633.0
3.	Plant & Machinery	13334.0
4.	E & I Installation	2390.0
5.	Environment Management system	911.0
6.	Engineering	130.0
7.	Lab equipment/set up	0.50
8.	Expense on Training	10.0
9.	Contingency	0.50
	Total	**28228.0**

Table 11.3 Bifurcation of Plot area

#	Particulars	Total Area (in Ha.)	Area
1.	Production Plant	0.712	14.66%
2.	Office & Lab Area	0.022	0.46%
3.	Raw Materials Storage Area	0.632	13.01%

4.	Solid Waste Storage Area	0.005	0.10%
5.	Open Space	1.835	37.79%
6.	Green Belt	1.650	33.98%
	Total	**4.856**	**100.00%**

11.1.1 Water

Source: Local Body/Irrigation Department

Requirement: 278 KLD (Fresh Water = 200 KLD)

Table 11.4 Water Consumption

S. No.	Particulars	Water Consumption, (KLD)
A.	**Domestic**	**15.0**
B.	**Industrial**	
1.	Processing/Cooling	150
2.	Dust suppression & Fire Fighting	10 KLD Fresh Water + 58 KLD from Blow down = 68 KLD
	Total Industrial	**160.0**
C.	**Gardening**	25 KLD Fresh water + 20 KLD recycled= Total 45
	Total Fresh water Requirement	**200.0**
	Total water Requirement	**278.0**

11.1.2 Electricity

The estimated power demand for the proposed grinding and packing plant is estimated as 13.5 MW, which will be sourced from state electricity board/wheeling from CPP at Sanghipuram.

11.1.3 Fuel

Approx. 12 TPH coal/lignite/petcoke will be required for HAG.

11.1.4 Manpower

Particulars	Construction Phase			Operation Phase		
	Direct	Indirect	Total	Direct	Indirect	Total
Skilled	45	280	325	20	30	50
Semi – Skilled	-	100	100	-	125	125
Unskilled	5	70	75	5	100	105
Total	**50**	**450**	**500**	**25**	**255**	**280**

11.1.5 Raw material

S.No.	Material	Requirement per Annum - Million Ton/Annum			
		100% OPC	100% PPC	100% PSC	Max per Annum
1.	Clinker - OPC	1.90	--	--	1.90
	Clinker - PPC	--	1.20	--	
	Clinker - PSC	--	--	1.10	
2.	Gypsum	0.10	0.10	0.10	0.10
3.	Fly Ash	--	0.70	--	0.70
4.	Slag	--	--	0.80	0.80
5.	Lignite / Coal / Petcoke	--	--	0.06	0.06

Magnitude of the Operation

Total cement produced per day = 2,000,000/ 330 = 6,060 T

Cement storage of 3x7,000 t multi compartment silo, is proposed, which is adequate for about 3 day of production. Cement from the grinding system is transported to the silos with the help of air slides and bucket elevators. From the silos, cement shall be transported to the packer with the help of a set of air slides and bucket elevators.

11.1.6 Air Environment

There will be fugitive emission from cement mill, Hot Air generator and packing of cement; while there will be no process gas emission.

Table 11.5: Fugitive Emission

S.No.	Location	Qty. Nos.	Capacity	Stack Details
C. Main Process Bag house				
A1	Cement Mill (VRM)	01	11,00,000 m^3/hr	Height – 55 m Dia – 3.2 m Air emission: PM 30 mg/Nm^3 SOx 100 ppm NOx 100 ppm
D. De-dusting Bag filters				
B1	Clinker & additive unloading station	02	11,000 m^3/hr	--
B2	Clinker Silo top	01	25,000 m^3/hr	--
B3	Cement Silo top	03	3,000 m^3/hr (each)	--
B4	Cement extraction under silo	03	3,000 m^3/hr (each)	--
B5	Packing plant top	01	45,000 m^3/hr	--
B6	Bulk cement loading	01	5,000 m^3/hr	--
B7	Fly ash silo top	01	3,000 m^3/hr	--
B8	Feed Hopper for HAG	01	5,000 m^3/hr	-

11.1.7 Solid Waste

S.No.	Waste Type	Qty / Annum	End use / Disposal
1.	Dust collected from APCM	--	Totally recycled in process
2.	Ash generated from HAG	18000 MT	100 % recycled in the plant in PPC
3.	Used Oil	60 MT	Secondary lubrication / send to Own Clinker plant under AFR

11.1.8 Noise Environment

The heavy machinery and large fans equipped in various parts of the cement grinding unit can give rise to noise and/or vibration emissions. Properly insulated enclosures will be provided for high noise generating plant machinery. Green belt (33%) will be developed around the site with noise absorbing trees. The adequate PPEs will be made available for all the workers during operation.

11.1.9 Occupational Health and Safety

Project proponent is committed towards the health and safety of workers. Safety training will be provided to the employees. Safety sirens with alarm system in case of emergency will be provided. Emergency control room will be established. Fire-fighting network including fire extinguishers, fire hydrant system etc. covering entire plant will be provided. First aid boxes at appropriate place and safety training will be provided. Personal protective gears and equipment will be provided to the

employees. Health check-ups will be organized at regular intervals. Proponent will make provision of industrial hygienist and monitoring of the occupational injury and maintain the record of the same as per requirement of Gujarat Factories Rules. All fire-fighting equipment and warning devices will be kept in perfect working conditions at all the times. It will be seen that all personnel are aware of the implications of environmental pollution and simple practices to avoid pollution.

11.2 DESCRIPTION OF THE ENVIRONMENT

The baseline study for various environmental parameters viz. air, water, soil, noise has been conducted for one season 1st Oct 2018 to 31st Dec 2018. The PM_{10} observed in the range 61.8 – 86.4 µg/m^3 and while $PM_{2.5}$ was 31.6 – 47.6 µg/m^3 which was under NAAQS limit. All other parameters are found within limit. The TDS in ground water ranged from 806 – 6722 mg/L while in surface water, it ranges between 1037 - 26863 mg/L. For ecological environment; Dominant flora of the study region is bangalibaval, gandobaval and desibabool. Area is not rich with floral diversity. Natural vegetation of study area is in degraded condition and wild mammal's density is also very low. There is no threatened or endangered species in study region. The socio-economic conditions in the study area showsalmost pakka road facility are available in all villages within 10 km radius. Literacy rate of the study region is from 72% to 93%. Almost all the villages have more than 50% people as non-workers. It indicates that the problem of unemployment can be solved by providing proper training and education. There is also need to establish more industries so that maximum number of employment can be generated.

11.3 IMPACT AND MITIGATION MEASURES

Activity	Environmental Attribute	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Intensity and Significance
Vehicle Movement and utilities operation	Air Quality	Exhaust Emissions *i.e*. NO_x, SO_2 Fugitive emission	Negative	Short Term	Reversible	Low, due to movement of vehicle only for loading and unloading of raw material. Provision of APC's.
	Noise Levels	Noise Generation	Negative	Short Term	Reversible	Low, due to limited activity
	Risk & Hazards	Accidents, collision of transport vehicles	Negative	Short Term	Reversible	Medium due to loss of property and injury to manpower.
Process of cement production and raw material handling, storage	Noise Levels	Noise Generation from utilities, processing machineries and reaction vessels	Negative	Long Term	Reversible	Low, due to noise reduction measures
	Work Zone Air Quality	Flue gas generation	Negative	Long Term	Reversible	Medium, due to air pollution control devices (APC's)
	Risk & Hazards	Catch fire accidents	Negative	Short Term	Reversible	High, due to injury to manpower and loss of properties and fatal accidents
Solid/ Hazardous Waste Disposal	Land and Soil	Generation of Solid Waste	Negative	Short Term	Reversible	Will be utilized in own cement plant.
Green Belt Development	Ecology	Planting of Trees	Positive	Long Term	Reversible	High, Positive Impact
	Air Quality	Dust barrier	Positive	Short	irreversible	Low, Positive Impact

Activity	Environmental Attribute	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Intensity and Significance
				Term		
	Noise	Noise barrier	Positive	Short Term	irreversible	Low, Positive Impact
	LU/LC	Conservation of Land	Positive	Long Term	irreversible	Medium, Positive Impact
	Soil	Increase in soil fertility	Positive	Long Term	Irreversible	Medium, Positive Impact
	Water	Water consumption	Negative	Long term	Irreversible	Low, due to water circulation
Employment Generation	Socio Economic Status	Direct and Indirect employment	Positive	Long term	Irreversible	High, the project will generate employment

11.4 Environmental Management Plan

#	Aspects due to proposed activity	Impact zones	Management plan	Responsibility
	Air Environment			
1.	Dust generation	Near storage area	➢ Dust collection system will be provided ➢ De-dusting bag filter will be provided.	EHS In-charge/ EHS team
2.	Dust generation due to grinding of Clinker with other materials.	Near grinding area	➢ Dust collection system will be provided ➢ Ensured continuous monitoring SPM concentration as per consent norms. ➢ Bag filters are proposed as APCM to control fugitive emission	EHS In-charge/ EHS team
3.	PM_{10} emission due to operation of Hot Air generator and operation of drying and cooling section in process	--	➢ Stack of 55m will be provided. ➢ Ensure monitoring of stack for SPM concentrations as per regulatory norms	EHS In-charge/ EHS team
4.	Transportation activities during construction and operation phase	nearby highway/Sea route	➢ Transportation of raw materials and finished goods will be carried out in well covered trucks ➢ Traffic Management Plan will be made and followed ➢ Records will be maintained for entry and exit of vehicles	EHS In-charge/ EHS team
	Water Environment			
1.	Sewage generation due to Influx of workers during construction and Operation phase	Within plant premises	➢ Sewage will be treated into Sewage treatment plant.	Design Head
2.	Consumption of water for operation of plant	Fresh water reservoir	➢ Online flow meters shall be installed at each of raw water consumption point. ➢ The fresh water demand	EHS In-charge/ EHS team

			will be reduced by recycling and reuse of waste water	
Land Environment				
1.	Soil Contamination due to Settling of particulate matter on nearby vegetation field		➢ Highly efficient bag filter shall be installed to collect particulate matter. ➢ Plant load will be lowered during monsoon season ➢ Green belt will be developed around the plant area	Design Head/ EHS In-charge/ EHS team
2.	Generation of ash from operation of Hot Air generator	Within plant premise	➢ Ash generated by the HAG will be 100% utilized in cement manufacturing process (PPC) Dust collected from air pollution control equipment will be totally recycled in process.	EHS In-charge/ EHS team
3.	Generation of scraps during construction and operation phase	Within plant premise	➢ Ensuring that solid waste are handled as per Solid Waste Management Rule, 2016 and sold to registered and authorized vendors	EHS In-charge/ EHS team
Noise Environment				
1.	Noise from operation of crushing and grinding units in plant	Within plant premise	➢ Green belt will be developed around the site with noise absorbing trees ➢ Proper maintenance of equipment will be done ➢ Proper PPE like Ear Plugs & ear muffs will be provided	Plant In-charge/ EHS In-charge/ EHS team
2.	Noise from operation of D.G set etc.	Near utility area	➢ Proper maintenance of equipment will be done ➢ Inbuilt acoustic enclosures will be ensured	Plant In-charge
3.	Noise due to Transportation of raw material and finished goods	Within site and transport route	➢ Valid PUC vehicles will be ensured during construction and operation phase.	EHS In-charge/ EHS team
Risk and Hazard				
1.	Emergency preparedness	Within site	➢ Fire protection and safety measures to be taken ➢ Safety training to avoid accidents ➢ Mock drill records, on site emergency and evacuation plan	EHS In-charge/ EHS team

11.5 CONCLUSION

Based on the EIA study conducted in Post Monsoon of 2018 (Oct. to Dec. 2018) and as per terms of reference given by SEAC, the following highlights emerge:

- There will be minimal pollution potential on air, water and noise environment, which, with the implementation of the mitigation measures and EMP, can be reduced considerably.
- The proposed project activities will have positive beneficial effect on the local population, economic output and other related facilities *viz.* employment, development of business, transportation *etc.*
- Risk assessment including emergency response plan and DMP has been prepared to handle any sort of emergencies.
- Looking to the overall project justification, process, pollution potential and pollution prevention measures /technologies installed by proponent, environmental management activities of proponent; the proposed project would be environmentally acceptable, in compliance with environmental legislation and standards.

Hence, looking to the overall project justification, process, pollution potential and pollution prevention measures/technologies installed by proponent, environmental management activities of proponent; it has been concluded that the proposed project would not have any considerable impacts on environment as well as socio-economic and ecological conditions of the project area. Hence proposed grinding unit at Shivrampur, Hazira is considered environmentally safe.

12 DISCLOSURE OF CONSULTANT ENGAGED

12.1 GENERAL

Sanghi Industries Limited (SIL) has appointed **Eco Chem Sales & Services (ECSS)** for carrying out this Environmental Impact Assessment Study as per the EIA notification, 2006 as amended till date. ECSS has approved EIA coordinators and Field Area Experts for undertaking Environmental and related studies in twenty-one (21) approved sectors by NABET, Quality Council of India, New Delhi.

12.2 BRIEF RESUME AND NATURE OF CONSULTANCY

ECO CHEM SALES & SERVICES (ECSS) is one of the leading companies in the field of Environmental Consultancy Service providers in India. We are NABET Accredited consultant for conducting Environmental Impact Assessment Studies (EIA) and obtaining Environmental Clearances. We also take up services which include and are not limited to Environment Monitoring & Testing, Environment Audit, Risk Assessment Studies, Turnkey solutions, Operation and Maintenance contracts and obtaining various statutory clearances from Ministry of Environment, Forest and Climate Change (MoEFCC) and State Pollution Control Boards. ECSS also has branch offices in Vapi, Dahej and Vadodara, Gujarat. The accreditation certificate number NABET/EIA/1720/RA 051 is valid up to 3rd Feb. 2020.

12.3 EIA TEAM MEMBERS

Eco Chem Sales & Services carried out work presented in this report with active co-operation from Sanghi Industries Ltd. The name of the team members associated in the preparation and studies of EIA/EMP for Standalone grinding unit with bulk and bag packing plant is mentioned in table 12.1.

Table 12.1: Team Members (TM)/FAA involved in EIA studies and EMP Preparation

Name of Internal Team Member	Activity / Area	Involvement	Under Approved Expert
		Actual Work Performed	
Dr. Ashok K. Rathoure	Quality Check & EIA documentation	Project Planning; Site visit; Primary Survey; Technical discussion with client; Water balance; Mass balance, Presentation before committee; Review of each chapters in EIA report; Guidance in writing and modification in Contents; EMP; budgetary outlay.	--
Mr. Praful Patel	EIA documentation & Conduction of PH	Site visit, coordination with environmental monitoring team, sample collection, conducting public hearing, EIA submission, and follow up with GPCB, EIA documentation.	EIA Coordinator
Ms. Priyanka Verma	Help in EIA Report writing	Coordination for data collection, data analysis, coordination with FAEs, various chapter preparations, compiling the primary & secondary data into EIA report.	EIA Coordinator
Mrs. Kanchan Prabha Rathoure	Socio-economics (SE)	Conduction baseline socio-economic surveys through interviews/questionnaire from the surrounding areas/villages of the proposed project, impact identification and mitigation measures for incorporating to EIA documentation.	FAE SE

12.4 LABORATORY INVOLVED FOR BASELINE MONITORING AND OTHER ANALYSIS

One season baseline monitoring and analysis has been done by Ecosystem Management Resource Pvt. Ltd., NABL accredited Laboratory, Certificate No. TC – 6603, issued on dated 26/10/2017 and valid till 25/10/2019. Certificate of NABL is attached as Annexure VII.

LARSEN & TOUBRO

Larsen & Toubro Limited
Hazira Central Services
Hazira Manufacturing Complex
Post: Bhatha, Surat 394 510
Gujarat, INDIA
Tel.: +91 261 280 5000
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www.Larsentoubro.com

HZMC/ADMIN/FOREST/2021/1

3rd Feb,2021

To,
Deputy Conservator of Forests,
Van Bhavan, Shivaji Chowk,
Gangeshwar Mahadev Road,
Adajan,
Surat-395009

Sub : An Application for seeking details of Wetland, Mangrove & Forest in the Hazira area.

Dear sir,

With reference to above subject, we request you to give details of area of Wetland, Mangrove and Forest for following villages included in Hazira area, Taluka- Choryasi, District-Surat:

1. Hazira,
2. Shivrampur(Junagam),
3. Mora
4. Suvali
5. Rajgari
6. Damka
7. Vansva
8. Tena
9. Bhatlai
10. Kavas
11. Limla
12. Bhatpore

Thanking you.

Regards,
For, Larsen & Toubro Limited

Authorised Signatory

નાયબ વન સંરક્ષક
સુરત વન વિભાગ, સુરત.
03-02-2021

S. M. SAIYAD, IFS
MEMBER SECRETARY
SEIAA (GUJARAT)

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY GUJARAT

Government of Gujarat

No. SEIAA/GUJ/EC/3(b)/1155/2018 Date: 23 AUG 2019 By R P A D

Time Limit

Sub: Environment Clearance to M/s. Sanghi Industries Limited for setting up of stand-alone Cement grinding unit at Survey No. 125/1, 125/2 and 126/1+2+3, Vill.: Shivrampur, Ta.: Choryasi, Dist.: Surat. In Category 3(b) of Schedule annexed with EIA Notification dated 14/09/2006.

Ref: Your Proposal No. SIA/GJ/INO/30448/2018.

Dear Sir,

This has reference to your application along with Form-I dated 03/04/2019 submitted to SEIAA seeking Environmental Clearance under Environment Impact Assessment Notification, 2006 and additional information / documents submitted vide letter dated 23/05/2019 to the SEAC.

The proposal is for Environmental Clearance to M/s. Sanghi Industries Limited for setting up of stand-alone Cement grinding unit at Survey No. 125/1, 125/2 and 126/1+2+3, Vill.: Shivrampur, Ta.: Choryasi, Dist.: Surat. In Category 5(f) of Schedule annexed with EIA Notification dated 14/09/2006. It is a proposed unit for manufacturing following products, which falls in the category - 3(b) of the schedule of the EIA Notification-2006:

Sr. No.	Name of the Products	Quantity, MMT/Annum
1	Cement (OPC / PPC / PSC)	2.0

The project activity is covered in 5(f) and is of 'B' Category. Public hearing was conducted on 22/03/2019.

The SEAC, Gujarat vide their letter dated 16/07/2019 has recommended to the SEIAA, Gujarat, to grant the Environment Clearance for the above-mentioned project based on its meeting held on 12/06/2019. The proposal was considered by SEIAA, Gujarat in its meeting held on 16/07/2019 at Gandhinagar. After careful consideration, the SEIAA hereby accords Environmental Clearance to above project under the provisions of EIA Notification dated 14th September, 2006 subject to the compliance of the following conditions.

A. CONDITIONS

CONSTRUCTION PHASE

a) Water demand during construction phase shall be reduced by use of curing agents, super plasticizers and other best construction practices.

b) Project proponent shall ensure that surrounding environment shall not be affected due to construction activity. Construction materials shall be covered during transportation and regular water sprinkling shall be done in vulnerable areas for controlling fugitive emission.

c) All required sanitary and hygienic measures shall be provided before starting the construction activities and to be maintained throughout the construction phase.

d) First Aid Box shall be made readily available in adequate quantity at all the times.

e) SIL (Sanghi Industries Ltd.) shall strictly comply with the Building and other Construction Workers' (Regulation of Employment & Conditions of Service) Act 1996 and Gujarat rules made there under and their subsequent amendments. Local bye-laws of concern authority shall be complied in letter and spirit.

f) Ambient noise levels shall conform to residential standards both during day and night. Incremental pollution load on the ambient air and noise quality shall be closely monitored during construction phase.

g) Use of Diesel Generator (DG) sets during construction phase shall be strictly equipped with acoustic enclosure and shall conform to the EPA Rules for air and noise emission standards.

h) Safe disposal of waste water and municipal solid wastes generated during the construction phase shall be ensured.

i) All topsoil excavated during construction activity shall be used in horticultural / landscape development within the project site.

j) Excavated earth to be generated during the construction phase shall be utilized within the premises to the maximum extent possible and balance quantity of excavated earth shall be disposed off with the approval of the competent authority after taking the necessary precautions for general safety and health aspects. Disposal of the excavated earth during construction phase shall not create adverse effect on neighbouring communities.

k) Project proponent shall ensure use of eco-friendly building materials including fly ash bricks, fly ash paver blocks.

Ready Mix Concrete [RMC] and lead free paints in the project

l) Fly ash shall be used in construction wherever applicable as per provisions of Fly Ash Notification under the E.P. Act, 1986 and its subsequent amendments from time to time.

OPERATION PHASE:

A. 1 SPECIFIC CONDITION :

1. Project proponent (Sanghi Industries Ltd.- SIL) shall procure raw materials like clinker for the proposed project from the authorized units having Environmental Clearance as per the EIA Notification 2006, CTE & CC&A from the concern authorities.
2. SIL shall abide by all the commitments and recommendations made in the EIA / EMP report prepared by Eco Chem Sales & Services, Surat and that during their presentation to the SEAC/SEIAA. The commitments made by S.I. to the issue raised during public hearing shall be implemented by the proponent. Implementation of the mitigation plan and regular monitoring shall be carried out to ensure no any degradation of the environment, which adversely affect the Green belt, water, Health of Employees, product quality and business of neighboring units.
3. Complete Zero Liquid Discharge (ZLD) status shall be maintained all the time and there shall be no drainage connection from the premises.
4. SIL shall allocate the separate fund of Rs. 4.24 Crores i.e. 1.5 % of the capital investment for activities mentioned in EIA report under Corporate Environment Responsibility (CER) in accordance to the MoEFCC's Office Memorandum No. F.No.22-65/2017-IA.III dated 01/05/2018. The entire activities proposed under CER shall be monitored and the monitoring report shall be submitted to the regional office of MoEF&CC as a part of half-yearly compliance report and to district collector. The monitoring report shall be posted on the website of the project proponent.
5. SIL shall commission continuous ambient air quality monitoring station (CAAQMS) at appropriate location and an arrangement shall also be done for reflecting the online monitoring results on the company's server, which can be accessable by the GPCB on real time basis.
6. SIL shall develop minimum 33% green belt with native tree species in and around periphery of proposed project as per the prevailing guidelines of CPCB/MoEF&CC, New Delhi
7. SIL shall provide boundary wall with adequate height for control of dusting and fugitive emission.
8. SIL shall install advance sprinkling system for raw material like fly ash, gypsum and coal handling system and finished product like cement handling system.
9. SIL shall strictly adhere with assurance that there shall not be any degradation of environment which adversely affects the green belt, Water, Health of employees, production quality and business of neighboring units.
10. SIL shall commission Dust extraction system with capacity of 11000 m3/H and fully enclosed system for unloading station within plant premises.
11. SIL shall adopt closed transportation system for loading/unloading and bulk cement in closed cement tanker and latest advance closed conveying system shall be installed for raw material and finished product transportation within production plant and loading/unloading station.
12. SIL shall strictly comply prevailing guidelines for coal and fly ash handling.
13. SIL shall not use lignite and Petcock as fuel.
14. SIL shall comply all the applicable standard conditions prescribed in Office Memorandum (OM) published by MoEF&CC vide no. F. No. 22-34/2018-IA.III dated 08/08/2018 for Stand-alone Cement grinding units whose Captive Power Plant as mentioned at Sr. no. xii).
15. SIL shall install 24x7 Continuous Emission Monitoring System (CEMS) at process stacks to monitor stack emission with respect to standards prescribed in Environment (Protection) Rules 1986 vide G.S.R. No. 612 (E) dated 28th August, 2014 (Cement) and subsequent amendment dated 9th May, 2016 (Cement) and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories.
16. SIL must strictly adhere to the stipulations made by the Gujarat Pollution Control Board, State Government and/or any other statutory authority.
17. The National Ambient Air Quality Emission Standards issued by the Ministry vide G. S. R. No. 826 (E) dated 16th November, 2009 shall be complied with.
18. SIL shall monitor fugitive emissions in the plant premises at least once in every quarter through labs recognized under Environment (Protection) Act, 1986.
19. Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.
20. Appropriate and adequate Air Pollution Control (APC) system shall be provided for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed stack/vent emission and fugitive emission standards.
21. PP shall ensure covered transportation and conveying of raw material to prevent spillage and dust generation. Use

closed bunkers for carrying fly ash

22. Pollution control system in the cement plant shall be provided as per the CREP Guidelines of CPCB.
23. Third party monitoring shall be carried out for dust pollution on monthly basis through GPCB approved Third party and report shall be submitted to GPCB.
24. All the issues raised in the public hearing shall be considered/addressed / complied with in a time bound manner.
25. The National Ambient Air Quality Emission Standards issued by the Ministry vide G. S. R. No. 826 (E) dated 16th November, 2009 shall be complied with.
26. SIL shall obtain CGWA permission for withdrawal of ground water as per the public notice of CGWA vide no. 26-NCGWA/PN/2018 dated 14/11/2018.
27. A dedicated environmental cell with qualified personnel shall be established. The head of the environment cell shall report directly to the head of the Organization.

A. 2 WATER:

28. Total water requirement for the project shall not exceed 278 KL/Day. SIL shall reuse 78 KL/Day of treated effluent for dust suppression and cooling tower within premises and hence, fresh water requirement shall not exceed 200 KL/Day and it shall be met through Irrigation department/Private tankers. Necessary permission from concern Authority in this regards shall be obtained.
29. The industrial effluent generation from the project shall not exceed 70 KL/day.
30. Total industrial effluent 70 KL/Day of cooling reject shall be used for dust suppression and in closed circuit cooling tower. No effluent shall be discharged outside premises by any means.
31. Domestic wastewater generation shall be 10 KL/Day and it shall be treated through adequate capacity STP and treated sewage shall be reused for garden rejplantation within premises.
32. During monsoon season when treated sewage effluent may not be required for the plantation / Gardening / Green belt purpose, it shall be stored within premises. There shall be no discharge of waste water outside the premises in any case.
33. SIL shall provide buffer water storage tank of adequate capacity for storage of treated waste water during rainy days.
34. The company shall harvest rainwater from the rooftop of the building to recharge the ground water and to use the same water for the various activities of the project to conserve fresh water. Before recharging the surface run off, pre-treatment must be done to remove suspended matter.

A. 3 AIR:

35. SIL shall not exceed fuel consumption for Cement Mill (VRM) as mentioned below:

Sr. no.	Source of emission With Capacity	Stack Height (meter)	Type of Fuel	Quantity of Fuel MT/Day	Type of emissions i.e. Air Pollutants	Air Pollution Control Measures (APCM)
1	Cement Mill (VRM)	40	Imported Coal	182	PM SOx Nox	Bag House

36. SIL shall provide adequate APCM with flue gas generation sources as mentioned above.
37. SIL shall provide adequate APCM with process gas generation sources as mentioned below:

Sr. no.	Source of emission	Type of emission	Stack/Vent Height (meter)	Air Pollution Control Measures (APCM)
1	Clinker unloading Station	Fugitive	Vent Fan	De-dusting Bag Filter
2	Additive Unloading Station	Fugitive	Vent Fan	De-dusting Bag Filter
3	Clinker Silo Top	Fugitive	Vent Fan	De-dusting Bag Filter
4	Cement Silo Top	Fugitive	Vent Fan	De-dusting Bag Filter
5	Cement Extraction	Fugitive	Vent Fan	De-dusting Bag Filter
6	Packing Plant	Fugitive	Vent Fan	De-dusting Bag Filter
7	Bulk Cement Loading	Fugitive	Vent Fan	De-dusting Bag Filter
8	Fly Ash Silo Top	Fugitive	Vent Fan	De-dusting Bag Filter
9	HAG Feed Hopper	Fugitive	Vent Fan	De-ducting Bag Filter

38. The above-mentioned measures are indicative and the unit may explore the possibilities of other latest devices also to achieve the better results & better compliance of the air pollution control norms prescribed by the Gujarat Pollution Control Board (GPCB).
39. The Reverse Pulse Jet Type Bag Filters shall be provided with proper metallic casing, adequate stack height and stack monitoring requirement facility.
40. The design of the air pollution control equipments (APCE) shall be validated by the reputed institutes and APCEs shall be fabricated, erected and commissioned under guidance and supervision of the said institute.
41. The APCM shall be operated efficiently and effectively to achieve the norms prescribed by the GPCB at stack outlet.
42. SIL shall provide leakage detection and mechanized bag cleaning facilities for better maintenance of bags.
43. SIL shall provide sufficient number of mobile or stationery vacuum cleaners to clean plan roads, shop floors, roofs

regularly.

44. SIL shall use leak proof trucks/dumpers for carrying coal and other raw materials and shall cover them with tarpaulin. SIL shall use closed bulkers for carrying fly ash.
45. SIL shall provide adequate wind shelter fence to avoid any escaping of dust from the premises.
46. SIL shall have separate truck/bulkers parking area. The traffic management plan with parking facilities submitted before SEAC shall be implemented in letter and spirit.
47. Numbers of trips (In & Out) shall not exceed 353 nos per day for transport of cement and raw material during the operations of the grinding unit.
48. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution and shall conform to the EPA Rules for air and noise emission standards.
49. Stack/Vents of adequate height shall be provided as per the prevailing norms for flue gas emission/Process gas emission.
50. Interlocking facility of the pollution control equipment and the equipment(s) to which it is attached should be provided in such a manner that in the event of pollution control equipment(s) not working, the respective unit(s) is shut down automatically.
51. Regular periodic preventive maintenance of the air pollution control systems shall be carried out during the operation phase.
52. The applicant shall carry out yearly performance evaluation of the air pollution control equipments through any reputed institute and furnish the report in this regard to the Gujarat Pollution Control Board every year.
53. The fugitive emission in the work zone environment and ambient air quality shall be monitored. The emission shall confirm to the standards prescribed by the concerned authorities including Director of Industrial Health and Safety as well as Gujarat Pollution Control Board from time to time. Following indicative guidelines shall be followed to reduce the fugitive emission.
    a) Enclosure shall be provided at all loading and unloading operations.
    b) Water shall be sprayed on all raw materials stock pile periodically to retain some moisture in top layer except wet gypsum to reduce the fugitive emission.
    c) All transfer points shall be fully enclosed.
    d) Accumulated dust on the ground and other surfaces shall be removed / swept regularly and water the area after sweeping.
    e) Internal roads shall be either asphalted or paved properly to reduce the fugitive emission during vehicular movement.
    f) The company shall install adequate dust collection and extraction system to control fugitive dust emission at various material handling areas. (eg: raw material loading, unloading, conveying, transporting, stacking, bagging and packing etc.) Guidelines / Code of Practice issued by the CPCB for prevention and control of the fugitive emission shall be followed.
54. Regular monitoring of ground level concentration of PM10, PM2.5, SO2 & NOx shall be carried out in the impact zone and its records shall be maintained. Ambient air quality levels shall not exceed the standards stipulated by the GPCB. If at any stage these levels are found to exceed the prescribed limits, necessary additional control measures shall be taken immediately. The location of the stations and frequency of monitoring shall be decided in consultation with the GPCB.

A. SOLID/HAZARDOUS WASTE:

55. All the hazardous waste management shall be taken care as mentioned below:

S. N	Type of Waste	Source	Category as per Haz. Waste Rules, 2016	Quantity, MT/ Annum	Management of HW
1	Used Oil	Utilities & Operation	5.1	50 MT/Annum	Collection, Storage, Transportation and Disposed off in own cement plant at Sanghipuram

B. SAFETY:

56. Proper ventilation shall be provided in the work area.
57. Personal Protective Equipments shall be provided to workers and its usage shall be ensured and supervised.
58. First Aid Box shall be made readily available in adequate quantity in the unit.
59. Regular periodic work zone ambient air monitoring shall be carried out for measuring concentrations of cement dust silica dust etc. through qualified industrial hygienist and its records shall be maintained.
60. Occupational health surveillance of the workers shall be done and its records shall be maintained. Pre-employment and periodical medical examination for all the workers shall be undertaken on regular basis as per Factories Act & Rules.
61. All necessary safety measures shall be taken to avoid any kind of accident.
62. Training shall be imparted to all the workers on safety and health aspects.

5. 6 NOISE:

63. The overall noise level in and around the plant area shall be kept well within the prescribed standards by providing noise control measures including acoustic insulation, hoods, silencers, enclosures vibration dampers etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under the Environment (Protection) Act and Rules. Workplace noise levels for workers shall be as per the Factories Act and Rules

6. 7 CLEANER PRODUCTION AND WASTE MINIMISATION

64. The SIL shall undertake the Cleaner Production Assessment study through a reputed institute / organization and shall form a CP team in the company. The recommendations thereof along with the compliance shall be furnished to the GPCB.

65. Efforts shall be made to use more fly ash in cement manufacturing without compromising the quality of the cement

A. 8 GREEN BELTS AND OTHER PLANTATION:

66. Green belt shall be developed in an area equal to 33% of the plant area with a native tree species in accordance with CPCB guidelines. The greenbelt shall inter alia cover the entire periphery of the plant.

67. The SIL shall develop green belt within the factory premises as per the CPCB guidelines, consisting of at least three rows of trees of local species on periphery. However, if the adequate land is not available within the premises, the SIL shall take up adequate plantation at suitable open land on road sides and other open areas in nearby locality or schools in consultation with the Gram Panchayat / GPCB and submit an action plan of plantation for next three years to the GPCB.

B. OTHER CONDITION

68. Unit shall comply all the applicable standard conditions prescribed in Office Memorandum (OM) published by MoEF&CC vide no. F. No 22-34/2018-IA.III dated 09/08/2018.

69. In case of use of spray dryer, the unit shall provide the adequate & efficient APCMs with spray dryer so that there should not be any adverse impact on human health & environment. Unit shall carry out third party monitoring of the proposed Spray dryer & its APCM through the credible institutes and study report for impacts on Environment and Human Health shall be submitted to GPCB every year along with half yearly compliance report.

The project proponent shall allocate the separate fund for Corporate Environment Responsibility (CER) in accordance to the MoEF&CC's Office Memorandum No. F.No.22-65/2017-IA.III dated 01/05/2018 to carry out the activities under CER in affected area around the project. The entire activities proposed under CER shall be monitored and the monitoring report shall be submitted to the regional office of MoEF&CC as a part of half-yearly compliance report and to district collector. The monitoring report shall be posted on the website of the project proponent

71. In the event of failure of any pollution control system adopted by the unit, the SIL shall be safely closed down and shall not be restarted until the desired efficiency of the control equipment has been achieved.

72. All the recommendations of the Corporate Responsibility of Environment Protection (CREP) shall be strictly followed.

73. All the environmental protection measures and safeguards recommended in the EIA / EMP report of the project submitted by SIL shall be implemented effectively and shall be complied in letter and spirit.

74. SIL shall also comply with any additional condition that may be imposed by the SEAC or the SEIAA or any other competent authority for the purpose of the environmental protection and management.

75. No further expansion or modifications in the plant likely to cause environmental impacts shall be carried out without obtaining prior Environment Clearance from the concerned authority.

76. The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act,1974 the Air (Prevention & Control of Pollution) Act 1981, the Environment (Protection) Act, 1986 and the Hazardous Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

77. The granting of Environment Clearance to the project by the SEIAA does not restrain or dilute any legal action to be initiated against SIL by any authority including the GPCB, for contravening the construction work and production without obtaining prior Environment Clearance.

78. The project proponent shall comply all the conditions mentioned in "The Companies (Corporate Social Responsibility Policy) Rules, 2014" and its amendments from time to time in a letter and spirit.

79. The project management shall ensure that Unit complies with all the environment protection measures, risk mitigation measures and safeguards recommended in the EMP report and Risk Assessment study report as well as proposed by project proponent.

80. The project authorities shall earmark adequate funds to implement the conditions stipulated by SEIAA as well as GPCB along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose.

81. The applicant shall inform the public that the project has been accorded environmental clearance by the SEIAA and that the copies of the clearance letter are available with the GPCB and may also be seen at the Website of SEIAA/ SEAC/

GPCB. This shall be advertised within seven days from the date of the clearance letter, in at least two local newspapers that are widely circulated in the region, one of which shall be in the Gujarati language and the other in English. A copy each of the same shall be forwarded to the concerned Regional Office of the Ministry.

82. The project proponent shall also comply with any additional condition that may be imposed by the SEAC or the SEIAA or any other competent authority for the purpose of the environmental protection and management.
83. It shall be mandatory for the project management to submit half-yearly compliance report in respect of the stipulated prior environmental clearance terms and conditions in soft copies to the regulatory authority concerned, on 1st June and 1st December of each calendar year.
84. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
85. The project authorities shall also adhere to the stipulations made by the Gujarat Pollution Control Board.
86. The SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not found satisfactory.
87. The company in a time bound manner shall implement these conditions. The SEIAA reserves the right to stipulate additional conditions, if the same is found necessary.
88. The project authorities shall inform the GPCB, Regional Office of MoEF and SEIAA about the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.
89. This environmental clearance is valid for seven years from the date of issue.
90. Any appeal against this environmental clearance shall lie with the National Green Tribunal if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.
91. Submission of any false or misleading information or data which is material to screening or scoping or appraisal or decision on the application makes this environment clearance cancelled.

With regards,
Yours sincerely,

(S. M. SAIYAD)
Member Secretary

Issued to:
M/s. Sanghi Industries Limited
19th Floor, Kataria Arcade, Off S G Highway
PO: Makarba, Ahmedabad- 380051

SEIAA

Minutes of the 253rd Meeting held on 16th July 2019 at 09.00 A.M.

The 253rd meeting of the State Level Environment Impact Assessment Authority (SEIAA) was held under the Chairmanship of Shri C. L. Meena at Gujarat Pollution Control Board, Gandhinagar. Prof. G.H. Ban, Member of SEIAA and Shri S. M. Saiyad, Member Secretary of the State Level Environment Impact Assessment Authority (SEIAA) attended the meeting.

The following cases were taken up during the meeting:-

1	**Macson Products** Plot No. 2424/2426, Sachin GIDC, Surat	Synthetic Organic Chemical Industry – 5(f)	Surat
2	**Sanghi Industries Limited** Survey No 125/1, 125/2 and 126/1+2+3, Vil. Shivrampur, Ta. Choryasi, Surat	Cement Industry – 3(b)	Surat
3	**K. Patel Chemo Pharma Pvt. Ltd. (Unit No. -2)** Plot No. 408/6 to 408/23 (except plot no. 408/10 & 408/11), Notified GIDC Industrial Estate, Panoli, Ta. Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
4	**Amita Chemical Industries** Plot No. 4784, GIDC Estate, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
5	**Galaxy Chemi Science** Plot No. 10008/2, GIDC Estate, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
6	**Maitri Pharma** Plot No. 25/10, GIDC Jhagadia, Nr. Pepsico India Pvt. Ltd., Industrial Estate, Jhagadia, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
7	**Mahek Life Science** Plot No. 2329, GIDC Industrial Estate, Panoli, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
8	**Charon Pharma Chem Industries** Survey No. 183, Hardesan, Mehsana	Synthetic Organic Chemical Industry – 5(f)	Mehsana
9	**Abad Chemicals** Plot No. 4774-4775, GIDC Estate, Ankleshwar, Bharuch	Synthetic Organic Chemical Industry – 5(f)	Bharuch
10	**Dutt Chemicals** Plot No. 308/3/2, 308/1, 308/2, GIDC Phase-II, GIDC Vatva, Ahmedabad	Synthetic Organic Chemical Industry – 5(f)	Ahmedabad

Having carefully considered the relevant aspects, the following decisions were taken:-

1) Macson Products, Dist. Surat

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

2) Sanghi Industries Limited, Dist. Surat

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

3) K. Patel Chemo Pharma Pvt. Ltd. (Unit No. -2), Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

SEIAA State Level Environment Impact Assessment Authority Gujarat

4) Amita Chemical Industries, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

5) Galaxy Chemi Science, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

6) Metr Pharma, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

7) Mahek Life Science, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

8) Charon Pharma Chem Industries, Dist. Mehsana

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

9) Abac Chemicals, Dist. Bharuch

- After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC.

10) Dutt Chemicals, Dist. Ahmedabad

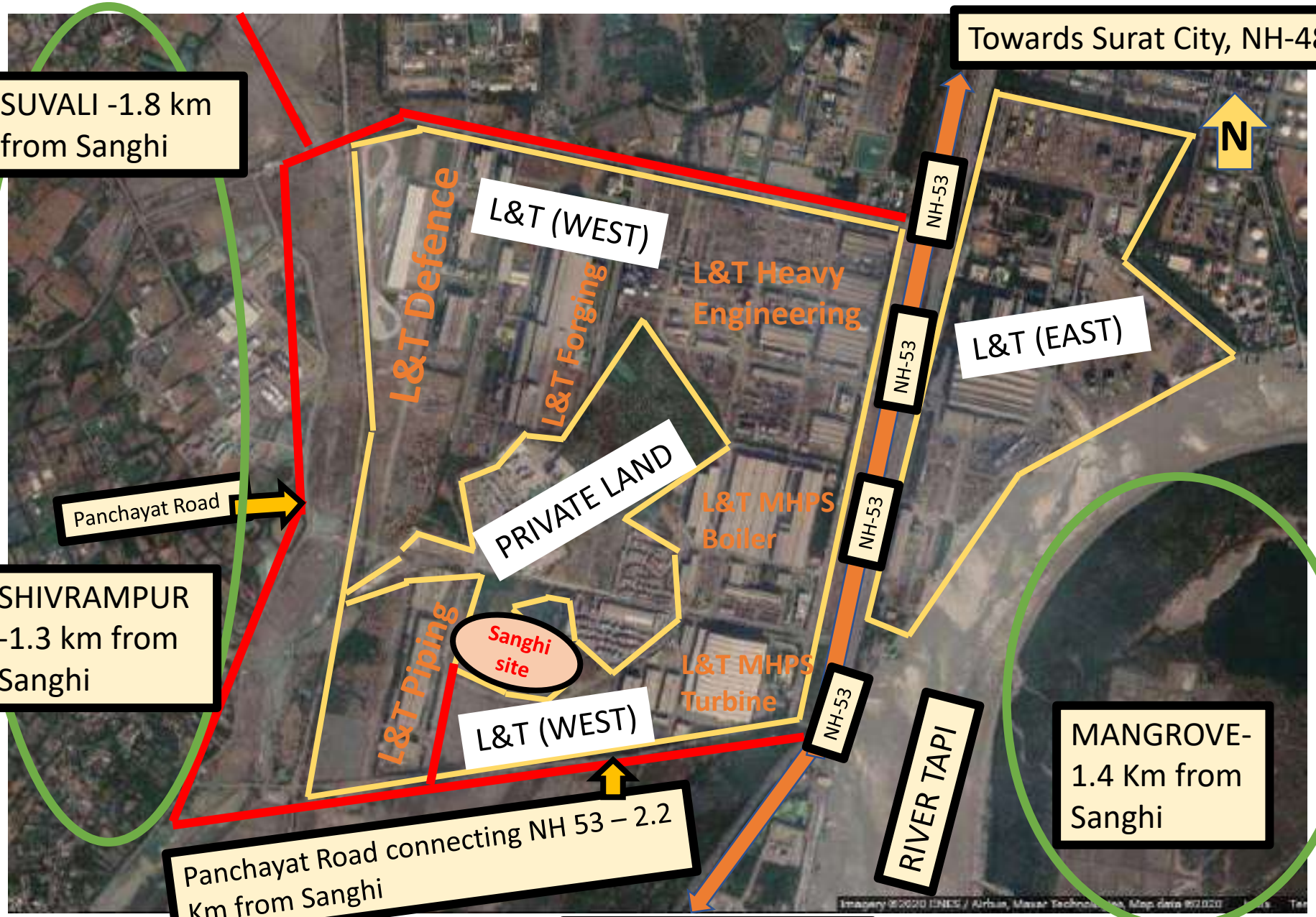
- After detailed discussion, it was decided to grant Terms of Reference as recommended by the SEAC.

Sr. No.	NAME	DESIGNATION	SIGNATURE
1.	Shri C. L. Meena	Chairman	
2.	Prof. G. H. Ban	Member	
3.	Shri S. M. Saiyad	Member Secretary	

ANNEXURE 13

Towards Surat City, NH-48 & SH-168
SUVALI -1.8 km
School- 1.3 Km
1100 Students
Sanghi Cement-
Proposed Site
NH-53
NH-53
NH-53
RIVER TAPI- 0.9 Km
SEA-3.3 Km
SHIVRAMPUR
-1.3 km
CREEK & FOREST
LAND-0.5 Km
MANGROVE-
1.4 Km
CREEK &
FOREST
LAND-3 Km
Towards Adani Port
998
3D

SANGHI CEMENT SITE LOCATED IN MIDST OF L&T COMPLEX LESS THAN 1 KM OF PERIPEHRY FROM ALL UNI

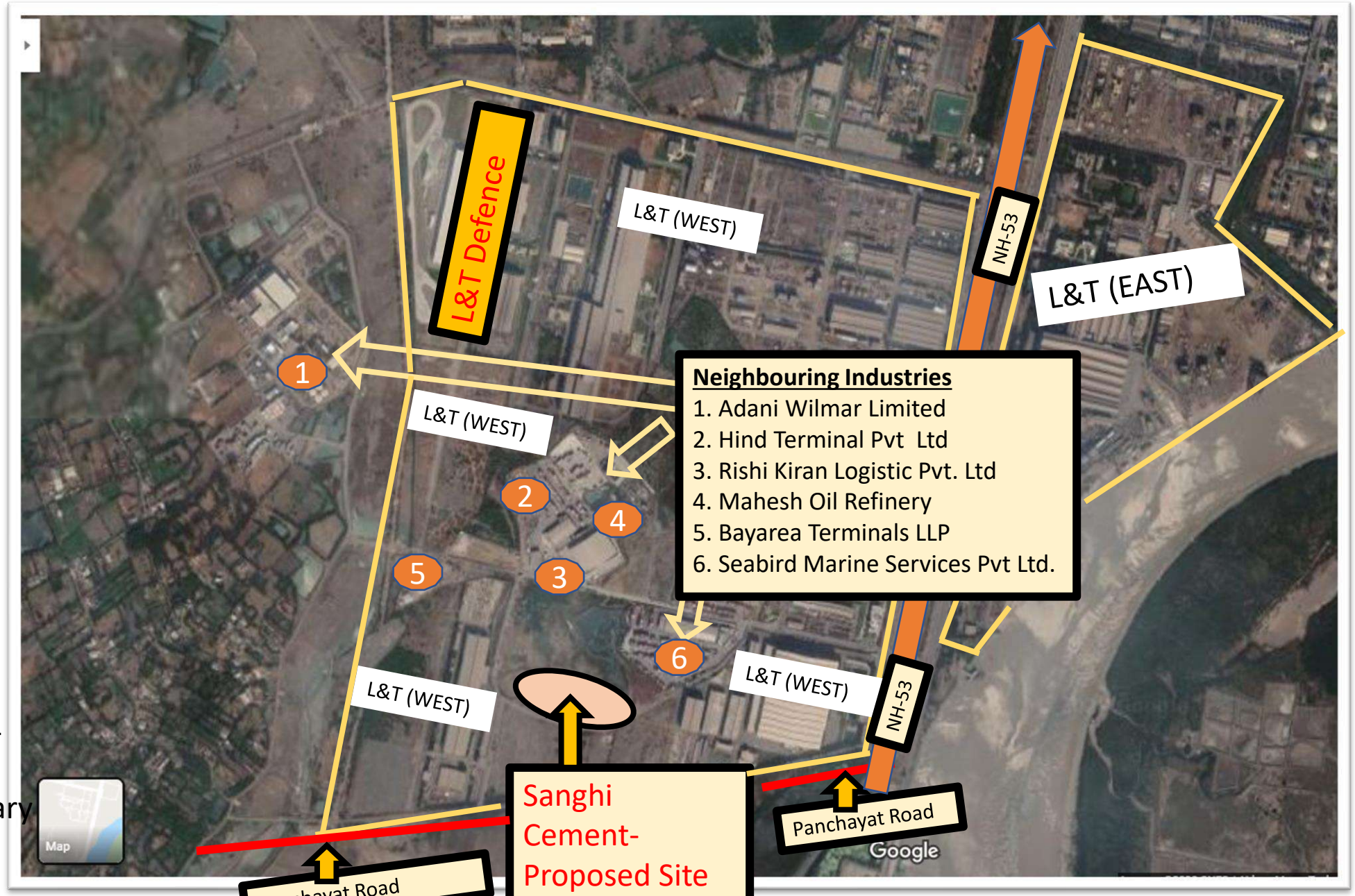


LEGEND

Panchayat Road

L&T Boundary

Neighbouring Industries in midst of L&T Hazira Manufacturing Complex



Neighbouring Industries

1. Adani Wilmar Limited
2. Hind Terminal Pvt Ltd
3. Rishi Kiran Logistic Pvt. Ltd
4. Mahesh Oil Refinery
5. Bayarea Terminals LLP
6. Seabird Marine Services Pvt Ltd.

LEGEND

L&T Boundary

Comprehensive General Development Control Regulations - 2017

(These regulations shall apply to the entire Gujarat state as classified categories in the notification)

(NOTIFICATION NO.- GH/V/269 OF 2017 / EDP – 102016 – 3629 – L DATED 12TH OCTOBER 2017 HAS BEEN SANCTIONED BY URBAN DEVELOPMENT AND URBAN HOUSING DEPARTMENT, GOVT. OF GUJARAT, GANDHINAGAR.)

(SCHEDULE – 1)

UD & UHD

URBAN DEVELOPMENT AND URBAN HOUSING DEPARTMENT,
BLOCK NO.- 14, 9TH FLOOR, NEW SACHIVALAYA,
GANDHINAGAR - 382010.
(Website – www.udd.gujarat.gov.in)

GOVERNMENT OF GUJARAT
URBAN DEVELOPMENT AND URBAN HOUSING DEPARTMENT
NOTIFICATION NO.GH/V/269 OF 2017/EDB-102016-3629-L
SACHIVALAYA, GANDHINAGAR.

NOTIFICATION

Date: 12.10.2017

NO.GH/V/269 of 2017/EDB-102016-3629-L: WHEREAS the Government of Gujarat is of the opinion that it is necessary, in the public interest, ease of doing business in the state to make variations in the General Development Control Regulation of the Final Development Plan of the Appropriate Authority specified in the Schedule-1 sanctioned under the respective Government Notifications, area under jurisdiction of the Gujarat Industrial Development Corporation, area covered under the jurisdiction of the Gandhidham Development Authority; area covered under the municipalities and area covered under Gram Panchayat, which are notified as Development Area Under THE GUJARAT TOWN PLANNING AND URBAN DEVELOPMENT ACT, 1976 and proposes new Gujarat Comprehensive General Development Control Regulation for the area under the jurisdiction of municipalities.

NOW THEREFORE, in exercise of the power conferred by

(1) sub-section (1) of section 116A read with sub-section(1) of section 122 of the Gujarat Town Planning and Urban Development Act, 1976;
(2) Section 155 of The Gujarat Nagarpalika Act, 1963;
(3) Clause (a) of Section 31 the Gandhidham (Development and Control on Erection of Buildings) Act 1957;
(4) Section 54 of the Gujarat Industrial Development Act, 1962 (Guj. XXIII of 1962)

The Government of Gujarat proposes the Regulations 2017 as follows namely:-

1. These Regulations as specified in the schedule appended here to may be called the Comprehensive General Development Control Regulation-2017, and;
2. Make Regulations for the area specified in Annexure – 2 in the manner specified in the Schedule appended hereto, and;
3. Proposes to modify the aforesaid development plan, Gujarat Industrial Development Conditions for plot/land allotted in Gujarat Industrial Development Corporation Estate Regulations, 1966, General Development Control Regulation for Gandhidham Development Authority by way of variation in the Schedule appended hereto, and;

The Government of Gujarat published the said modifications under Government Notification, Urban Development and Urban Housing Department GH/V/109 of 2017/EDB-102016-3629-L, dtd.05.06.2017, in the Gujarat Government Gazette Ext. Part.IV-B dated.05.06.2017 on Page No.225-1 to 225-7 for inviting from any person, to submit suggestions or objections, if any with respect to the proposed modifications to the Additional Chief Secretary to the Government of Gujarat, Urban Development and Urban Housing Department, Sachivalaya, Gandhinagar, in writing, within a period of one months from the date of publication of the said modification in Government Gazette.

AND WHEREAS, the Government of Gujarat has considered the suggestions and objection on merit;

NOW THEREFORE in exercise of the power conferred by

(1) sub-section (2) of section 116A read with sub-section(1) of section 122 of the Gujarat Town Planning and Urban Development Act, 1976;
(2) Section 155 of The Gujarat Nagarpalika Act, 1963;
(3) Clause (a) of Section 31 the Gandhidham (Development and Control on Eroction of Buildings) Act 1957;
(4) Section 54 of the Gujarat Industrial Development Act, 1962 (Guj. XXIII of 1962)

The Government of Gujarat sanction the Comprehensive General Development Control Regulations 2017 as follows namely:-

1. These Regulations as specified in the schedule appended here to may be called the Comprehensive General Development Control Regulation-2017, and;
2. Specify that the above Regulations 2017 shall come into force from the date of this notification;

SCHEDULE

Variations in the General Development Control Regulation of the Appropriate Authority specified in Annexure-1, Annexure-3, and Annexure-4, sanctioned under the respective Government Notifications of Urban Development and Urban Housing Department, Gujarat Industrial Development Corporation, Gandhidham Development Authority and make General Development Control Regulation for the local authorities functioning under the Gujarat Municipality Act-1963 as specified in Annexure-2. These Comprehensive General Development Control Regulations - 2017 is categorised in D 1 to D 9 as below.

Classification of Development Authorities and ULB's	
Class	Development Authority / ULB
D1	Urban Development Authority (Constituted under Section 22 of The GTP&UD Act) Ahmedabad Urban Development Authority(AUDA), Gandhinagar Urban Development Authority(GUDA), Surat Urban Development Authority(SUDA), Vadodara Urban Development Authority (VUDA)& Rajkot Urban Development Authority(RUDA).
D2	Urban/ Area Development Authority (Constitued under Section 22/ 5 of The GTP&UD Act) Junagadh Urban Development Authority(JUDA), Jamnagar Area Development Authority(JADA), Bhavnagar Area Development Authority(BADA), Bharuch-Ankleshwar Urban Development Authority(BAUDA)
D3	Area Development Authority (Constitued under Section 5 of The GTP&UD Act)and Municipality(Seismic Zone – V,) Bhuj Area Development Authority, Bhachau Area Development Authority, Rapar Area Development Authority, Anjar Area Development Authority, and Mandvi (Kautch)MUnicipality
D4	Urban Development Authority (Constitued under Section 22 of The GTP&UD Act) (other than Seismic Zone - V ,)

Classification of Development Authorities and ULB's		
Class	Development Authority / ULB	
	Himmatnagar Urban Development Authority(HUDA), Surendranagar-Wadhwan Urban Development Authority(SWUDA), Morbi-Wankaner Urban Development Authority(MWUDA), Bardoli Urban Development, authority(BUDA), Navsari Urban Development Authority(NUDA), Anand-Vidhyanagar-Karmasad Urban Development Authority(AVKUDA).	
D5	Area Development Authority (Constitued under Section 5 of The GTP&UDAct) (Special Project related areas.) Alang Area Development Authority, Ambaji Area Development Authority, Shamlaji Area Development Authority	
D6	The Gandhidham (Development and Control On Erection Of Buildings) Act – 1957. (Bombay Act No. Xix Of 1958) : Gandhidham Development Authority	
D7	Area Development Authority (Designated under Section 6 of The GTP&UD Act)	
	D7 (A)	Amreli, Botad, Godhra, Jetpur - Navagadh, Mahesana, Nadiad, Palanpur, Patan, Porbandar, Valsad, Vapi, Veraval-Patan,Bilimora, Borsad, Dabhoi, , Dahod, Deesa, Dhangadhra, Dholka, Dhoraji, Gondal, , Kadi, Keshod, , Khambhat, , Mahuva, Mangrol, Modasa, Okha, Palitana, Petlad, Savarkundala, Siddhapur, Una, Unjha, Upleta, Viramgam, Visnagar,
	D7 (B)	Ahawa (Dang), Anklav, Bagasara, Balasinor, Barwara, Bavla, Becharaji, Bhayavdar, Khambhaliya, Chansma, Chhaya, Chhota udepur, ChorwadDakor, Devgadhbaria, Dhandhuka, Dharampur, Dharmaj, Dwarka, Gandevi, Halol, Halwad, Idar, Jagadiya-Sultanpura, Jambusar, JamjodhpurKalawad, Kalol(Godhara), Kapadvanj, Karjan, Kathor, Kayavarohan Kheda, Khedbrahma, Kodinar, Kosamba, Limbdi, LunawdaManavadar, Mandal, Mandvi(Surat), Mansa, Matar, Pardi, Prantij, Radhanpur, Rajpipla, Ranpur, Sankheda, Santarampura, Savali, Shihor, Sojitra, Talod, Tarsadi, Thangadh, Udwada, Umargam, Umreth, Vadinar, Vadnagar, Vaghodia, Vaso, Vijapur, Vyara, Waghai (Dang), Kayavorahan.
D8	Nagarpalika declared under the Gujarat Municipalities Act, 1963 All Nagarpalika not included in D1 to D7(A) and D7(B)	
D9	Gujarat Industrial Development Act, 1962 All Industrial estates or industrial areas under the jurisdiction of Gujarat Industrial Development Corporations included in D1 to D8 or otherwise	

The provisions of the sanctioned the General Development Control Regulation stands replaced by the Schedule - 1.

By order and in the name of the Governor of Gujarat,

(Neela Munshi)
Officer on Special Duty & Ex-Officio Joint Secretary
to the Government of Gujarat
Urban Development and Urban Housing Department

7 GENERAL PLANNING AND DEVELOPMENT REGULATIONS

7.1 Zone Classification

Different zones and uses prescribed in the development plans as grouped below are conceptulised as per table 7.1.1. below.

Table No. 7.1.1.

Sr. No	Use Zone / Use as per Development Plan of Competent Authority	As mentioned	
		Conceptulised Use Zone	Code
(1)	(2)	(3)	(4)
1	Core Walled City	Core Walled City	CW
2	Walled City, City Area A (JADA, BADA, RUDA), City area B (RUDA), Nucleus Vistar 1, Nucleus Vistar 2, Existing Nucleus Node, Residential area A (Alang), Bhavanath (Junagadh), Gamtal, Gauthan, Village and Gamtal	Gamtal	GM
3	Village Extension, Gamtal Extension, Natural Growth of Village, Buffer zone of gamtal	Gamtal Extension	GME
4	Residential Zone, Residential Zone -1 (other than GUDA), Residential Zone -2, 3, 4, 5 (GUDA), City Area B (JADA, BADA), City Area C (JADA, BADA, RUDA), City Area E (BADA), Residential Area B (Alang), N. A. Residential Zone (Kalavad), Mix Use	Residential 1	R1
5	Residential Zone R2 (other than GUDA), Resudential Zone III (VUDA) City Area E (BADA)	Residential 2	R2
6	Residential Zone R3 (other than GUDA & VUDA), Recreation Zone (GUDA)	Residential 3	R3
7	Residential Zone R1 GUDA	Residential 4	R4
8	Residential Renewal Zone (GUDA)	Residential 5	R5
9	Residential Affordable Housing Zone - 1, Residential Affordable Housing Zone	Residential Affordable Housing	RAH
10	Restricted Residential Zone, Restricted Area, Flood Prone Area / Zone, Restriction Zone RZ1, RZ2, RZ3, RZ4 of VUDA, Hazard Prone Area, Defense Zone,	Restricted Zone	RZ

UD & UHD

Sr. No	Use Zone / Use as per Development Plan of Competent Authority	As mentioned	
		Conceptulised Use Zone	Code
(1)	(2)	(3)	(4)
11	Local Commercial Zone, Commercial Zone excluding of UDA.	Commercial 1	C1
12	Commercial Zone of UDA, Commercial Zone-I, Commercial Zone - II, Commercial Zone- III (other than GUDA), Commercial Zone IV (other than GUDA)	Commercial 2	C2
13	Commercial Zone III & IV of GUDA	Commercial - 3	C3
14	General Commercial Zone (GCZ)	Commercial - 4	C4
15	Central Business District	Commercial – 5	C5
16	Industrial Zone General, Industrial Zone, Non Obnoxious & Non Hazardous Industrial Zone, Light Industrial Zone, Industrial-A, GIDC.	Industrial Zone- 1	IZ1
17	Industrial Buffer Zone	Industrial Zone - 2	IZ2
18	GIDC Estate 1	Industrial Zone - 3	IZ3
19	GIDC Estate 2	Industrial Zone - 4	IZ4
20	Heavy Industrial Zone, Industrial Zone- Special, Obnoxious & Hazardous Industrial Zone	Industrial Zone - 5	IZ5
21	Industrial-B	Industrial Zone - 6	IZ6
22	Mix Industrial Use	Industrial Zone - 7	IZ7
23	Education Zone, Educational Purpose, Education, Religious & other Facilities, Service & Institutional Purpose, Institutional, Knowledge Precinct Institutional Zone II, Institutional Zone III, Institutional Zone IV (other than GUDA) Special Node I (I.T., Finance Services and Related Activities), Special Node 1 Special Node 2 (Technology and Bio tech Park), Special Node 2, Health Node,	Knowledge and Institutional Zone - 1	KZ1

UD & UHD

Sr. No	Use Zone / Use as per Development Plan of Competent Authority	As mentioned	
		Conceptulised Use Zone	Code
(1)	(2)	(3)	(4)
	Knowledge Township (VUDA)		
24	Institutional Zone –IV (GUDA)	Knowledge and Institutional Zone - 2	KZ2
25	Essential Public Purpose, Public Service, Necessary Public Service, Public Purpose (other than RUDA), Public & Semi-Public Purpose, Public Utility, Public Utility & Services, Neighbourhood Centre & Town Centre, Public Purpose Building, Existing Pubic Purpose, Public / Semi-public, Parking, Public Use	Public Purpose Zone - 1	PPZ1
26	Public Purpose (RUDA)	Public Purpose Zone - 2	PPZ2
27	Recreational, Recreational Zone 1, Recreational Zone 2, Green Institutional Zone-GI 1	Recreation Zone	REZ
28	Parks, Gardens and Open Space	PGO	P
29	Agriculture Zone, Agriculture, General Agriculture Zone	Agriculture – 1	AG1
30	Prime Agriculture, Agriculture (SP), Agriculture Special, High-tech Agriculture, Hi-Tech Agriculture Use, Agriculture – 1 (GUDA)	Agriculture – 2	AG2
31	Restricted Agriculture Zone	Agriculture – 3	AG3
32	Restricted Agriculture Zone (High Flood Zone)	Agriculture – 4	AG4
33	Logistics Zone, Logistic Park, Transport Node, Transport & Communication, Public Purpose (ST).	Logistics Zone	LZ
34	Special Plan Development Zone of GIFT	Special Plan Development Zone - 1	SPD1
35	Special Plan Development Zone of Sabarmati Riverfront Development	Special Plan Development Zone - 2	SPD2
36	SPD- Science Park	Special Plan Development Zone - 3	SPD3
37	SPD-Gandhi Ashram Special Development Area	Special Plan Development Zone - 4	SPD4

UD & UHD

Sr. No	Use Zone / Use as per Development Plan of Competent Authority	As mentioned	
		Conceptulised Use Zone	Code
(1)	(2)	(3)	(4)
38	Transport Oriented Zone, Smart City Node/ Transport Node, Highdensity zone available in both the sides of 200 mtr. from the edge of the road.	Smart City & TOZ	SPD5
39	Closed Textile Mill Zone	CZ	CZ
40	Forest Land	Forest Zone	FZ
41	Fishing Beach Zone	Special Zone 1	SZ1
42	Buffer Zone	Special Zone 2	SZ2
43	Hilly Area	Special Zone 3	SZ3
44	Heritage Zone	Special Zone 4	SZ4
45	Residential Tourist Accommodation Zone	Special Zone 5	SZ5
46	Special Tourism Project Area	Special Zone 6	SZ6
47	Vacant Land	Vacant Land	VL

7.2 Concept of zones

7.2.1 Core Walled City (CW)

This zone has been exclusively identified for promoting conservation of heritage structures and the urban fabric within the walled city.

7.2.2 Gamtal (GM)

This zone constitutes of gamtals having a traditional, organic character and compact development. This zone is identified to conserve this traditional character.

7.2.3 Gamtal Extension (GME)

This zone acts as a buffer zone for gamtals to allow their natural growth.

7.2.4 Residential Zone – 1, 2, 3, 4 (R1, R2, R3, R4)

This is the main zone of the Development area covering normally the largest area and includes residential, commercial and mixed land uses as per permissible uses and intended for a low to moderate to high density.

7.2.5 Residential Renewal zone (R5)

This is an overlay zone consisting of existing dilapidated government houses of sectors within the Gandhinagar Municipal Corporation area. It overlies the base Residential Zone 3.

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7.2.6 Residential- Affordable Housing Zone and Use (RAH)

This zone is an overlay Zone that permits predominantly residential development for providing Affordable Housing along with ancillary commercial uses
Affordable Housing as a use is permitted in all zones except all types of industrial Zones, Restricted Zone, Residential 3 and agriculture Zone. It shall also be permitted as a use in all other categories.

7.2.7 Restricted Zone (RZ)

This zone is intended for a limited residential use and as restricted subject to relevant regulations.

7.2.8 Commercial Zone – 1, 2, 3, 4, 5 (C1, C2, C3, C4, C5)

This zone is mainly intended for commercial use and may also include residential and mixed land uses as per permissible uses.

7.2.9 Industrial Zone - 1, 2, 3, 4 (IZ1, IZ2, IZ3, IZ4, IZ7)

This zone is intended for the development of all types of light industries that include small scale factories, transport terminals, etc. except hazardous industries. Other non-hazardous uses like residential buildings for industrial workers, commercial and institutional buildings supporting the existing industries are also permitted subject to relevant regulations.

7.2.10 Industrial Zone – 5, 6 (IZ5, IZ6)

This zone is intended for the development of obnoxious and high hazard industries including storage of inflammable goods and petrol, LPG, CNG and eco-friendly fuel Fuelling stations. The residential dwellings in this zone are only for industrial workers having maximum built up area up to 50 sq.mts per dwelling unit up to a maximum of 20% of the total utilised FSI of the plot area or subject to the relevant regulations. Dumping of solid industrial wastes is permitted subject to N.O.C. and conditions laid down by Pollution Control Board.

7.2.11 Knowledge and Institutional Zone –1, 2 (KZ1, KZ2)

This zone is proposed to be developed with large scale educational and institutional facilities promoting the city as an educational hub supported by some residential and basic commercial facilities. Under this zone, uses such as small and large schools, colleges, research institutions, etc are permitted. This zone is also Intended for activities related to I. T. , technology and Bio -Tech Park, bio-tech industries, R & D centre and its allied activities along with other residential, commercial, entertainment and recreational activities. The zone is also Intended for activities related to Medical, Centre and its related activities excluding infectious and contagious diseases & mental hospitals. along with other residential, commercial, entertainment, tourism and recreational activities.
The residential and Commercial use shall also be permitted if the plot is proposed for development for other than knowledge use.

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1 PREAMBLE

In pursuance of the provisions contained in clause (m) of sub-section (2) of section 12 and clause (c) of subsection (2) of section 13 of the Gujarat Town Planning and Urban Development 1976, the Surat Urban Development Authority hereby makes the following Regulations.

1.1 SHORT TITLE-EXTENT AND COMMENCEMENT

1.1.1

These regulations may be called the revised draft general development control regulation of the revised draft development plan of SUDA (including Surat municipal corporation area).

1.1.2

These Regulations shall come into force on and from the date prescribed in the notification of sanction of the Development Plan.

1.1.3

Subject to the provisions of the Gujarat Town Planning and Urban Development Act-1976, these Regulations shall apply to all the developments in the Urban Development Area including Surat Municipal Corporation area notified under sub-section (2) of section 22 of the Act vide Gujarat Government, Panchayat, Housing and Urban Development Notification No.GHB/ R1 / UDA / 1177 / 646 (4) – q-2 Dated 31st January, 1978 as may be modified or amended from time to time.

1.1.4

The sanctioned General Development Control Regulations of SUDA are Replaced by these Regulations.

SAVINGS:

Not withstanding anything done or any action taken under the regulations in force prior to such revision shall be deemed to be valid and continue to be so valid, unless otherwise specified.

2 DEFINITIONS

In these regulations, unless the context otherwise requires, the terms and expressions defined as follows shall have the meaning indicated against each of them.

The terms and expressions not defined in these regulations shall have the same meanings as in the Gujarat Town Planning & Urban Development Act, 1976 or Local Acts and the rules framed there under or as mentioned in National Building Code (NBC) as the case may be, unless the context otherwise requires.

2.1 ACT

Means the Gujarat Town Planning and Urban Development Act, 1976 (President Act No.27 of 1976) and B. P. M. C. ACT 1949 or Local Acts as stated in the context.

2.2 ADDITIONS AND /OR ALTERATIONS

Means any change in existing authorised building or change from one use to another use, or a structural change such as additions to the area or height, or the removal of part of a building, or a change to the structure such as the construction or cutting into or removal of any wall or part of a wall, partition, column, beam, joist, floor including a mezzanine floor or other support or a change to or closing of any required means of ingress or egress or a change to fixtures or equipments, as provided in these regulations. The addition to any existing structure shall only be permitted if it complies with the provisions of regulation No.17.4.

2.3 ADVERTISING SIGN/HOARDING

Means any surface or a structure with character, letter or illustration, applied there to and displayed in any manner whatsoever out of doors for the purpose of advertising giving information regarding or to attract the people to any place, person, public performance, article or merchandise, and which surface or structure is attached to, forms part of, or is connected with any building or is fixed to a tree or to the ground or to any pole, screen, hoarding or displayed any space or in or over any water body included in the limits of notified area of Competent Authority.

2.4 AIR-CONDITIONING

Means the process of treating air to control simultaneously its temperature, humidity, cleanliness and distribution to meet the requirement of an enclosed space.

2.5 AMENITIES

Means roads, streets, open spaces, parks, recreational grounds, play-grounds, gardens, water supply, electric supply, street lighting, drainage, sewerage, public works and other utilities, communication network, surface and convenience.

2.6 APARTMENT/FLATS

Apartment/Flats shall means residential buildings constructed in a detached or semi-detached manner being designed as Ground Floor plus more upper floors and constructed as separate dwelling unit with common staircase.

2.7 AUTOMATIC SPRINKLER SYSTEM

Means an arrangement of pipes and sprinklers, automatically operated by heat and discharging water on fire, simultaneously an audible alarm.

2.8 BASEMENT OR CELLAR

Shall mean the lower storey of a building having at least half of the clear floor height of the basement or cellar below average ground level.

2.9 BUILDING

Means all types of permanent building defined in (a) to (r) below, but structure of temporary nature like tents, hutment as well as shamianas erected for temporary purposes for ceremonial occasions, with the permission of the Competent Authority, shall not be considered to be "buildings".

(a) "Assembly building" means a building or part thereof where groups of people congregate or gather for amusement, recreation, social, religious, patriotic, civil, travel and similar purposes. "Assembly building" include buildings of drama and cinema theatres, city halls, town halls, auditoria, exhibition halls, museums, "marriage hall", "skating rings", gymnasia, stadia, restaurants, eating or boarding houses, place of worship, dance halls, clubs, gymkhanas, road, air, sea or other public transportation stations and recreation piers.

(b) "Business building" means any building or part thereof used for transaction of record therefor, offices, banks, all professional establishments, court houses classified as business buildings if their principal function is transaction of business and/or keeping of books and records.

(c) "Detached building" means a building with walls and roofs independent of any other building and with open spaces on all sides.

(d) "Semi-Detached Building" means a building having one or more side attached with wall and roof with other building.

(e) "Educational building" means a building exclusively used for a school or college, recognised by the appropriate Board or University, or any other Competent Authority involving assembly for instruction, education or recreation incidental to educational use, and including a building for such other uses incidental thereto such as a library or a research institution. It shall also include quarters for essential staff required to reside in the premises, and a building used as a hostel captive to an educational institution whether situated in its campus or not.

(f) "Hazardous building" means a building or part thereof used for, -

(i) storage, handling, manufacture or processing of radio-active substances or of highly combustible or explosive materials or products which are liable to burn with extreme rapidity and/or producing poisonous fumes or explosive enabatuibs.

(ii) storage, handling, manufacture or processing of, which involves highly corrosive, toxic obnoxious alkalis, acids, or a other liquids, gases or chemicals producing flame, fumes, and explosive mixtures or which result in division of matter into fine particles and capable of spontaneous ignition.

(g) "Industrial building" means a building or part thereof wherein products or, material are fabricated, assembled or processed, such as assembly plants, laboratories, power plants, refineries, gas plants, mills dairies and factories.

(h) "Institutional building" means a building constructed by Government, Semi-Government organisations, public sector undertakings, registered Charitable Trusts for their public activities, such as education, medical, recreational and cultural , hostel for working women or men or for an auditorium or complex for cultural and allied activities or for an hospice, care of orphans, abandoned women, children and infants, convalescents, destitute or aged persons and for penal or correctional detention with restricted liberty of the inmates ordinarily providing sleeping accommodation, and includes dharamshalas, hospitals, sanatoria, custodian and penal institutions such as jails, prisons, mental hospitals, houses of correction, detention and reformatories building constructed for the promotion of Tourism such a, stared hotels, clubs, golf course, sport stadium and all activities of Tourist Unit as may be declared by Government from time to time.

USE ZONE TABLE :

Sr. No.	Zone	Type of development for which the zone is primarily intended	Type of development, which may be permitted by Competent Authority.	Type of development, which may not be permitted.	Remarks.
01	02	03	04	05	06
1	Residential zone	a) All type of Residential Dwellings, apartments, Chawls, Flats, Tenements, Play fields, gardens, gymnasium, swimming pool , etc. b) Pre-primary and primary schools, dispensary, clinic, maternity home, pathological laboratory , Service Establishment(Residential) c) The part of residential building may be permitted to use as office in case of professional requirements such as advocates, doctors, architects, engineers, chartered accountants etc. bank, public buildings, educational institutions, such as secondary, high school, college, technical and vocational educational institutions, research institutions, library, community hall, auditorium, town hall. (d) Cottage industries not involving use of or installation of any machinery driven by power of any kind and which do not create noise, vibration, fume dust etc. provided that such home occupations and cottage industries shall not be permissible in the tenement dwellings or flats, service establishment (residential) light home workshop etc. lodging house boarding house,etc. Commercial uses such as shopping / commercial centre, restaurant, hotel, hostel, indoor hospital, nursing home, surgical hospital etc. subject to provisions of regulation no.12.1	a) LPG, Cylinder delivery centers for the domestic consumption, coal depot, etc. on ground floor of building used for permissible non-residential use, petrol pump with or without service station. b) Development Activities related to tourism sponsored / recommended by tourism Department of Government. c) Diamond industries d) Development activities related to Information Technology. The above uses shall be permitted in accordance with the provisions of regulation No.12.1	Obnoxious and hazardous uses, steel stock yard, truck terminal, saw mill, timber mart, ice factory and cold storage, junk yard, non-obnoxious and non-hazardous industries, wholesale market, ware houses, storage of perishable and inflammable goods, hospital for infectious and contagious diseases, mental hospital, jail, Dying house, LPG cylinder godown etc.	a) All permissible non-residential uses in residential zone may be permitted in a residential dwelling only on ground floor or any other floor with separate means of access/staircase from within the building or outside the building but not within the prescribed marginal space. b) Club house, party plot, wadi, community hall, auditorium, town hall, public assembly shall be permitted as specified in note under this table.

Sr. No.	Zone	Type of development for which the zone is primarily intended	Type of development, which may be permitted by Competent Authority.	Type of development, which may not be permitted.	Remarks.
2	Restricted Residential Use	Only EWS Housing and Low Cost Housing	____	____	____
3.	Gamtal as defined under regulation no. 2.48	All uses mentioned in Col. 3 of zone at Sr. No.1.	All uses mentioned in Col.4 of zone at Sr.No.1	All uses mentioned in Col. 5 of zone at Sr. No. 1, college, community hall, auditorium, town hall, vocational and technical education institutions, Cinema Theater, starred hotel, coal depot, storage of perishable and inflammable goods, *Petrol* pump, filling station or filling cum service station.	As mentioned Col. 6 of zone at Sr. No.1. Note: No development of non-residential building except dispensary and domestic flour-factory shall be permitted on roads having width less than 7.5 mts. *Petrol* pump, filling station or filling cum service station and CNG Filling Station Are Permitted ON 18.00 mts. widt Road or more than 18.00 mts. wide Road.
4	Commercial zone	All uses mentioned in Col. 3 of zone at Sr. no. 1 use excluding residential. Wholesale market and their ancillary uses, ice factory and cold storage, ware houses, godowns, transport terminal for goods and passengers, kerosene depot, steel stock yard, timber stock yard (lati), Junk yard (kabadi), saw mill, stone cutting and polishing industries.	Development activities related to tourism sponsored/recommended by tourism corporation of Government building, Residential Dwellings.	As mentioned in Col.5 of zone at Sr.No.1 Obnoxious and hazardous uses, non-obnoxious and non-hazardous industries, hospitals for infections and contiguous diseases, mental hospital, jail.	As mentioned in Col.6 of zone at Sr.No.1 Residential use is permitted but regulations of commercial zone shall be applicable.

Sr. No.	Zone	Type of development for which the zone is primarily intended	Type of development, which may be permitted by Competent Authority.	Type of development, which may not be permitted.	Remarks.
		LPG Cylinder storage depot and delivery centre, storage of perishable goods, petrol pump with or without service station, cinema , cinema video hall, coal depot, newspaper printing press.			
4.	General Industrial Zone.	All Industries except obnoxious and hazardous industries as mentioned in Appendix-A. All uses mentioned in col. 3 of zone at Sr. No 3 except col.3 of zone at Sr. no.-1. Hotel, Restaurant, canteen, bank, business building Development activities related to tourism sponsored/recommended by tourism corporation of Government.	a) Storage of inflammable goods such as petrol, diesel, crude oil and kerosene. Residential dwelling only for industrial workers and other public utility service staff working within the industrial premises, querying of gravel, sand, clay and stone. Dumping of solid industrial wastes (subject to N.O.C. and conditions laid down by Pollution Control Board). b) All uses mentioned in Column (4) of zone at Sr. No. 1	Obnoxious and hazardous industries, mental hospital, hospital for infectious & contiguous diseases, jail, dwelling except mentioned in Col. 4 of this zone.	If mixed development is asked regulations relating to industrial zone shall be applicable.
5.	Obnoxious and hazardous industrial zone	All obnoxious and hazardous industries as mentioned in Appendix -A, storage of inflammable goods.	Residential dwelling only for industrial worker and other public utility services buildings for staff working within the industrial premises, shops, Restaurants, canteen and bank , business building . Quarrying of gravel, sand clay and stone. Dumping of solid industrial wastes, garbage disposal, treatment plant for solid or liquid industrial /domestic and hospital wastage (subject to N.O.C. and conditions laid down by Pollution Control Board)	Residential dwelling except mentioned in Col. 4 of this zone. Hospital for infectious and contagious diseases, mental hospital, jails.	

Sr. No.	Zone	Type of development for which the zone is primarily intended	Type of development, which may be permitted by Competent Authority.	Type of development, which may not be permitted.	Remarks.
6.	Educational Purpose.	Schools, Colleges, Educational Buildings, research institutions, hostels, boarding houses, staff quarters, Banks, canteens, sports complex gymnasium, dispensary, auditorium, library.	Retail shops & restaurants as a part of educational institute. Development activities related to Information Technology.	All other uses not mentioned in Col. 3 and Col.4.	The built-up area shall not exceed 30% of the area of the building Unit/Plot.
7.	Recreational Zone	Recreation of any type, Residential accommodation and shops incidental to recreation, aquarium, natural reserve and sanctuary race track, shooting range, zoo, nursery, stadium, botanical garden, planetarium, amusement park, swimming pool, exhibition and mela, drive-in-cinema, motion picture hall, cinema, restaurants, party plots, recreational use of water park.	Farm houses, educational and Medical institutions (excluding infectious and contagious diseases, mental hospital) Hotels as per norms notified by the tourism Corporation of Gujarat. Development activities related to Information Technology.	All other uses not mentioned in Col. 3 & 4.	1) More than one farm house may be permitted provided the minimum area required for farm house is satisfied as mentioned in Col. 6, at Sr. No. 8. 2) Building to be constructed at a distance of not less than 30 mts. from the road, on which it abuts. 3) The built up area (ground coverage) shall not exceed 15% of the plot area. 4) The maximum permissible FSI shall not exceed 0.25.

Sr. No.	Zone	Type of development for which the zone is primarily intended	Type of development, which may be permitted by Competent Authority.	Type of development, which may not be permitted.	Remarks.
8.	Agricultural zone	Horticulture, poultry keeping subject to the N.O.C./approval and conditions laid down by the Department of poultry, Dairy Development, fisheries, animal rearing and breeding, open storage of drying manure. Farm house located in land of not less than 4000 sq. Mts., Camp for recreation of any type natural reserves and sanctuaries, race track, shooting range, zoo, nursery, stadium, botanical garden, agricultural equipment, repair of tools and equipment of agricultural use, tannery, saw mill, timber depot, uses pertaining to processing of agro/farm/milk products, institutional uses, vocational training centre, for agriculture purposes wayside shops, restaurant, ice factory & cold storage, godowns and warehouses subject to N.O.C./approval & conditions laid down by warehousing corporation/ FCI/ Appropriate Govt./ Semi Govt. Department,transportnagar and truck terminal, hospital for infectious and contiguous diseases, mental hospital and sanitarium subject to NOC/Approval and conditions laid down by Civil Surgeon. Petrol pump with or without service station, garages, and workshop, Studio, roofing tiles and cement pipes, brick kiln, mining and quarrying, cemetery and burial ground, jail. Camp, for recreation of any type, club, aquarium, , planetarium, amusement park. Development activity related to	Slaughter house, touring cinema, drive-in-cinema, video cinema , storage of inflammable materials and explosive goods subject to NOC/Approval and conditions laid down by concerned department/ authority dealing with such work. Dumping of solid industrial waste subject to N.O.C. and conditions laid down by Pollution Control Board. Institutional Buildings, govt., semi govt. buildings, Buildings of public sector undertakings, Garden houses, petrol filling station, educational and Medical institutions(excluding infectious and contagious diseases, mental hospitals), Training and research centres, building for autonomous bodies related to their activities statutory organisations, convention centres. Development activities related to Information Technology.	All other uses not mentioned in Col. 3 and Col. 4. All other uses not mentioned in Column. No.3 and 4.	1) Building to be constructed at a distance of not less than 30 Mts. from the road, on which it abuts. 2) Permissible Built-up area (ground coverage) a) For farm house it shall not exceed 5% of the land area with maximum permissible height 7.5 mts. b) Agrobased uses activities for this zoning regulation, ground coverage shall not exceed 5% of the land area with Maximum permissible height 7.5 mts. In case of public and semi-public uses and buildings of charitable & religious purposes the competent authority may permit development

Sr. No.	Zone	Type of development for which the zone is primarily intended	Type of development, which may be permitted by Competent Authority.	Type of development, which may not be permitted.	Remarks.
		tourism sponsored/recommended by tourism Department of the Government. 1)Recreation of any type, Residential accommodation and shops incidental to recreation, aquarium, Natural reserve and sanctuary race track, shooting range, zoo, nursery, stadium, botanical garden, planetarium, amusement park, swimming pool, exhibition and mela, drive- in -cinema, motion picture hall, cinema, restaurants, party plots, recreational use of water park, Resorts, hotels and Motels as per norms notified by the tourism corporation of Gujarat.			activities to the extent of 15% of the land area with maximum permissible height 10 mts. The above restriction of built up area shall not apply to the following uses subject to maximum ground coverage of 15 % of the land with maximum permissible height 10 mts. i) Education, Hospital for infectious and contiguous disease, mental hospital, sanitarium. ii) Jail. iii) Transport nagar & truck terminal. iv) Slaughter house, cold storage. v) Govt./Semi-Govt./ FCI godowns and warehouses and Charitable Trust. vi) Development Activities related to tourism approved by tourism Department of Government. c) Only basement, Ground floor, and first floor structure may be permitted, however, the structure for storage of inflammable

Sr. No.	Zone	Type of development for which the zone is primarily intended	Type of development, which may be permitted by Competent Authority.	Type of development, which may not be permitted.	Remarks.
					material and explosive goods shall be single storied only. 3) For poultry farm, sheds of floor height upto 10 Mts. at the ridge level of the roof with perforated jali on all sides, maximum 25% ground coverage shall be permitted.

Sr. No	Zone	Type of development for which the zone is primarily intended	Type of development which may be permitted by Competent Authority.	Type of development which may not be permitted.	Remarks.
9.	Village Extension Area (Villages/ Gamtal falling within agricultural zone only for natural growth of the village)	All uses of residential zone permitted in Col. 3 at Sr. No.1.	All uses of residential zone permitted in Col. 4 at Sr. No. 1, Cinema, Light industries, medium industries.	All uses mentioned in Col. 5 of residential zone at Sr. No. 1.	For natural growth of village 1) Village extension area around existing gamtal/ gamtalav and adjoining the existing Gamtal limit will be for development of the respective village for its natural growth. 2) For the natural growth of the villages, the development permission for uses mentioned in Col. 3 and 4 of Sr. No. 1 may be permitted in area adjoining existing villages in revenue survey nos. outside existing gamtal within - a) 200 Mt. from the limits of existing gamtal/gamtalav and adjoining the existing Gamtal limit 3) Provisions of regulation no.11 and 12 shall be applied excluding the provisions as mentioned in addition to the above conditions, other development control regulations mentioned in these regulations , shall be applicable for the development.

Sr. No	Zone	Type of development for which the zone is primarily intended	Type of development which may be permitted by Competent Authority.	Type of development which may not be permitted.	Remarks.
10	Public Purpose	All uses permissible for educational use shall be permitted. Public facilities and amenities like health, transport and communication, public security, social welfare.			

NOTE:-

1) Public Utility Services buildings which shall include buildings or works developed or undertaken by the Govt./ Semi-Govt. or Public Undertaking only, such as sub-station, and receiving station of the Electricity Board, Building for infrastructure facilities like bus service, water supply, drainage, sanitation, domestic garbage disposal, pumping station, electricity, purification plant, police building, post & telegraph and telecommunication, public urinals, milk , octroi and public telephone booth, fire brigade station, ward and zonal offices of appropriate authority, taxies, scooter and cycle stand and parking plot, garden, nursery, playground and open spaces, canal, communication network, first aid medical centre, primary health centre, dispensary, library, reading room and religious buildings/places of public worship shall not exceed 10% of plot area.

2) Twenty Percent area of the "open space plots" provided under T.P.Schemes may be utilised for the construction with required margins for the common/institutional/community use having basement, ground floor or a floor on stilt only. In addition to the stair cabins and ramps, 5% of the permissible built-up area of this plot shall be allowed to be built-up on for the construction of storm room, chawkidar room, toilet etc. at the ground level, in case the building is constructed on stilt. The rest of the "Open Space Plot" shall be kept open to sky.

3) For Railway Container Depot the permission shall be issued for development for structures for Railway department.

4) No development shall be permitted in area designated for water body, pond and talav in development plan .

5) The land designated for agricultural produce market, GID, GHB, telephone exchange, the uses shall be permissible as per the requirements of concerned departments.

6) Development as mentioned in Col.3 & 4 may be permitted only on roads as specified in regulation No.12.1.

7) The religious building shall be permitted in all use zone with consent of the competent authority

8) Permission for Clubs, Wadis, & Party Plots shall be permitted only if it comply with following requirements.

   (a) Minimum building unit required is 2000 sq.mtrs

   (b) It shall be permitted on roads having width of 18.00 mts. or more.

   (c) A garbage container of minimum 4.00 Ton capacity with 6.00 mtrs X 7.50 mtr paved area shall be provided for garbage disposal, abutting the road.

   (d) All necessary permission and N.O.C. shall be obtained from relevant offices, before commencing the use.

   (e) To see that the place is use according to provision of this regulation, competent authority can collect, security deposit from the plot owners as may be decided by competent authority from time to time.

   (f) Parking shall be provided as per regulation No. 18.1

EXPLANATION :

1. LIGHT INDUSTRY :

Light Industry means an industry in which the processes are carried out without detriment to the neighboring residential areas by reason of noise, vibration, smell, fumes, smoke, soot, ash, dust or grit. It will be subject to the following restrictions:

i) Power used will be electrical.

ii) Maximum power used will be 10 KW which may be enhanced upto 25 KW by the Competent Authority in special case of genuine expansion of existing factory which may have reached the maximum limit of power.

iii) Maximum floor space occupied should be 500 Sq.Mts.

iv) It will be housed in a building suitable for the purpose. However, it shall not include the following industries:

Manufacture or refining of ammonia, bleaching powder, chlorine, asphalt, brick, terra-cotta, gypsum, lime, plaster of Paris, coke, creosote, exctrain, glucose, starch, dye, explosive of fire works or storage thereof in excess of 50 Kg. fertilizers, gas (fuel or illuminating) in excess of three hundred cubic Mt., gelatine or glue or zie from fish or animal refuse or offal, hydrochloric acid, nitric acid, sulphuric or sulphurous acid, lead black, linoleum or oil cloth, matches, pyrexylin or articles thereof or storage in excess of 250 Kg. rubber or treatment thereof involving offensive odour, tar, turpentine or Blast furnace, coal or junk yard, distillation of bores, coal weed or tar or manufacture of any of their distilled products, drop forsages, fat grease lard of fallow manufactures, refining or rendering lout or grist mill, hot rolling mill, incineration, reduction, or dumping of dead animals, garbage or refuse except when accumulated and consumed on the same premises without the emission of odour, production or refining or storage above ground of petroleum or other inflammable liquids except heating fuels, slaughtering of animals, tanning or curing or storage of raw hides and skins, tire recapping.

2. SERVICE ESTABLISHMENT (RESIDENTIAL) :

The Service Establishment wherein the work done or the machinery installed in such as would render service to the local residents and would satisfy their day-to-day residential needs and which does not create nuisance to the surrounding development in terms of noise dust and air pollution. It will be subject to the following restrictions:

i) Power used will be electrical.

ii) Maximum power used to be 10 KW for residential zone and not more than 25 KW in commercial zone.

iii) Maximum floor space occupied will be 50 sq.mts.

iv) It shall be detached and housed in a shop or a building specially designed for the purpose. Such establishment may be petrol pumps, service station, flour mill, bakery, laundry, air compressor unit, electrical motors, optical repair and watch repair shops, repair of musical instruments, carpentry, book-binding, printing press, paper-cutting, water cooling, and juice extracting units, black-smithy, vulcanizing, motor winding, cutting and nut cutting units etc.

3. LIGHT HOME WORKSHOPS :-

Light Home Workshop means a workshop wherein the work done or the machinery installed is such as could be done or installed in any residential area without detriment to the neighborhood by means of noise, vibration, smell, fumes, smoke, soot, ash, dust or grit etc.

It will be subject to the following restrictions:

i) Power used will be electrical.

ii) Maximum power used will be 1.5 KW.

iii) Maximum floor space occupied will be 20 sq.mts.

iv) It will be worked by the members of the family.

v) Any part of the machinery including pulley, belt shafts etc. shall be attached to the walls or other parts of the building except the floor at which the same machinery is supported.

Such home workshop may be gold smithy, milk or curd churning, pills making, stitching embroidery, tailoring, vulcanising, sewing machine, folding machine, milk-separation

4. OBNOXIOUS AND HAZARDOUS INDUSTRY :-

Obnoxious & hazardous industry means industry which will create nuisance to the surrounding development in the form of smell, smoke, gas, dust, air pollution, water pollution and other unhygienic conditions.

5. WORKSHOP :-

Workshop is a place wherein work done or machinery installed is such as would render service to the local business people and would satisfy their day-to-day commercial needs and shall be subject to the following restrictions:

i) The workshop is not governed under the Indian Factories Act.

ii) The plinth area of the structure in which the workshop is to be housed shall not exceed 80 Sq.Mts.

APPENDIX : C
LIST OF OBNOXIOUS AND HAZARDOUS INDUSTRIES

Sr. No.	Industrial Groups	Noxious Characteristics
01.	02.	03.

(1)	**CHEMICAL INDUSTRY :-**		
A.	Inorganic Manufacturing Industries :		
i)	Acids, sulphuric acid, nitric acid, acetic acid (glacial) picric acid, hydrochloric acid, phosphoric acid, etc.		Fire hazards, offensive fumes and smokes.
ii)	Alkalis, caustic soda, caustic potash, soda ash etc.		Fire hazards, corrosive substances.
iii)	Production of mineral salts which involves use of acids.		Fire hazards,smoke & fumes
iv)	Carbon disulphide, ultramarine blue, chlorine, hydrogen.		Risk of fire, dust and fumes.
B.	Organic Manufacturing Industries :		
i)	Dyes and dyestuff intermediate manufacture.		Washer water is acidic contain quantities of sluge.
ii)	Synthetic plastic like polyethylene P.V.C. rexin, raisin nylon.		Distillates from reaction vessels, fire risk also.
iii)	Synthetic rubber.		Liquid effluents with unpleasant smell.
iv)	Insecticides, fungicides and pesticides.		Unpleasant smell and dust; fire hazards.
v)	Phenoils and related industries based on coal tar distillations.		Risk of fire.
vi)	Organic solvents, chlorinated minerals, methanol, methylated spirits.		Fire hazards, unpleasant smell
vii)	Manufacture of compressed `Permanent' liquified and dissolved gases.		Risk of fire.
viii)	Acetylides pyridines, lotoform. B-Nepthol etc.		Risk of fire, smell.
(2)	**MISCELLANEOUS :-**		
	Electro-thermal industries such as manufacture of calcium carbide, phosphorous, aluminum dust, paste, powder, copper, zinc etc.		Risk of fire.
I	**POISONS**		
	Ammonium Sulpho-cyanide, arsenic and its compound, barium acetates, barium bodies, barium carbonate, barium cyanide, barium ethylsuphate, barium acetate, cinnabar copper sulphocyanide, Ferrocyanides, nitrocyanic acid, pottassium cyanide etc.		Contamination if stored on same floor as or on floors above food (fire hazards in any case.
	Manufacture of cellulosic products : rayon fibre, waster products, rayophans paper etc. cellulose, nitrate, celluoid articles, scrap & solution.		Risk of fire.
	Paints, enamels, colours, varnish (other than Litho Varnish) and Varnish remover of all kinds.		Risk of fire.and smell
	Turpentine & turpentine substitutes.		Fire hazards.
	Matches.		Fire hazards.

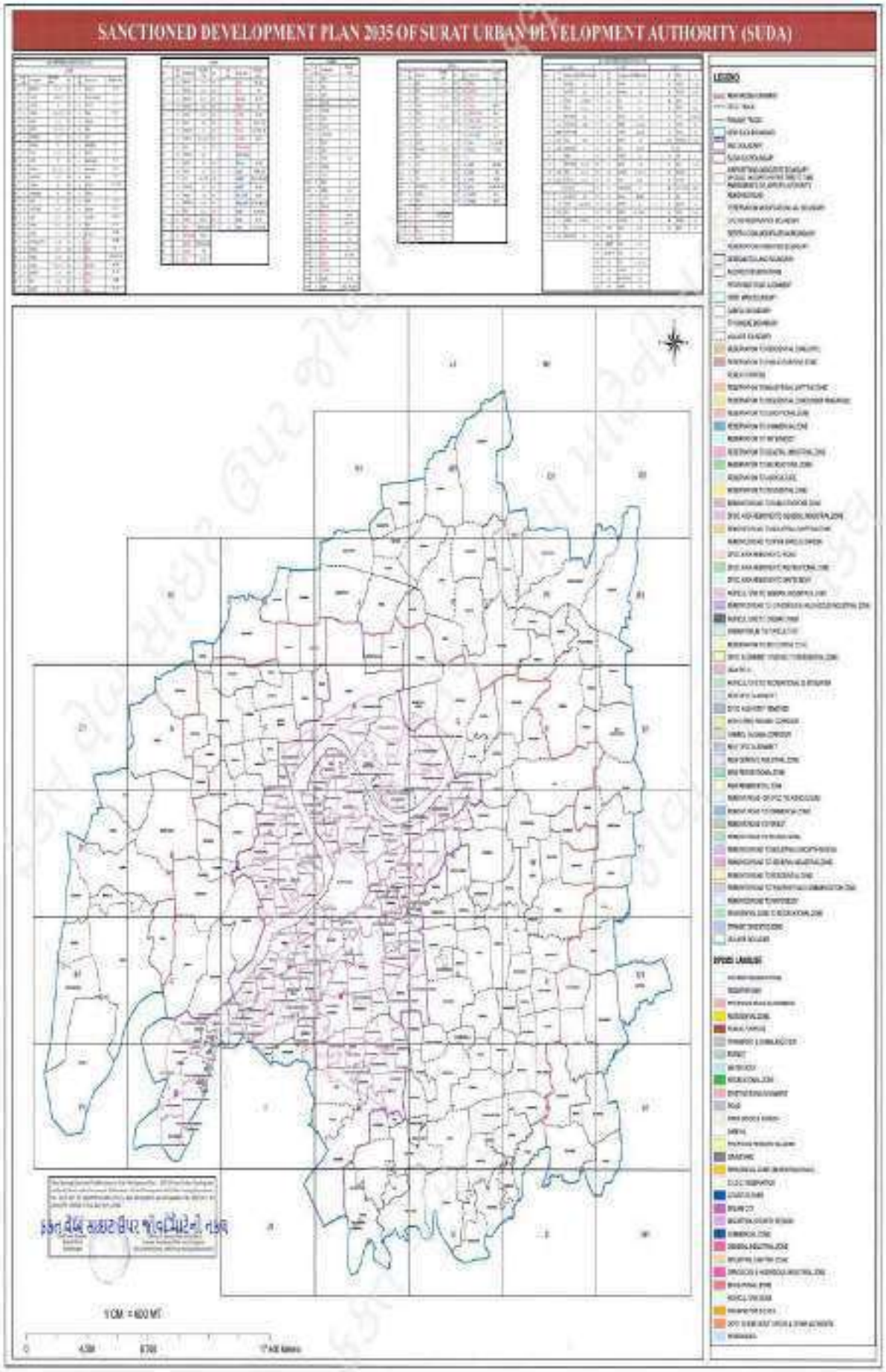
	Printin ink.	fire hazards.
	Industrial alcohol.	Unpleasant smell.
	Manufacture of newsprint.	Unpleasant smell, enormous quantity of contaminated waste, fire hazards.
II	**Petroleum Products :**	
1	Crude oil refining, processing & cracking, petroleum jelly, neptha cracking, including gas cracking for any purpose.	Inflammable fumes & noise.
2	Carbon black manufacture and black of all kinds.	Fire hazards.
3	Petroleum coke usage for graphite production.	Fire hazards.
4	Lubricating & fuel oils & other oils such as schise oil, shale oil etc.	Fi Fire hazards.
III	**Rubber Industry**	
	Reclamation of rubber andproduction of tyres, rubber solutions containing mineral neptha and rubber waste.	Fire hazards.
IV	**Metallurgical Industries** with the following Operations : (1) Sintering smelting.	Inflammable fumes & noise Noise, dust, smoke & risk of fire
	(2) Blast furnaces.	
	(3) Recasting of ore sulphide	
V	oxides mixtures.	
	Manufacture of Radio Active Elements such as :	Radiation hazards
VI	Thorium, radium & similar isotopes recovery of rare earth	
	Paper & Paper products : Large scale paper pulp and board manufacture.	Unpleasant smell, large quantities of contaminated waste water.
VII		

VIII	**Leather & other Animal Products** (1) Leather tanning. Obnoxious smell. (2) Glue & gelatine manufacture from bones & flesh. (3) Bone crist, bonemeal, bone powder or storage of bones in the plan (4) Gandular extractions. (5) Animal & fish oils.	Obnoxious smell. Obnoxious smell Obnoxious smell. Risk of fire. Fire explosion hazards.
IX	**Manufactures of explosive :** (1) All types of explosive of their ingredients such as fire works of all kinds, bombs, gun cotton, gun powder, flash powders, rockets. (2)Industrial gelatine, nitregly cating and fulminate.	Dust Smoke & Solid wastes Smoke and furnace Fire
X	**Manufacture of Cement & Refractories :** (1) Portland cement. (2) Refractories. (3) Thamslling vitreous. (4) Glass furnaces of 4 tonne capacity and above. (5) Mechanical stone crushing	. Dust, Slurry, Noise. Fire, noise, atmosphere pollution due to obnoxious gases fair and dust.
	Fertilizers : Nitrogenous and phosphatic manufacturing on a large scale except mixing of fertilizer for	

compounding.

XI.	**Heavy Engineering & Forgoing shops**:	
	Using steam & power hammers & heavy metal forgings.	Noise, vibration & smoke.
XII.	**Wood & Wood Products :**	
	Distillation of Wood.	
XIII	**Textiles :**	
1)	Oil sheets & waterproof clothing	Fire hazards.
	Wool spinning.	Wool washing liquors containing certain impurities.
2)	Clean rags (not including clean textiles cutting only) and grassy rags.	Fire hazards.
3)	Flax yarn & other fibre.	Fire hazards.
4)	Textile finishing, bleaching and dyeing.	Waste water containing acid etc.
XIV	**Foods :**	
1)	Vegetable oils.	Noise, unpleasant smell.
2)	Abattoirs.	Water, water with obnoxious smell.
3)	Alcohol distilleries and breweries & potanis spirit.	Oxygen causing unpleasant smell, noise, fire hazards.
4)	Sugar refining.	Unpleasant smell, fire hazards.

XV.	**Transport :**	
	Manufacture of aircraft, locomotives, tractors etc.	Smoke and noise.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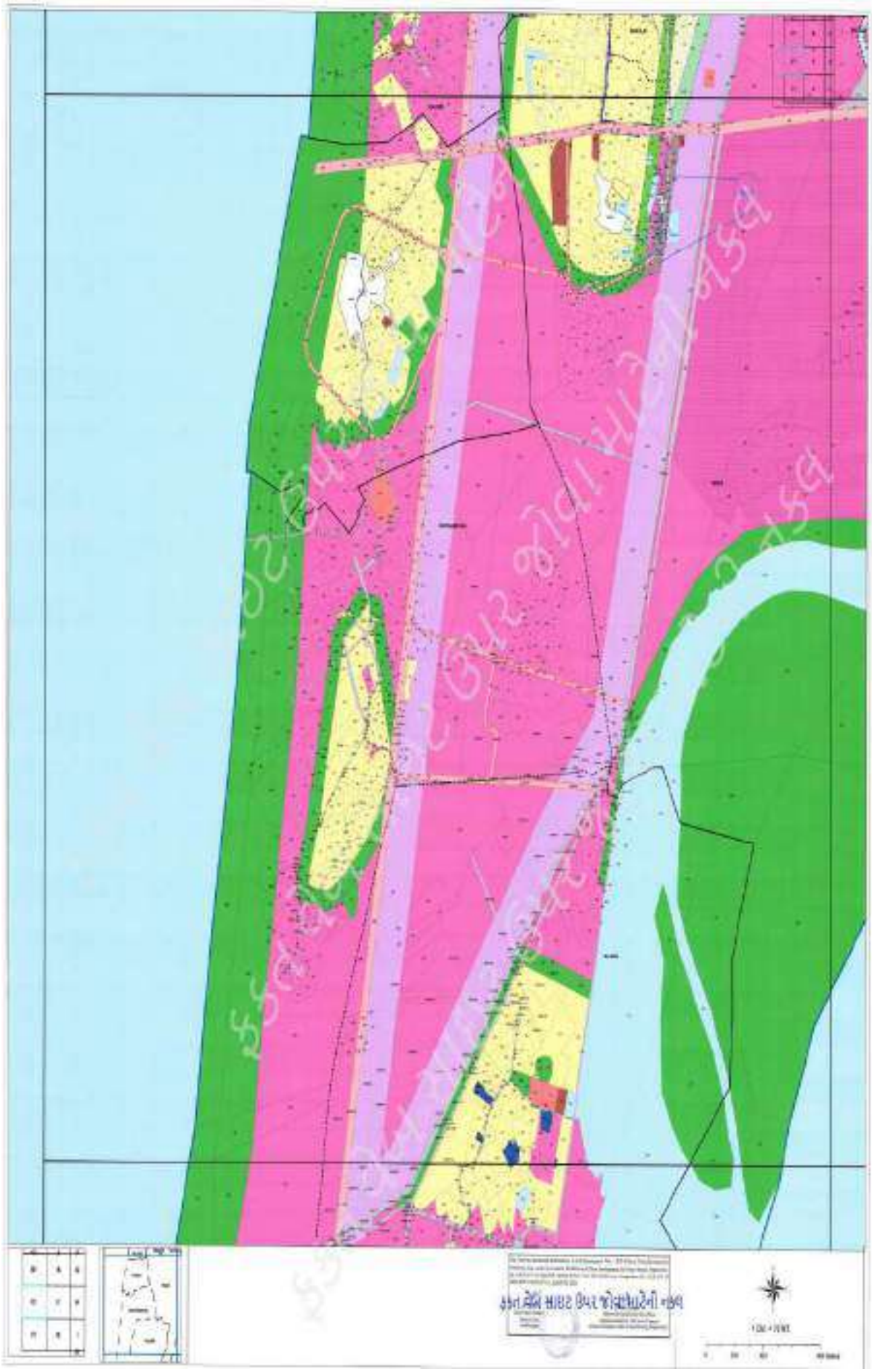

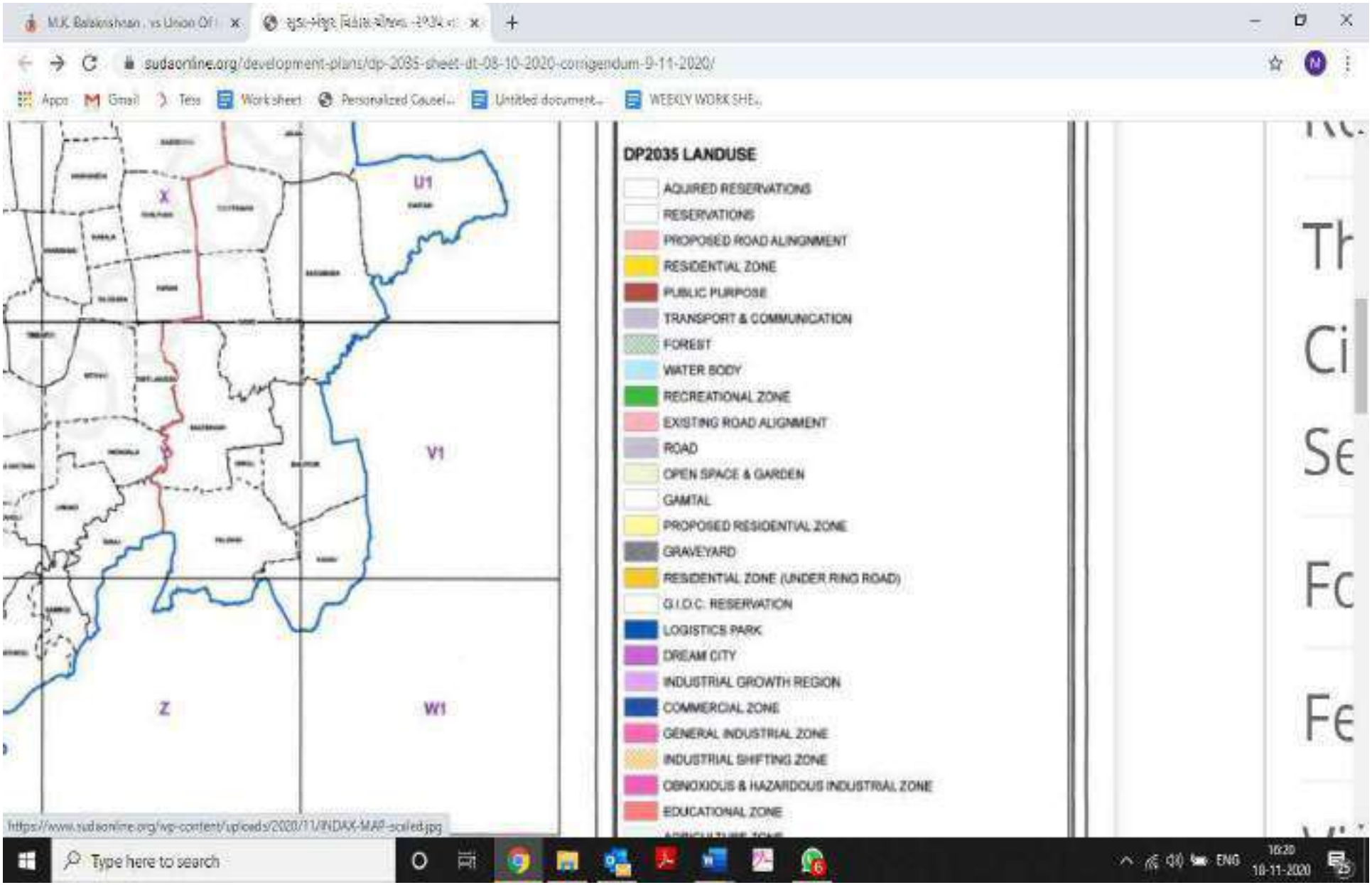
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RECREATIONAL ZONE
EXISTING ROAD ALIGNMENT
ROAD
OPEN SPACE & GARDEN
GAMTAL
PROPOSED RESIDENTIAL ZONE
GRAVEYARD
RESIDENTIAL ZONE (UNDER RING ROAD)
G.I.D.C. RESERVATION
LOGISTICS PARK
DREAM CITY
INDUSTRIAL GROWTH REGION
COMMERCIAL ZONE
GENERAL INDUSTRIAL ZONE
INDUSTRIAL SHIFTING ZONE
OBNOXIOUS & HAZARDOUS INDUSTRIAL ZONE
EDUCATIONAL ZONE
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INDIA NON JUDICIAL

Government of Gujarat

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2019

Certificate of Stamp Duty

Certificate No.	:	IN-GJ93206235901777R
Certificate Issued Date	:	10-Jan-2019 11:10 AM
Account Reference	:	SHCIL (FI)/ gshcli01/ ADAJAN/ GJ-SU
Unique Doc. Reference	:	SUBIN-GJGJSHCIL01925965875158681
Purchased by	:	SANGHI INDUSTRIES LIMITED
Description of Document	:	Article 20(a) Conveyance - Immovable Property
Property Description	:	DIST:SURAT,SUB DIST:CHORASI,MOUJE:SHIVRAMPUR,S/BL NO:125/PAIKI 1,AGRICULTURAL LAND ADM 14569 SQ.MTS
Consideration Price (Rs.)	:	13,93,23,300 (Thirteen Crore Ninety Three Lakh Twenty Three Thousand Three Hundred only)
First Party	:	KAUSHIKBHAI MANIBHAI PATEL AND OTHERS
Second Party	:	SANGHI INDUSTRIES LIMITED
Stamp Duty Paid By	:	SANGHI INDUSTRIES LIMITED
Stamp Duty Amount(Rs.)	:	66,27,000 (Sixty Eight Lakh Twenty Seven Thousand only)

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RT/9/CYS

2019

SALE DEED

Sale Deed of Agricultural land admeasuring 10569 sq. mtrs. of Survey/Block No.125/ paiki 1 [Old Survey No 466/ paiki 4 of Mouje Sunvali] situate, lying and being at Mouje Shivranpur, Taluka. Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.13,93,23,300/- (Rupees Thirteen Crores Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

SRO/CYS

2019

Sale Deed of Agricultural land admeasuring 13569 sq. mtrs. of Survey/Block/s No.125/paiki 1 Old Survey No.466 /paiki 4 of Mouje-Sarvali, situate, lying and belong at Mouje Shivrampar, Taluka Chorasi in the registration Dist. of Surat and Sub-District Chorasi for Rs.1,93,23,309/- (Rupees One Crore Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

FIRST PARTY:
VENDOR:

[1] Kaushikbhai Manibhai Patel
PAN: ABEPP6503C
Age: Adult,
Occupation: Farming and Business

[2] Rajesh Kaushikbhai Patel
PAN: BEHPP5901A
Age: Adult,
Occupation: Farming and Business
Through his Power of Attorney
Kaushikbhai Manibhai Patel

[3] Hiral Kaushikbhai Patel
PAN: COOPP2320C
Age: Adult,
Occupation: Farming and Business

All Resident of
A/102, Shivam Apartment,
Behind Khevna Nagar, Khatodara,
Surat.

Hereinafter called **"THE VENDOR"** OR **"FIRST PARTY"** (Which expression shall unless it be repugnant to the context or meaning thereof be deemed to include the Vendor and their heirs, executors, successors, assignees and administrators etc.) of the One Part.

SURAT/CHORASI

2019

Sale Deed of Agricultural land admeasuring 14569 sq. mts. of Survey/Block No.125/paiki 1 (Old Survey No.466 / paiki 4 of Mouje Sunvali) situate, lying and being at Mouje Shivaraipur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.15,90,23,500/- (Rupees Fifteen Crore Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

SECOND PARTY: Sanghi Industries Limited

PURCHASER: PAN: AAECS5510Q

A company through its
Senior Vice President
Shri Govindbhai Ajmalbhai Bhatt,
Adult, Occupation: Service,
Address: 10th Floor,
Kanaiya Arcade, Makarba, Ahmedabad

Hereinafter called "THE PURCHASER" (which expression shall unless repugnant to the context or meaning thereof mean and include the Purchaser and its present and future Directors, executors, successors, assignees and administrators etc.) of the Second Part;

WHEREAS :

The Vendor is seized and possessed of and otherwise well and sufficiently entitled to all that piece and parcel of Agricultural land admeasuring 14569 sq. mts. of Survey/Block No.125/ paiki 1 (Old Survey No.466/ paiki 4 of Mouje Sunvali) situate, lying and being at Mouje Shivaraipur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi (hereinafter called "the said land").

Originally the land of Survey/Block No.125/ paiki 1 of Mouje Shivaraipur (Old Survey No.466 / paiki 4 of Mouje Sunvali) belonged to Narottambhai Bachubhai. Hereafter Narottambhai Bachubhai obtained loan of Rs.1,60,000/- from Bank of Baroda, Mota Varachha. Entry to that effect was entered in the revenue record by Entry

SRO/CYS

2019

Sale Deed of Agricultural land situated in [illegible] of Survey/Block No.123/paiki 1 [Old Survey No.466 / paiki 4] of Mauje Somadi, lying and being at Mauje Shivrampur, Taluka Chhotaudepur in the Registration District of Baroda and Sub-District Chhotaudepur for Rs.[illegible] (Rupees Thirteen Crores Ninety-Five Lakhs Seventy-Three Thousand Three Hundred Only)

No.3814 dated 28.3.94 which was certified. Thereafter loan obtained against the said land of Survey No. 466 paiki 4 from Bank of Baroda, Meva Branch was repaid, hence the charge of said bank was removed. Entry to the effect was entered in the revenue record by Entry No.3857 dated 3.3.99 which was certified.

Thereafter Narottambhai Bhikhabhai sold and conveyed land of Survey/Block No.466 / paiki 4 to Kaushikbhai Manibhai Patel by Sale Deed which is registered in the office of Sub Registrar under serial No.237 dated 20.3.14. Entry to that effect was entered in revenue record by Entry No.4341 dated 20.3.14 which was certified on 12.5.14.

Thereafter, (1) Pabiben W/o. Narottambhai Bhikhabhai (2) Hasmukhbhai Narottambhai Patel (3) Jasuben W/o.Hasmukhbhai Narottambhai Patel (4) Hiren Hasmukhbhai Patel (5) Vandaben D/o.Hasmukhbhai Narottambhai Patel and W/o. Mitesh Patel (6) Hardik Hasmukhbhai Patel and (7) Baldevbhai Narottambhai Patel (8) Kantaben W/o. Baldevbhai Narottambhai Patel (9) Nirmal Baldevbhai Patel (10) Priyanka D/o. Baldevbhai Narottambhai Patel (11) Kalej D/o. Baldevbhai Narottambhai Patel (12) Navinbhai Narottambhai Patel (13) Kalavatiben W/o.Navinbhai Narottambhai Patel (14) Dhaval Navinbhai Patel (15) Upekshu D/o. Navinbhai Patel (16) Yatin Navinbhai Patel (17) Pareshbhai Narottambhai Patel (18) Nayanaben W/o.Pareshbhai Narottambhai Patel as self and as natural guardian of Minor Chirag and Minor Vipul (19) Bhanuben D/o.Narottambhai Bhikhabhai Patel and Wife of Champakbhai Amrutlalbhai Patel (20) Ambaben D/o.Narottambhai Bhikhabhai and Wife of Nathubhai Somabhai (21) Nirubeni D/o.Narottambhai Bhikhabhai Patel and Wife of Navinchandra Shankarbhai Patel executed Confirmation Deed on 21-8-2014 for the said land in favour of Kaushikbhai Manibhai

SRT/9/CYS
6
2019

Sale Deed of Agricultural land admeasuring 14569 sq. mts. of Survey/Block No.125/paiki 1 [Old Survey No.466 / paiki 4 of Mouje Sunvali] situate, lying and being at—Mouje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.15,93,23,300/- (Rupees Thirteen Crores Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

Patel which was registered in the office of Sub-Registrar- 9 (Chorasi) under serial No.617 on 29-8-2014.

Thereafter Kaushikbhai Manibhai Patel during his life time entered the names of his son [1] Brijesh Kaushikbhai Patel and daughter [2] Hiral Kaushikbhai Patel in the said land. Entry to that effect was entered in revenue record by Entry No.4424 dated 6.9.14 which was certified on 27.10.14.

Thereafter as per Govt. Notification No.DHM/99/80/M/PFR/2895/2821/L AND and Amendment Notification of Govt. No.PFR/5211.593 L-1 dtd.5.3.12 the lands of Village Sunvali including Survey/Block No.466/ paiki 4 were transferred to Village Shivrampur. Entry to that effect was entered in revenue record by Entry No.4615 dtd.8.3.18 which was certified on 27.4.18.

Thereafter the land admeasuring 14569 sq. mts. of Survey No.466/paiki 4 was allotted Survey/Block No.125/paiki 1 admeasuring 14569 sq. mts as per certified copy of Land record office dated 21.5.2015. Thereafter, as per order of Mamlatdar Chorasi bearing No. EST/Sudhara Hukam/Regi. No. 40/18 Vashi1248/18 dated 27.12.2018 it is clarified that the land of Old Survey No. 466/paiki 4 of Mouje Sunvali, Taluka Chorasi, District Surat was given Revenue Survey / Block No. 125/paiki 1 of Mouje Shivrampur in the Revenue Record and the said land is described as land of Survey / Block No. 466/paiki 1 in D.I.L.R. record. Thus by the said order it is clarified that the land of Survey / Block No. 466/paiki 4 as per Revenue Record and land of Survey / Block No. 466/paiki 1 as per D.I.L.R. record is the same.

As above, the said Agricultural land admeasuring 14569 sq. mts. Of Survey / Block No.-125/paiki 1 [Old Survey No.466/paiki 4 of Mouje Sunvali] situate, laying and being at Mouje Shivrampur, Taluka

SURAT-9.1

SUV/9/CYS

2014

Sale Deed of Agricultural land admeasuring 14561 sq mts. of Survey/Block No.425/paiki 1 (Old Survey No.448 / paiki 4 of Mouje Sisvasni situate, lying and being at Mouje Shivanagar, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.13,93,23,308/- (Rupees Thirteen Crores Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

Chorasi in the Registration District of Surat and Sub-District Chorasi is jointly owned, occupied and possessed by the Vendor (1) Kaushikbhai Manibhai Patel (2) Brijesh Kaushikbhai Patel and (3) Hiral Kaushikbhai Patel.

WHEREAS Purchaser i.e. Sanghi Industries Limited, a company through its Senior Vice President Shri Ghanshyambhai Jayantibhai Bhatt contacted Vendor i.e. [1] Kaushikbhai Manibhai Patel [2] Brijesh Kaushikbhai Patel and [3] Hiral Kaushikbhai Patel for purchase of said land for bonafide **Industrial Purpose under Section 63 AA of The Bombay Tenancy and Agricultural Land Act, 1948** and Vendor has agreed to sell the said land for bonafide **Industrial** Purpose at the total consideration of **Rs.13,93,23,308/- (Rupees Thirteen Crores Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)** and Purchaser has agreed to purchase the said land at the said consideration. The consideration of the land includes the price of all the trees, leaves, fence, woods etc. standing in the land and the purchaser have not to pay any separate amount for the same. The Vendor agrees and assures that the above stated sale consideration is for the total land of the said Survey Number and no deduction will be allowed from the said area of the land as the Purchaser requires the total land to implement its industrial project

WHEREAS, the Vendor declares that the said land is Old Tenure land and in future if the said land is declared as New Tenure land any premium is attracted for transferring the said land in Non Agricultural use then the said amount of premium will be paid by the Vendor and if the said amount will be directly paid by the Purchaser to the Authority, then the same is to be refunded by the Vendor to Purchaser and the Vendor is not entitled to make any dispute.

WHEREAS, The Vendor agrees that they shall obtain confirmation of their family members for the sale of the said land and they shall be fully and

SURVEYS
2019

Sale Deed of Agricultural land admeasuring 14569 sq. mts. of Survey/Block No.175/parki 1 [Old Survey No.906 / paiki 1 of Mouje Sunrali] situate, lying and and Sub-District Olpad for Rs.13,93,23,300/- (Rupees Thirteen Crores Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

completely liable for any cost, expenses, loss, damages that may occur due to any objection or dispute raised by any of her family members or predecessor in title. The First Party Vendor is fully aware that it is their sole liability to pay any amount from the sale consideration received from this transaction to any of their Family members, legal claimants etc, and the Purchaser is not responsible under any circumstances to pay any additional amount apart from the consideration paid under this indenture. The Vendor gives such specific guarantee and undertaking to the Purchaser and on the basis of that the Second Party has agreed to purchase the said land.

WHEREAS, the Vendor agree to provide necessary application, affidavit, indemnity bond and other writings to transfer the said land in the name of the Purchaser and also will have to provide confirmation of all legal heirs, guardians, successors, family members that they have agreed to sell / convey the said land to the Purchaser.

WHEREAS, the Vendor agreed to fulfill all terms and conditions of Memorandum of Understanding executed between the parties which is notarized before Notary Bharat R. Chauhan under serial No.10069/18 dated 7.12.18 for obtaining permission of Industrial Use and the following sale consideration is paid by Purchaser to Vendor as per the terms and conditions of the Memorandum of Understanding.

AND WHEREAS the Purchaser has paid to the Vendor the said sum of Rs.13,93,23,300/- (Rupees Thirteen Crores Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only) in following manner:

Rs.50,000/- (Rupees Five Lakh Fifty Thousand only) by cheque No.028061 drawn on Kotak Mahendra Bank, Ahmedabad to Vendor No.1.

SRT/B/CYS
2019

Sale Deed of Agricultural land admeasuring 34569 sq. mtr. of Survey/Block No.129/1- Ni 1 Old Survey No.468 / paiki 6 of Mauje Shivranjani, Taluka Chorasi to Re. Registration District of Surat and Sub-District Olpad for Rs.13,93,23,300/- (Rupee Thirteen Crore Ninety-Three Lakh Twenty-Three Thousand Three Hundred Only)

Rs.2,26,70,550/- [Rupees Two Crore Twenty Six Lakh Seventy Thousand Five Hundred Fifty only] by cheque No.263 drawn on H.D.F.C.Bank, Prahladnagar Branch, Ahmedabad to Vendor No.1.

Rs.1,16,10,275/- [Rupees One Crore Sixteen Lakh Ten Thousand Two Hundred Seventy Five only] by cheque No.264 drawn on H.D.F.C.Bank, Prahladnagar Branch, Ahmedabad to Vendor No.1.

Rs.1,16,10,275/- [Rupees One Crore Sixteen Lakh Ten Thousand Two Hundred Seventy Five only] by cheque No.265 drawn on H.D.F.C.Bank, Prahladnagar Branch, Ahmedabad to Vendor No.1.

Rs.2,32,20,550/- [Rupees Two Crore Thirty Two Lakh Twenty Thousand Five Hundred Fifty only] by cheque No.266 drawn on H.D.F.C.Bank, Prahladnagar Branch, Ahmedabad to Vendor No.2.

Rs.1,16,10,275/- [Rupees One Crore Sixteen Lakh Ten Thousand Two Hundred Seventy Five only] by cheque No.267 drawn on H.D.F.C.Bank, Prahladnagar Branch, Ahmedabad to Vendor No.2.

SRT/9/CYS

2019

Sale Deed of Agricultural land admeasuring 14399 sq. mtrs of Survey/Block No 127/paiki 1 (Old Survey No.466 / paiki 1 of Mouje Sumrail) situate, lying and being at Mouje Sinkaupur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.13,93,23,500/- (Rupee Thirteen Crores Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

Rs.1,16,10,275/- [Rupees One Crore Sixteen Lakh Ten Thousand Two Hundred Seventy Five only] by cheque No.268 drawn on H.D.F.C.Bank, Prahladnagar Branch, Ahmedabad to Vendor No.2.

Rs.2,32,20,550/- [Rupees Two Crore Thirty Two Lakh Twenty Thousand Five Hundred Fifty only] by cheque No.269 drawn on H.D.F.C.Bank, Prahladnagar Branch, Ahmedabad to Vendor No.3.

Rs.1,16,10,275/- [Rupees One Crore Sixteen Lakh Ten Thousand Two Hundred Seventy Five only] by cheque No.270 drawn on H.D.F.C.Bank, Prahladnagar Branch, Ahmedabad to Vendor No.3.

Rs.1,16,10,275/- [Rupees One Crore Sixteen Lakh Ten Thousand Two Hundred Seventy Five only] by cheque No.271 drawn on H.D.F.C.Bank, Prahladnagar Branch, Ahmedabad to Vendor No.3.

Rs.13,93,23,500/- (Rupees Thirteen Crores Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

SRT/9/CTS

2019

Sale Deed of Agricultural land admeasuring 14569 sq. mtrs. of Survey No.125/paiki 1 Old Survey No.468/paiki 4 of Mouje Sunsali situate, lying and being at Mouje Shiv Jetpur, Taluka Chorasi in the Registration District of Surat and Sub District Chorasi for Rs.13,93,23,300/- (Rupees Thirteen Crore Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

NOW THIS INDENTURE WITNESSETH that in consideration of Rs.13,93,23,300/- (Rupees Thirteen Crores Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only) paid by the Purchaser to the Vendor on or before execution hereof as mentioned above being the full consideration payable by the Purchaser to the Vendor, the Vendor doth hereby admit and acknowledge receipt thereof and acquit, release and discharge the Purchaser from the payment & and every part thereof. The Vendor doth hereby grant, sell, convey, assure release and transfer and delivers the vacant and peaceful possession forever to the PURCHASER of all that piece or parcel of the said land owned and possessed by the Vendors more particularly described in the schedule hereunder written;

AND TOGETHER WITH right in all and singular courts, yards, areas, compounds, ways, sewers, ditches, fences, trees, drainages, water courses, plinth, paths, passages, wells, lights, electric connections, liberties, privileges, easements, profits, advantages, rights, members and appurtenances whatsoever to the said land, hereditaments and land or any part thereof belonging or in any way appertaining to or with the same or any part thereof now hath or any time heretofore usually held, used, occupied or enjoyed or reputed or known as part or members thereof and to belong or be appurtenant thereto AND ALSO TOGETHER WITH all deeds, documents, writings, vouchers and other evidences of title relating to the said land, TOGETHER WITH all rights, interests, benefits and advantages of and under the Town Planning Scheme, by way of land of Final Plots, compensation and in any other form whatsoever, including benefit, compensation of the said land or any part thereof surrendered (if any) to ring road, past, present and future, AND ALL THE ESTATE right, title, interest, possession, benefit, claim and demand whatsoever at law and in equity of the Vendor into, out of or upon the said land, hereditaments or any part thereof TO HAVE AND TO HOLD all and singular the said land hereby granted, conveyed, transferred and assured and intended or expressed so to be with their and every of their rights, members, covenants

SRD/CYS

2019

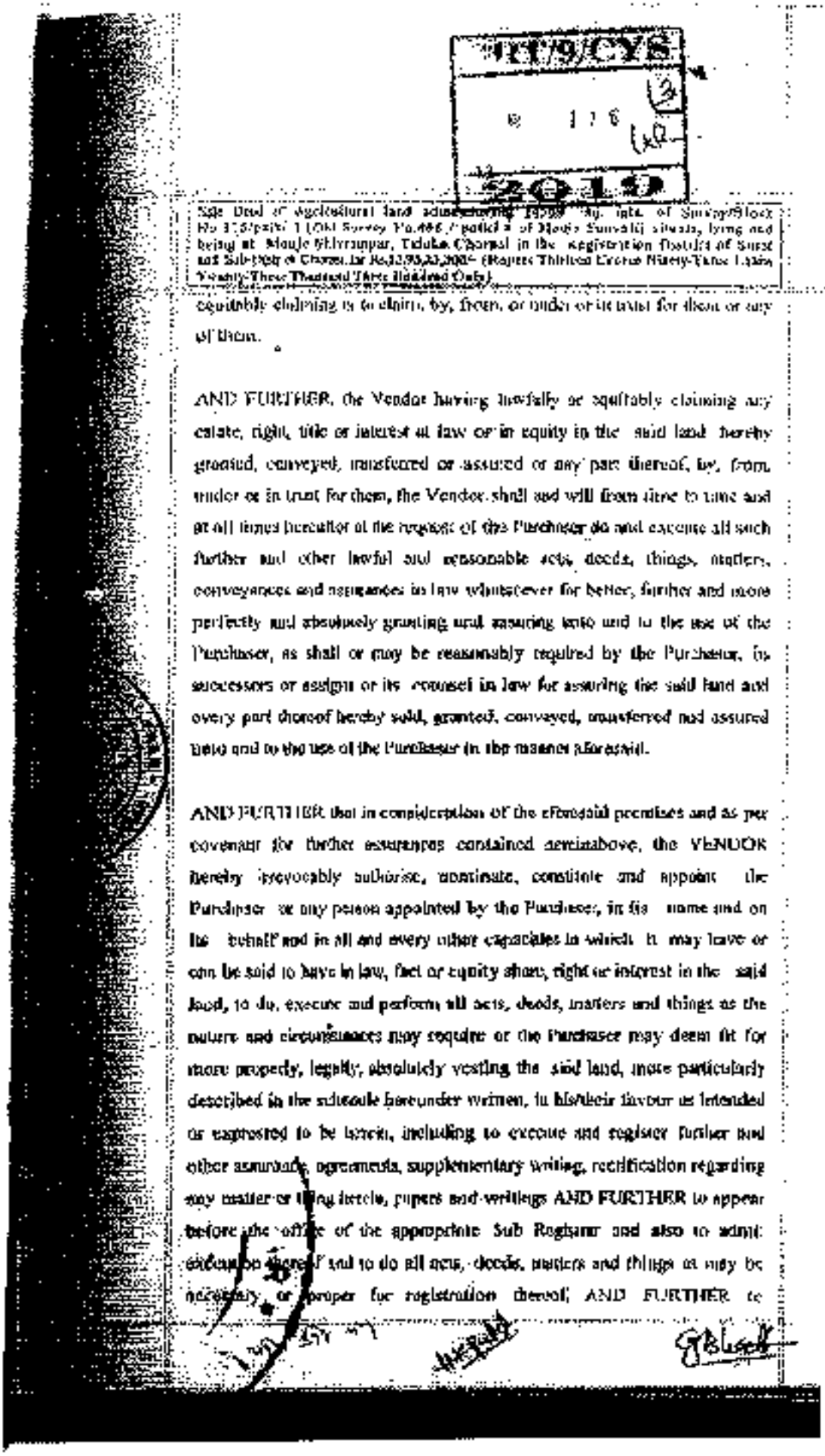
Sale Deed of Agricultural Land admeasuring 04569 sq. mts. of Survey Block No.173/paiki 3 (Old Survey No.466/paiki) of Mouje Sakvelpur, Taluka Chikodi in the Registration District of Belgaum Sub-District Chikodi for Rs.23,9323,304- (Rupees Thirteen Crores Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

and appurtenances UNTO AND TO THE USE and benefit of the Purchaser forever as full and absolute owner.

AND THAT the quiet, actual and peaceful possession of the said land is delivered by the Vendor hereon to the Purchaser today.

AND THE VENDOR do hereby for themselves and for their assigns and successors COVENANT with the PURCHASER that notwithstanding any act, deed, matter or thing whatsoever by the Vendor or any of their predecessors - in - title or any person or persons lawfully, or equitably claiming by, from through, under or in trust for them or any of them made, done, committed, omitted or knowingly or willingly suffered to the contrary they, the VENDOR now hath in themselves, at the time of selling and delivering of these presents, good right, full power and absolute authority to grant, release, convey and assure the said land hereby granted, conveyed, released and assured or intended so to be upon and to the use of the Purchaser.

AND THAT it shall be lawful for THE PURCHASER from time to time and at all times hereafter peaceably and quietly to hold, enter upon, have occupy, possess and enjoy the Said land and receive the rents, issues and profits thereof and of every part thereof quite and for its use and benefit without any suit, lawful eviction, interruption, claim or demand whatsoever from or by the VENDOR or any of their predecessors -- in -- title or by any person or persons, lawfully or equitably claiming by, from under or in trust for them or any of them AND THAT free and clear and freely and clearly and absolutely acquitted, exonerated, released and for ever discharged or otherwise by the Vendor, well and sufficiently saved, defended and kept harmless and indemnified of and from and against all former and other estate, title, charges and encumbrances, whatsoever, either already or hereafter had made, executed, occasioned or suffered by the Vendor or their predecessors in title or by any other person or persons lawfully or



Sale Deed of Agricultural land admeasuring 1a 00 Ag. Gts. of Survey/Block No 31/paiki 1 (Old Survey No.466/paiki 2 of Bhoje Sunvali) situate, lying and being at Bhoje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-Dist of Chorasi for Rs.13,93,33,000/- (Rupees Thirteen Crore Ninety-Three Lakhs Thirty-Three Thousand Three Hundred Only)

equitably claiming to claim, by, from, or under or in trust for them or any of them.

AND FURTHER, the Vendor having lawfully or equitably claiming any estate, right, title or interest at law or in equity in the said land hereby granted, conveyed, transferred or assured or any part thereof, by, from, under or in trust for them, the Vendor shall and will from time to time and at all times hereafter at the request of the Purchaser do and execute all such further and other lawful and reasonable acts, deeds, things, matters, conveyances and assurances in law whatsoever for better, further and more perfectly and absolutely granting and assuring unto and to the use of the Purchaser, its successors or assigns or its counsel in law for assuring the said land and every part thereof hereby sold, granted, conveyed, transferred and assured unto and to the use of the Purchaser in the manner aforesaid.

AND FURTHER that in consideration of the aforesaid premises and as per covenant for further assurances contained hereinabove, the VENDOR hereby irrevocably authorise, nominate, constitute and appoint the Purchaser or any person appointed by the Purchaser, in its name and on its behalf and in all and every other capacities in which it may have or can be said to have in law, fact or equity share, right or interest in the said land, to do, execute and perform all acts, deeds, matters and things as the nature and circumstances may require or the Purchaser may deem fit for more properly, legally, absolutely vesting the said land, more particularly described in the schedule hereunder written, in his/their favour as intended or expressed to be herein, including to execute and register further and other assurances, agreements, supplementary writing, rectification regarding any matter or thing herein, papers and writings AND FURTHER to appear before the office of the appropriate Sub Registrar and also to admit execution thereof and to do all acts, deeds, matters and things as may be necessary or proper for registration thereof; AND FURTHER to

SRT/BCYS

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2019

Sale deed of Agricultural land admeasuring 14500 sq. mts. of Survey/Block No.825/paiki 1 (Old Survey No.448 / paiki 1 of Moje Survadi Sirsale, lying and being at Moje Bhivrampur, Taluka Chanvel in the Registration District of Nasik and sub-district Chanvel for Rs.11,323,900/- (Rupees Eleven Crores Thirty-Three Lakhs Twenty-Three Thousand Three Hundred Only)

compromise, carry on or defend all actions, suits or other proceedings touching the said land or any part thereof and to appear and represent in any court and before all judicial, revenue, municipal, town planning or other authorities whatsoever and if the said Purchaser think fit to compromise, refer to arbitration, submit to judgment, discontinue or become non suited in any action, suit or proceedings and to declare and affirm all pleints, written statements, affidavits, petitions and other necessary pleadings, AND FURTHER to obtain Permission under Section 63 AA of Tenancy Act, Non Agricultural Usage Permission, prepare and get sanctioned plans and/or revised plans from the concerned authority/authorities for putting up construction on the said land and to sign and execute applications, layout plans, construction plans, declaration, undertaking, etc. AND FURTHER to examine, adjust and settle all accounts and reckonings with any person or persons whomsoever and to receive the balance if any with respect to the Said Land AND generally to do any act, deed, matter or thing with respect to, touching to or concerning the said land AND FURTHER to delegate all or any of the powers and authorities contained herein to any person or persons whomsoever.

AND FURTHER THE VENDOR represents, assures and confirms to the Purchaser that no litigation or proceedings of any nature concerning them or any of them or the said land or concerning any predecessors in title in respect of the said land are pending before any Judicial, quasi judicial, revenue, local, state, or any other Government authorities whomsoever and that neither the said land nor any part thereof is under any acquisition, requisition or any reservation for any purpose and that no one else has any rights including right of maintenance from and over the said land and that they have not entered in any other agreement or arrangement, oral or written, with any other person whomsoever nor have created any charge or encumbrance over the said land or any part thereof. AND the Vendor immediately before the execution hereof have made usual Declaration cum Indemnity on title attested by Notary Public confirming

SRT/D/CYS

Sale Deed of Agricultural land admeasuring 14949 sq. mtr. bearing plot No.12/paiki 2 (old survey No.708 / paiki 4 of Mouje Shivalli situate, lying and being at Mouje Shivampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.13,95,23,300/- (Rupees Thirteen Crore Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

that their title to the said land is clear and marketable, and on the basis of available registration record and believing the papers and documents produced to be true and trustworthy and on the basis of the undertaking given in Declaration cum Indemnity Bond by the Vendor, M/s.H.M.Rawal & Company, Advocate has Issued Title Clearance Certificate dated 2.1.2019.

AND FURTHER THAT, the Vendor assure that they have paid all rates, cesses, betterment / taxes upto the date of this Indenture and if the same are found to be due or unpaid, the Vendor shall be liable to pay the same and failing which, the Purchaser shall be entitled to recover them from the Vendor. Hereinafter Purchaser is liable for payment of all type of taxes.

The Second Party has authorized its Senior Vice President Shri Gunvantbhai Jayantibhai Bipin to sign M.O.U., Agreement for Sale, Sale Deed and other related documents for purchase of said land on behalf of Company by passing resolution in its Business Operations And Finance Committee of the Board of Directors of the Company held on 6th November 2018.

The Vendor has handed over all original/photo copies of documents pertaining to the said land to the Purchaser.

All expenses for Stamp Duty, Registration Fees, miscellaneous expenses, in respect of these presents have been borne and paid by the Purchaser.

The Purchaser has paid Stamp Duty of Rs.68,27,000/- as per the sale consideration of the said document @4.9% as per the prevailing Stamp Act. The sale consideration is more than the prevailing Jantri value.

SRT/6/CYS

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2019

Sale Deed of Agricultural land admeasuring 11569 sq. mts. of Survey/Block No.125/ paiki 2 (Old Survey No.466 / paiki 4 of Mouje Sunvali) situate, lying and being at Mouje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.1,07,23,000/- (Rupees Thirteen Crores Ninety-Three Lakhs Twenty-Three Thousand Three Hundred Only)

THE SCHEDULE ABOVE REFERRED TO :-

ALL THAT piece or parcel of Agricultural land admeasuring 11569 sq. mts. of Survey/Block No.125/ paiki 2 (Old Survey No.466/paiki 4 of Mouje Sunvali) situate, lying and being at Mouje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi.

The said land is bounded as follows :

On East	:	Survey No. 125/ paiki 2
On West	:	Survey No. 105/A/2
On North	:	Survey No.124
On South	:	Survey No. 105/A/2

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OF THE

SURAT-9.

SRT/9/CYS/
2019

Sale Deed of Agricultural land admeasuring 14569 sq. mts. of Survey/Block No.1&Sub No.1 Old Survey No.468 / paiki 4 of Mouje Vanesidi remote, taluq and being at Mouje Bhimpore, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.1,93,45,900/- (Rupees Thirteen Crores Ninety-Three Lakhs Forty-Three Thousand Three Hundred Only)

PHOTOGRAPHS OF THE LAND

Sale Deed of Agricultural land admeasuring 1-1569 sq. mtr of Survey/Block No.125/paiki 3 [Old Survey No.466/ paiki 3 of Mouje Survali, situate, lying and being at Mouje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi Rs Rs.[illegible] (Rupees Thirteen Crore Ninety Three Lakhs Twenty-Three Thousand Three Hundred Only)

Postal Address: Survey/Block No.125/paiki 3 [Old Survey No.466/ paiki 3 of Mouje Survali] Mouje Shivrampur, Taluka Chorasi, District Surat

VENDOR

[1] Kaushikbhai Manibhai Patel

[2] Brijesh Kaushikbhai Patel
Through his Power of Attorney
Kaushikbhai Manibhai Patel

[3] Hiral Kaushikbhai Patel

PURCHASER
SANGHI INDUSTRIES LTD

Sanghi Industries Limited
Through its Senior Vice President
Shri Gaurangbhai Jayantibhai Bhatt

SRT/9/CYS
2019

Sale Deed of Agricultural land admeasuring 14569 sq. mts of Survey/Block No.125/paiki 1 (Old Survey Account paiki 4 of Moje Sunvasi situate, lying and being at Moje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.83,93,200/- (Rupees Eighty Three Lakhs Ninety Three Thousand Two Hundred Only)

IN WITNESS WHEREOF the parties hereto have hereunto set and subscribed their respective hands hereunder on this 28th January, 2019 at Surat.

SIGNED AND DELIVERED BY
THE WITHIN NAMED VENDOR :-

[1] Kanubhai Manibhai Patel

[2] Urjitah Kanubhai Patel
Through his Power of Attorney
Kanubhai Manibhai Patel

[3] Hiral Kanubhai Patel

SIGNED AND DELIVERED BY
WITHIN NAMED PURCHASER:
Sanghi Industries Limited
through its Senior Vice President
Shri Gurusagbhai Jayantibhai Bhatt

SANGHI INDUSTRIES LTD
AUTHORISED SIGNATORY

In the presence of following two
witnesses :-

1)

2)

SRT/9/CYS

2019

Sale Deed of Agricultural land admeasuring 14569 sq mts of Survey/Block No.1/Appeal 1 Old Survey No.466 / paiki 4 of Mouje Surali) situate, lying and being at Mouje Shivaranjani, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.[illegible] (Rupees Thirteen Crores Ninety Three Lakhs Twenty Three Thousand Three Hundred Only)

SCHEDULE

SIGNATURE PHOTOGRAPH THUMB IMPRESSION

FIRST PARTY/VENDOR

[1] Kaushikbhai Manjibhai Patel

[2] Brijesh Kaushikbhai Patel
Through his Power of Attorney
Kaushikbhai Manjibhai Patel

[3] Hirat Kaushikbhai Patel

SECOND PARTY/PURCHASER

Sraghi Industries Limited
through its Senior Vice President

SARAGHI INDUSTRIES LTD

AUTHORISED SIGNATORY

Shri Gajendrabhai Jayantibhai Bhatt

પરીશીષ્ટ

દસ્તાવેજ નંબર ૨૫

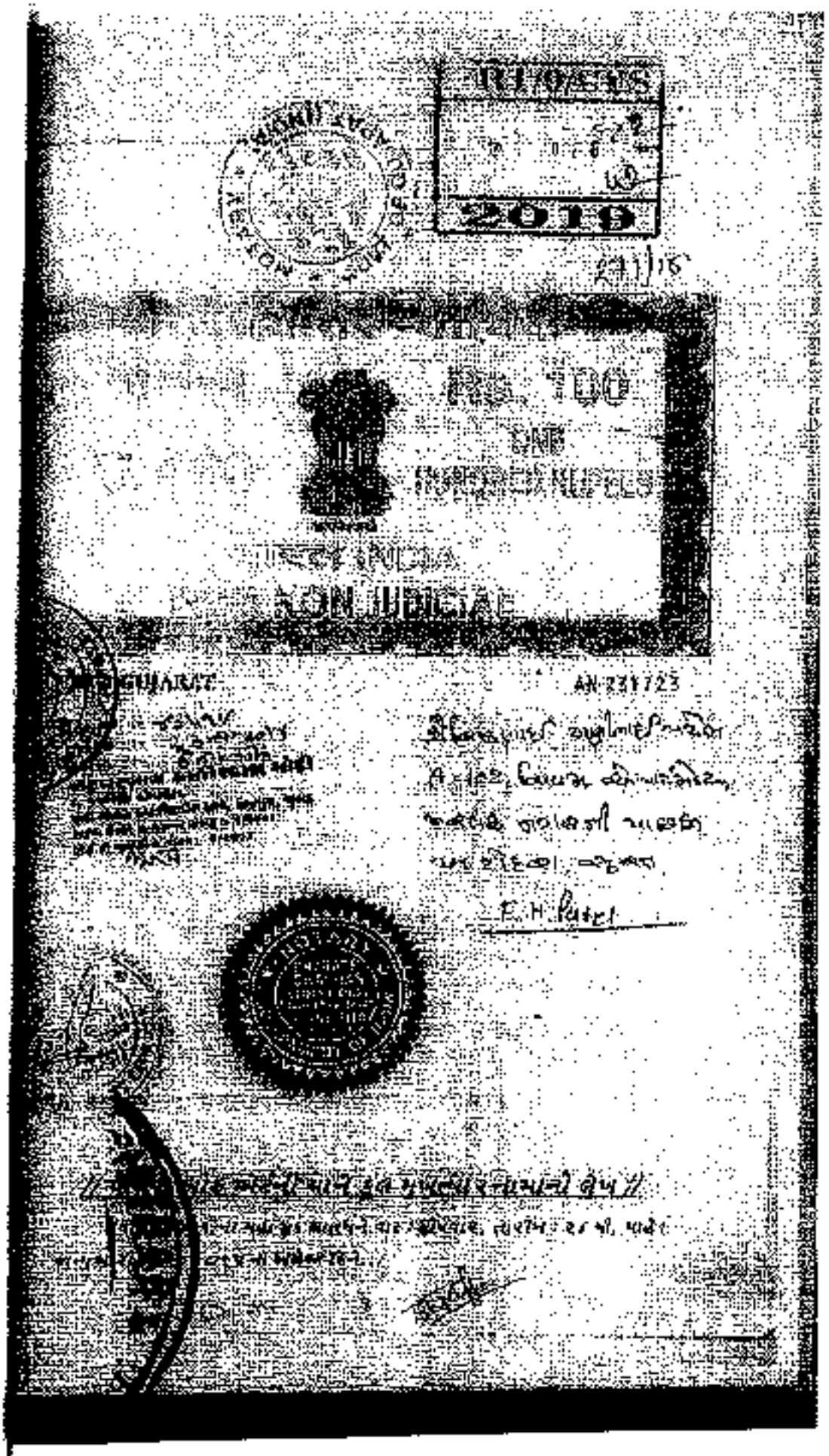
તારીખ

ગીપલી નોટિફિકેશન ૧૯૬૮ ની કલમ ૩૪ ની પેટા કલમ ૩ મુજબનું જોડાણ.

ક્રમ નં.	પ્રશ્ન	જવાબ (હા કે ના)
લગ્ન અપનાર, એજન્ટ અપનાર કે તેઓના કુટુંબના પ્રશ્નો :		
૧	શોધમાં દર્શાવેલ પુરુષ મુનવરી (ઉંમર૨૫) ના. બોધરી ૯૦ પુરુષ નામની ચર્ચ પંચર ૨૬૫ પ્લોટ ૬ (મુખ્ય મિલ નામ:૨૫૬ ૯ ઉંમરે થી મોટી જગીન બિનઉપયોગ કરી આપેલ છે. ?	ના
૨	કબજો, કબ્જાના મુજબ ૧૨૬૯૭ ચો. મી. ની મોટી જગીન માટે લેવા કરી આપેલ છે ?	ના
૩	શોધમાં દર્શાવેલ પુરુષની વિગતે અરજી કરવામાં આવેલ છે. ? ૨૬.૧૨.૨૦૨૦,૧૦૦૨	ના
૪	તમામ દસ્તાવેજ વિગતો વાંચી, સમજીને, સ્વીકારી, વિશ્વાસીને તમે પોતે જાતે જોઈ અંગુઠાની છાપ કરેલ છે કે તમે સહી કરી છે ?	ના
૫	આપ આપ સાક્ષી અપનાર કબ્જાદેખ્યે તરીકે કામ કર્યા છે.*	ના
૬	આપને આપે કરારના સમયમાં આપને અને બેંકને કોઈ અપનાર આર્થિક /અન્ય કોઈ સંબંધોનું નિશાન કરેલ છે. ?	ના
૭	આપને આપે કરારની કોપી દસ્તાવેજની તારીખે આપવામાં છે. ?	ના
૮	કોલેજમાં ઓફિસ આવું નામને ઓળખતા પ્રોફે તેવી વ્યક્તિઓને સાથે રાખેલ છે. ?	ના
અપનાર અપનારને પૂછવાના પ્રશ્નો ?		ના
૧	કબ્જાદેખ્યે તમો અપનાર વ્યક્તિ/ઓને કે બેંકમાંથી કોઈ વ્યક્તિ આવી તમોને તપેલાને ઓળખો છો ?	ના
૨	દસ્તાવેજના સમયે આપ અને કોઈ અપનાર વ્યક્તિ/ઓ કે જેઓને ઓળખાણ આપી હતી તે આપ જાણો છો ?	ના
૩	કોઈ વ્યક્તિએ કોઈ લાભ મેળવવા માટે ખોટા રજુ કરી તમો આપને ખોટી રીતે ?	ના

(સહી)

SEAL OF REGISTRATION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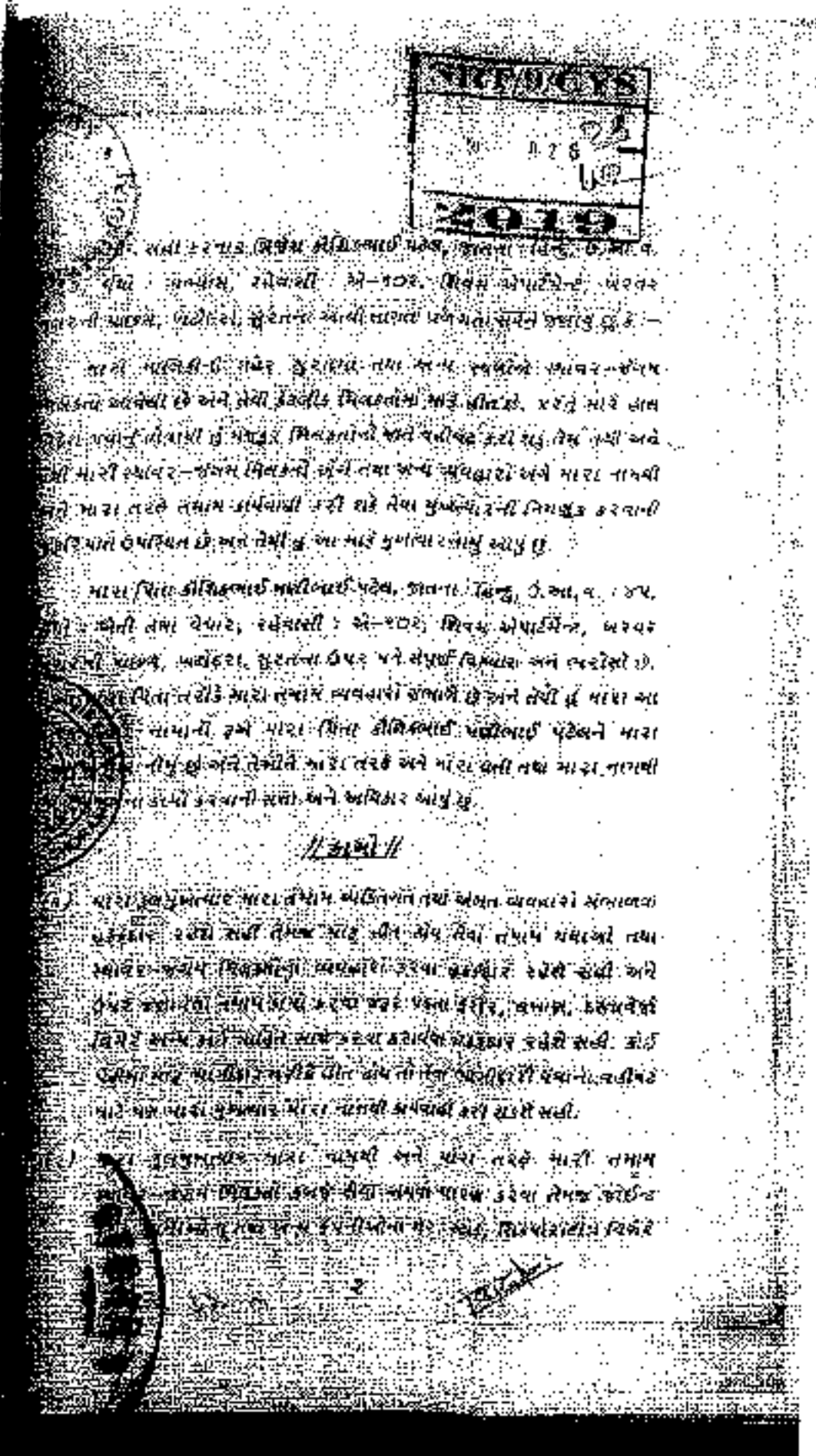


હું, મારા પિતા હસમુખભાઈ મણિલાલભાઈ પટેલ, ઉંમર વર્ષ ૬૦, ધંધો : નિવૃત્ત, રહેવાસી : બી-૧૦૨, શિવમ એપાર્ટમેન્ટ, ખરવર રાજની બાજુમાં, પાંડેસરા, સુરતનાં વતની તથા મારા પિતાના સગપણ ધરાવું છું કે —

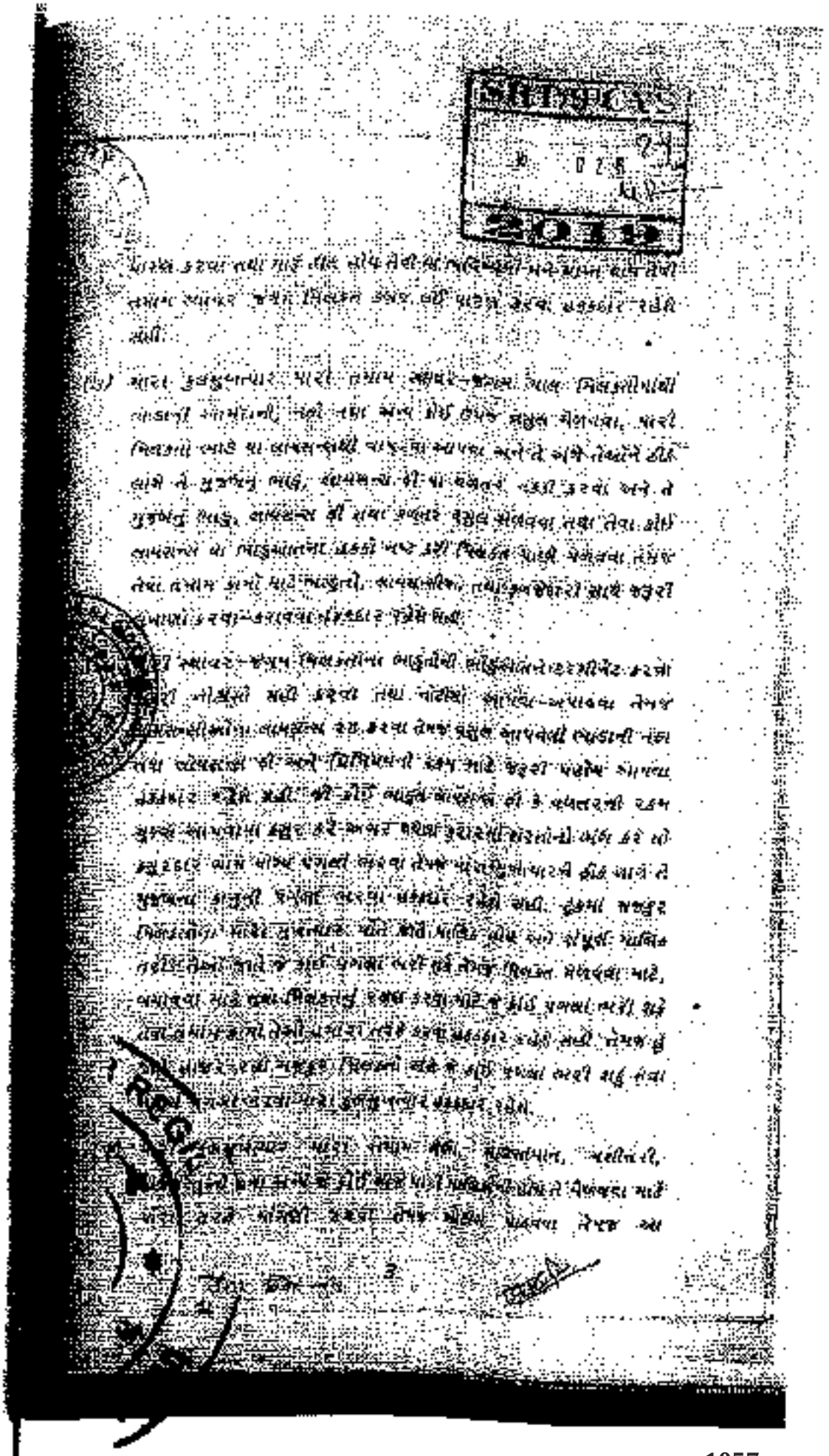
મારી માલિકી-હકની સુરતમાં તથા અન્ય સ્થળોએ સ્થાવર-જંગમ મિલકત આવેલી છે અને તેવી કોઈપણ મિલકતમાં મારું હિતસંબંધ, કરતું મારે લાગ જેવા જેવું જોવાથી હું મારફત મિલકતોની અને વહીવટ કરી શકું તેમ નથી અને તેથી મારી સ્થાવર-જંગમ મિલકતો અંગે તથા અન્ય વ્યવહારો અંગે મારા નામથી અને મારા તરફે તમામ કાર્યવાહી કરી શકે તેવા મુખત્યારનામું નિયમિત કરવાની જરૂરિયાત ઉપસ્થિત છે અને તેથી હું આ મારું મુખત્યારનામું આપું છું.

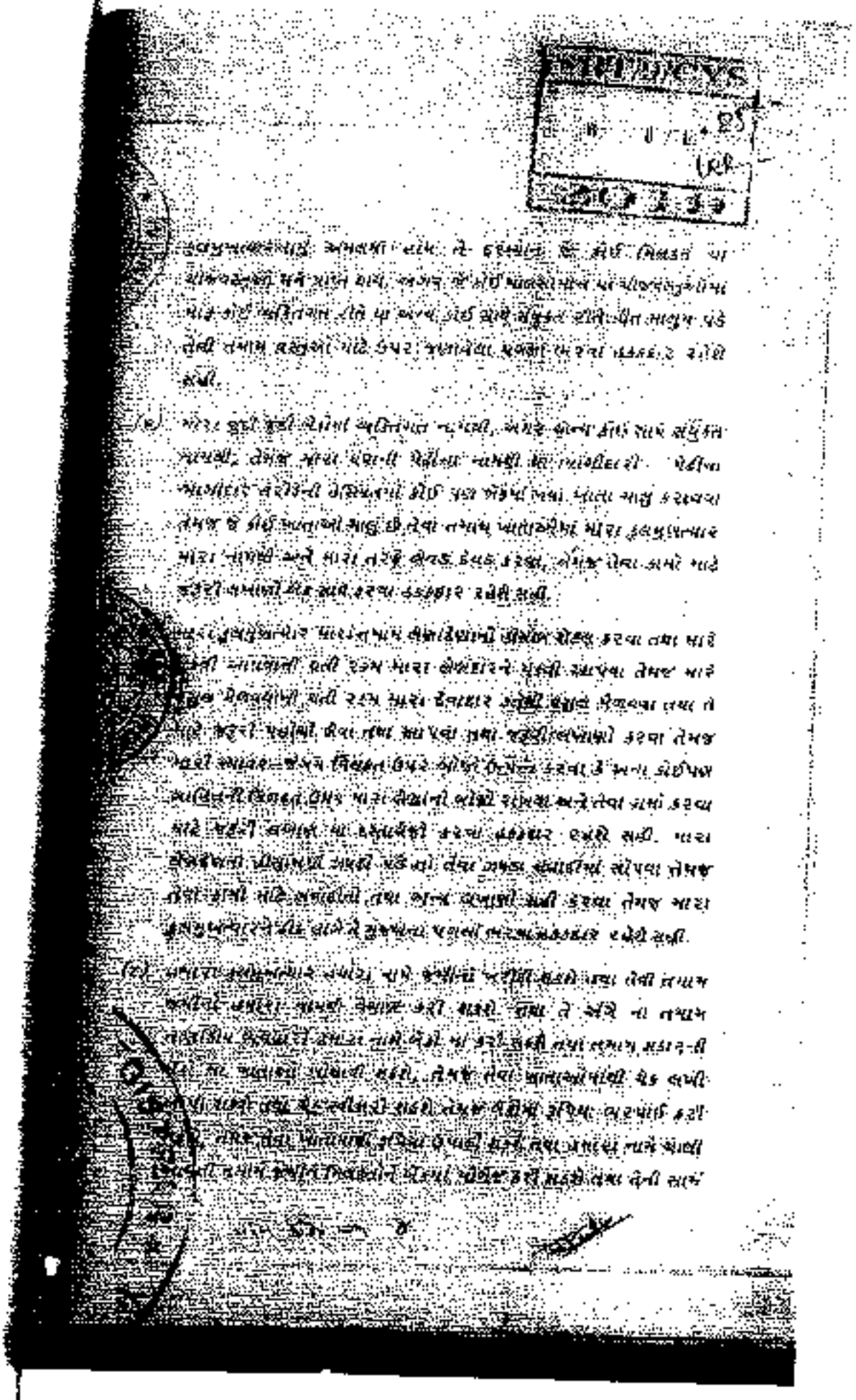
મારા પિતા હસમુખભાઈ મણિલાલભાઈ પટેલ, ઉંમર વર્ષ ૬૦, ધંધો : નોકરી તથા વેપાર, રહેવાસી : બી-૧૦૨, શિવમ એપાર્ટમેન્ટ, ખરવર રાજની બાજુમાં, પાંડેસરા, સુરતના વતની તથા સંપૂર્ણ વિશ્વાસ અને ભરોસો છે. મારા પિતા તરીકે મારા તમામ વ્યવહારો સંભાળે છે અને તેથી હું મારા આ મુખત્યારનામાની રૂએ મારા પિતા હસમુખભાઈ મણિલાલભાઈ પટેલને મારા વતી નીમું છું અને તેમને મારા તરફે અને મારા વતી તથા મારા નામથી નીચે મુજબની કામગીરી કરવાની સત્તા અને અધિકાર આપું છું.

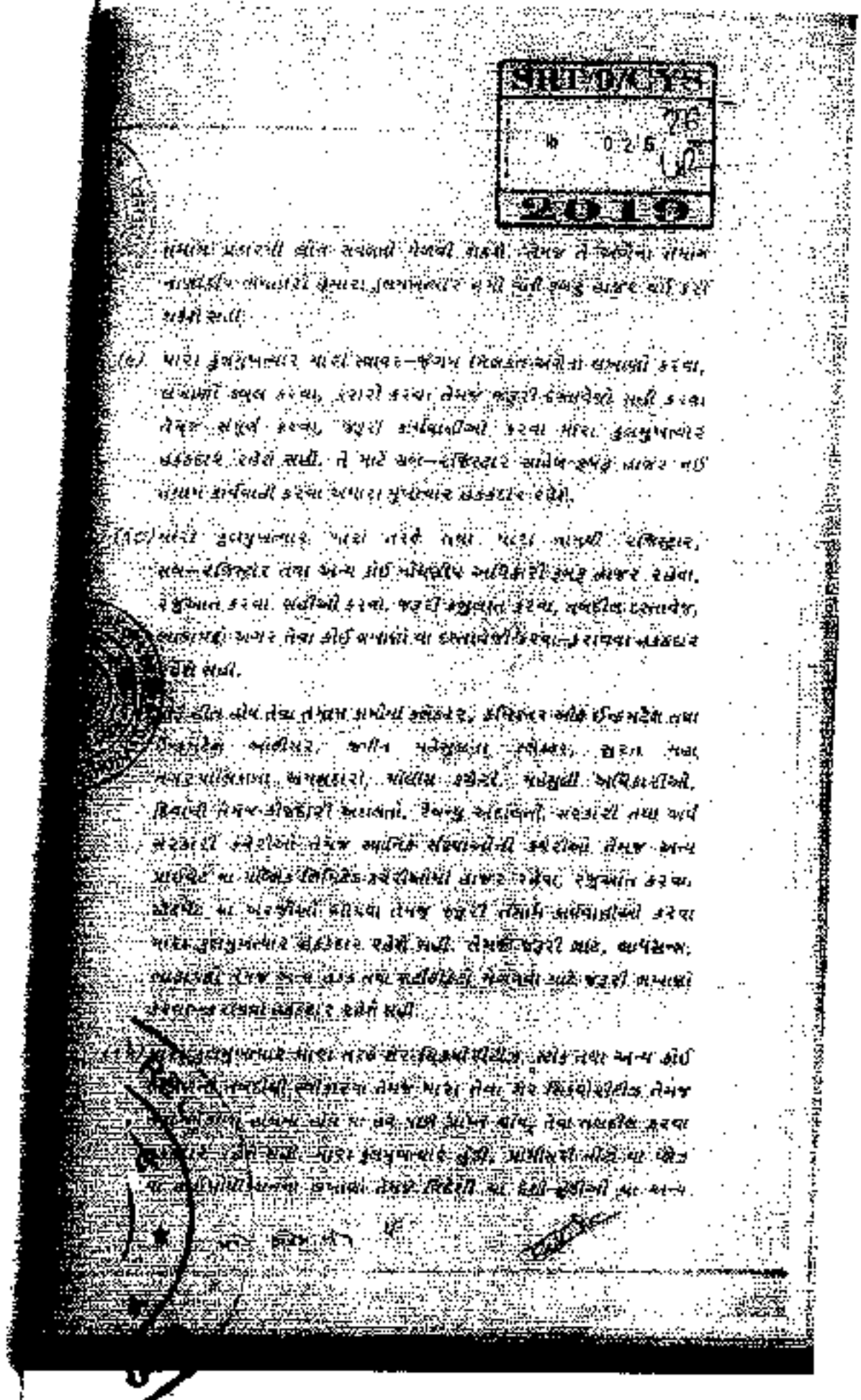
// કામગીરી //

(૧) મારા ઉપરોક્ત મારા તમામ મિલકતો તથા અન્ય વ્યવહારો સંભાળવા ઉપરાંત રહેશે સાથે તેમજ મારું નામ લેવા તથા મારા સંબંધો તથા સ્થાવર-જંગમ મિલકતનો વ્યવહારો કરવા હકદાર રહેશે સાથે અને ઉપરોક્ત કામગીરી નામદાર કરવા વકીલ પણ રોકી શકશે, તમામ કોર્ટમાં મિલકતો અને મારી વતીને મારા કરવા કરાવવા હકદાર રહેશે સાથે. કોર્ટ ઉપરાંત કોઈ પણ ઓફિસો તથા બેંક તથા તેના અધિકારી વગેરેને મારા નામના મુખત્યાર મારા નામથી કામગીરી કરી શકશે સાથે.

(૨) મારા મુખત્યાર મારા નામથી અને મારા તરફે મારી તમામ મિલકત વિષયક કોઈપણ જાતના પાવર કરવા તેમજ કોઈપણ વ્યક્તિ/સંસ્થા/બેંક વગેરે સાથે કોઈપણ જાતના કરાર, સિધ્ધરાઈના વિષયે







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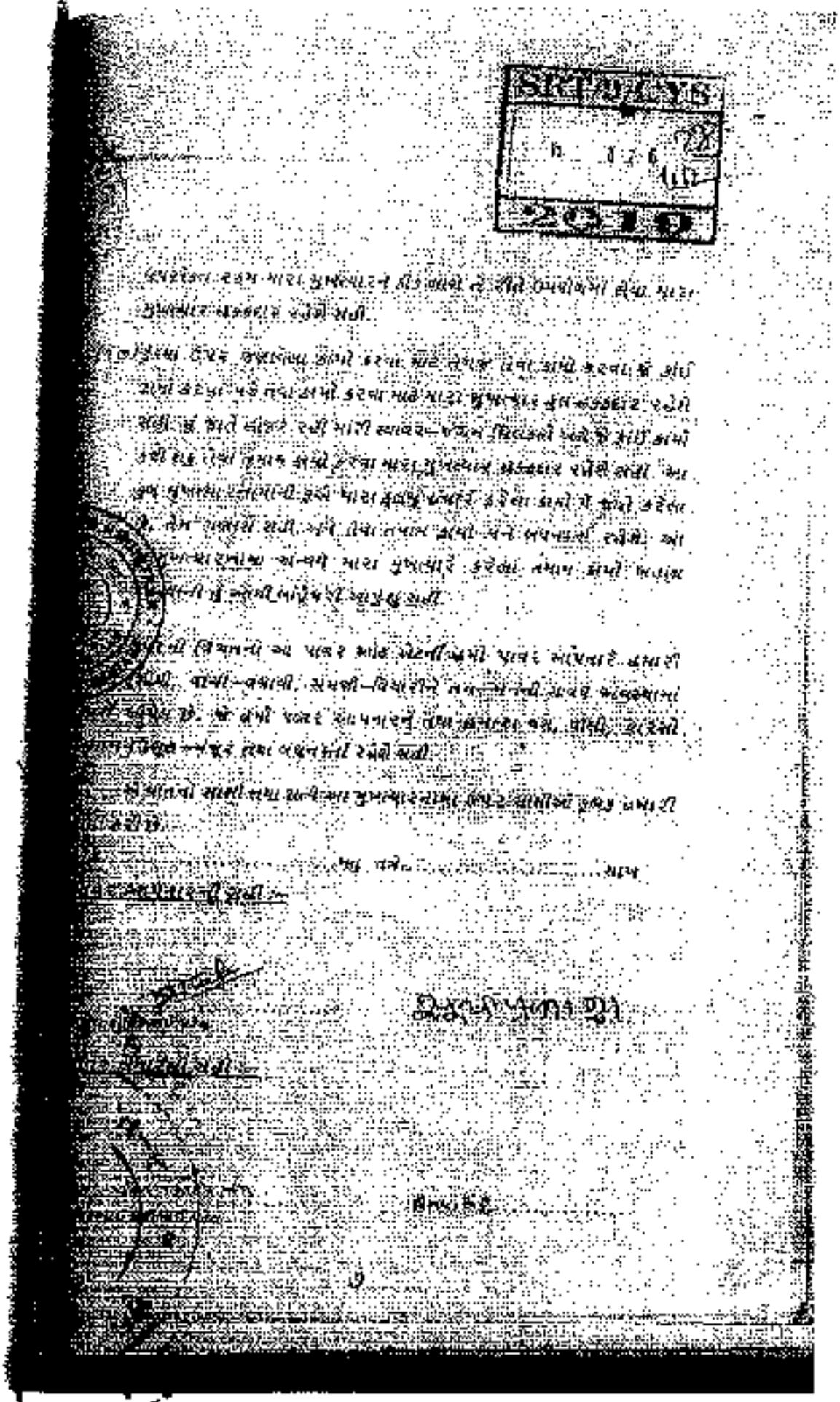
(૧૦) તેમણે મિલ્કત ઉપરાંત પોતે મોટી આસામી હોઈ સ્ટીલ્ટરનો, બેન્કોમાં કરવા આવ્યા, વગાડવા માં રોકાણ કરી મુનાફા તેમજ બોનસીન થા મુનાફામાં કરવા બેકરીમાં રહેવા રહી તેમજ મારા કુટુમ્બીજનોના નામના શેર સિક્યુરીટીસ તથા સ્ટોક વિગેરેના ડીવીડેન્ડ, વ્યાજ તથા બોનસ વગેરે મેળવવા હકદાર રહેશે નહી.

(૧૧) મારી સ્થાવર-જંગમ મિલ્કતો અને દિવાની, ફોજદારી થા રેવન્યુ અદાલતોમાં ચાલતા મુકદમો સીવી તથા બોર્ડ ઓફ ડિરેક્ટર્સ તથા અન્ય કંપનીઓ, બોર્ડો, કમીટીઓ, બોર્ડ ઓફ ટ્રસ્ટીઓ તથા તે બોર્ડ મેનેજમેન્ટમાં કરવા, સ્ટીયરીંગમાં કરવા, ડેટમેટ ખાતામાં, બોર્ડ ઉપર મુખ્યની બોર્ડમાં, બેન્કમાં જુદાજુદા ખાતાઓ ચાલુ કરવા, કરીયાદ કરવી અપીલ, રીવ્યુ, રીવીઝન તથા બીજા જરૂરીયાત મુજબ કામ ચલાવવા, કરારમેળે રકમ કરવા, તમામ બાબતો પેરવીવાળા નામના જમા કરવા તમામ વસુલ મેળવવા, દસ્તાવેજો સહી કરવા તથા કોર્ટોમાં કોર્ટના કામકાજમાં કરાવવા તથા સાક્ષીઓ તપાસવા, ઉલટતપાસ કરવા તથા કોર્ટોમાં સોપવા તેમજ તેના તમામ કામો માટે વકીલ, એડવોકેટ થા બેરીસ્ટરની નિમણુંક કરવા હકદાર રહેશે વળી.

(૧૨) ઉપરોક્ત કામકાજોના સમાધાન કરવા, બાંધી આપવા, નિકાલ કરવા તથા કબુલાતો લેવા અગર સલાહ મળે તે મુજબના અન્ય કોઈ પણ રીતે બાબતો ઉકેલ આવવા જે કોઈ કામો કરવા પડે તેવા તમામ કામો કરવા માટે મુખત્યાર હકદાર રહેશે વળી.

(૧૩) ઉપરોક્ત મુખત્યાર મારા નામથી તથા મારા તરફે ઇન્કમટેક્ષ કમિશનર, ઇન્કમટેક્ષ ઓફિસર, ઇન્કમટેક્ષ એપેલેટ ટ્રીબ્યુનલ તથા આઈ.ટી.એ.ટી. બોર્ડ ઓફ રેવન્યુ ઓથોરીટીઝ તથા અન્ય કચેરીઓ તેમજ ઇન્કમટેક્ષ તથા તે ઉપર લગી [illegible] હકદાર રહેશે વળી.

(૧૪) ઉપરોક્ત મિલ્કત યોગ્ય કરવાની બાબતમાં પોતે પણ તથા અન્ય સરકારી અધિકારીઓ સાથે રહેવા કરવા રહેવા બાબતમાં મારફતે ઉપરી લેવા તેમજ



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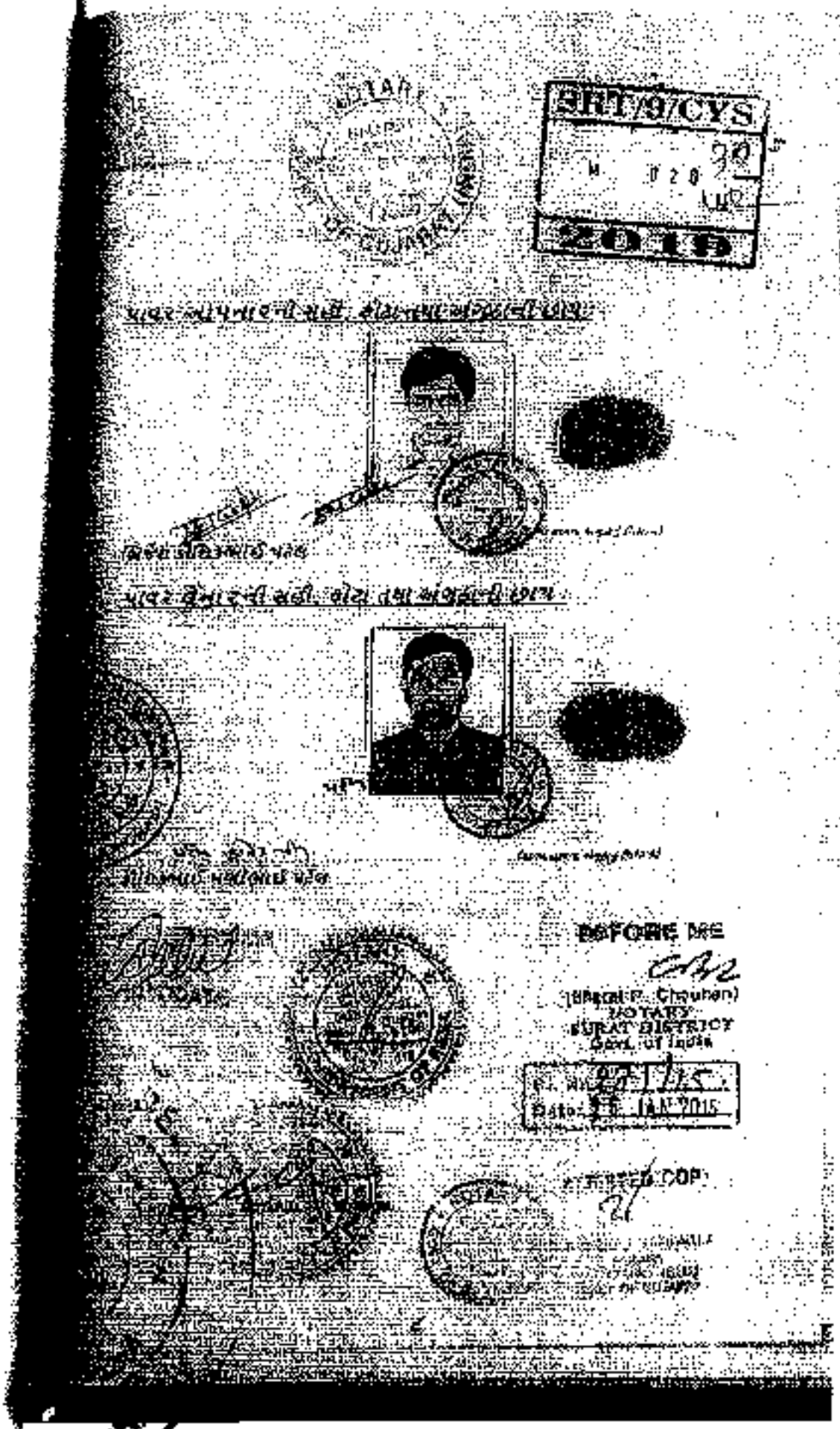
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SURAT DISTRICT
Govt. of India
Date: 16 JAN 2015
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SRT/9/CVS
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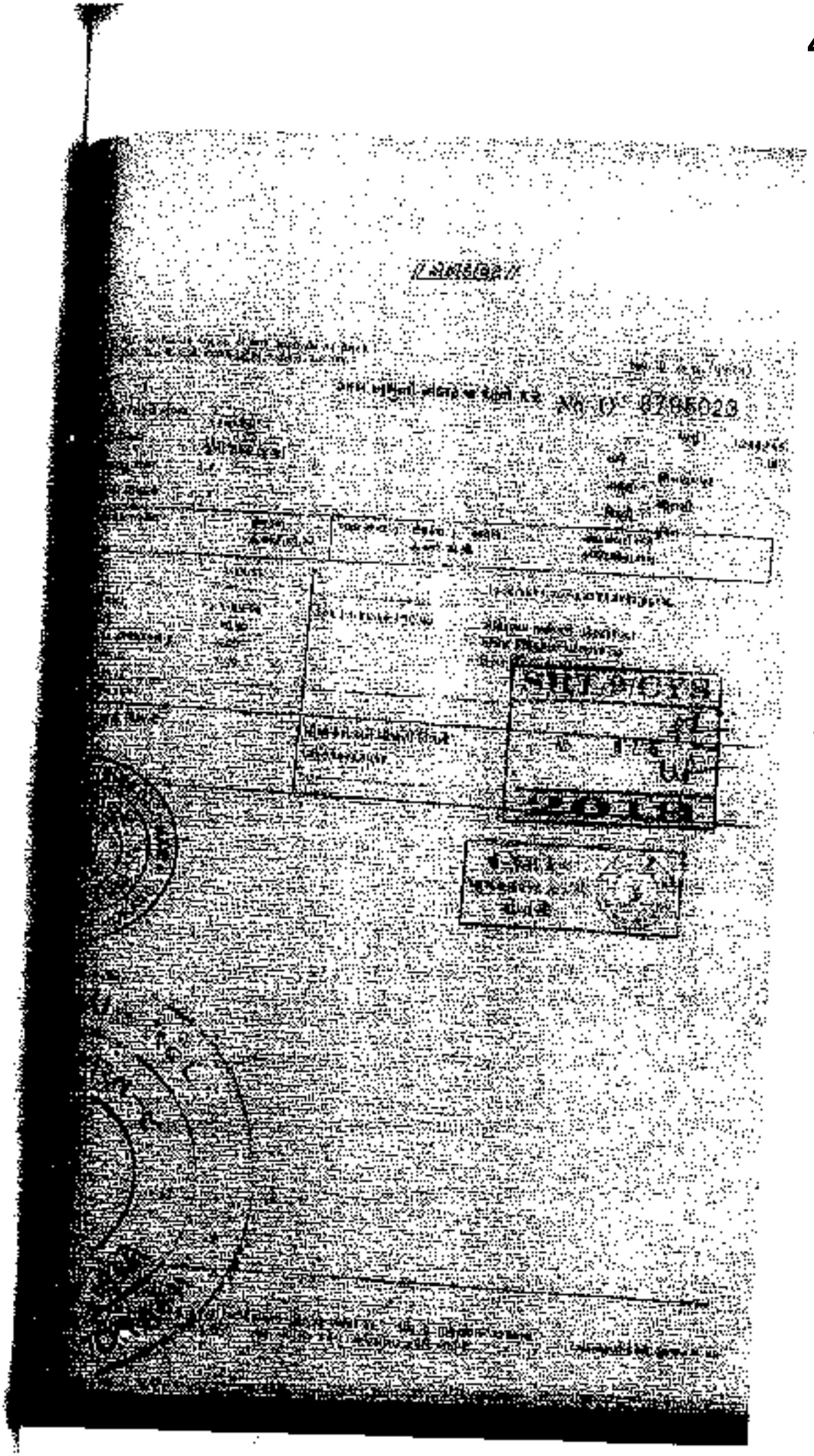
आयकर विभाग
INCOME TAX DEPARTMENT
भारत सरकार
GOVT. OF INDIA
PERMANENT ACCOUNT NUMBER



CERTIFIED TRUE COPY OF RESOLUTION PASSED AT THE MEETING OF THE BUSINESS OPERATIONS AND FINANCE COMMITTEE OF THE BOARD OF DIRECTORS OF SANGHI INDUSTRIES LIMITED ("COMPANY") HELD ON 6TH NOVEMBER 2018 AT 10TH FLOOR, KATARIA ARCADE, OFF. S.G. HIGHWAY, POKE NEAR BRTS, AHMEDABAD-380051.

"RESOLVED THAT Mr. Gaurang Dhoot, S/o Jayantilal Dhoot, aged about 51 years presently working as Senior Vice President (Corporate Affairs) of the company, whose signatures are verified below, be and is hereby authorized to deal with the matters pertaining to land procurement for proposed Clinkering Unit to be set up at Surat District for the Company and is authorized to sign and execute the MOU, Conveyance Deed, Undertaking and all other required documents to purchase the land in favour of the company and to do all such acts and things as may be required for the purpose of giving effect to this resolution."

"RESOLVED FURTHER THAT the Committee confirms and ratifies and agrees to confirm and ratify all and whatsoever Mr. Gaurang Dhoot shall do lawfully for the above said purpose."

Signature of Mr. Gaurang Dhoot

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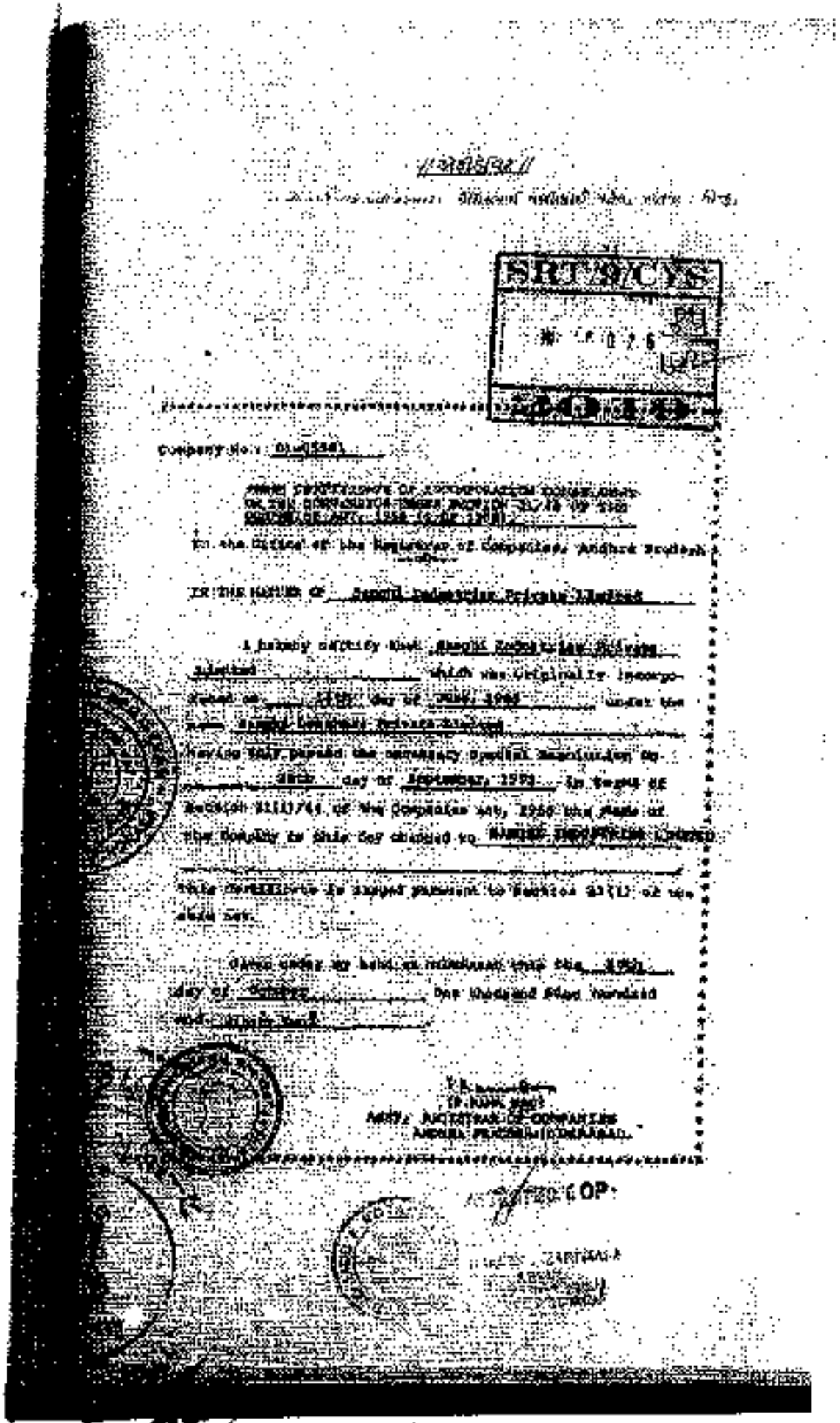
"Certified Copy"
For Sanghi Industries Limited

Anil Agrawal
Company Secretary

CERTIFIED COPY

Sanghi Industries Limited



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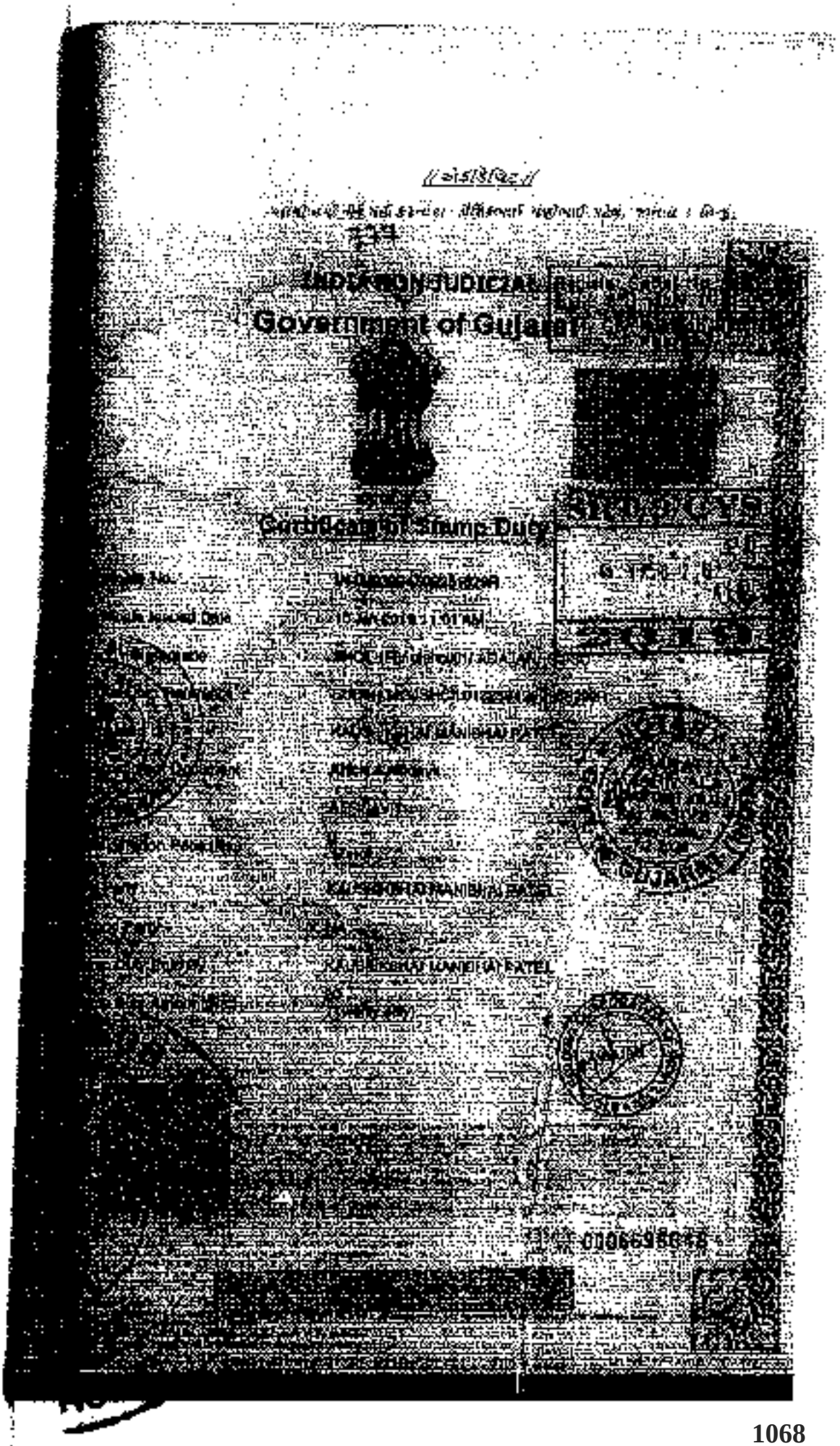

Government of Gujarat
Certificate of Stamp Duty

// સોગંદનામું //

SHT/9/CYS

10 JAN 2019

BEFORE ME

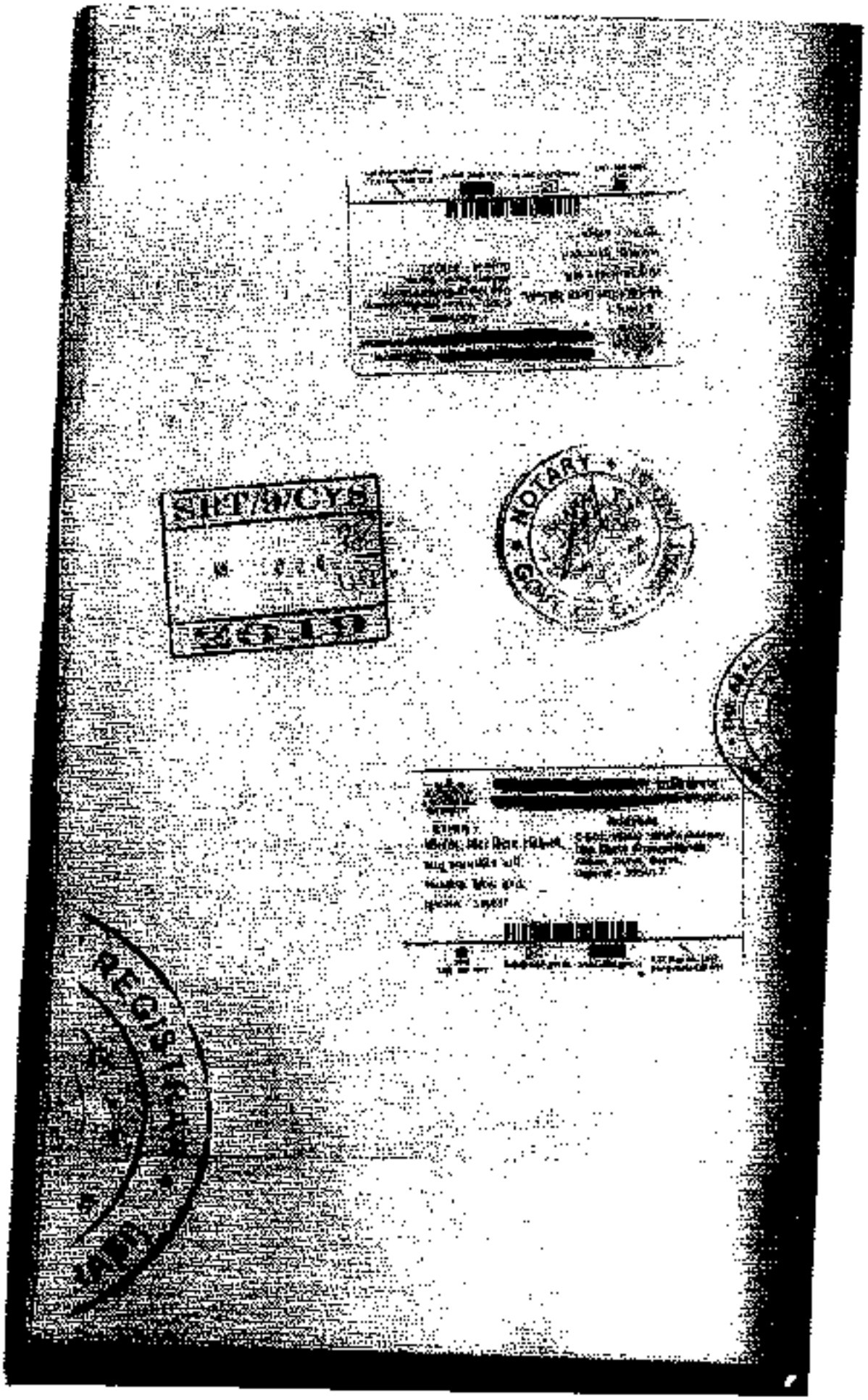
2019

BHARAT J. JARIWALA
NOTARY
HIGH COURT (GUJ.)
GOVT. OF GUJARAT

Notarial Serial No. 2
Date 10 JAN 2019
My Commission Expires
On 7th February 2020

10 JAN 2019

SH/29/CYS
2019
NOTARY
BHARAT
J. JARIWALA
GUJARAT (INDIA)



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2019

Version 1.1.2018.7

Sangita Industries Limited A company through its Senior Vice President Shri Gaurangbhai Jayantibhai Bhatt

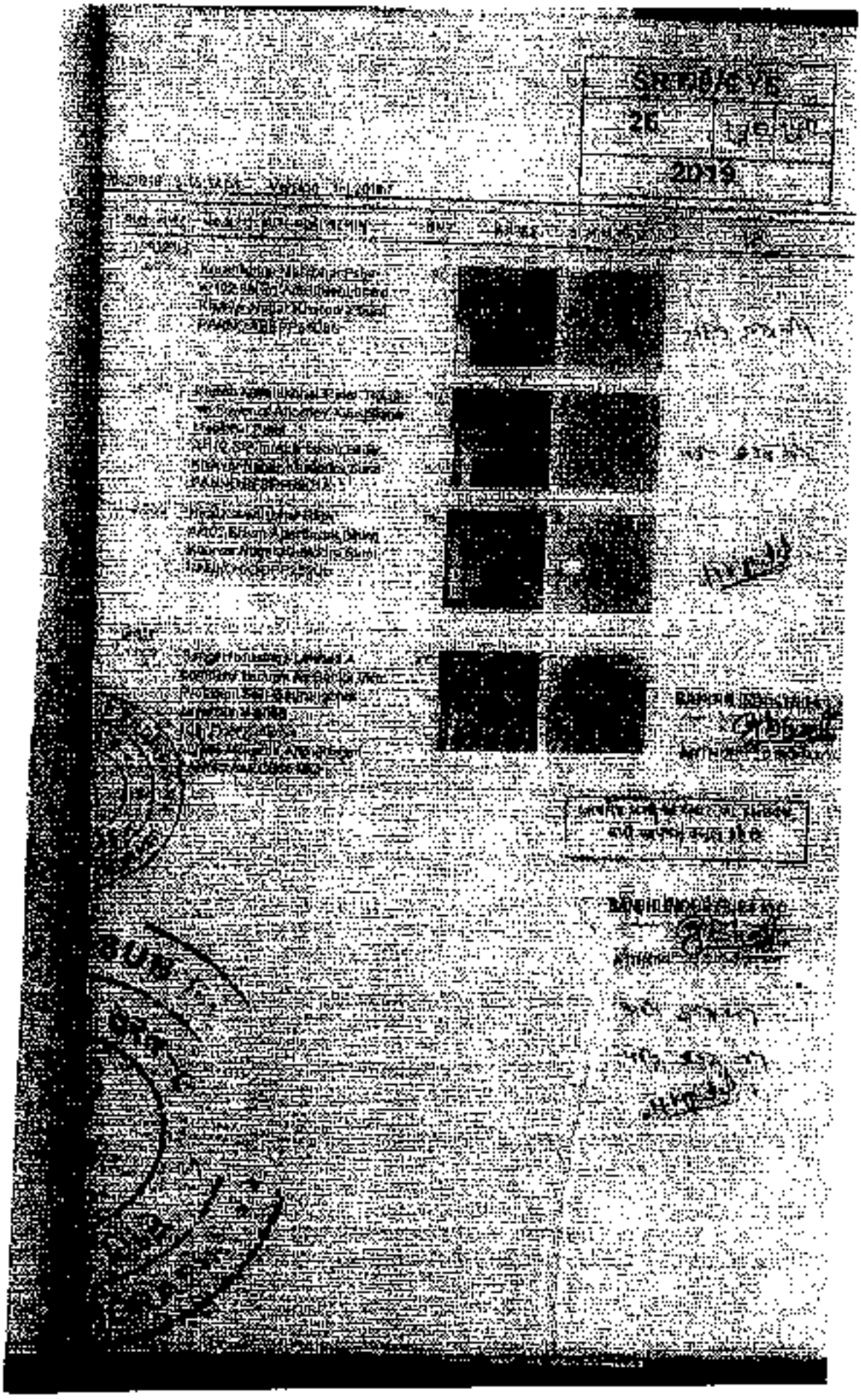
(Tonya Dilipkumar Labhsankar)
સહ દસ્તાવેજ
સુરત-૯ (ચોર્યાસી)

(Tonya Dilipkumar Labhsankar)
સહ દસ્તાવેજ
સુરત-૯ (ચોર્યાસી)

10 JAN 2019

સહ-દસ્તાવેજ-૯
સુરત-૯ (ચોર્યાસી)

REGISTRAR



TWENTY RUPEES
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2019

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No 025 2-31

INDIA NON JUDICIAL

Government of Gujarat

Certificate of Stamp Duty

SRT/9/CYS

No 025 1-31

2019

Certificate No.	IN-GJ03295757446069R
Certificate Issued Date	10-Jan-2019 11:10 AM
Account Reference	SHCIL (FI)/ gjshcil01/ ADAJAN/ GJ-SU
Unique Doc. Reference	SUBIN-GJGJSHCIL0132595027416731R
Purchased by	SANGHI INDUSTRIES LIMITED
Description of Document	Article 20(a) Conveyance - Immovable Property
Property Description	MOUJE:SHIVRAMPUR,S/BL:125/PAIKI 2,ADM 14670 SQ.MTS AND S/BL.:126/1+2+3,ADM 19324 AGRICULTURAL LAND
Consideration Price (Rs.)	32,50,84,600 (Thirty Two Crore Fifty Lakh Eighty Four Thousand Six Hundred only)
First Party	PUNAM JAYANTIBHAI ALIAS JAYANTILAL PATEL
Second Party	SANGHI INDUSTRIES LIMITED
Stamp Duty Paid By	SANGHI INDUSTRIES LIMITED
Stamp Duty Amount(Rs.)	1,59,29,300 (One Crore Fifty Nine Lakh Twenty Nine Thousand Three Hundred only)

STOCK HOLDING CORPORATION OF INDIA LTD.

TC 0006696651

SRT/9/CYS

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SALE DEED

Sale Deed of (1) Agricultural land admeasuring 14670 sq. mts. of Survey/Block No.125/paiki 2 [Old Survey No.466/ paiki 3 of Mouje Sonvadi] and (2) Agricultural land admeasuring 15324 sq.mts. of Survey/Block No.126/1+2+3 [Old Survey No.467/1+2+3 of Mouje Sonvadi] situate, lying and being at Mouje Shivranjan, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.32,50,84,000/- (Rupees Thirty Two Crore Fifty Lakh Eighty Four Thousand Six Hundred Only)

P.J. Patel

SRT/9/CYS

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Sale Deed of (1) Agricultural land admeasuring 1 3670 sq. mts. of Survey/Block No.125/paiki 1 3 (Old Survey No.467 paiki 1/2, Mouje Sarvadi) and (2) Agricultural land admeasuring 4534 sq.mts. of Survey/Block No.126/1+2+3 (Old Survey No.467/1+2+3+4 Mouje Sarvadi) situate lying and being at Mouje Sarvempur, Taluka Chorasi in the Registration District of Surat and Sub-District Olpad - for Rs.32,64,600/- (Rupees Thirty Two Lakhs Fifty-Four Thousand Six Hundred Only)

FIRST PARTY: Purnam Jayantibhai alias

VENDOR: Jayantibhai Patel

PAN: AOYPP4410K
Age: Adult,

Occupation : Farming and Business

Resident of: 13, Milap Enclave,

Anand Mahal Road, Adajan, Surat

Hereinafter called "THE VENDOR" OR "FIRST PARTY" (Which expression shall unless it be repugnant to the context or meaning thereof be deemed to include the Vendor and his heirs, executors, successors, assignees and administrators etc.) of the One Part.

SECOND PARTY: Sanghi Industries Limited

PURCHASER: PAN: AAECS5810Q

A company through its
Senior Vice President
Shri Gurunghbhai Jayantibhai Bhatt,
Adult, Occupation: Service,
Address: 10th Floor,
Kasturya Arcade, Mahanbir, Ahmedabad

Hereinafter called "THE PURCHASER" (which expression shall unless repugnant to the context or meaning thereof mean and include the Purchaser and its present and future Directors, executors, successors, assignees and administrators etc.) of the Second Part.

P.J. Patel

GJ Bhatt

SRT/9/CVS

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2019

Sale Deed of [1] Agricultural land admeasuring 14670 sq. mts. of Survey/Block No.125/paiki 2 [Old Survey No.466/paiki 3] of Moujo Sunvalli and [2] Agricultural land admeasuring [illegible] of Survey/Block No.120/1243 [Old Survey No.466/1243] of Moujo Sunvalli situate, lying and being at Moujo Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.[illegible] (Rupees Thirty Two Crore Fifty Lakh Eighty-Four Thousand Rs Nineteen Only)

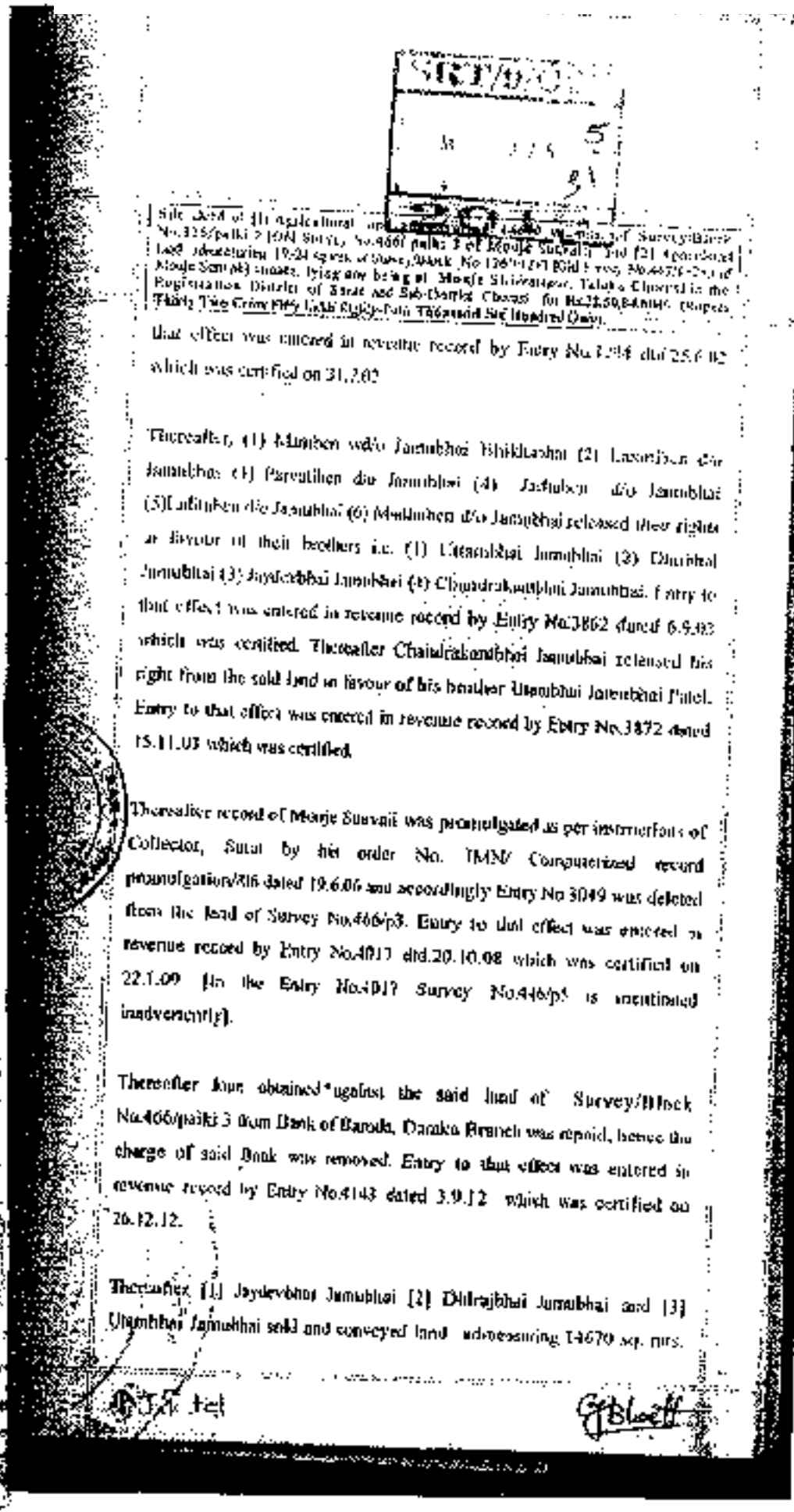
WHEREAS :

The Vendor is seized and possessed of and otherwise well and sufficiently entitled to all that piece and parcel of [1] Agricultural land admeasuring 14670 sq. mts. of Survey/Block No.125/paiki 2 [Old Survey No.466 / paiki 3 of Moujo Sunvalli] and [2] Agricultural land admeasuring 19324 sq.mts. of Survey/Block No.120/1243 [Old Survey No.467/1243 of Moujo Sunvalli] situate, lying and being at Moujo Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi (hereinafter called "the said land").

Survey/Block No. 125/paiki 2:-

The land of Survey/Block No. 125/ paiki 2 of Shivrampur [Old Survey No.466/ paiki 3 of Moujo Sunvalli originally belonged to Jamubhai Bhikhabhai. Thereafter Jamubhai Bhikhabhai entered the names of his sons (1)Uttambhai Jamubhai (2) Dhirubhai Jamubhai (3) Jaydevbhai Jamubhai (4) Chandrakantbhai Jamubhai in the said land. Entry to that effect was entered in the revenue record by Entry No.3501 dated 5.2.93 which was certified. Thereafter loan was obtained against the said land of Survey No.466/paiki. Entry to that effect was entered in the revenue record by Entry No.3572 dated 1.1.96 which was certified.

Thereafter Jamubhai Bhikhabhai died intestate leaving behind his heirs viz (1) L. Maniben w/o Jamubhai Bhikhabhai (2) Laxmiben d/o Jamubhai (3) Uttambhai Jamubhai (4) Parsaniben d/o Jamubhai (5) Dhirubhai Jamubhai (6) Jashuben d/o Jamubhai (7) Jaydevbhai Jamubhai (8) Chandrakantbhai Jamubhai (9)Lalitaben d/o Jamubhai (10) Madhuben d/o Jamubhai Entry to



Sale Deed of [1] Agricultural [illegible] No.325/paiki 2 [Old Survey No.466] paiki 3 of Mouje Suvali, Tal [illegible] Land Admeasuring 19-24 sq.mts. of Survey/Block No 126/1/2/3 Old Survey No.466/2+3 of Mouje Suvali) situate, lying and being at Mouje Shivanagar, Taluka Choryasi in the Registration District of Surat and Sub-District Choryasi for Rs.23,50,84 [illegible] (Rupees Thirty Two Crore Fifty Lakh Eighty-Four Thousand Six Hundred Only.

that effect was entered in revenue record by Entry No.3954 dtd 25.6.02 which was certified on 31.7.02

Thereafter, (1) Manuben w/o Jamubhai Bhikhabhai (2) Laxmiben d/o Jamubhai (3) Parvatiben d/o Jamubhai (4) Jashuben d/o Jamubhai (5)Lalitaben d/o Jamubhai (6) Mathuben d/o Jamubhai released their rights in favour of their brothers i.e. (1) Chandubhai Jamubhai (2) Dhirubhai Jamubhai (3) Jaydevbhai Jamubhai (4) Chandrakantbhai Jamubhai. Entry to that effect was entered in revenue record by Entry No.3862 dated 6.9.02 which was certified. Thereafter Chandrakantbhai Jamubhai released his right from the said land in favour of his brother Umedbhai Jamubhai Patel. Entry to that effect was entered in revenue record by Entry No.3872 dated 15.11.03 which was certified.

Thereafter record of Mouje Suvali was promulgated as per instructions of Collector, Surat by his order No. TMN/ Computerized record promulgation/216 dated 19.6.06 and accordingly Entry No 3049 was deleted from the land of Survey No.466/p3. Entry to that effect was entered in revenue record by Entry No.4017 dtd.20.10.08 which was certified on 22.1.09 [In the Entry No.4017 Survey No.446/p3 is mentioned inadvertently].

Thereafter loan obtained against the said land of Survey/Block No.466/paiki 3 from Bank of Baroda, Dumka Branch was repaid, hence the charge of said Bank was removed. Entry to that effect was entered in revenue record by Entry No.4143 dated 3.9.12 which was certified on 26.12.12.

Thereafter [1] Jaydevbhai Jamubhai [2] Dhirajbhai Jamubhai and [3] Umedbhai Jamubhai sold and conveyed land admeasuring 14670 sq. mts.

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Sale Deed of (1) Agricultural land admeasuring 14670 sq. mts. of Survey/Block No.428/paiki 2 (Old Survey No.466 paiki 1 of Mouje Sonsadi) and (2) Agricultural land admeasuring 1920 sq.mt. of Survey/Block No.126/212/3 (Old Survey No.165/1+2+3) of Mouje Sonsadi supple, Tpng and being at Mouje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.32,00,000/- (Rupees Thirty Two Crore Fifty Lakh Eighty-Four Thousand only)

of Survey/Block No.466/paiki 3 to Purnam Jayantibhai alias Jayantilal Patel by Sale Deed which is registered in the office of Sub Registrar under serial No.53 dated 13.1.14. Entry to that effect was entered in revenue record by Entry No.9265 dated 13.1.14 which was certified on 28.2.14.

Thereafter, Chandrikaxaben Jamubhai Patel executed Confirmation Deed on 13-01-2014 for the said land in favour of Purnam Jayantibhai Alias Jayantilal Patel which was registered in the office of Sub-Registrar- 9 (Chorasi) on same day under serial No.34. Thereafter, (1) Hansaben W/o. Uttambhai Jamubhai Patel (2) Maheshbhai Uttambhai Patel and (3) Manishaben Maheshbhai as Natural Guardian of Minor Dhruvil Maheshbhai and Minor Pathiv (4) Shaileshbhai Dhirubhai Patel (5) Kalpanaben Maheshbhai as Natural Guardian of Minor Mit and Minor Krupa Shaileshbhai (6) Nileshbhai Uttambhai Patel (7) Dharmishthaben Nileshbhai as Natural Guardian of Minor Kavya (8) Dakshaben W/o.Uttambhai Jamubhai Patel and Wife of Satishbhai Patel (9) Ranjanben W/o. Dhirajbhai Jamubhai Patel (10) Chiragbhai Dhirajbhai Patel (11) Pankilbhai Dhirajbhai Patel (12) Jainilbhai Dhirajbhai Patel (13) Ushaben W/o. Jaydevbhai Jambubhai Patel (14) Hemantbhai Jaydevabhai Patel (15) Khushbu Wife of Hemantbhai Jaydevabhai (16) Mayurbhai Jaydevbhai Patel (17) Parulben Wife of Mayurbhai Jaydevbhai Patel (18) Jyotiben D/o. Jaydevabhai Jamubhai and Wife of Chiranbhai Patel and Vanitaben D/o. Jaydevabhai Jamubhai Patel executed Confirmation Deed on 24.4.15/12.5.15 for the said land in favour of Purnam Jayantibhai Alias Jayantilal Patel which was registered in the office of Sub-Registrar- 9 (Chorasi) on same day under serial No.196.

Thereafter Mamlatdar, Chorasi passed order No.RST/Sudhara Hukum region/329/Sonsadi.466/15 dated 26.4.15 stating that Survey/Block No.466/paiki 3 is Survey No.466/paiki 3 and ordered to mutate entry No.3872 from Village Form No.7/12. Accordingly entry to that effect was entered in

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Sale Deed of [1] Agricultural land admeasuring 14670 sq. mts. of Survey/Block No.125/paiki 2 (Old Survey No.466/ paiki 3 of Mouje Sunvali) and [2] Agricultural land admeasuring 19324 sq.mts. of Survey/Block No.126/1+2+3 (Old Survey No.467/1+2+3 of Mouje Sunvali) situate, lying and being at Mouje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.32,58,84,608/- (Rupees Thirty Two Crore Fifty Lakh Eighty-Four Thousand Six Hundred Only).

revenue record by Entry No.4463 dated 17.4.15 which was certified on 12.6.15.

Thereafter Deputy Collector, Olpad Prant, Surat granted permission under Section-63 of Bombay Tenancy and Agricultural Lands Act, 1948 for sell of said land for Non-Agricultural use for Industrial Purpose to Shakti Vijayalaxmi Corporation, a Partnership Firm by order No.GNT KALAM-63/Vashi 3398/15/regi.no.13/2016 dated 27.5.15. Entry to that effect was entered in revenue record by Entry No.4538 dated 3.6.16 which was certified on 29.7.16. But thereafter the said Company has not fulfilled all terms and conditions of the order of Deputy Collector, Olpad Prant, Surat and decided not to purchase the said land. Moreover No Objection Certificate of Shakti Vijayalaxmi Corporation, a Partnership Firm has been obtained by Vender for the sale of the said land to any Third Party.

Thereafter as per Govt. Notification No.DHM/99/80/M/PFR/2895/2821/L AND and Amendment Notification of Govt. No.PFR/5211.593 L-1 dtd.5.3.12 the lands of Village Sunvali including Survey No.466/ paiki 3 were transferred to Village Shivrampur. Entry to that effect was entered in revenue record by Entry No.4615 dtd.8.3.18 which was certified on 27.4.18.

Thereafter the land admeasuring 14670 sq. mts. of Survey/Block No.466/paiki 3 was allotted new Survey No.125/paiki 2 admeasuring 14670 sq. mts as per certified copy of Land record office dated 21.5.2015. Thereafter, as per order of Mamlatdar Chorasi bearing No. EST/Sudhara Hukam/Regi. No. 30/18 /Vashi1247/18 dated 27.12.2018 it is clarified that the land of Old Survey No. 466/paiki 3 of Mouje Sunvali, Taluka Chorasi, District Surat was given Revenue Survey / Block No. 125/paiki 2 of Mouje Shivrampur in the Revenue Record and the said land is described as land of Survey / Block No. 466/paiki 2 in D.I.L.R. record. Thus by the said order

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Sale Deed of (1) Agricultural land admeasuring 1450 sq. mts. of Survey/Block No.125/paiki 2 (Old Survey No.466 paiki 3 of Mouje Sarvali) and (2) Agricultural land admeasuring 19324 sqmts. of Survey/Block No.126/1+2+3 (Old Survey No.467/1+2+3 of Mouje Sarvali) situate, lying and being at Mouje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.32,50,56,600/- (Rupees Thirty Two Crore Fifty Lakh Eighty Five Thousand Six Hundred only)

it is clarified that the land of Survey / Block No. 466/paiki 3 as per Revenue Record and land of Survey / Block No. 466/paiki 2 as per D.E.L.R. record is the same

Survey/Block No.126/1+2+3:-

The land of Survey/Block No.126/1+2+3 of Mouje Shivrampur (Old Survey No.467/1+2+3 of Mouje Sarvali) originally belonged to Thakorbhai Lalabhai. Thereafter Thakorbhai Lalabhai died intestate on 30.4.10 leaving behind his heirs viz. (1) Kamuben w/o Thakorbhai (2) Rameshbhai Thakorbhai (3) Savitaben Thakorbhai (4)Namradaben Thakorbhai w/o Manilal alias Manubhai (5) Ashokbhai Thakorbhai (6) Jyotsanben Thakorbhai w/o Natvarlal [died on 7.3.97] (7)Divyeshbhai Natvarlal. Entry to that effect was entered in revenue record by Entry No.4131 dated 14.5.12 which was certified on 31.12.12.

Thereafter [1] Kamuben w/o Thakorbhai [2] Rameshbhai Thakorbhai [3] Savitaben Thakorbhai [4] Namradaben Thakorbhai w/o Manilal alias Manubhai [5] Ashokbhai Thakorbhai and [6] Divyeshbhai Natvarlal sold and conveyed land admeasuring 19324 sq. mts. of Survey/Block No.467/1+2+3 to Punam Jayantibhai Patel by Sale Deed which is registered in the office of Sub Registrar under serial No.462 dated 31.7.13. Entry to that effect was entered in revenue record by Entry No.4196 dated 31.7.13 which was certified on 13.9.13. The said Sale Deed was confirmed by [1] Divyut Natvarbhai Patel and [2] Natvarbhai Narshibhai Patel in favour of Punam Jayantibhai Patel by Deed of Confirmation registered before Sub Registrar of Surat-9-Chorasi under serial No.2 E dtd.9.1.2019.

Thereafter [1] Nayanaben Ashokbhai Patel (2) Chandrikaben Rameshbhai Patel as Natural Guardian of Minor Monika Ashokbhai, Minor Ankita Ashokbhai and Minor Fenil Ashokbhai [3] Snehal Rameshbhai Patel, [4]

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Sale Deed of [1] Agricultural land admeasuring 14670 sq. mts. of Survey/Block No.125/paiki 2 [Old Survey No.468/ paiki 3 of Mouje Sunvali] and [2] Agricultural land admeasuring 19324 sq.mts. of Survey/Block No.126/1+2+3 [Old Survey No.467/1+2+3 of Mouje Sunvali] situate, lying and being at Mouje Shivranpur, Taluka Olpad in the Registration District of Surat and Sub-District Olpad for Rs.31,50,84,660/- (Rupees Thirty Two Crore Fifty Lakh Eighty-Four Thousand Six Hundred Only).

Priyanka Rameshbhai Patel and [3] Kaushik Rameshbhai Patel executed Confirmation Deed on 31-07-2013 for the said land in favour of Pritesh Jayantibhai Alias Jayantilal Patel which was registered in the office of Sub-Registrar 9 (Olpad) on same day under serial No.563.

Thereafter Deputy Collector, Olpad Prant, Surat granted permission under Section-63 of Bombay Tenancy and Agricultural Lands Act, 1948 for sell of said land for Non-Agricultural use for Industrial Purpose to Shakti Vijayalaxmi Corporation, a Partnership Firm by order No.GNT KALAM-63/Vashi 3598/15/reg.no.13/2016 dated 27.5.15. Entry to that effect was entered in revenue record by Entry No.4538 dated 3.6.16 which was certified on 29.9.16. But thereafter the said Company has not fulfilled all terms and conditions of the order of Deputy Collector, Olpad Prant, Surat and decided not to purchase the said land. Moreover No Objection Certificate of Shakti Vijayalaxmi Corporation, a Partnership Firm has been obtained by Vendor for the sale of the said land to any Third Party.

Thereafter as per Govt. Notification No.DIM/99/809/M/TEH/2895/2821/L AND and Amendment Notification of Govt. No.PER/5211/593 L-1 dtd.5.3.12 the lands of Village Sunvali including land of Block/Survey No.467/1+2+3 were transferred to Village Shivranpur. Entry to that effect was entered in revenue record by Entry No.4615 dtd.8.3.18 which was certified on 27.4.18. Thereafter the land admeasuring 19324 sq. mts. of Survey/Block No.467/1+2+3 was allotted new Survey No.126/1+2+3 admeasuring 19324 sq. mts as per certified copy of Land record office dated 21.5.2018.

As above, the said [1] Agricultural land admeasuring 14670 sq. mts. of Survey/Block No.125/paiki 2 [Old Survey No.468/ paiki 3 of Mouje Sunvali] and [2] Agricultural land admeasuring 19324 sq.mts. of Survey/Block No.126/1+2+3 [Old Survey No.467/1+2+3 of Mouje

Raj. Patel

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Sale Deed of [2] Agricultural land admeasuring 14020 sq. mtr. of Survey/Block No.125/paiki 2 (old Survey no.46/1 paiki 3) of Mouje Sunvali) and [2] Agricultural land admeasuring 19024 sqmts. of Survey/Block No.126/1 3/3 (Old Survey No.46/1/2/2) of Mouje Sunvali) situate, lying and being at Mouje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.32,58,84,600/- (Rupees Thirty Two Crore Fifty Lakh Eighty Four Thousand Six Hundred Only)

Sunvali) situate, lying and being at Mouje Shivrampur, Taluka Chorasi In the Registration District of Surat and Sub-District Chorasi is owned occupied and possessed by the Vendor

WHEREAS Purchaser i.e. Sunghi Industries Limited, a company through its Senior Vice President Shri Gunvanghhai Jayantibhai Bhatt nominated Vendor i.e. Pravin Jayantibhai Patel for purchase of said land **for bonafide Industrial Purpose under Section 63 AA of the Bombay Tenancy and Agricultural Land Act, 1948** and Vendor has agreed to sell the said land for **bonafide Industrial Purpose** at the total consideration of **Rs.32,58,84,600/- (Rupees Thirty Two Crore Fifty Lakh Eighty Four Thousand Six Hundred Only)** and Purchaser has agreed to purchase the said land at the said consideration. The consideration of the land includes the price of all the trees, leaves, fence, woods etc standing in the land and the purchaser have not to pay any separate amount for the same. The Vendor agrees and assures that the above stated sale consideration is for the total land of the said Survey Number and no deduction will be affected from the said area of the land as the Purchaser requires the total land to implement its industrial project.

WHEREAS, the Vendor declares that the said land is Old Tenure land and in future if the said land is declared as New Tenure land any premium is attracted for transferring the said land in Non Agricultural use, then the said amount of premium will be paid by the Vendor and if the said amount will be directly paid by the Purchaser to the Authority, then the same is to be refunded by the Vendor to Purchaser and the Vendor is not entitled to make any dispute.

WHEREAS, The Vendor agrees that they shall obtain confirmation of their family members for the sale of the said land and they shall be fully and

P. J. Patel

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Sale Deed at [1] Agricultural land admeasuring 14470 sq mts of Survey/Block No.125/paiki 2/2014 Survey No.466/ paiki 3 of Mouje Shivrampur and [2] Agricultural land admeasuring 19524 sqmts of Survey/Block No.126/1+2+3/2014 Survey No.467/1+2+3 of Mouje Shivrampur, Taluka Chorasi situate, lying and being at Mouje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.32,50,84,600/- (Rupees Thirty Two Crore Fifty Lakh Eighty Four Thousand Six Hundred Only).

completely liable for any cost, expenses, loss, damages that may occur due to any objection or dispute raised by any of the family members or predecessor in title. The First Party Vendor is fully aware that it is their sole liability to pay any amount from the sale consideration received from this transaction to any of their family members, legal claimants etc. and the Purchaser is not responsible under any circumstances to pay any additional amount apart from the consideration paid under this indenture. The Vendor gives such specific guarantee and undertaking to the Purchaser and on the basis of that the Second Party has agreed to purchase the said land.

WHEREAS, the Vendor agree to provide necessary application, affidavit, indemnity bond and other writings to transfer the said land in the name of the Purchaser and also will have to provide confirmation of all legal heirs, guardians, successors, family members that they have agreed to sell / convey the said land to the Purchaser.

WHEREAS, the Vendor agreed to fulfill all terms and conditions of Memorandum of Understanding executed between the parties which is notarized before Notary Bharat R. Chauhan under serial No.10065/18 dated 7.12.18 for obtaining permission of Industrial Use and the following sale consideration is paid by Purchaser to Vendor as per the terms and conditions of the Memorandum of Understanding.

AND WHEREAS, the Purchaser has paid to the Vendor the said sum of Rs.32,50,84,600/- (Rupees **Thirty Two Crore Fifty Lakh Eighty Four Thousand Six Hundred Only**) in following manner:

Rs.5,50,000/- (**Rupees Five Lakh Fifty Thousand only**) by cheque No.028059 drawn on Kotak Mahendra Bank.

P.J. Patel

1079/CONS
12
31
2019

Sale Deed of [1] Agricultural land admeasuring 14470 sq. mt. of Survey/Block No.128 paiki 2 (Old Survey No.406 paiki) of Mouje Sarsali and [2] Agricultural Land admeasuring 19924 sq.mt. of Survey/Block No.226/1/2/1 (Old Survey No.407/1/2/2) of Mouje Sarsali situate, lying and being at Mouje Shivranpur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.32,50,83,000/- (Rupees Thirty Two Crore Fifty Eight Thousand Eight Hundred Only).

Rs.4,39,74,300/- [Rupees Four Crore Nineteen Lakh Seventy Four Thousand Three Hundred only] by cheque No.272 drawn on H.D.F.C. Bank, Prahladnagar Branch, Ahmedabad.

Rs.4,00,00,000/- [Rupees Four Crore only] by cheque No.273 drawn on H.D.F.C Bank, Prahladnagar Branch, Ahmedabad

Rs.4,00,00,000/- [Rupees Four Crore only] by cheque No.274 drawn on H.D.F.C. Bank, Prahladnagar Branch, Ahmedabad.

Rs.4,00,00,000/- [Rupees Four Crore only] by cheque No.275 drawn on H.D.F.C. Bank, Prahladnagar Branch, Ahmedabad

Rs.4,12,63,150/- [Rupees Four Crore Twelve Lakh Sixty Two Thousand One Hundred Fifty only] by cheque No.276 drawn on H.D.F.C. Bank, Prahladnagar Branch, Ahmedabad.

Rs.4,00,00,000/- [Rupees Four Crore only] by cheque No.277 drawn on H.D.F.C. Bank, Prahladnagar Branch, Ahmedabad.

Rs.36,000/- [Rupee Thirty Six Thousand only] by cheque No.280 drawn on H.D.F.C. Bank, Prahladnagar Branch, Ahmedabad.

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2019

Sale Deed of (1) Agricultural land admeasuring 14670 sq. mts. of Survey/Block No.123/pait 2 (Old Survey Number part) 4 of Mouje Sunvali) and (2) Agricultural land admeasuring 19734 sq.mts. of Survey/Block No.276/1+2+3 (Old Survey No.below 213) of Mouje Sunvali) aforesaid, lying and being at Mouje Khevraspur, Taluka Choryasi in the Registration District of Surat and Sub-District Olpad for Rs.32,50,84,600/- (Rupees Thirty Two Crore Fifty Lakh Eighty-Four Thousand Six Hundred Only.

Rs.4,12,62,1500- [Rupees Four Crore Twelve Lakh Sixty Two Thousand One Hundred Fifty only] by cheque No.279 drawn on H.D.F.C. Bank, Prahladnagar Branch, Ahmedabad

Rs.4,00,00,000/- [Rupees Four Crore only] by cheque No.270 drawn on H.D.F.C. Bank Prahladnagar Branch, Ahmedabad,

Rs.32,50,84,600/- (Rupees Thirty Two Crore Fifty Lakh Eighty Four Thousand Six Hundred Only)

NOW THIS INDENTURE WITNESSETH that in consideration of Rs.32,50,84,600/- (Rupees Thirty Two Crore Fifty Lakh Eighty Four Thousand Six Hundred Only) paid by the Purchaser to the Vendor on or before execution hereof as mentioned above being the full consideration payable by the Purchaser to the Vendor, the Vendor doth hereby admit and acknowledge receipt thereof and acquit, release and discharge the Purchaser from the payment & and every part thereof. The Vendor doth hereby grant, sell, convey, assure release and transfer and delivers the vacant and peaceful possession forever to the PURCHASER of all that piece or parcel of the said land owned and possessed by the Vendors more particularly described in the schedule hereunder written;

AND TOGETHER WITH right in all and singular courts, yards, areas, compounds, ways, sewers, ditches, fences, trees, drainages, water courses, plants, paths, passages, wells, lights, electric connections, liberties, privileges, easements, profits, advantages, rights, members and appurtenances whatsoever to the Said land, hereditaments and land or any part thereof belonging or in any way appertaining to or with the same or

SRT/9/CYS

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2019

Sale Deed of [1] Agricultural land admeasuring [illegible] Survey/Block No.125/paiki 2 [Old Survey No.401/ paiki 2 of Mouje Sunvali] and [2] Agricultural land admeasuring 1920 sqms of Survey/Block No.126/1263 [Old Survey No.1671/1263 of Mouje Sunvali] situate, lying and being at Mouje Shivanagar, Taluka Chorasi of the Registration District of Surat and Sub-District Chorasi for Rs.32,50,54,600/- (Rupees Thirty Two Crore Fifty Lakh Eighty Four Thousand Six Hundred Only).

any part thereof now hath or at any time heretofore usually held, used, occupied or enjoyed or reputed or known as part or parcels thereof and to belong or be appurtenant thereto AND ALSO TOGETHER WITH all deeds, documents, writings, vouchers and other evidences of title relating to the said land, TOGETHER WITH all rights, interests, benefits and advantages of and under the Town Planning Scheme, by way of land of Final Plots, compensation and in any other form whatsoever, including benefit, compensation of the said land or any part thereof surrendered (if any) to flag mast, past, present and future, AND ALL THE ESTATE right, title, interest, possession, benefit, claim and demand whatsoever at law and in equity of the Vendor into, out of or upon the said land, hereditaments or any part thereof TO HAVE AND TO HOLD all and singular the said land hereby granted, conveyed, transferred and assured and intended or expressed so to be with their and every of their rights, members, easements and appurtenances UNTO AND TO THE USE and benefit of the Purchaser forever as full and absolute owner.

AND THAT that quiet, vacant and peaceful possession of the said land is delivered by the Vendor herein to the Purchaser today.

AND THE VENDOR do hereby for themselves and for their assigns and successors COVENANT with the PURCHASER that notwithstanding any act, deed, matter or thing whatsoever, by the Vendor or any of their predecessors - in - title or any person or persons lawfully, or equitably claiming by, from, through, under or in trust for them or any of them made, done, committed, omitted or knowingly or willingly suffered to the contrary they, the VENDOR now hath in themselves, at the time of selling and delivering of these presents, good right, full power and absolute authority to grant, release, convey and assure the said land hereby granted, conveyed, released and assured or intended so to be unto and to the use of the Purchaser.

SRT/8/CYS

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2019

Sale Deed of (1) Agricultural land admeasuring 1[1]70 sq. mts. of Survey/Block No.125/paiki 2 (Old Survey No.846/ paiki 3 of Mouje Sutrali) and (2) Agricultural land admeasuring 1[4]06 sq.mts. of Survey/Block No.125/1/2/3 (Old Survey No.846/1/2/3) of Mouje Sutrali, Olpad, lying and being at Mouje Shivrampur, Taluka Olpad in the Registration District of Surat and Sub-District Olpad for Rs.[7,50,84,000/- (Rupees Seven Lac Fifty Thousand Eight Eighty Four Hundred Only).

AND THAT it shall be lawful for THE PURCHASER from time to time and at all times hereafter peaceably and quietly to hold, enter upon, have occupy, possess and enjoy the Said land and receive the rents, issues and profits thereof and of every part thereof into and for its use and benefit without any suit, lawful eviction, interruption, claim or demand whatsoever from or by the VENDOR or any of her predecessors – in – title or by any person or persons, lawfully or equitably claiming by, from under or in trust for them or any of them AND THAT free and clear and freely and clearly and absolutely acquitted, exonerated, released and for ever discharged or otherwise by the Vendor, well and sufficiently saved, defended and kept harmless and indemnified of and from and against all former and other estate, title, charges and encumbrances, whatsoever, either already or hereafter had, made, executed, occasioned or suffered by the Vendor or their predecessors in title or by any other person or persons lawfully or equitably claiming or to claim, by, from, or under or in trust for them or any of them.

AND FURTHER, the Vendor having lawfully or equitably claiming any estate, right, title or interest at law or in equity in the said land hereby granted, conveyed, transferred or assured or any part thereof, by, from, under or in trust for them, the Vendor shall and will from time to time and at all times hereafter at the request of the Purchaser do and execute all such further and other lawful and reasonable acts, deeds, things, matters, conveyances and assurances in law whatsoever for better, further and more perfectly and absolutely granting and assuring unto and to the use of the Purchaser, as shall or may be reasonably required by the Purchaser, its successors or assigns or its counsel in law for assuring the said land and every part thereof hereby sold, granted, conveyed, transferred and assured unto and to the use of the Purchaser in the manner aforesaid.

SURAT-9.

Sub Plot of [1] Agricultural and admeasuring 14670 sq. mts. of Survey/Block No.125/paiki 2 (Old Survey No.166/ paiki 3 of Mouje Kumrali) and [2] Agricultural Single Survey/plot/ Land lying and being at Mouje Kumrapur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.33,50,84,660/- (Rupees Thirty Two Crore Fifty Lakh Eighty Four Thousand Six Hundred only)

AND FURTHER that in consideration of the aforesaid premises and as per covenant for further assurances contained hereinbefore, the VENDOR hereby irrevocably authorise, nominate, constitute and appoint the Purchaser or any person appointed by the Purchaser, in its estate and on its behalf and in all and every other capacities in which it may have or can be said to have in law fact or equity share, right or interest in the said land, to do, execute and perform all acts, deeds, matters and things as the nature and circumstances may require or the Purchaser may deem fit for more properly, legally, absolutely vesting the said land, more particularly described in the schedule hereunder written, in his/their favour as intended or expressed to be herein, including to execute and register further and other assurance, agreements, supplementary writing, rectification regarding any matter or thing herein, papers and writings AND FURTHER to appear before the office of the appropriate Sub Registrar and also to admit execution thereof and to do all acts, deeds, matters and things as may be necessary or proper for registration thereof, AND FURTHER to commence, carry on or defend all actions, suits or other proceedings touching the said land or any part thereof and to appear and represent in any court and before all judicial, revenue, municipal, town planning, or other authorities whatsoever and if the said Purchaser think fit to compromise, refer to arbitration, submit to judgement, dis-continue or become non suited in any action, suit or proceedings and to declare and affirm all plaints, written statements, affidavits, petitions and other necessary pleadings, AND FURTHER to obtain Permission under Section 63 AA of Tenancy Act, Non Agricultural Usage Permission, prepare and get sanctioned plans and/or revised plans from the concerned authority/authorities for putting up constructions on the said land and to sign and execute applications, layout plans, construction plans, declaration, undertakings, etc. AND FURTHER to examine, adjust and settle all accounts and recknings with any person or persons whatsoever and to receive the balance if any with respect to the Said Land AND generally to

RT/B/CYS

2019

Sale Deed of [1] Agricultural land admeasuring 14670 sq. mts. of Survey/Block No.[illegible] [10] Survey No.460 paiki 3 at Mouje Surwali and [2] Agricultural land admeasuring 4950 sqmts of Survey/Block No.[illegible] Survey No.460/3 paiki of Mouje Surwali [illegible], lying and being at Mouje Shirvaipur, Taluka Chorasi in the Registration District of Surat and Sub District Olpad for Rs.31,50,44,600/- (Rupees Thirty Two Crore Fifty lakh Eighty Four Thousand Six Hundred Only).

do any act, deed, matter or thing with respect to, touching or concerning the said land AND FURTHER to delegate all or any of the powers and authorities contained herein to any person or persons whomsoever;

AND FURTHER THE VENDOR represents, assures and confirms to the Purchaser that no litigation or proceedings of any nature concerning them or any of them or the said land or concerning any predecessors in title in respect of the said land are pending before any judicial, quasi judicial, revenue, local, state or any other Government authorities whomsoever and that neither the said land nor any part thereof is under any requisition, requisition or any reservation for any purpose and that no one else has any rights including right of maintenance *qua* and over the said land and that they have not entered in any other agreement or arrangement, oral or written, with any other person whomsoever nor have created any charge or encumbrance over the said land or any part thereof. AND the Vendor immediately before the execution hereof have made distal Declaration cum Indemnity on title attested by Notary Public confirming that their title to the said land is clear and marketable and on the basis of available registration record and believing the papers and documents produced to be true and trustworthy and on the basis of the undertaking given in Declaration cum Indemnity Bond by the Vendor, M/s.H.M.Ruwal & Company, Advocate has issued Title Clearance Certificate dated 2.1.2019.

AND FURTHER THAT, the Vendor assure that they have paid all taxes, cesses, betterment taxes upto the date of this indenture and if the same are found to be due or unpaid, the Vendor shall be liable to pay the same and failing which, the Purchaser shall be entitled to recover them from the Vendor. Hereinafter Purchaser is liable for payment of all type of taxes.

SRT/9[illegible]

[illegible] 18

21

Sale Deed of (1) Agricultural land admeasuring 14670 sq. mts. of Survey/Block No.125/paiki 2 [Old Survey No.466/ paiki 3 of Mouje Sunvali] and (2) Agricultural land admeasuring 19324 sqmts of Survey/Block No.126/1+2+3 [Old Survey No.467/1+2+3 of Mouje Sunvali] situate, lying and being at Mouje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.3240,84,000/- (Rupees Three Crore Forty Lakh Eighty Four Thousand Six Hundred Only)

The Second Party has authorized its Senior Vice President Shri Gurusingbhai Jayantibhai Bhatt to sign M.O.U., Agreement for Sale, Sale Deed and other related documents for purchase of said land on behalf of Company by passing resolution in its Business Operations And Finance Committee of the Board of Directors of the Company held on 6th November 2018.

The Vendor has handed over all original/photo copies of documents pertaining to the said land to the Purchaser.

All expenses for Stamp Duty, Registration Fees, miscellaneous expenses, in respect of these presents have been borne and paid by the Purchaser

The Purchaser has paid Stamp Duty of Rs.1,59,27,300/- as per the sale consideration of the said documents @4.9% as per the prevailing Stamp Act. The sale consideration is more than the prevailing Jantri value.

-: THE SCHEDULE ABOVE REFERRED TO :-

ALL THAT piece or parcel of [1] Agricultural land admeasuring 14670 sq. mts. of Survey/Block No.125/paiki 2 [Old Survey No.466/ paiki 3 of Mouje Sunvali] and [2] Agricultural land admeasuring 19324 sq.mts. of Survey/Block No.126/1+2+3 [Old Survey No.467/1+2+3 of Mouje Sunvali] situate, lying and being at Mouje Shivrampur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi.

The said land of Survey/Block No.125/paiki 2 is bounded as follows:

On East — Survey No.125

On West — Survey No. 125/ paiki 1

P.J. [illegible]

SRT/9/CYS
2019

Sale Deed of Agricultural land admeasuring 16610 sq. mts. of Survey/Block No.125/palki 2 (Old Survey No.402/1+2) and 372 Accultied land admeasuring 10324 sq.mts. of Survey/Block No.126/1+2+3 (Old Survey No.402/1+2) of Navje Shivajinagar, Taluka Chorasi in the Registration District of South and Sub-District Chorasi for Rs.32,50,96,600/- (Rupees Thirty Two Crore Fifty Lakh Eighty Four Thousand Six Hundred Only).

On North : Survey No.124

On South : Survey No. 105/A/2

The said land of Survey/Block No.126/1+2+3 is bounded as follows :

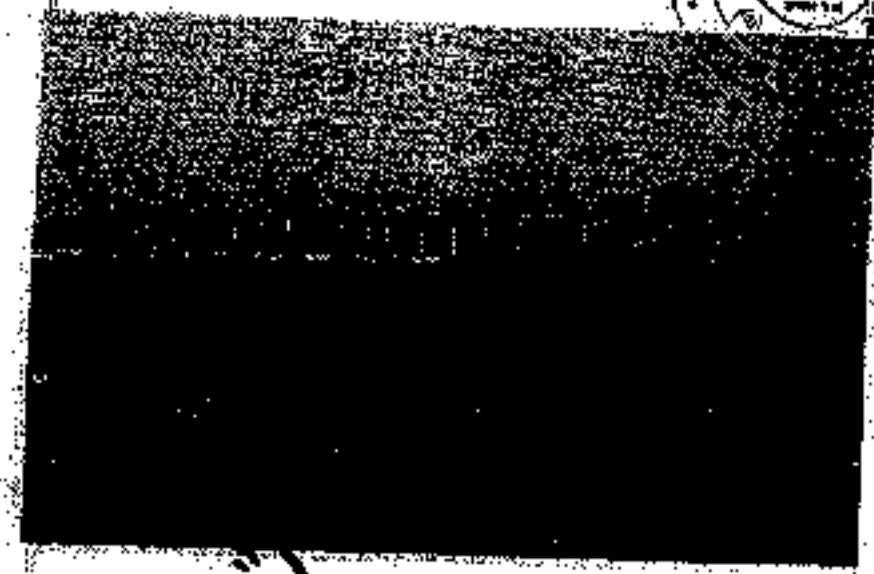
On East : Survey No. 105/A/2

On West : Survey No.125/palki 2

On North : Survey No.125

On South : Survey No. 105/A/2

PHOTOGRAPHS OF THE LAND



SRT/3/[illegible]

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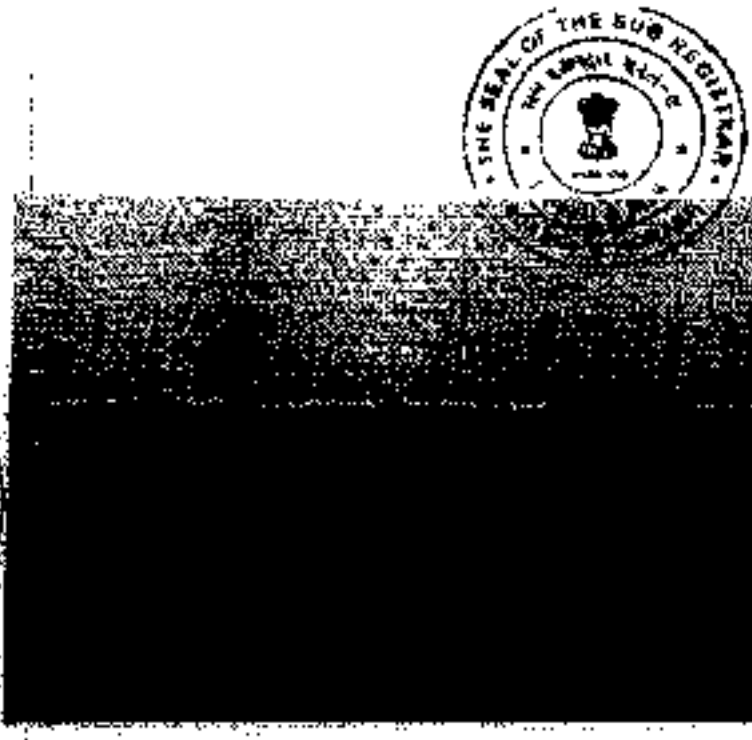
2012

Sale Deed of (1) agricultural land admeasuring 346/0 sq. mts. of Survey/Block No.125/paiki 2 [Old Survey No.466 paiki 1 of Mouje Sunvali] and [2] Agricultural land admeasuring 1935 sq.mts. of Survey/Block No.126/1+2+3 [Old Survey No.467/1+2+3 of Mouje Sunvali] situate, lying and being at Mouje Shivamyur, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.32,30,84,000/- (Rupees Thirty Two Crore Five Lakh Eighty Four Thousand Six Hundred Only).



Postal Address: [1] Survey/Block No.125/paiki 2 [Old Survey No.466/ paiki 1] of Mouje Sunvali] and [2] Survey/Block No.126/1+2+3 [Old Survey No.467/1+2+3 of Mouje Sunvali], Mouje Shivamyur, Taluka Chorasi, District Surat

P.J. [illegible]

SURAT-9

SRT/9/CYS
21
3
2019

Sale Deed of (1) Agricultural land admeasuring [illegible] sq.mtrs. of Survey No.[illegible] [Old Survey No.[illegible] of Mouje Sonvali] and (2) Agricultural land admeasuring 7924 sq.mtrs. of Survey/Block No.[illegible] [Old Survey No.[illegible] of Mouje Sonvali] Ahwane, lying and being at Mouje Bhatargaon, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.12,50,84,600/- (Rupees Twelve Crore Fifty Lakh Eighty-Four Thousand Six Hundred Only).

VENDOR

Punam Jayantibhai
alias Jayantilal Patel

PURCHASER

SANGHI INDUSTRIES LTD.

Authorised Signatory

Sanghi Industries Limited
through its Senior Vice President
Shri Gaurangbhai Jayantibhai Bhatt

IN WITNESS WHEREOF the parties hereto have hereunto set and subscribed their respective hands hereunder on this 16th January, 2019 at Surat.

SIGNED AND DELIVERED BY
THE WITHIN NAMED VENDOR :-

Punam Jayantibhai
alias Jayantilal Patel

SIGNED AND DELIVERED BY
WITHIN NAMED PURCHASER:
Sanghi Industries Limited
through its Senior Vice President
Shri Gaurangbhai Jayantibhai Bhatt

SANGHI INDUSTRIES LTD.

AUTHORISED SIGNATORY

In the presence of following two witnesses :-

1)

2)

REGISTRAR
(CHORASI)

OF THE
SURAT-9

SRT

Sale Deed of (1) Agricultural land admeasuring 14070 sq. mts. of Survey/Block No.[illegible] paiki 2 Old Survey No.[illegible] paiki 3 of Mouje Sanvaliy and (2) Agricultural land admeasuring 1932 sq.mts. of Survey/Block No.[illegible] Old Survey No.[illegible] both Mouje Sanvali Bhuvan, lying and being at Mouje Shivrangini, Taluka Chorasi in the Registration District of Surat and Sub-District Chorasi for Rs.32,50,46,600/- (Rupees Thirty Two Crore Fifty Lakh Forty Six Thousand Six Hundred Only)

SCHEDULE

FIRST PARTY/VENDOR

SIGNATURE

PHOTOGRAPH

THUMB IMPRESSION

Punam Jayantibhai

alias Jayantilal Patel

SECOND PARTY/PURCHASER

SIGNATURE

PHOTOGRAPH

THUMB IMPRESSION

Sanghi Industries Limited through its Senior Vice President

SANGHI INDUSTRIES LTD

AUTHORISED SIGNATORY

Gauraghbhai Jayantibhai Bhatt

SRT/9/CYS

પરિશીષ્ટ

દસ્તાવેજ નંબર - 2N

તા. 2019

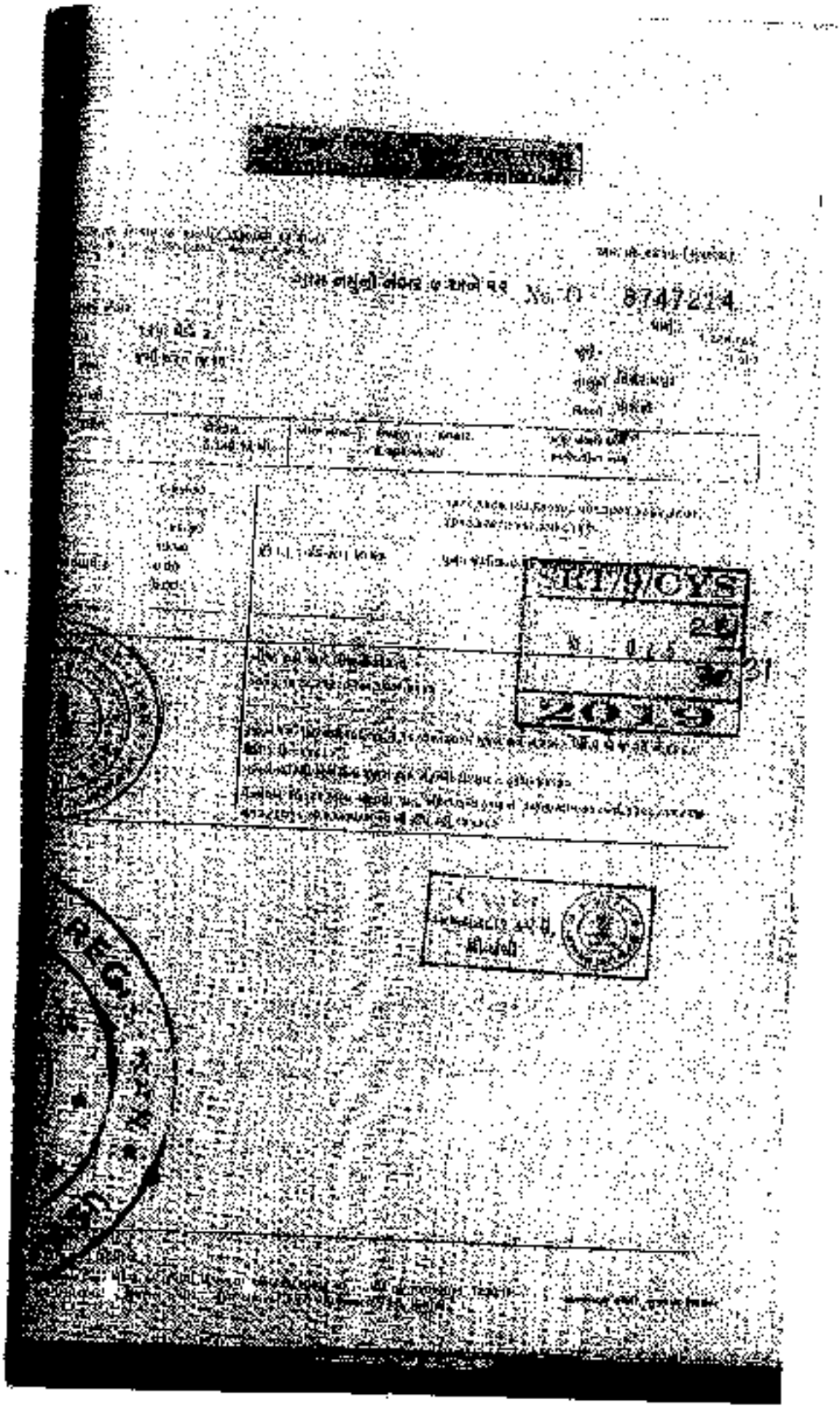
નોટરી અધિનિયમ-૧૯૫૨ ની કલમ-૪ ની પેટા કલમ-૩ મુજબનું સોગંદનામું

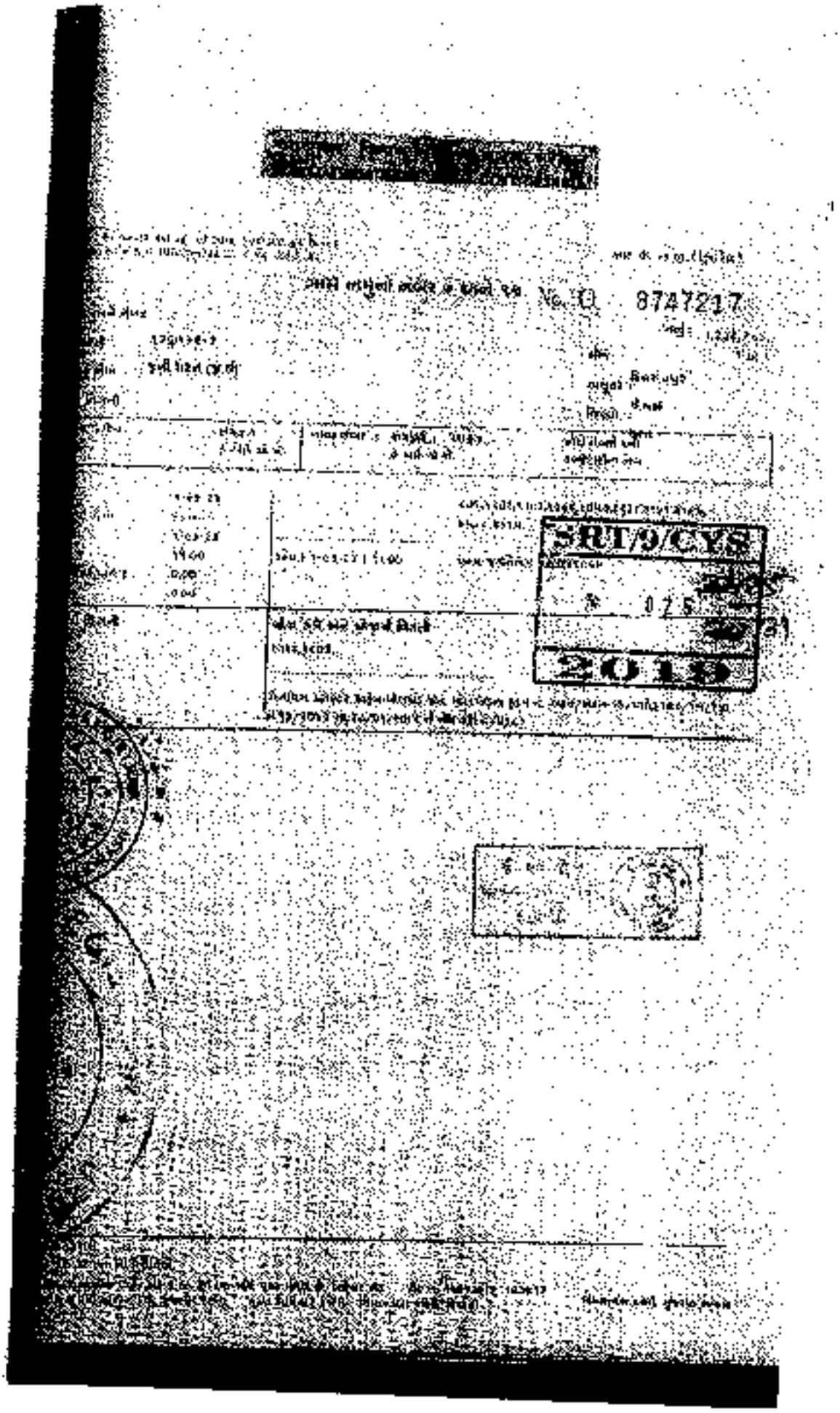
અ.નં.	પ્રશ્ન	જવાબ (હા કે ના)
	શ્રી/શ્રીમતી આપનાર, સંમતિ આપનાર કે તેઓના કુ.મુ.ને પુછવાના પ્રશ્નો :	
૧	લેખમાં દર્શાવ્યા મુજબ મુળજી (શિવસંખપુર) તા. ચોર્યાસી જી.સુરત ગામની સર્વે નંબર ૧૨૬/૧/૨/પૈકી/મુળ સર્વે નંબર-૪૬૬ પૈકી ૩ તથા સર્વે નંબર - ૧૨૬/૧+૨+૩ (જુના સર્વે નંબર-૪૬૭/૧+૨+૩) વાળી મોજીની જમીન મિલકતના વેચાણ લેખ કરી આપેલ છે ?	હા
૨	લેખમાં દર્શાવ્યા મુજબ 33094 ચો.મીટર. વાળી મોજીની જમીન માટે લેખ કરી આપેલ છે ?	હા
૩	લેખમાં દર્શાવ્યા મુજબની વિગતે અવેજની રકમ મેળવેલ છે ? રૂા.32,60,64,600/-	હા
	લેખમાં દસ્તાવેજ વિગતો વાંચી, વંચાવીને, સમજી, વિચારીને તમે મારી જાતે સહી અંગુઠાની છાપ કરેલ છે તે તમે કબુલ કરો છો ?	હા
	પાવર ઓફ એટર્ની આપનાર દસ્તાવેજની જરૂરીયાત હયાત છે ?	—
	પાવર ઓફ એટર્નીના લેખમાં પાવર ઓફ એટર્ની આપનાર વ્યક્તિ અંધ કે સ્ત્રી/અભણ/અશક્ત નિશાન કરેલ છે ?	—
	પાવર ઓફ એટર્નીની બીજ દસ્તાવેજની તારીખે જીવતા છે ?	—
	ઓળખાણ આપવા સારૂ તમને રોબરૂમાં હોય એવી વ્યક્તિઓ સાથે લાવ્યા છે ?	હા
	ઓળખાણ આપનારનું પુછવાના પ્રશ્નો ?	
૧	દસ્તાવેજ કરી આપનાર વ્યક્તિ/ઓ કે જેઓએ કબુલાત આપી તેઓને તમે ઓળખો છો ?	હા
૨	દસ્તાવેજમાં લખેલ નામ ધામ કબુલત આપનાર વ્યક્તિ/ઓ કે જેઓએ કબુલાત આપી તેઓ ને તમે જાતે ઓળખો છો ?	હા
૩	ઓળખાણ આપનાર ઓળખ પરેડ કરી કબુલાત આપી નથી એવી તમે જાતરી આપો છો ?	હા

આપનાર/સંમતિ આપનાર કુ.મુ.ની સહી

ઓળખાણ આપનારની સહી

(સહી)

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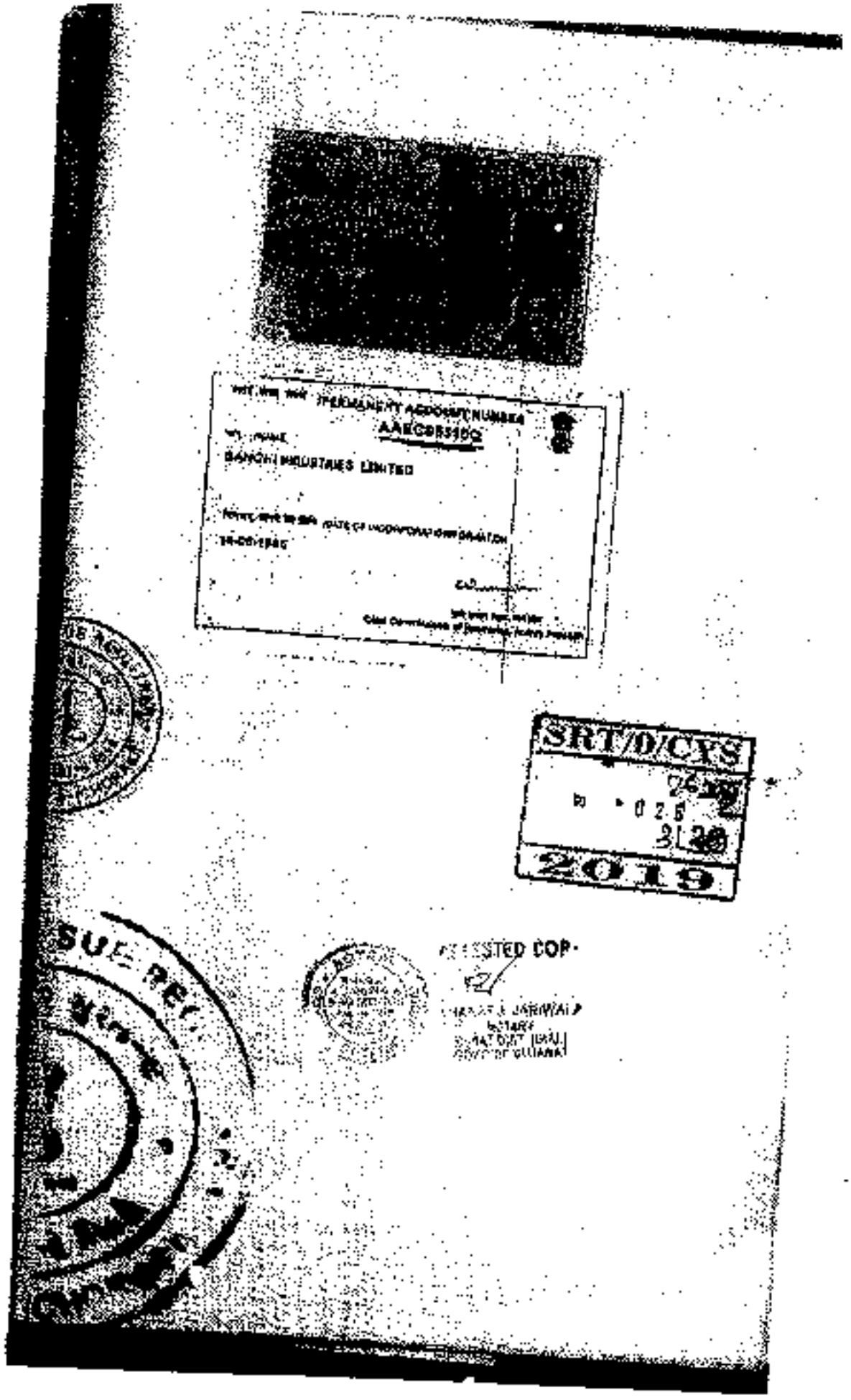

PERMANENT ACCOUNT NUMBER
AAECB5310Q
SRT/D/CYS
2019

SRT/9/CYS
25
2019

SRT/9/CYS
21-25
21-30
2019

SANGHI CEMENT

CERTIFIED TRUE COPY OF RESOLUTION PASSED AT THE MEETING OF THE BUSINESS OPERATIONS AND FINANCE COMMITTEE OF THE BOARD OF DIRECTORS OF SANGHI INDUSTRIES LIMITED ("COMPANY") HELD ON 6TH NOVEMBER 2019 AT 10TH FLOOR, KATARIA ARCADE, OFF. S. G. HIGHWAY, POST. MAKARBA, AHMEDABAD- 380051.

"RESOLVED THAT Mr. Gaurang Bhatt, S/o Jayantilal Bhatt, aged about 51 years presently working as Senior Vice President (Corporate Affairs) of the company, whose signatures are verified below be and is hereby authorized to deal with the matters pertaining to land procurement for proposed Grinding Unit to be set up at Surat District for the Company and is authorized to sign and execute the MOU, Conveyance Deed, Undertaking and all other required documents to purchase the land in favour of the Company and to do all such acts and things as may be required for the purpose of giving effect to this resolution."

FURTHER RESOLVED FURTHER THAT the Committee confirms and ratifies and agrees to ratify all and whatever Mr. Gaurang Bhatt has done shall be lawfully for the said purpose."

Signatures of S.O. Gaurang Bhatt :

// Certified Copy //

For Sanghi Industries Limited

ATTESTED COPY

BHAVESH JARIWALA
NOTARY
SURAT (GUJ.) INDIA
GOVT. OF GUJARAT

Anil Agrawal
Company Secretary

Sanghi Industries Limited

SRT/9/CYS
25
2019

SRT/9/CYS
2019

Company No.: 01-05801

CERTIFICATE OF INCORPORATION CONSEQUENT
ON FIRST CONVERSION UNDER SECTION 21/44 OF THE
COMPANIES ACT, 1956 (1 OF 1956)

In the Office of the Registrar of Companies, Andhra Pradesh
-:OOO:-

IN THE MATTER OF Ramki Industries Private Limited

I hereby certify that Ramki Industries Private Limited which was originally incorporated on 14th day of June, 1968 under the name Ramki Textiles Private Limited having duly passed the necessary Special Resolution on 26th day of September, 1972 in terms of Section 21(1)/44 of the Companies Act, 1956 the name of the Company is this day changed to RAMKI INDUSTRIES LIMITED

This Certificate is issued pursuant to section 23(1) of the said Act.

Given under my hand at Hyderabad this the 16th day of October, One thousand Nine hundred and seventy Four

(P.RAMA RAO)
ASST. REGISTRAR OF COMPANIES
ANDHRA PRADESH:HYDERABAD.

TRUE COPY

SRT/9/CYS
25 | 29 | 31
2019

Sanghi Industries Limited A company through its Senior Vice President Shri Gaurangbhai Jayantibhai Bhatt

(Tenya Dineshkumar Labhsankar)

(Tenya Dineshkumar Labhsankar)

Punam Jayantibhai alias Jayabla Patel
13,Milap Enclave,Asmod Mahal Road,Adajan,Surat
PANNO.AOYPP4410K

P.J. Patel

Sanghi Industries Limited A company through its Senior Vice President Shri Gaurangbhai Jayantibhai Bhatt
10th Floor,Kataria Acrade,Makarba,Ahmedabad
PANNO.AAECS5510Q

SANGHI INDUSTRIES LTD

AUTHORISED SIGNATORY

P.J. Patel

SRT/91CYS
2019
TWENTY RUPEES
TWENTY RUPEES

SRT/9/CYS
25
2019

LARSEN & TOUBRO

Larsen & Toubro Limited
Hazira Central Services
Hazira Manufacturing Complex
Post: Bhatha, Surat 394 510
Gujarat, INDIA
Tel.: +91 261 280 5000
Fax: +91 261 280 5050
www.Larsentoubro.com

HZMC/SUDA/2021/1

27th January 2021

Chief Executive Authority,
SUDA Bhavan, Vesu,
Surat.

Sub: Seeking information regarding setting up Cement Industry in Revenue Survey No. 125 & 126 Mouje : Shivrampura Tal Choryasi.

Ref: 1. Zoning Certificate no. SUDA/Tech/Zo.Certi/252907 Dated 11/01/2021
2. The Part Plan of SUDA Dated 07/01/2021

Dear Sir,

We refer your zoning certificate no. SUDA/Tech/Zo.Certi/252907 Dated 11/01/2021 for Revenue Survey No. 125 & 126 Mouje: Shivrampura Tal: Choryasi.

As per this certificate, above mentioned Revenue Survey numbers fall under General Industrial Zone **NOT** under Obnoxious and Hazardous Industrial Zone.

We request you to give us clarity that Cement Grinding Unit (Cement Industry) can be set up in these Revenue Survey numbers or not.

Thanking You,

Yours Truly,
For **Larsen & Toubro Limited**

Authorised Signatory

Encl:- As above

29/1/22

SURAT URABAN DEVELOPMENT AUTHORITY

To, Hiren shah
1101, Rajhans Campus, Pal, Hazira Road,
Surat

No.Suda/Tech/Zo. Certi/ 252907
SUDA bhavan, Vesu-Abhva Road,
Vesu, Surat-395007
Date : 11/01/2021

Sub: Regarding Zoning Certificate
Ref : Your Application Dates 07/01/2021

With reference to above subject, it is informed that according to final changes in the sanctioned Development Plan 2035 of the area of Surat Urban Development Authority by Government Notification no. GH/V/157 of 2020/DV-142018-5731-L Dated 08.10.2020 and Corrigendum no. GH/V/173 of 2020/DVP-142018-5731-L Dated 09.11.2020 under the provision of Gujarat Town Planning and Urban Development Act 1976, the details of land of Village Shivrampura Tal- Choryasi R.S. No./Block no./Ward No. 125,126 C. S No. ____-----____ are as follows:

1) R.S. No. 125 land falls under General industrial Zone and this land is affected by 22 mt proposed road.
2) R.S. No. 126 falls under General Industrial Zone.

Above provisions are bound by following details of Sr no. 1
1) Land number/Area/Measurement/location status remain valid as per office.
2) As The said land comes under area of TP Scheme no._____ it is bound by other proposal/provision and modification under of TP Scheme.

Note : This is Zoning Certificate only
It is not Development permission

Sd-
Assistant Town Planner
Surat Urban Development Authority
Surat

22

સુરત શહેરી વિકાસ સત્તામંડળ, સુરત.

નં.સુડા / ટેક. / ઝો.સર્ટી /૨૫૨૯૦૭
"સુડાભવન", વેસુ-આભવા રોડ,
વેસુ, સુરત – ૩૯૫૦૦૭
તારીખ:-૧૧/૦૧/૨૦૨૧

પ્રતિ,
શ્રી હિરેન શાહ
૧૧૦૧,રાજહંસ કેમ્પસ,પાલ હજીરા રોડ,
સુરત.

વિષય :-ઝોનીંગ સર્ટીફિકેટ બાબત.
અનુ.:-આપશ્રીની તા.૦૭/૦૧/૨૦૨૧ ની અરજી અન્વયે.

ઉપરોકત વિષય અન્વયે જણાવવાનું કે ગુજરાત નગર રચના અને શહેરી વિકાસ અધિનિયમ ૧૯૭૬ ની જોગવાઇઓ મુજબ સરકારશ્રી ના નોટીફિકેશન નંબર જીએચ/વી/૧૫૭ ઓફ ૨૦૨૦/ડીવીપી-૧૪૨૦૧૮-૫૭૩૧-એલ,તા:૦૮/૧૦/૨૦૨૦ તથા CORRIGENDUM નં.જીએચ/વી/૧૭૩ ઓફ ૨૦૨૦/ડીવીપી-૧૪૨૦૧૮-૫૭૩૧-એલ.તા:૦૯/૧૧/૨૦૨૦ થી સુરત શહેરી વિકાસ સત્તામંડળના વિસ્તારની મંજુર કરાયેલ વિકાસ યોજના-૨૦૩૫ ના અંતિમ ફેરફાર પ્રમાણે મોજે:-શિવરામપુરા તા.:-ચોર્યાસી ના રે.સ.નં./બ્લોક નં./વોર્ડનં ૧૨૫,૧૨૬ સી.સ.નં ---------ની જમીનની વિગત નીચે મુજબ છે.

(૧)રે.સ.નં.૧૨૫ ની જમીન જનરલ ઇન્ડસ્ટ્રીયલ ઝોનમાં આવે છે.તથા સદર જમીનને ૨૨.૦૦મી.ના સુચિત રસ્તાની અસર થાય છે.(૨)રે.સ.નં.૧૨૬ ની જમીન જનરલ ઇન્ડસ્ટ્રીયલ ઝોનમાં આવે છે.

ઉપરોકત જોગવાઇઓને નીચે જણાવેલ અનું. નં.(૧).....ની વિગતો બંધનકર્તા રહેશે.

(૧) જમીનના નંબર/ક્ષેત્રફળ/માપ/સ્થળસ્થિતિ અધિકૃત દફતર માન્ય રહે છે.
(૨) સદરહુ જમીન ટી.પી.સ્કીમ નં.---------.....ના વિસ્તારમાં હોવાથી તેની ટી.પી.સ્કીમ હેઠળની અન્ય દરખાસ્ત/જોગવાઇઓ તથા ફેરફારને બંધનકર્તા રહેશે.

નોંધ-"આ ફકત ઝોનીંગ સર્ટીફિકેટ છે.
બાંધકામની પરવાનગી નથી."

URBAN DEVELOPMENT AUTHORITY * SURAT

મદદનીશ નગર નિયોજક
સુરત શહેરી વિકાસ સત્તામંડળ
સુરત.

CHALLAN NO.252907 500

DATE :- 07/01/2021

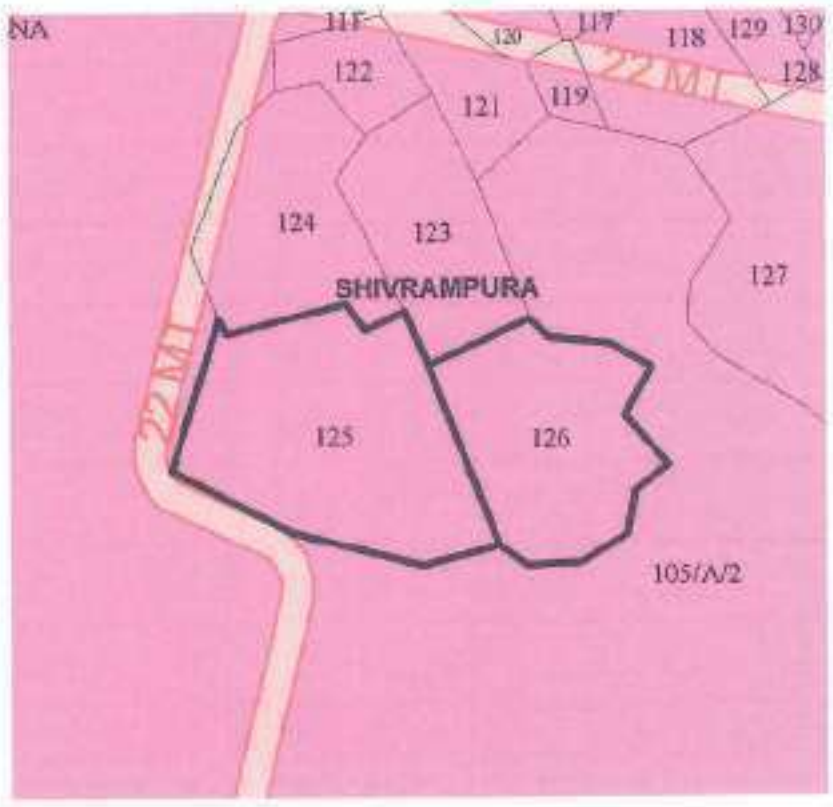
23

SURAT URBAN DEVELOPMENT AUTHORITY

PART PLAN OF SANCTIONED MODIFICATION DEVLOPMENT PLAN-2035 OF SURAT URBAN DEVLOPMENT AUTHORITY SURAT,UNDER GOVERMENT NOTIFICATION OF URBAN DEVLOPMENT AND URBAN HOUSING DEPARTMENT,NO. GH/V/157 OF 2020/ DVP-142018-5731-L,DATED. 08/10/2020 AND CORRIGENDUM NO. GH/V/173 OF 2020/DVP-142018-5731-L,DATED. 09/11/2020

VILLAGE :- SHIVRAMPURA **TALUKA :- CHORYASI** **DISTRICT :-SURAT**

THIS PART PLAN IS CERTIFIED FOR THE **R.S NO.:- 125,126**



જમીનના નંબર /ક્ષેત્રફળ / માપ / સ્થળ–સ્થિતિ બાબત અધિકૃત દફતર માન્ય રહેશે.

LEGEND

- GENERAL INDUSTRIAL ZONE
- PROPOSED ROAD

PREPARED BY :-

COMPARED BY :-

SURAT URBAN DEVELOPMENT AUTHORITY SURAT

TRUE COPY

Assistant Town Planner
Surat Urban Development
Authority, SURAT.

N

1 CM. = 70 MT.

1110

NOTIFICATION

Urban Development and Urban Housing Department,
Sachivalaya, Gandhinagar.
Dated the 18th June, 2020.

Constitution of India.

NO.KV/46 of 2020/SMN/902019/9933/P:-WHEREAS the Government of Gujarat, in exercise of the powers conferred by sub-section (2) of section 3 of the Gujarat Provincial Municipal Corporations Act, 1949 (Bom. LIX of 1949) under Government Notification, Panchayat, Housing and Urban Development Department No.KP-771/SMC/1066/5618/P, dated the 5th September, 1966 has constituted the City of Surat;

AND WHEAREAS having regard to the population of the areas, the density of the population therein, the revenue generated for local administration, the percentage of employment in non-agricultural activities and the economic importance of the areas, it is considered necessary to include certain areas in the existing local limits of the Municipal Corporation of the City of Surat;

NOW, THEREFORE, in exercise of the powers conferred by clause (2) of article 243Q of the Constitution of India, the Government of Gujarat hereby specifies the areas of the following Municipalities and Gram Panchayats as specified in the Schedule-1 and Schedule-2 respectively to be the larger urban areas and includes such larger urban areas which shall form the part of the Municipal Corporation of the City of Surat.

The Government land situated within the areas of the Municipalities, Gram Panchayats and revenue villages as specified in the Schedules shall not vest in the Municipal Corporation of the City of Surat.

SCHEDULE-1

No.	Name of the Municipality	Name of the Municipality included
1.	Sachin	Sachin
2.	Kansad	Kansad

SCHEDULE-2

No.	Name of the revenue Village Panchayat	Name of the Village included
1.	Segva Syadla	Segva Syadla
2.	Vasvari	Vasvari
3.	Gothan	Gothan
4.	Umra	Umra
5.	Bharthana Kosad	Bharthana Kosad
6.	Pardi Kande	Pardi Kande

No.	Name of the revenue Village Panchayat	Name of the Village included
7.	Talangpor	Talangpor
8.	Pali	Pali
9.	Umber	Umber (Excluding Sachin INA)
10	Kandi Faliya	Kandi Faliya
11.	Bhatpor	Bhatpor
12.	Bhatha	Bhatha
13.	Ichaapor	Ichaapor
14.	Bhesan Group Gram Panchayat	1. Bhesan, 2. Okha, 3. Vankala, 4. Vihel, 5. Chichi
15.	Malgama	Asarma
16.	Kathodara	Kathodara
17.	Valak	Valak
18.	Velanja	Velanja
19.	Abrama	Abrama
20.	Bhada	Bhada
21.	Kathor	Kathor
22.	Khadsad	Khadsad
23.	Laskana	Laskana
24.	Saniya-Hemad	Saniya-Hemad
25.	Pasodra	Pasodra
26.	Kumbhariya	Kumbhariya
27.	Saroli	Saroli

By order and in the name of the Governor of Gujarat,

(Anand Zinzala)
Joint Secretary to Government

To,

- The Secretary to Hon. Governor of Gujarat, Gandhinagar. (By letter).
- The Principal Secretary to Hon. Chief Minister, Swarnim Sankul-1, Sachivalaya, Gandhinagar.
- The PS to Hon. Deputy Chief Minister, Swarnim Sankul-1, Sachivalaya, Gandhinagar.
- The PS to all Hon. Ministers, Swarnim Sankul-1 & 2, Sachivalaya, Gandhinagar.
- The PS to all Hon. Minister of State, Swarnim Sankul-2, Sachivalaya, Gandhinagar.

- The Joint Secretary to Hon. Chief Secretary, Sachivalaya, Gandhinagar.
- The Secretary, Gujarat Legislative Assembly, Gandhinagar. (By letter)
- The Additional Chief Secretary, Revenue Department, Sachivalaya, Gandhinagar.
- The Additional Chief Secretary, Panchayat, Rural Housing and Rural Development Department, Sachivalaya, Gandhinagar.
- The Secretary, State Election Commission, Gujarat State, Gandhinagar.
- Joint Secretary(TP), Urban Development and Urban Housing Department, Sachivalaya, Gandhinagar.
- Deputy Secretary(NP), Urban Development and Urban Housing Department, Sachivalaya, Gandhinagar.
- OSD, Urban Development and Urban Housing Department, Sachivalaya, Gandhinagar.
- The Development Commissioner, Gandhinagar.
- The Commissioner of Municipality Administration, Gujarat State, Gandhinagar.
- The Municipal Commissioner, Surat Municipal Corporation, Surat.
- The Collector, Surat District, Surat.
- The District Development Officer, Surat.
- MD, Gujarat Urban Development Mission, Gandhinagar.
- CEO, Gujarat Municipal Finance Board, Gandhinagar.
- CEO, Surat Urban Development Authority, Surat.
- The Regional Municipal Commissioner, Surat.
- The Manager, Government Central Press, Gandhinagar... with a request to publish the aforesaid Notification in the Extraordinary Government *Gazettee*, Part-I, Central Section, **dated the 18th June, 2020** and request you to kindly send 100 copies thereof to this department.
- The Assistant Draftman, Legislative and Parliamentary Affairs Department, Sachivalaya, Gandhinagar... with a request to send Gujarati Version of the aforesaid Notification for publication and forward its 100 copies to this department.
- Deputy Director(IT), Urban Development and Urban Housing Department, Sachivalaya, Gandhinagar - with request to upload the same on the Website of UDD.
- Dy.S.O. Select File-2020/Branch Select File-2020

BEFORE THE CENTRAL POLLUTION CONTROL BOARD, NEW DELHI

IN FURTHERANCE OF THE ORDER DATED 21.01.2021

PASSED IN THE MATTER *LARSEN & TOUBRO VS SANGHI INDUSTRIES LTD & ORS. (APPEAL NO.36 OF 2020 – ERSTWHILE APPEAL NO.66 OF 2019)* BY THE HON'BLE NATIONAL GREEN TRIBUNAL (PRINCIPAL BENCH)

ADDITIONAL DOCUMENTS FILED BEFORE CPCB ON BEHALF OF LARSEN & TOUBRO

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3.	Annexure 21 – **Colour Map** - Distance & Area Dated - 17.12.2020	67 - 69
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5.	Annexure 23 - Wetlands (Conservation & Management) **Rules**, 2010	76 - 83
6.	Annexure 24 - **Judgment**: Hanuman Laxman Aroskar vs Union of India [(2019) 15 SCC 401] – • *Deliberately concealing material information for EC renders application liable for rejection;* • *Post – facto explanations are inadequate in dealing with due process failures in environmental regulation governance;* • *EAC must apply itself to every aspect and it is not bound by the EIA report in any manner.*	84 - 139
7.	Annexure 25 - **Judgment**: M. K. Balakrishnan & Ors. vs Union of India & Ors. [2018 (2) SCJ 207] - *Apprehension that with the passage of time there is a possibility that some of the wetlands might disappear was not unfounded.*	140 - 143

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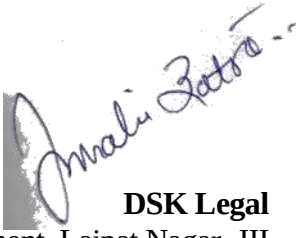
On behalf of Larsen &Toubro
Rimali Batra / Mahip Singh



DSK Legal
G- 29, Basement, Lajpat Nagar- III
Near Mool Chand Hospital,
New Delhi – 110024
E-mail: rimali.batra@dsklegal.com

Place: New Delhi
Date: 16.04.2021

ANNEXURE - 19

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,

PRINCIPAL BENCH, NEW DELHI

IA NO._____ OF 2020

IN

APPEAL NO. 36 OF 2020

IN THE MATTER OF:

Larsen & Toubro Limited ....Appellant

Versus

Sanghi Industries Limited & Ors. ....Respondents

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2.	**Annexure A** – RTI Application and the documents provided under the same	12-57

Through

Rimali Batra / Mahip Singh

Rimali Batra

DSK Legal

Counsel for the Appellant

G 29, Basement, Lajpat Nagar- III

Near Mool Chand Hospital,

New Delhi – 110024

E-mail: rimali batra@dsklegal.com

Place : New Delhi

Date : 05.01.2021

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH, NEW DELHI
IA NO._____ OF 2020
IN
APPEAL NO. 36 OF 2020

IN THE MATTER OF:

Larsen & Toubro Limited ....Appellant

Versus

Sanghi Industries Limited & Ors. ....Respondents

APPLICATION SEEKING LIBERTY TO PLACE ON RECORDS SUBSEQUENT DEVELOPMENTS IN RELATION TO I.A. NO.91/2020 AND TO PLACE ON RECORD THE DOCUMENTS FURNISHED UNDER RIGHT TO INFORMATION ACT FROM RESPONDENT NO.2, GPCB UNDER RULE 24 OF THE NGT ACT

1. That the present appeal has been filed by the Appellant challenging the Environment Clearance bearing no. SEIAA/GUJ/EC/3(b)/1155/2018 dated August 23rd, 2019 (Impugned EC) granted to the Respondent No.1 for its proposed project of 2.0 Million Metric Tonne Per Annum (TPA) Standalone Grinding Unit with bulk and bag packing plant at Hazira Industrial Zone, Survey No.125/1, 125/2, 126/1+2+3. Village Shivrampur, Tal Choryasi, District-Gujarat, Surat (Grinding Unit Project).

2. The Appellant believes that the complete records of the environmental proceedings of the cases filed against Respondent No.1 should be brought before this Hon'ble Tribunal in order to better appreciate the modus operandi of the Respondent No.1 cement plant and the probable

environmental concerns it poses. The show-cause notice3 2-
issued to the Respondent No.1 and any other proceedings initiated by the pollution control boards against the Respondent No.1 with respect to its cement manufacturing operations are crucial for proper and fair adjudication of the present appeal and the environmental concerns raised therein.

3. It is pertinent to note that in order to present the complete picture before the Hon'ble Tribunal, the Appellant on 14.09.2020 had filed an Application **(IA 91 of 2020)** seeking appropriate directions to the Respondent No.1 and 2 for producing before the Hon'ble Tribunal all such show-cause notices, inspection reports and other relevant information crucial to determine the environmental impact of the cement grinding plant. The Appellant made the following prayer in its application filed on 14.09.2020:

> *"Direct the Respondent No.1 and Respondent No.2 to file the copies of all show cause notices issued, inspection reports of the Respondent No.1's Kutch plant and other relevant records of environmental proceedings related to the Kutch cement plant;"*

4. However, neither of the Respondents provided any document sought nor even cared to even respond to the said application. The Respondents firstly failed to produce the relevant records and secondly even failed to acknowledge / respond/ oppose the said Application. Therefore, the Appellant / Applicant was convinced that not only the Respondents especially GPCB are

protecting the Respondent No.1 but also deliberately choosing to conceal all such information prejudicial to the interest of Respondent No.1.

5. It may be noted that one of the local villagers from the Suvali Village filed an RTI Application seeking details on show cause notices, inspection reports etc. from GPCB i.e. Respondent No.2 in the present Appeal. The Respondent No.2 refused to provide majority of the information sought, for no justifiable reason. However, the limited information provided by GPCB shows multiple violations on part of Respondent No.1 resulting in serious deterioration of the environment and adding on to the pollution in the area.

6. It is further pertinent to highlight that even in response to the RTI Application, the Respondent No.2 i.e. GPCB refused to provide copies of the complaints by residents of the nearby areas or associations or NGOS about air pollution caused by transportation of cement and raw material from and to the plant stating that representations regarding pollution received from complainants which comes under section 8(1) J of RTI act as the information of third party cannot be provided.

7. That the limited information provided by the GPCB establish that the activities of the Respondent No.1 are at the least questionable and detrimental to the surrounding environment. The transportation of cement and raw material is being done in blatant disregard to the precautionary principles and with absolute no adherence to the air pollution control measures.

The same is evident from the extracts of the notices and inspection reports received in response to RTI application. The said extracts are reproduced hereinunder for ready reference:

S. No.	Notice	Content
1.	**NOT-553468 on 03/02/2020**	**553914-IEV D1.08/01/2020** Unit is inspected with reference to complaint received from Mr. Karamshi Nanga Khatana regarding Sanghi industry is produced very high dust and chemical in air and our drinking water.
2.		**541837-SCN DT. 25/09/2019** Unit is inspected with reference to complaint received from Mr. Karamshi Nanga Khatana regarding "Heavy Dusting and chemical flue gases During inspection, Clinker plant just started one day before and under stabilization. It was not in operation since long due to heavy rain in this region. During inspection thick emission is observed from stack attached with raw mill kiln and heavy fugitive. emission from top of the pre-heater, one air sample collected from stack attached to raw mill kiln.
3.	**AMD-529348 on 09/12/2019**	**534699-APP DT.29/07/2019** Unit has applied for CCA renewal along with one year late fees.
4.	**SCN-519700 on 05/09/2019**	**534699-APP DT.29/07/2019** • Unit has provided Waste Heat recovery system (WHRS); during inspection WHRS is observed not in operation • Clinker plant was observed not in operation due to power failure; hence air sample was not collected and plant installation work of line-2 is going on. (682)-01/08/2019m RO Comments/Reply : 14 I recommend :May be GRANTED (After making necessary verification; I agree with inspecting officer, hence issuance / renewal of Authorization to the Industry is recommended as per the provisions of Rule 6(2) of the Hazardous and Other Wastes (Management & Handling & Transboundary Movement)
5.	**AMD-529353 on 09/12/2019**	**527709-APP DT.04/06/2019** There is a complaint received from "Mamadh Sumra Jat" regarding Akali Dust dumping and vehicle transporting material are not covered. During inspection it is observed that High chloride-containing dust from alkali bypass is disposed into haphazard manner and high wind velocity leads to deteriorate air quality. Unit is

		asked to come up with proper management plan for alkali dust. Few of Clinker transporting truck are found not covered, hence instructed to cover all truck used for transportation of material
6.	**NOT-478357 on 10/12/2018**	**500747- APP DT. 22/10/2018** • During inspection, Clinker plant is observed in operation & production of cement a clinker is going on. During inspection emission is observed from stack attached with ram mill kiln and fugitive emission is observed due to leakages in pre-heater section and raw material feeding section; photograph of the same is attached herewith as a pdf. • During inspection, two air emission samples are collected as mention in sample details section.
7.		**496336- COM. DT. 19/09/2018** Unit is inspected w.r.t Complaint received vide H.O let No:GPCB/CCA-Kutch-4546)/466502 dt:23/08/2018 & Hon'rable C.M Office Ref. No:Sankalan/Lok Fariyad/VASI/2225/08/2018/LF-7443 dt:13/08/2018. During inspection unit is observed not in operation due to maintenance in Main Kiln & Clinker Cooler since last 2 days. Detail Inspection report in prescribed formate uploaded as pdf. (633) 21/09/2018- RO Comments/Reply :Action on merit bases-22/09/2018 AMD-475456 489521-APP DT 25/07/2018 .
8.		**434496- COM. DT. 12/04/2017** This unit is inspected with reference to Complain. Unit is engaged in production of Cement Clinker = 292000 MT/Month & having valid CCA, which is valid up to 18/03/2018. During inspection, Clinker plant is not found in operation due to Jam in clinker cooler great plat since last night. During inspection; fugitive emission observed due to high wind velocity from raw materials stacking area.
9.	**SCN-414367 on 08/06/2017**	**426927- ROU DT. 14/02/2017** During inspection; fugitive emission observed due to spillage of raw materials from conveyor belt-1.
10	**SCN-374631 on 08/06/2017**	**412553- COM DT. 22/10/2016** This unit is inspected wr to Complaint made by Mr. Haresh Vyas, social worker, Bhuj, Kutch regarding 29/10/2016 not obey environmental laws and forwarded through shree shaktisinh Gohil MLA, (Complaint received at this office through HO mail dated 19/10/2016). Complaint made by Mr. Haresh Vyas, social worker; Bhuj, Kutch regarding Contempt of laws and a habituated offender forwarded by Ashok

		chauhan (UTO) Forest & Env. Dept, Gnagar :(Complaint received at this office through Ho mail dated 21/9/2016). Detail IR is uploaded as doc it may be referred please) |439|-26/10/2016- RO Comments/ Reply Unit was inspected w.r to complaint. 27/10/2016
1	**AMD-373927 on 25/10/2016**	**404755- APP DT. 30/08/2016** • During inspection, three air emission samples are collected. • Tarpaulin sheet/cover is not observed on loaded trucks to avoid dusting during inspection. During inspection one conveyer belt from their Jadava mine to cement plant, installation works in under progress. A detail of production is uploaded Jas PDF. Corrective measure notice given in Gujarati to the person contacted during the inspection
12	**NOT-355736 on 05/12/2016**	**375650- SCN DT. 17/02/2016** • Fugitive emission during lime stone stacking & due to vehicle movement is observed during inspection, Wind velocity is high at the time of inspection. • Tarpaulin sheet/cover is not observed on loaded trucks to avoid dusting during inspection.
13	**NOT-329582 on 09/10/2015**	**349579 DT. 31/07/2015** • Unit is inspected w r to Narayan sarovar Chinakar project & CCA-Amendment application for co 123/01/2016 processing of liquid &solid waste. During Inspection, unit is not found in operation as plant is under shut down for annual maintenance, so performance could not evaluate. • It is observed that unit have not Z installed online monitoring system since long as per CPCB directive order for which GPCB may be held responsible for non-implementation of Direction order passed by CPCB to GPCB. EC condition of MoEF. & Direction passed by GPCB during 03/2015 is found violated as per corrective measure notice given at st:No-3 in Gujarati &Unit will not take seriously without further action. Considering above non implementation, Presently we may reject CC&A for amendment of utilization of various HAZ.
14	**AMD-341440 on 13/01/2016**	**349579 DT. 31/07/2015** Unit is inspected w r to Narayan sarovar Chinakar project & CCA-Amendment application for co 123/01/2016 processing of liquid &solid waste. During Inspection, unit is not found in operation as plant is under shut down for annual maintenance, so performance could not evaluated.

15	**AMD-333948 on 07/12//2015**	**349579- APP DT. 31.07.2015** • Unit is inspected w r to Narayan sarovar Chinakar project & CCA-Amendment application for co 123/01/2016 processing of liquid &solid waste. During Inspection, unit is not found in operation as plant is under shut down for annual maintenance, so performance could not evaluate. • It is observed that unit have not Z installed online monitoring system since long as per CPCB directive order for which GPCB may be held responsible for non-implementation of Direction order passed by CPCB to GPCB. EC condition of MoEF. & Direction passed by GPCB during 03/2015 is found violated as per corrective measure notice given at st:No-3 in Gujarati &Unit will not take seriously without further action, Considering above non implementation, Presently we may reject CC&A for amendment of utilization of various HAZ.
16	**NOT-318711 on 29/06/2015**	**340360- COM DT. 13/05/2015** • Unit is visited on dated 13/05/2015 wr to hung-up CCA-Amendment application for co-processing of 29/06/2015 liquid & solid waste and also complaint made by Mr Haresh Vyas vide his letter dated 11-04-2015 & 04-05-2015 regarding Overruling environmental laws & Illegalities done by group of Sanghi Industries. • As informed by person contacted, plant is closed since 7th May, 2015 Due to raw mill breakdown.

8. That in view of the above, the Appellant/Applicant is hereby filing an Application for placing on record certain public documents and seeking necessary directions to the pollution control authorities in lieu of the same. It may be noted that the documents being placed on record have been procured through Right to Information Act and are relevant for fair adjudication of the present appeal and the issues involved herein.

The RTI Application along with the complete set of the documents received from GPCB pursuant to the RTI

Application are annexed as **Annexure A**, along with the translated copies of the letters in colloquial language. The same may kindly be taken on record.

9. It may noted that the GPCB is a party to the present appeal and has not only failed to place on record its Reply to the earlier application filed by the Appellant seeking directions for GPCB, but has also deliberately refused to provide the relevant information to the RTI Application, solely with the objective to conceal the true picture of environmental degradation done by the Respondent No.1 from this Hon'ble Tribunal.

10. It may be noted that being a statutory body responsible for pollution control, the Respondent No.2 should have provided all the relevant information of the harmful impact of cement manufacturing in the area before this Hon'ble Tribunal. The Respondent No.2 should have also placed on record the Inspection Reports of the cement manufacturing plants of Respondent No.1 in the State of Gujarat in order to inform the Hon'ble Tribunal of the prospective issues which arise in the cement plants of Respondent No.1.

11. That in light of the above, the Appellant is constrained to file the present application before the Hon'ble Tribunal to seek appropriate direction for the Respondent No.2 in order to direct it to produce the Inspection Reports and complaints received for the cements plants run by the Respondent No.1 in the state of Gujarat.

12. No prejudice will be caused to the Respondents if the present application of the applicant is allowed by the Hon'ble Tribunal.

13. The documents being sought to be placed on record by the applicant and the documents sought to be produced by the Respondent No.2 are relevant and material to the controversy in issue. The said document would enable in administration of justice and adjudication of issues raised in the present appeal.

PRAYER:

a) Allow the applicant to place on record the subsequent developments in relation to IA 91 of 2020;

b) Direct the Respondent No.2 to produce the documents sought by way of RTI Application annexed herewith;

c) Any other just and equitable order in the interest of the justice may kindly be passed;

Through

Rimali Batra / Mahip Singh
DSK Legal
Counsel for the Appellant
G- 29, Basement, Lajpat Nagar- III
Near Mool Chand Hospital,
New Delhi – 110024
E-mail: rimali.batra@dsklegal.com

Place : New Delhi
Date : 05.01.2021

BEFORE THE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

APPEAL NO. 36 OF 2020

IN THE MATTER:

Larsen and Toubro Limited ...Appellant

Versus

Sanghi Industries Limited and Ors ...Respondents

NOTARY HARISH K. CHAUHAN SURAT CITY (GUJ.) Reg. No. 723 EXPIRY DATE 11-02-2024 GOVT. OF GUJARAT (INDIA)

AFFIDAVIT

I, Hiren Shah, aged 43 years s/o Kiritbhai Shah address at Larsen & Toubro Limited, Hazira Manufacturing Complex, P.O.-Bhatha Dist-Surat 394510 authorized representative of the Appellant herein, do hereby solemnly affirm and declare as under:-

1. That I am the authorized representative of the Applicant herein and as such am duly competent to swear the present affidavit on behalf of the Applicant

2. That I have read the contents of the accompanying application and state that the facts contained therein are true and correct and based on the records of the case as available with the Applicant and that the legal submissions made therein are based on legal advice received by me and believed to be true and correct and that nothing material has been concealed therefrom.

3. That the contents of the present affidavit are true to my best knowledge and belief. No parts of the same are false and nothing material or relevant has been concealed therefrom.

HKShah

DEPONENT

11

VERIFICATION

Verified at SURAT on this 4th day of JANUARY 2021 that the contents of the present affidavit are true to the best of my knowledge and belief. No parts of the same are false and nothing material or relevant has been concealed therefrom.

DEPONENT

I Know the Signatory and identified by me

Advocate

P. H. Desai
B.A., LL.B.
Surat.

NOTARY
HARISH K. CHAUHAN
SURAT CITY (GUJ.)
Reg. No. 723
EXPIRY DATE
11-02-2024
GOVT. OF GUJARAT (INDIA)

Sr. No. 04/2021
Date 2 JAN 2021

Solemnly affirmed before me by Hiren Shah
who is identified by Shri P. H. Desai (Advocate)
whom I personally know.

BEFORE ME

02-01-2021
HARISH K. CHAUHAN
NOTARY
SURAT CITY (GUJ.)
GOVT. OF GUJARAT
Page No 1402

Harish K. Chauhan
M. Com., LL.B.
ADVOCATE & NOTARY
SURAT-5 GUJARAT

Hiren Kirtikumar Shah
DOB: 20/09/1976
MALE
Mobile No: 9879589900
8250 1938 5788

નમૂનો – ગ "ટ"

(જુઓ નિયમ – ૪ (૧)) R.P.A.D

અરજદારને માહિતી આપવા અને / અથવા તેનો અસ્વીકાર કરવા બાબત.

ન. જીપીસીબી/આરટીઆઇ/આઇડી-૧૮૩/૨૦૨૦-૨૧/ 5૫૩૩ ૫૫૮

21 NOV 2020

પ્રતિ,

આહિર અબ્દુલાઇ ગાંડાભાઇ

ગુ.બી.સુવાણી,તા.ઓખાસો

ડી-સુરત-૩૬૪૫૧૭

વિષયઃ RTI માહિતી આપવા બાબત.

સંદર્ભે ૧).આપની અરજીની તારીખ ૧૩/૧૦/૨૦૨૦.૨) અરજી અત્રે મળ્યા તારીખ-૧૪/૧૦/૨૦૨૦

૩). ચાર્જ મંગાવ્યા તારીખ ૧૧/૧૧/૨૦૨૦ ૪). ચાર્જ ભર્યા તારીખ ૧૮/૧૧/૨૦૨૦

શ્રીમાન,

૧.માહિતીના અધિકાર અધિનિયમ, ૨૦૦૫ હેઠળ માહિતી / દસ્તાવેજો આપવા માટેની વિનંતી કરતી સંદર્ભમાં દર્શાવેલ આપની અરજીના અનુસંધાનમાં;

૨. તમારી ઉપરની અરજીમાં તમે માંગેલ જરૂરી માહિતી/દસ્તાવેજો આ સાથે બીડેલ છે.

(૧) કુલ પાના - ૪૦

અત્ર ઉપરના નિર્ણયથી નારાજ થયેલ હોય તો, નિર્ણય મળ્યાની તારીખથી ત્રીસ દિવસની અંદર આપ એપેલેટ અધિકારીશ્રી,એન.એમ.તાબાડી, નાયબ મુખ્ય પર્યાવરણ ઈજનેર, ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડ, પર્યાવરણ ભવન, વડી કચેરી સેક્ટર-૧૦/એ, ગાંધીનગર-૩૮૨૦૧૦ ને અપીલ કરી શકશો.

ગુ.પ્ર.નિ.બોર્ડના નામે અને વતી,

(શ્રીમતી યુ.કે.ઉપ ધ્યાય)
પર્યાવરણ ઈજનેર &
જાહેર માહિતી અધિકારી
કાર્યક્ષેત્ર : વડી કચેરી.
પર્યાવરણ ભવન, સેક્ટર-૧૦એ,
ગાંધીનગર-૩૮૨૦૧૦

કચ્છ (પૂર્વ)
આઈ.ડી-૧૮૩

તા./૧૨/૨૦૨૦

પ્રતિ,
જાહેરમાહિતી અધિકારીશ્રી,
ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડ,
ગાંધીનગર

વિષય :- આઇ.ડી નંબર૧૮૩તારીખ૧૬/૧૮/૨૦૨૦.

સંદર્ભ :- આપની કચેરીનો પત્ર ક્રમાંક :જીપીસીબી /આર.ટી.આઇ/આઇ.ડી-૧૮૩/૨૦૨૦-૨૧/૫૩૦૧૬૪ તા. ૧૬/૧૦/૨૦૨૦ ની શ્રી બાબુભાઈ ગોડાભાઈ આહીર (સુરત) ની અરજી.

શ્રીમાન,

ઉપરોક્ત વિષય તથા સંદર્ભ પરત્વે જણાવવાનું કે, આઇ.ડી. નં.૧૮૩ અન્વયે માગવામા આવેલી મુદ્દાવાર માહિતીની વિગત નીચે મુજબ છે.

ક્રમ	મુદ્દા	માહિતી
૧.	કચ્છ વિસ્તારમાં ચાલે સાંધી ઇન્ડસ્ટ્રીઝના સિમેન્ટ પ્લાંટની આસપાસના વિસ્તારોમાં વાયુ પ્રદૂષણ અંગે આજુબાજુના વિસ્તારમા રહેતા રહેવાસીઓ, પંડળો(એસોસીએશન), તથા એન.જી.ઓ. દ્વારા કરવામાં આવેલી ફરિયાદોની નકલો આપવા વિનંતી.	પ્રદૂષણ બાબતેની મળેલ ફરિયાદોની બાબતે બાબતે જણાવવાનું કે RTI કાયદા કલમ -૮(૧)(j) હેઠળ જાહિત પ્રસારની માહિતી પાડવી શકાય તેમ નથી.
૨	છેલ્લા દસ વર્ષમાં સાંધીના કચ્છ પ્લાન્ટમાં કરવામાં આવેલ સ્થળ તપાસ/નિરીક્ષણ/મુલાકાતની વિગતો	બીડાણ -૧ મુજબ માહિતી આપેલ છે.
૩	સ્થળ તપાસ/નિરીક્ષણ/મુલાકાતનાં જમાં કરવામાં આવેલ બધા જ રીપોર્ટની નકલો આપવા વિનંતી. ભલે આ તપાસ/મુલાકાત/ નિરીક્ષણ વહીવટી રાહે અથવા તો પાણી/ વાયુ પ્રદૂષણ રોકવાની કાયદાની જોગવાઈ અનુસાર કરી હોય.	બીડાણ -૧ મુજબ માહિતી આપેલ છે.
૪	ઉપર મુજબની તપાસ/ નિરીક્ષણ/ મુલાકાત દરમ્યાન એકઠા કરવામા આવેલ કેમીકલ એનાલીસીસનાં રીપોર્ટની નકલો આપવી.	બીડાણ -૧ મુજબ માહિતી આપેલ છે.
૫	છેલ્લા દસ વર્ષમાં જીપીસીબી દ્વારા પ્રદૂષણ સહિત સાંધીને નોટીસો/પત્રો/ચેતવણી પત્રો ફટકારવામાં આવ્યા હોય તેની નકલો.	બીડાણ -૧ મુજબ માહિતી આપેલ છે.
૬	પ્રદૂષણનાં કારણે લાદવામાં આવેલ બુડાની અથવા દંડની વિગતો પ્રદૂષણનાં કારણે સાંધી સામે	માહિતી શૂન્ય જણાવી.

	દાખલ કરવામાં આવેલ કેસો અથવા કોર્ટમાં ચાલી રહેલ કેસની વિગતો આપવી.	
૭	સંચાલન કરવા માટે સંમતિ (Consent to Operate) ને ફરી તાજુ કરવાની મંજુરી આપતા પહેલા કરવામાં આવેલ સ્થળ તપાસ/નિરીક્ષણ નાં રીપોર્ટ (અહેવાલો)ની નકલ આપવી.	બીડાણ-૧ મુજબ માહિતી શામેલ છે.
૮	સંચાલન કરવા માટે સંમતિ (Consent to Operate) ને મંજુર/નામંજુર કરવામાં આવેલ પત્રો અથવા હુકમોની નકલો આપવી.	બીડાણ-૨ મુજબ માહિતી શામેલ છે.
૯	સાંધોનાં પ્લાન્ટમાંથી સિમેન્ટ અને કાચમાલનાં પરિવહનને કારણે થતાં પ્રદુષણ માટે નોંધાયેલી ફોજદારી ફરિયાદોની નકલ આપવી.	પ્રદુષણ બાબતેની મહેસુલ કચેરીઓમાં બાકવતે પાછળની રજુઆત જે RTI હેઠળ માંગવા કેસમાં ૮(૧)-જ હેઠળ જાહેર પરબારની માહિતી પાડવી શકાય તેમ નથી.

વિજિટ હેડ,૭૫૭ (પૂર્વ)
વડી કચેરી,ગાંધીનગર.

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Form-G-'C'
(See Rule- 4(1))

Matter of giving information to the applicant and /or denying it

No. GPCB/RTI/ID-183/2020-21/573544

To,
Abir Babubhai Gandabhai
PO-Suvali Taluka- Choryasi
Dist- Surat-394517
Sub: Matter of providing RTI information

Reference : 1) Your Application Dated 13/10/2020 2) Application received here Dated - 14/10/2020 3) Charges ordered dated 11/11/2020 4) Payment of charges Dated 18/11/2020

Shreeman (Mr.),

1. In context of your application of request for providing information / documents under Right of information Act, 2005.
2. The required information / document you have requested in your above application is attached herewith.
   (1) Total Pages -40

If you are dissatisfied with above decision, you can file appeal to Appellate Officer Mr.N .M Tabhani Deputy Chief Environment Engineer, Gujarat Pollution Control Board, Paryavaran Bhavan, Head Office, Sector- 10/A,Gandhinagar-382010 within thirty days from the date of receipt of decision.

For GPCB

Mrs. U K Upadyay
Environment Engineer
& Public Information Officer
Work area- Head Office
Paryavaran Bhavan,
Sector- 10/A,
Gandhinagar-382010

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Kutch (East)
ID-183

To,
Public Information Officer,
Gujarat Pollution Control Board,
Gandhinagar

Sub: ID Number 183 Dated -16/10/2020

Ref- Your Office Letter No.-GPCB/RTI/ID-183/202021/570194 Dated 16/10/2020 of Mr. Babubhai Gandabhai Ahir (Surat)Application

Shreeman (Mr.)

With reference to above subject and context, it is hereby informed that the details of information requested in accordance with ID-183 are as follows:

S N	Issues	Information
1	Copy of complaints by residents of the nearby areas or associations or NGOS about air pollution in the Kutch area and vicinity of the Sanghi Industries Limited (SIL) Plant;	The representations regarding pollution received from complainants which comes under section 8(1) J of RTI act as the information of third party cannot be provided
2	Details pertaining to number of times the SIL Kutch plant was inspected in the last 10 years;	Contains information as per Enclosure-1
3	Copy of all the reports submitted pursuant to such inspections irrespective whether the inspection was conducted administratively or under the statutory provisions of the Water/Air Prevention of Pollution Act.	Contains information as per Enclosure-1
4	Copy of the Chemical Analysis Report of the samples collected during such inspection;	Contains information as per Enclosure-1
5	Notices/Letters/Warning issued by GPCB relating to pollution to SIL for the last 10 years;	Contains information as per Enclosure-1
6	Details of any fine or penalty or damages pertaining to pollution imposed. Any case pending or initiated against Sanghi for pollution;	Information considered to be Zero
7	Copy of Reports of the inspection conducted prior to grant of Renewal of Consent to Operate;	Contains information as per Enclosure-1
8	Copy of Orders/Letters granting /refusing grant of	Contains information as per

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	consent to operate;	Enclosure-2
9	Any complaints filed for pollution caused by transportation of cement and raw material from and to the plant.	The representations regarding pollution received from complainants which comes under section 8(1) J of RTI act as the information of third party cannot be provided

Unit Head Kutch (East)
Head Office, Gandhinagar

Click On Green Cases	Case Details
	555431-HOR DT.25/01/2020 unit is inspected with reference to E-mail received from Hazardous Waste Cell dated 24/01/2020. Detail inspection report in prescribed format attached here with. [633]-26/01/2020- RO Comments/Reply :Action on merit basis-04/02/2020
NOT-553468 Dt 03/02/2020	**553914-IEV DT.08/01/2020** Unit is inspected with reference to complaint received from Mr. Karamshi Nanga Khetana regarding "Sanghi industry is produced very high dust and chemical in air and our drinking water." During inspection; Clinkerisation plant observed in operation. Unit has provided (1) Bag House with stack attached to raw mill kiln (2) ESP with stack attached to alkali by pass system (3) ESP with stack attached to cooler exit (4) Bag filter with both stack attached to coal mill and (5) Bag filter at various transfer point of material as an APCM. Unit has provided online monitoring system. Unit has provided Waste Heat recovery system (WHRS). Unit has provided silos for storage of clinker, cement & fly ash. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. Source of water is through mine's water. Liquid waste feeding facility of co-processing is under installation. During inspection, civil work of Line-2 cement plant is going on. Detailed complain investigation report is attached herewith as a pdf. Unit having CCA for production of Cement Clinker & WHRS, CCA (AWH-103662) is valid up to 18/09/2024. [682]-16/01/2020 - RO Query to Staff: pls update [682]-16/01/2020-RO Comments/Reply :Action on merit basis-16/01/2020
	541837-SCN DT.25/09/2019 Unit is inspected with reference to complaint received from Mr. Karamshi Nanga Khatana regarding "Heavy Dusting and chemical flue gases". During inspection, Clinker plant just started one day before and under stabilization. It was not in operation since long due to heavy rain in this region. During inspection thick emission is observed from stack attached with raw mill kiln and heavy fugitive emission from top of the pre-heater. one air sample collected from stack attached to raw mill kiln. Unit has provided (1) Bag House with stack attached to raw mill kiln (2) ESP with stack attached to alkali by pass system (3) ESP with stack attached to cooler exit (4) Bag filter with both stack attached to coal mill and (5) Bag filter at various transfer point of material as an APCM. Unit has provided online monitoring system & results showing of raw mill- PM = 26.27 mg/Nm3, So2= 65.20 mg/Nm3, Nox = 212 mg/Nm3; Coal mill-1- PM = 23.62 mg/Nm3; Cooler- PM 21.04 mg/Nm3; Alkali by pass- PM 21.76 mg/Nm3. Unit

	has provided Waste Heat recovery system (WHRS); during inspection WHRS is observed not in operation as plant yet not stabilized. . Unit has provided silos for storage of clinker, cement & fly ash. High chloride containing dust from alkali bypass is disposed into separate pit. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. Source of water is through desalination plant as mines water is dry. During inspection stock of used oil is 0.70 MT. During inspection; civil work of line-2 is going on. [633]-26/09/2019~ RO Comments/Reply :Action on merit basis-01/10/2019
GRT-529352 On 07/12/2019	534699-APP DT.29/07/2019 This unit is inspected with reference to CCA-renewal application. Unit has obtained CCA for production of Cement Clinker = 292000 MT/Month and Waste Heat recovery system (WHRS) 15MW. Unit has applied for CCA renewal along with one year late fees. Unit has provided (1) Bag House with stack attached to raw mill kiln (2) ESP with stack attached to alkali by pass system (3) ESP with stack attached to cooler exit (4) Bag filter with both stack attached to coal mill and (5) Bag filter at various transfer point of material. Unit has provided online monitoring system. Unit has provided Waste Heat recovery system (WHRS), during inspection WHRS is observed not in operation. Unit has provided silos for storage of clinker, cement & fly ash. Unit uses coal as fuel in kiln. Source of water is through desalination plant. Water is required for process cooling and other auxiliary for industrial purpose & domestic purpose. Unit has provided STP for domestic wastewater treatment. High chloride containing dust from alkali bypass is disposed into separate pit. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. During inspection stock of used oil is 0.20 MT. During inspection, Clinker plant was observed not in operation due to power failure; hence air sample was not collected and plant installation work of line-2 is going on. [682]-01/08/2019~ RO Comments/Reply / I recommend :May be GRANTED (After making necessary verification; I agree with inspecting officer. Hence issuance / renewal of Authorization to the Industry is recommended as per the provisions of Rule 6(2) of the Hazardous and Other Wastes (Management & Handling & Transboundary Movement) Rules 2016)-07/08/2019
AMD-529348 On 09/12/2019	534699-APP DT.29/07/2019 This unit is inspected with reference to CCA-renewal application. Unit has obtained CCA for production of Cement Clinker = 292000 MT/Month and Waste Heat recovery system (WHRS) 15MW. Unit has applied for CCA renewal along with one year late fees. Unit has provided (1) Bag House with stack attached to raw mill kiln (2) ESP with stack attached to alkali by pass system (3) ESP with stack

	attached to cooler exit (4) Bag filter with both stack attached to coal mill and (5) Bag filter at various transfer point of material. Unit has provided online monitoring system. Unit has provided Waste Heat recovery system (WHRS); during inspection WHRS is observed not in operation. Unit has provided silos for storage of clinker, cement & fly ash. Unit uses coal as fuel in kiln. Source of water is through desalination plant. Water is required for process cooling and other auxiliary for industrial purpose & domestic purpose. Unit has provided STP for domestic wastewater treatment. High chloride containing dust from alkali bypass is disposed into separate pit. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. During inspection stock of used oil is 0.20 MT. During inspection, Clinker plant was observed not in operation due to power failure; hence air sample was not collected and plant installation work of line-2 is going on. [682]-01/08/2019~ RO Comments/Reply : / I recommend :May be GRANTED (After making necessary verification; I agree with inspecting officer; hence issuance / renewal of Authorization to the Industry is recommended as per the provisions of Rule 6(2) of the Hazardous and Other Wastes (Management & Handling & Transboundary Movement) Rules 2016.]-01/08/2019
SCN-5 [9700 -Oe- 05/09/2019	**534699-APP DT.29/07/2019** This unit is inspected with reference to CCA renewal application. Unit has obtained CCA for production of Cement Clinker – 292000 MT/Month and Waste Heat recovery system (WHRS) 15MW. Unit has applied for CCA renewal along with one year late fees. Unit has provided (1) Bag House with stack attached to raw mill kiln (2) ESP with stack attached to alkali by pass system (3) ESP with stack attached to cooler exit (4) Bag filter with both stack attached to coal mill and (5) Bag filter at various transfer point of material. Unit has provided online monitoring system. Unit has provided Waste Heat recovery system (WHRS); during inspection WHRS is observed not in operation. Unit has provided silos for storage of clinker, cement & fly ash. Unit uses coal as fuel in kiln. Source of water is through desalination plant. Water is required for process cooling and other auxiliary for industrial purpose & domestic purpose. Unit has provided STP for domestic wastewater treatment. High chloride containing dust from alkali bypass is disposed into separate pit. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. During inspection stock of used oil is 0.20 MT. During inspection, Clinker plant was observed not in operation due to power failure; hence air sample was not collected and plant installation work of line-2 is going on. [682]-01/08/2019~ RO Comments/Reply : / I recommend :May be GRANTED (After making necessary verification; I agree with inspecting officer; hence issuance / renewal of Authorization to the Industry is recommended as per the provisions of

	Rule 6(2) of the Hazardous and Other Wastes (Management & Handling & Transboundary Movement) Rules 2016)-01/08/2019
AMD-529353 On 09/12/2019	**527709-APP DT.04/06/2019** This cement plant is inspected with reference to CCA-amendment application utilization of hazardous waste in kiln as an alternative fuel. Unit has applied for 17 types of hazardous waste & 8 types of non-Hazardous as an alternative fuel as quantity wise list uploaded. During inspection whole plant is not in operation due to breakdown maintainance in power plant. Unit has two types of fuel feeding system for utilization of hazardous waste (1) Solid fuel feeding system with hopper, shredder & conveyor belt; having capacity 10 TPH. During inspection sredder for solid waste, plastic waste was in maintanance. (2) For Liquid fuel feeding system with 20 KL storage tank & 5X2 intermediate tank with fluid pump; having capacity 2 KL/hr. but looking to the condition of 20 KL storage is not compatible with type of waste going to handle. Even electrical connection for pumping system was not flame proof. Earthing system for solvent tanker unloading was not provided. Separate storage facility for solvent not provided. Overall looking to the condition that unit is not ready with infrastructure point of view to handle waste comprising high calorific value. Unit is having CCA for production of Cement Clinker = 292000 MT/M. CCA is valid up to 31/01/2020. Unit has provided (1) Bag House with stack attached to raw mill kiln (2) ESP with stack attached to alkali by pass system (3) ESP with stack attached to cooler exit (4) Bag filter with both stack attached to coal mill and (5) Bag filter at various transfer point of material. Unit has provided online monitoring system. Unit has provided Waste Heat recovery system (WHRS). Unit has provided silos for storage of clinker, cement & fly ash. There is complained received from " Mamadh Sumra Jat" regarding Alkali Dust dumping and vehicle transporting material are not covered; which is linked with PCB ID 18029 (Lime stone mines). During inspection it is observed that High chloride containing dust from alkali bypass is disposed into haphazard manner and high wind velocity leads to deteriorate air quality. Unit is asked to come up with proper management plan for alkali dust. Few of Clinker transporting truck are found not covered, hence instructed to cover all truck used for transportation of material. [633]-05/06/2019- RO Comments/Reply :Action on merit basis / I recommend :May be REJECTED-10/06/2019
AMD-511759 On 29/06/2019	**515217-APP DT.21/02/2019** This cement plant is inspected with reference to CTE-amendment application utilization of hazardous waste in kiln as an alternative fuel. Unit has applied for 17 types of hazardous waste & 8 types of non-Hazardous as an alternative fuel as quantity wise list uploaded. Unit has two types of fuel feeding

	system for utilization of hazardous waste (1) Solid fuel feeding system with hopper, shredder & conveyor belt having capacity 10 TPH (2) Liquid fuel feeding system with 20 KL storage tank & 5X2 intermediate tank with fluid pump; having capacity 2 KL/hr. unit has provided separate hazardous waste storage area. Unit is having CCA for production of Cement Clinker = 292000 MT/M. CCA is valid up to 31/01/2020. During inspection, Clinker plant is observed in operation & production of cement clinker is going on. During inspection emission is observed from stack attached with raw mill kiln. Unit has provided (1) Bag House with stack attached to raw mill kiln (2) ESP with stack attached to alkali by pass system (3) ESP with stack attached to cooler exit (4) Bag filter with both stack attached to coal mill and (5) Bag filter at various transfer point of material. Unit has provided online monitoring system & results showing of raw mill- PM = 25.49 mg/Nm3, So2= 22.59 mg/Nm3, Nox = 101.14 mg/Nm3; Coal mill-1- PM = 21.52 mg/Nm3; Cooler- PM 27.68 mg/Nm3; Alkali by pass- PM 19.44 mg/Nm3. Unit has provided Waste Heat recovery system (WHRS); during inspection WHRS is observed in operation at load @ 6 MW power generation. Unit has provided silos for storage of clinker, cement & fly ash. High chloride containing dust from alkali bypass is disposed into separate pit. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. Source of water is through desalination plant as mines water is dry. During inspection stock of used oil is 0.70 MT. During inspection; civil work of line-2 is going on. [650]-22/02/2019~ RO Comments/Reply action on merit basis / I recommend :May be GRANTED-22/02/2019
NOT-478357 On 10/12/2018	**S00747-APP DT.22/10/2018** This cement plant is inspected with reference to CCA amendment application utilization of hazardous waste in kiln as an alternative fuel & HO letter no. PC/CCA/KUTCH-454(6)/GPCB ID-18026/471099 dated 04/10/2018. Unit has applied for 17 types of hazardous waste & 8 types of non-Hazardous as an alternative fuel as quantity wise list attached herewith as a pdf. Unit has two types of fuel feeding system for utilization of hazardous waste (1) Solid fuel feeding system; having capacity 10 TPH (2) Liquid fuel feeding system; having capacity 2 KL/hr. unit has provided separate hazardous waste storage area. Unit is having CCA for production of Cement Clinker – 292000 MT/M. CCA is valid up to 31/01/2020. During inspection, Clinker plant is observed in operation & production of cement clinker is going on. During inspection emission is observed from stack attached with ram mill kiln & fugitive emission is observed due to leakages in pre-heater section & raw material feeding section; photograph of the same is attached herewith as a pdf. Unit has provided (1) Bag House with stack attached to raw mill kiln (2) ESP with stack attached to alkali by pass system (3) ESP with stack attached to cooler exit

	(4) Bag filter with both stack attached to coal mill and (5) Bag filter at various transfer point of material. Unit has provided online monitoring system & results are attached herewith. During inspection, two air emission samples are collected as mention in sample details section. Unit has provided Waste Heat recovery system (WHRS); during inspection WHRS is observed in operation at load @ 11.38 MW power generation. Unit has provided silos for storage of clinker, cement & fly ash. High chloride containing dust from alkali bypass is disposed into separate pit. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. Source of water is through mines harvested water. During inspection stock of used oil is 0.52 MT. During inspection civil work of line-2 is going on. [650]-29/10/2018~ RO Comments/Reply :Action on merit basis / I recommend :May be GRANTED (After making necessary verification; I agree with inspecting officer; hence issuance / renewal of Authorization to the Industry is recommended as per the provisions of Rule 6(2) of the Hazardous and Other Wastes (Management & Handling & Transboundary Movement) Rules 2016.) -30/10/2018
	#00747-APP DT.22/10/2018 This cement plant is inspected with reference to CCA amendment application utilization of hazardous waste in kiln as an alternative fuel & HO letter no. PC/CCA/KUTCH-454(6)/GPCB ID-18026/471099 dated 04/10/2018. Unit has applied for 17 types of hazardous waste & 8 types of non-Hazardous as an alternative fuel as quantity wise list attached herewith as a pdf. Unit has two types of fuel feeding system for utilization of hazardous waste (1) Solid fuel feeding system; having capacity 10 TPH (2) Liquid fuel feeding system; having capacity 2 KL/hr. unit has provided separate hazardous waste storage area. Unit is having CCA for production of Cement Clinker = 292000 MT/M. CCA is valid up to 31/01/2020. During inspection, Clinker plant is observed in operation & production of cement clinker is going on. During inspection emission is observed from stack attached with ram mill, kiln & fugitive emission is observed due to leakages in pre-heater section & raw material feeding section. photograph of the same is attached herewith as a pdf. Unit has provided (1) Bag House with stack attached to raw mill/kiln (2) ESP with stack attached to alkali by pass system (3) ESP with stack attached to cooler exit (4) Bag filter with both stack attached to coal mill and (5) Bag filter at various transfer point of material. Unit has provided online monitoring system & results are attached herewith. During inspection, two air emission samples are collected as mention in sample details section. Unit has provided Waste Heat recovery system (WHRS); during inspection WHRS is observed in operation at load @ 11.38 MW power generation. Unit has provided silos for storage of clinker, cement & fly ash. High chloride containing dust from alkali bypass is disposed into separate pit. Generated hazardous waste i.e. used/spent oil is

	using into coating kiln as an alternative fuel. Source of water is through mines harvested water. During inspection stock of used oil is 0.52 MT. During inspection civil work of line-2 is going on. [650]-29/10/2018~ RO Comments/Reply :Action on merit basis / I recommend. May be GRANTED (After making necessary verification; I agree with inspecting officer; hence issuance / renewal of Authorization to the Industry is recommended as per the provisions of Rule 6(2) of the Hazardous and Other Wastes (Management, Handling & Transboundary Movement) Rules 2016.)-30/10/2018~ [illegible]
	496336-COM DT.19/09/2018 Unit is inspected w.r.t Complaint received vide H.O let No:GPCB/CCA-Kutch-454(6)/466502 dt:23/08/2018 & Hon'rable C.M Office Ref. No:Sankalan/Lok Fariyad/VASI/2225/08/2018/LF-7443 dt:13/08/2018.During inspection unit is observed not in operation due to maintenance in Main Kiln & Clinker Cooler since last 2 days. Detail Inspection report in prescribed formate uploaded as pdf. [633]-21/09/2018~ RO Comments/Reply :Action on merit bases-22/09/2018
AMD-475456 **O:** **14/11/2018**	**489521-APP DT.25/07/2018** This cement plant is inspected with reference to CTE-amendment application for expansion of plant capacity by installing 4 MTPA clinker plant & 2.6 MTPA cement mill with packing unit. Unit has proposed to increase production capacity from 3500000 MT/annum to total 7500000 MT/annum & proposed to limestone consumption increase from 4600000 MT/annum to total 1000000 MT/annum, laterite consumption increase from 280000 MT/annum to total 600000 MT/annum, clay consumption increase from 510000 MT/annum to total 1270000 MT/annum, silica sand consumption increase from 510000 MT/annum to total 1270000 MT/annum, gypsum requires 119000 MT/ annum, fly ash requires 510000 MT/ annum and slag 155000 MT/Month. Unit has existing coal consumption is 569400 MT/annum to and proposed to Lignite/Coal/Pet coke total consumption 1700000 MT/annum as a fuel. Unit has proposed increase total water consumption from 1807 KLD to total 3875 KLD. Required water demand proposed to meet through own desalination plant/ rain water harvested through mines. Unit has not proposed w/w generation from manufacturing process & unit has provided STP having root zone technology for colony & generated treated w/w is used for gardening purpose. Unit has proposed to increase alkali dust generation from 30000 MT/year to total 70000 MT/Year & alkali dust is proposed to dispose through recycle in cement plant, sent to other units & disposed in to pit. Unit has proposed to increase used oil generation from 131.4 KL/year to total 266.4 KL/Year & generated used oil is proposed to utilized in own kiln as an alternative fuel. Unit has proposed following plant machinery as: 1) Raw mill /kiln: proposed to provide pulse jet bag filter as an

	APCM with 100 meter stack height along with SMF 2) Coal mill; proposed to provide pulse jet bag filter as an APCM with 59 meter stack height along with SMF 3) Alkli by pass; proposed to provide pulse jet bag filter as an APCM with 75 meter stack height along with SMF 4) cooler; proposed to provide ESP as an APCM with 56 meter stack height along with SMF 5) Cement mill; proposed to provide pulse jet bag filter as an APCM with 55 meter stack height along with SMF. Unit has proposed bag filters at various transfer points. Unit has obtained EC for this proposed expansion with letter vide no. F.No.J-11011/387/2006-IA-II (I) dated 01/05/2018. During inspection site cleaning of proposed area is going on. Unit is having CCA for production of Cement Clinker = 292000 MT/M & CCA is valid up to 31/01/2020. During inspection, Clinker plant is found in operation & production of cement clinker is going on. Unit has provided online monitoring system & results are attached here with. During inspection, one air emission samples are collected as mention in sample details section. During inspection, trucks are observed covered with tarpaulin/green-net. Unit has provided silos for storage of clinker, cement & fly ash. High chloride containing dust from alkali bypass is disposed into separate pit and unit has provided bunds along alkli disposal pit; photograph attached. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. Source of water is through mines harvested water. [650]-30/07/2018- RO Comments/Reply :For further action pls / I recommend :May be GRANTED 31/07/2018
NOT-457616 Cs 08/06/2018	**460607-COM DT.15/05/2018** This unit is inspected with reference to complain. Detailed comptain investigation report in Gujarati along with photographs is attached in pdf. Unit is having CCA for production of Cement Clinker = 292000 MT/Month & CCA is valid up to 31/01/2020. During inspection, Clinker plant is found in operation & production of cement clinker is going on. Unit has provided on line monitoring system for PM. During inspection, total two air emission samples are collected as mention in sample details section. Unit has provided silos for storage of clinker, cement & fly ash. High chloride containing dust from alkali bypass is disposed into separate pit. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. Source of water is from mines dam. [650]-21/05/2018 - RO Query to Staff: pls update [682]-21/05/2018-Details updated [682]-21/05/2018
AMD-48320 Cs 22/05/2018	**469175-APP DT.15/02/2018** This unit is inspected with respect to CCA-Amendment application for waste heat recovery with three boilers 1) AQC Boiler capacity 47.4 TPH 2) Alkali By-pass Boiler capacity 16.4 TPH 3) Pre heater boiler capacity 99.1 TPH. Total steam generated from all three waste heat recovery boilers utilize for power

	generation with the 15 MW turbines. Unit has CTE for waste heat recovery boilers (1) AQC Boiler capacity 47.4 TPH 2) Alkali By-pass Boiler capacity 16.4 TPH 3) Pre heater boiler capacity 19.1 TPH) and power generation – 15 MW vide CTE no 81985 which is valid up to 11/06/2019. Unit has obtained CCA for Cement Clinker – 2, 92,000 MT/Month, Which is valid up to 12/10/2021. Unit has installed three types of waste heat recovery boilers; (1) Air Quenching Cooler boiler (cap. 47.6 TPH) which recover heat from flue gas coming from clinker air quenching Cooler and outlet of boiler given to existing APCM (Bag filter). Inlet temperature of flue gas enter into boiler is 389 0C and outlet temperature of flue gas is 95 0C (2) Alkali Bypass boiler (cap. 16.4 TPH) recover heat from flue gas coming from Alkali bypass duct and outlet of boiler flue gas is given to existing APCM (ESP). Inlet temperature of flue gas enter into boiler is 465 0C and outlet temperature of flue gas is 203 0C (3) Pre Heater boiler (cap. 19.1 TPH) recover heat from flue gas coming from ILC fan riser line and outlet of boiler flue gas is given to existing APCM (Common Bag house connected with rotary kiln and raw mill). Inlet temperature of flue gas enter into boiler is 380 0C and outlet temperature of flue gas is 260 0C. Unit has recovered waste heat hence there is no change in existing fuel consumption. Water consumption is increased from 1605 KLD to 1870 KLD. Water requirement is full fil. by existing mines dam. Wastewater generated 118 KLD from cooling tower blow down; DM plant regeneration; RO Reject will be collected in neutralizing pit and after pH correction it will be utilized in gardening purpose. During inspection, refractory dry out was going on, and as informed by contacted person they have taken a trial run of turbine @ 4.5 MW. During inspection, Production plant is found in operation @ 8500 MTD capacity & production of cement clinker is going on. Unit has provided on line monitoring system for PM,Sox Nox, at stack attached to rotary kiln and raw mill shows result 23.6 mg/Nm3, 31.7 ppm, 31.7 ppm respectively. Unit has provided silos for storage of clinker, cement & fly ash. No industrial w/w generation/discharge observed at the time of inspection. High chloride containing dust from alkali bypass is disposed into separate pit. During inspection, one air emission sample is collected from the stack attached to Raw Mill and rotary Kiln. There is no change in hazardous waste generation and mode of disposal category (5.1 Used oil) total quantity is 1.5 +MT per year will remain same as informed by contacted person. Unit has facility for waste co-processing (Liquid +Solid), during inspection stock of waste plastic waste 20 MT & Used oil 11000 Ltrs observed. [683]-16/02/2018~ RO Comments/Reply : / I recommend :May be GRANTED-
	450833-HOR DT.07/09/2017 This cement plant is inspected with reference to HO reference letter no. GPCB/KUTCH-C-

	179/2017/419101 dated 01/08/2017. Unit is having CCA for production of Cement Clinker = 292000 MT/Month & CCA is valid up to 18/03/2018. During inspection, Clinker plant is found in operation & production of cement clinker is going on. Unit has provided on line monitoring system for PM & results are noted as follow: 36 mg/Nm3 of raw mill, 26 mg/Nm3 of Coal mill-1, 40 mg/Nm3 of coal mill-2, 30 mg/Nm3 of alkali by pass and 36 mg/Nm3 of Cooler stack. During inspection, total two air emission samples are collected as mention in sample details section. Unit has provided silos for storage of clinker, cement & fly ash. High chloride containing dust from alkali bypass is disposed into separate pit. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. During inspection; fugitive emission observed due to leakages in clinker silo pile. During inspection, trial run of conveyer belt from their Jadawa mine to cement plant, installation works is going on. Erection work of waste heat recovery plant is going on during inspection. Source of water is from mines dam. [650]-15/09/2017
	442845-COM DT.20/06/2017 This unit is inspected with reference to Supreme Court order & detailed inspection report is attached herewith in prescribed formatas a pdf. [633]-27/06/2017 - RO Query to Staff. -- [498]-28/06/2017
	434496-COM DT.12/04/2017 This unit is inspected with reference to Complain. Unit is engaged in production of Cement Clinker = 292000 MT/Month & having valid CCA, which is valid up to 18/03/2018. During inspection, Clinker plant is not found in operation due to Jam in clinker cooler great plat since last night. During inspection; fugitive emission observed due to high wind velocity from raw materials stacking area. Unit has provided (1) Bag House with raw mill kiln (2) ESP with alkali by pass system (3) ESP with cooler exit (4) Bag filter with both coal mill and at various transfer point of material. Civil work of waste heat recovery plant is going on during inspection. Source of water is from mines dam. [650]-29/04/2017
SCN-4 [4367] 2 08/0 /2017	**426927-ROU DT.14/02/2017** This unit is inspected with reference to routine monitoring program. Unit is engaged in production of Cement Clinker = 292000 MT/Month & having valid CCA, which is valid up to 18/03/2018. During inspection, Clinker plant is found in operation & production of cement clinker is going on. Unit has provided on line monitoring system for PM & results are noted as follow: 31 mg/Nm3 of raw mill, 18.1 mg/Nm3 of Coal mill-1, 10.3 mg/Nm3 of coal mill-2, 29.7 mg/Nm3 of alkali by pass and 26.9 mg/Nm3 of Cooler stack. During inspection, one air emission samples is collected from the stack attached to raw mill through APCM. Unit has provided silos for storage of clinker, cement & fly ash. High chloride

	containing dust from alkali bypass is disposed into separate pit. Co-processing of Coal-Tar waste in the cement plant is observed during inspection. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. During inspection, fugitive emission observed due to spillage of raw materials from conveyor belt -1. During inspection, erection work of conveyer belt from their Jadava mine to cement plant, installation works is completed. Construction of auto feeding of AFR is going on. Civil work of waste heat recovery plant is going on during inspection. Source of water is from mines dam. Detail of production & water consumption data is uploaded as PDF. [650]-21/02/2017
NOT-404491 On 20/02/2017	**415537-SCN DT.20/11/2016** This cement plant inspected with reference to SCN-374631, Dated 29/10/2016. Unit is engaged in Cement Clinker from the lime stone & having valid, CCA, which is valid up to 18/03/2018. During inspection, Clinker plant is found in operation & production of cement clinker is going on. Unit has provided on line monitoring system for PM which is observed working. Unit has provided silos for storage of clinker, cement & fly ash. No industrial w/w generation/discharge observed at the time of inspection. High chloride containing dust from alkali bypass is disposed into separate pit. During inspection, two air emission samples are collected. One from the stack attached to alkali bypass and one from coal mill 02 through APCM. Co-processing of Coal-Tar waste in to cement kiln is observed during inspection. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. During inspection, Loaded trucks are found covered with tarpaulin sheet. During inspection, work of conveyer belt from their Jadava mine to cement plant, installation works in under progress & civil work is going on for waste heat recovery plant. Source of water is from mines dam/MED plant. Corrective measure notice given in Gujarati to the person contacted during the inspection. [650]-28/11/2016
SCN-374631 On 29/10/2016	**412553-COM DT.22/10/2016** This unit is inspected w r to Complaint made by Mr. Haresh Vyas, social worker, Bhuj, Kutch regarding not obey environmental laws and forwarded through shree shaktisinh Gohil ,MLA,(Complaint received at this office through HO mail dated 19/10/2016).Complaint made by Mr. Haresh Vyas, social worker, Bhuj, Kutch regarding Contempt of laws and a habituated offender forwarded by Ashok chaunan (IFS) Forest & Env. Dept Gnagar ,(Complaint received at this office through HO mail dated 21/9/2016). Detail IR is uploaded as .doc it may be referred please. [439]-26/10/2016~ RO Comments/Reply (Unit has submitted a written complaint -27/10/2016
AMD-373927	**404755-APP DT.30/08/2016**

On 25/10/2016	This unit is inspected with respect to CTE-Amendment application for expansion of waste heat recovery capacity from 11.5MW to 15 MW, there will be no any change in production capacity. Unit has CTE for waste heat recovery boiler = 11.5 MW CTE vide no 52803 which is valid up to 11/06/2019. Unit has obtained CCA for Cement Clinker - 2, 92,000 MT/Month, Which is valid up to 18/03/2018. Unit has proposed three types of waste heat recovery boilers; (1) AQC boiler (cap. 39.6 TPH) attached to clinker Cooler with Dust collector Cyclone (2) AB boiler (cap. 13.8 TPH) attached to Alkali bypass with Dust collector Cyclone (3) PH boiler (cap. 19.1 TPH) attached to ILC riser line with Dust collector Cyclone. Unit has recovered waste heat hence there will be no change in existing fuel consumption. Unit has proposed, in existing plant water consumption is 1605 m3/day and after explanation @ 265 m3/day will be added so total is @ 1870 m3/day. Source of water is from mines dam/MED plant. For the generated waste water from boiler and cooling tower blow down they will be provide a neutralization pit with chemical dosing system. Treated w/w will be used for plantation and gardening within premises. The hazardous waste category (5.1 used oil) increasing 10 KL per year due to proposed expansion having total Quantity is 141.4 KL per year. During inspection at site excavation activity is going on for the proposed expansion. During inspection, Production plant is found in operation & production of cement clinker is going on. Unit has provided on line monitoring system for PM which is observed working. Unit has provided silos for storage of clinker, cement & fly ash. No industrial w/w generation/discharge observed at the time of inspection. High chloride containing dust from alkali bypass is disposed into separate pit. Gas analyzer for online monitoring for Sox & NOx is yet not installed. During inspection, three air emission samples are collected. One from the stack attached to Raw Mill Kiln 01, one from alkali bypass and one from coal mill 01 through APCM. Co-processing of Coal-Tar waste in to cement kiln is observed during inspection. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. Tarpaulin sheet/cover is not observed on loaded trucks to avoid dusting during inspection. During inspection one conveyer belt from their Jadava mine to cement plant, installation works in under progress. A detail of production is uploaded as PDF. Corrective measure notice given in Gujarati to the person contacted during the inspection. [650]-20/09/2015~ RO Comments/Reply :Recommended for May be Granted on Merit Basis. / I recommend :May be GRANTED-22/09/2016
AMD-413818 On 01/06/2017	404755-APP DT.30/08/2016 This unit is inspected with respect to CTE-Amendment application for expansion of waste heat recovery capacity from 11.5MW to 15 MW, there will be no any change in production capacity. Unit has CTE for

	waste heat recovery boiler – 11.5 MW CTE vide no 62803 which is valid up to 11/06/2019. Unit has obtained CCA for Cement Clinker – 2, 92,000 MT/Month, Which is valid up to 13/03/2018. Unit has proposed three types of waste heat recovery boilers, (1) AQC boiler (cap. 39.6 TPH) attached to clinker Cooler with Dust collector Cyclone (2) AB boiler (cap. 13.8 TPH) attached to Alkali bypass with Dust collector Cyclone (3) PH boiler (cap. 19.1 TPH) attached to ILC riser line with Dust collector Cyclone. Unit has recovered waste heat hence there will be no change in existing fuel consumption. Unit has proposed, in existing plant water consumption is 1605 m3/day and after explanation @ 265 m3/day will be added so total is @ 1870 m3/day. Source of water is from mines dam/MED plant. For the generated waste water from boiler and cooling tower blow down they will be provide a neutralization pit with chemical dosing system. Treated w/w will be used for plantation and gardening within premises. The hazardous waste category (5.1 used oil) increasing 10 KL per year due to proposed expansion having total Quantity is 141.4 KL per year. During inspection at site excavation activity is going on for the proposed expansion. During inspection, Production plant is found in operation & production of cement clinker is going on. Unit has provided on line monitoring system for PM which is observed working. Unit has provided silos for storage of clinker, cement & fly ash. No industrial w/w generation/discharge observed at the time of inspection.. High chloride containing dust from alkali bypass is disposed into separate pit. Gas analyzer for online monitoring for Sox & NOx is yet not installed. During inspection, three air emission samples are collected..One from the stack attached to Raw Mill Kiln 01, one from alkali bypass and one from coal mill 01 through APCM. Co-processing of Coal-Tar waste in to cement kiln is observed during inspection. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. Tarpaulin sheet/cover is not observed on loaded trucks to avoid dusting during inspection. During inspection one conveyer belt from their Jadava mine to cement plant, installation works in under progress. A detail of production is uploaded as PDF. Corrective measure notice given in Gujarati to the person contacted during the inspection. (650)-20/09/2016- RO Comments/Reply Recommended for May be Granted on Merit Basis. / 1 Recommend May be GRANTED-22/09/2016
	402088-VIG DT.08/08/2016 This unit is visited w r t routine monitoring. Unit is engaged in manufacturing clinker from the lime stone. Unit has installed one rotary kiln having 10000 MMTA capacities. During visit unit observed not in operation and annually maintenance work is going on observed. Person contacted informed that unit is shutdown since 17 July and will be restart on 17 August. During visit modification of the bag house

	of the raw mill & kiln going on. Unit has installed one coal tar storage tank 20 KL capacity having heating system and this coal tar used as fuel in primary ignition and secondary ignition kiln. However the booking quantity is @ 150KL day but daily 20 KL coal tar received as informed by person contacted. About 3 to 4 hours time is required for the consumption of 20 KL coal tar. Unit is going to install 15 MW waste heat recovery power plant from hot gas of rotary kiln as informed by person contacted. Necessary written instruction is given. Unit has valid CCA. [372]-10/08/2016
NOT-355736 On 12/05/2016	**375650-SCN DT.17/02/2016** This clinkerisation Plant is inspected with reference to notice issued u/s 31(A) of the Air Act, 1981 dated 09/10/2015 & SCN dated 19/01/2016. During inspection, plant is observed in operation with respective APCM. Unit has provided on line monitoring system for PM which is observed working and data is uploaded with this I/R as doc. Gas analyzer for online monitoring for Sox & NOx is yet not installed. Unit has provided silos for storage of clinker, cement & fly ash. No ind w/w generation/discharge observed at the time of inspection. High chloride containing dust from alkali bypass is disposed into separate pit. Fugitive emission during lime stone stacking & due to vehicle movement is observed during inspection. Wind velocity is high at the time of inspection. During inspection, Air emission sample is collected from the stack attached to Raw Mill Kiln through APCM. Co-processing of Coal-Tar waste in to cement kiln is observed during inspection. Source of water is from desalination plant. Generated domestic effluent is being treated in provided STP and treated w/w is being discharged on land for plantation/gardening within premises. During inspection provided STP is observed in operation. One treated sewage w/w sample is collected from final outlet of STP. Generated hazardous waste i.e. used/spent oil is using into existing kiln as an alternative fuel. Tarpaulin sheet/cover is not observed on loaded trucks to avoid dusting during inspection. Last three months data regarding Coal consumption, Water consumption, Plastic waste consumption, Tar-Waste, Oily Rags/Cotton waste is uploaded with this I/R as doc. Corrective measure notice given in Gujarati to the person contacted during the inspection. [471]-29/02/2016
SCN-342179 On 20/01/2016	**361852-NOT DT.21/11/2015** Unit is inspected w r to NOT issued U/s 31A vide let. No:329582 dt:09/10/2015& Sankalan que Of Ho'nable MP Shri Vinodbhai Chavda. During inspection clinkerisation plant is found in operation, unit has provided (1) Bag House with raw mill kiln (2) ESP with alkaliby pass system (3) ESP with cooler exit (4) provided Bag filter with both coal mill and at various transfer point of material. Unit has provided silos for storage of clinker, cement & fly ash. Till date no any activity yet started for WHRB 11.5 MW

	power plant. No ind w/w generation/ discharge. High chloride containing dust from alkali bypass is disposed into separate pit of Size @186x150x10 meter Silica sand mines area. During inspection Air emission sample is collected from the stack attached to Raw Mill Kiln through APCM & AAQM sample carried out at Main Gate of Sanghipuram(Motiber Road). Installation work of online monitoring system is under progress.Copy of reply of sanklan is uploaded as .doc. [521]-07/12/2015
NOT-329582 On 09/10/2015	349579-APP DT.31/07/2015 Unit is inspected w r to Narayan sarovar Chinakar project & CCA-Amendment application for co-processing of liquid &solid waste. During Inspection, unit is not found in operation as plant is under shut down for annual maintenancey so performance could not evaluated. At the time of inspection , cleaning/ changing of bag filter in bag house is going on. As informed by person contacted informed that plant will be restart on 20-08-2015.Unit has going to utilize the available Hazardous / Non Hazardous Wastes for co-processing, such as: i) Coal tar from nearby Generators (Industries) located in Bhuj, Morbi, Gandhidham etc. (ii) Plastic Waste generated from the Paper Manufacturing Industries located at Morbi, Vapi as well as in other area of Gujarat. (iii) Oily Rags / Cotton Wastes from Adani Port & Special Economic Zone Limited, Mundra, Kutch (Gujarat). It is observed that unit have not installed online monitoring system since long as per CPCB directive order for which GPCB may be held responsible for non implementation of Direction order passed by CPCB to GPCB. EC condition of MoEF & Direction passed by GPCB during 03/2015 is found violated as per corrective measure notice given at Sr.No-3 in Gujarati &Unit will not take seriously without further action. Considering above non implementation; Presently we may reject CC&A for amendment of utilization of various HAZ Waste in Co-processing &reco.to pass further necessary Directions.Following corrective measures in Gujarati are given to the industry for implementation and improvements. [439]-06/08/2015- RO Comments/Reply :Recommend :May be REJECTED-06/08/2015
AMD-329566 On 09/10/2015	349579-APP DT.31/07/2015 Unit is inspected w r to Narayan sarovar Chinakar project & CCA-Amendment application for co-processing of liquid &solid waste. During Inspection, unit is not found in operation as plant is under shut down for annual maintenance, so performance could not evaluated. At the time of inspection , cleaning/ changing of bag filter in bag house is going on. As informed by person contacted informed that plant will be restart on 20-08-2015.Unit has going to utilize the available Hazardous / Non Hazardous Wastes for co-processing, such as: i) Coal tar from nearby Generators (Industries) located in Bhuj, Morbi, Gandhidham etc. (ii) Plastic Waste generated from the Paper Manufacturing Industries

	located at Morbi, Vapi as well as in other area of Gujarat. (iii) Oily Rags / Cotton Wastes from Adani Port & Special Economic Zone Limited, Mundra, Kutch (Gujarat). It is observed that unit have not installed online monitoring system since long as per CPCB directive order for which GPCB may be held responsible for non implementation of Direction order passed by CPCB to GPCB. EC condition of MoEF & Direction passed by GPCB during 03/2015 is found violated as per corrective measure notice given at sr.No-3 in Gujarati &Unit will not take seriously without further action. Considering above non implementation; Presently we may reject CC&A for amendment of utilization of various HAz.Waste in Co-processing &reco.to pass further necessary Directions.Following corrective measures in Gujarati are given to the industry for implementation and improvements. [439]-06/08/2015- RO Comments/Reply : I recommend :May be REJECTED-06/08/2015
AMD-341440 On 13/01/2016	349579-APP DT.31/07/2015 Unit is inspected w r to Narayan sarovar Chinakar project & CCA-Amendment application for co-processing of liquid &solid waste. During Inspection, unit is not found in operation as plant is under shut down for annual maintenance, so performance could not evaluated. At the time of inspection cleaning/ changing of bag filter in bag house is going on. As informed by person contacted informed that plant will be restart on 20-08-2015.Unit has going to utilize the available Hazardous / Non Hazardous Wastes for co-processing, such as: i) Coal tar from nearby Generators (Industries) located in Bhuj, Morbi, Gandhidham etc. (ii) Plastic Waste generated from the Paper Manufacturing Industries located at Morbi, Vapi as well as in other area of Gujarat. (iii) Oily Rags / Cotton Wastes from Adani Port & Special Economic Zone Limited, Mundra, Kutch (Gujarat). It is observed that unit have not installed online monitoring system since long as per CPCB directive order for which GPCB may be held responsible for non implementation of Direction order passed by CPCB to GPCB. EC condition of MoEF & Direction passed by GPCB during 03/2015 is found violated as per corrective measure notice given at sr.No-3 in Gujarati &Unit will not take seriously without further action. Considering above non implementation; Presently we may reject CC&A for amendment of utilization of various HAz.Waste in Co-processing &reco.to pass further necessary Directions.Following corrective measures in Gujarati are given to the industry for implementation and improvements. [439]-06/08/2015- RO Comments/Reply : I recommend :May be REJECTED-06/08/2015
AMD-333948 On 07/12/2015	349579-APP DT.31/07/2015 Unit is inspected w r to Narayan sarovar Chinakar project & CCA-Amendment application for co-processing of liquid &solid waste. During Inspection, unit is not found in operation as plant is under

	shut down for annual maintenance, so performance could not evaluated. At the time of inspection , cleaning/ changing of bag filter in bag house is going on. As informed by person contacted informed that plant will be restart on 20-08-2015.Unit has going to utilize the available Hazardous / Non Hazardous Wastes for co-processing, such as: i) Coal tar from nearby Generators (Industries) located in Bhuj, Morbi, Gandhidham etc. (ii) Plastic Waste generated from the Paper Manufacturing Industries located at Morbi, Vapi as well as in other area of Gujarat. (iii) Oily Rags / Cotton Wastes from Adani Port & Special Economic Zone Limited, Mundra, Kutch (Gujarat). It is observed that unit have not installed onlnne monitoring system since long as per CPCB directive order for which GPCB may be held responsible for non implementation of Direction order passed by CPCB to GPCB. EC condition of MoEF & Direction passed by GPCB during 03/2015 is found violated as per corrective measure notice given at sr.No-3 in Gujarati &Unit will not take seriously without further action. Considering above non implementation; Presently we may reject CC&A for amendment of utilization of various HAz.Waste in Co-processing &reco.to pass further necessary Directions.Following corrective measures in Gujarati are given to the industry for implementation and improvements. [439]-06/08/2015~ RO Comments/Reply :I recommend :May be REJECTED-06/08/2015
NOT-318711 On 29/06/2015	340360-COM DT.13/05/2015 Unit is visited on dated 13/05/2015 wr to hung-up CCA-Amendment application for co-processing of liquid & solid waste and also complaint made by Mr Haresh Vyas vide his letter dated 11-04-2015 & 04-05-2015 regarding Overruling environmental laws & illegalities done by group of Sanghi Industries. Unit has informed that they will utilize the available Hazardous / Non Hazardous Wastes for co-processing such as: i) Coal tar from nearby Generators located in Bhuj, Morbi, Gandhidham etc. (ii) Plastic Waste generated from the Paper Manufacturing Industries located at Morbi, Vapi as well as in other area of Gujarat. (iii) Oily Rags / Cotton Wastes from Adani Port & Special Economic Zone Limited, Mundra, Kutch (Gujarat). During the visit it is observed that industrial plant is light up & only heating process is going on. As informed by person contacted, plant is closed since 7th May, 2015 due to raw mill breakdown. Unit is asked to submit the said CCA-Amendment application with all required details. The detailed repor wr to above said complaints is uploaded with this I/R. [471]-03/06/2015 [471]-03/06/2015 [408]-04/06/2015 ~ RO Query to Staff: pl. check as detailed report is not uploaded [283]-05/06/2015~ RO Comments/Reply :Visited w.r to complaint & hung up CCA Amn application. - 10/06/2015
AMD-323193	339198-APP DT.07/05/2015

On 04/08/2015	This is a duplicate Inspection ID generated to send the cca-amendment application for extension of validity for one year more to CC&A being a --ISO: 14001-- Certificate. Unit was already visited on dated 07/04/2015 & I/R of which already sent vide Outward No: 14745-23/04/2015. Crux of said visit report is as follow. (This clinkerisation Plant is visited with reference to Narayan Sarovar Chinkara Century Abhyaran Project. During visit clinkerisation plant is found in operation, unit has provided (1) Bag House with raw mill kiln (2) ESP with alkali by pass system (3) ESP with cooler exit (4) provided Bag filter with both coal mill and at various transfer point of material. Unit has provided silos for storage of clinker, cement & fly ash. Till date no any activity yet started for WHRB 11.5 MW power plant. No ind w/w generation/discharge. High chloride containing dust from alkali bypass is disposed into separate pit. Provide pucca road, plantation and mechanical sweeper machine. During visit Air emission sample is collected from the stack attached to Raw Mill Kiln through APCM. Coprocessing of Plastic waste in to cement kiln is observed during visit.Written instructions are given for improvement during visit. [129]-21/04/2015 - RO Query to Staff: 1 year extn. appln. recd. as ISO14001 unit ,Kindly include water & Haz part in crux [283]-22/04/2015~Source of water is from desalination plant. There is no generation of industrial w/w from manufacturing process. Generated domestic effluent is being treated in provided STP and then treated w/w is being discharged on land for plantation/gardening within premises. During visit provided STP is found in operation. Generated hazardous waste (used spent oil-131.4MT/Yr) is using into existing kiln as an alternative fuel. During visit spent oil @0.5kl is observed at spent oil collection MS tank at hazardous waste storage area .[129]-23/04/2015) [471]-07/05/2015~ RO Comments/Reply :CCA for one year extention based on ISO-14001 may be process on merits.Comp. option selected / I recommend :May be GRANTED (After making necessary verification; I agree with inspecting officer; hence issuance / renewal of Authorization to the Industry is recommended as per the provisions of Rule 5(4) of the Hazardous Wastes (Management & Handling & Transboundary Movement) Rules 2008.)-08/05/2015
AMD-323192 On 04/08/2015	339193 APP DT.07/05/2015 This is a duplicate Inspection ID generated to send the cca-amendment application for extension of validity for one year more to CC&A being a --ISO: 14001-- Certificate. Unit was already visited on dated 07/04/2015 & I/R of which already sent vide Outward No: 14745-23/04/2015. Crux of said visit report is as follow. (This clinkerisation Plant is visited with reference to Narayan Sarovar Chinkara Century Abhyaran Project. During visit clinkerisation plant is found in operation, unit has provided (1) Bag House with raw mill kiln (2) ESP with alkali by pass system (3) ESP with cooler exit (4) provided

	Bag filter with both coal mill and at various transfer point of material. Unit has provided silos for storage of clinker, cement & fly ash. Till date no any activity yet started for WHRB 11.5 MW power plant. No ind w/w generation/discharge. High chloride containing dust from alkali bypass is disposed into separate pit. Provide pucca road, plantation and mechanical sweeper machine. During visit Air emission sample is collected from the stack attached to Raw Mill Kiln through APCM. Coprocessing of Plastic waste in to cement kiln is observed during visit.Written instructions are given for improvement during visit. [129]-21/04/2015 - RO Query to Staff: 1 year extn. appln. recd. as ISO14001 unit .Kindly include water & Haz part in crux [283]-22/04/2015~Source of water is from desalination plant. There is no generation of industrial w/w from manufacturing process. Generated domestic effluent is being treated in provided STP and then treated w/w is being discharged on land for plantation/gardening within premises. During visit provided STP is found in operation. Generated hazardous waste (used spent oil-131.4MT/Yr) is using into existing kiln as an alternative fuel. During visit spent oil @0.5kl is observed at spent oil collection MS tank at hazardous waste storage area. [129]-23/04/2015 [471]-07/05/2015~ RO Comments/Reply :CCA for one year extention based on ISO-14001 may be process on merits.Comp. option selected / I recommend :May be GRANTED (After making necessary verification; I agree with inspecting officer; hence issuance / renewal of Authorization to the Industry is recommended as per the provisions of Rule 5(4) of the Hazardous Wastes (Management & Handling & Transboundary Movement) Rules 2008.)-08/05/2015
	335360-ROU DT.07/04/2015 This clinkerisation Plant is visited with reference to Narayan Sarovar Chinkara Century Abhyaran Project. During visit clinkerisation plant is found in operation, unit has provided (1) Bag House with raw mill kiln (2) ESP with alkali by pass system (3) ESP with cooler exit (4) provided Bag filter with both coal mill and at various transfer point of material. Unit has provided silos for storage of clinker, cement & fly ash. Till date no any activity yet started for WHRB 11.5 MW power plant. No ind w/w generation/discharge. High chloride containing dust from alkali bypass is disposed into separate pit. Provide pucca road, plantation and mechanical sweeper machine. During visit Air emission sample is collected from the stack attached to Raw Mill Kiln through APCM. Co-processing of Plastic waste in to cement kiln is observed during visit.Written instructions are given for improvement during visit. [129]-21/04/2015 - RO Query to Staff: 1 year extn. appln. recd. as ISO14001 unit ,Kindly include water & Haz part in crux [283]-22/04/2015~Source of water is from desalination plant. There is no generation of industrial w/w from manufacturing process. Generated domestic effluent is being treated in provided

	STP and then treated w/w is being discharged on land for plantation/gardening within premises. During visit provided STP is found in operation. Generated hazardous waste (used spent oil-131.4MT/Yr) is using into existing kiln as an alternative fuel. During visit spent oil @0.5kl is observed at spent oil collection MS tank at hazardous waste storage area. [129]-23/04/2015
DIR-308618 On 31/03/2015	**330497-VIG DT.11/03/2015** This unit is inspected w.r.t. complaint of Shri Jat Abdul Karim Mamadh Hassan regarding air pollution from this unit. Detailed investigation report is forwarded to HO vide this office letter no. GPCB/VIG-RAJ/30 (C) 1264/264 dated 24/03/2015.Photographs taken during investigation and goog e image of the site is uploaded herewith. [503]-24/03/2015~ Vigilence Comments/Reply for inf & to issue improvement lr. ce -25/03/2015
	321054-ROU DT.07/01/2015 This clinkerisation Plant is visited with reference to Narayan Sarovar Chinkara Century Abhyaran Project. During visit clinkerisation plant is found in operation, unit has provided (1) Bag House with raw mill kiln (2) ESP with alkali by pass system (3) ESP with cooler exit (4) provided Bag filter with both coal mill and at various transfer point of material Unit has provided silos for storage of clinker, cement & fly ash. Till date no any activity yet started for WHRB 11.5 MW power plant. No ind w/w generation/discharge. High chloride containing dust from alkali bypass is disposed into separate pit. Provide pucca road, plantation and mechanical sweeper machine. During visit following samples are collected (1) Treated sewage w/w sample from the final outlet of STP (2) Air emission sample is collected from the stack attached to Raw Mill Kiln through APCM. Written instructions are given for improvement during visit. [521]-13/01/2015
	314839-ROR DT.14/11/2014 Unit is visited wrt H.O.Instructiuon. During visit unit is found in operation. AAQM is carried out at three locations (1) On the terrace of Residence of Sarpanch Judhava village, (2) At Residence of Hamir bhai Rabari Village - Judhava(2) On the terrace of Sidheswar mahadev Temple,Village -Kharai During visit Wind velocity is @6.0km/hr &direction is SEto South Noted. [408]-28/11/2014
	311818-SCN DT.14/10/2014 Unit is visited w.r.t Narayan sarovar chinkara abhiyaran project.Clinker manufacturing is not going on during visit. Plant is not in operation since last one month as their raw mill kiln stack is collapsed due to thunder storm & striking of lighting on 2-9-14 New stack erection work is in progress and cleaning of bag house & kiln through blowing the air is going on.No any activity is started for WHRB type 11.5

	MW power plant.No ind w/w generation/discharge.High chloride containing dust from alkali bypass is disposed in to separate dump pit. They have provided Pucca road within premises and plantation along the boundary. They have provided mechanical sweeper to collect ground level dust which is recycle back however dust is seen on pacca road.During visit following samples are collected - (1) treated w/w sample from the final outlet of STP, which is used for gardening/plantation within premises (2)AAQM carried out near adm building of clikerization plant within premises.Written instructions are given to unit for the compliance.During visit dusty/cloudy atmosphere is observed in this region due to yesterday's cyclonic effect [529]-17/10/2014
	301136-SCN DT 14/07/2014 This clinkerisation Plant is visited with reference to Narayan Sarovar Chinkara Centu / Abhyaran Project. During visit clinkerisation plant is found not in operation, only maintenance & cleaning activities is observed during visit because of Annual maintenance shutdown. Unit has also informed board through e-mail dated 11th July2014 about various units of sanghi's is being shut down from 09/07/14 & the tentative date of putting back in operation is 05/08/14. During visit provided units of STP are found in operation. A sample of treated domestic w/w from the final outlet of STP is being collected during visit which being discharge on land for plantation. As per record clinker production for the month of Apr-14 to Jun-14 is 252394MT, 229930MT & 209215MT and Coal consumption is 94056MT, 88173MT & 29783MT resp. General housekeeping & AAQ observed normal, Written instructions are given for improvement. [521]-19/07/2014
SCN-218728 On 19/06/2014	**290514-COM DT.04/04/2014** Unit is visited w.r t Narayan sarovar chinkara abhiyaran project and complain from parth foundation about pollution created by sanghi industries.Complainer was not contacted as his telephone number was not given correct by him. Regarding compliant separate investigation report is forward to H.O. Clinker manufacturing is going on during visit. At present they are using rain water stored at reservoir provided in lime stone mines area.No ind w/w generation/discharge. Provided apcm with raw mill kiln is not found in operation properly. Replacing of filter bags in three compartments of bag house is in progress.Provided online monitoring system for raw mill stack is not in operation during visit due to technical problem. High chloride containing dust from alkali bypass is disposed in to separate dump pit without apcm. Present generation of high chloride containing dust is about 30 MT/D. Unit is not having apcm for materisl handling/storage area hence dusting is observed from the material handling area. They have provided pacca road within premises and provided mechanical sweeper to collect ground

	level dust however dust is seen on pacca road. Written instructions are given to unit for the compliance. |529\]-16/04/2014 ~ RO Query to Staff: mark the location in photo and opinion about complaint \[175\]-19/04/2014-visible smoke from stack is seen, however complainers major points are false |529\]-21/04/2014
	285822-CTH DT.06/03/2014 This unit is visited w.r.t be presence during feeding H. Waste Coal-Tar (Cat-1.2) of Schedule-I in raw mill kiln. Unit has obtained permission of GPCB wide letter No. GPCB/Hag Gen-379/152544 dt.15/10/2013 for the Trial run permission for Co-Processing of H. Waste Coal-Tar(Cat-1.2) of Schedule-I for @50MT from the M/s. Ashapura Volclay Ltd.-Bhuj in the cement kiln of M/s Sanghi Industries LTD. and having CCA-AWH-54935 valid up to 18/03/18. Detail visit Report is uploaded in DOC \[129\]-11/03/2014
AMD-216706 On 19/06/2014	**282613-APP DT.12/02/2014** Unit is visited wrt their cte amendment application for their power plant of 11.5 MW through waste heat recovery boiler (WHRB):This is an existing clinker mfg unit having cca up to 18-3-2018. Clinker manufacturing is going on during visit. At present they are using rain water stored at reservoir provided in lime stone mines area No ind w/w generation/discharge. Provided apcm with raw mill kiln is not found in operation properly hence they are instructed to maintain the same. During visit dusting is observed from the material handling area. High chloride containing dust from alkali bypass is disposed in to separate dump pit. Unit is having mechanical road sweeper for the cleaning of internal pacca road. During visit one nos of flue gas stack sample is collected from the stack attached to raw mill kiln through APCM.As proposed by them they will provide WHRBs attached to kiln. From different points of kiln waste heat will be taken in to WHRB. As proposed there will be one turbine of 11.5 MW. As proposed 73 KL/d of effluent generated from the boiler & cooling tower blow down will be used for gardening/dust suppression through one collection/neutralization/disposal tank. As stated by them there will not be increase in use of fuel and flue gas from WHRB will be release through existing apcm/stack. As proposed used oil will be used as an alternative fuel in their kiln. No any construction activity is started for WHRB type 11.5 MW power plant. Written instructions are given to unit. \[529\]-17/02/2014~ RO Comments/Reply :action may be taken on basis of IR &AR / I recommend :May be REJECTED-17/02/2014~ RO Comments/Reply : / I recommend :May be REJECTED-25/03/2014
AMD-230854 On	**282613-APP DT.12/02/2014** Unit is visited wrt their cte amendment application for their power plant of 11.5 MW through waste

17/1?/2014	heat recovery boiler (WHRB).This is an existing clinker mfg unit having cca up to 18-3-2013. Clinker manufacturing is going on during visit. At present they are using rain water stored at reservoir provided in lime stone mines area. No ind w/w generation/discharge. Provided apcm with raw mill,kiln is not found in operation properly hence they are instructed to maintain the same. During visit dusting is observed from the material handling area. High chloride containing dust from alkali bypass is disposed in to separate dump pit. Unit is having mechanical road sweeper for the cleaning of internal pacca road. During visit one nos of flue gas stack sample is collected from the stack attached to raw mill kiln through APCM. As proposed by them they will provide WHRBs attached to kiln. From different points of kiln waste heat will be taken in to WHRB. As proposed there will be one turbine of 11.5 MW. As proposed 73 KL/d of effluent generated from the boiler & cooling tower blow down, will be used for gardening, dust suppression through one collection/neutralization/disposal tank. As stated by them there will not be increase in use of fuel and flue gas from WHRB will be release through existing apcm/stack. As proposed used oil will be used as an alternative fuel in their kiln. No any construction activity is started for WHRB type 11.5 MW power plant. Written instructions are given to unit. [529]-17/02/2014- RO Comments/Reply :action may be taken on basis of IR &AR / I recommend :May be REJECTED-17/02/2014- RO Comments/Reply : / I recommend :May be REJECTED-25/03/2014-
SCN-239746 0(1) 29/07/2014	**280534-VIG DT.29/01/2014** Sanghi industries limited (clinker unit) is visited on 29.1.2014. During visit, production of clinker is going on, where raw mill, coal mill, alkali by-pass & cooler exit are found in operation. For air aspects, they have provided Bag house (with 22 compartment having 232 bags in each compartment) for raw mill & kiln, Bag filter for coal mill, ESP with Cooler exit (one) etc. During visit, provided all APCM are found in operation. For co-processing, they had taken trial of liquid waste (tar waste) earlier in their charging system. They have provided only 10 KL tar storage tank, where instruction for providing more capacity storage tank with measuring device is issued. One air sampling taken of flue gas stack, from stack attached to raw mill kiln through APCM taken for analysis. Further, in their coal go-down, they have not provided walls, sprinklers, for which written instruction is issued. They have covered belt conveyors and bag filters at their transfer points. They have provided pacca road within premises. Due to leakages at expansion joint duct, ambient air quality needs improvement. They have provided online monitoring system for PM for Raw mill showing results of 40 mg/NM3, where frequency of calibration is once in year & instruction for making calibration in quarterly is issued. Unit is having sewage treatment plant for domestic effluent & treated effluent is used for plantation & gardening purpose. On

	verification of data, they manufactured of clinker, coal consumed of 217954 T, 38639 T in Dec-13 and 206546 T and 36667 T upto 28.1.2014 The necessary written instruction is issued and is as under: [380]-05/02/2014– Vigilance Comments/ Reply :may issued strict instruction for co incineration facility by HAZ Branch-10/02/2014
	272947-ROU DT.07/01/2014 Unit is visited w.r.t Narayan sarovar chinkara Abhiyaran project. During visit production of clinker is going on. Source of water supply is from own mines dam (Rain water harvesting) No ind w/w generation/discharge.Unit has provided Bag house with 22 compartment having 232 bags in each compartment as apcm in raw mill kiln, ESP to alkali bye pass & coal mill stack. Provided apcm with raw m.. kiln is not found in operation properly hence they are instructed to ma..tain the same. During visit dusting is also observed from silo and raw mill duct. High chloride containing dust from alkali bypass is disposed in to separate dump pit. During visit following samples are collected :- (1) treated w/w sample from the final outlet of STP, which is used for gardening/plantation within premises (2) 01 Nos of flue gas stack sample, from the stack attached to raw mill kiln through APCM. Unit has provided covered belt conveyors and bag filters at their transfer points. They have provided Pacca road within premises. Dust is observed on this road. General housekeeping and ambient air quality not observed normal. Written instructions are given to unit for the compliance. [521]-15/01/2014- RO Comments/Reply :action may be take on basis of IR & AR-18/01/2014
	266812-SCN DT.22/10/2013 This unit is visited w. r. to Narayan Sarovar Chinkara Century Abhayaran Project. During visit plant is found in operation. There is no discharge of industrial effluent and for domestic effluent of colony unit has provided sewage treatment plant (root zone treatment system). During visit provided sewage treatment system is found in operation and treated sewage is found used for plantation & gardening. One sample of treated sewage is collected. Unit has provided following apcm-Bag house with Raw mill & kiln, Bag filter with both coal mill, ESP with Alkali bypass, ESP with Cooler exit & dust collector with various transfer points. During visit provided all apcm are found in operation. Unit has provided online opacity meter with raw mill kiln stack & during visit reading noted 67 mg/nm3. Two air emission samples from stack attached to (1) Raw mill & Kiln and (2) Alkali Bypass are collected. Unit has provided water sprinkling arrangement around coal yard and also done plantation in coal yard. Generated alkali dust is found disposed in pit identified n.. Labor colony. Unit has planted sapling n.. & around Alkali disposal pit. As per record production of cement for the month of July -13 to Sept-13

	are 201190 MT, Nil MT (shut down) & 131867 MT. resp. [497]-24/10/2013~ RO Comments/Reply action may be take on basis of IR & AR-31/10/2013
SCN-157877 On 27/08/2013	**253784-ROU DT.02/07/2013** This unit is visited w. r. to Narayan Sarovar Chinkara Century Abhayaran Project & under routine monitoring program. During visit plant is found in operation. There is no discharge of industrial effluent and for domestic effluent of colony unit has provided sewage treatment plant (root zone treatment system). During visit provided sewage treatment system is found in operation and treated sewage is found used for plantation & gardening. One sample of treated sewage is collected. Unit has provided following apcm-Bag house with Raw mill & kiln, Bag filter with both coal mill, ESP with Alkali bypass, ESP with Cooler exit. During visit provided all apcm are found in operation however emission from raw mill kiln stack & coal mill stacks are observed hence person contacted has been instructed to operate all apcm efficiently. Dusting from raw material handling conveyor transfer point & raw material storage area are also noticed. Ambient air quality is found not fair. Two air emission samples from stack attached to (1) Raw mill & Kiln and (2) Coal mill-No.-1 are collected. Generated alkali dust is found disposed in pit identified nr. Labor colony. As per record production of cement for the month of April-13 to June-13 are 184705 MT, 262062 MT & 164818 MT. resp. [497]-18/07/2013~ RO Comments/Reply action may be take on basis of IR & AR-19/07/2013
GRT-153357 On 18/07/2013	**245754-APP DT.16/04/2013** This unit is visited w. r. to eca renewal application. Unit is engaged in mfg. of cement clicker, during visit production plant is found in operation. Water is mainly used for domestic & cooling purpose only. Source of water is rain water stored in used lime stone mining block. Cooling water is recirculated and there is no industrial effluent discharge. For colony sewage unit has provided root zone treatment system & treated sewage is used for green belt development. One sample of treated sewage which is utilised for green belt development is collected for analysis. Unit has provided apcm i.e. Bag house with Raw mill & kiln, Bag filter with both coal mill, ESP with Alkali bypass, ESP with Cooler exit & dust collector with various transfer points. During visit provided all apcm are found in operation. Two air emission samples from stack attached to (1) Raw mill & Kiln and (2) Alkali bypass are collected. Unit has provided water sprinkling arrangement around coal yard and also done plantation in coal yard. Generated alkali dust is found disposed in identified pit. GHK & AAQ is found normal. Unit has provided online opacity meter with raw mill kiln stack & during visit reading noted 53 mg/nm3, they are also planning to provide continuous ambient air quality monitoring station. monitoring There is a

	generation of used oil as a haz. waste which is now they want to use as a fuel in kiln. As per record production of clinker for the month of Jan-13, Feb. 13 & March-13 are 201266 MT, 184562 MT & 211676 MT resp. [497]-26/04/2013 [497]-26/04/2013- RO Comments/Reply May be granted. However ARs of stack emission samples are awaited. / I recommend :May be GRANTED (After making necessary verification; I agree with inspecting officer; hence issuance / renewal of Authorization to the Industry is recommended as per the provisions of Rule 5(4) of the Hazardous Wastes -04/05/2013
AMD-511760 On 29/06/2019	**245754-APP DT.16/04/2013** This unit is visited w. r. to cca renewal application. Unit is engaged in mfg. of cement clicker, during visit production plant is found in operation. Water is mainly used for domestic & cooling purpose only. Source of water is rain water stored in used lime stone mining block. Cooling water is recirculated and there is no industrial effluent discharge. For colony sewage unit has provided root zone treatment system & treated sewage is used for green belt development. One sample of treated sewage which is utilised for green belt development is collected for analysis. Unit has provided apcm i.e. Bag house with Raw mill & kiln, Bag filter with both coal mill, ESP with Alkali bypass, ESP with Cooler exit & dust collector with various transfer points. During visit provided all apcm are found in operation. Two air emission samples from stack attached to (1) Raw mill & Kiln and (2) Alkali bypass are collected. Unit has provided water sprinkling arrangement around coal yard and also done plantation in coal yard. Generated alkali dust is found disposed in identified pit. GHK & AAQ is found normal. Unit has provided online opacity meter with raw mill kiln stack & during visit reading noted 53 mg/nm3, they are also planning to provide continuous ambient air quality monitoring station. monitoring There is a generation of used oil as a haz. waste which is now they want to use as a fuel in kiln. As per record production of clinker for the month of Jan-13, Feb. 13 & March-13 are 201266 MT, 184562 MT & 211676 MT resp. [497]-26/04/2013 [497]-26/04/2013- RO Comments/Reply :May be granted. However ARs of stack emission samples are awaited. / I recommend :May be GRANTED (After making necessary verification; I agree with inspecting officer; hence issuance / renewal of Authorization to the Industry is recommended as per the provisions of Rule 5(4) of the Hazardous Wastes -04/05/2013
	239005-OTH DT.04/03/2013 This unit is visited w. r. to instruction given by the District Collector –Bhuj during Sankal Meeting on 15/02/2013, with regard to question raised by Shr. Chabilbhai Patel, MLA-Abdasa regarding unused alkali dust disposed in open by Sanghi Industry creating an environment issue. During visit plant is found not in operation as CPP boiler was under maintenance. Unit is mfg. clinker using raw material

	lime stone. They are separating lime stone dust which contain more than 0.08 % chloride contain which is alkaline in nature, micro fine & not usable in mfg. process and require to dispose. As per technical information, earlier this type of dust generation was 7 MT/hr which was partly dumped in identified disposal pit (located b/h. labour colony), partly nr. Line-II area for leveling (within clinker plant premises) and partly back side of clinker plant premises. There may be chances of air borne during high wind velocity. Before three months unit has taken remedial measures to reduce such type of dust quantity based on study of FLS by changing profile & modifying feeding inlet and now dust generation has reduced up to 4 MT/hr. Now unit is disposing such alkali dust in identified pit located b/h. labour colony only (size 260 mtr x 260 mtr.) and also started to lift the dust which was disposed earlier in back side of clinker plant through loader, excavator & dumpers. Person contacted informed that entire stock will be lifted & again refilled in identified pit within 15 days and they will spread soil & area will be used for plantation. Statement showing alkali generation & disposal calculation is uploaded in .doc. During visit shifting of old dust disposal to identifying pit is going on, however they have been again given written instruction to disposed alkali dust in identify location only and shift the dust disposed in open land in past at the earliest. [497]-06/03/2013
	234799-VIG DT.05/02/2013 M/s Sanghi Industries, sanghipuram, Kutchchh is visited on 5.2.2013. During visit, plant is found in operation, where raw mill, coal mill, alkali by-pass and cooler exit are found in operation. In this premises, unit is carrying out of grinding activities at other place (pcb-ID-18025) having @ 12 KM distance far from this location through trucks transportation. Unit is having sewage treatment plant for domestic effluent and treated sewage is used for plantation & gardening purpose. For air aspects, they have provided Bag house for raw mill & kiln, Bag filter with both coal mill (one in operation, total 2 nos), ESP with Alkali bypass (one no), ESP with Cooler exit (one) etc. During visit provided all aper are found in operation. Dusting in premises near raw mill fresh air damper observed. Further, in their coal go down, they have not provided walls, sprinklers and shed, for which written instruction is issued. Necessary written instruction for providing of sprinklers in raw material yard, providing of online ambient ammonitoring stations in upward and downward direction, carry out co-incineration of plastic waste/tea waste etc, provide waste heat recovery system for using of waste heat etc. are issued. For production data, they manufactured of 201266 T in Jan-2013 respectively. [380]-14/02/2013-Verified Comments/Reply not in based on the case history.-15/02/2013
	230319-ROU DT.02/01/2013

	This unit is visited w. r. to Narayan Sarovar Chinkara Century Abhayaran Project & under routine monitoring program. During visit plant is found in operation. There is no discharge of industrial effluent and for domestic effluent of colony unit has provided sewage treatment plant. During visit provided sewage treatment system is found in operation and treated sewage is found used for plantation & gardening. One sample of treated sewage is collected. Unit has provided following apcm- Bag house with Raw mill & kiln, Bag filter with both coal mill, ESP with Alkali bypass, ESP with Cooler exit. During visit provided all apcm are found in operation Dusting from raw mill fresh air damper is again observed. Ambient air quality is found not fair Two air emission samples from stack attached to (1) Raw mill & Kiln and (2) Coal mill-No.-2 are collected. As per record production of clinker for the month of Oct-12, Nov-12 & Dec-12 are 254873 MT, 273095 MT & 232596 MT resp. [497]-09/01/2013
	221194-ROU DT.08/10/2012 This unit is visited w. r. to Narayan Sarovar Chinkara Century Abhayaran Project & under routine monitoring program. During visit plant is found in operation. There is no discharge of industrial effluent and for domestic effluent of colony unit has provided sewage treatment plant. During visit provided sewage treatment system is found in operation and treated sewage is found used for plantation & gardening. One sample of treated sewage is collected. Unit has provided following apcm- Bag house with Raw mill & kiln, Bag filter with both coal mill, ESP with Alkali bypass, ESP with Cooler exit. During visit provided all apcm are found in operation. Dusting from raw mill fresh air damper is observed, person contacted informed that because of the technical problem in raw mill they have stop the mill operation since today 11 AM hence system is pressurized & creat dusting problem. Ambient air quality is found not fair. Two air emission samples from stack attached to (1) Raw mill & Kiln and (2) Coal mill-No.1 are collected. As per record production of clinker for the month of July-12, Aug.-12 & Sept.-12 are 191310 MT, 104226 MT & 154085 MT resp.
	216942-HOR DT.04/09/2012 This unit is visited w. r. to complaint of Jadva Villagers regarding Air Pollution problem due to Sanghi Industries Ltd., During visit clinker plant is found in operation. Air emission samples from stack attached to (1) Raw Mill Kiln through Bag House (2) Coal Mill-1 through Bag filter and (3) Alkali Baypass through ESP are collected. AAQM sample from terrace of Shri Bhojabhai Rabari, Vill. Jadva is also collected. Detailed visit report in Gujarati is uploaded in doc.
	211641-ROU DT.15/07/2012 This unit is visited w. r. to Narayan Sarovar Chinkara Century Abhayaran Project & under routine

	monitoring program. During visit clinker plant is found not in operation, person contacted informed that plant is annual shut down from 09/07/2012. There is no discharge of industrial effluent and for domestic effluent of colony unit has provided sewage treatment plant. During visit provided stp units are found in operation and treated sewage is found utilized for plantation & gardening. One sample of treated sewage is collected. As per record production of clinker for the month of April, May & June-12 are 196160 MT, 209620 MT & 194390 MT resp.
	202442-ROU DT.16/04/2012 This unit is visited w. r. to Narayan Sarovar Chinkara Century Abhayaran Project & under routine monitoring program. During visit clinker plant is found in operation. There is no discharge of industrial effluent and for domestic effluent of colony unit has provided sewage treatment plant. During visit provided stp units are found in operation and treated sewage is found utilized for plantation & gardening. One sample of treated sewage is collected. Unit has provided following apcm-Bag house with Raw mill & kiln, Bag filter with both coal mill, ESP with Alkali bypass, ESP with Cooler exit. During visit provided all apcm are found in operation, visible emission from raw mill kiln-stack is observed, person contacted informed that they have already change @ 2000 bags in bag house and more 2000 bags will be change shortly. Regarding alkali waste dust person contacted informed that they have identified space to dump such dust in abandoned additive mines and as soon it is finalized dust will disposed in pit of abandoned mines till that it is disposed in line-II low laying area adjacent to existing clinkerisation plant. Spreading of Earlier observed alkaline dust heat through loader is going on. Work for the Paved road from clinker plant to Jetty is found completed. During visit emission samples from stack attached to (1) Raw mill & Kiln and (2) Coal mill No.1 are collected. Ambient air quality is found not fair. As per record production of clinker for the month of Jan-12, Feb-12 & March-12 are 198490 MT, 80732 MT & 187238 MT resp.
	192167-ROU DT.03/01/2012 This unit is visited w. r. to complaint of various villagers (Hothiyai, Naniber, Motiber, Navavas, Vadavarovandh, Akuroo, Golay, Bhangorivandh & rohara) received from HO- Complaint cell vide letter No. 2011/V.K-28/98464, dtd 01/12/2011 regarding air pollution & Narayansarovar Chinkara Century Abhayaran Project. Complaint report in Gujarati is uploaded separately in .doc. During visit clinker plant is found in operation. There is no discharge of industrial effluent and for domestic effluent of colony unit has provided sewage treatment plant. During visit provided stp units are found in operation and treated sewage is found utilized for plantation & gardening. One sample of treated sewage is

	collected.Unit has provided following apcmBag house with Raw mill & kiln, Bag filter with both coal mill, ESP with Alkali bypass, ESP with Cooler exit. During visit provided all apcm are found in operation but continuous heavy fugitive dust emission from raw mill kiln stack is observed. Huge quantities of alkali lime stone waste dust are found dumped on open land towards west direction from premises gate. Dusting from material transpher point & vehicular movement is also observed. During visit emission samples from stack attached to (1) Raw mill & Kiln (2) Coal mill-No.2 and (3) cooler exit are collected. Ambient air quality is found very poor. As per record production of clinker for the month of Oct.-11, Nov-11 & Dec-11 are 169312 MT, 173139 MT & 234142 MT resp.
	184754-SCN DT.13/10/2011 This unit is visited w.r.t Narayan sarovar chinkara Abhiyaran project quarterly basis and H.O.letter. During visit, the clinkerization plant is in operation Source of water supply is from own mines dam (Rain water harvesting).Provided APCMs are in operation. Unit has provided Bag house with 22 compartment having 232 bags in each compartment as apcm in Raw mill & kiln, ESP to alkali bye pass & coal mill stack. During visit following samples are collected - (1) treated w/w sample from the final outlet of STP, which is used for gardening/plantation within premises (2) 02 Nos flue gas Stack sample, from the stack attached to raw mill & kiln stack & stack attached to Alkali bypass through APCM. (3)AAQM carried out near fabrication yard. Unit has provided covered belt conveyors and bag filters at their transfer points They have provided Pucca road within premises and plantation along the boundary. They have provided mechanical sweeper to collect ground level dust which is recycle back. Generated High chloride content material / rejected dust is disposed of low lying area. Regarding compliant separate investigation report is forward to H.O. General house keeping and ambient air quality observed normal. Production of clinker for last three months, July-11 to Sept.2011 are in MT = 103180,89069,120189, respectively.
SCN 91681 Grg 15/09/2011	**175226-ROU DT.11/07/2011** This unit is visited w. r. to Narayansarovar Chinkara Abhayaran Project. During visit clinker plant is found in operation. There is no discharge of industrial effluent and for domestic effluent of colony unit has provided sewage treatment plant. During visit provided stp units are found in operation and treated sewage is found utilized for plantation & gardening. One sample of treated sewage is collected. Unit has provided following apcm Bag house with Raw mill & kiln Bag filter with both coal mill ESP with Alkali bypass, ESP with Cooler exit. During visit provided all apcm are found in operation but emissions from all the stacks are observed hence instructed to operate apcm efficiently. Dusting from the heap of raw

	material stack & coal stack due to high wind velocity is also observed. During visit emission samples from stack attached to (1) Raw mill & Kiln (2) Coal mill-No.2 and (3) cooler exit are collected. Ambient air quality is found not fair. As per record production of clinker for the month of April, May & June-11 is 176702 MT, 206772 MT & 162495 MT resp.
	168092-HOR DT.27/04/2011 This unit is visited w.r.t Narayan sarovar chinkara Abhiyaran project quarterly basis and H.O.letter. During visit, the clinkerization plant is in operation Provided APCMs are found in operation. Unit has provided Bag house with 22 compartment having 232 bags in each compartment as apcm in Raw mill & kiln, ESP to alkali bye pass & coal mill stack as apcm. At the time of visit following samples are collected - (1) treated w/w sample from the final outlet of STP, which is used for gardening/plantation (2) flue gas Stack sample, from the stack attached to raw mill & kiln through APCM(3)flue gas stack sample from stack attached to Alkali bypass through APCM. (4)AAQm carried out nr fabrication yard. Unit has provided covered belt conveyors and bag filters at their transfer points. They have provided Pucca road within premises and done plantation along the boundary. They have provided mechanical sweeper to collect ground level dust . General house keeping and ambient air quality observed normal Production of clinker for last three months are Jan-11 (218060MT), Feb-11, (103781MT), March-11(116898MT), - RO Comments/Reply :For necessary action pt.-09/05/2011

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GPCB

GUJARAT POLLUTION CONTROL BOARD

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In exercise of the power conferred under section-25 of the Water (Prevention and Control of Pollution) Act-1974, under section-21 of the Air (Prevention and Control of Pollution)-1981 and Authorization under rule 6(2) of the Hazardous & Other Waste (Management & Transboundary Movement) Rules-2016, framed under the Environmental (Protection) Act-1986. The Board has granted the consent order no AWH-54935, valid up to 18/03/2019

And whereas Board has received application inward No 161436 and 155302, dated 25/07/2019 and 18/05/2019 for the Renewal of Consolidated Consent and Authorization (CC&A) of the Board under the provisions / rules of the aforesaid Acts. Consents & Authorization are hereby granted as under:

CONSENTS AND AUTHORISATION:
(Under the provisions /rules of the aforesaid environmental acts)

To,
Sanghi Industries Ltd.
(Clinkerization Plant),
Survey no. 96, 97, 99, 100, 123, 124 of Motiber
and 84, 85 of Nothiyoy
Vill: Motiber, Ta. Abdasa,
Dist: Kutch.

1. **Consent Order No. AWH-103562 Date of Issue: 22/08/2019.**
2. The consent shall be valid up to 18/03/2024 for use of outlet for the discharge of trade effluent & emission due to operation of industrial plant for manufacture of the following product:

Sr. No.	Product	Quantity per Month
1.	Cement Clinker	2,92,000 MT
2.	Waste Heat Recovery Boiler System	15 MW

SUBJECT TO THE FOLLOWING SPECIFIC CONDITIONS:

1 Industry shall comply with the conditions of Environment Clearance issued by MoEF&CC vide order no. J-11012/105/94-IA.II, dated 15/09/1995.

2 No ground water shall be withdrawn without obtaining prior permission from competent authority.

3 Industry shall manage Solid Wastes generated from industrial activities as per Solid Waste Management Rules-2016 (solid waste as defined in Rule-3(46)).

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4. As per Provisions of Rule 18 of Solid Waste Management Rules-2016 you are directed to make an arrangement in Utilities to replace at least five percent (5%) of your solid fuel requirement by 'refused derived fuel'.
5. Industry shall take adequate measures to control fugitive emission in the unit.
6. Unit shall operate the APCM efficiently provided at transfer point coal conveyor crusher and at screening area to control fugitive emission.
7. Unit shall provide and operate the centralized de-dusting system
8. Online monitoring system shall be regularly calibrated and shall be in operation.
9. Industry shall comply with the Coal handling guidelines.

SPECIFIC CONDITIONS FOR CO-PROCESSING OF WASTES

10. Industry shall receive waste from industry, who have obtained CCA from competent authority for sending waste to unit for Co-processing.
11. Industry shall transport the generated waste for Co-processing purpose through dedicated tankers with GPS enable system in line with Hazardous and Other Waste (M & TM) Rules – 2016
12. Industry and generator shall use hazardous waste tracking system of Xtended Green Node (XGN) for online real data for preparing online manifest system for regular updation received and maintain record thereof by generator as well as receiver. The compile data shall be submitted at the end of the year after due verification by facility operator / receiver to the concern GPCB, Regional office and Head Office, Gandhinagar
13. Industry strictly adhere to the guidelines issued by GPCB for Co-processing of cement plant.
14. Industry shall submit the monthly data of waste received and co processed
15. Applicant shall operate APCMs regularly and efficiently to achieve emission norms.
16. Applicant shall operate regularly and efficiently lime charging system to control emission of SO_2.
17. Industry shall store the wastes received in the dedicated storage area.
18. Industry shall maintain log book for the quantity of waste received along with the name of supplier and quantity on day to day basis.
19. Industry shall take utmost care that there is no spillage or leakage of waste.
20. Industry shall comply with the emission norms.
21. Industry shall maintain the records in form of manifest and the monthly data of co-processing of waste shall be submitted to this office.
22. Industry shall comply with the guidelines issued by Central Pollution Control Board for Waste co-processing in Cement unit.

Outward No: 38532 Dt: 27/2/2019

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GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, Gandhinagar 382 010
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Website : www.gpcb.gov.in

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23. Unit shall handle hazardous waste in an environmentally safe manner avoiding the possibilities of contaminating the environment and eliminate the chances of accidents leading to environment damage.

24. The containers utilized for storing and handling Hazardous and other wastes for the purpose of co-processing must be able to withstand normal handling and retain integrity for a minimum period of six months.

25. Unit shall ensure to prevent waste feed in following conditions:

- At start up, until temperature of 850°C or 1100°C in calciner or 1100°C at kiln inlet as the case may be.
- Whenever the temperature of 850°C or 1100°C as the case may be is not maintained.
- Whenever emission monitoring show that any emission limits value is exceeded due to disturbances or failures of air pollution control devices.
- In case of disturbed process in kiln.

26. The management of the pre and co-processing plant shall be in the control of a technical person competent to manage the hazardous waste in an environmentally sound manner.

3. CONDITIONS UNDER WATER ACT 1974 AMENDED AS FOLLOWS:

3.1 Source of Water: Own Desalination Plant

3.2 The quantity of water consumption for industrial purpose shall not exceed 450 KL/Day.

3.3 The quantity of water consumption for domestic purpose shall not exceed 250 KL/Day.

3.4 There shall be no industrial wastewater generation from manufacturing process and other ancillary operations.

3.5 The quantity of domestic waste water shall not exceed 250 KL/day from industry and industry's colony.

3.6 Domestic waste water shall be treated in sewage treatment plant of colony and confirm to the following standards:

PARAMETERS	PERMISSIBLE LIMIT
pH	6.5 to 9.0
BOD (5 days at 200 C)	30 mg/L
Suspended Solids	100 mg/L
Fecal Coliform	1000 MPN/ 100 ml

3.7 The treated sewage after confirming to standards shall be utilized for gardening and plantation purpose in the colony.

3.8 The unit shall provide fix pipeline for the utilization of the treated sewage for gardening and plantation.

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4. CONDITIONS UNDER AIR ACT 1981:

4.1 The following shall be used as fuel in kiln respectively.

Sr. No.	Fuel	Quantity
1	Coal	559400 MT/Year

4.2 The flue gas emission through various stacks/vent of reactors, process vessel shall conform to the following standards.

Sr. No.	Stack Attached to	Stack Height in Meter	APCM	Parameter	Permissible Limit
1	Kiln and Raw Mill	125	Bag Filter	PM	30 mg/Nm^3
				SO_2	100 mg/Nm^3
				NO_x	800 mg/Nm^3
				HCl	10 mg/Nm^3
				HF	1 mg/Nm^3
				TOC	10 mg/Nm^3
				Hg & Its compounds	0.05 mg/Nm^3
				Cd + Tl & their compound's	0.05 mg/Nm^3
				Sb + As + Pb + Co + Cr + Cu + Mn + Ni + V and their compounds	0.5 mg/Nm^3
				Dioxins and Furans	0.1 ngTEQ/Nm^3

4.3 The following shall be process gas emission from the manufacturing and other ancillary activities and shall confirm to the following standards

Sr. No.	Stack attached to	Stack height in Meter	APCM	Parameter	Permissible Limit
1.	Coal Mill - I	56.40	Bag Filter	PM	50 mg/Nm^3
2.	Coal Mill - II	56.40	Bag Filter	PM	50 mg/Nm^3
3	Alkali Bypass	75	ESP	PM	50 mg/Nm^3
4	Cooler	52.50	ESP	PM	50 mg/Nm^3

Outward No: 52935 Dt: 06/12/2019

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4.4 The concentration of the following parameters in the ambient air within the premises of the industry shall not exceed the limits specified hereunder as per National Ambient Air Quality Standards issued by MoEF&CC dated 16th November-2009.

Sr. NO.	Pollutant	Time Weighted Average	Concentration in Ambient air in µg/m³
1.	Sulphur Dioxide (SO_2)	Annual	50
		24 Hours	80
2.	Nitrogen Dioxide (NO_2)	Annual	40
		24 Hours	80
3.	Particulate Matter (Size less than 10 µm) OR PM_{10}	Annual	60
		24 Hours	100
4.	Particulate Matter (Size less than 2.5 µm) OR $PM_{2.5}$	Annual	40
		24 Hours	60

4.5 The applicant shall provide potholes, ladder, platform etc at chimney(s) for monitoring the air emissions and the same shall be open for inspection. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted / displayed to facilitate identification.

4.6 The level of Noise in ambient air within the premises of industrial unit shall not exceed the following levels:

Between 6 am to 10 pm : 75 dB(A)
Between 10 pm to 6 am : 70 dB(A)

5. Authorization under Hazardous and Other Waste (Management & Transboundary Movement) Rules, 2016 & amended.

5.1 Authorization Number: AWH- 103662 and shall valid up to 18/03/2024.

5.2 M/s. Sangni Industries Limited (Clinkerisation Plant) is hereby granted an authorization to operate facility for following hazardous waste at plot no. 95, 97, 99, 100, 123, 124 of Mundra and 64 & 65 of Hodhray Village: Mokbar, Taluka: Abdasa, Dist.: Kutch

Sr. No.	Waste	Quantity per Annum	Category	Facility
1.	Used Oil	131.4 MT	5.1	Collection, storage, transportation, disposal by sending to authorized recycler
2.	Tar Waste from Mogul region	54000 MT	11.3	Reception, Storage, Co-processing in the Kiln of the unit
3.	Waste Residue containing oil	3000 MT	5.2	Reception, Storage, Co-processing in the Kiln of the unit

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4.	Residue or Sludge Containing oil	15000 MT	19.1	Reception, Storage, Co-processing in the Kiln of the unit
5	Spent Solvent	10000 MT	20.2	Reception, Storage Co-processing in the Kiln of the unit
6.	Distillation Residue	20000 MT	20.3	Reception, Storage, Co-processing in the Kiln of the unit
7.	Processing Waste residues & sludge (Paint sludge)	5000 MT	21.1	Reception, Storage, Co-processing in the Kiln of the unit
9	Waste or Residue	15000 MT	23.1	Reception, Storage, Co-processing in the Kiln of the unit
0.	Process waste / residue	15000 MT	26.1	Reception, Storage, Co-processing in the Kiln of the unit
10.	Process residue & waste	24000 MT	28.1	Reception, Storage, Co-processing in the Kiln of the unit
11.	Spent Carbon	8000 MT	28.3	Reception, Storage, Co-processing in the Kiln of the unit
12.	Off specification products	1000 MT	28.4	Reception, Storage, Co-processing in the Kiln of the unit
13.	Spent Solvent	15000 MT	28.5	Reception, Storage, Co-processing in the Kiln of the unit
14.	Process Waste or residue	15000 MT	29.1	Reception, Storage, Co-processing in the Kiln of the unit
15.	Sludge containing residual pesticides	15000 MT	29.2	Reception, Storage, Co-processing in the Kiln of the unit
16.	Spent Ion exchange resin containing toxic metals (Plastics & resin waste)	5000 MT	35.2	Reception, Storage Co-processing in the Kiln of the unit
17.	Chemical Sludge from waste water treatment	24000 MT	35.3	Reception, Storage, Co-processing in the Kiln of the unit
18.	Concentration or evaporation residue	10000 MT	37.3	Reception, Storage, Co-processing in the Kiln of the unit

The list of proposed non-hazardous wastes to be co-processed are mentioned as below

Sr. No.	Name of waste	Quantity per Annum	Facility
1.	Plastic Waste	8000 MT	Reception, Storage, Co-processing in the Kiln of the unit
2.	Tyre Chips	2000 MT	Reception, Storage Co-processing in the Kiln of the unit
3.	Carbon Black	24000 MT	Reception, Storage, Co-processing in the Kiln of the unit

Outward No: 5823

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Sr. No.	Name of waste	Quantity per Annum	Facility
4.	Agro Waste	30000 MT	Reception, Storage, Co-processing in the Kiln of the unit.
5.	Saw Dust	5000 MT	Reception, Storage, Co-processing in the Kiln of the unit
6.	Trade reject	1000 MT	Reception, Storage, Co-processing in the Kiln of the unit
7.	MSW (RDF/SRF)	20000 MT	Reception, Storage, Co-processing in the Kiln of the unit.
8.	Bio-sludge	60000 MT	Reception, Storage Co-processing in the Kiln of the unit
9.	Cotton Husk / peanut shell	75600 MT	Reception, Storage, Co-processing in the Kiln of the unit

5.3 The authorization is granted to operate a facility for collection, storage within factory premises, transportation, and ultimate disposal of Hazardous wastes as per condition no. 5.2.

6.4 The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act, 1986.

5.5 **TERMS AND CONDITIONS OF AUTHORISATION:**

1. The authorized person shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.
2. The authorization or its renewal shall be produced for inspection at the request of an officer authorized by the State Pollution Control Board.
3. The person authorized shall not rent, lease, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorization.
4. Any unauthorized change in personnel, equipment or working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorization.
5. The person authorized shall implement Emergency Response Procedure (ERP) for which this authorization is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drills in this regard at regular interval of time.
6. The person authorized shall comply with the provisions outlined in the Central Pollution Control Board guidelines on 'Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and Penalty'.
7. It is the duty of the authorized person to take prior permission of the State Pollution Control Board to close down the facility.
8. The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.

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3. The record of consumption and fate of the imported hazardous and other wastes shall be maintained.

10. The hazardous and other waste which gets generated during recycling or reuse or recovery or preprocessing or utilization of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorization.

11. The importer or exporter shall bear the cost of import or export and mitigation of damages if any.

12. An application for the renewal of an authorization shall be made as laid down under these Rules.

13. Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.

14. Annual return shall be filed by June 30th for the period ensuring 31st day of the year

6. **GENERAL CONDITIONS:**

6.1 Unit shall develop green belt within premises as per the CPCB guidelines. However, if adequate land is not available within premises the unit shall tie up with local agencies like gram panchayat, school, social forestry office etc. for the plantation at suitable open area in nearby locality and submit an action plan of plantation for next three years to GPCB.

6.2 Adequate plantation shall be carried out all along the periphery of the industrial premises in such a way that the density of plantation is at least 1000 trees per acre of land and a green belt of 10 meters width is developed.

6.3 The applicant shall have to submit the returns in prescribed form regarding water consumption and shall have to make payment of water cess to the Board under the Water (Prevention and Control of Pollution) Cess Act- 1977.

6.4 In case of change of ownership/management the name and address of the new owners/partners/directors/proprietor should immediately be intimated to the Board.

6.5 The applicant shall however, not without the prior consent of the Board bring into use any new or altered outlet for the discharge of effluent or gaseous emission or sewage waste from the proposed industrial plant. The applicant is required to make applications to the Board for it is purpose in the prescribed forms under the provisions of the Water (Prevention and Control of Pollution) Act-1974, the Air (Prevention and Control of Pollution) Act-1981 and the Environment (Protection) Act-1986.

6.6 The overall noise level in and around the plant area shall be kept well within the standards by providing the noise control measures including engineering control like acoustic enclosure, hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise level shall conform to the standards prescribed under the Environment (Protection) Act, 1986 & Rules.

Outward No. [illegible]

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6.7 Applicant is required to comply with the manufacturing, Storage and Import of Hazardous Chemicals Rules 1989 framed under the Environment (Protection) Act-1986.

6.8 If it is established by any competent authority that the damage is caused due to their industrial activities to any person or his property in that case they are obliged to pay the compensation as determined by the competent authority.

6.9 Applicant shall have to comply with all the guidelines / Directive issued / being issued by MoEF&CC / CPCB / DoEF from time to time

6.10 Applicant shall not use/withdraw ground water either during construction and for operation phase.

6.11 Environmental cell shall be setup and shall be responsible for the total Environmental management.

6.12 Monitoring in respect to Air, Water, Noise level shall be carried out and results shall be submitted to GPCB on quarterly basis.

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

(Smt. U.K. Upadhyay)
Environmental Engineer

Date:

NO: PC/ CCA-KUTCH- 454(7)/ ID 18026/

ISSUED TO:
Sanghi Industries Ltd
(Clinkerization Plant),
Survey no. 96, 97, 99, 100, 123, 124 of Mothor
And 84, 65 of Hothiyay, &
Vill: Motibar, Ta. Abdasa,
Dist: Kutch

Online Receipt No: 529352, 06/12/2012

ANNEXURE - 20

G.P.Byn.-(V)-2002-30,00,000-07-2020-(1)
G.R. R.D., No. R.A.M. 102006-1223-L.1. dated 3-4-2006.

આર. વી. ૭ (તુષારેલ)

ગામ નમુનો નંબર ૭ અને ૧૨

No. S 7936119

1227936119
1 of 1

બ્લોક/સરવે નંબર :	૩૦૬/૫/૧/૭/૫/૨	પાનું :	૬૭૨૧
રાવાપ્રકાર :	સરકારી પડતર	મોજે :	બોરસી
ખેતરનું નામ :	નવો સ.નં.૧૧૮/૫/૧/૭/૫/૧/૭, અનામત જંગલ	તાલુકો :	મુરલ
અન્ય વિગતો :		જિલ્લો :	

ધારક જમીન	ક્ષેત્રફળ	ખાતા નંબર	ક્ષેત્રફળ	આકાર	નોંધ નંબરો અને
જાહેર	હે.આરે.ચો.મી.		હે.આરે.ચો.મી.		કબજેદારનો નામ
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કુલ ક્ષેત્રફળ	૨૩-૯૫-૩૫	૫૨૧	૨૩-૯૫-૩૫	0.00	નામદાર કલક્ટર(૨૨૫૦)
આકાર રૂ.	0.00				
જુડી તથા વિશેષપારે રૂ	0.00				
પાણીપટ્ટા રૂ.	0.00				

ગણોતિયાની વિગતો	બીજા હકો અને બોજાની વિગતો
	૧૬૫૫,૨૨૧૧,૨૨૫૦,૨૬૩,૬૬૮,

	અનામત જંગલ તરીકે જાહેર કરેલ છે.<૨૨૫૦>

Processed By: (આસિસ્ટન્ટ ઓપરેટર(ઈ-પટ્ટા))

G.P.Rvn.-(V)-2002-30,00,000-07-2020-(1)
G.R.,R.D.,No.R.A.M.102006-1223-L.1.dated:3-8-2006.

ફાર્મ. વી. (સુધારેલ)

ગામ નમુનો નંબર ૭ અને ૧૨ No. S 7936118

1227936118
1 of 1

બ્લોક/સરવે નંબર :	૧૩૯/૫૫/૧૬૧ સરકારી પડતર	પાનું :	૬૭૨૧
તલાટીકાર :		મોજે :	ચોરાશી
ખેતરનું નામ :	નવો સ.નં.૧૫૫/૧/૬૨૨, અનામત જંગલ	તાલુકો :	મુરત
અન્ય વિગતો :		જિલ્લો :	

ધારક જમીન	ક્ષેત્રફળ	ખાતા નંબર	ક્ષેત્રફળ	આકાર	બોજા નંબરો અને ધારકોના નામ
જરાયત	હે.આરે.ચો.મી. ૮૬-૨૦-૩૦		હે.આરે.ચો.મી.	૨૨૬૦,૨૩૫૨,	
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કુલ ક્ષેત્રફળ	૮૬-૨૦-૩૦	૫૨૧	૮૬-૨૦-૩૦	૦.૦૦	નામદાર સરકાર(૨૨૬૦)
આકાર રૂ.	૦.૦૦				
જુડી તથા વિશેષપારે રૂ	૦.૦૦				
પાણીલાગ રૂ.	૦.૦૦				

ગણોતિયાની વિગતો	બીજા હકો અને બોજાની વિગતો
	૧૬૩૫,૨૨૬૦,૨૩૫૨,

	અનામત જંગલ તરીકે જાહેર કરેલ છે.<૧૬૩૫>
	અનામત જંગલ તરીકે જાહેર કરેલ છે.<૨૩૫૨>

Processed By: (નામ મામલતદાર/ડે-પટા)

ઇ-નકલ મંજુર ૬-૧૨-૨૦૨૧

16/12/2020 ૪:૨૦ pm ની સ્થિતિએ

વેચાણની નકલ/ Chargable Copy ૧૫ રૂ. ૫- (રૂપીયા પાંચ પુરા) ભરેલ છે. આકાર ૨૬. પ્રિંટ તા. 16/04/2021 11:01:43
શોધન : તપ્રીમ કમ્પ્યુટિંગ કેન્દ્ર, ગુજરાત રાજ્ય

મામલતદાર કચેરી, મુરત સરકાર

G.P.Byn.-(V)-2002-30.00,000-07-2020-(1)
G.R.,R.D., No.R.A.M. 102009-1223-L.1 dated: 3-8-2006.

આર. બી. [illegible] (ગુજરાતી)

ગામ નમુનો નંબર ૭ અને ૧૨ No. S 7936120

1227936120
1 of 1

બ્લોક/સરવે નંબર : ૪૨૪/૭૧/૨
સરજારી પડતર

ગામ : કજોદ
મોજે : પોરાલી
તાલુકો : માંગરોળ
જિલ્લો : સુરત

સત્તાપ્રકાર : નવી સ.ન.૨૫૫૪૪/૧૬૬, અનામત જંગલ
ખેતરનું નામ :
અન્ય વિગતો :

લાયક જમીન જરાયત	ક્ષેત્રફળ હે.આરે.ચો.મી.	આકાર	નોંધ નંબરો અને [illegible]
		હે.આરે.ચો.મી.	
.....	.....		૨૬૮,૩૧૬,૪૦૯,૬૬૯,૨૨૬૦,૨૪૩૯,૨૫૩૬,૨૫૮ ૪ ૨૫૮૫,૨૫૮૬,૨૫૮૭,૨૫૮૯,૨૫૯૨,
કુલ ક્ષેત્રફળ	૪૩-૩૫-૩૨	.....	.....
આકાર રૂ.	0.00	૫૨૧ | ૪૩-૩૫-૩૨ | 0.00	નામદાર સરકાર(૨૨૬૦)
જુડી તથા વિશેષપારો રૂ	0.00		
પાણીપટ્ટા રૂ.	0.00		

ગણોતિયાની વિગતો

બીજા હકો અને બોજાની વિગતો

૬૦૩,૧૦૩૫,૨૧૬૬,૨૨૬૦.

અનામત જંગલ તરીકે જાહેર કરેલ છે.<૨૨૬૦>

મે.કલેક્ટરશ્રી સુરતના હુકમનં.આરટીએસ/ગણોતીયા/સીવીઝન/કેસ નં.૪/૨૦૦૬ તા.૨૬/૦૩/૨૦૧૦ ના હુકમ થી ગા પડેલ કેફિયત નોંધ નં.૨૨૬૦ વાળી તેમજ<૨૪૩૫>

ગુજરાતનું ફુરસ્તી પત્રક પોકલવા ડી.આઇ.એલ.આર ને જાણ કરતો હુકમ<૨૪૩૫>

મે.સચિવશ્રી મહેસુલ વિભાગ (વિવાદ) અમદાવાદના હુ.નં.મવિવિ/જમન/સત/૩૬/૨૦૧૦ તા.૧૬/૧૨/૨૦૧૫ થી આપવામાં આવેલ હકમની નોંધ કરી.<૨૫૮૪>

મે.સચિવશ્રી મહેસુલ વિભાગ (વિવાદ) અમદાવાદના હુ.નં. મવિવિ/જમન/સત/૪૦/૨૦૧૦ તા.૧૬/૧૨/૨૦૧૫ મુ આપવામાં આવેલ હકમની નોંધ કરી.<૨૫૮૫>

મે.સચિવશ્રી મહેસુલ વિભાગ (વિવાદ) અમદાવાદના હુ.નં. મવિવિ/જમન/સત/૪૨/૨૦૧૦ તા.૧૬/૧૨/૨૦૧૫ થી આપવામાં આવેલ હકમની નોંધ કરી.<૨૫૮૬>

મે.સચિવશ્રી મહેસુલ વિભાગ (વિવાદ) અમદાવાદના હુ.નં. મવિવિ/જમન/સત/૪૧/૨૦૧૦ તા.૧૬/૧૨/૨૦૧૫ થી આપવામાં આવેલ હકમની નોંધ કરી.<૨૫૮૭>

સચિવશ્રી મહે. વિભાગ(વિવાદ) અમદાવાદના ખે હુ.નં.મવિવિ/જમન/સત/૧ થી ૩૮/૨૦૧૦ લીઝ નં. મવિવિ/જમન/સત/૪૩/૨૦૧૦ તા.૩૦/૧૦/૨૦૧૫ મજબ<૨૫૮૯>

નામદાર ગુજરાત હાઈકોર્ટમાં સ્પે.સી.એ.નં. ૨૩૭૨/૧૨ બાબતે જે કંઈ નિર્ણય થાય તે તમામ પક્ષકારોને બંધનકર્તા રહેશે<૨૫૮૯>

પંચેશ્વાનસર્ટી તા.૧૬/૨/૧૫ ગુજબ હજુરત કન્ટેઈનર ફેઈટ સ્ટેશન પ્રાઈવેટ લીમીટેડ વતે પોર્ટ બેઝ અપ ફેસીલીટીના ૨૫ ઝેરા વાપરણી ક્ષ<૨૫૯૨>

Processed By. [illegible]

[illegible] ૯-૦૪-૨૦૧૬

14/04/2016 01:05 pm થી વિતરિત

વેચાણની નકલ/ Chargable Copy માટે રૂ. ૫૦ (પચાસ પાંચ પુરા) ચલણ છે. આકાર ૪૩. ફી તા. 16/04/2021 11:05:00

મામલતદાર તથા [illegible] સરકાર

મીજબ્ય : રાષ્ટ્રીય સુચના-વિજ્ઞાન કેન્દ્ર, ગુજરાત રાજ્ય નકલ આપનાર કર્મચારી : ગ્રામ પંચાયત Jangalia, પોરાલી

R V 24 G(Amended)

Village Form No. 7 & 12 No. S 7936119

Block/Survey No. : 306/A/1/A/1/A2 Page : 1 of 1

Tenure of Land : Government Land Mouje (Village name) : Hajira

Field Name ; New Survey No. 128/A/1/1/A/1/B Reserved Forest Taluka : Chorasi

Other Details : District : Surat

Land	Area	Account No./ Area/ Aakar	Entry Number & Occupier Name
Jarayat	Hector- Are-Sq M		2211,2260,316,392,41,551
Total Area Aakar Rs. Judi & Sp. Dharo Rs. Water Charge Rs.	23-95-75 0.00 0.00 0.00	521/23-95-75/0.00	Hon'ble Government(2260)
Tenancy Details		Second Right & Burden details 1975,2211,2260,263,669 _____ Declared as Reserved Forest <2260>	

Dy Mamalatdar E-dhara

#Not Approved & Disputed + Cancel
16/12/2010 7.30pm
Chargeable Copy Rs.5/- (Five Rupees) Thanks Print 16/04/2021 11.01.43
Source : National Information Science Center Gujarat State

R V 24 G(Amended)

Village Form No. 7 & 12 No. S 7936118

Block/Survey No. : 179/A1/A2 Page : 1 of 1

Tenure of Land : Government Land Mouje (Village name) : Hajira

Field Name: New Survey No. 1/A/1/A/2 Reserved Forest Taluka : Chorasi

Other Details : District : Surat

Land	Area	Account No./ Area/ Aakar	Entry Number & Occupier Name
Jarayat	Hector- Are-Sq M		2260,2352
Total Area Aakar Rs. Judi & Sp. Dharo Rs. Water Charge Rs.	86-20-30 0.00 0.00 0.00	521/86-20-30/0.00	Hon'ble Government(2260)
Tenancy Details		Second Right & Burden details 1975,2260,263,2352 _____ Declared as Reserved Forest <1975> Declared as Reserved Forest <2352>	

Dy Mamalatdar E-dhara

_____

#Not Approved & Disputed +Cancel

16/12/2010 7.30pm

Chargeable Copy Rs.5/- (Five Rupees) Thanks Print 16/04/2021 11.01.43

Source : National Information Science Center Gujarat State

R V 24 G(Amended)

Village Form No. 7 & 12 No. S 7936120

Block/Survey No. : 434/A1/2 Page : 1 of 1

Tenure of Land : Government Land Mouje (Village name) : Hajira

Field Name: New Survey No. 255/A/1/B Reserved Forest Taluka : Chorasi

Other Details : District : Surat

Land	Area	Account No./ Area/ Aakar	Entry Number & Occupier Name
Jarayat	Hector- Are-Sq M		268,316,409,965,2260,2435,2579,2584
Total Area	47-75-32		2585,2586,2578,2589,2592
Aakar Rs.	0.00	521/47-75-32/0.00	Hon'ble Government(2260)
Judi & Sp. Dharo Rs.	0.00		
Water Charge Rs.	0.00		
Tenancy Details		Second Right & Burden details 603,1975,2196,2260 _____ Declared as Reserved Forest <2260> Hon'ble Collector Surat Order/RTS/SUmoto/Revision/Case no.4/2009 Date 26/03.2010 mutation entry no. 2260 <2415> Amended Durasti Record sent to DILR Order <2435> Hon'ble Secretary Revenue Department (Dispute) Ahmedabad no. MVV/JMN/ST/39/2010 Date 16/12/2015 order noted<2584> Hon'ble Secretary Revenue Department (Dispute) Ahmedabad no. MVV/JMN/ST/40/2010 Date 16/12/2015 order noted<2585> Hon'ble Secretary Revenue Department (Dispute) Ahmedabad no. MVV/JMN/ST/42/2010 Date 16/12/2015 order noted<2586> Hon'ble Secretary Revenue Department (Dispute) Ahmedabad no. MVV/JMN/ST/41/2010 Date 16/12/2015 order noted<2587> Secretary Revenue Department (Dispute) Ahmedabad no. MVV/JMN/ST/1 to 38/2010 link no. MVV/JMN/ST/43/2010 Date 30/10/2015 order noted<2589> Hon'ble Gujarat High court Sp C A no. 2702/12- whatever decision to be taken will be bound to all parties<2589> Possession certi. Dated 19/02/15 to Hajira Container Freight Station pvt Limitedand Port back up facility 25 hector Right of Use<2592>	

Dy Mamalatdar E-dhara

#Not Approved & Disputed +Cancel

14/04/2016 1.05pm

Chargeable Copy Rs.5/- (Five Rupees) Thanks Print 16/04/2021 11.01.43

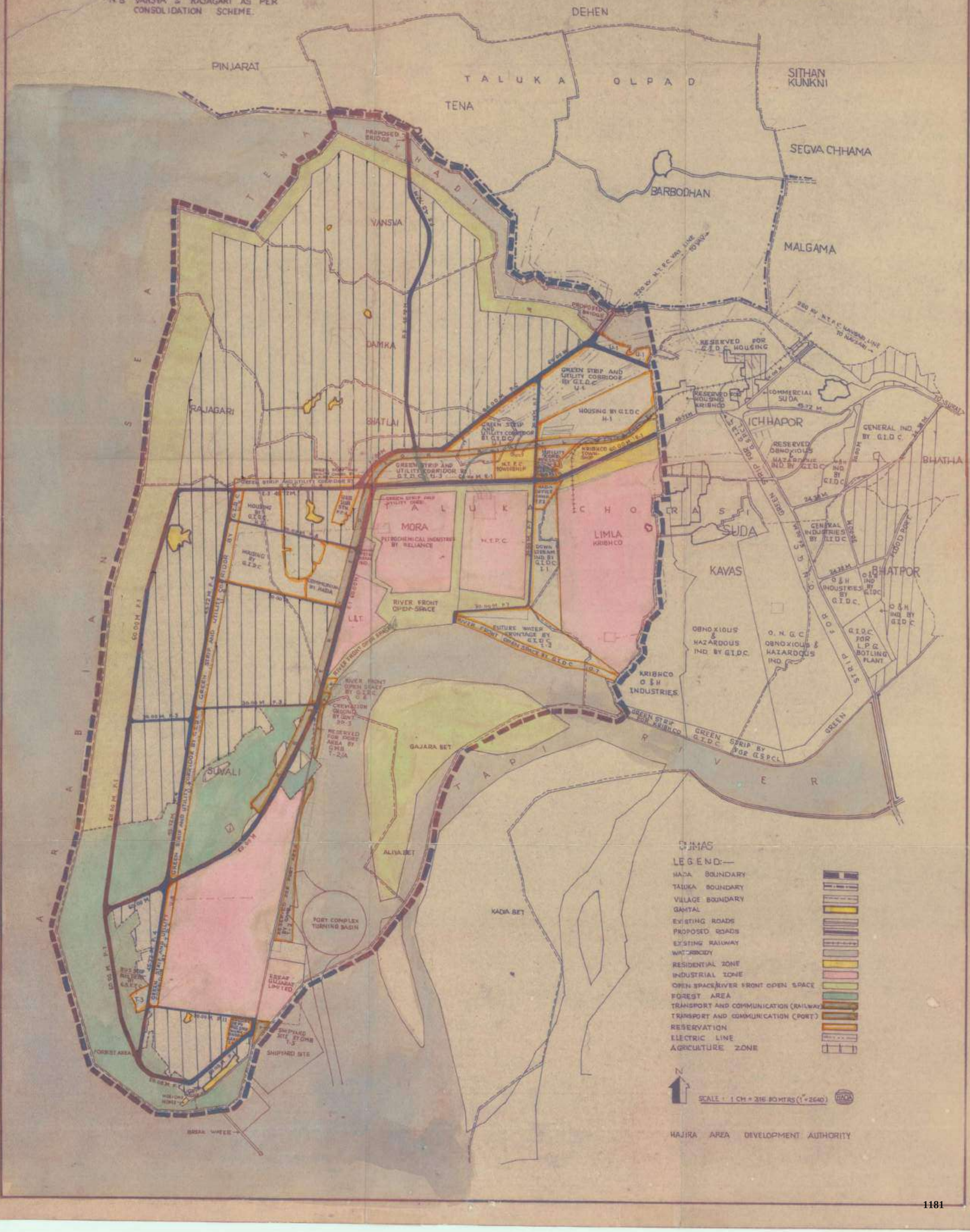
Source : National Information Science Center Gujarat State

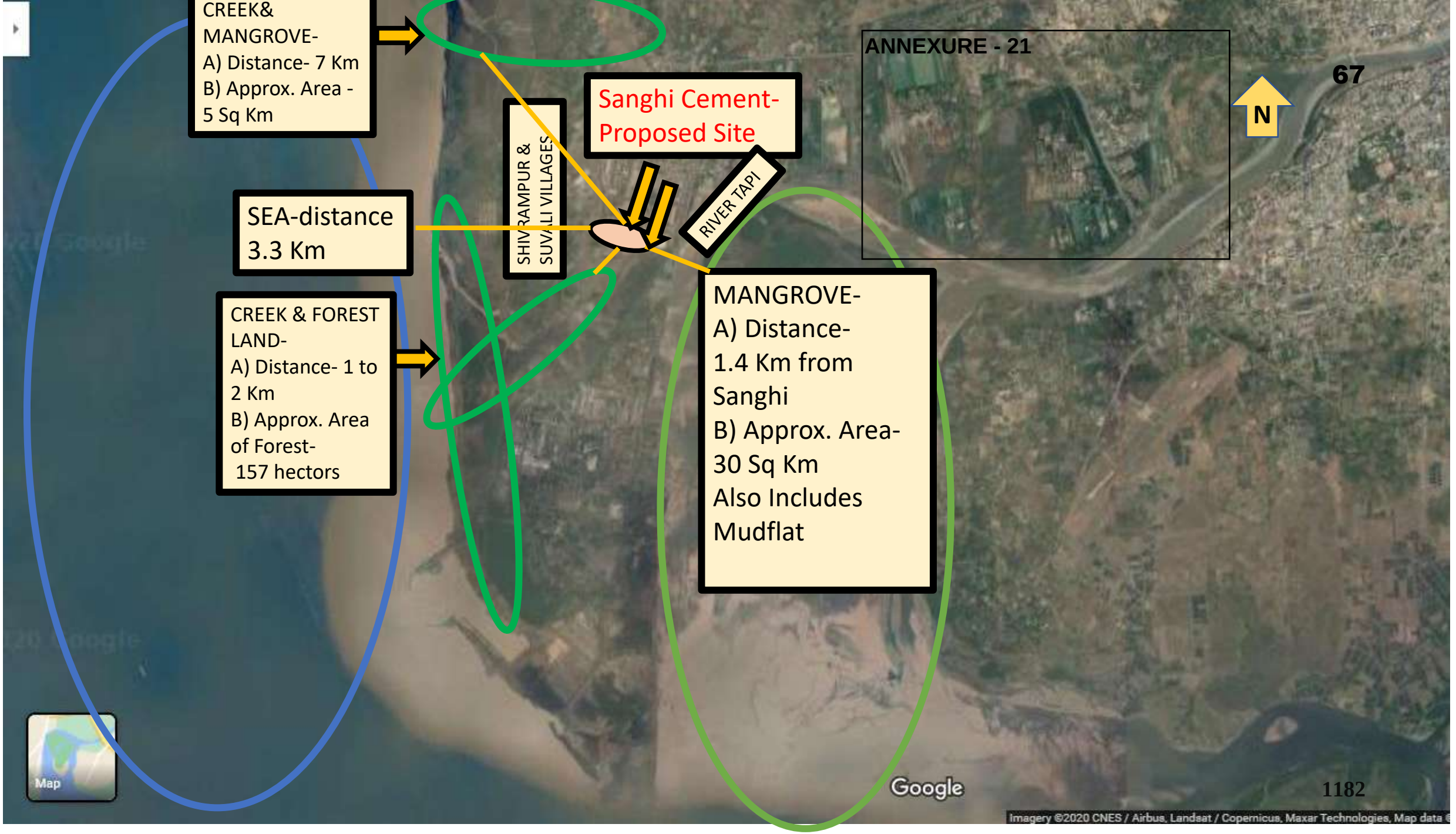
મોજે સુવાલી (સુવાલી)
તાલુકો ચોર્યાસી
જીલ્લો સુરત
મોજે સુવાલી
તાલુકો ચોર્યાસી
જિલ્લો સુરત

SANCTIONED DEVELOPMENT PLAN OF HAJIRA DEVELOPMENT AREA

PROPOSED LAND USE PLAN 2001 A.D.

N.B VANSVA & RAJAGARI AS PER CONSOLIDATION SCHEME.




ANNEXURE - 21
67
N
CREEK&
MANGROVE-
A) Distance- 7 Km
B) Approx. Area -
5 Sq Km
Sanghi Cement-
Proposed Site
RIVER TAPI
SHIVRAMPUR &
SUVALI VILLAGES
SEA-distance
3.3 Km
CREEK & FOREST
LAND-
A) Distance- 1 to
2 Km
B) Approx. Area
of Forest-
157 hectors
MANGROVE-
A) Distance-
1.4 Km from
Sanghi
B) Approx. Area-
30 Sq Km
Also Includes
Mudflat
Map
Google
1182
Imagery ©2020 CNES / Airbus, Landsat / Copernicus, Maxar Technologies, Map data

CREEK& MANGROVE-
A) Distance- 7 Km
B) Approx. Area - 5 Sq Km

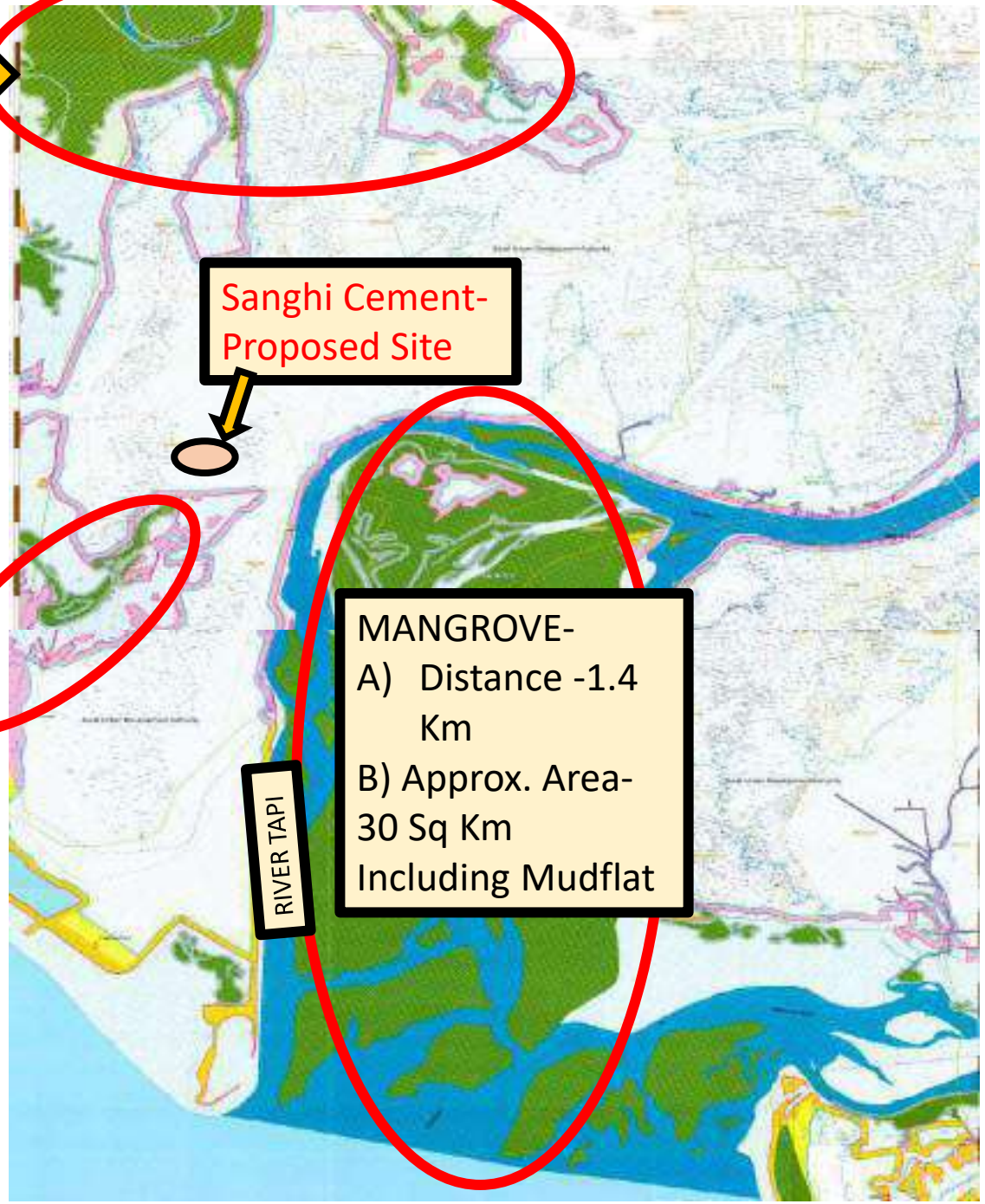
Sanghi Cement-
Proposed Site

SEA-distance
3.3 Km

CREEK & FOREST LAND-
A) Distance- 1 to 2 Km
B) Approx. Area of Forest-
157 hectors

MANGROVE-
A) Distance -1.4 Km
B) Approx. Area- 30 Sq Km
Including Mudflat

RIVER TAPI



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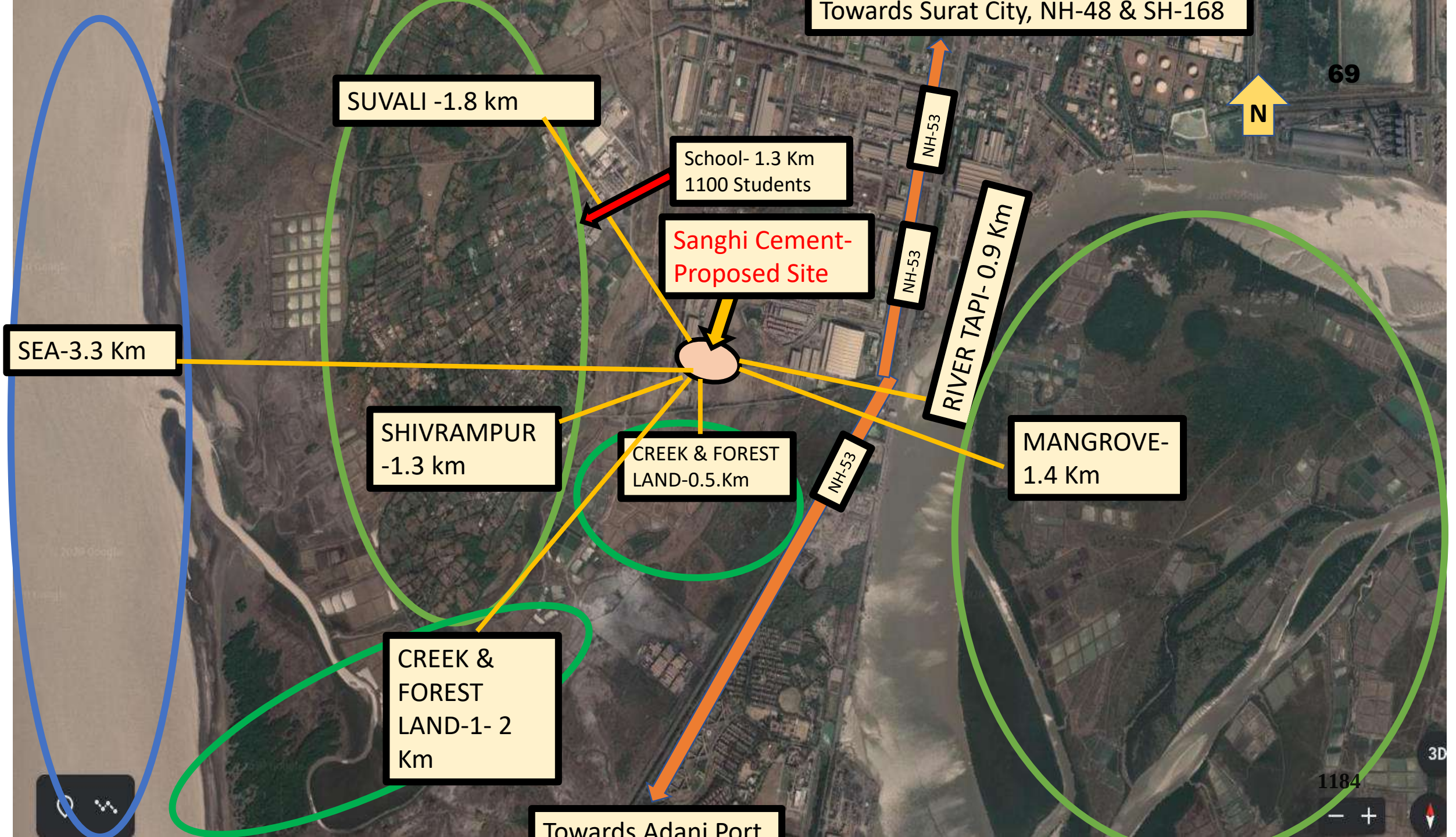

Towards Surat City, NH-48 & SH-168
69
N
SUVALI -1.8 km
School- 1.3 Km
1100 Students
Sanghi Cement-
Proposed Site
NH-53
NH-53
NH-53
RIVER TAPI- 0.9 Km
SEA-3.3 Km
SHIVRAMPUR
-1.3 km
CREEK & FOREST
LAND-0.5.Km
MANGROVE-
1.4 Km
CREEK &
FOREST
LAND-1- 2
Km
Towards Adani Port
1184
3D

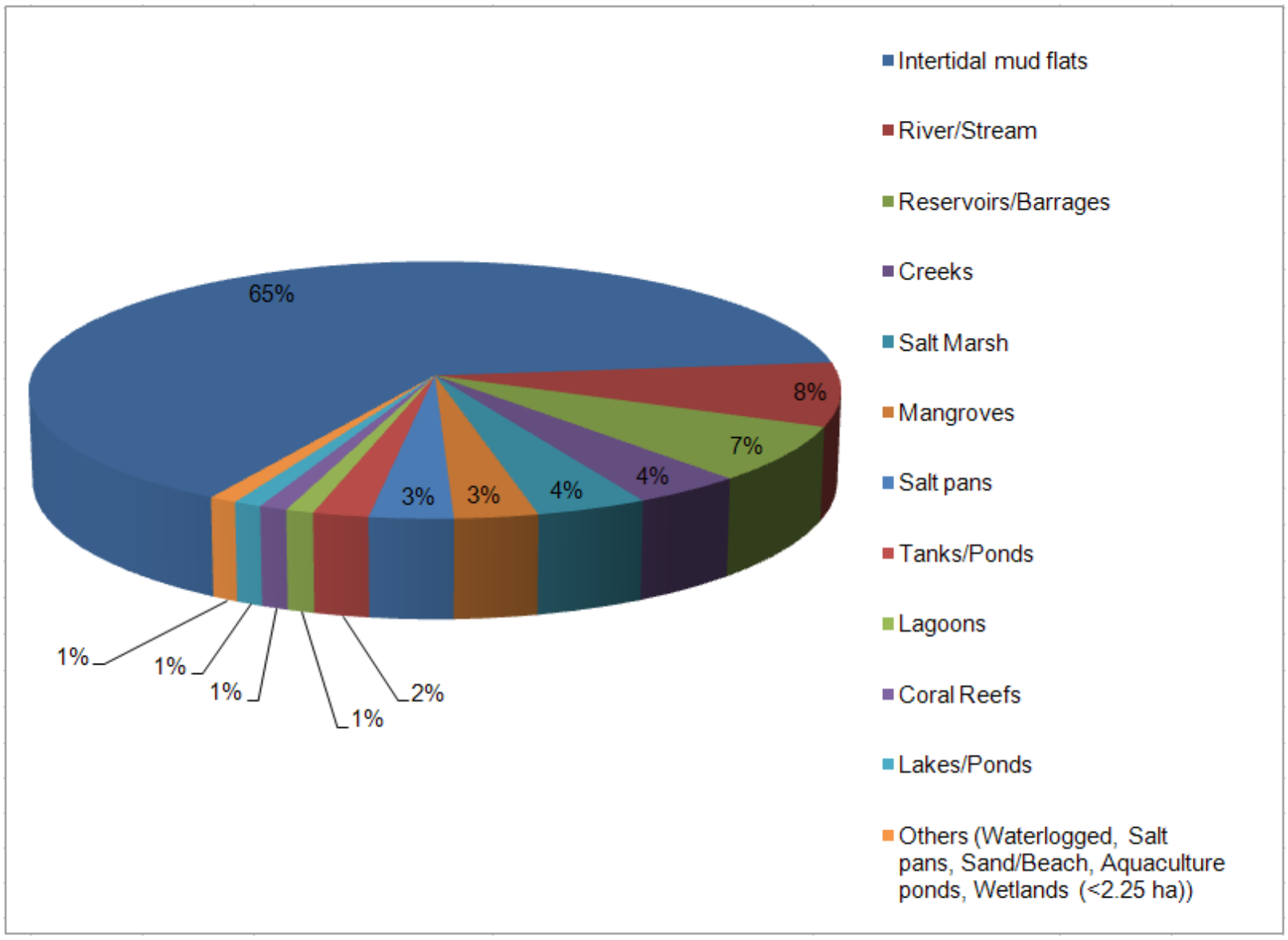


Figure 10: Type-wise wetland distribution in Gujarat

7.1 DISTRICT-WISE WETLAND MAPS AND STATISTICS

The state has 25 districts. The geographic area varied from 45652 sq. km (Kachchh) to 649 sq. km (Gandhinagar). The wetland area in each district as per cent of total state wetland area ranged from 0.13% (The Dangs) to 67.94 % (Kachchh). The wetland area in the districts as per cent of geographic area varied from 1.93% (Mehsana) to 51.72 % (Kachchh). Kachchh, Jamnagar, Bharuch, Bhavnagar and Surat are wetland rich districts mainly due to coastal wetlands. Coral is one of the special wetland types found only in the district of Jamnagar lying in the Gulf of Kachchh. The area occupied by Coral is around 33,547 ha, scattered over 50 sites. Mangrove is another special wetland type found in 13 districts, covering an area of 90475 ha. However, maximum mangrove area is observed in Kachchh district having 50197 ha, followed by Jamnagar district with 18537 ha. Salt marsh is observed in 15 districts. Maximum area under this is observed in Bhavnagar district (25374 ha), followed by Ahmedabad district (22858 ha). There are 8818 Tanks/pond (man made) distributed through out the state covering an area of 73,873 ha. Maximum number are observed in the Kachchh district (1438 with 14449 ha area), followed by Surendranagar district (719 with 7941 ha area). Least number of Tanks is observed in the district of Dangs (only 3). Patan, Surendranagar and Ahmedabad districts are rich in natural Lakes/pond with 9, 8 and 7 numbers each out of the total 40 mapped in the state.

District-wise wetland area estimates is given in Table-5 and graphical distribution of wetlands is shown in Figure - 11.

Wetland statistics followed by wetland map and corresponding satellite data for each district is given to have a fairly good idea about the distribution pattern and density of wetlands in the district.

Table-5:District-wise wetland area

Sr. No.	District	Geographic Area (sq. km)	Wetland Area (ha)	% of total wetland area	% of district geographic area
1	Kachchh	45652	2360909	67.94	51.72
2	Banaskantha	12703	43491	1.25	3.42
3	Patan	5738	34268	0.99	5.97
4	Mehsana	4386	8462	0.24	1.93
5	Sabarkantha	7390	42653	1.23	5.77
6	Gandhinagar	649	4263	0.12	6.57
7	Ahmadabad	8707	63303	1.82	7.27
8	Surendranagar	10489	52896	1.52	5.04
9	Rajkot	11203	55820	1.61	4.98
10	Jamnagar	14125	198657	5.72	14.06
11	Porbandar	2294	22199	0.64	9.68
12	Junagadh	8839	30563	0.88	3.46
13	Amreli	6760	28505	0.82	4.22
14	Bhavnagar	11155	85895	2.47	7.7
15	Anand	2942	67570	1.94	22.97
16	Kheda	4215	14415	0.41	3.42
17	Panch Mahals	5219	38049	1.09	7.29
18	Dohad	3642	15092	0.43	4.14
19	Vadodara	7794	35553	1.02	4.56
20	Narmada	2749	22501	0.65	8.19
21	Bharuch	6524	112453	3.24	17.24
22	Surat	7657	86062	2.48	11.24
23	The Dangs	1764	4368	0.13	2.48
24	Navsari	2211	23888	0.69	10.8
25	Valsad	3034	23116	0.67	7.62
	TOTAL	**197841**	**3474951**	**100**	**14.06**

7.1.22 Surat

Surat is an administrative district of Gujarat with Surat city as its head quarter town. It is the second most industrialized and advanced district of Gujarat after Ahmedabad. The district covers an area of 7,657 sq. km with total population of 49, 96,391 according to 2001 census. Surat is bordered by the districts of Bharuch and Narmada in the north, Navsari and Dang in the south and the Gulf of Khambat in the west.

Total 595 wetlands are mapped including 267 small wetlands (< 2.25 ha) with 86062 ha area. Inland wetlands contribute 70% of the total wetland area and coastal wetlands contribute 30% of the total wetland area. Major wetland categories of the district are Reservoirs, Rivers/streams, Inter-tidal mud flats, Salt marsh and mangroves. Details of area estimates of wetlands in Surat district is shown in Table-27.

Area under aquatic vegetation in post-monsoon is about 3727 ha and significantly high during pre-monsoon (15886 ha). Open water spread of the wetlands is higher in post-monsoon (58091 ha) than during pre-monsoon (37398 ha). Major part of the open water area is under low turbidity during both the seasons.

Table 27: Area estimates of wetlands in Surat

Area in ha

Sr. No.	Wettcode	Wetland Category	Number of Wetlands	Total Wetland Area	% of wetland area	Open Water	
						Post-monsoon Area	Pre-monsoon Area
	1100	**Inland Wetlands - Natural**					
1	1101	Lakes/Ponds	2	237	0.28	237	99
2	1106	River/Stream	39	16210	18.84	10953	7266
	1200	**Inland Wetlands -Man-made**					
3	1201	Reservoirs/Barrages	7	42095	48.91	42098	25306
4	1202	Tanks/Ponds	147	1142	1.33	1070	524
		Total - Inland	**195**	**59684**	**69.35**	**54358**	**33195**
	2100	**Coastal Wetlands - Natural**					
5	2102	Creeks	7	2866	3.33	2261	2812
6	2103	Sand/Beach	1	102	0.12	-	-
7	2104	Intertidal mud flats	34	11769	13.68	-	-
8	2105	Salt Marsh	19	4923	5.72	-	-
9	2106	Mangroves	39	3655	4.25	-	-
	2200	**Coastal Wetlands - Man-made**					
10	2201	Salt pans	7	1617	1.88	364	491
11	2202	Aquaculture ponds	26	1179	1.37	1108	900
		Total - Coastal	**133**	**26111**	**30.34**	**3733**	**4203**
		Sub-Total	**328**	**85795**	**99.69**	**58091**	**37398**
		Wetlands (<2.25 ha), mainly Tanks	267	267	0.31	-	-
		Total	**595**	**86062**	**100.00**	**58091**	**37398**

Area under Aquatic Vegetation	3727	15886

Area under turbidity levels		
Low	52069	31228
Moderate	3650	3316
High	2372	2854

State : Gujarat

WETLAND MAP

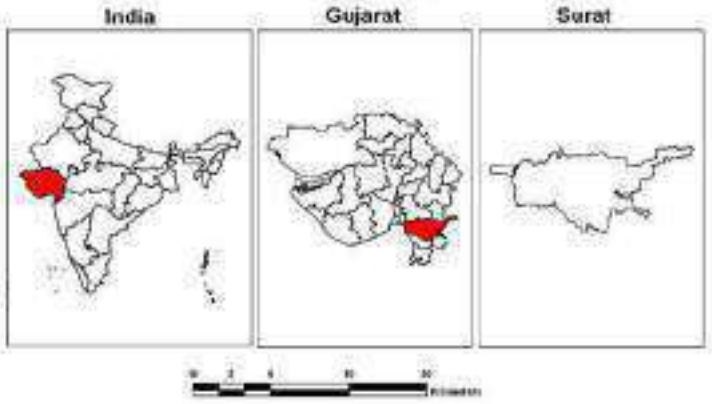
District : Surat

Symbol	Typecode	Level I	Level II	Level III
		Inland Wetlands		
			Natural	
	1101			Lakes/Ponds
	1102			Ox-bow lakes/ Cut-off meanders
	1103			High altitude wetlands
	1104			Reverine wetlands
	1105			Waterlogged
	1106			River/Stream
			Man-made	
	1201			Reservoirs/Barrages
	1202			Tanks/Ponds
	1203			Waterlogged
	1204			Salt pans
		Coastal Wetlands		
			Natural	
	2101			Lagoons
	2102			Creeks
	2103			Sand/Beach
	2104			Intertidal mud flats
	2105			Salt marsh
	2106			Mangroves
	2107			Coral reefs
			Man-made	
	2201			Salt pans
	2202			Aquaculture ponds

Legend

- Wetlands (<2.25ha)
- Settlements
- Roads
- Railway
- Canals
- Drainage (line)
- Town/Settlements
- District boundary
- State boundary
- International boundary

Location Map



Data Source :
IRS P6 LISS III data (Pre-monsoon and Post-monsoon Season 2006-07)

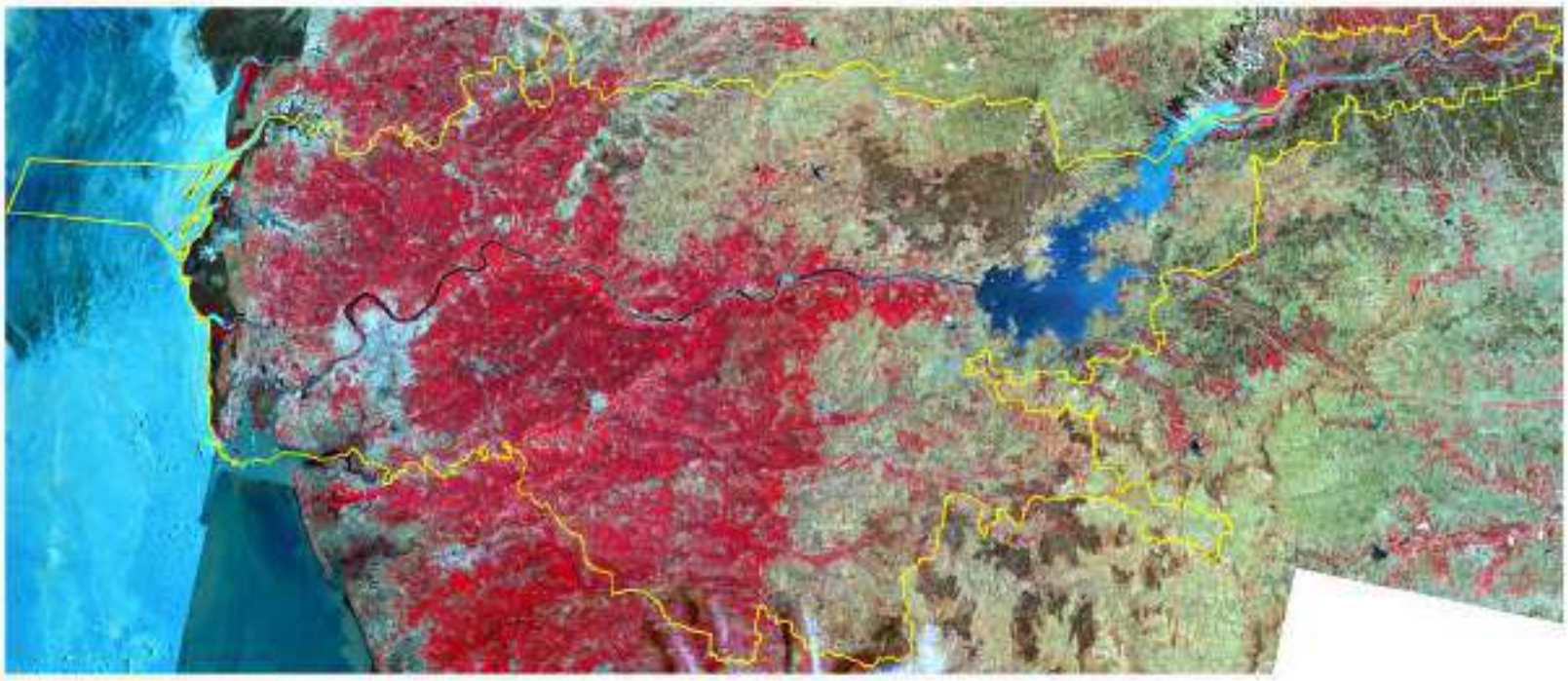
Prepared By :
Space Applications Centre (ISRO), Ahmedabad
and
Bhaskaracharya Institute for Space Applications and Geo-informatics, Gandhinagar

Sponsored By:
Ministry of Environment and Forests
Government of India

74

State : Gujarat

District : Surat



IRS P6 LISS-III Pre-monsoon data (2007)

ANNEXURE - 23

[TO BE PUBLISHED IN THE GAZETTE OF INDIA, PART II, SECTION 3, SUB-SECTION (ii)]

GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi the ..... of November, 2010

G.S.R. ..... **WHEREAS** the wetlands, vital parts of the hydrological cycle, are highly productive, support exceptionally large biological diversity and provide a wide range of ecosystem services, such as waste assimilation, water purification, flood mitigation, erosion control, ground water recharge, microclimate regulation, aesthetic enhancement of the landscape while simultaneously supporting many significant recreational, social and cultural activities, besides being a part of the cultural heritage;

AND WHEREAS many wetlands are seriously threatened by reclamation through drainage and landfill, pollution (discharge of domestic and industrial effluents, disposal of solid wastes), hydrological alterations (water withdrawal and inflow changes) and over-exploitation of their natural resources resulting in loss of biodiversity and disruption in goods and services provided by wetlands;

AND WHEREAS India is a signatory to the Ramsar Convention for the conservation and wise use of wetlands, which includes in its ambit a wide variety of habitats, such as rivers and lakes, coastal lagoons, mangroves, peatlands, coral reefs, and numerous man-made wetlands, such as ponds, farm ponds, irrigated agricultural lands, sacred groves, salt pans, reservoirs, gravel pits, sewage farms, and canals;

AND WHEREAS the Central Government has identified certain wetlands for conservation and management under its conservation programme and provides financial and technical assistance to the State Governments and Union territory Administrations for various conservation activities through approval of the Management Action Plans;

AND WHEREAS the National Environment Policy, 2006 recognises the ecological services provided by wetlands and emphasizes the need to set up a regulatory mechanism consistent with the Ramsar Convention to maintain the ecological character of the identified wetlands and develop a national inventory of such wetlands;

NOW, THEREFORE, in exercise of the powers conferred by section 25, read with sub-section (1) and clause (v) of sub-section (2) and sub section (3) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following rules for conservation and management of wetlands, namely:-

1. **Short title and commencement.-**

   1. These rules may be called the Wetlands (Conservation and Management) Rules, 2010.

2. They shall come into force on the date of their publication in the Official Gazette.

2. **Definitions.- (1)In these rules, unless the context otherwise requires,-**

(a) "Act" means the Environment (Protection) Act, 1986 (29 of 1986);

(b) "Authority" means the Central Wetlands Regulatory Authority constituted under rule 5;

(c) "dredging" means an excavation activity or operation usually carried out at least partly underwater, in shallow sea or fresh water areas with the purpose of gathering up bottom sediments and disposing them off at a different location,

(d) "National Park" means an area declared, as National Park under section 35 or section 38, or deemed to be declared as a National Park under sub-section (3) of section 66, of the Wild Life (Protection) Act, 1972 (35 of 1972);

(e) "Ramsar Convention" means the Convention on Wetlands signed at Ramsar, Iran in 1971;

(f) "UNESCO" means the United Nations Educational, Scientific and Cultural Organisation;

(g) "wetland" means an area or of marsh, fen, peatland or water; natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six meters and includes all inland waters such as lakes, reservoir, tanks, backwaters, lagoon, creeks, estuaries and manmade wetland and the zone of direct influence on wetlands that is to say the drainage area or catchment region of the wetlands as determined by the authority but does not include main river channels, paddy fields and the coastal wetland covered under the notification of the Government of India in the Ministry of Environment and Forest, S.O. number 114 (E) dated the 19th February, 1991 published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii) of dated the 20th February,1991;

(h) "wildlife sanctuary" means an area declared as a wildlife sanctuary under the provisions of Chapter IV of the WildLife (Protection) Act, 1972 (35 of 1972) and shall include an area deemed to be sanctuary under sub section (4) of section 66, of the said Act.

(2) The word and expressions used in these rules and not defined but defined in the Act, shall have the meaning respectively assigned to them in the Act.

3. **Protected wetlands.-**

Based on the significance of the functions performed by the wetlands for overall well being of the people and for determining the extent and level of regulation, the following wetlands shall be regulated under these rules, namely:

(i) wetlands categorised as Ramsar Wetlands of International Importance under the Ramsar Convention as specified in the Schedule.

(ii) wetlands in areas that are ecologically sensitive and important, such as, national parks, marine parks, sanctuaries, reserved forests, wildlife habitats, mangroves, corals, coral reefs, areas of outstanding natural beauty or historical or heritage areas and the areas rich in genetic diversity;

(iii) wetlands recognised as or lying within a UNESCO World Heritage Site;

(iv) high altitude wetlands or high altitude wetland complexes at or above an elevation of two thousand five hundred metres with an area equal to or greater than five hectares;

(v) wetlands or wetland complexes below an elevation of two thousand five hundred metres with an area equal to or greater than five hundred hectares.

(vi) any other wetland as so identified by the Authority and thereafter notified by the Central Government under the provisions of the Act for the purposes of these rules.

4. Restrictions on activities within wetlands.-

(1) The following activities within the wetlands shall be prohibited, namely:-

(i) reclamation of wetlands;

(ii) setting up of new industries and expansion of existing industries;

(iii) manufacture or handling or storage or disposal of hazardous substances covered under the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 notified vide S.O. number 966 (E) dated the 27th November, 1989 or the Rules for Manufacture, Use, Import, Export and Storage of Hazardous Micro-organisms/Genetically engineered organisms or cells notified vide GSR number 1037 (E) dated the 5th December, 1989 or the Hazardous Wastes(Management, Handling and Transboundry Movement) Rules, 2008 notified vide S.O. number 2265 (E), dated the 24th September,2008;

(iv) solid waste dumping provided that the existing practices, if any, existed before the commencement of these rules shall be phased out within a period not exceeding six months from the date of commencement of these rules;

(v) discharge of untreated wastes and effluents from industries, cities or towns and other human settlements: provided that the practices, if any, existed before the commencement of these rules shall be phased out within a period not exceeding one year from the date of commencement of these rules;

(vi) any construction of a permanent nature except for boat jetties within fifty metres from the mean high flood level observed in the past ten years calculated from the date of commencement of these rules.

(vii) any other activity likely to have an adverse impact on the ecosystem of the wetland to be specified in writing by the Authority constituted in accordance with these rules.

(2) The following activities shall not be undertaken without the prior approval of the State Government within the wetlands, namely:-

(i) withdrawal of water or the impoundment, diversion or interruption of water sources within the local catchment area of the wetland ecosystem;

(ii) harvesting of living and non-living resources;

(iii) grazing to the level that the basic nature and character of the biotic community is not adversely affected;

(iv) treated effluent discharges from industries, cities or towns, human settlements and agricultural fields falling within the limits laid down by the Central Pollution Control Board or the State Pollution Control Committee, as the case may be;

(v) plying of motorized boat, if it is not detrimental to the nature and character of the biotic community;

(vi) dredging, only if the wetland is impacted by siltation;

(vii) construction of boat jetties;

(viii) activities within the zone of influence, as per the definition of wetlands, that may directly affect the ecological character of the wetland;

(ix) facilities required for temporary use, such as pontoon bridges, that do not affect the ecological character of the wetland;

(x) aquaculture, agriculture and horticulture activities within the wetland;

(xi) repair of existing buildings or infrastructure including reconstruction activities.

(xii) any other activity to be identified by the Authority.

(3) Notwidstanding anything in sub-rule (1) or sub- rule(2), the Central Government may permit any of the prohibited activities or non-wetland use in the protected wetland on the recommendation of the Authority.

(4) The State Government shall ensure that a detailed Environment Impact Assessment is carried out in accordance with the procedures specified in the notification of the Government of India in the Ministry of Environment and Forests S.O. number 1533 (E) dated the September 14th, 2006 as amended from time to time.

(5) No wetland shall be converted to non-wetland use unless the Central Government is satisfied on the recommendation of the Authority that it is expedient in the public interest and reasons justifying the decision are recorded.

5. Constitution of Central Wetlands Regulatoty Authority.-

(1) The Central Government, in exercise of the powers conferred by sub-section(3) of section 3 of the Environment (Protection) Act,1986 (29 of 1986), hereby constitutes Central Wetlands Regulatory Authority consisting of the following Chairpersons and members for the purpose of these rules, namely:-

(a) Secretary, Ministry of Environment and Forests, Government of India – Chairperson;

(b) a representative (not below the rank of Joint Secretary) from Ministry of Tourism, Government of India - Member ex-officio;

(c) a representative (not below the rank of Joint Secretary) from Ministry of Water Resources, Government of India -- Member ex-officio;

(d) a representative (not below the rank of Joint Secretary) from Ministry of Agriculture, Government of India – Member ex-officio;

(e) a representative (not below the rank of Joint Secretary) from Ministry of Social Justice, Government of India – Member ex-officio;

(f) Chairman or his nominee, the Central Pollution Control Board, Member ex-officio;

(g) Joint Secretary or Adviser, dealing with the wetland in the Ministry of Environment and Forests, Government of India, - member ex-officio;

(h) Dr. Asad R. Rahmani, Director ,Bombay Natural History Society, Hornbill House, Dr. Salim Ali Chowk, Shaheed Bhagat Singh Road , Mumbai – 400 023; Expert Ornithology –Member.

(i) Dr. M. R.D. Kunadangu, Darul Aloom Qasmia Lane, Botshah Mohalla, Lal Bazar, Srinagar, Kashmir ; Expert Limnology- Member

(j) Dr. C.K. Varshney, 88 Vaishali, Pitampura, New Delhi-110034; Expert Ecology- Member

(k) Dr. E. J. James , Director, Water Institute, Karunya University, Coimbatore, Tamil Nadu ; Expert Hydrology- Member;

(l) Director or Additional Director or Joint Director dealing with the Wetland in the Ministry of Environment and Forests-Member Secretary.

(2) The term of the Authority shall be three years effected from the date of publication of the notification referred to in sub-rule(1).

(3) The Authority shall exercise the following powers and perform the following functions, namely:-

(i) appraise proposals for identification of new wetlands, projects or activities in consultation with the concerned local authorities;

(ii) identify and interface with the concerned local authorities to enforce the provisions contained under these rules and other laws for the time being in force;

(iii) grant clearances or identify in consultation with the local state government, the areas for the grant of clearance for regulated activities in the wetlands within their respective jurisdictions;

(iv) determine, in consultation with concerned local authority, the zone of direct influence of the wetlands;

(v) issue whatever directions, necessary for the conservation, preservation and wise use of wetlands to the State Governments.

(4) The Authority shall periodically review the list of wetlands and the details of prohibited and regulated activities under the rules.

(5) The Authority shall specify the threshold levels for activities to be regulated and the mode and methodology for undertaking activities in wetland.

6. Process for identification of wetlands under different categories.-

(1) Wetlands covered under item (i) of rule 3 specified under Schedule shall be the wetland to be regulated under these rules.

(2) The States Government shall prepare, within a period of one year from the commencement of these rules, 'Brief Document' identifying and classifying the wetlands within their respective territories in accordance with the criteria specified under Rule 3 and submit the same to Authority.

(3) The 'Brief Document' of each wetland for identification shall comprise of following information, namely:-

i) broad geographic delineation of the wetland;
ii) its zone of influence along with a map (accurate and to scale);
iii) the size of the wetland;
iv) account of pre-existing rights and privileges, consistent or not consistent with the ecological health of the wetland.

(4) The Authority, shall on receipt of the 'Brief document' under sub-rule(2), if consider it necessary refer in consultation with the State Government to a research institute or university having relevant multi-disciplinary expertise related to wetlands, to conduct a comprehensive survey of the wetland within a period of thirty days: provided that the institute or university to which the matter has been referred under sub-rule(4) shall submit a report within next ninety days from the date of such reference to Authority, which shall contain information with respect to the criteria specified under rule 3

(5) The Authority shall, thereafter, arrive at a decision in consultation with the State Government, on the proposal, within a period of ninety days from the date of receipt of the report under sub-rule(4)

(6) The Central Government shall on the receipt of the recommendation of the Authority notify the area of wetlands as recommended by the Authority for public information inviting objections and suggestions from the general public likely to be affected to make representation to the Central Government within a period of sixty days;

(7) The Authority shall consider all the representations which the Central Government may receive under sub-rule(6) and submit its recommendations on the such representations to Central Government within a period of sixty days for final notification;

(8) The Central Government shall on receipt of the recommendations of the Authority under sub-rule(7) issue a final notification notifying therein the area of the wetland its category or classification to be regulated under these rules and display the said notification in public places in English and vernacular languages.

(10) The Authority may, *suo moto* or on application made to it, review any decision under these rules or issue direction for inclusion of wetland under these rule.

7. **Overlapping provisions.-**

(1) The wetlands within the protected areas of the National Parks and Wildlife Sanctuaries shall be regulated by the provisions of WildLife (Protection) Act, 1972(35 of 1972).

(2) The wetlands within the protected or notified forest areas shall be regulated by the provisions of the Indian Forest Act, 1927(16 of 1972); the Forest (Conservation) Act, 1980(69 of 1980); and the Environment (Protection) Act, 1986(29 of 1986).

(3) The gaps in the regulation of wetlands within the protected and notified forest areas, if any, under the provisions of the Indian Forest Act, 1927, Wildlife (Protection) Act, 1972; and Forest (Conservation) Act, 1980, shall be plugged by invoking provisions of the Environment (Protection) Act, 1986.

(4) The wetlands situated outside the protected or notified forest areas referred to in sub rule(2) shall be regulated by the relevant provisions of the Environment (Protection) Act, 1986(29 of 1986)

8. **Enforcement of regulated activities.-**

(1) The identified activities for management and wise use of wetlands situated within the protected or notified forest areas referred to in sub rule (2) of rule 7 shall be regulated by the Forest Department of the State concerned.

(2) The identified activities for management and wise use of wetlands situated outside the protected or notified forest areas shall be regulated by the nodal Department or the relevant local state agencies to be designated by the State Government within a period of six months from the date of commencement of these rules.

9. **Appeals against the decisions of Authority-**

Any person aggrieved by the decision of the Authority may prefer an appeal to the National Green Tribunal constituted under the National Green Tribunal Act, 2010(19 of 2010) with in a period of sixty days from the date of such decision: Provided the National Green Tribunal may entertain any appeal after the expiry of the said period of sixty days if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal in time.

THE SCHEDULE
[see-rule 3(i)]

List of wetlands in India identified as Ramsar sites under Ramsar Convention on Wetland

Serial Number	Name of Wetland	State
(1)	(2)	(3)
1	Ashtamudi Wetland	Kerala
2	Bhitarkanika Mangroves	Orissa
3	Bhoj Wetland	Madhya Pradesh
4	Chilika Lake	Orissa
5	Deepor Beel	Assam
6	East Calcutta Wetlands	West Bengal
7	Harike Lake	Punjab
8	Kanjli	Punjab
9	Keoladeo National Park	Rajasthan
10	Kolleru Lake	Andhra Pradesh
11	Loktak Lake	Manipur
12	Point Calimere Wildlife and Bird Sanctuary	Tamil Nadu
13	Pong Dam Lake	Himachal Pradesh
14	Ropar	Punjab
15	Sambhar Lake	Rajasthan
16	Sasthamkotta Lake	Kerala
17	Tsomoriri	Jammu and Kashmir
18	Vembanad-Kol Wetland	Kerala
19	Wular Lake	Jammu and Kashmir
20	Chandratal	Himachal Pradesh
21	Renuka	Himachal Pradesh
22	Rudrasagar	Tripura
23	Upper Ganga	Uttar Pradesh
24	Hokarsar (Hokera)	Jammu and Kashmir
25	Surinsar and Mansar (complex)	Jammu and Kashmir

[F.No. J-22012/31/05-CS(W)]

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ANNEXURE - 24

(2019) 15 Supreme Court Cases 401 : 2019 SCC OnLine SC 441

In the Supreme Court of India

(BEFORE D.Y. CHANDRACHUD AND HEMANT GUPTA, JJ.)

Civil Appeal No. 12251 of 2018[1]

HANUMAN LAXMAN AROSKAR . . Appellant;

Versus

UNION OF INDIA . . Respondent.

With

Civil Appeal No. 1053 of 2019

FEDERATION OF RAINBOW WARRIORS . . Appellant;

Versus

UNION OF INDIA AND OTHERS . . Respondents.

Civil Appeals No. 12251 of 2018 with No. 1053 of 2019, decided on March 29, 2019

A. **Environment Law — Development vis-à-vis Ecology: National, Urban and Rural Development — Development Projects — Prerequisites for/Environmental clearance/viability — Development of greenfield airport project in State of Goa — Environmental clearance (EC) — Flaws in environmental impact assessment (EIA) process — Suspension of environmental clearance (EC) and directions issued for proper EIA — Expert Appraisal Committee (EAC) constituted under EIA Notification, 2006 directed to revisit recommendations made by it for grant of EC having regard to specific concerns highlighted in this judgment**

— One month's time given for this — Till then EC granted by Ministry of Environment, Forests and Climate Change (MoEFCC) on 28-10-2015 shall remain suspended — No other court or tribunal shall entertain any challenge to report that is to be submitted before Court by EAC in compliance with the present order — MoEFCC and State Government given liberty to file report of EAC before Court to facilitate passing of appropriate orders thereon

(Paras 162 to 166)

— Concerns highlighted in judgment:

— (1) Flaws in EIA process — (a) Non-disclosure of vital information, suppression of material facts by project proponent, (b) non-application of mind by EAC as an expert body and its failure to give cogent reasons, while recommending for grant of EC, and (c) failure of NGT as an adjudicatory body to carry out a merits review

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— (2) Airport operations — Collection of baseline data — Guidance Manual for Airports specifically requires collection of baseline data on (i) land environment, (ii) water environment, (iii) air environment, (iv) noise environment, (v) biological environment, (vi) socioeconomic environment, and (vii) solid waste — As airport operations might have possible impact on biological environment, collection of baseline data on sensitive habitats and wild or endangered species in project area is contemplated — Baseline data of environmental parameters aid in preparation of an environment management plan (EMP)

(Paras 63 to 69)

— (3) EAC shall have due regard to assurance furnished by concessionaire to Court that it is willing to adopt and implement necessary safeguards bearing in mind international best practices governing greenfield airports

(Para 163.5)

— (4) Duty and onus of project proponent — It is duty of project proponent to make full, complete and candid disclosure of all environmental aspects — Burden of establishing environmental compliance rests on a project proponent who intends to bring about a change in

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the existing state of environment — However, in present case project proponent failed to disclose wetlands, water sources, water bodies, biospheres, mountains and forests within an aerial distance of 15 km as required by Form 1 of EIA Notification, 2006 — Duty to disclosure about forest does not mean only reserve forest as contemplated within S. 20(2) of Forest Act, 1927 or forest as understood in any statutory enactment — Expression "forest" must receive its ordinary and natural connotation — The effort must not be to overlook and destroy forests but to notice and protect them — A failure to disclose information in Form 1 impairs the functioning of EAC in preparation of ToR and in consequence, leads to preparation of a deficient EIA report — There has been a patent failure on part of the project proponent to make mandatory disclosures stipulated in Form 1 under the 2006 Notification, that must have consequences in law

(Paras 70 to 82)

— (5) EIA report defective — EIA report failed to notice existence of Ecologically Sensitive Zones (ESZs) within buffer distance of 10 km of project site — EIA report must encompass all aspects of environmental concern which render area ecologically sensitive i.e. wetlands, water sources, water bodies, coastal zones, biospheres, mountains and forests

(Paras 91 and 92)

— (6) Data collection incomplete — Allegedly, no primary data with regard to environmental parameters like air quality, water quality, noise quality and flora and fauna were collected from State of Maharashtra and related only to State of Goa

(Paras 93 to 101)

— (7) Incorrect information about trees — EIA report incorrectly stated that area required for proposed airport has only few trees but evidently permissions were granted for felling 54,676 trees — Issues pertaining to vegetational cover must be taken seriously in the EIA process

(Paras 102 to 109)

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— (8) Issues raised in pubic consultation not included in EIA — Intrinsic and instrumental value of public consultation — Stages of public consultation — Project proponent's duty to address all material environmental concerns raised during public consultation and make appropriate changes in draft EIA and EMP — Though only seven out of sixty-eight issues dealt with issue of unemployment, project proponent observed that major issue was unemployment — Duty of the project proponent to place fairly all the environmental concerns raised during the public hearing is the crucial link in the appraisal by EAC, which it failed in doing

(Paras 110 to 117)

— (9) EAC as an expert body failed to apply mind — Duty to apply mind to documents like EIA report, outcome of public consultation and public hearing proceedings — EAC is under a mandate to conduct process of appraisal in "a transparent manner" — And make a categorical recommendation about grant of EC on stipulated terms and conditions or rejection of EC — Recommendations made by EAC to regulatory authority must be based on "reasons" — Said recommendations constitute substantive material which ultimately affects decision-making process and also might form subject-matter of challenge before Tribunal — However, minutes indicate non-application of mind by EAC with reference to 15 ESZs in study area — In absence of critical analysis EAC failed in discharging its duties under 2006 Notification

(Paras 118 to 129)

— (10) NGT as an expert adjudicatory body on environment failed in its duty to exercise the jurisdiction entrusted to it under S. 16(h) r/w S. 20, NGT Act, 2010 by merely deferring decision to recommend and grant an EC — Though several important submissions were urged before it, entire analysis by NGT is contained in one paragraph and next para only deals with requirement of data collection — This does not fulfil requirement of merits review by the expert adjudicatory body like NGT

(Paras 130 to 141)

— (11) In environmental governance, means are as significant as ends, process of decision is as crucial as ultimate decision — However, there has been a failure of due process commencing from non-disclosure of vital information by project proponent to non-application of mind by EAC and failure of merits review by NGT — Thus in present case neither decision-making process nor ultimate decision of granting EC can be said to be valid — Bearing in mind that there is an urgency

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for setting up a new airport to tackle with increasing volume of passengers and at the same time protect environment, time bound directions were issued

(Paras 142 to 167)

— Infrastructure Laws — Carriage of Goods and Persons by Air, Land and Sea — Carriage by Air/Aircraft and Airports — Airport Development — EIA Guidance Manual for Airports, 2010 — Forests, Wildlife and Zoos — Demarcation/Determination/Identification of Forest Land — Forest Act, 1927 — S. 20 — Environmental Clearance/NOC/Environment Impact Assessment (EIA) — EIA Notification, 2006 — Form 1 — Regulatory Framework, Bodies and Judicial Intervention — Expert Appraisal Committee (EAC) — Duties of and manner of exercise of power while conducting EIA in grant of EC — National Green Tribunal Act, 2010 — Ss. 16(h) and 20 — Duties of and proper

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exercise of power — Doctrine of proportionality must be applied to matters concerning the environment as part of judicial review — Words and Phrases — "Forest"

B. **Environment Law — National Green Tribunal Act, 2010 — S. 22 — Appeal to Supreme Court against orders of Tribunal — Maintainability — Locus standi, bona fides, plea of personal agenda — Approach of Court — Doctrine of proportionality must be applied to matters concerning the environment as part of judicial review**

— In cases concerning environmental governance, courts should decide case on merits — Such cases involve present and future generations, sustainable development for today and tomorrow — If a court comes to finding that appeal before it lacks bona fides, it may issue directions which it thinks appropriate in that case — Vague aspersions on the intention of public-spirited individuals does not constitute an adequate response to those interested in the protection of the environment — Regulatory Framework, Bodies and Judicial Intervention — Generally — Environmental adjudication — Approach to — Constitution of India, Arts. 21 and 19(1)(g) & (g)

(Para 164)

C. **Environment Law — Environmental Clearance/NOC/Environment Impact Assessment (EIA) — EIA Notification, 2006 distinguished from 1994 Notification**

(Para 41)

D. **Environment Law — Environmental Clearance/NOC/Environment Impact Assessment (EIA) — EIA Notification, 2006 — Procedure for grant of environmental clearance (EC) under — Four stages of obtaining EC, discussed, that is, screening, scoping, public consultation and appraisal by EAC — Importance and objectives of 2006 Notification**

— In laying down a detailed procedure for the grant of an EC, 2006 Notification attempts to bridge perceived gap between environment and development — Development vis-à-vis Ecology: National, Urban and Rural Development — Development Projects — Prerequisites for/Environmental clearance/viability

(Paras 45 to 62)

E. **Environment Law — Environmental Clearance/NOC/Environment Impact Assessment (EIA) — EIA Notification, 2006 — Procedure for grant of environmental clearance (EC) under — Rejection of application for EC for missing and misleading information provided in Form 1 by project proponent**

— Information provided by project proponent in Form 1 serves as the base upon which EAC or the State Expert Appraisal Committees (SEAC) to prepare comprehensive Terms of Reference (ToR), which applicant is required to address during course of preparation of EIA — ToR so prepared addresses all possible environmental concerns — Missing or misleading information in Form 1 significantly impedes the functioning of the authorities and process stipulated under the notification — For this reason, any application made or EC granted on the basis of a defective Form 1 is liable to be rejected immediately — Development vis-à-vis Ecology: National, Urban and Rural

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Development — Development Projects — Prerequisites for/Environmental clearance/viability

(Paras 45 to 62)

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F. **Environment Law — Environmental Clearance/NOC/Environment Impact Assessment (EIA) — Objectives of EIA process**

— To ensure that environmental and developmental concerns are appropriately balanced on the basis of the most accurate information available — This will determine what conditions be imposed for grant of EC — EC is required before any construction work, or preparation of land (except for securing the land) is started on the project or activity listed in the schedule to 2006 Notification — Development vis-à-vis Ecology: National, Urban and Rural Development — Development Projects — Prerequisites for/Environmental clearance/viability

(Paras 34 to 62)

The present appeal under Section 22 of the NGT Act, 2010 was filed to challenge the grant of environmental clearance (EC) for the development of a greenfield international airport at Mopa in Goa. The allegation was that project proponent (the State Government) did not disclose the material facts required by the 2006 Notification. And that the project proponent did not appraise the EAC about important issues raised during public consultation. And that the EAC as an expert body abdicated its duty to apply mind and give cogent reasons for grant of EC. And that NGT, an expert adjudicatory body also failed to carry out a merits review of grant of EC. NGT approved EC granted with certain additional conditions. Hence, the present appeals.

Allowing the appeals and setting aside EC granted and remanding matter back to EAC for proper application of mind with other directions, the Supreme Court

Held :

C. Scheme of the 2006 Notification and the Guidance Manual for Airports

C.1. EIA Process

The objective of the EIA process is to ensure that environmental and developmental concerns are appropriately balanced on the basis of the most accurate information available.

(Para 34)

The salient objective which underlies the 2006 Notification is the protection, preservation and continued sustenance of the environment when the execution of new projects or the expansion or modernisation of existing projects is envisaged. It imposes certain restrictions and prohibitions based on the potential environmental impact of projects unless prior EC has been granted by the authority concerned. EC is required before any construction work, or preparation of land (except for securing the land) is started on the project or activity listed in the schedule to the notification.

(Para 42)

The 2006 Notification embodies the notion that the development agenda of the nation must be carried out in compliance with norms stipulated for the protection of the environment and its complexities. In laying down a detailed procedure for the grant of an EC, the 2006 Notification attempts to bridge the perceived gap between the environment and development.

(Para 56)

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It is for this reason that EAC and SEAC comprise experts in the field of environmental law. Given that these bodies comprise experts in the field of environmental law, the recommendation of EAC or SEAC to grant EC to an applicant or reject the application is *normally* accepted by the regulatory authority.

(Paras 57 and 58)

Given the environmental consequences of a proposed project, no difference of opinion is provided for in the grant of an EC at the State level. It is further mandated that the project management submit half-yearly compliance reports to the regulatory authority in respect of EC and conditions.

(Para 59)

Under the 2006 Notification, the process of obtaining an EC commences from the production of the information stipulated in Form 1/Form 1-A. Crucial information regarding the particulars of the proposed project is sought to enable EAC or SEAC to prepare comprehensive Terms of Reference (ToR) which the applicant is required to address during the course of the preparation of the EIA. The ToR so prepared addresses all possible environmental concerns. It is on the basis of ToR, that further studies and the EIA are carried out on the impact of the proposed project on the environment.

(Paras 60 and 61)

The information provided in Form 1 serves as a base upon which the process stipulated under the 2006

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Notification rests. An applicant is required to provide all material information stipulated in the form to enable the authorities to formulate comprehensive ToR and enable persons concerned to provide comments and representations at the public consultation stage. The depth of information sought in Form 1 is to enable the authorities to evaluate all possible impacts of the proposed project and provide the applicant an opportunity to address these concerns in the subsequent study. Missing or misleading information in Form 1 significantly impedes the functioning of the authorities and the process stipulated under the notification. For this reason, any application made or EC granted on the basis of a defective Form 1 is liable to be rejected immediately.

(Para 62)

C.2. *Guidance Manual for Airports*

In February 2010, MoEF brought out its Guidance Manual for Airports. The need for a sector-specific manual arose because the 2006 Notification "re-engineered the entire EC process" under its earlier avatar of 1994 and new sectors were incorporated into the ambit of EC process. The 2006 Notification noted that as many as 39 developmental sectors require prior ECs. Sector-specific manuals, it was hoped, would bring about standardisation in the quality of appraisal and obviate potential inconsistencies between the work performed by SEIAAS and SEACs.

(Para 63)

Baseline data of environmental parameters which may be affected by airport activities is collected through primary monitoring in the study area and through secondary sources. The baseline data facilitates the evaluation of the predicted impact on environmental attributes in the study area by using scientific analysis and EIA methodologies. The object is to also aid in the preparation of an EMP that would outline measures for improving environmental quality as well as retain the scope for future expansions in a sustainable manner. The Guidance Manual specifically requires collection of baseline data on the following: (*i*) land environment; (*ii*) water environment; (*iii*) air environment; (*iv*) noise environment;

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(*v*) biological environment; (*iv*) socioeconomic environment; and (*vii*) solid waste.

(Para 64)

The Guidance Manual brings into focus the biological environment. It acknowledges that airport operations may alter ecosystems, threaten endangered species and disturb the movement and breeding patterns of wildlife. In this context, the collection of baseline data on sensitive habitats and wild or endangered species in the project area is contemplated.

(Para 68)

It is in the backdrop of the 2006 Notification and the Guidance Manual that it becomes necessary to assess the process that was adopted in the present case and its outcome.

(Para 69)

D. *Forests*

The court cannot gloss over the patent and abject failure of the State of Goa as the project proponent in failing to disclose wetlands, water sources, water bodies, biospheres, mountains and forests within an aerial distance of 15 km as required by Form 1. A duty is cast upon the project proponent to make a full, complete and candid disclosure of all aspects bearing upon the environment in the area of study. The project proponent cannot profess an ignorance about the environment in the study area. The project proponent is bound by the highest duty of transparency and rectitude in making the disclosures in Form 1.

(Paras 70 to 73)

It cannot be accepted that the disclosure required was of reserved forests comprehended within a notification under Section 20(2) of the Forest Act, 1927. The expression "forests", means a forest as commonly understood, without reference to a notification under the Forest Act, 1927 or any other statutory enactment. Such an interpretation will subserve the purpose of an EIA. The purpose is to ensure that all relevant facets of the environment are noticed, that baselines are documented, and that the potential impact of a project or activity on the environment is assessed. Forests are forests without reference to recognition in a statutory form devised for a specific purpose.

(Para 74)

In the context of the 2006 Notification and the underlying purpose of facilitating an EIA report, the expression "forests" must receive its ordinary and natural connotation. The effort must not be to overlook and destroy forests but to notice and protect them.

(Para 77)

T.N. Godavarman Thirumulpad v. *Union of India*, (1997) 2 SCC 267; *Noida Memorial Complex Near Okhla Bird Sanctuary, In re*, (2011) 1 SCC 744, *distinguished*

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Federation of Rainbow Warriors v. *Union of India*, 2017 SCC OnLine NGT 1964; *Federation of Rainbow Warriors* v. *Union of India*, 2017 SCC OnLine NGT 1962; *Federation of Rainbow Warriors* v. *Conservator of Forests*, 2018 SCC OnLine Bom 329 : (2018) 3 Mah LJ 424; *Hanuman Laxman Aroskar* v. *Union of India*, 2019 SCC OnLine SC 500, *referred to*

Alternative submission that disclosure about forests was made not tenable

The alternate submission that the EIA report does, as a matter of fact, consider the prevalence of forested areas both in Goa and in Maharashtra within the study area is not tenable. Though the EIA report adverts to the presence of forests within the study area in Goa and Maharashtra, it has to be considered whether this by itself warrants the grant of an EC in spite of the fact that there has been a patent failure on part of the project proponent to make a transparent and candid disclosure of material facts in Form 1. A failure to disclose information in Form 1 impairs

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the functioning of EAC in the preparation of ToR and in consequence, leads to preparation of a deficient EIA report.

(Paras 78 to 81)

The failure on the part of a project proponent to disclose material information in Form 1 as stipulated under the 2006 Notification has a cascading effect on the salient objective which underlies the 2006 Notification. The burden of establishing environmental compliance rests on a project proponent who intends to bring about a change in the existing state of the environment. Whereas, in the present case, there has thus been a patent failure on the part of the project proponent to make mandatory disclosures stipulated in Form 1 under the 2006 Notification, that must have consequences in law. There can be no gambles with the environment: a "heads I win, tails you lose" approach is simply unacceptable; unacceptable if we are to preserve environmental governance under the rule of law.

(Para 82)

E. *Ecologically Sensitive Zones (ESZs)*

The glaring deficiency which emerges from the EIA report is its failure to notice the existence of ESZs within a buffer distance of 10 km of the project site. The EIA report fails to meet a classical requirement of administrative law: to take into account a relevant consideration, namely, that within the study area which has to be considered, there is the presence of ESZs.

(Para 91)

The EIA report must factor in those specific features which make an area ecologically sensitive. These would encompass all aspects of environmental concern which render the area ecologically sensitive. This would include wetlands, water sources, water bodies, coastal zones, biospheres, mountains and forests. The deficiency of the EIA report emanates from its failure to notice that the purpose of the study was not only to determine whether the project site is ecologically sensitive. Confining itself to this aspect, the EIA report failed to consider a crucial and relevant consideration.

(Para 92)

F. *Sampling points*

The submission of the appellants is that the Guidance Manual requires the collection of primary data through measures and field studies in the study area within 10 km radius from the ARP. Secondary data has to be collected within a 15 km aerial distance for the parameters mentioned in Column 9(III) of Form 1 of the 2006 Notification. In the present case, it was urged that not a single sampling station with reference to any of the parameters is situated in Maharashtra.

(Para 93)

The grievance is that no data has been collected from the State of Maharashtra and all secondary data collected by the project proponent related only to the State of Goa. There is substance in the submission which has been urged on behalf of the appellant. A reading of the counter-affidavit filed by the State of Goa would seem to support the appellant's submission.

(Paras 93 to 101)

F.5. *Felling of trees*

The Court expresses its serious displeasure with the manner in which the EIA report made an attempt to gloss over the existence of trees. The EIA report prevaricated by recording that the area required for the proposed airport has only a few trees, mostly bushes. The State of Goa would have the court gloss over the felling of trees by submitting that 54,676 trees over a project area of 2133 ac averages out to 25 trees per acre or one tree over an area of 160 sq m. This is a fallacious approach to the issue.

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Mathematical averages cannot displace factual

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data about the actual number of trees which were affected by the project. The EIA report ought to have scrutinised the number of trees, their nature and longevity. Issues such as the extent to which the trees or some of them were capable of being transplanted had to be considered in the EIA report. The location of the trees is also significant. In a given case, if the trees appear in clusters or in a dense formation in segments of the project site, it would be necessary to determine whether felling all of them was necessary for the project to be implemented.

(Paras 102 to 108)

The purpose of prescribing an EIA report is precisely to undertake a baseline study on all aspects of the environment and to anticipate the impact of a projected activity on the environment. Ignoring *any* component of the environment amounts to a serious dereliction of duty which detracts from the rule of law in matters of environmental governance.

(Para 108)

Issues pertaining to vegetational cover must be taken seriously in the EIA process. The formula of planting a set number of trees for every existing tree felled must be alive to the fact that the survival of new plantations is replete with uncertainty. The survival of transplanted trees is equally a matter of uncertainty. Though the development of infrastructure may necessitate the felling of trees, the process stipulated under the 2006 Notification must be transparent, candid and robust. A regulatory regime for environmental governance is based on the hypothesis that all stakeholders will act with rectitude. Hiding significant components of the environment from scrutiny is not an acceptable modality to secure project approvals. There was a serious lacuna in regard to disclosures and appraisal on this aspect of the controversy.

(Para 109)

G. *Public consultation*

The importance of public consultation is underscored by the 2006 Notification. Public consultation, as it states, is "the process by which the concerns of local affected persons and others who have a plausible stake in the environmental impacts of the project or activity are ascertained with a view to take into account all the material concerns in the project or activity design as appropriate". This postulates two elements. They have both, an intrinsic and an instrumental character. The intrinsic character of public consultation is that there is a value in seeking the views of those in the local area as well as beyond, who have a plausible stake in the project or activity.

(Paras 110 to 112)

Apart from the intrinsic value of public consultation, it serves an instrumental function as well. The purpose of ascertaining the views of stakeholders, is to account for all the material concerns in the design of the proposed project or activity. For this reason, the process of public consultation involves several important stages. The Pollution Control Board is under a mandate to forward the proceedings to the regulatory authority. The project proponent must address all material environmental concerns and make appropriate changes in the draft EIA and EMP. The project proponent may even submit a supplementary report to the draft EIA.

(Para 113)

(*i*) significant environmental concerns have not been taken into account;

(*ii*) there was an absence of a full disclosure when the EIA report was put up for consultation; and

(*iii*) concerns which have been expressed by persons affected by the project have not been adequately dealt with or analysed.

(para 113)

Crucial objections and environmental concerns which were raised during the consultative process were reduced to a single issue by the project proponent before EAC: the need for employment opportunities. The project proponent failed in its duty to inform EAC. The record does not indicate a critical appraisal or analysis by EAC. EAC was duty-bound to apply its mind to the environmental

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concerns raised by stakeholders. The duty of the project proponent to place fairly all the environmental concerns raised during the public hearing is the crucial link in the appraisal by EAC. The minutes of the

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meeting indicate that there was no fair and complete disclosure of the objections which were raised during the public hearing before EAC. There is evidently a failure in the process of applying and implementing the norms laid down in the 2006 Notification in this regard.

(Paras 113 to 117)

Utkarsh Mandal v. *Union of India*, 2009 SCC OnLine Del 3836, *approved*

H. *Appraisal by EAC*

Appraisal by EAC is structured and defined by the 2006 Notification. The process of appraisal is defined to mean "a detailed scrutiny" by EAC of the application and other documents like EIA report and the outcome of the public consultation, including the public hearing proceedings, submitted by the applicant to the regulatory authority for the grant of an EC. EAC is under a mandate to conduct the process of appraisal in "a transparent manner". On the conclusion of these proceedings, EAC has to make "categorical recommendations" to the regulatory authority either for:

(*i*) the grant of a prior environmental clearance on stipulated terms and conditions; or

(*ii*) the rejection of the application.

The recommendations made by EAC to the regulatory authority must be based on "reasons".

(para 118)

EAC has failed to consider relevant circumstances bearing on the environmental impact of the project and has instead considered circumstances extraneous to its function. That the project proponent, according to EAC, has not concealed facts and circumstances is not reason enough to warrant a grant of an EC. Moreover, even this hypothesis is incorrect. There is no analysis of the EIA report. EAC has failed to answer to the call to its expertise.

(Paras 119 to 125)

EAC is an expert body. It must speak in the manner of an expert. Its remit is to apply itself to every relevant aspect of the project bearing upon the environment. It is not bound by the analysis which is conducted in the EIA report. It is duty-bound to analyse the EIA report. Where it finds it deficient it can adopt such modalities which, in its expert decision-making capacity, are required. The reasons which are furnished by EAC constitute a live link between its processes and the outcome of its adjudicatory function. In the absence of cogent reasons, the process by its very nature, together with the outcome stands vitiated.

(Para 127)

EAC, as an expert body, has to scrutinise all relevant aspects of the project or activity proposed, including its impact on the environment. In taking that decision, the EIA report is an input for its analysis. The scrutiny and appraisal has to be undertaken by EAC as an expert body and its reasons must reflect that this has been done. As the minutes indicate, the non-application of mind by EAC is evident with reference to the presence of 15 ESZs in the study area. EAC notes that the project is outside the ESZ delineated by the Kasturirangan Committee. In the absence of a critical analysis, EAC failed in discharging its duties under the 2006 Notification. The recommendations of EAC furnish a guide for MoEFCC. Indeed, the 2006 Notification stipulates that the recommendations of EAC would normally

be accepted. Consequently, a failure of due process before EAC, as in the present case, must lead to the invalidation of EC.

(Para 129)

I. *The appellate jurisdiction of NGT: the requirement of a merits review*

The failure to consider materials on a vital issue and indeed the non-consideration of vital issues raises a substantial question of law leading to the invoking of the jurisdiction of the Supreme Court under Section 22 of the NGT Act, 2010. The failure of process in the present case has been compounded by the absence of a merits review by NGT.

(Paras 132 to 136)

Save Mon Region Federation v. *Union of India*, (2013) 1 All India NGT Reporter 1; *Sreeranganathan K.P.* v. *Union of India*, 2014 SCC OnLine NGT 15, *approved*

The doctrine of proportionality must be applied to matters concerning the environment as part of judicial review.

(Para 140)

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Lafarge Umiam Mining (P) Ltd. v. *Union of India*, (2011) 7 SCC 338, *relied on*

EAC as an expert body abdicated its obligations to make an expert determination based on reasons. NGT as an adjudicatory body failed to exercise the jurisdiction entrusted to it under Section 16(*h*) read with Section 20 of the NGT Act, 2010 by merely deferring to the decision to recommend and grant an EC. The parameters in regard to the existence of substantial questions of law have hence been established in the classical or conventional sense of that expression.

(Paras 130 to 141)

Mantri Techzone (P) Ltd. v. *Forward Foundation*, (2019) 18 SCC 494 : 2019 SCC OnLine SC 322; *Chunilal V. Mehta and Sons Ltd.* v. *Century Spg. and Mfg. Co. Ltd.*, 1962 Supp (3) SCR 549 : AIR 1962 SC 1314; *Vellore Citizens' Welfare Forum* v. *Union of India*, (1996) 5 SCC 647; *M.C. Mehta* v. *Kamal Nath*, (1997) 1 SCC 388; *M.C. Mehta* v. *Union of India*, (1997) 2 SCC 353; *A.P. Pollution Control Board* v. *M.V. Nayudu*, (1999) 2 SCC 718; *Narmada Bachao Andolan* v. *Union of India*, (2000) 10 SCC 664; *Indian Council for Enviro-Legal Action* v. *Union of India*, (2011) 8 SCC 161 : (2011) 4 SCC (Civ) 87, *relied on*

3. *Environmental rule of law*

Since the Stockholm Conference, there has been a dramatic expansion in environmental laws and institutions across the globe. In many instances, these laws and institutions have helped to slow down or reverse environmental degradation. However, this progress is also accompanied, by a growing understanding that there is a considerable implementation gap between the requirements of environmental laws and their implementation and enforcement—both in developed and developing countries alike. The environmental rule of law seeks to address this gap.

(Paras 142 to 155)

United Nations Environment Programme, First Environmental Rule of Law Report. Available at <https://wedocs.unep.org/bitstream/handle/20.500.11822/27279/Environmental_rule_of_law.pdf?sequence=1&isAllowe d=y>; Bruntdland definition of Sustainable Development, *referred to*

In the area of environmental governance, the means are as significant as the ends. The processes of decision are as crucial as the ultimate decision. The basic postulate of the 2006 Notification is that the path which is prescribed for disclosures, studies, gathering data, consultation and appraisal is designed in a manner that would secure decision making which is transparent, responsive and inclusive.

(Paras 156 and 157)

In the present case, there has been a failure of due process commencing from the non-disclosure of vital information by the project proponent in Form 1.

(Para 159)

EAC, as an expert body abdicated its role and function by taking into account circumstances which were extraneous to the exercise of its power and failed to notice facets of the environment that were crucial to its decision making.

(Para 160)

In this view of the matter, neither the process of decision making nor the decision itself can pass legal muster. Bearing in mind the need to bring about a wholesome balance between the development of infrastructure of an airport and the preservation of the environment, time-bound directions should be issued. Bearing in view the necessity to maintain a balance between the need for an airport and environmental concerns, it would be appropriate if EAC is directed to revisit the conditions subject to which it granted its EC on the basis of the specific concerns which have been highlighted in this judgment.

(Paras 158 and 161 to 167)

Federation of Rainbow Warriors v. *Union of India*, 2018 SCC OnLine NGT 831, *reversed*

SS-D/62216/S

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The Judgment of the Court was delivered by

D.Y. CHANDRACHUD, J.—

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A. *Introduction*

1. An appeal was filed before the Principal Bench of the National Green Tribunal (NGT) at New Delhi challenging the grant of an environmental clearance (EC) for the development of a greenfield international airport at Mopa in Goa. NGT, by its judgment dated 21-8-2018 came to the conclusion that the present case "is not a case where the project compromises

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with the environment". While affirming EC, NGT came to the conclusion that "further safeguards for environmental protection need to be incorporated". NGT, accordingly, proceeded to formulate additional conditions, while affirming the grant of EC.

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2. Village Mopa is situated in North Goa, in close proximity to the inter-State boundary which the State shares with Maharashtra. The site of the proposed airport lies at a distance of 35 km from Panaji, the capital of Goa. The Village of Mopa is situated in Pernem Taluka. The site for the development of the airport is situated on a tabletop plateau which rises to a height of 150 to 180 m above mean sea level and is surrounded by steep slopes. The soil is predominantly of a laterite character. The airport which presently serves the region is situated at Dabolim, Goa.

3. Since the airport at Dabolim is saturated in terms of its capacity for annual air traffic, the State Government initiated a process in 1997 to commission studies and project reports for a proposed international airport, which include the following:

3.1. A project report prepared by Engineers and Management Associates, Spain in 1997.

3.2. A preliminary technical feasibility study prepared by the Airports Authority of India in May 1998.

3.3. A final feasibility report for the proposed airport at Goa prepared by the International Civil Aviation Organisation, Montreal, Canada in August 2005.

3.4. A Goa dual airport study prepared by the International Civil Aviation Organisation in August 2007.

3.5. A report of a Six-member Committee chaired by the Chief Minister of Goa in 2008 to "look into all aspects relating to construction of an international airport at Mopa, Goa".

3.6. A document styled as the "Airport Master Plan" dated 10-2-2012, submitted to the Public Private Partnership (PPP) cell of the Government of Goa by Ammann & Whitney, USA envisaging: "consultancy services for preparation of master plan, preliminary project report, tender document and project management services for the proposed greenfield airport and commercial/industrial and allied development near Mopa in the State of Goa".

4. On 1-5-2000, the Government of India communicated its approval for the setting up of an airport at Mopa and for the closure of the existing airport for civilian operations on the commissioning of the new airport. Subsequently, on 1-7-2010, the earlier decision was modified to allow for the continuation of civilian aircraft operations at Dabolim even after the commissioning of the new airport. The process of land acquisition commenced in 2008 under the Land Acquisition Act, 1894. Originally, the land area anticipated for the development of the project was pegged at 4500 ac. During the pendency of project appraisals, the area required for the proposed airport stood reduced to 2271 ac.

5. On 14-9-2006, the Government of India in the Ministry of Environment and Forests (MoEF, later renamed as MoEFCC in 2014) issued a notification [No. S.O. 1533 (the 2006 Notification)] mandating a prior EC for Category 'A' projects (specified in the Schedule) by the Union Government and for Category 'B' projects at the State level by the State Level Environment Impact Assessment Authority (SEIAA). Following the 2006 Notification, MoEF placed an EIA Guidance Manual for Airports (the Guidance Manual) in the public

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domain in February 2010. The stages of scoping, public consultation and appraisal, leading up to the grant of EC for the proposed airport are governed by the express terms of the 2006 Notification.

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6. In March 2011, the State of Goa, as the project proponent submitted Form 1 as stipulated in the 2006 Notification to MoEF. On 8-3-2011, the State of Goa applied for terms of reference (ToR) to MoEF. ToR were finalised on 11-5-2011 and 12-5-2011 by the Expert Appraisal Committee (EAC) constituted under the 2006 Notification. On 1-6-2011, MoEF issued ToR for the preparation of the Environmental Impact Assessment (EIA) report. ToR was valid for a period of two years until 31-5-2013. On 22-11-2012, the Government of Goa revised the project boundary by decreasing the project area from 4500 ac to 2271 ac. At its meetings on 28-1-2013 and 29-1-2013, EAC recommended an amendment to ToR as requested by the State Government and granted an extension to the validity of ToR until 31-5-2014. On 19-6-2013, MoEF communicated its approval for the amendment of ToR and for the extension of its validity.

7. On 3-10-2014, the State Government floated a tender for the development of a greenfield international airport project on a PPP basis. On 20-10-2014, the Directorate of Civil Aviation, Government of Goa submitted a draft EIA report to the Goa State Pollution Control Board, requesting it to initiate steps to conduct a public hearing. A public hearing was conducted at the project site on 1-2-2015. EAC, at its meetings held on 9-3-2015 to 11-3-2015, recommended an extension of the validity of ToR for another year ending on 31-5-2015.

8. On 20-5-2015, the State of Goa submitted a final EIA report to MoEFCC, seeking the grant of an EC for the project. On 29-5-2015, MoEFCC communicated its approval for extending the validity of ToR until 31-5-2015. Between 24-6-2015 and 26-6-2015, EAC, at its 149th meeting, deliberated on the EIA report and sought additional information from the project proponent, inter alia, on:

"• 10 years' data regarding rainfall in the area;

• Drawing of traffic circulation plan for smooth circulation of traffic in the area;

• Minimum 20% energy conservation measures should be adopted in incorporating provisions for use of LED, star rated ACs, and a revised energy conservation plan to be submitted;

• Measures taken to comply with the CPCB guidelines formulated for noise pollution control in airport area to be submitted."

In the meantime, a representation was submitted by the Federation of Rainbow Warriors, one of the appellants before this Court to EAC. EAC, at its 151st meeting held on 7-9-2015 to 9-9-2015, deliberated upon the representation and sought a clarification from the project proponent on the issues raised. On 28-9-2015, the project proponent submitted its reply to the representation. EAC, at its 152nd meeting on 20-10-2015, sought a further clarification from

the project proponent on the reply submitted by the Federation of Rainbow Warriors. At that meeting, EAC recommended the grant of an EC for the project.

9. On 28-10-2015, MoEFCC, as the regulatory authority under the 2006 Notification for Category 'A' projects, communicated its approval for the grant of an EC. Following the grant of EC, the tender process which had been initiated on 3-10-2014 was concluded on 26-8-2016. Consequent to the opening of the final bids, a technical scrutiny, evaluation coupled with pre-bid meetings, deliberations on the draft concession agreement and other required steps, GMR Goa International Airport Ltd. (GGIAL) was awarded the contract on a revenue sharing of 36.99% to the State of Goa. On 8-11-2016, the concession agreement was executed between the Government of Goa and GGIAL for the development and operation of the airport with the concession period of 40 years. Upon financial closure, the three-year period for the construction of the airport commenced on 4-9-2017. The target date for the commissioning of the first phase of the project is 3-9-2020.

10. The grant of EC was challenged before the Western Zonal Bench of NGT (Appeal No.

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61 of 2015) by the Federation of Rainbow Warriors. Hanuman Laxman Aroskar also filed an appeal (Appeal No. 1 of 2016) before the Western Zonal Bench of NGT. These appeals were subsequently renumbered (Appeals Nos. 5 and 6 of 2018) before the Principal Bench of NGT at New Delhi. On 7-11-2017[2], NGT issued an ad interim order restraining the cutting or felling of trees in the area designated as the site of the proposed airport. On 22-11-2017[3], the order of restraint was modified on the statement of the Advocate General of Goa that the State shall not cut or fell any trees, nor allow it to take place without valid permission from the lawful authority for a fortnight thereafter in order to enable the appellants to pursue their remedies. On 6-2-2018, the Deputy Conservator of Forests granted permission for felling 21,703 trees at the airport site. The appellate authority under the Goa, Daman and Diu Preservation of Trees Act, 1984 (6 of 1984) dismissed the appeal on 7-3-2018.

11. On 8-3-2018[4], the High Court of Judicature at Bombay at its seat at Goa set aside the order of the Deputy Conservator of Forests and remanded the matter to be heard by the Principal Chief Conservator of Forests. On 2-4-2018, the Principal Chief Conservator of Forests stipulated several conditions for the cutting and the felling of trees at the site of the airport including: (*i*) enumeration of trees; and (*ii*) the plantation of ten times the number of trees felled. Upon being moved in a public interest litigation (PIL), the High Court by its order dated 25-4-2018 allowed the exercise of enumeration to be carried out. As a result, 54,676 trees were enumerated, including the 1548 trees which had been

felled earlier in terms of the order dated 6-2-2018 of the Deputy Conservator of Forests. On 13-1-2018, the High Court issued final directions in the PIL directing the State of Goa to approach NGT seeking permission for felling and cutting trees. The State was directed to carry out the cutting and felling of trees only after prior permission was granted by NGT.

12. A miscellaneous application (MA No. 975 of 2018) was filed by the State of Goa before NGT on 2-7-2018 seeking permission for the felling of trees. By its judgment dated 21-8-2018[1], NGT disposed of both the appeals and the miscellaneous application filed by the State of Goa, upholding EC and imposing additional conditions to safeguard the environment. This Court has been informed that the felling of trees was initiated on 3-9-2018 and completed on 14-1-2019. Assailing the judgment of NGT, two appeals have been filed before this Court: one by Hanuman Laxman Aroskar (Civil Appeal No. 12251 of 2018) and the other by the Federation of Rainbow Warriors (Civil Appeal No. 1053 of 2019).

13. On 18-1-2019[5], notice was issued in the appeals and an order of status quo was passed by this Court. The appeals were admitted for hearing and final disposal.

B. *Submissions*

14. We have heard Ms Anitha Shenoy, learned counsel appearing on behalf of the appellants. Mr K.K. Venugopal, learned Attorney General (AG) for India appeared on behalf of the State of Goa. Mr Atmaram S. Nadkarni, learned Additional Solicitor General (ASG) of India appeared on behalf of MoEFCC. Mr Parag P. Tripathi, learned Senior Counsel and Ms Aastha Mehta, learned counsel appeared on behalf of the concessionaire.

15. Ms Anitha Shenoy, learned counsel appearing on behalf of the appellants urged that the EIA report which is carried out under the terms of the 2006 Notification is a tool to evaluate the environmental consequences of a proposed activity. The proposed international airport, being a Category 'A' project, is governed by the second, third and fourth stages of scoping, public consultation and appraisal respectively envisaged under the 2006 Notification. In addition to the 2006 Notification, the Guidance Manual furnishes a significant signpost in the procedure envisaged prior to the grant of an EC. The project proponent is required to submit Form 1 complete with relevant details of the proposed project and the status of the environment. ToR which is finalised by EAC is founded on the disclosures which are made by the project proponent.

16. In this backdrop, the principal submissions urged by the appellants before the Court

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are as follows:

16.1. There were material concealments by the project proponent in failing to disclose that as many as 54,676 trees were required to be felled. Form 1, which was submitted by the project proponent, was silent in regard to the

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number of trees required to be felled. The final EIA report, while dealing with the biological environment in Clause 2.1.5 contains the following statement:

> "2.1.5. Biological environment
> Construction phase
> *Impacts (Significance-Medium)*
> The area acquired for proposed airport has only few trees, mainly bushes. These will be cleared during site preparation."

Contrary to the above assertion is the statement contained in the counter-affidavit filed by the State of Goa:

> "...I say that the permissions which have been obtained for cutting of 54,676 trees have been granted by the authorities concerned in terms of the relevant statutory provisions and after laying down various conditions. I say that the context in which it was mentioned as sparse trees has to be seen from the huge area of the land. The land being 2133 ac, it would proportionally work out to about 25 trees in an area of 1 ac i.e. 4000 sq m, which is one tree in an area of about 160 sq m."

The submission urged by the appellants is that the purpose of the EIA report is to form an assessment of the state of environment as it exists in reality. The project proponent is duty-bound to make a proper disclosure and the highest level of transparency is required. Accompanying Form 1 is a declaration of the project proponent that EC will be liable to be rejected in the event of a suppression or misstatement of material facts. The State of Goa filed a miscellaneous application before NGT seeking permission to fell around 55,000 trees. This is a clear indicator that the original statement by the project proponent in Form 1 as well as in Clause 2.1.5 of the EIA report that only a few trees were required to be felled is factually incorrect.

16.2. There was a concealment of Ecologically Sensitive Zones (ESZs) in the State of Maharashtra. In terms of the Guidance Manual, primary data through measures and full surveys; and secondary data from secondary sources have to be collected. Primary data includes the study area within 10 km radius from the Aerodrome Reference Point (ARP) and covers one season other than the monsoon. Secondary data includes data collected within an aerial distance of 15 km for the parameters which are specifically mentioned in Column 9 (III) of Form 1 of the 2006 Notification and covers one full year. In the present case, while furnishing details of ESZs falling within an aerial distance of 15 km, the EIA report stipulates that there were none in the State of Maharashtra. The State of Goa has also averred in its counter that there are no ESZs within a radius of 15 km from ARP and that there are no reserve forests in that radius. After hearings had begun before NGT, a letter was addressed by the Principal Chief Conservator of Forests on 12-2-2018 to the Director of Civil Aviation stating that a list of reserved forests had been notified under Section 20 of the Forest Act, 1927 in Sawantwadi Forest Division of Sindhudurg District in Maharashtra which was obtained from the working plan of Sawantwadi Forest Division

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(2014-15 to 2023-24). The letter stated that there was no reserved forest notified under Section 20 of the Forest Act, 1927 in the Sawantwadi Forest Division, within a radius of 15 km from the ARP. On this aspect, it was urged on behalf of the appellants that restrictions

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come into force as soon as a notification under Section 4 of the Forest Act, 1927 is issued. Under the Forest Conservation Act, 1980, any use of forest land for non-forest purposes requires prior permission of the Union Government, as elaborated in the judgment of this Court in *T.N. Godavarman Thirumulpad* v. *Union of India*[6] (*Godavarman*). The purpose of elucidating forest areas which fall within an aerial distance of 15 km from the project site is to enable an assessment to be made of the impact of the project on forested areas. Failure to mention forests in the State of Maharashtra was a significant omission in the EIA report.

16.3. Form 1 requires a disclosure of the details of ESZs within an aerial distance of 15 km of the project boundary. The EIA report rests content in stating that Pernem Taluka is not included in an ESZ by the High Level Working Group (HLWG) constituted under the Chairmanship of Dr K. Kasturirangan, Member (Science), Planning Commission (Kasturirangan Report). The project proponent, in response to the disclosures required for areas which are important or sensitive for ecological reasons — wetlands, water sources or other water bodies, coastal zone, biospheres, mountains and forests, left the required details blank. In this context, it was urged by the appellants that the purpose of the EIA report was not only to make an assessment of the project site but also of an area surrounding the project site within an aerial distance of 15 km. HLWG recognised that there were ESZs. In the present case, several villages are situated at a bare distance of 1.5 km from the project site in Maharashtra. Yet, there was no disclosure of this fact and the EIA report merely recorded that Pernem Taluka is not included in an ESZ.

16.4. The State of Maharashtra comprises nearly 40% of the study area. Yet, there was no sampling of soil, air and water in Maharashtra. Sampling was carried out in 2011 and 2014-15 in Goa but no sampling site is situated in Maharashtra. In the absence of baseline data generated with regard to environmental parameters in the State of Maharashtra surrounding the project site, the EIA report suffers from a gross deficiency.

16.5. The EIA report is grossly deficient in failing to notice wildlife in the surrounding forests. On the contrary, the appellants have relied on a rapid survey conducted to assess the presence of various mammals in the study area. Moreover, no avi-faunal study was done.

17. Apart from the above submissions, Ms Shenoy has urged that the stages of public consultation and appraisal under the 2006 Notification are crucial to the assessment process. As far as the public consultation is concerned, the draft EIA is given before the hearing. During the course of the public consultation, as many as 70 persons spoke, 1150 representations were received and 1586 persons are stated to have participated. The range of concerns expressed during

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the course of the public consultation covered a variety of environmental issues. Amongst them was the presence of perennial springs, the porous nature of the laterite plateau where permeation is a source of drainage for water collection and the existence of cashew plantations on which the livelihood of the local residents depends. Under the 2006 Notification, the State Pollution Control Board (SPCB) was required to collate the issues raised and the response of the project proponent, before submitting required documents to EAC. Before EAC, the project proponent in its presentation, indicated that the objections were only about employment opportunities. The project proponent clearly failed in its duty to appraise EAC about serious environmental concerns which were raised during the course of the public consultation.

18. On the aspect of appraisal, it has been urged that the minutes of EAC meeting recommending the grant of an EC contain, as the learned counsel for the appellants submitted, "not a line on the EIA report". EAC was required to state its reasons for recommending the grant of an EC in terms of the 2006 Notification. The reasons must indicate that there was an appraisal by EAC. In the present case, the recommendations of

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EAC are based on vague considerations such as: (*i*) larger public interest; (*ii*) non-concealment of the facts by the project proponent; and (*iii*) the delay which had occurred in the process. The submission urged is that EAC, as an expert body, has failed to furnish reasons; acted on the basis of considerations which are not germane to the exercise of its functions and failed to apply its mind to relevant considerations including the environmental consequences of the project.

19. Finally, it has been submitted that under Section 16(*h*) of the National Green Tribunal Act, 2010 (the NGT Act, 2010) an appellate remedy is provided against the order granting EC. By virtue of the provisions of Section 20, NGT is under a mandate to apply the principles of sustainable development, the precautionary principle and the polluter pays principle while passing any order, decision or making the award. An appeal lies before this Court under Section 22 from an order, decision or award of the Tribunal on a substantial question of law as specified in Section 100 of the Code of Civil Procedure, 1908. NGT, by virtue of its adjudicatory authority under Section 16(*h*), is entrusted with a duty to conduct a merits review. The failure to consider materials on a vital issue constitutes a substantial question of law as does the failure to consider vital issues in the proceedings before it. In the present case, the Tribunal has merely relied on the process conducted by EAC and its recommendations, abdicating its own jurisdiction to conduct a merits review.

20. Mr A.N.S. Nadkarni, learned Additional Solicitor General appearing on behalf of MoEFCC, urged that the EIA report, besides dealing with environmental concerns, addresses the impact of the project during both the phases of construction and operation. EAC is sourced from experts from outside the Government. The airport project was conceived in 1996; consultants were appointed and three sites were initially shortlisted. It was in 2011 that ToR were sought by and given to the project proponent by EAC. The draft EIA

was placed for public consultation in 2014 and the final EIA report came to be submitted in 2015. EAC deferred consideration of the EIA report on three occasions, including among them to consider the representation filed by the Federation of Rainbow Warriors.

21. Countering the submission of the appellants on the non-disclosure of *reserved forests* in Form 1, the learned ASG urged the following submissions:

21.1. The submission of the appellants was not raised either in the public hearing or in the grounds urged before NGT, but was addressed in the written submissions filed before NGT and when a map of the Surveyor General of India was produced.

21.2. Table 2.1.5 of the EIA report states that there is no reserved forest in the State of Maharashtra while delineating ESZs within 15 km from the project boundary. The report proceeded on the plain meaning of the Forest Act, 1927 according to which it is only upon the issuance of a notification under Section 20 that a reserved forest is declared.

21.3. As a matter of fact, within the area of 15 km from the project boundary in the State of Maharashtra, no reserved forest stands declared under Section 20(2) of the Forest Act, 1927.

21.4. The decision in *Godavarman*[6] which adopts the ordinary meaning of the expression "forest" is site specific: MoEFCC follows it scrupulously even if there is a notification under Section 4 while considering the diversion of forest land for non-forest uses. The decision in *Godavarman*[6] has also been explained in the decision of this Court in *Noida Memorial Complex Near Okhla Bird Sanctuary, In re*[7] (*Okhla Bird Sanctuary*).

21.5. The Guidance Manual notices that environmental facets which have to be considered in relation to airport development are categorised into seven groups: (*a*) land use; (*b*) water quality; (*c*) air quality; (*d*) noise pollution; (*e*) biological environment; (*f*) socioeconomic changes and occupational health; and (*g*) solid waste management. Baseline data of these environmental facets is ascertained through primary data extending to one season while secondary data extending to a year is gathered in terms of the Guidance

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Manual and the distance specified in Para 4.1.

21.6. The EIA report records that the surrounding land use of the airport site is predominantly forest land. Land use and land cover specifically for a 10 km radius from the airport site in Maharashtra is also set out in Chapter II of the EIA report, which indicates a reference to the forest area. Annexure IX of the EIA report incorporates land use with land cover maps, both for Goa and Maharashtra in the 10 km radius, which includes forested areas within the State of Maharashtra; Annexure X of the EIA report elucidates surface water bodies both in Maharashtra and in Goa in the radius of 10 km while Annexure XI provides a hydrogeomorphological map of Goa and Maharashtra. In other

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words, it was urged that: (*i*) a legally designated forest under the Forest Act, 1927 requires a notification under Section 20; however, at the same time, (*ii*) the EIA report contains a clear disclosure of the presence of forest areas in both the States of Goa and Maharashtra within a radius of 10 km including areas of dense forest.

22. As regards the lack of *sampling points* in Maharashtra, the learned ASG urged that while all the six sampling points for ambient air quality within 10 km of the study area were in Goa, the air quality which was being tracked was within the stipulated radius and was not confined to the State of Goa. Similarly, in studying the water environment, the groundwater quality was measured at four locations in Goa within 10 km of the study area. As regards the monitoring of noise, nine sampling points were chosen within the State of Goa in accordance with the Central Pollution Control Board (CPCB) guidelines. The monitoring of noise environment, both at the construction and operational phases, has similarly been dealt with in the EIA report. The learned ASG urged that the choice of the sampling locations was not arbitrary: though the sampling points were not in Maharashtra, data required was tracked across a radius of 10 km from the ARP which also included the State of Maharashtra.

23. Dealing with the submission that no avi-faunal study was carried out, it was urged that the EIA report specifically deals with this aspect in paragraph 4.6 of Chapter II which elucidates that 385 species of plants belonging to 88 plant families were documented and identified in the 10 km radial distance of the proposed project site. The study similarly dealt with faunal diversity. As many as 86 species of birds were observed in the course of the avi-faunal study, which has been elucidated in Table 4.17 of the EIA report.

24. On the issue of ESZs, the learned ASG urged that there is a specific reference to the Kasturirangan Report, under the heading of "Environmentally Sensitive Zones" in Chapter IV of the EIA report. The EIA report notices that the proposed airport site falls in Pernem Taluka of North Goa which has not been included in the ESZs mapped by HLWG. Annexure XVI of the EIA report is a notification dated 13-11-2013 (the 2013 Notification) of MoEF, which contains a list of villages (State, district and taluk-wise) identified by HLWG. Para 9 of the 2013 Notification which has been issued under Section 5 of the Environment (Protection) Act, 1986 specifies the categories of new and expansion projects which are prohibited in ESZ. The proposed airport notification project does not fall within the prohibited category. Moreover, since the site of the proposed airport was not included in an ESZ, the prohibition imposed by the 2013 Notification had no application.

25. The learned ASG has also urged that the report of HLWG on Western Ghats, submitted on 15-4-2013, stipulates certain development restrictions in ESZs which are as follows:

25.1. A complete ban on mining, quarrying and sand mining.

25.2. A complete ban on thermal power projects while hydro power projects may be permitted subjected to conditions.

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25.3. A strict prohibition on "red category" industries.

25.4. A prohibition on building and construction projects of 20,000 sq m.

25.5. All other infrastructure and development projects/schemes would be subject to the grant of an EC as Category 'A' projects under the 2006 Notification.

25.6. All development projects within 10 km of the Western Ghats ESZ and requiring ECs shall be regulated in accordance with the 2006 Notification.

26. Based on the above recommendation of HLWG, it was submitted that the proposed airport project, which falls under Category 'A' projects as delineated by the 2006 Notification, is regulated by it and does not attract a blanket prohibition.

27. The submission that EAC had failed to apprise the environmental consequences of the project and should have applied its mind to environmental concerns has been countered by relying on the minutes of the meetings conducted by EAC.

27.1. At its 149th meeting held on 26-6-2015, EAC sought additional information on six distinct aspects upon receiving the presentation by the project proponent.

27.2. At its 151st meeting held on 7-9-2015 to 9-9-2015, EAC took note of a representation filed by the Federation of Rainbow Warriors and deferred further consideration of proposal for the grant of EC. The project proponent was called upon to submit a response to the issues raised in the representation.

27.3. At its 152nd meeting held on 20-10-2015, EAC dealt with clarifications issued by the project proponent to the concerns raised by Rainbow Warriors and proceeded to recommend the project for the grant of an EC subject to the stipulated conditions.

28. On 28-10-2015, EC was granted by the Union Government. On the basis of the procedure which was followed by EAC, the following submissions have been urged:

28.1. The application of mind by EAC can be inferred and seen from the record.

28.2. Where considered necessary, EAC sought information outside the EIA report.

28.3. Having appraised the EIA report, EAC imposed site specific conditions.

28.4. EAC consists of experts in the field and once it has been shown that all relevant considerations were borne in mind, this Court must give due deference to their view.

29. Mr K.K. Venugopal, learned Attorney General, appearing on behalf of the State of Goa, urged the following submissions:

29.1. The proposed project for setting up an international airport at Mopa has been on the drawing board for nearly two decades. Successive studies were

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commissioned to assess the feasibility of the project from diverse sources, both within and outside the Government. This includes studies by private organisations as well as reports by Airports Authority of India, the International Civil Aviation Organisation and the six-member Committee constituted by the State Government under the auspices of the Chief Minister.

29.2. The setting up of an airport is an imminent need, since the existing airport at Dabolim has reached a saturation point and is unable to cater to the growing volume of passenger traffic into Goa.

29.3. Tourism, it has been urged, is a major source of revenue for the State, with the banning of mining activities. A balance must be drawn between development and the environment. A distinction needs to be drawn between overwhelming environmental objections which are not reversible and incapable of amelioration, and cases such as the present where the environmental consequences of project are capable of being countered by suitable measures.

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29.4. Objections primarily based on a defect in procedure should not be sufficient to quash a project conceived in public interest with vast benefits for the development of the State and for the members of the travelling public. It was urged that there was no major environmental objection and the challenge to the EIA report is not substantial enough to overcome the interests of three million passengers. The expected inflow is anticipated to reach 30 million in 2030.

30. On the aspect of the *felling of trees*, the learned AG submitted that following the order of the Bombay High Court, the Principal Chief Conservator of Forests passed an order on 2-4-2018 providing for:

(*i*) enumeration of all trees covered by the project site;

(*ii*) issuance of tree felling permission by the Deputy Chief Conservator of Forests; and

(*iii*) plantation of ten times the number of trees felled under the supervision of the Forest Department.

Thereafter, when the High Court was moved in a PIL, an order was passed on 13-6-2018 that the grant of permission for felling trees and the actual felling of trees will be carried out only after NGT granted permission in the pending proceedings. A miscellaneous application seeking permission for the felling of trees was instituted before NGT. In its final order dated 21-8-2018[1], NGT disposed of both the appeals as well as the miscellaneous application. Moreover, NGT has specifically dealt with the felling of trees in the course of its distinction.

31. On behalf of the concessionaire, Mr Parag P. Tripathi, learned Senior Counsel and Ms Astha Mehta, learned counsel urged that upon the grant of an EC, a concession agreement was executed by it with the State of Goa on 8-11-2016. Possession of the project site was handed over on 4-9-2017 and work commenced on 3-3-2018. The indicative capital for Phase 1 of the development is Rs 1900 crores while the cost of the entire project is likely to

be Rs 3000 crores. The State of Goa has incurred a total expenditure of Rs 240 crores for land acquisition, rehabilitation, road widening, consultancy and other related aspects while the concessionaire has thus far incurred an expenditure of Rs 230 crores as on 18-1-2019. 14.06% of the project work has been completed and a manpower consisting of 1500 persons has been mobilised at the site together with plant and machinery.

32. The concessionaire has stated that it has tied up with a consortium of banks and the servicing of the loans is linked to project milestones. As on 18-1-2019, the major works in progress included:

(*i*) site preparation and earth works such as excavation and filling up of runways, taxiways, aprons and parking bays;

(*ii*) PTB-foundations and column works; and

(*iii*) excavation of the foundations for the ATC building.

The concessionaire has submitted that apart from the plantation of ten trees for every single tree which has been felled, the Forest Department identified about 500 trees for transplantation, which process is being carried out. In this background, it has been submitted that the project should not be interdicted. The concessionaire, it has been urged, is committed to the completion of the project which accords with all the approvals that have been received.

33. The rival submissions now fall for our consideration.

C. *Scheme of the 2006 Notification and the Guidance Manual for Airports*

C. 1. *EIA Process*

34. The objective of the EIA process is to ensure that environmental and developmental concerns are appropriately balanced on the basis of the most accurate information available.

35. The Constitution (Forty-second Amendment) Act, 1976, which came into force with effect from 3-1-1977, inserted Article 48-A to the Constitution which mandates that the

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State shall endeavour to protect and improve the environment and safeguard the forests and wildlife of the country. Article 51-A(*g*) of the Constitution places a corresponding duty on every citizen to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures. Following the decisions taken at the United Nations Conference on the Human Environment held at Stockholm (the Stockholm Conference) in June 1972 in which India participated, Parliament enacted the Environment (Protection) Act, 1986 to protect and improve the environment and prevent hazards to human beings, other living creatures, plants and property.

36. On 27-1-1994, MoEF, in exercise of the powers conferred by sub-section (1) and clause (*v*) of sub-section (2) of Section 3 of the 1986 Act read with clause (*d*) of sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986, issued a notification, S.O. 60(E) (the 1994 Notification) imposing restrictions and prohibitions on the expansion and modernisation of any activity

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or new project unless an EC was granted under the procedure stipulated in the notification. Under the notification, any person undertaking a new project or expanding and modernising an existing project was required to submit an application to the Secretary, Ministry of Environment and Forests, New Delhi.

37. The application, which was to be made in accordance with the schedule provided in the notification was to be submitted with a project report which included with it an EIA report, an Environment Management Plan (EMP) and the details of a public hearing which had been carried out in accordance with guidelines issued by the Central Government from time to time. Limited exceptions to the public hearing process and the submission of an EIA were provided.

38. MoEF as the Impact Assessment Agency (IAA) would then evaluate the application and reports submitted. IAA was empowered to constitute a committee of experts, if necessary, which would have a right of entry into and inspection of the site during or after the commencement of the preparations relating to the project. IAA would prepare a set of recommendations based on the documents furnished by an applicant within 90 days from the receipt of the documents and a decision would be conveyed to the applicant within 30 days thereafter. EC granted was valid for a period of five years and a successful applicant was required to submit half-yearly reports to IAA. Concealing factual data or submitting false or misleading information would make the application liable for rejection and would lead to the cancellation of any EC granted on that basis.

39. The 1994 Notification was amended to reflect the growing protection accorded to the environment.

40. On 14-9-2006, MoEF released another notification, S.O. 1533 (the 2006 Notification) in supersession of the previous notification. The 2006 Notification directed thus:

> "...on and from the date of its publication the required construction of new projects or activities or the expansion or modernisation of existing projects or activities listed in the schedule to this notification entailing capacity addition with change in process and or technology shall be undertaken in any part of India only after the prior environmental clearance from the Central Government or as the case may be, by the State Level Environment Impact Assessment Authority, duly constituted by the Central Government under sub-section (3) of Section 3 of the said Act, in accordance with the procedure specified hereinafter in this notification."

41. There are significant differences between the 1994 Notification and the 2006 Notification. They are:

41.1. The 2006 Notification categorically states that an EC must be granted by the regulatory authority prior to the commencement of any construction work or preparation of land.

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41.2. The 2006 Notification divides all projects into Category 'A' and Category 'B' projects. MoEFCC continues to regulate projects of large scale (Category 'A'), while SEIAAs regulate comparatively smaller projects (Category 'B').

41.3. Under the 1994 Notification, an applicant was required to submit an application along with all reports including the EIA report at the time of the application. Under the 2006 Notification, prior to the preparation of the EIA report by the applicant, the authority concerned formulates comprehensive ToR on the basis of the information furnished by the applicant addressing all relevant environmental concerns. This forms the basis for the preparation of the EIA report. A pre-feasibility report must also be submitted with the application unless exempted in the notification. Under the 2006 Notification, a draft EIA is first prepared and it is only after the public consultation process that a final EIA report must be prepared addressing all the concerns raised during public consultation.

41.4. The 2006 Notification stipulates the creation of a regulatory body at the State level — SEIAA comprising members with expertise in the field of environmental laws which is charged with granting ECs for Category 'B' projects.

41.5. Under the 1994 Notification, the final approval was granted by IAA. Under the 2006 Notification, though the final regulatory approval is granted by MoEFCC or SEIAA, as the case may be, the approval is to be based on the recommendations of EAC functioning in MoEFCC or the State Expert Appraisal Committees (SEAC) which are constituted for that specific purpose.

41.6. Under the 2006 Notification, the application can be rejected by the regulatory authority on the basis of the recommendation of EAC or SEAC, as the case may be, at the preliminary stage itself, prior to public consultation.

41.7. Under the 1994 Notification, the public hearing process was overseen by the State Pollution Control Boards (SPCB) which would constitute a public hearing panel for the purpose. Under the 2006 Notification, the public consultation process is expanded to include the receipt of written comments from persons concerned. The public hearing component was to be overseen by SPCBs or the Union Territory Pollution Control Committee (UTPCC).

42. The salient objective which underlies the 2006 Notification is the protection, preservation and continued sustenance of the environment when the execution of new projects or the expansion or modernisation of existing projects is envisaged. It imposes certain restrictions and prohibitions based on the potential environmental impact of projects unless prior EC has been granted by the authority concerned. EC is required before any construction work, or preparation of land (except for securing the land) is started on the project or activity listed in the schedule to the notification. The process stipulated under the 2006 Notification is illustrated by the following flowchart:

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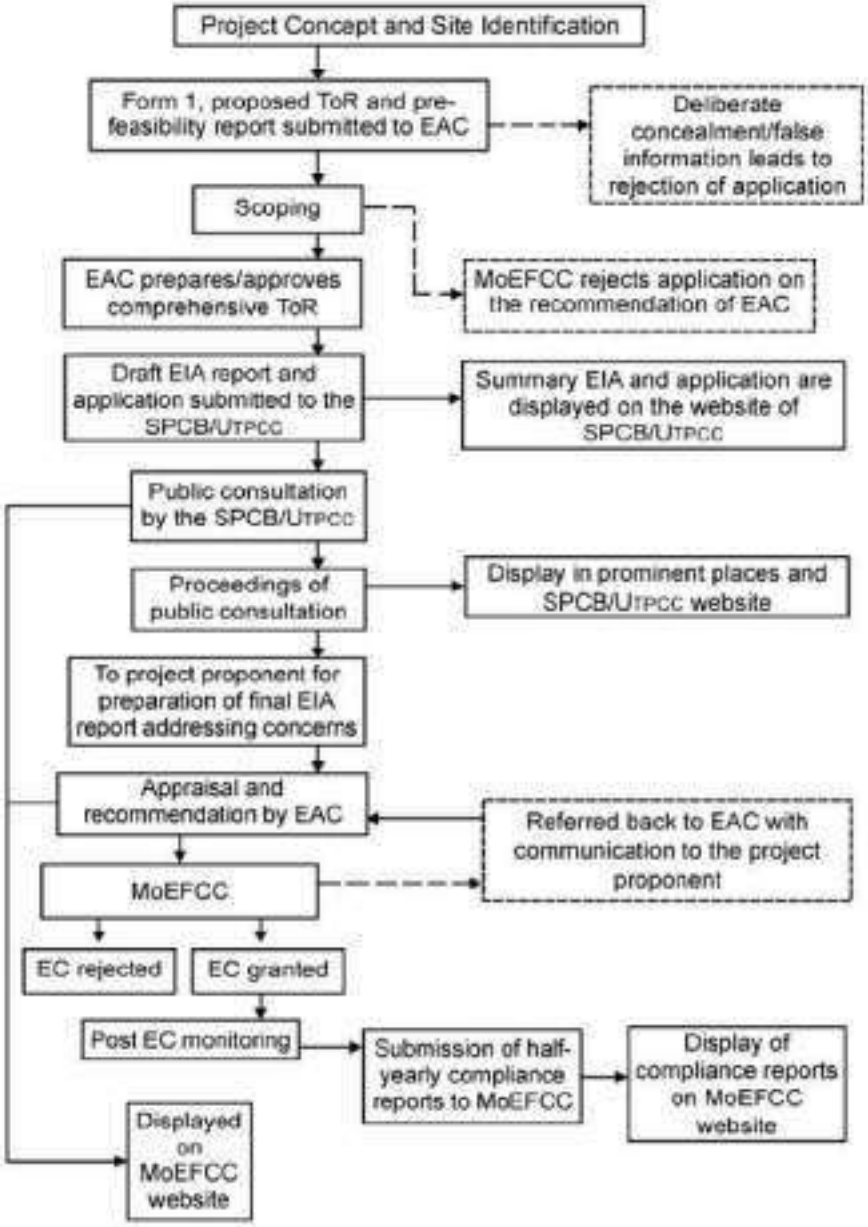
EIA Process for Category 'A' projects



43. Based on the spatial extent of the potential impact and the potential impacts on human health and natural and man-made resources, the 2006 Notification categorises all projects into Category 'A' and Category 'B' projects. MoEFCC in the Central Government and SEIAA at the State level constitute the regulatory authorities for the purposes of the notification. Category 'A' projects require prior environmental clearance from MoEFCC, based on the recommendation of EAC constituted by the Central Government for this purpose. Category 'B' projects will require prior environmental clearance from SEIAA, based on the recommendations of SEAC. Where no SEIAA or SEAC has been constituted, Category 'B' projects are treated as Category 'A' projects.

44. Once a prospective site has been identified by the applicant for the proposed project,

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all applications seeking an EC shall be made in the prescribed Form 1 and Supplementary Form 1-A[8], if applicable. The application must be submitted prior to the commencement of any construction activity, or preparation of the land at the site. A pre-feasibility report must also be submitted with the application except in the cases of construction projects in Item 8 of the Schedule, for which a conceptual plan must be submitted. The significance of the information furnished by the applicant in Form 1 shall be explored shortly.

45. The process to obtain environmental clearance as stipulated by the notification for *new* projects[9] comprises a maximum of four stages, all of which may not apply depending on the specific case stipulated under the notification:

1. Screening;
2. Scoping;
3. Public Consultation; and
4. Appraisal.

Screening

46. This step is restricted only to Category 'B' projects. This stage entails an examination of whether the proposed project or activity requires further environmental studies for the preparation of an EIA for its appraisal prior to the grant of an EC. Those projects requiring an EIA are further categorised as Category 'B1' projects and remaining projects are categorised as Category 'B2' projects. Category 'B2' projects do not require an EIA. The categorisation is in accordance with the guidelines issued in this regard by MoEFCC from time to time.

Scoping

47. At this stage, EAC or SEAC, as the case may be, formulates detailed and comprehensive terms of reference which address all relevant environmental concerns for the preparation of the EIA. Amongst other things, the information furnished by the applicant in Form 1/Form 1-A along with the proposed ToR by the applicant form the basis for the preparation of ToR. ToR must be conveyed to the applicant within 60 days of the receipt of Form 1, failing which, ToR proposed by the applicant shall be deemed as approved. Significantly, applications for EC may be rejected by the regulatory authority at this stage itself on the recommendation of EAC or SEAC, as the case may be, and the decision along with reasons is to be communicated to the applicant within 60 days of receipt of application.

Public Consultation

48. Prior to this stage, a summary EIA is prepared in the format given in Appendix IIIA on the basis of ToR furnished to the applicant. This stage involves the process "by which the concerns of local affected persons and others who have plausible stake in the environmental impacts of the project or activity are ascertained with a view of taking into account all the material concerns in the project or activity design as appropriate". The detailed procedure is stipulated in Appendix IV. Subject to the exceptions provided in the 2006 Notification, all Category 'A' and Category 'B1' projects shall undertake the public consultation process. This stage comprises of two components:

(*i*) A public hearing at the site or in its close proximity — district-wise to be carried out in the manner prescribed in Appendix IV; and

(*ii*) Procurement of written responses from persons concerned having a plausible stake in the environmental aspects surrounding the project.

49. The State Pollution Control Board (SPCB) or the Union Territory Pollution Control Committee (UTPCC) is charged with conducting the public hearing in the manner stipulated in Appendix IV and forwarding the proceedings to the regulatory authority within 45 days of a request from the applicant. The regulatory authority is empowered to engage another

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public agency or authority to carry out the process within a further period of forty-five days in case SPCB or UTPCC does not adhere to the prescribed time period stipulated in the notification. The public hearing should be arranged in a "systematic, time-bound and transparent manner" to ensure the "widest possible public participation at the project site (s) or in its close proximity district-wise". The public hearing proceeding is filmed and a copy of the video is submitted to the regulatory authority concerned.

50. Within seven days of receiving a written request to initiate the public consultation process, SPCB or UTPCC shall place the summary EIA and the application on their website and invite responses. The authority concerned may also make use of other appropriate media in addition to publication on their website to ensure wide publicity of the project. On a written request from any person concerned, the authority will make available a hard copy of the draft

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EIA for inspection at a notified place during office hours till the date of the public hearing. A duty is placed on the authority to forward all responses and comments received at this stage to the applicant through the quickest available means.

51. After the public consultation process, the applicant is duty-bound to address all the material environmental concerns expressed during the process and make appropriate changes to the draft EIA and EMP. The applicant shall then forward the final EIA report to the regulatory authority to initiate the next stage. Alternatively, the applicant may submit a supplementary report to the summary EIA and EMP.

Appraisal

52. This stage involves detailed scrutiny by EAC or SEAC of all the documents submitted by the applicant for the grant of EC. The appraisal is carried out in a transparent manner in a process to which the applicant shall be invited for furnishing clarification in person or through an authorised representative. Appendix V stipulates that the following documents are also submitted to the regulatory authority:

(*i*) Final EIA report

(*ii*) A copy of the video tape or CD of the public hearing proceedings

(*iii*) A copy of the final layout plan

(*iv*) A copy of the project feasibility report.

53. The regulatory authority must examine the documents "strictly with reference to ToR" and communicate any inadequacy to EAC or SEAC, as the case may be, within 30 days of receipt of the documents. Within sixty days of the receipt of all the documents, EAC or SEAC, as the case may be, shall complete the appraisal process as prescribed in Appendix V. Within the next fifteen days, EAC or SEAC shall make categorical recommendations to the regulatory authority concerned to either grant EC on the stipulated terms and conditions or reject the application, together with reasons. The appraisal of projects which are not required to undergo the public consultation process or the submission of an EIA is to be carried out on the basis of the prescribed application Form 1 or Form 1-A, as applicable.

54. MoEFCC or SEIAA shall thereafter consider the recommendations of EAC or SEAC and convey its decision to the applicant within 45 days of receipt of the recommendations. The regulatory authorities shall *normally* accept the recommendations of EAC or SEAC, as the case may be. Where there is a disagreement, the regulatory authority shall ask for a reconsideration of the recommendation within 45 days of the receipt of the recommendations. This decision shall be conveyed to the applicant. EAC or SEAC shall then reconsider its recommendation within a further period of 60 days and make its recommendations to the regulatory authority. The regulatory authorities shall then take a decision after considering the views communicated to it and convey the decision to the applicant within the next 30 days.

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55. If no decision is communicated to the applicant within the time prescribed, the applicant may proceed according to the recommendation of EAC or SEAC recommending either the grant or rejection of EC. The decision of the regulatory authority and the final recommendations of EAC or SEAC shall be public documents on the expiry of the prescribed timelines. Deliberate concealment and/or the submission of false or misleading information material to the steps involved in the grant of an EC make the application liable for rejection and cancellation of any EC granted on that basis.

56. The 2006 Notification embodies the notion that the development agenda of the nation must be carried out in compliance with norms stipulated for the protection of the environment and its complexities. It serves as a balance between development and protection of the environment: there is no trade-off between the two. The protection of the environment is an essential facet of development. It cannot be reduced to a technical formula. The notification demonstrates an increasing awareness of the complexities of the environment and the heightened scrutiny required to ensure its continued sustenance, for today and for generations to come. It embodies a commitment to sustainable development. In laying down a detailed procedure for the grant of an EC, the 2006 Notification attempts to bridge the perceived gap between the environment and development.

57. It is for this reason that EAC and SEAC comprise experts in the field of environmental law. The Chairperson of EAC shall be a person who is an "outstanding and experienced environmental policy expert or expert in management or public administration with wide experience in the relevant development sector". Appendix VI to the 2006 Notification stipulates that EAC and SEAC comprise 15 members who are either "experts" or "professionals". Experts must have at least 15 years of relevant experience in the field or an advanced degree (PhD) with 10 years of relevant experience. Where experts are not available, professionals may be appointed to EAC.

58. EAC and SEAC are charged with evaluating the information submitted by the applicant in Form 1/Form 1-A and preparing comprehensive ToR which guide the preparation of the EIA reports. Given that these bodies comprise experts in the field of environmental law, the recommendation of EAC or SEAC to grant EC to an applicant or reject the application is *normally* accepted by the regulatory authority.

59. The regulatory authority at the State level (SEIAA) which is charged with the approval or rejection of an application for EC comprises three members who possess the qualifications in the field as prescribed in Appendix VI. Significantly, sub-clause (7) of Para 3 of the 2006 Notification stipulates that all decisions of SEIAA shall be unanimous and taken in a meeting. Given the environmental consequences of a proposed project, no difference of opinion is provided for in the grant of an EC at the State level. It is further mandated that the project management submit half-yearly compliance reports to the regulatory authority in respect of EC and conditions.

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60. Under the 2006 Notification, the process of obtaining an EC commences from the production of the information stipulated in Form 1/Form 1-A. Crucial information regarding the particulars of the proposed project is sought to enable EAC or SEAC to prepare comprehensive ToR which the applicant is required to address during the course of the preparation of the EIA. Some of the information sought is produced thus:

60.1. Construction, operation or decommissioning of the project involving actions, which

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will cause physical changes in the locality (topography, land use, changes in water bodies, etc.).

60.2. Use of natural resources for construction or operation of the project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply).

60.3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about the actual or perceived risks to human health.

60.4. Production of solid wastes during construction, operation or decommissioning.

60.5. Release of pollutants or any hazardous, toxic or noxious substances to air.

60.6. Generation of noise and vibration, and emissions of light and heat.

60.7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea.

60.8. Risk of accidents during construction or operation of the project, which could affect human health or the environment.

60.9. Environment sensitivity which includes, amongst other things, the furnishing of the following details:

60.9.1. Areas protected under international and national legislation.

60.9.2. Ecologically sensitive areas.

60.9.3. Areas used by protected, important or sensitive species of flora or fauna.

61. Under the 2006 Notification, EC process is based on the information provided by the applicant in Form 1. That the information provided in Form 1 is crucial can be borne from the following circumstances:

61.1. EAC or SEAC, as the case may be, formulates comprehensive ToRs on the basis of the information furnished in Form 1 which addresses all possible environmental concerns. It is on the basis of ToR, that further studies and the EIA are carried out on the impact of the proposed project on the environment.

61.2. At the appraisal stage, the regulatory authority examines the documents submitted by the applicant "strictly with reference to ToR" and communicates any inadequacy to EAC or SEAC.

61.3. Category B2 projects, which do not require scoping, are evaluated by SEAC on the basis of the information furnished by the applicant in Form 1 alone.

61.4. The appraisal of all projects or activities which are not required to undergo public consultation, or submit an EIA report, shall be carried out on the basis of the prescribed application Form 1 and Form 1-A as applicable.

61.5. An application for extension of the validity of EC for certain projects is to be made by submitting a revised Form 1 within the validity period.

62. The information provided in Form 1 serves as a base upon which the process stipulated under the 2006 Notification rests. An applicant is required to provide all material information stipulated in the form to enable the authorities to formulate comprehensive ToR and enable persons concerned to provide comments and representations at the public consultation stage. The depth of information sought in Form 1 is to enable the authorities to evaluate all possible impacts of the proposed project and provide the applicant an opportunity to address these concerns in the subsequent study. Missing or misleading information in Form 1 significantly impedes the functioning of the authorities and the process stipulated under the notification. For this reason, any application made or EC granted on the basis of a defective Form 1 is liable to be rejected immediately. Clause (*vi*) of Para 8 of the notification provides thus:

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"Deliberate concealment and/or submission of false or misleading information or data which is material to screening or scoping or appraisal or decision on the application shall make the application liable for rejection, and cancellation of prior environmental clearance granted on that basis. Rejection of an application or cancellation of a prior environmental clearance already granted, on such ground, shall be decided by the regulatory authority, after giving a personal hearing to the applicant, and following the principles of natural justice."

C.2. *Guidance Manual for Airports*

63. In February 2010, MoEF brought out its Guidance Manual for Airports. The need for a sector specific manual arose because the 2006 Notification "re-engineered the entire EC process" under its earlier avatar of 1994 and new sectors were incorporated into the ambit of EC process. The 2006 Notification noted that as many as 39 developmental sectors require prior ECs. Sector specific manuals, it was hoped, would bring about standardisation in the quality of appraisal and obviate potential inconsistencies between the work performed by SEIAAs and SEACs. Chapter IV of the Guidance Manual, which is titled "Description of Environment", prescribes the study area for carrying out an EIA:

"Primary data through measurements and field surveys; and secondary data from secondary sources are to be collected in the study area within 10 km radius from Aerodrome Reference Point (ARP). Primary data should cover one season other than monsoon and secondary data is to cover one full year. The basis for selection of these criteria is that the aircraft gains

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a height of 1000 ft in this area below which noise and air pollution are generated maximum during its take off stage. Secondary data should be collected within 15 km aerial distance for the parameters as specifically mentioned at Column 9(III) of Form 1 of the EIA Notification, 2006. Details of secondary data, the method of collection of secondary data, should be furnished. Similarly, the proposed locations of monitoring stations of water, air, soil and noise, etc. should be shown on the study area map."

64. Baseline data of environmental parameters which may be affected by airport activities is collected through primary monitoring in the study area and through secondary sources. The baseline data facilitates the evaluation of the predicted impact on environmental attributes in the study area by using scientific analysis and EIA methodologies. The object is to also aid in the preparation of an EMP that would outline measures for improving environmental quality as well as retain the scope for future expansions in a sustainable manner. The Guidance Manual specifically requires collection of baseline data on the following: (*i*) land environment; (*ii*) water environment; (*iii*) air environment; (*iv*) noise environment; (*v*) biological environment; (*vi*) socioeconomic environment; and (*vii*) solid waste.

65. The importance of collecting data on land environment is emphasised in the following extract:

"The terrain and hill slope, general slope and elevation of the area, the flow direction of streams and rivers, the water bodies and wetlands and the vegetation which together describe the physiography of the land, will control the drainage pattern in the region. Land farms, terrain, may get affected due to construction of airport. It may require large-scale quarrying, dredging and reclamation, which may cause changes in the topography. This in turn may affect the drainage pattern of the land/terrain. Baseline data pertaining to existing land at the proposed project area including the description of terrain hill slopes, terrain features, slope and elevation are to be collected. Study of land use pattern, habitation, cropping pattern, forest cover, environmentally sensitive places, etc., is to be undertaken by employing remote sensing techniques and ground truthing. Ecological features of forest area; agricultural land; grazing land; wildlife sanctuary land

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and national parks; migratory routes of fauna; water bodies; and drainage pattern including the orders of the drain and watersheds are to be described. Settlements in the study area may be delineated with respect to ARP on the site map. High rise buildings, industrial areas and zones, slaughterhouses and other features of flight safety importance may also be marked on the map. Secondary data from Central Water Board, GOI; State Groundwater Department, State Irrigation Department is to be obtained. Geomorphology of the region is to be clearly delineated. Study of land use patterns, habitation, cropping pattern, and forest cover data is undertaken. Information on the location of water bodies, drainage, forests, surface travel routes with respect to the project site is obtained within the study area and plotted on a map. This map will show the natural slopes and the drainage

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patterns, which give a guideline while planning the drains in the airport project. The drains help in discharge of storm water from the airport to avoid flooding and waterlogging in the project area."

66. The study of the water environment is necessitated for the following reasons:

"Groundwater quality is important, as change in its chemical parameters will affect the water quality. Airport activities during construction/operation may have impact on groundwater quality. Due to airport construction, existing low areas may be reclaimed with dredged spoil. The pollutants from dredged spoil are likely to enter into the groundwater. This is likely to increase sedimentation of pollutants in airport area, which may migrate in time to the neighbouring groundwater. Also runoff from solid waste, if any, may percolate into the ground and may contaminate the groundwater. Hence, they need to be studied through primary surveys and secondary sources. Monitoring locations are to be finalised as per CPCB norms which can represent the baseline conditions."

67. On the aspect of air environment, the Guidance Manual emphasises that:

"Aircraft engines produce emissions that are similar to other emissions resulting from any oil-based fuel combustion. These, like any exhaust emissions, can affect local air quality at ground level. It is emissions from aircraft below 1000 ft, above the ground (typically around 3km from departure or, for arrivals, around 6 km from touchdown) that are chiefly involved in influencing local air quality. These emissions disperse with the wind and blend with emissions from other sources such as emissions from domestic sources, emissions from industries and from surface transport."

Local emissions attributed to aircraft operations at airports include oxides of nitrogen (NOx), carbon monoxide (CO), hydrocarbons (HC), sulphur dioxide (SO_2), and particulate matter (PM 10 and PM 2.5).

68. The Guidance Manual brings into focus the biological environment. It acknowledges that airport operations may alter ecosystems, threaten endangered species and disturb the movement and breeding patterns of wildlife. In this context, the collection of baseline data on sensitive habitats and wild or endangered species in the project area is contemplated. The Guidance Manual stipulates thus:

"Airport operations may cause change in local ecosystems, threaten endangered species, and disturb movements and breeding patterns of local wildlife. Airports are located within a variety of settings (both urban and rural), which support habitats and species of their own, some of which will have direct interaction with those located on the airport and vice versa. Some local areas will also be designated for their nature conservation value. The biological environment of the airport should hence be seen as

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an integral component of the wider landscape scale ecological network. To accomplish this:

(*i*) Baseline data from field observations for various terrestrial and aquatic systems are to be generated.

(*ii*) Comparison of the data with authentic past records to understand changes is undertaken.

(*iii*) Environmental components like land, water, flora and fauna are characterised and,

(*iv*) The impact of airport development on vegetation structure in and around project site is to be understood.

Data on sensitive habitats, wild or endangered species in the project area also is to be collected from Zoological Survey of India (ZSI), Botanical Survey of India (BSI), Wildlife Institute of India (WII) and Ministry of Earth Sciences. Wildlife symbolises the functioning efficiency of the entire ecosystem. Just as wild flora needs special treatment for preservation and growth, wild fauna as well deserves specific conservatory pursuits for posterity. As per the Wildlife Act (1972), the various wild animals are enlisted in the schedules of the Wildlife Act based on the intensity of threat to them as rare, endangered, threatened, vulnerable, etc. Primary data on survey of the wild animals and birds in the study area is collected and identified with the classification into various schedules taken from secondary data."

69. It is in the backdrop of the 2006 Notification and the Guidance Manual that it becomes necessary to assess the process that was adopted in the present case and its outcome.

D. *Forests*

70. The essence of the challenge to EC is twofold:

70.1. Form 1, which was filed by the project proponent, did not contain any disclosure of the name or identity of forests within an aerial distance of 15 km. Item 2 under the heading of "Environmental Sensitivity" requires a clear disclosure of "areas which are important or sensitive for ecological reasons — wetlands, water sources or other water bodies, coastal zone, biospheres, mountains and forests".

70.2. Table 2.1 of Chapter II of the EIA report delineates ESZs within an aerial distance of 15 km from the project boundary. For the State of Goa, the table indicates the presence of forests but not of protected forests. For the State of Maharashtra, Table 2.1 indicates that there were neither reserved nor protected forests within 15 km from the project boundary.

71. The learned ASG made an earnest effort to support this by urging that a reserved forest is one which is notified under Section 20 of the Forest Act, 1927. The issuance of a notification under Section 4, it was urged, is indicative only of an intent and a forest stands reserved under sub-section (2) of Section 20 only upon the issuance of a notification. The ASG submitted that the reliance which the appellants placed on the Survey of India map is misplaced as, in the absence of a notification under Section 20, a forest cannot be regarded as being

reserved. In the alternative, it was urged that as a matter of fact, the EIA report (save and except Table 2.1) takes into account the forest cover surrounding the site and within the prescribed aerial distance. As regards Form 1, the learned ASG submitted that at that stage, the project proponent may not be expected to be aware of all the features of the environment and hence, the omission to refer to forests and other areas which are sensitive ecologically should be discountenanced.

72. We cannot gloss over the patent and abject failure of the State of Goa as the project proponent in failing to disclose wetlands, water sources, water bodies, biospheres, mountains and forests within an aerial distance of 15 km as required by Form 1. The

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disclosure in Form 1 constitutes the very foundation of the process which is initiated on the basis of the information supplied by the project proponent. Following the disclosure in Form 1, ToR are formulated, and this leads to the preparation of the EIA report. A duty is cast upon the project proponent to make a full, complete and candid disclosure of all aspects bearing upon the environment in the area of study. The project proponent cannot profess an ignorance about the environment in the study area. The project proponent is bound by the highest duty of transparency and rectitude in making the disclosures in Form 1.

73. There can be no manner of doubt that Form 1 is an important ingredient in the entire process envisaged under the 2006 Notification. Hence, clause (*vi*) of Para 8 of the 2006 Notification provides that deliberate concealment or submission of false or misleading information or data which is material to screening or scoping or appraisal or decision on the application shall make the application liable for rejection and lead to the cancellation of a prior EC granted on that basis. The declaration which is required of the project proponent is to a similar effect.

74. We are unable to accept the submission that the disclosure required was of reserved forests comprehended within a notification under sub-section (2) of Section 20 of the Forest Act, 1927. Form 1 requires a disclosure of areas which are important or sensitive for ecological reasons, among them, being "forests". The expression "forests" is used without reference to a statutory or artificial definition and must hence incorporate a meaning which bears upon the ordinary description of the term. The expression "forests", means a forest as commonly understood, without reference to a notification under the Forest Act, 1927 or any other statutory enactment. Such an interpretation will subserve the purpose of an EIA. The purpose is to ensure that all relevant facets of the environment are noticed, that baselines are documented, and that the potential impact of a project or activity on the environment is assessed. Forests are forests without reference to recognition in a statutory form devised for a specific purpose.

75. The need to construe the expression "forests" in a broad and generic sense was emphasised in the decision of this Court in *Godavarman*[4]. This Court held: (SCC pp. 269-70, para 4)

> "*4.* The Forest (Conservation) Act, 1980 was enacted with a view to check further deforestation which ultimately results in ecological imbalance; and therefore, the provisions made therein for the conservation

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of forests and for matters connected therewith, must apply to all forests irrespective of the nature of ownership or classification thereof. The word "forest" must be understood according to its dictionary meaning. This description covers all statutorily recognised forests, whether designated as reserved, protected or otherwise for the purpose of Section 2 (*i*) of the Forest (Conservation) Act. The term "forest land", occurring in Section 2, will not only include "forest" as understood in the dictionary sense, but also any area recorded as forest in the government record irrespective of the ownership."

76. Subsequently, in *Okhla Bird Sanctuary*[2], this Court explained the position: (SCC p. 762, para 35)

> "*35.* Almost all the orders and judgments of this Court defining "forest" and "forest land" for the purpose of the FC Act were rendered in the context of mining or illegal felling of trees for timber or illegal removal of other forest produce or the protection of national parks and wildlife sanctuaries."

In *Okhla Bird Sanctuary*[4], trees had been planted with an intent to set up an urban park. This Court found it "inconceivable" that those trees would turn into a forest "within a span of ten to twelve years and the land, which was for agricultural use would be converted into forest land". Hence, the decision was based on a factually distinguishable situation. The decision emphasises that in construing the term "forest", courts must have due regard both

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to text and to context.

77. In the context of the 2006 Notification and the underlying purpose of facilitating an EIA report, the expression "forests" must receive its ordinary and natural connotation. The effort must not be to overlook and destroy forests but to notice and protect them.

78. Having said this, we must delve into the alternate submission that the EIA report does, as a matter of fact, consider the prevalence of forested areas both in Goa and in Maharashtra within the study area. In this context, Para 2 of the Executive Summary introducing the EIA report acknowledges that the "surrounding land use of the airport site is predominantly forest land". In the context of land environment, the EIA report records that "forest is the predominant land use in the study area". The EIA report acknowledges that territories in Maharashtra fall within one kilometre from the proposed greenfield airport. Villages falling in Goa and Maharashtra within the 10 km radius were considered for assessment. Para 2.3.1 of Chapter II deals with land use. Land use/Land cover statistics for a 10 km radius from the Mopa airport in the State of Maharashtra have been tabulated. Among them is the following:

Sl. No.	*Description*	*Area (sq m)*	*Area (ha)*
5.	Forest-Tree Clad Area-Dense	6,63,41,913.84	6634.19

Similarly Para 4.4 in Chapter IV, which is titled "description of environment statistically", provides thus:

> "Surrounding land use of the airport site is predominantly forest land. The northern and eastern side of site is reserve forest areas, whereas western side is barren and village cultivated land. The existing land use plan is attached as Annexure IX."

79. The presence of a "diverse system set as dense and open forest, cultivated lands, sand dune vegetation, wetlands and human habitation" is noticed in Para 4.6 dealing with the biological environment. Annexure IX to the EIA report provides land use/land cover maps for both Goa and Maharashtra in the study area. The maps in Annexure IX cover forested areas in Maharashtra and Goa within an aerial boundary of 10 km from the project site. Annexure XI contains the hydrogeomorphological maps for Goa and Maharashtra.

80. Though the EIA report adverts to the presence of forests within the study area in Goa and Maharashtra, we have to consider whether this by itself warrants the grant of an EC in spite of the fact that there has been a patent failure on the part of the project proponent to make a transparent and candid disclosure of material facts in Form 1. Information furnished in Form 1 is crucial to the preparation of ToR by EAC. EAC comprises of experts. It is constituted, among other reasons, for the specific purpose of assessing the information furnished in Form 1 and preparing comprehensive ToR. There is an intrinsic link between the disclosures in Form 1 which constitute the basis for formulating ToR and between the ambit of the EIA report required by ToR and the final EIA report. ToR guide the preparation of the EIA report. A failure to disclose information in Form 1 impairs the functioning of EAC in the preparation of ToR and in consequence, leads to preparation of a deficient EIA report.

81. The submission that the EIA report deals with the prevalence of forested areas and warrants the grant of an EC cannot be accepted for yet another reason. EACs and SEACs are conferred with the authority to reject applications for the grant of an EC at the stage of scoping itself, prior to the preparation of ToR. The application may be rejected on the basis of the information furnished by the project proponent in Form 1. Claiming an EC as a matter of right merely because the EIA report has assessed parameters that were omitted in Form 1, bypasses the authority of EAC and SEAC to reject an application at the preliminary stage and cannot be countenanced. The regulatory authority is required to assess the final documents submitted to it "strictly with reference to ToR" and communicate to EAC and SEAC any discrepancies between the EIA report and ToR. A deficient ToR on the basis of the

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non-disclosure of material information in Form 1 impedes this process.

82. The failure on part of a project proponent to disclose material information in Form 1 as stipulated under the 2006 Notification has a cascading effect on the salient objective which underlies the 2006 Notification. The 2006 Notification represents an independent code with the avowed objective of balancing the development agenda with the protection of the environment. An applicant cannot claim an EC, under the 2006 Notification, based on substantial or proportionate compliance with the terms stipulated in the notification. The

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terms of the notification lay down strict standards that must be complied with by an applicant seeking an EC for a proposed project. The burden of establishing environmental compliance rests on a project proponent who intends to bring about a change in the existing state of the environment. Whereas, in the present case, there has thus been a patent failure on the part of the project proponent to make mandatory disclosures stipulated in Form 1 under the 2006 Notification, that must have consequences in law. There can be no gambles with the environment: a "heads I win, tails you lose" approach is simply unacceptable; unacceptable if we are to preserve environmental governance under the rule of law.

E. *Ecologically Sensitive Zones (ESZs)*

83. The substratum of the case of the appellants is based on the following extract contained in the EIA report:

> "Ecologically Sensitive Zones, Ministry of Environment and Forests had constituted a High-level Working Group (HLWG) under the Chairmanship of Dr K. Kasturirangan, Member (Science), Planning Commission vide office order dated 17-8-2012 to study the preservation of the ecology, environmental integrity and holistic development of the Western Ghats in view of their rich and unique biodiversity. HLWG submitted its report to MoEF on 15-4-2013. HLWG identified 37% of natural landscape having high biological richness, low forest fragmentation, low population density and containing protected areas, world heritage sites and tiger and elephant corridors as ecologically sensitive areas (ESA). The present proposed airport site is falling under Pernem Taluka of North Goa District. The Pernem Taluka has not been included in the ecologically sensitive areas submitted by HLWG. MoEF order on ESA is attached as Annexure XVI."

84. According to Ms Shenoy, the EIA report notices the Kasturirangan Report submitted on 15-4-2013. The submission is that the EIA report has conveniently glossed over the areas adverted to by the Kasturirangan Report as an ESZ. This includes those areas which fall within the study area on the ground that Pernem Taluka, where the project site is situated, has not been included as an ESZ. In this context, reliance is placed on a draft notification dated 3-10-2018 issued by MoEFCC under which the Union Government has proposed to notify 56,825 sq m spread across six States — Gujarat, Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu as the Western Ghats ESZ. The preamble to the draft notification adverts to the steps taken by the Union Government between 2013 and 2016 in pursuance of the report of the HLWG. This includes draft notifications issued on 10-3-2014 and 4-9-2015. The draft notification dated 3-10-2018 emphasises the importance of the Western Ghats as a global biodiversity hot spot:

> "WHEREAS, Western Ghats is an important geological landform on the fringe of the west coast of India and it is the origin of Godavari, Krishna, Cauvery and a number of other rivers and extends over a distance of approximately 1500 km from Tapti River in the north to Kanyakumari

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in the south with an average elevation of more than 600 m and traverses through six

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States, namely, Gujarat, Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu;

AND WHEREAS, Western Ghats is a global biodiversity hotspot and a treasure trove of biological diversity and it harbours many endemic species of flowering plants, endemic fishes, amphibians, reptiles, birds, mammals and invertebrates and it is also an important centre of evolution of economically important domesticated plant species such as pepper, cardamom, cinnamon, mango and jackfruit;

AND WHEREAS, Western Ghats has many unique habitats which are home to a variety of endemic species of flora and fauna such as Myristica swamps, the flat-topped lateritic plateaus, the Sholas and wetland and riverine ecosystems;

AND WHEREAS, UNESCO has included certain identified parts of Western Ghats in the UNESCO World Natural Heritage List because Western Ghats is a centre of origin of many species as also home for rich endemic biodiversity and hence a cradle for biological evolution;"

85. Ms Shenoy has emphasised that sixteen villages in the taluka of Sawantwadi of the district of Sindhudurg which fall within the study area have been mapped as an ESZ in the annexure to the draft notification dated 3-10-2018. They are:

"State	District	Taluk	Village Name
Maharashtra	Sindhudurg	Sawantwadi	Tamboli
Maharashtra	Sindhudurg	Sawantwadi	Kumbhavade
Maharashtra	Sindhudurg	Sawantwadi	Degave
Maharashtra	Sindhudurg	Sawantwadi	Banda
Maharashtra	Sindhudurg	Sawantwadi	Padve Majgaon
Maharashtra	Sindhudurg	Sawantwadi	Ronapal
Maharashtra	Sindhudurg	Sawantwadi	Padve
Maharashtra	Sindhudurg	Sawantwadi	Dandeli
Maharashtra	Sindhudurg	Sawantwadi	Madura
Maharashtra	Sindhudurg	Sawantwadi	Dingne
Maharashtra	Sindhudurg	Sawantwadi	Aros
Maharashtra	Sindhudurg	Sawantwadi	Galel
Maharashtra	Sindhudurg	Sawantwadi	Kondure
Maharashtra	Sindhudurg	Sawantwadi	Satarda
Maharashtra	Sindhudurg	Sawantwadi	Dongarpal
Maharashtra	Sindhudurg	Sawantwadi	Sateli Tarf Soundal"

86. A comparison of the above villages with Annexure IX of the EIA report indicates that several of the above villages which have been mapped as ESZs in the draft notification fall within the 10 km buffer from the project site. Hence, the submission of Ms Shenoy merits a close analysis.

87. The EIA report has rested content with the observation that Pernem Taluka, where the project site is situated, is not an ESZ. That is not sufficient or adequate, since the purpose of the EIA report is to make an assessment of ESZs which fall within the study area. Mr Nadkarni's response to the above submission is that:

87.1. Neither the Mopa Plateau nor Pernem Taluka constitute a part of the Western Ghats.

87.2. The HLWG chaired by Dr Kasturirangan recommended a prohibition of specified activities while for other activities, the 2006 Notification was required to be followed.

87.3. The EIA report, while considering the project, has also adverted to the

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Kasturirangan Report.

87.4. Infrastructure projects except in the prohibited category are permissible, subject to an EIA.

88. The report of the HLWG dated 15-4-2013 recommends that there should be a complete ban on mining, quarrying and sand mining activity in the ESZ. Similarly, it recommends that no thermal power project should be allowed in ESZs and that all "red category" industries should be strictly banned. Building and construction projects of 20,000 sq m and above should not be allowed. However, all other infrastructure and development projects, which have been recommended, should be subject to the grant of ECs under Category "A" projects of the 2006 Notification.

89. The Union Government issued a Notification on 13-11-2013 in pursuance of Section 5 of the Environment (Protection) Act, 1986 to the effect that from the date of the issuance of those directions, no pending case or fresh case shall be considered by EACs/MoEF or SEACs/SEIAAs covering the following industries:

(*a*) Mining, quarrying and sand mining;

(*b*) Thermal power plants;

(*c*) Building and construction projects of 20,000 sq m area and above;

(*d*) Township and area development projects with an area of 50 ha and above and/or with a built-up area of 1,50,000 sq m and above; and

(*e*) "Red category" industries.

90. The submission of the ASG is that there is no prohibition on setting up a Category "A" project in an ESZ. An infrastructure project such as an airport does not fall within the range of prohibited activities. What is necessary is that the project must be assessed in terms of the 2006 Notification.

91. The glaring deficiency which emerges from the EIA report is its failure to notice the existence of ESZs within a buffer distance of 10 km of the project site. On one hand, the EIA report takes note of the HLWG report dated 15-4-2013. But, on the other hand, the EIA report ignores the existence of ESZs within the study area on the ground that the *project site* is not situated in an ESZ. That, as we have seen, can never be accepted as an adequate

response. The purpose and object of the EIA report is to map areas, understand their vulnerabilities, and conduct a study on a scientific basis of the impact of the proposed project on an ecologically sensitive terrain. The EIA report fails to meet a classical requirement of administrative law: to take into account a relevant consideration, namely, that within the study area which has to be considered, there is the presence of ESZs.

92. In deducing the impact of a proposed activity on an ESZ, it is not sufficient to take recourse to a generic assessment of a proposed activity on the ecology of the study area. The EIA report must factor in those specific features which make an area ecologically sensitive. These would encompass all aspects of environmental concern which render the area ecologically sensitive. This would include wetlands, water sources, water bodies, coastal zones, biospheres, mountains and forests. The vulnerabilities of each of them must be studied as distinctive components together with a holistic analysis of their existence in a chain of biodiversity. Where an area is ecologically sensitive because of the presence of flora or fauna requiring protection, that must be specifically adverted to and studied. The deficiency of the EIA report emanates from its failure to notice that the purpose of the study was not only to determine whether the project site is ecologically sensitive. Confining itself to this aspect, the EIA report failed to consider a crucial and relevant consideration.

F. Sampling points

93. The submission of the appellants is that the Guidance Manual requires the collection of primary data through measures and field studies in the study area within 10 km radius

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from the ARP. Secondary data has to be collected within a 15 km aerial distance for the parameters mentioned in Column 9(III) of Form 1 of the 2006 Notification. In the present case, it was urged that not a single sampling station with reference to any of the parameters is situated in Maharashtra. As a result, no sampling sites for any of the parameters fall within 40% of the study area. Consequently, no primary data collection was done despite the carrying out of two samples in 2011 and 2014 respectively. In response to this submission, it has been urged that all sampling points were based on Para 4.1 of the Guidance Manual. As a result, it was submitted that areas within Goa and Maharashtra were studied along with impact studies. In order to assess the submission, it is necessary to refer to relevant aspects of the EIA report:

F.1. *Air quality*

94. In order to study the ambient air quality in terms of suspended particulate matter, respirable particulate matter, SO_2, NO_x, CO and HC, ambient air quality monitoring stations were set up at six locations. They are at Sinechaadvin, Katwal, Mopa Village, Pernem, Nagzor and Patradevi. All are in Goa. The location at Patradevi was on the border shared by Goa with Maharashtra. The study area extended to a radial distance of 10 km from the ARP. We accept the submission of the ASG that they would hence cover areas falling within both Goa and Maharashtra. Para 4.1.2 of Chapter IV of the EIA

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report sets out the baseline data collected at the monitoring stations. Since the entire study area within a radius of 10 km was considered for monitoring air quality, we accept the submission that the location of the sampling points within Goa did not preclude the monitoring of air quality within the study area.

F.2. *Water quality*

95. Para 4.2 of the EIA report states that groundwater quality was measured at four locations: Mopa Village, Pernem, Dargal and Patradevi marked within 10 km of the study area. The surface water quality was measured at three locations: Chapora River, Tiraikol River and Nala near Mopa Village within 10 km of the study area. The impact assessment is contained in the EIA report. The Mopa Plateau is at a height of 155 metres above mean sea level and water from the plateau flows down to the rivers in the State of Goa. The laterite plateau is an important source of drainage by providing natural channels for water. The impact of a greenfield airport on the closing of natural channels which feed the water bodies has not been scientifically mapped or studied.

F.3. *Noise quality*

96. While monitoring the noise quality, the EIA report covered a radius of 10 km. In order to obtain baseline data of noise quality, nine monitoring stations were chosen in the study area. While it is true that all nine locations were situated in the State of Goa, one (Patradevi) was situated on the border shared between Goa and Maharashtra. The EIA report contains an impact study and the study area covered includes both the States.

F.4. *Flora and fauna*

97. The EIA report indicates that the area surrounding the site for the proposed airport has dense forests[10]. These total up to nearly 6634.19 hectares[11]. Ms Shenoy has urged that it is impossible that the fauna found by the project proponent through both primary sampling and secondary sources was only limited to animals such as: domestic dog, cat and cattle, common house mouse, rat and mongoose, jackal and the three striped palm squirrel. This, in her submission, is a clear indication that the EIA report is faulty and clearly incorrect.

98. While dealing with the above submissions, it is necessary to note that the Guidance Manual contains a specific reference to the collection of data of sensitive habitats and wild/endangered species in the project area. The Guidance Manual stipulates thus:

"Data on sensitive habitats, wild or endangered species in the project area also is to

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be collected from Zoological Survey of India (ZSI), Botanical Survey of India (BSI), Wildlife Institute of India (WII) and Ministry of Earth Sciences. Wildlife symbolises the functioning efficiency of the entire ecosystem. Just as wild flora needs special treatment for preservation and

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growth, wild fauna as well deserves specific conservatory pursuits for posterity."

99. The grievance is that no data has been collected from the State of Maharashtra and all secondary data collected by the project proponent related only to the State of Goa. There is substance in the submission which has been urged on behalf of the appellant. A reading of the counter-affidavit filed by the State of Goa would seem to support the appellant's submission. It is stated:

"I say that several recognised publications and research papers were referred to in order to verify and assess the data collected, to name a few of the publications:

(*i*) *Birds of Goa* by Heinz Lainer & Rahul Alvares;

(*ii*) *The Goan Jungle Book* by Nirmal Kulkarni;

(*iii*) *A Photographic Guide to Butterflies of Goa* by Parag Ragnekar;

(*iv*) *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli* (Vol. 1) by R.S. Rao;

(*v*) *Flora of Goa, Diu, Daman, Dadra and Nagarhaveli* (Vol. 2) by R.S. Rao;

(*vi*) *Red Data Book* published by Botanical Survey of India;

(*vii*) Study materials published in Goa ENVIS Centre were also referred."

100. The appellant, on the other hand, has sought to rely upon several independent studies including the following:

"(*a*) A rapid survey to assess mammal presence at Barazan Plateau, Mopa, Goa, India conducted by Girish Punjabi (Wildlife Biologist) and Atul S. Borker (Full Member of IUCN/SSC Otter Specialist Group) that Schedule I species such as gaur, leopard and Indian Pangolin; Schedule II species such as giant squirrel, common palm civet; Schedule III species such as sambar, wild pig and Schedule IV species such as Indian hare, Indian porcupine.

The report also mentions the presence of the Sawantwadi — Dodamarg wildlife corridor within the 10 km proposed project site.

(*b*) Report on one day survey conducted to find evidence of Otter presence at Mopa, Goa conducted by Atul Borker (Full Member of IUCN/SSC Otter Specialist Group) that found that a perennial stream on the plateau had presence of the smooth coated otter, that falls within Schedule II of the Wildlife (Protection) Act, 1972.

(*c*) Report on two days' survey to find evidence of plant and bird species at Mopa Plateau conducted by Aparna Watve (Ecologist) and Sanjay Thakur (Wildlife Biologist) that found Schedule I species such as the Indian peafowl and the Dipcadi Concanese which is critically

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endangered. The study clearly mentions that the EIA study is entire deficit as it does not accurately consider the flora and fauna of the area as well as the number of trees to be cut."

101. We find that the collection of both primary and secondary data of fauna in the EIA report was perfunctory. The primary study is not based on data collected from acknowledged sources such as the Zoological Survey of India, Wildlife Institute of India and Ministry of Earth Sciences as required under the Guidance Manual. Similarly, as regards avi-faunal studies, the EIA report lists 385 plant species in Table 4.15 of Chapter IV, titled

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"Description on Environment". It also states that 86 species of birds were observed during the survey in the 10 km study area from the proposed site. Column 9(III) of Form 1 refers to "areas" in the following terms:

> "areas which are used by protected, important or sensitive species of flora or fauna for breeding, foraging, nesting, resting, over wintering or migration".

The above column was left blank by the project proponent in Form 1. According to the Guidance Manual, secondary data has to be collected within an aerial distance of 15 km for the parameters specifically specified in Column 9(III) of Form 1 of the 2006 Notification. This was evidently not done. A careful avi-faunal study was necessary, having due regard to the fact that the proposed project is an airport site. Bearing in mind the profile of airport operations, foraging or nesting by bird species in and around the airport must not be discarded. It must be accepted that in a project involving the setting up of an airport, the EIA report must deal with the impact of the airport on birds and likewise the impact of birds on aircraft operations.

F.5. *Felling of trees*

102. Para 2.1.5 of the executive summary to the EIA report deals with the biological environment. Para 2.1.5 stipulates thus:

> "*The area required for proposed airport has only few trees, mainly bushes*. These will be cleared during site preparation."
>
> (emphasis supplied)

103. Similarly, Chapter II which deals with project description specifies in Para 2.3.1 that "*vegetation and trees are sparse at the site*". That the trees which were required to be felled were far from "few" is evident from the reply filed by the State of Goa in the present proceedings where it has been stated that permissions were granted for the *felling of 54,676 trees*. The EIA report ignored them. The submission in the EIA report that there were only sparse trees is sought to be explained by the State from the perspective of the large area of the land proposed for the project. It is sought to be explained that since the total area is 2133 ac, the number of trees would proportionately work out to about 25 trees in an area of one acre (about one tree in an area of 160 sq m).

104. In terms of the order passed by the Bombay High Court in the PIL, to which we have adverted earlier, the Principal Chief Conservator of Forests, Goa passed an order on 2-4-2018 providing for:

104.1. The enumeration of all trees.

104.2. Exploring the possibility of transplanting existing trees which could be safely transplanted into ground areas.

104.3. Issuance of tree cutting permission by the Deputy Conservator of Forests.

104.4. Planting of ten times the number of trees felled by the concessionaire under the supervision of the Forest Department.

105. On 6-2-2018, the Deputy Conservator of Forests had granted permission for felling of 21,703 trees. Following the dismissal of an appeal under Section 15 of the Goa, Daman and Diu Preservation of Trees Act, 1984 filed by the Federation of Rainbow Warriors, a writ petition was filed before the Bombay High Court (WP No. 1 of 2018). The High Court set aside[4] the order of the Deputy Conservator of Forests and remanded the proceedings to the Principal Chief Conservator who passed the order which has been noted above. Following the order of the Principal Chief Conservator, 54,676 trees were enumerated. The competent authority granted permission for the felling of trees thereafter on the following dates:

(*i*) 1422 trees by an order dated 20-4-2018;

(*ii*) 18,408 trees by an order dated 24-7-2018; and

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(*iii*) 33,298 trees by an order dated 1-10-2018.

Following this exercise, the felling of trees was completed on 18-1-2019. The Bombay High Court having directed that the order of the Principal Chief Conservator of Forests shall be subject to the specific permission of NGT in the pending proceedings, a miscellaneous application was moved before NGT. While disposing of the main appeal, NGT also disposed of the miscellaneous application and under the head of "Biological Environment", the following directions have been issued:

"E. *Biological environment*

1. Efforts be made to transplant the trees to other locations in the same vicinity by using appropriate mechanical devices which are available these days.

2. Efforts be made to plant indigenous species which are tall in size rather than small saplings.

3. Concerns have been raised by the appellants with regard to plant species "Dipcadi Concanense" which has been claimed to be a threatened plant. This claim of the appellants has been negated by the respondent by producing a documentation of Botanical Survey of India, Western Regional Centre, Pune, Maharashtra titled as "A

Note on Occurrence and Distribution of Dipcadi Concanense". By invoking precautionary principle, we direct the project proponent to draw up a conservancy by plan/scheme for "Dipcadi Concanense" in collaboration with Forest Department, State of Goa and Botanical Survey of India and ensure its implementation."

106. We express our serious displeasure with the manner in which the EIA report made an attempt to gloss over the existence of trees. The EIA report prevaricated by recording that the area required for the proposed airport has only a few trees, mostly bushes. The EIA report states that vegetation and trees are sparse at the site. A photograph and a google map image are put forth as illustrations in Figure 2.3 of Chapter II. To realise later that the project involved the felling of 54,676 trees is indicative of the cavalier approach to the issue and a process of fact finding which is parsimonious with the truth. Post facto explanations are inadequate to deal with a failure of due process in the field of environmental governance. The State of Goa would have us gloss over the felling of trees by submitting that 54,676 trees over a project area of 2133 ac averages out to 25 trees per acre or one tree over an area of 160 sq m. This is a fallacious approach to the issue. Mathematical averages cannot displace factual data about the actual number of trees which were affected by the project. The EIA report ought to have scrutinised the number of trees, their nature and longevity. Issues such as the extent to which the trees or some of them were capable of being transplanted had to be considered in the EIA report. The location of the trees is also significant. In a given case, if the trees appear in clusters or in a dense formation in segments of the project site, it would be necessary to determine whether felling all of them was necessary for the project to be implemented.

107. In the written submissions which have been filed by the State of Goa, it has been submitted that of the 54,676 trees which were felled:

(*i*) 32,193 trees representing 59% had a girth of 30 to 50 cm;

(*ii*) 19,903 trees representing 36% had a girth of 50 to 100 cm; and

(*iii*) "only 2580 trees" had a girth exceeding 100 cm.

108. The Goa, Daman and Diu Preservation of Trees Act, 1984 defines the expression "tree" in Section 2(*j*) in the following terms:

"**2. (*j*) "tree"** means any woody plant whose branches spring from and are supported upon the trunk or the body and whose trunk or body is not less than ten centimetres in diameter at a height of one meter from the ground level and includes coconut palm."

This definition has been highlighted to indicate that it incorporates a stringent meaning of

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the expression "trees". The point, however, is simple: there was a glaring omission of the factual existence of as many as 54,676 trees in the EIA report. For project proponents, the environment may not possess a human voice. But the purpose of prescribing an EIA report is precisely to undertake a baseline study on all aspects of the environment and to anticipate the impact of a projected activity on the environment. Ignoring *any* component of the

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environment amounts to a serious dereliction of duty which detracts from the rule of law in matters of environmental governance.

109. The order of the Principal Chief Conservator of Forests mandating transplantation, where possible, and the plantation of ten trees for every tree felled provides a measure of rectification. But there is a reason why issues pertaining to vegetational cover must be taken seriously in the EIA process. The formula of planting a set number of trees for every existing tree felled must be alive to the fact that the survival of new plantations is replete with uncertainty. The survival of transplanted trees is equally a matter of uncertainty. Though the development of infrastructure may necessitate the felling of trees, the process stipulated under the 2006 Notification must be transparent, candid and robust. A regulatory regime for environmental governance is based on the hypothesis that all stakeholders will act with rectitude. Hiding significant components of the environment from scrutiny is not an acceptable modality to secure project approvals. There was a serious lacuna in regard to disclosures and appraisal on this aspect of the controversy.

G. Public consultation

110. The importance of public consultation is underscored by the 2006 Notification. Public consultation, as it states, is "the process by which the concerns of local affected persons and others who have a plausible stake in the environmental impacts of the project or activity are ascertained with a view to take into account all the material concerns in the project or activity design as appropriate". This postulates two elements. They have both, an intrinsic and an instrumental character. The intrinsic character of public consultation is that there is a value in seeking the views of those in the local area as well as beyond, who have a plausible stake in the project or activity. Public consultation is a process which is designed to hear the voices of those communities which would be affected by the activity. They may be affected in terms of the air which they breathe, the water which they drink or use to irrigate their lands, the disruption of local habitats, and the denudation of environmental ecosystems which define their existence and sustain their livelihoods.

111. Public consultation involves a process of confidence building by giving an important role to those who have a plausible stake. It also recognises that apart from the knowledge which is provided by science and technology, local communities have an innate knowledge of the environment. The knowledge of local communities is transmitted by aural and visual traditions through generations. By recognising that they are significant stakeholders, the consultation process seeks to preserve participation as an important facet of governance based on the rule of law. Participation protects the intrinsic value of inclusion.

112. The 2006 Notification postulates:

112.1. A public hearing at or in close proximity to the project site to ascertain the views of "locally affected persons".

112.2. Obtaining written responses from "other concerned" individuals having a "plausible stake" in the environmental aspects of the project or the activity.

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112.3. The duty of SPCB to conduct hearings and to forward the proceedings to the regulatory authority within the stipulated time.

112.4. Placing on the website of the Pollution Control Board a summary of the EIA report in the prescribed format and the making available of the draft EIA report by the regulatory authority on a written request by any person concerned, for inspection.

112.5. The duty of the applicant to address all material concerns expressed during the process of public consultation.

112.6. The making of appropriate changes in the draft EIA and EMP.

112.7. The submission of the final EIA report by the applicant to the regulatory authority for appraisal.

112.8. Each of these features is crucial to the success of a public consultation process. Public consultation cannot be reduced to a mere incantation or a procedural formality which has to be completed to move on to the next stage. Underlying public consultation is the important constitutional value that decisions which affect the lives of individuals must, in a system of democratic governance, factor in their concerns which have been expressed after obtaining full knowledge of a project and its potential environmental effects.

113. Apart from the intrinsic value of public consultation, it serves an instrumental function as well. The purpose of ascertaining the views of stakeholders, is to account for all the material concerns in the design of the proposed project or activity. For this reason, the process of public consultation involves several important stages. The Pollution Control Board is under a mandate to forward the proceedings to the regulatory authority. The project proponent must address all material environmental concerns and make appropriate changes in the draft EIA and EMP. The project proponent may even submit a supplementary report to the draft EIA. Each of these elements is crucial to the design features of the 2006 Notification. A breach will render the process vulnerable to challenge on the ground that:

(*i*) significant environmental concerns have not been taken into account;

(*ii*) there was an absence of a full disclosure when the EIA report was put up for consultation; and

(*iii*) concerns which have been expressed by persons affected by the project have not been adequately dealt with or analysed.

114. The public consultation was held on 1-2-2015 at Mopa. Nearly 70 persons spoke on the occasion and 1586 persons signed the attendance sheet. 1150 representations were received. Some of the environmental concerns expressed during the public hearing are catalogued below:

114.1. Mopa Plateau has multiple watersheds and the discharge of water goes down to the rivers.

114.2. Nearly forty springs would be affected along with flora and fauna.

114.3. The public hearing had been conducted in an area where the land was barren and with no plantation.

114.4 The impact on River Chapora, which is within a 10 km radius from the project, has not been adequately analysed.

114.5. Mopa Plateau has a natural mechanism for groundwater recharge.

114.6. Protection of the Western Ghats is necessary, particularly with the view to not disturb flora and fauna.

114.7. The EIA report has not been made available to the affected areas and Gram Panchayats in the buffer zone.

114.8. Local plantations would be affected.

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114.9. The number of trees to be felled by the project proponent has not been specified in the EIA report.

114.10. The Dodamarg Wildlife Sanctuary had been "sanitised" by the High Court.

114.11. Forest clearance had not been obtained.

114.12. The sacred groves of the area have not been described, including the Barazan which will be lost.

114.13. The slopes sustain cashew plantations with nearly forty lakh cashew trees resulting in an annual income of rupees fifty crores.

114.14. No study has been carried out in the 10 km radius falling in Maharashtra.

115. These concerns are at the forefront of the debate in the present case. What is significant, is the manner in which they were projected before EAC at its 149th meeting on 26-6-2015 where the project proponent made a presentation. The minutes of the meeting recorded the following observations of the project proponent:

> "(*x*) Public hearing was conducted on 1-2-2015 at Simechen Adven, Mopa, Goa. *The major issues raised during public hearing and responses sought from the project proponent related to employment opportunities.*"
>
> (emphasis supplied)

On the basis of a factual analysis, Ms Shenoy has submitted that only seven out of the 68 objections dealt with the issue of employment. Evidently, the project proponent failed to address the other significant concerns in the manner which is required by the 2006 Notification.

116. In *Utkarsh Mandal* v. *Union of India*[12], the Delhi High Court has succinctly summarised the duty of EAC to apply its mind to the objections raised in the course of public hearings: (SCC OnLine Del para 40)

> "*40.* ... It is that body that has to apply its collective mind to the objections and not merely MoEF which has to consider such objections at the second stage. We therefore hold that in the context of the EIA Notification dated 14-9-2006 and the mandatory requirement of holding

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public hearings to invite objections it is the duty of EAC, to whom the task of evaluating such objections has been delegated, to indicate in its decision the fact that such objections, and the response thereto of the project proponent, were considered and the reasons why any or all of such objections were accepted or negatived. The failure to give such reasons would render the decision vulnerable to attack on the ground of being vitiated due to non-application of mind to relevant materials and therefore arbitrary."

117. Crucial objections and environmental concerns which were raised during the consultative process were reduced to a single issue by the project proponent before EAC: the need for employment opportunities. The project proponent failed in its duty to inform EAC. The record does not indicate a critical appraisal or analysis by EAC. EAC was duty-bound to apply its mind to the environmental concerns raised by stakeholders. The duty of the project proponent to place fairly all the environmental concerns raised during the public hearing is the crucial link in the appraisal by EAC. The minutes of the meeting indicate that there was no fair and complete disclosure of the objections which were raised during the public hearing before EAC. There is evidently a failure in the process of applying and implementing the norms laid down in the 2006 Notification in this regard.

H. *Appraisal by EAC*

118. Appraisal by EAC is structured and defined by the 2006 Notification. The process of appraisal is defined to mean "a detailed scrutiny" by EAC of the application and other documents like EIA report and the outcome of the public consultation, including the public hearing proceedings, submitted by the applicant to the regulatory authority for the grant of

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an EC. EAC is under a mandate to conduct the process of appraisal in "a transparent manner". On the conclusion of these proceedings, EAC has to make "categorical recommendations" to the regulatory authority either for:

(*i*) the grant of a prior environmental clearance on stipulated terms and conditions; or

(*ii*) the rejection of the application.

The recommendations made by EAC to the regulatory authority must be based on "reasons".

119. EAC, at its 149th meeting held on 26-6-2015, considered the EIA report and sought a clarification from the project proponent on the following six aspects:

"(*i*) There is a need to superimpose the layout plan showing the drainage pattern including natural drainage, construction in the area on superimposed map showing clear topography of the region;

(*ii*) 10 year data regarding rainfall in the area;

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(*iii*) Justification on sustainability of existing traffic and transportation arrangements especially at intersection points of the approach road to the airport needs to be submitted;

(*iv*) A traffic circulation plan needs to be evolved for smooth running of traffic in the area;

(*v*) Measures taken to comply with the CPCB guidelines formulated for noise pollution control in airport areas to be submitted; and

(*vi*) Minimum 20% energy conservation measures should be adopted incorporating provisions for use of LED, star-rated ACs, etc. Revised Energy Conservation Plan to be submitted."

120. A representation was received from the Federation of Rainbow Warriors, consequent to which the consideration was deferred and the project proponent was requested to submit a "pointwise reply to the issues raised" in the representation. EAC, at its 152nd meeting held on 20-10-2015, observed that the project proponent had provided "pointwise clarifications to the concerns raised by the 'NGO'". EAC noted thus:

"(*i*) The EIA report has been updated by the PP after taking into account the issues raised in the public hearing and the same has been put in public domain.

(*ii*) The project is outside the ESZ delineated by the Dr Kasturirangan Committee and TERI.

(*iii*) The project envisages construction of rainwater harvesting pits within the plot area, which would contribute to groundwater recharge. Hence, the objection of NGO in this regard does not hold.

(*iv*) The biological data in respect of flora and fauna was collected by the functional area experts of M/s Engineers India Ltd. and not by M/s Pragati Labs stationed at Goa during November 2014 to January 2015 for collection of ambient air quality, noise, water quality, soil, socioeconomics."

121. Following the above statement, EAC recommended the grant of an EC subject to certain conditions. Para 3.1.2 of the minutes of EAC is as follows:

"The Committee noted the peculiar circumstances of the case and the difficulties in land acquisition which led to delay in preparation of the EIA report, and the larger public interest involved.

Keeping in view the fact that the project proponent has not concealed facts and circumstances of the case and the project is in the public interest, the Ministry may take an appropriate view on the objection that the public hearing could not have been held, in the absence of valid ToR, though the validity has been extended twice and regularised

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subsequently. The Committee also noted that the public hearing was attended by about 3000 people and hence, there is substantive and active public participation as required under the law for public consultation.

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The PP further provided their reply to the rebuttal by the said NGO on various issues.

EAC, after deliberations, recommended the project for grant of EC subject to the above and the following:

(*i*) The project proponent shall ensure availability of adequate land at the junction of Mopa Airport Road and Mumbai/Goa NH 17 for traffic circulation/management and to provide for all the traffic interchanges and proposed cover.

(*ii*) The approach and exit roads to the airport would be approved from the NHAI and should be according to IRC norms.

(*iii*) A perusal of the topo sheet superimposed on the runway area indicates that the extreme end of the runway is covering the drainage area partly. The drainage area which is under the runway needs to be channelised. The area between the parallel taxi way and runway needs to be handled carefully to drain the water from the area in the outfall."

122. The above explanation must be assessed with reference to the norm that EAC is required to submit reasons for its recommendation. The above extract indicates that EAC has adverted to the following circumstances:

122.1. The "peculiar circumstances" of the case.

122.2. The difficulties in land acquisition which led to a delay in the preparation of the EIA report.

122.3. The "larger public interest" involved.

122.4. The project proponent had not concealed facts and circumstances of the case.

122.5. The project is in the public interest.

122.6. The project proponent had provided a reply to the rebuttal by Rainbow Warriors on various issues.

123. This analysis of the EIA report is, to say the least, sketchy and perfunctory and discloses an abdication of its functions by EAC. The requirement that EAC must record reasons, besides being mandatory under the 2006 Notification, is of significance for two reasons:

123.1. EAC makes a recommendation to the regulatory authority in terms of the 2006 Notification. The regulatory authority has to consider the recommendation and convey its decision to the project proponent. The regulatory authority, as Para 8(*ii*) provides, shall normally accept the recommendations of EAC. Where it disagrees, it would request reconsideration, stating the reasons for its disagreement. In turn, EAC will consider the observations of the regulatory authority and furnish its views within a stipulated period.

123.2. The grant of an EC is subject to an appeal before NGT under Section 16 of the NGT Act, 2010.

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124. The reasons furnished by EAC for its recommendation are a basic link in the ultimate decision of the regulatory authority. They constitute substantive material which will be considered by the Tribunal when it considers a challenge to the grant of an EC.

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125. What, then, do the reasons which have been furnished by EAC tell us? EAC relies on the "peculiar circumstances of the case" as the basis of its recommendation. What the peculiar circumstances are, is left for pure guesswork or surmise. EAC refers to the delay in acquisition proceedings, a larger public interest and the fact that the project proponent "has not concealed facts and circumstances". Each one of the reasons which has weighed with EAC betrays a lack of comprehension of the true nature of its function under the 2006 Notification. EAC has failed to consider relevant circumstances bearing on the environmental impact of the project and has instead considered circumstances extraneous to its function. That the project proponent, according to EAC, has not concealed facts and circumstances is not reason enough to warrant a grant of an EC. Moreover, even this hypothesis (as we have seen earlier) is incorrect. There is no analysis of the EIA report. EAC has failed to answer to the call to its expertise.

126. Clause (*vi*) of Para 8 of the 2006 Notification stipulates thus:

> "(*vi*) Deliberate concealment and/or submission of false or misleading information or data which is material to screening or scoping or appraisal or decision on the application shall make the application liable for rejection, and cancellation of prior environmental clearance granted on that basis. Rejection of an application or cancellation of a prior environmental clearance already granted, on such ground, shall be decided by the regulatory authority, after giving a personal hearing to the applicant, and following the principles of natural justice."

Deliberate concealment or the submission of false or misleading information or data material for screening, scoping, appraisal or decision on the application makes it liable for rejection. That the project proponent must submit all information and data without concealing relevant features is a basic hypothesis and expectation of the 2006 Notification. EAC has, in the brief reasons which are contained in Para 3.1.2, not applied its mind at all to the environmental concerns raised in relation to the project nor do its reasons indicate an appraisal of those concerns by evaluating the impact of the project.

127. EAC is an expert body. It must speak in the manner of an expert. Its remit is to apply itself to every relevant aspect of the project bearing upon the environment. It is not bound by the analysis which is conducted in the EIA report. It is duty-bound to analyse the EIA report. Where it finds it deficient it can adopt such modalities which, in its expert decision-making capacity, are required. The reasons which are furnished by EAC constitute a live link between its processes and the outcome of its adjudicatory function. In the absence of cogent reasons, the process by its very nature, together with the outcome stands vitiated.

128. Mr A.N.S. Nadkarni, learned ASG, urged that EAC had, in its 149th meeting, sought additional information on six issues. Subsequently, at its 151st meeting, it deferred consideration upon the representation filed by the Federation of Rainbow Warriors and at its 152nd meeting, it analysed the response of the project proponent to the representation. Hence, EAC must be deemed to have applied its mind. This approach is completely flawed. At its 149th meeting, EAC specifically called for a clarification on six issues. The next meeting was deferred. The minutes of the 152nd meeting contain no assessment of whether the clarifications which were sought by EAC had been replied to its satisfaction by the project proponent. The objection to the modalities adopted by EAC, however, are more fundamental. The minutes of the 152nd meeting indicate that EAC primarily, if not exclusively, dealt with the "pointwise clarifications" of the project proponent to the representation by the Federation of Rainbow Warriors. Dealing with a representation is not exhaustive of the function of EAC. Arguably, if no representation was received, or if a representation submitted by an individual objector is found to be incorrect, that by itself is

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no ground to recommend an EC.

129. EAC, as an expert body, has to scrutinise all relevant aspects of the project or activity proposed, including its impact on the environment. In taking that decision, the EIA report is an input for its analysis. The scrutiny and appraisal has to be undertaken by EAC as an expert body and its reasons must reflect that this has been done. As the minutes indicate, the non-application of mind by EAC is evident with reference to the presence of 15 ESZs in the study area. EAC notes that the project is outside the ESZ delineated by the Kasturirangan Committee. In the absence of a critical analysis, EAC failed in discharging its duties under the 2006 Notification. The recommendations of EAC furnish a guide for MoEFCC. Indeed, the 2006 Notification stipulates that the recommendations of EAC would normally be accepted. Consequently, a failure of due process before EAC, as in the present case, must lead to the invalidation of EC.

I. The appellate jurisdiction of NGT: the requirement of a merits review

130. NGT is entrusted with appellate jurisdiction under Section 16 of the NGT Act, 2010. Section 16(*h*) provides thus:

> "**16. *Tribunal to have appellate jurisdiction***.—Any person aggrieved by—
>
> * * *
>
> (*h*) an order made, on or after the commencement of the National Green Tribunal Act, 2010, granting environmental clearance in the area in which any industries, operations or processes or class of industries, operations and processes shall not be carried out or shall be carried out subject to certain safeguards under the Environment (Protection) Act, 1986 (29 of 1986);"

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131. Section 20 mandates that the Tribunal shall, while passing any order, decision or award, apply the principles of sustainable development, the precautionary principle and the polluter pays principle. Several decisions of this Court have given meaning to these principles[13].

132. The decision of NGT indicates that several significant submissions were urged before it. The entire analysis by NGT is contained in one paragraph of its judgment dated 21-8-2018[1] which is extracted below: (*Federation of Rainbow Warriors case*[1], SCC OnLine NGT para 27)

> "*27*. We find that the Expert Appraisal Committee had before it pointwise reply of the project proponent which we have already quoted above. Therein delay in land acquisition process and collection of fresh baseline data are mentioned. It is also mentioned that data for Maharashtra was also considered. Other issues duly explained are hydro-geological features and data with regard to flora and fauna, socioeconomic profile, topography, vegetation, observance of due procedure in public hearing, relevance of study with regard to ecosensitive areas of Western Ghats, feasibility of proposed airport in terms of cost benefit analysis as well as environmental cost benefit analysis. EAC also considered the data compiled by various offices. Mere fact that different opinions have been expressed by other experts is not enough to hold that EAC did not apply its mind. The rehabilitation programme was also produced before EAC."

The next paragraph contains a brief reference to the fact that the requirement of a study over a distance of 15 km is in regard to the collection of secondary data. The above paragraph, in our view, does not fulfil the requirement of a merits review by an expert adjudicatory body vested with appellate jurisdiction.

133. The NGT Act provides for the constitution of a tribunal consisting both of judicial and expert members. The mix of judicial and technical members envisaged by the statute is for the reason that the Tribunal is called upon to consider questions which involve the application and assessment of science and its interface with the environment. In order to be

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eligible for appointment as an expert member, a person must fulfil the following qualifications prescribed in Section 5(2):

"**5. (2)** A person shall not be qualified for appointment as an Expert Member, unless he—

(*a*) has a degree in Master of Science (in physical sciences or life sciences) with a Doctorate degree or Master of Engineering or Master of Technology and has an experience of fifteen years in the relevant field including five year's practical experience in the field of environment and

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forests (including pollution control, hazardous substance management, environment impact assessment, climate change management, biological diversity management and forest conservation) in a reputed National level institution; or

(*b*) has administrative experience of fifteen years including experience of five years in dealing with environmental matters in the Central or a State Government or in a reputed National or State level institution."

134. NGT is an expert adjudicatory body on the environment.

135. In two of its previous decisions, NGT has shown the path along with which it must traverse in arriving at its decisions:

135.1. In *Save Mon Region Federation* v. *Union of India*[14], the grant of an EC to a 780 MW Hydroelectric Project in Tawang District of Arunachal Pradesh was challenged. NGT framed the question before it in broad terms:

"... the material issue, therefore, that needs to be answered in the present appeal is as to whether the process of grant of prior EC to the project in question suffers from vice of faulty scoping process or not."

Having reviewed the information furnished in Form 1 by the project proponent as well as the multiple reports on record on the bird species involved in the site for the proposed project, NGT held that facts material to the case were not present before EAC and the consequent "vacuum in the EIA report" led to aberrations in the appraisal process conducted by it. Suspending EC granted to the project, NGT accepted the contention which was urged before it that NGT has the "authority to take an appropriate decision on the facts placed before it" and "set aside or suspend EC".

135.2. Similarly, in *Sreeranganathan K.P.* v. *Union of India*[15], the grant of an EC to the KGS Aranmula International Airport Project was challenged. NGT found fault with the process leading to up to the grant of EC since sector-specific issues had not been dealt with. NGT extensively reviewed the information submitted by the project proponent in Form 1, the deficiencies in the EIA report, the process of appraisal conducted by EAC and the sector-specific guidelines laid down with regard to the constructions of airports and held thus: (SCC OnLine NGT paras 182 & 187)

"*182*. ... a duty is cast upon EAC or SEAC, as the case may be, to apply the cardinal principle of sustainable development and principle of precaution while screening, scoping, and appraisal of the projects or activities. While so, it is evident in the instant case that EAC has miserably failed in the performance of its duty not only as mandated by the EIA Notification, 2006, but has also disappointed the legal expectations from the same. For a huge project as the one in the instant case, the consideration for approval has been done in such a cursory and arbitrary manner without taking note of the implication and importance of environmental issues. ... Thus, EAC has not conducted itself as mandated by the EIA Notification,

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2006 since it has not made proper appraisal by considering the available materials and objections in order to make proper evaluation of the project before making a recommendation for grant of EC.

* * *

187. ... the Tribunal is of the considered opinion that there is no option but to scrap the impugned EC granted by MoEF to the 3rd respondent/project proponent for setting up the Aranmula airport."

136. The failure to consider materials on a vital issue and indeed the non-consideration of vital issues raises a substantial question of law leading to the invoking of the jurisdiction of this Court under Section 22 of the NGT Act, 2010. The failure of process in the present case has been compounded by the absence of a merits review by NGT.

137. The learned ASG has placed reliance on the decision of this Court in *Lafarge Umiam Mining (P) Ltd.* v. *Union of India*[16] (*Lafarge*) to contend that the failure to disclose the presence of trees should not lead to the invalidation of EC. In that case, an application was made under the 1994 Notification for the grant of an EC to a proposed limestone mining project at Nongtrai Village, East Khasi Hills District, Meghalaya. EC was granted for the project in 2001. Pursuant to a letter by the Principal Chief Conservator of Forests to MoEF drawing attention to the non-disclosure of forests, the project proponent applied for a revised EC and forest clearance under the Forest (Conservation) Act, 1980. An ex post facto EC along with forest clearance was granted in 2010. Challenging the grant of EC, it was urged that there was a failing on part of the project proponent to disclose the presence of forests on the proposed project site.

138. A three-Judge Bench of this Court rejected the challenge and upheld the grant of EC to the proposed project. This Court relied, among other factors, on the following:

138.1. The mining of limestone in Khasi Hills dates back to 1763 and is an integral part of the culture of Nongtrai Village.

138.2. The site was cleared after thorough consultation with the custodian of the land, who decided to lease the land for the mining project following the loss of revenue caused due to mining by the unorganised sector.

138.3. The Headman of Nongtrai and Village Durbar, who participated at the public hearing and filed written submissions before this Court, supported the project and certified that no damage would be caused to adjacent lands.

138.4. At the stage of site clearance, MoEF had before it certificates by the Executive Committee, Khasi Hills Autonomous District Council and the DFO, Khasi Hill Division, Shillong, certifying that there were no forests in the proposed project site.

138.5. The DFO certified that the proposed mining site was not a forest as defined in *Godavarman*[8].

138.6. The 2006 Notification was not applicable.

138.7. MoEF had, at multiple stages, sought clarifications from the project proponent and had undertaken requisite care and caution to protect the environment.

139. Upholding the grant of EC and the forest clearance, this Court held thus: (*Lafarge case*[16], SCC p. 380, para 120)

"*120.* ... The word "development" is a relative term. One cannot assume that the tribals are not aware of principles of conservation of forest. *In the present case, we are satisfied that limestone mining has been going on for centuries in the area and that it is an activity which is intertwined with the culture and the unique landholding and tenure system of Nongtrai Village.* On the facts of this case, we are satisfied with the due

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diligence exercise undertaken by MoEF in the matter of forest diversion. *Thus, our order herein is confined to the facts of this case.*"

(emphasis supplied)

140. The decision of this Court in *Lafarge*[16], was based on the facts summarised above. Significantly, the standard of judicial review which must be applied in cases relating to the environment has been formulated by the three-Judge Bench in *Lafarge*[16]. S.H. Kapadia, C.J. noted that the doctrine of proportionality must be applied to matters concerning the environment as part of judicial review. The principles of judicial review in environmental matters have been enunciated thus: (SCC p. 380, para 119)

"*119*. ... In the circumstances, barring exceptions, decisions relating to utilisation of natural resources have to be tested on the anvil of the well-recognised principles of judicial review. Have all the relevant factors been taken into account? Have any extraneous factors influenced the decision? Is the decision strictly in accordance with the legislative policy underlying the law (if any) that governs the field? Is the decision consistent with the principles of sustainable development in the sense that has the decision-maker taken into account the said principle and, on the basis of relevant considerations, arrived at a balanced decision? Thus, the Court should review the decision -making process to ensure that the decision of MoEF is fair and fully informed, based on the correct principles, and free from any bias or restraint."

141. In a recent three-Judge Bench decision of this Court in *Mantri Techzone (P) Ltd.* v. *Forward Foundation*[17], this Court had the occasion to construe the provisions of Section 22 of the NGT Act, 2010. Speaking for the Bench, Abdul Nazeer, J. held that the test to determine whether a substantial question of law arises (within the meaning of Section 100 CPC) was formulated in the decision of a Constitution Bench in *Chunilal V. Mehta and Sons Ltd.* v. *Century Spg. and Mfg. Co. Ltd.*[18], where it was held thus: (AIR p. 1318, para 6)

"6. ... The proper test for determining whether a question of law raised in the case is substantial would, in our opinion, be whether it is of general

public importance or whether it directly and substantially affects the rights of the parties and if so whether it is either an open question in the sense that it is not finally settled by this Court or by the Privy Council or by the Federal Court or is not free from difficulty or calls for discussion of alternative views. If the question is settled by the highest court or the general principles to be applied in determining the question are well settled and there is a mere question of applying those principles or that the plea raised is palpably absurd the question would not be a substantial question of law."

Reappreciation of the "factual matrix" has been held to be distinct from a substantial question of law. In the present case, we have indicated the basis for the invocation of the jurisdiction of this Court under Section 22. There was a failure to follow binding norms under the 2006 Notification. There were serious flaws in the decision-making process. Relevant material has been excluded from consideration and extraneous circumstances were borne in mind. EAC as an expert body abdicated its obligations to make an expert determination based on reasons. NGT as an adjudicatory body failed to exercise the jurisdiction entrusted to it under Section 16(*h*) read with Section 20 of the NGT Act, 2010 by merely deferring to the decision to recommend and grant an EC. The parameters in regard to the existence of substantial questions of law have hence been established in the classical or conventional sense of that expression.

J. Environmental Rule of Law

142. Fundamental to the outcome of this case is a quest for environmental governance within a rule of law paradigm. Environmental governance is founded on the need to promote environmental sustainability as a crucial enabling factor which ensures the health of our ecosystem.

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143. Since the Stockholm Conference, there has been a dramatic expansion in environmental laws and institutions across the globe. In many instances, these laws and institutions have helped to slow down or reverse environmental degradation. However, this progress is also accompanied, by a growing understanding that there is a considerable implementation gap between the requirements of environmental laws and their implementation and enforcement — both in developed and developing countries alike[18]. The environmental rule of law seeks to address this gap.

144. The environmental rule of law provides an essential platform underpinning the four pillars of sustainable development — economic, social, environmental and peace[19]. It imbues environmental objectives with the essentials of rule of law and underpins the reform of environmental law and governance[19]. The environmental rule of law becomes a priority particularly when we acknowledge that the benefits of environmental rule of law extend far beyond the environmental sector. While the most direct effects are on protection of the environment, it also strengthens rule of law more broadly, supports sustainable economic and social development, protects public health,

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contributes to peace and security by avoiding and defusing conflict, and protects human and constitutional rights[19]. Similarly, the rule of law in environmental matters is indispensable "for equity in terms of the advancement of the Sustainable Development Goals (SDGs), the provision of fair access by assuring a rights-based approach, and the promotion and protection of environmental and other socioeconomic rights[20]."

145. Amartya Sen argues for a broadening of the notion of sustainable development which is the most dominant theme of environmental literature, from a need-based standard[21] to a standard based on freedoms[22]. Thus recharacterised, it encompasses the preservation, and when possible even the expansion of the substantive freedoms and capabilities of people today without compromising the capability of future generations to have similar — or more — freedoms. The intertwined concepts of environmental rule of law thus further intragenerational as well as intergenerational equity.

146. Decision 27/9 which was adopted by the United Nations Environment Programme's (UNEP's) Governing Body at its first universal session in 2013 on "Advancing Justice, Governance and Law for Environmental Sustainability" was the first internationally negotiated document to establish the term "environmental rule of law." It declared that "the violation of environmental law has the potential to undermine sustainable development and the implementation of agreed environmental goals and objectives at all levels and that the rule of law and good governance play an essential role in reducing such violations". It thus urged governments and organisations to reinforce cooperation to combat non-compliance with environmental laws towards achieving sustainable development. It also called upon the Executive Director to assist with the "development and implementation of environmental rule of law with attention at all levels to mutually supporting governance features, including information disclosure, public participation, implementable and enforceable laws, and implementation and accountability mechanisms including coordination of roles as well as environmental auditing and criminal, civil and administrative enforcement with timely, impartial and independent dispute resolution". Similarly, the first United Nations Environment Assembly in 2014 adopted Resolution 1/13, which calls upon countries "to work for the strengthening of environmental rule of law at the international, regional and national levels".

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147. In 2016, the First World Environmental Law Congress, co-sponsored by the International Union for Conservation of Nature and UN Environment, adopted the IUCN World Declaration on the Environmental Rule of Law[22] which outlines 13 principles for developing and implementing solutions for ecologically sustainable development:

(*i*) Obligation to Protect Nature
(*ii*) Right to Nature and Rights of Nature
(*iii*) Right to Environment.
(*iv*) Ecological Sustainability and Resilience
(*v*) In Dubio Pro Natura
(*vi*) Ecological Functions of Property
(*vii*) Intragenerational Equity
(*viii*) Intergenerational Equity
(*ix*) Gender Equality
(*x*) Participation of Minority and Vulnerable Groups
(*xi*) Indigenous and Tribal Peoples
(*xii*) Non-regression
(*xiii*) Progression

148. Dhvani Mehta's doctoral thesis[24] explores this idea of environmental rule of law in the Indian context by analysing the functioning of the three institutions of the Government with regard to environmental law. It develops a framework to assess whether the environmental rule of law in India is being strengthened or weakened, through an analysis of the legal instruments of each of the institutions of Government-statutes, executive orders and judicial decisions. The indicators on the basis of which this is done are:

(*a*) the capacity of statutes to guide behaviour (one of the organising principles of the rule of law) by clearly articulating goals or balancing competing interests;

(*b*) the ability of the executive to take flexible but reasoned decisions grounded in primary legislation; and

(*c*) the ability of the judiciary to apply statutory interpretation and consistent standards of judicial review to give effect to environmental rights and principles.

149. In 2015, the International Community adopted the 2030 Agenda for Sustainable Development and its 17 SDGs. These 17 goals are:

(*i*) Eradication of poverty;
(*ii*) Eradication of hunger;
(*iii*) Good health and well-being;

(*iv*) Quality education;
(*v*) Gender equality;
(*vi*) Clean water and sanitation;
(*vii*) Affordable and clean energy;
(*viii*) Decent work and economic growth;
(*ix*) Industry, innovation and infrastructure;
(*x*) Reduced inequalities;
(*xi*) Sustainable cities and communities;
(*xii*) Sustainable consumption and production;
(*xiii*) Climate action;
(*xiv*) Protecting life below water;
(*xv*) Life on land;

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(*xvi*) Peace, justice and strong institutions; and

(*xvii*) Partnerships to achieve the goals.

150. Each of these goals has a vital connection to the others. Together, they provide an agenda for human development: development in a manner which accords adequate protection to the environment. UNEP recognises that the natural environment—forests, soils and wetlands—contributes to the management and regulation of water availability and water quality, strengthening the resilience of watersheds and complements investments in physical infrastructure and institutional and regulatory arrangements for water access and disaster preparedness.

151. SDG 13 emphasises the urgent action required to combat climate change and its impacts. This is based on the recognition that extreme weather events such as heat waves, droughts, floods and tropical cyclones have aggravated the need for water management, pose a threat to food security, increase health risks, damage critical infrastructure and interrupt the provision of basic civil services.

152. The statistics on climate change indicate that:

152.1. Between 1880 and 2012, average global temperatures have increased by 0.85°C.

152.2. Between 1901 and 2010, as ocean expanded, the global average sea level has risen by 19 cm.

152.3. Since 1990, global emissions of CO_2 increased by almost 50%.

152.4. Between 2000 and 2010, emissions grew at a more rapid rate than each of the three decades preceding it.

153. In this backdrop, SDG 16 emphasises the need to protect, restore and promote sustainable use and management of terrestrial ecosystems and forests, combat desertification of river lands, prevent land degradation and halt the loss of biodiversity. Terrestrial ecosystems provide a range of ecosystem services including the capture of carbon, maintenance of soil quality, provision of habitat for biodiversity, maintenance of water quality and regulation of water flow together with control over erosion. Maintenance of ecosystems is hence

crucial to efforts to combat climate change, mitigate and reduce the risks of natural disasters including floods and landslides. In this backdrop, promoting environmental justice and ensuring strong institutions is quintessential to promoting peaceful and inclusive societies for sustainable development. SDG 16, therefore, construes the promotion of the rule of law as intrinsic towards implementing multilateral environmental agreements and progressing towards internationally agreed environmental goals.

154. On 2-10-2016, India ratified the Paris Agreement[25] on climate change which reaffirmed the goal of "limiting global temperature increase to well below 2°C, while pursuing efforts to limit the increase to 1.5 degrees above pre-industrial levels". Article 5 of the Agreement encourages parties to conserve and enhance sinks and reservoirs of greenhouse gases, which include forests. Under its Nationally Determined Contributions under the Paris Agreement, India made the following three commitments[26]:

(*i*) Greenhouse gas emission intensity of its gross domestic product will be reduced by 33-35% below 2005 levels by 2030;

(*ii*) 40% of India's power capacity would be based on non-fossil fuel sources; and

(*iii*) An additional "carbon sink" of 2.5 to 3 billion tonnes of CO_2 equivalent through additional forest and tree cover will be created by 2030.

155. In March 2019, UNEP released the Global Environment Outlook themed "Healthy Planet, Healthy People"[27]. Noting clear "links between human health and the state of the environment", the report concludes that clean-up and efficiency improvements are not adequate to pursue the 2030 Agenda and SDGs and achieve the internationally agreed

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environmental goals on pollution control. Instead, "transformative change" which reconfigures basic social and production systems and structures is needed. This includes well-designed policies on institutional frameworks, social practices, cultural norms and values along with their implementation, compliance and enforcement. In this view, a systemic and integrated policy action[27] would ensure that a "healthy environment is a prerequisite and foundation for economic prosperity, human health and well-being"[27].

156. The rule of law requires a regime which has effective, accountable and transparent institutions. Responsive, inclusive, participatory and representative decision making are key ingredients to the rule of law. Public access to information is, in similar terms, fundamental to the preservation of the rule of law. In a domestic context, environmental governance that is founded on the rule of law emerges from the values of our Constitution. The health of the environment is key to preserving the right to life as a constitutionally recognised value under Article 21 of the Constitution. Proper structures for environmental decision making find expression in the guarantee against arbitrary action and the affirmative duty of fair treatment under Article 14 of the Constitution.

157. The 2006 Notification must hence be construed as a significant link in India's quest to pursue SDGs. Many of those goals, besides being accepted by the international community of which India is a part, constitute a basic expression of our own constitutional value system. Our interface with the norms which the international community has adopted in the sphere of environmental governance is hence as much a reflection of our own responsibility in a context which travels beyond our borders as much as it is a reflection of the aspirations of our own Constitution. The fundamental principle which emerges from our interpretation of the 2006 Notification is that in the area of environmental governance, the means are as significant as the ends. The processes of decision are as crucial as the ultimate decision. The basic postulate of the 2006 Notification is that the path which is prescribed for disclosures, studies, gathering data, consultation and appraisal is designed in a manner that would secure decision making which is transparent, responsive and inclusive.

158. Repeatedly, it has been urged on behalf of the State of Goa, MoEFCC and the concessionaire that the need for a new airport is paramount with an increasing volume of passengers and consequently the flaws in the EIA process should be disregarded. The need for setting up a new airport is a matter of policy. The role of the decision-makers entrusted with authority over the EIA process is to ensure that every important facet of the environment is adequately studied and that the impact of the proposed activity is carefully assessed. This assessment is integral to the project design because it is on that basis that a considered decision can be arrived at as to whether necessary steps to mitigate adverse consequences to the environment can be strengthened.

159. In the present case, as our analysis has indicated, there has been a failure of due process commencing from the non-disclosure of vital information by the project proponent in Form 1. Disclosures in Form 1 are the underpinning for the preparation of ToR. The EIA report, based on incomplete information has suffered from deficiencies which have been noticed in the earlier part of this judgment including the failure to acknowledge that within the study area contemplated by the Guidance Manual, there is a presence of ESZs.

160. EAC, as an expert body abdicated its role and function by taking into account circumstances which were extraneous to the exercise of its power and failed to notice facets of the environment that were crucial to its decision making. The 2006 Notification postulates that normally, MoEFCC would accept the recommendation of EAC. This makes the role of EAC even more significant. NGT is an adjudicatory body which is vested with appellate jurisdiction over the grant of an EC. NGT dealt with the submissions which were urged before it in essentially one paragraph. It failed to comprehend the true nature of its

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role and power under Section 16(*h*) and Section 20 of the NGT Act, 2010. In failing to carry out a merits review, NGT has not discharged an adjudicatory function which properly belongs to it.

161. In this view of the matter, neither the process of decision making nor the decision itself can pass legal muster. Equally, as an area requiring balance between development of infrastructure and the environment, we are of the view that appropriate directions should be issued by this Court, which would ensure that while the need for a public project as significant as an international

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airport is duly factored into the decision making calculus, such development proceeds on a considered view of the importance of the prevailing state of the environment. Bearing in mind the need to bring about a wholesome balance between the development of infrastructure of an airport and the preservation of the environment, we have come to the conclusion that time-bound directions should be issued.

162. Bearing in view the necessity to maintain a balance between the need for an airport and environmental concerns, we are of the view that it would be appropriate if EAC is directed to revisit the conditions subject to which it granted its EC on the basis of the specific concerns which have been highlighted in this judgment. Such an exercise primarily is for EAC to carry out in its expert decision-making capacity. EAC is entrusted with that function as an expert body. The role of judicial review is to ensure that the rule of law is observed. Hence, we propose by the directions which we will issue under Article 142 of the Constitution, to direct EAC to revisit the conditions for the grant of an EC. While doing so, it would be open to EAC to have due regard to the conditions which were incorporated in the order of NGT and to suitably modulate those conditions in pursuance of the liberty which we have preserved to it. To facilitate an expeditious decision, we propose to direct EAC to carry out this exercise in a prescribed time schedule during which period, EC shall remain suspended. We propose to direct that after EAC has formulated its views, they shall be placed before this Court in a miscellaneous application in the present proceedings, so as to enable the Court to pass final orders. The miscellaneous application may be filed either by the State of Goa as the project proponent or by MoEFCC. We clarify that no other court or tribunal shall entertain any challenge to the ultimate decision of EAC and final orders thereon shall be passed by this Court in the present proceedings.

K. *Directions*

163. We accordingly issue the following directions:

163.1. EAC shall revisit the recommendations made by it for the grant of an EC, including the conditions which it has formulated, having regard to the specific concerns which have been highlighted in this judgment.

163.2. EAC shall carry out the exercise under 163.1 above within a period of one month of the receipt of a certified copy of this order.

163.3. Until EAC carries out the fresh exercise as directed above, EC granted by MoEFCC on 28-10-2015 shall remain suspended.

163.4. Upon reconsidering the matter in terms of the present directions, EAC, if it allows the construction to proceed will impose such additional conditions which in its expert view will adequately protect the concerns about the terrestrial ecosystems noticed in this judgment. EAC would be at liberty to lay down appropriate conditions concerning air, water, noise, land, biological and socioeconomic environment.

163.5. EAC shall have due regard to the assurance furnished by the concessionaire to this Court that it is willing to adopt and implement necessary safeguards bearing in mind international best practices governing greenfield airports.

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163.6. We grant liberty to the State of Goa as the project proponent and MoEFCC, as the case may be, to file the report of EAC before this Court in the form of a miscellaneous application so as to facilitate the passing of appropriate orders in the proceedings.

163.7. No other court or tribunal shall entertain any challenge to the report that is to be submitted before this Court by EAC in compliance with the present order.

164. Before we part with the present case, we consider it appropriate to record a finding on the bona fides of the appellants before this Court. It was briefly urged by the respondents that the appellants have invoked the jurisdiction of this Court based on a personal agenda and consequently, the present appeal is liable to be dismissed. This argument cannot be accepted. We accept the submission of Ms Shenoy, learned counsel appearing on behalf of the appellants, that the non-consideration of vital issues by EAC has led to the invocation of the statutory remedy available to them under Section 22 of the NGT Act, 2010. Vague aspersions on the intention of public-spirited individuals does not constitute an adequate response to those interested in the protection of the environment. If a court comes to the finding that the appeal before it was lacking bona fides, it may issue directions which it thinks appropriate in that case. In cases concerning environmental governance, it is a duty of courts to assess the case on its merits based on the materials present before it. Matters concerning environmental governance concern not just the living, but generations to come. The protection of the environment, as an essential facet of human development, ensures sustainable development for today and tomorrow.

165. The learned Attorney General for India has presented the submissions before this Court with his characteristic sense of objectivity and candour. We wish to record our appreciation for the able assistance rendered to this Court by Ms Anitha Shenoy, learned counsel for the petitioner, Mr A.N.S. Nadkarni, learned Additional Solicitor General for MoEF, Mr Parag P. Tripathi, learned Senior Counsel and Ms Aastha Mehta, learned counsel for the concessionaire.

166. The appeal is allowed in the above terms. There shall be no order as to costs.

Civil Appeal No. 1053 of 2019

167. This appeal is also disposed of in the same terms, conditions, directions and observations as in Civil Appeal No. 12251 of 2018.

———

[1] Arising from the Judgment and Order in *Hanuman Laxman Aroskar* v. *Union of India* (National Green Tribunal, Principal Bench at New Delhi, Appeal No. 6 of 2018, 21-8-2018 sub nom *Federation of Rainbow Warriors* v. *Union of India* [National Green Tribunal, Principal Bench at New Delhi, Appeal No. 5 of 2018 (earlier Appeal No. 61/2015/WZ), dt. 21-8-2018] 2018 SCC OnLine NGT 831

[1] *Federation of Rainbow Warriors* v. *Union of India*, 2018 SCC OnLine NGT 831

[2] *Federation of Rainbow Warriors* v. *Union of India*, 2017 SCC OnLine NGT 1964

[3] *Federation of Rainbow Warriors* v. *Union of India*, 2017 SCC OnLine NGT 1962

[4] *Federation of Rainbow Warriors* v. *Conservator of Forests*, 2018 SCC OnLine Bom 329 : (2018) 3 Mah LJ 424

[5] *Hanuman Laxman Aroskar* v. *Union of India*, 2019 SCC OnLine SC 500

[6] *T.N. Godavarman Thirumulpad* v. *Union of India*, (1997) 2 SCC 267

[7] *Noida Memorial Complex Near Okhla Bird Sanctuary, In re*, (2011) 1 SCC 744

[8] Only for construction projects listed under Item 8 of the Schedule.

[9] Applications for EC for expansions or modernisation of *existing* units as stipulated under the notification are made in Form 1 and shall be considered by EAC or SEAC within 60 days, which will decide on the due diligence necessary including the preparation of the EIA and public consultations and the application shall be appraised accordingly for the grant of environmental clearance.

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[10] See for instance Para 2.0 of the executive summary and Para 2.3.1 of Chapter I.

[11] See Para 2.3.1, Chapter II.

[12] *Utkarsh Mandal* v. *Union of India*, 2009 SCC OnLine Del 3836

[13] *Vellore Citizens' Welfare Forum* v. *Union of India*, (1996) 5 SCC 647; *M.C. Mehta* v. *Kamal Nath*, (1997) 1 SCC 388; *M.C. Mehta* v. *Union of India*, (1997) 2 SCC 353; *A.P. Pollution Control Board* v. *M.V. Nayudu*, (1999) 2 SCC 718; *Narmada Bachao Andolan* v. *Union of India*, (2000) 10 SCC 664; *Indian Council for Enviro-Legal Action* v. *Union of India*, (2011) 8 SCC 161 : (2011) 4 SCC (Civ) 87

[14] *Save Mon Region Federation* v. *Union of India*, (2013) 1 All India NGT Reporter 1

[15] *Sreeranganathan K.P.* v. *Union of India*, 2014 SCC OnLine NGT 15

[16] *Lafarge Umiam Mining (P) Ltd.* v. *Union of India*, (2011) 7 SCC 338

[17] *Mantri Techzone (P) Ltd.* v. *Forward Foundation*, (2019) 18 SCC 494 : 2019 SCC OnLine SC 322

[18] *Chunilal V. Mehta and Sons Ltd.* v. *Century Spg. and Mfg. Co. Ltd.*, 1962 Supp (3) SCR 549 : AIR 1962 SC 1314

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[25] Entered into force on 4-11-2016.

[26] India's Intended Nationally Determined Contribution: Working Towards Climate Justice at P. 29, submitted to the UNFCCC secretariat.

[27] Global Environment Outlook 6, UNEP, 4-3-2019

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MANU/SC/1750/2017

Equivalent Citation: 2018 (2) SCJ 207

IN THE SUPREME COURT OF INDIA

Writ Petition (Civil) No. 230/2001

Decided On: 08.02.2017

Appellants: **M.K. Balakrishnan and Ors.**
Vs.
Respondent: **Union of India (UOI) and Ors.**

Hon'ble Judges/Coram:
Madan B. Lokur and Prafulla C. Pant, JJ.

Counsels:
For Appellant/Petitioner/Plaintiff: Gopal Sankaranarayanan, Zeeshan Diwan, Joginder Samal, Advs. Naresh Kumar, AOR and Ravinder Kumar Singh, Advs.

For Respondents/Defendant: A.K. Panda, Ajit Kumar Sinha, A.K. Sanghi, Sr. Advs., Wasim A. Qadri, Binu Tamta, Sunita Sharma, Shailender Saini, Vibhu Shankar Mishra, Pankaj Pandey, Raj Bahadur, Gurmeet Singh Makker, B.K. Prasad, Rajesh Mishra, M.K. Maroria, A.K. Kaul, Abhinav Mukherjee, Advs., Jayant Bhushan, Sr. Adv., Guntur Prabhakar, Prerna Singh, Shuvodeep Roy, Advs., Anil Shrivastava, Gopal Singh, AORs, Varsha Poddar, Aniruddha P. Mayee, A. Selvin Raja, Advs., Hemantika Wahi, AOR, Puja Singh, Mamta Singh, Advs. Sanjay Kumar Visen, AOR, D.K. Thakur, AAG, William Vinod, Varinder Kumar Sharma, Pragati Neekhra, Advs., Sunil Fernandes, AOR, Tapesh Kumar Singh, Mohd. Waquas, Aditya Pratap Singh, Sukant Vikram, Advs., V.N. Raghupathy, AOR, Prakash Jadhav, Lagnesh Mishra, Advs., G. Prakash, AOR, Jishnu M.L., Priyanka Prakash, Beena Prakash, Manu Srinath, Advs., Purushaindra Kaurav, AAG, Mishra Saurabh, AOR, Ankit Kumar Lal, Nishant Ramakantrao Katneshwarkar, Sapam Biswajit Meitei, B. Khushbansi, Advs., Ranjan Mukherjee, AOR, Pragyan Sharma, Shikhar Garg, Ganesh Bapu, Advs., P.V. Yogeswaran, K. Enatoli Sema, AORs, Edward Belho, Amit Kumar Singh, K. Luikang Michael, Advs., Sibo Sankar Mishra, AOR, Uma Kant Mishra, Adv., Sanchar Anand, AAG, Apoorv Singhal, Anant Kumar Vatsya, Advs., S.S. Shamshery, AAG, Amit Sharma, Ankit Raj, Milind Kumar, Aruna Mathur, Yusuf Khan, Avneesh Arputham, Anuradha Arputham, Amit Arora, Advs. for Arputham Aruna & Co., B. Balaji, S. Kumar, S. Udaya Kumar Sagar, Mrityunjai Singh, Advs., Rituraj Biswas, Joydeep Mazumdar, Debojyoti Bhattacharya, Parijat Sinha, Advs., V.G. Pragasam, AOR, S. Prabhu Ramasubramanian, Bhupesh Narula, Advs., G. Indira, AOR, Monika Gusain, Adv., Abhijit Sengupta, Abhishek Chaudhary, Anil Kumar Jha, Anuvrat Sharma, A. Venayagam Balan, B.S. Banthia, Khwairakpam Nobin Singh, Kunal Verma, Naresh K. Sharma, P.V. Dinesh, R. Ayyam Perumal, R.D. Upadhyay, R. Nedumaran, S. Chandra Shekhar, D. Bharathi Reddy, Shiv Sagar Tiwari, AORs., Corporate Law Group (NP), Kamini Jaiswal, Sumita Hazarika, AORs. and Minati Rani, Adv.

Case Category:
LETTER PETITION AND PIL MATTER

Case Note:
Environment - Finalization - Draft Wetlands (Conservation and

Management) Rules, 2016 (Rules) - Present petition filed seeking directions to finalize publication of Rules - Whether non action of Respondent regarding finalization of Rules justified -

Facts:

An affidavit was filed with reference to the Rules. The Rules were made available to the public for inviting objections/suggestions. For the examination of these comments, a Committee was constituted. The Committee was given 45 days to look into the suggestions and submit its report. It was contended that the matter was pending for more than one year hence, present petition was made.

Held, while listing appeal:

(i) The apprehension that with the passage of time there is a possibility that some of the wetlands might disappear was not unfounded. The Central Wetland Regulatory Authority would take up the rectification of deficiencies with the State Governments with promptitude and ensure that all these deficiencies are removed and complete proposals/brief documents are furnished within the next about one month so that the Central Wetland Regulatory Authority is in a position to take a final decision with regard to these 1683 wetlands and their notification. [11] and[14]

JUDGMENT

1. We have, at length, heard learned Counsel for the parties including learned Counsel for the Union of India.

2. An affidavit dated 7th February, 2017 filed by the Union of India has been shown to us.

3. Annexed to the affidavit is an Office Memorandum issued on 6th January, 2017 with reference to the Draft Wetlands (Conservation and Management) Rules, 2016. The Draft Rules were made available to the public for inviting objections/suggestions some time in March, 2016. As many as 175 comments were received. For the examination of these comments, a Committee has been constituted. The Committee was given 45 days to look into the suggestions and submit its report to the Union of India.

4. We are told orally by learned Counsel appearing for the Union of India that perhaps the term of the Committee may need to be extended. This is stated by him on the basis of information received pursuant to a meeting held yesterday, i.e., 7th February, 2017 by the said Committee.

5. Be that as it may, for the reasons given below, we are compelled to direct that the Wetlands (Conservation and Management) Rules, 2016 should be notified on or before 30th June, 2017. We are compelled to issue this direction since the matter has been pending with the Union of India for the last almost a year and there has to be some finality to the publication of the Rules. The comments/suggestions have been given by all stakeholders such as the State Governments including its organizations, individuals and civil society organizations. That being the position, there is obviously a great deal of interest in the Rules being formulated and notified. Under these

circumstances, there is no justification why the Union of India should not have taken prompt action and constituted the Committee much earlier for the purposes of finalizing the Rules. Finally, the conservation of wetlands is of immense ecological importance.

6. Learned Counsel for the Union of India says that all efforts will be made to ensure compliance with this direction and to ensure that the Rules are notified on or before 30th June, 2017.

7. We are sure that both the Committee as well as the Union of India will take into consideration the comments and suggestions offered by the State Governments and its organizations, individuals and civil society organizations before taking a final decision.

8. With regard to the Central Wetlands Regulatory Authority, we are told that its term is expiring on 14th February, 2017. We have been informed by learned Counsel for the Union of India that the Central Wetlands Regulatory Authority will be notified on 13th February, 2017. The Union of India is bound by the statement made by learned Counsel for the Union of India, which statement has been made on instructions received by him from an officer of the Ministry of Environment, Forest and Climate Change.

9. In our order dated 31st January, 2017, we had required the Union of India to tell us the steps taken to preserve the 26 wetlands covered by Ramsar Convention, 1971. The affidavit that has now been filed by the Union of India merely gives the disbursal of amount made by the Union of India from time to time. What specific steps have been taken including how the funds made available have been utilized and what is the impact of those steps have not been adverted to. We must have specific details. We direct the Union of India to file an affidavit within four weeks positively giving required specific details.

10. Learned Counsel for the Petitioners has drawn our attention to an additional affidavit filed by the Union of India on or about 9th September, 2014. The additional affidavit contains an Information Brochure "National Wetland Inventory & Assessment". This Brochure indicates on page 11 thereof that 2,01,503 wetlands have been mapped at 1:50,000 scale. All these wetlands have an area of more than 2.25 hectares. As a first step, the 'Brief Documents' with regard to these 2,01,503 wetlands should be obtained by the Union of India from the respective State Governments in terms of Rule 6 of the Wetlands (Conservation and Management) Rules, 2010. We are told that obtaining these 'Brief Documents' may take some time. We are inclined to grant adequate time for this purpose. The Union of India should follow this up with the State Governments and inform us of the time frame on the next date of hearing.

11. The apprehension expressed by learned Counsel for the Petitioners is that with the passage of time there is a possibility that some of the wetlands may disappear. On a reading of the Information Brochure, this apprehension is not unfounded.

12. Accordingly, we direct the application of the principles of Rule 4 of the Wetlands (Conservation and Management) Rules, 2010 to these 2,01,503 wetlands that have been mapped by the Union of India. The Union of India will identify and inventorize all these 2,01,503 wetlands with the assistance of the State Governments and will also communicate our order to the State Governments which will also bind the State Governments to the effect that these identified 2,01,503 wetlands are subject to the

principles of Rule 4 of the Wetlands (Conservation and Management) Rules, 2010, that is to say:

(i) reclamation of wetlands;

(ii) setting up of new industries and expansion of existing industries;

(iii) manufacture or handling or storage or disposal of hazardous substances covered under the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 notified vide S.O. No. 966(E), dated the 27th November, 1989 or the Rules for Manufacture, Use, Import, Export and Storage of Hazardous Micro-organisms/Genetically engineered organisms or cells notified vide GSR No. 1037(E), dated the 5th December, 1989 or the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 notified vide S.O. No. 2265(E), dated the 24th September, 2008;

(iv) solid waste dumping: provided that the existing practices, if any, existed before the commencement of these Rules shall be phased out within a period not exceeding six months from the date of commencement of these rules;

(v) discharge of untreated wastes and effluents from industries, cities or towns and other human settlements: provided that the practices, if any, existed before the commencement of these Rules shall be phased out within a period not exceeding one year from the date of commencement of these rules;

(vi) any construction of a permanent nature except for boat jetties within fifty metres from the mean high flood level observed in the past ten years calculated from the date of commencement of these rules;

(vii) any other activity likely to have an adverse impact on the ecosystem of the wetland to be specified in writing by the Authority constituted in accordance with these rules.

13. Learned Counsel for the Union of India has shown us a chart of proposals/brief documents that have already been received by the Union of India under Rule 6 of the Wetlands (Conservation and Management) Rules, 2010. The total number of wetlands covered in this document are 1683. Many of these proposals/brief documents received by the Union of India contain deficiencies which have already been identified in the document handed over to us.

14. The Central Wetland Regulatory Authority will take up the rectification of deficiencies with the State Governments with promptitude and ensure that all these deficiencies are removed and complete proposals/brief documents are furnished within the next about one month so that the Central Wetland Regulatory Authority is in a position to take a final decision with regard to these 1683 wetlands and their notification, if required, on or before 31st March, 2017.

List the matter on 3rd April, 2017.

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ANNEXURE - 26

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(1975) 1 Supreme Court Cases 770

(BEFORE A.N. RAY, C.J. AND K.K. MATHEW AND V.R. KRISHNA IYER, JJ.)

PASUPULETI VENKATESWARLU . . Appellant;

Versus

MOTOR & GENERAL TRADERS . . Respondent.

Civil Appeals Nos. 2120 to 2122 of 1972±, decided on March 18, 1975

Civil Procedure Code, 1908 — Order 7 Rule 7 — Relief — Courts, including appellate courts, to take cognisance of events happening after institution of suit

Rent Control and Eviction — Eviction on ground of personal requirement for starting business — At revision stage High Court taking cognisance of subsequent event of acquisition of some non-residential building by the plaintiff — Eviction petition dismissed — If dismissal proper — A.P. Buildings (Lease, Rent and Eviction) Control Act, 1960 — Sections 10(3)(iii)(a) and (b)

Held :

For making the right or remedy claimed by the party just and meaningful as also legally and factually in accord with the current realities, the Court can,

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and in many cases must, take cautious cognisance of events and developments subsequent to the institution of the proceeding provided the rules of fairness to both sides are scrupulously obeyed.

(Para 4)

It is basic to our processual jurisprudence that the right to relief must be judged to exist as on the date a suitor institutes the legal proceeding. Equally clear is the principle that procedure is the handmaid and not the mistress of the judicial process.

(Para 4)

If a fact, arising after the lis has come to court and has a fundamental impact on the right to relief or the manner of moulding it, is brought diligently to the notice of the tribunal, it cannot blink at it or be blind to events which stultify or render inept the decretal remedy. Equity justifies bending the rules of procedure, where no specific provision or fairplay is violated, with a view to promote substantial justice — subject, of course, to the absence of other disentitling factors or just circumstances. Nor can the Court contemplate any limitation on this power to take note of updated facts to confine it to the trial court. If the litigation pends, the power exists, absent other special circumstances repelling resort to that course in law or justice.

(Para 4)

Lachmeshwar Prasad Shukul v. *Keshwar Lal Chaudhuri*, 1940 FCR 84 : AIR 1941 FC 5, *followed*

Patterson v. *State of Alabama*, 294 US 600, 607 and *Minnesota* v. *National Tea Co.*, 309 US 551, 555, *referred to*

On facts, the later recovery of another accommodation by the landlord, during the pendency of the case, has a material bearing on the right to evict in view of the inhibition written into Section 10 (3)(iii) itself.

(Para 4)

However, on the peculiar facts of the case, the landlord may be allowed to amend his petition if he has a case for eviction on any other legally permissible ground and the parties may be given fair and full opportunity to file additional pleadings and lead evidence thereon. The finding of legal disability, however, cannot be reopened.

(Paras 5 & 6)

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Appeal partly allowed M/2428/C

Advocates who appeared in this case :

K.S. Ramamurthi, Senior Advocate (M.S. Narayana Achari and C.S.S. Rao, Advocates, of J.B. Dadachadji & Co. with him) for the Appellant;

K.R. Choudhury and K. Rajendra Choudhry, Advocates, for the Respondent.

The Judgment of the Court was delivered by

V.R. KRISHNA IYER, J.— Once the facts are stated fairly, one is left to wonder what substantial issue of law deserving of adjudication by the Supreme Court survives at all in these appeals. We may straightway proceed to state, with brevity, the case of the appellant presented for our scrutiny and make short shrift of it as it merits little more.

2. The appellant, a landlord of a large building, had leased out in separate portions his building to several tenants. One of such tenants is the respondent. The former resolved to start a business in automobile spares and claimed eviction of the respondent by Rent Control proceedings, under Sections 10(3)(*iii*)(*a*) and (*b*) of the Andhra Pradesh Buildings (Lease, Rent and Eviction) Control Act, 1960. The petition was resisted and the Rent Controller dismissed the petition. The appeal by the landlord failed but, in revision, the High Court chose to remand the case to the Appellate Authority. The litigation lengthened further because the latter, after hearing parties, remitted the whole case to the trial court for fresh disposal in accordance with some directions and, after allowing

parties to lead evidence. Instead of finishing the case at the trial court level, the landlord repeated a revision to the High Court on the perhaps technically correct stand that a wholesale remittal, as against calling for a finding on a specific point, was illegal. While hearing protracted arguments it came to the ken of the Court that certain material events of fatal import to the maintainability of the eviction proceedings had come to pass and so it decided to mould the relief in the light of these admitted happenings. The learned Judge observed:

> "If the fact of the landlord having come into possession during the pendency of the proceedings of Shop No. 2 is to be taken into account, as indeed it must be, then clearly the petition is no longer maintainable under Section 10(3)(*iii*) of the Act, as the requisite condition for the invoking of that provision has ceased to exist viz. that the landlord was not occupying a non-residential building in the town. 'Building', of course means a portion of a building. As the prerequisite for the entitlement of the petitioner to institute and continue a petition has ceased to exist, it must follow that ABA No. 5/1967 is no longer maintainable and must be dismissed."

The inevitable sequel was the dismissal, not only of the civil revision, but also of the eviction petition. Thus, after a marathon forensic battle lasting over six years, the landlord lost even the flickering hope of success before the trial court as a result of supererogatory revision to the High Court. It is against this adverse decision he has, by special leave, come to this Court.

3. Two submissions were advanced by Sri K.S. Ramamurthy to salvage his client's case. He argued that it was illegal for the High Court to have taken cognisance of subsequent events, disastrous as they proved to be. Secondly, he urged that once the High Court held — as it did — that the Appellate Tribunal acted illegally in remitting the whole case to the Rent Controller, it could not go further to dismiss his whole eviction proceedings, a misfortune heavier than would have been, had he not moved

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the High Court at all.

4. We feel the submissions devoid of substance. First about the jurisdiction and propriety vis-a-vis circumstances which come into being subsequent to the commencement of the proceedings. It is basic to our processual jurisprudence that the right to relief must be judged to exist as on the date a suitor institutes the legal proceeding. Equally clear is the principle that procedure is the handmaid and not the mistress of the judicial process. If a fact, arising after the lis has come to court and has a fundamental impact on the right to relief or the manner of moulding it, is brought diligently to the notice of the tribunal, it cannot blink at it or be blind to events which stultify or render inept the decretal remedy. Equity justifies bending the rules of procedure, where no specific provision or fairplay is violated, with a view to promote substantial justice — subject, of course, to the absence of other disentitling factors or just circumstances. Nor can we contemplate any limitation on this power to take note of updated facts to confine it to the trial court. If the litigation pends, the power exists, absent other special circumstances repelling resort to that course in law or justice. Rulings on this point are legion, even as situations for applications of this equitable rule are myriad. We affirm the proposition that for making the right or remedy

Page: 773

claimed by the party just and meaningful as also legally and factually in accord with the current realities, the Court can, and in many cases must, take cautious cognisance of events and developments subsequent to the institution of the proceeding provided the rules of fairness to both sides are scrupulously obeyed. On both occasions the High Court, in revision, correctly took this view. The later recovery of another accommodation by the landlord, during the pendency of the case, has as the High Court twice pointed out, a material bearing on the right to evict, in view of the inhibition written into Section 10(3)(*iii*) itself. We are not disposed to disturb this approach in law or finding of fact.

5. The law we have set out is of ancient vintage. We will merely refer to *Lachmeshwar Prasad Shukul* v. *Keshwar Lal Chaudhuri*[1] which is a leading case on the point. Gwyer, C.J., in the above case, referred to the rule adopted by the Supreme Court of the United States in *Patterson* v. *State of Alabama*[2]:

> "We have frequently held that in the exercise of our appellate jurisdiction we have power not only to correct error in the judgment under review but to make such disposition of the case as justice requires. And in determining what justice does require, the Court is bound to consider any change, either in fact or in law, which has supervened since the judgment was entered."

and said that that view of the Court's powers was reaffirmed once again in the then recent case of *Minnesota* v. *National Tea Co.*[3]. Sulaiman, J., in the same case[4] relied on English cases and took the view that an appeal is by way of a re-hearing and the Court may make such order as the Judge of the first instance could have made if the case had been beard by him *at the date on which the appeal was heard* (emphasis, ours). Varadachariar, J. dealt with the same point a little more comprehensively. We may content ourselves with excerpting one passage which brings out the point luminously (at p. 103):

> "It is also on the theory of an appeal being in the nature of a re-hearing that the courts in this country have in numerous cases recognized that in moulding the relief to be granted in a case on appeal, the court of appeal is entitled to take into

F. No. L-11011/1/2021-IA-II(I)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi – 110003
E-mail: r.sundar@nic.in
Tel: 011-24695304
Dated: 16th July, 2021

To

Shri. Ankur Tiwary, Scientist 'D'
Central Pollution Control Board,
Parivesh Bhawan, CBD-cum-Office Complex
East Arjun Nagar,
Delhi - 110 032,
Email: ankur.cpcb@nic.in

Subject: Order dated 21/01/2021 of Hon'ble National Green Tribunal in Appeal No. 36/2020 Larsen & Toubro Limited Vs Sanghi Industries Limited & Ors. – **Submission of final report by the Expert Committee – regarding.**

Sir,

Reference is invited to the Order dated 21/01/2021 of Hon'ble National Green Tribunal with respect to the cement grinding unit of M/s. Sanghi Cement at Hazira, Gujarat (copy enclosed) for which EC was accorded by SEIAA - Gujarat.

2. In pursuance to the aforesaid Order, the meetings of Expert Committee were convened by the Ministry of Environment, Forest and Climate Change (MoEF&CC) on 13/04/2021, 17/05/2021 & 12/07/2021 through Video-Conferencing (VC) under the chairmanship of Mr. C. N. Pandey, Chairman, EAC (Industry I). The final report has been duly approved by the Chairman on 12/07/2021.

3. In this regard, the undersigned is hereby directed to forward the final approved report along with the written submissions of the concerned parties and request you to submit the final report to the Hon'ble NGT in compliance with the directions of Hon'ble National Green Tribunal.

3. This issues with the approval of the Competent Authority.

Encl: as above.

Yours faithfully,

(Sundar Ramanathan)
Scientist 'E'

Copy to

1. All the members of the Expert Committee (As per the list)
2. PPS to JS(SKB)

(Sundar Ramanathan)
Scientist 'E'

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Expert Appraisal Committee – Industry 1	
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14.	**Shri. Ankur Tiwary** Scientist 'D', IPC – II Division, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032. Email: ankur.cpcb@nic.in

*****

Item No. 02 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Appeal No. 36/2020
(Earlier Appeal No. 66/2019 (WZ))

Larsen & Toubro Limited Appellant

Versus

Sanghi Industries Limited & Ors. Respondent(s)

Date of hearing: 06.01.2021
Date of uploading of order: 22.01.2021

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

ORDER

1. This appeal has been preferred against order dated 23.08.2019 of the State Level Environment Impact Assessment Authority (SEIAA), Gujarat, granting Environmental Clearance (EC) to M/s. Sanghi Industries Limited for setting up of stand-alone Cement grinding unit at Survey No. 125/1 and 126/1+2+3, Village Shivrampur, Ta: Choryasi, Distt.: Surat in category 3(b) of Schedule annexed with Environment Impact Assessment (EIA) Notification dated 14.09.2006.

2. The appellant is a company engaged in construction, manufacturing and other industrial/commercial activities. Its grievance is that the project in question will have hazardous impact on Hazira Manufacturing Complex where the appellant is manufacturing defence equipments. The said industrial area at Surat is 'polluted industrial area' classified as such based on data of air water and soil quality, called 'comprehensive

environment pollution index' (CEPI). The unit is of 'red' category in terms of categorisation of industries based on level of contribution to pollution under the Environment (Protection) Rules. EC has been granted without consideration of crucial aspects such as air emissions, water availability, wildlife etc.

3. The appeal was filed on 20.09.2019. Notice was issued on 26.09.2019. The appeal was allowed to be amended on 24.10.2019. IA No. 28/2020 has been filed by the interveners viz. the village Panchayat. IA No. 131/2019 has been filed by the appellant for production of documents relating to compliance status of main cement unit of the project proponent at Kutch in terms of environmental norms.

4. By way of amendment, the appellant has brought on record proceedings of public hearing dated 22.03.2019 wherein, among others, questions with regard to generation of dust from the plant, capacity of the road and source of water were raised. According to the appellant, such concerns relating to increased air and water pollution have not been addressed. The appellant has also pointed out discrepancies in the EIA report. It is submitted that neither the EIA report explains potential of compliance with the environmental norms nor State Environment Assessment Committee (SEAC) and SEIAA have given any reasons from which possibility of such compliance can be inferred. The proceedings do now show application of mind on the environmental consequences and the EC has been granted in a mechanical manner.

5. There are mangroves in the area but the project proponent concealed the said information in application Form I. Similarly, there is reserve forest area which will be impacted which has not been mentioned. 2 Million Tonnes Per Annum (MTPA) cement is proposed to be grinded

which will require raw material including clinker, gypsum, fly ash, slag which has to be transported, involving movement of huge number of trucks. We made a reference to Table 4.17 in the EIA report showing the truck/tanker capacity and the frequency of trucks per day. The said table is reproduced in para 15 of this order. Though EC mentions that only 363 trucks will be permitted for transporting 278,000 liters water per day (as per specific condition no. 47), atleast 799 canters per day will be required. The land allotted is total 12 acres, out of which 33% is to be green area (as per specific condition no. 67 of the EC) Condition no. 67 of the specific conditions mentions that if land for green belt is not available, plantation can be in open land on road sides. The condition is as follows:

> *"67. The SIL shall develop green belt within the factory premises as per the CPCB guidelines,* ***consisting of at least three rows of trees of local species on periphery. However, if the adequate land is not available within the premises, the SIL shall take up adequate plantation at suitable open land on road sides and other open areas in nearby locality or schools in consultation with the Gram Panchayat/GPCB and submit an action plan of plantation for next three years to the GPCB."***

6. There is no provision in the EIA for space for parking for the trucks and other vehicles. Shifting of green belt outside the factory complex will defeat the object of mitigation of pollution. The industrial area in question is polluted industrial area which has no capacity for any further polluting activities as held in the order of this Tribunal dated 10.07.2019 in OA No. 1038/2018, *News item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels".*

7. The project proponent-Respondent No. 1 has filed reply by stating that it has state of art facilities to adhere to the environmental norms. The mangroves have been duly disclosed in the EIA report. The project is at a distance of 1.3 km from the mangroves. The Krishak Bharati Cooperative

Ltd. (KRIBHCO) has agreed to supply water through irrigation pipelines. The water requirement will be partly met by recycling.

8. Reply of the SEIAA, Gujarat is that EC has been granted based on EIA report furnished by the project proponent. Undertaking was given not to use lignite and pet coke which is not permissible fuel. The project was considered by the SEAC in the meeting held on 12.06.2019 in continuation of meeting held on 16.04.2019. The project proponent explained mitigation measures against the emissions on which the members of SEAC were satisfied and on their recommendation SEIAA granted EC on 16.7.2019. Relevant extract from the reply of SEIAA is:

> *" xxx xxx*
> *12. I say that the answering respondent authority after receiving the recommendation considered the same alongwith the relevant material at its meeting held on 16.07.2019. A true copy of the minutes of the meeting of the respondent authority held on 16.07.2019 is annexed herewith and marked as Annexure R4. Being satisfied with the recommendation made by the Expert Appraisal Committee on the basis of the material and consideration of relevant aspects, the respondent authority decided to grant environment clearance for the proposed project. Accordingly, the clearance was issued on 23.08.2019."*

9. Relevant extracts from the minutes of the meetings of SEAC dated 16.04.2019 and 12.06.2019 are:

> ***"The 497th meeting of the State Level Expert Appraisal Committee (SEAC) was held on 16th April, 2019 at Gujarat Pollution Control Board, Sector 10-A, Gandhinagar.***
>
> *xxx xxx xxx*
>
> ***In view of the above, Committee unanimously decided to consider the proposal the proposal after submission of the following details:***
>
> *xxx xxx xxx*
>
> *iii.* ***Fugitive emission details with its mitigation measures****.*
> *Fugitive emission during raw material handling and feeding process and vehicle movements.*

Mitigation measures – High efficiency pulse air jet type bag filters will be considered to arrest the air borne dust at all the locations where transfer of material are takes place; The automatic bagging machine with bag filters will be installed for packing plant; unloading of coal trucks will be carried out with proper care avoiding dropping of the materials from height. Sprinklers will be installed in Raw Material/ Fuel Storage/Loading / Unloading areas. The sprinkling of water will be done along with internal roads in the plant in order to control the dust arising due to the movement of vehicular traffic; Proper maintenance of vehicles shall be carried out; All the workers inside the plant will be provided with disposable dust masks; thick greenbelt will be developed around the plant to arrest the fugitive emissions; and Periodic air quality monitoring shall be carried out as per CPCB/ SPCB norms etc.

xxx xxx xxx

***After deliberation, SEAC unanimously decided to consider the proposal after submission of the following details**:*

1. to 4. xxx xxx xxx

5. Sound APCM to control fugitive dust emission during raw material transportation, storage, handling, loading, unloading, transfer, fuel grinding etc."

xxx xxx xxx

"Minutes of the 514th meeting of the State Level Expert Appraisal Committee held on 12/06/2019 at Committee Room, Gujarat Pollution Control Board, Sector 10-A, Gandhinagar.

xxx xxx xxx

15	*SIA/GJ/IND2/ 30448/2018*	*M/s. Sanghi Industries Limited Survey No. 125/1, 125/2 and 126/1+2+3, Vill.: Shivrampur, Tal.: Choryasi, Distt.: Surat*	*Appraisal – Recommendation*

xxx xxx xxx

iii, ***Fugitive emission details with its mitigation measures:***

xxx xxx xxx

***On Road**:*

- *All internal roads used for transport of vehicles will be paved and maintained properly and repaired immediately when required.*
- *For prevention of road dust emission, speed will be restricted to 10 km/hr for heavy vehicles within the project premises.*

- *All preventive measures i.e. covering of trucks, paving and maintenance of internal roads will be adopted.*
- *Regular vacuum sweeping and water spraying will be done on the internal roads.*
- *Proper maintenance of vehicles will be carried out."*

10. The minutes of the meeting of SEIAA dated 16.07.2019 are:

> ***"Minutes of the 253rd Meeting held on 16th July, 2019 at 09:00 A.M.***
>
> *The 253rd meeting of the State Level Environment Impact Assessment Authority (SEIAA) was held under the Chairmanship of Shri C.L. Meena at Gujarat Pollution Control Board, Gandhinagar. Prof. G.H. Ban, Member of SEIAA and Shri S.M. Saiyad, Member Secretary of the State Level Environment Impact Assessment Authority (SEIAA) attended the meeting.*
>
> *xxx* *xxx* *xxx*
>
> ***2) Sanghi Industries Limited, Dist. Surat***
>
> - ***After detailed discussion, it was decided to grant environment clearance with all the conditions recommended by the SEAC."***

11. The stand of the Ministry of Defence is that L&T facility is only a defence manufacturing facility and not a defence establishment. Thus, Works of Defence Act, 1903, prohibiting activities within a particular distance therefrom, does not apply.

12. We have heard Shri Raj Panjwani, learned Senior Counsel for the appellant, Shri Pinaki Mishra, learned Senior Counsel for Respondent No. 1 and Shri Maulik Nanavati, learned Counsel for SEIAA, Gujarat and perused the documents on record, with their assistance. We have also perused the written submissions filed by the parties in pursuance of order dated 06.01.2021 passed on conclusion of the hearing. In view of the fact that we are giving liberty to the parties to file written submissions before the CPCB for consideration of the Committee to which the matter is being referred, we do not find it necessary to make any comment on the said

submissions, beyond the comment on the rival contentions already raised before the Tribunal.

13. Shri Panjwani has drawn our attention to Form I, the EIA and the minutes of the SEAC. He pointed out contradictions in the information in the EIA compared to the information furnished in Form-1, particularly with regard to the mangroves, forests and birds. From the EIA documents, it is pointed out that the project proponent is one of largest cement plants at Kutch while the present project is proposed as grinding unit at Hazira Industrial Zone, Village Shivrampur, Taluka-Choryasi, District-Surat, Gujarat. The land procured for the purpose is 4.856 hectare for use as per following break-up:

"Table 2.7 Land Breakup of Cement Grinding Unit

#	*Particulars*	*Total Area (in Ha.)*	*Area*
1.	*Production Plant*	*0.712*	*14.66%*
2.	*Office & Lab Area*	*0.022*	*0.46%*
3.	*Raw Material Storage Area*	*0.632*	*13.01%*
4.	*Solid Waste Storage Area*	*0.005*	*0.10%*
5.	*Open Space*	*1.835*	*37.79%*
6.	*Green Belt*	*1.650*	*33.98%*
	Total	***4.856***	***100.00%***

"

In the above break up, there is no provision for parking of large number of trucks to be used for about 800 trips per day for transporting material and other trucks for transporting water.

14. The main raw material i.e. clinker is to be transported from Kutch plant by sea/road as per statement in the EIA as follows:

> ***"2.6.3 Transportation & Storage of Raw Material***
>
> *The clinker shall be transported from Sanghipuram (IU) to Surat GU mainly by sea. Clinker shall be extracted from the Clinker load out silos at IU, transported to the captive Jetty of SIL by trucks and loaded on to the barges by grab cranes. Barges shall transport the Clinker to*

the ship stationed at high seas. ***At Surat, the Clinker shall be unloaded from the ship at nearest port and transported to the Surat GU site by trucks. The clinker received through self-tipping trucks shall be unloaded by into a box feeder and transported to clinker storage silo through conveyor and elevator. The clinker storage has been envisaged in RCC silos of capacity 50,000 Ton, adequate for about 10 day requirement of the plant. Clinker shall be extracted from the bottom of the clinker silos and fed to the clinker hoppers in the cement grinding section through a belt conveyors and elevator****."*

15. Under the heading 'air environment', the EIA mentions as follows:

"Table-4.17: Incoming & Outgoing Transportation

Incoming Raw Material Transportation							
S.No.	***Raw Material***		***Quantity TPA***	***Quantity TPD***	***Source***	***Mode of Transport***	***No. of vehicles (Truck/day)***
1.	*Clinker*		*2000000*	*6061*	*Captive*	*Sea*	*184*
2.	*Additives like Gypsum, Fly Ash, Slag*				*Purchase*	*Road*	
	Fuel		*60000*	*182*	*Purchase*	*Road*	
Total No. of Trucks deployed/day will be							***184***
Outgoing Product Transportation							
S. No.	***Product***	***Quality Million TPA***	***Quantity TPA***	***Quantity TPD***	***Source***	***Mode of Transport***	***No. of vehicles (Truck/day)***
1.	*Cement*	*2.0*	*2000000*	*6061*	*Captive*	*Road/Sea*	*179*
Total No. of Trucks deployed/day will be							***363***

Frequency of Vehicles:

Total Capacity (Fuel, Clinker, Fly ash)	*40, 60,000 TPA*
No. of working days	*330*
Transportation of incoming and outgoing material	*12303 Tons/day*
Working hours per day	*24 hours (3 shifts)*
Truck/Tanker Capacity	*34 Tons*
Frequency of trucks/day (92 No. × 4 trips/day × 2 (up/down)	*363 ×2*
Frequency of trucks deployed/hr	*16*
Increase in PCU/hr	*16× 3 = 48*

"

16. The mode of transportation mentioned in para 5.3 of the EIA is as follows:

"5.3 ALTERNATIVE FOR TECHNOLOGY AND OTHER PARAMETERS

xxx *xxx* *xxx*

S. No.	***Site Particular***	***Alternative Option 1***	***Alternative Option 2***	***Remarks***
1 to 6	*xxx*	*xxx*	*Xxx*	*Xxx*
7.	*Road*	*Metallic Road*	*Kachcha Road*	*The road is well furnished. Most of*

				the raw material and fuel will be transported through ship (sea route)

17. Under the hearing mitigation measures, table 2.13 is as follows:

"Table 2.13: Aspects & Impacts Analysis

Activity	***Environmental Attribute***	***Cause***	***Impact Characteristics***			
			Nature	***Duration***	***Reversibility***	***Intensity and Significance***
Vehicles Movement and utilities operation	*Air quality*	*Exhaust Emissions i.e. NO_X, SO_2, Fugitive emission*	*Negative*	*Short Term*	*Reversible*	*Low, due to movement of vehicle only for loading and unloading of raw material. Provision of APC's.*
	Noise Levels	*Noise Generation*	*Negative*	*Short Term*	*Reversible*	*Low, due to limited activity*
	Risk & Hazards	*Accidents, collision of transport vehicles*	*Negative*	*Short Term*	*Reversible*	*Medium due to loss of property and injury to manpower.*

"

18. Conclusions in the EIA report are:

"11.5 Conclusion

Based on the EIA study conducted in Post Monsoon of 2018 (Oct. to Dec. 2018) and as per terms of reference given by SEAC, the following highlights emerge:

- *There will be minimal pollution potential on air, water and noise environment, which, with the implementation of the mitigation measures and EMP, can be reduced considerably.*
- *The proposed project activities will have positive beneficial effect on the local population, economic output and other related facilities viz. employment, development of business, transportation etc.*
- *Risk assessment including emergency response plan and DMP has been prepared to handle any sort of emergencies.*
- *Looking to the overall project justification, process, pollution potential and pollution prevention measures/technologies installed by proponent, environmental management activities of proponent; the proposed project would be environmentally acceptable, in compliance with environmental legislation and standards.*

Hence, looking to the overall project justification, process, pollution potential and pollution prevention, measures/technologies installed by proponent, environmental management activities of proponent, ***it has been concluded that the proposed project would not have any considerable impacts on environment as well as socio-economic and ecological conditions of the project area. Hence proposed grinding unit at Shivrampur, Hazira is considered environmentally safe."***

19. Learned Counsel for the appellants has then referred to documents filed with IA No. 8/2020 and documents filed on 18.11.2020 by the intervener – Suvali Gram Panchayat. In para 15 of the reply filed by Suvali Gram Panchayat, it is mentioned that the project is in violation of Comprehensive General Development Control Regulations (CGDCR) notified by the State Government on 12.10.2017 under the Gujarat Town Planning and Urban Development Act, 1976. The CGDCR classify different zones for the permissible activities also specify negative list of activities. According to the said regulations, there is prohibition of Obnoxious & Hazardous industries in general industrial zone.

20. On being called upon, the learned Counsel for the project proponent as well as learned Counsel for the SEIAA were unable to show any discussion in the minutes of the SEAC or any material which may reflect application of mind to the assessment of impact of dust generation during the transportation and mitigation measures against the same. Beyond saying that provision has been made for covering the vehicles during transport and sprinkling of water, it has not shown as to how generation of dust and causing of noise pollution by movement of large number of heavy vehicles will be neutralized, given the carrying and load bearing capacity of the Panchayat road in question.

21. In view of above, we find that the precautionary principle, for which EIA is conducted, remains to be addressed. As held in Hanuman Laxman

Aroskar v. Union of India[1], the object of EIA is to ensure that all concerns affecting the environment are duly taken care of. Thus, the impugned EC cannot be sustained until the environmental concerns are duly addressed. We are informed that the project has not yet commenced. Even learned Counsel for the project proponent and the SEIAA fairly accepted this factual position.

22. Accordingly, we refer the issue of assessment of carrying and load bearing capacity of the Panchayat road in question and evaluation of EIA and EMP prepared by the project proponent to the EAC of the MoEF&CC dealing with the cement plants, alongwith the representatives of CPCB, NEERI and IIT Mumbai. The CPCB will be the nodal agency for coordination and compliance. Coordination with the EAC may be through the MoEF&CC. The Committee may assess how generation of dust and causing of noise pollution by movement of large number of heavy vehicles will be neutralized, given the carrying and load bearing capacity of the Panchayat road in question. The Expert Committee may furnish its report to this Tribunal within three months by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF.

23. The appellant, the Suveli Gram Panchayat and the project proponent may file their respective written submissions to the CPCB within two weeks for consideration by the Committee.

A copy of this order be forwarded to the MoEF&CC, CPCB, NEERI and IIT Mumbai by e-mail for compliance.

[1] (2019) 15 SCC 401

List for further consideration on 14.07.2021.

Adarsh Kumar Goel, CP

S.K. Singh, JM

Dr. Nagin Nanda, EM

January 22, 2021
Appeal No. 36/2020
(Earlier Appeal No. 66/2019 (WZ))
DV