BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

WESTERN ZONE BENCH AT PUNE

APPEAL NO. 26 OF 2025

IN THE MATTER OF:

Go Green Foundation Trust …Appellant

-Versus-

Union of India & Ors. …Respondents

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Date: 04.11.2025
Place: Pune

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REPLY AFFIDAVIT ON BEHALF OF GREENFIELD CHEMICAL COMPLEX, GHCL LTD. (RESPONDENT NO. 13) TO THE ORIGINAL APPLICATION

1. That this Hon'ble Tribunal is currently seized of the abovementioned Appeal which challenges the Environmental Clearance 12.12.2024 granted to Greenfield Chemical Complex, GHCL Ltd., (Respondent No 13 herein) for the proposed production of 11,00,000 TPA capacity of Light Soda Ash (LSA), 5,00,000 TPA capacity of Dense Soda Ash (DSA) and 2,00,000 TPA capacity of Sodium Bicarbonate in Village Bada, Taluka Mandvi, Kutch District of Gujarat. It is alleged, albeit wrongly, that the Greenfield Chemical Complex, GHCL Ltd has submitted misleading and false information in Form 1, conducted an improper public hearing, situated in an ecologically sensitive area, non-compliance with CRZ conditions, irrelevant baseline study, impact on agriculture and fishing, among other grounds for challenging the validity of the Environmental Clearance dated 12.12.2024.

2. That the Greenfield Chemical Complex, GHCL Ltd. (hereinafter referred as the "Answering Respondent"), who has been arrayed as Respondent No. 13, is submitting the instant Reply in the present Appeal and is the Project Proponent responsible for the implementation of the Project for the proposed production of 11,00,000 TPA capacity of Light Soda Ash ("LSA"), 5,00,000 TPA capacity of Dense Soda Ash ("DSA") and 2,00,000 TPA capacity of Sodium Bicarbonate

(hereinafter referred as "Soda Ash Project") in Village Bada, Taluka Mandvi, Kutch District of Gujarat.

3. That the Answering Respondent, at the outset, submits that all those averments in the present Reply Affidavit that have not been specifically admitted are herewith denied and are not to be construed as having been accepted by the Answering Respondent as if traversed seriatim.

4. That before averting to the para wise reply on the merits of the Appeal, the Answering Respondent seeks to place on record its Preliminary Submissions, which in its humble opinion, are crucial for a holistic adjudication of the present matter.

I. Preliminary Objections on the maintainability of the Appeal

a) Appellant is not an aggrieved person under Section 18 of the NGT Act, 2010

5. That the National Green Tribunal (Practice and Procedure) Rules, 2011 clarify in Rule 2(d) that an Appellant means a person making an appeal to the Tribunal under Section 16 read with Section 18. Section 16 of the National Green Tribunal Act, 2010 uses the term a 'person aggrieved'. Section 18 of the National Green Tribunal Act, 2010 has clarified 'Who' is an Aggrieved Person and clearly states that – "….*an application for grant of relief or compensation or settlement of dispute may be made to the Tribunal by* -

   a. *The person, who has sustained the injury; or*
   b. *The owner of the property to which the damage has been caused or;*
   c. *where death has resulted from the environmental damage, by all or any of the legal representatives of the deceased; or*
   d. *any agent duly authorised by such person or owner of such property or all or any of the legal representatives of the deceased, as the case may be; or*

e. any person aggrieved, including any representative body or organisation; or

f. the Central Government or a State Government or a Union territory Administration or the Central Pollution Control Board or a State Pollution Control Board or a Pollution Control Committee or a local authority, or any environmental authority constituted or established under the Environment (Protection) Act, 1986 (29 of 1986) or any other law for the time being in force:

……

Provided further that the person, the owner, the legal representative, agent, representative body or organisation shall not be entitled to make an application for grant of relief or compensation or settlement of dispute if such person, the owner, the legal representative, agent, representative body or organisation have preferred an appeal under section 16."

6. That in view of the abovementioned position of law, it is pertinent to note that the Appellant claims to be Secretary of a NGO, Go Green Foundation Trust. However, the Appellant has neither annexed the registration of the NGO nor any other details which clarify the Bonafide's of the NGO. Further, the Address of the Appellant NGO at page 29 of the Appeal is Bek Sheri, Lodhva Village, Sutrapada Taluka, Junagadh District, Gujarat, which is 537 km away from the location of the project of the Answering Respondent. The Appellant has also failed to highlight any grievances raised by the Appellant either by way of a representation to the authorities or during the public hearing. There is no document on record to show that the Appellant has participated in the public hearing for the project. However, after the grant of the Environmental Clearance dated 12.12.2024, the Appellant has now approached this Hon'ble Tribunal in a frivolous litigation, for reasons best known to the Appellant. In the humble submission of the Answering Respondent, the Appellant fails to satisfy the

test of an 'Aggrieved Person' within the meaning of Section 18 of the National Green Tribunal Act, 2010.

7. That in State of Uttar Pradesh v. Uday Education and Welfare Trust, 2022 SCC OnLine SC 1469, the Hon'ble Supreme Court in Uday Welfare has categorically held that the credentials and Bonafide's of the litigator ought to be considered and tested, especially when the rights of many are going to be adversely affected. Copy of the Judgment of the Hon'ble Supreme Court in Uday Foundation case has been compiled in a Convenience Compilation, which shall be referred to during the course of the hearing.

8. That further in Anand Kumar Jha v. Union of India and Ors, I.A. No.78/2021/EZ) in Appeal No.05/2021/EZ), this Hon'ble Tribunal stated that there is a need for thorough examination of litigants' credentials before allowing cases with significant ramifications. It further stated that the National Green Tribunal must verify the genuineness and intentions of such litigants, particularly when their grievances could affect numerous rights and interests. Further, in Rana Sengupta v. Union of India, 2013 SCC OnLine NGT 31, it was held that the, "Appellant did not have locus as the Appellant could not show any expertise to evaluate impact on environment and there was no record of appellant's participation the public consultation process and raised any issue regarding the environment or socioeconomic adverse impact on account of establishment of the proposed project". True copy of the said Judgments has been compiled in a Convenience Compilation, which shall be referred to during the course of the hearing.

9. That in another case of Ankur vs Maharashtra State Environment Impact Assessment Authority & Ors [2012 SCC OnLine NGT 53 (OA No. 30/2012)] , this Hon'ble Tribunal dismissed the challenge to an Appeal filed by a Public Trust for revocation of Environmental Clearance granted to an

iron ore mine, while noting that there is no material to show that the Trust was formed with an object to protect constitutional rights of the farmers. This Hon'ble Tribunal further held that, "it goes without saying that the Applicant has no locus standi to file the application. The farmers who are said to have been adversely affected by the mining activity have not come forward to file the application". True copy of the said Judgment has been compiled in a Convenience Compilation, which shall be referred to during the course of the hearing.

10. That in another instance, the Hon'ble Supreme Court disposed of the Writ Petition filed by an NGO with a prayer to ban the use of asbestos in any manner and issued contempt notices against members of the NGO. The Hon'ble Apex Court, noting that the NGOs were not registered , had failed to substantiate the allegations with adequate proof and held that the petition had been filed in private interest to give rise to business opportunities. [Kalyaneshwari v. Union of India and others , WP No. 260 of 2004; Ashok Kumar Pandey v. State of West Bengal, (2004) 3 SCC 349]. True copy of the said Judgments has been compiled in a Convenience Compilation, which shall be referred to during the course of the hearing.

11. That further, the Appellant had impleaded the Expert Appraisal Committee (Respondent No, 2), State of Gujarat (Respondent No, 3), Forest and Environment Department Principle Secretory (Respondent No, 4), Gujarat Coastal Zone Management Authority (Respondent No 5), State Level Environment Impact Assessment Authority (Respondent No. 7), the National Fisheries Development Board (Respondent No. 6), GPCB Regional Office of Junagadh (Respondent No. 9), PCCF/ CWWL (Respondent No. 10), Gram Panchayat of Bada (Respondent No. 11) and Collector of Kutch (Respondent No. 12) , who are not necessary and proper

parties for the present Appeal, and have been arrayed merely as a delay tactic for keeping the Appeal pending for adjudication. This clearly highlights that the Appellant has approached this Hon'ble Tribunal with unclean hands, and the present Appeal may be dismissed on this ground itself. This Hon'ble Tribunal by way of an Order dated 01.08.2025 were pleased to delete Respondent Nos 3, 4, 6 and 7. It is therefore prayed that the remaining unnecessary parties such as Respondent Nos 2, 5, 9, 10, 11 and 12 may also be deleted as they are not involved in granting of prior Environment Clearance.

12. That Appellant has further copied and pasted the Grounds N, O, P, Q and R from an Iranian research paper titled "Towards sustainable soda ash production: A critical review on eco-impacts, modification and innovative approaches". This clearly highlights the callous and casual attitude of the Appellant in approaching this Hon'ble Tribunal, based on research papers pertaining to projects in another country and without any reference to the said paper/report in the present Appeal. Rule 13 of the NGT Practice and Procedure Rules, 2011 clearly states *inter alia* that every appeal should set forth concisely under distinct heads the grounds for such appeal. Thus, the NGT Rules, 2011 do not allow the Appellant to copy-paste the contents of an Iranian research paper and make the same contents as the grounds for challenging a Clearance granted in India as they have no relevance or context with each other. This is a ground alone to dismiss this Appeal with huge costs.

b) Multiple Reliefs are barred under Rule 14 of the NGT Rules, 2011

13. That further, Rule 14 of the NGT Rules, 2011, clearly states that an application or appeal shall be based on a single cause of action and may seek one or more relief provided that they are consequential to one another.

In the present case, the Appellants have challenged the Environmental Clearance dated 12.12.2024 as well as the CRZ Clearance dated 26.12.2023 under Section 16(h) , which is clearly evident from the submission at page 4 read with the grounds and prayers. The NGT Act, 2010, clearly prescribes a separate procedure for challenging the CRZ clearance under Section 16(g). Thus, two different clearances cannot be challenged in the same Appeal challenging Environmental Clearance under Section 16(h). This is clearly an attempt to override the limitation period of 30 days for challenging the CRZ Clearance dated 26.12.2023. The same may be disregarded at the outset by this Hon'ble Tribunal.

14. That this Hon'ble Tribunal in a catena of judgments [DV Girish & Ors. vs the Secretary to Government & Ors. (Application No.154 of 2014 (SZ) AND M.A. No. 284 of 2014 (SZ)), Vikas K. Tripathi Mumbai Vs. The Secretary, MoEF reported in 2014 ALL (I) NGT Reporter (3) (Pune) 9; Subir Mario Chowfin Vs. State of Uttarakhand & Ors. (O.A. No. 637 of 2016)] that the cause of action in an OA or an Appeal has to be a single one with a specific date as to when it first arose, and cannot seek plural remedies. In view of the challenge to the EC as well as CRZ clearance in the same Appeal, the present Appeal deserves to be dismissed in limine. The abovesaid judgments have been compiled in a Convenience Compilation, which shall be referred to during the course of the hearing.

II. Preliminary Submissions

15. That it is also pertinent to add that the Appellants have made baseless submissions in their Appeal pertaining to the Environmental Clearance dated 12.12.2024 as well as other permissions and have raised frivolous grounds, without any evidence on record to substantiate allegations of illegality/arbitrariness in the grant of Environmental Clearance on facts and

on law. The Answering Respondent submits that all the permissions, including the Environmental Clearance have been obtained in due compliance of the law and after detailed assessments by multiple statutory bodies as well as expert agencies of national and international repute. The preliminary submissions are similar to the submissions in Appeal No 19/2025 titled Vijay Kumar Karsanbhai v. Union of India and Others. However, the same are being produced herein for ready reference of this Hon'ble Tribunal and to put on record the specific objections of the Answering Respondent herein to the allegations in the Appeal, which are similar to the allegations in Appeal No. 19/2025.

A. Vibrant Gujarat Initiative

16. That the answering Respondent on 12th January 2017 signed a Memorandum of Understanding ("MoU") with the Gujarat Industrial Development Corporation (Government of Gujarat) for establishment of a Soda Ash Plant in the District of Kutch, Gujarat under the Vibrant Gujarat, 8th Global Summit to boost the economy of the State with a state-of-the-art technology. A copy of the MOU is appended as **ANNEXURE R/1.**

B. The EIA and EMP Report has been undertaken by accredited consultants in accordance with the law and includes detailed studies of impact on flora and fauna as well as the marine biodiversity.

17. That the Environmental Clearance ("EC") dated 12.12.2024 was granted to M/s GHCL Ltd. for its Greenfield Chemical Complex at Village Bada, Taluka Mandvi, District Kutch, after due diligence, technical studies, and legal compliance in accordance with the EIA Notification, 2006. Infact, the due diligence and procedural compliance was undertaken as early as

2017, almost four years prior to the submission of the application for environmental clearance in 2021. On 23.11.2017, the Answering Respondent wrote to the Ministry of Environment, Forest and Climate Change ("MoEF&CC") seeking clarification regarding the engagement of accredited consultants for the preparation of EIA/EMP study for soda ash plants, as at that time there were no consultants specifically accredited by QCI-NABET for the soda ash sector. Copies of the Letter dated 23.11.2017 and accreditation list of 2017 are annexed collectively as **ANNEXURE R/2 (Colly).**

18. That however, no response was received from the MoEF&CC. Accordingly, on 05.06.2018, the Answering Respondent awarded the Work Order for preparation of the EIA and EMP Report for the proposed Soda Ash Project to CSIR–NEERI, India's premier environmental research institute, based on its extensive experience in EIA for similar projects particularly along the Gujarat coast and who are accredited for Chlor Alkali which was the broader classification earlier for such assessments,. Simultaneously, a separate work order was awarded to CSIR–National Institute of Oceanography ("NIO") to conduct an independent oceanographic study to assess coastal and marine impacts. The other reputed companies such as Tata Chemicals Ltd., and Nirma Limited which were establishing soda ash manufacturing plants in Gujarat were granted EC on the basis of EIA study conducted by the consultant(s) who are accredited for Chlor Alkali such as NEERI. Last, but not the least, was the Covid – 19 Pandemic and the various restrictions imposed by the Government of India in a manner like never ever witnessed before in human history, which severely paralysed all normal activities even of the Government of India and the State Governments resulting in the total

chaos that temporarily closed all known channels of personal interaction thus making it difficult, if not impossible, for the Answering Respondent to personally visit and seek clarifications before making the online application on 28.07.2021 for grant of TOR.

19. That it is pertinent to mention here that this Hon'ble Tribunal as well as the Hon'ble Supreme Court in a catena of cases has referred NEERI for preparation of reports on issues of water pollution, coastal studies as well as air pollution. Recently, the Hon'ble Supreme Court in Chinmay Mishra v. Union of India and Others, judgment dated 27.02.2025, noted that NEERI is the most reputed environmental institution in the country and is relied upon by courts in matters of environmental assessment. The abovesaid judgment has been compiled in a Convenience Compilation, which shall be referred to during the course of the hearing.

20. That to address wildlife concerns, the Answering Respondent commissioned the Zoological Survey of India ("ZSI") in April 2019 to conduct a six-months status survey of marine fauna, particularly sea turtles, in the Mandvi Taluka. The ZSI report concluded that the project site exhibited only sporadic nesting activity due to rocky and steep beach slopes, narrow intertidal zones, and unsuitable nesting conditions. The report recorded no sightings of turtles or crawl marks over six months of continuous monitoring along a 3 km stretch between Mota Layja and Bada village. It further clarified that sporadic nesting, if any, occurred several kilometres away near the Rukmawati River mouth and Mandvi Palace which are areas outside the project's core zone. The relevant extracts of the ZSI report are annexed as **ANNEXURE R/3**.

21. That thereafter, in August 2020, CSIR–NIO completed a study on sand dune mapping and morphological changes near the river mouth at the

proposed project site, assessing geomorphological stability and sediment transport patterns . Additionally, the Marine EIA/EMP Study (2018–2020) was also prepared by CSIR–NIO for the seawater intake and effluent disposal facilities for the Greenfield Chemical Complex off Bada Coast, Arabian Sea, which reported that no turtles were sighted along the Bada coastline. Copy of the relevant excerpt of the Marine EIA/EMP study is extracted and annexed as **ANNEXURE R/4**.

22. That thereafter, the Answering Respondent applied for the Terms of Reference ("TOR") on 28.07.2021. It is pertinent to mention that the cover letter transparently stated that CSIR–NEERI had been appointed as the EIA consultant for preparation of the EIA and EMP report. On 30.07.2021**,** MoEF&CC raised an Essential Details Sought ("EDS") query regarding the Consultant's appointment, to which the Answering Respondent provided a detailed reply on 06.08.2021, reaffirming CSIR–NEERI's engagement and explaining the absence of accredited soda ash consultants in India. After reviewing the submission, MoEF&CC granted the ToR on 10.08.2021 under Item 4(e) of the EIA Notification, 2006. Copies of the TOR application cover letter, EDS response as well as TOR dated 10.08.2021 were annexed as **ANNEXURE R/5 (Colly)**.

23. That in compliance with the conditions of the TOR, CSIR–NEERI prepared the Draft Environmental Impact and Risk Assessment Study in October 2021, which covered (i) a Light Soda Ash Plant (11,00,000 TPA), (ii) a Dense Soda Ash Plant (5,00,000 TPA), (iii) a Sodium Bicarbonate Plant (2,00,000 TPA), (iv) a 120 MW solid-fuel-based captive co-generation power plant, and (v) associated seawater intake and effluent disposal systems. The draft report incorporated an Ecological Study and Wildlife Conservation Plan, noting a very low density of turtle nesting

along the Bada and Bambhdai coasts and clarifying that only 2 km of the 23 km study area overlapped with the project footprint. Copy of the relevant extracts of the CSIR-NEERI EIA Report dated October 2021 is annexed as **ANNEXURE R/6**.

24. That additionally, in March 2022**,** CSIR–NIO prepared an Addendum to the Marine EIA/EMP Report specifically addressing the conservation and protection of coastal sand dunes and the mitigation of impacts during the construction and operation of seawater intake and outfall pipelines. This addendum proposed best-practice measures for sediment stabilization, shoreline protection, and ecological restoration of dune systems in compliance with national coastal management standards. Copy of the relevant extracts of the said Report is appended as **ANNEXURE R/7.**

25. That, alternative site assessment was also conducted during the study period and five different sites namely Pingleshwar village, Suthri village in Abdasa Taluka, Bambdhai and Modhva Village in Mandvi Taluka including the present site at Bada village were studied and compared based on environmental and social dimensions. The selected site has been thoroughly evaluated based on environmental, social, and technical factors, ensuring its feasibility for the proposed project. In connection with this, the Government has provided in principle approval for the selected site. The present site at village Bada was considered to be most favourable from the ecological and social standpoint. The relevant pages of alternative site assessment is attached above in Annexure R/6.

C. Public Hearing conducted in accordance with law

26. That after preparation of the draft EIA-EMP Report, the Answering Respondent in due compliance with the provisions of the EIA

Notification, 2006 initiated the process for conducting the Public Hearing and all procedural safeguards were duly followed to ensure transparency, participation, and compliance. A notice announcing the Public Hearing, initially scheduled for 06.04.2022, was published on 04.03.2022 in both Gujarati and English newspapers. Thereafter, on 05.03.2022, the Gujarat Pollution Control Board ("GPCB") circulated letters to the District Collector, MoEF&CC, District Industrial Centre, District Development Officer, and Taluka Development Officer, directing them to publicly display the EIA/EMP report for public access. However, when the hearing was convened on 06.04.2022, it could not be completed due to large-scale disruptions, spread of false and misleading information about the project, leading to a potential law-and-order situation. Consequently, the Regional Office of GPCB and the Resident Additional Collector, Kutch, jointly decided to postpone the hearing in view of the hostile environment.

27. That subsequently, the GPCB on 30.09.2022 wrote to the District Collector and other officers for displaying the EIA/EMP Report of the Answering Respondent. The Notice for rescheduling the public hearing for 17.10.2022 was also issued and published in Gujarati newspapers on 30.09.2022 and in English on 01.10.2022. In an attempt to obstruct the process, a Public Interest Writ Petition [WP (PIL) No. 85/2022 – Bharat Gangji Gala & Others v. Gujarat Pollution Control Board] was filed before the Hon'ble Gujarat High Court on 11.10.2022, alleging that the 30 days' notice period requirement under the EIA Notification was violated. The Petitioners therein had suppressed the fact of the amended EIA Notification dated 09.05.2022, which clarified the procedural timelines for rescheduled hearings. The Hon'ble Gujarat High Court, by a detailed order dated 18.10.2022, dismissed the Writ Petition while imposing a huge cost

of Rs. 50,000, finding the challenge meritless. The public hearing was therefore conducted as scheduled on 17.10.2022, during which all public grievances, were duly recorded and later incorporated into the revised EIA/EMP report. It is pertinent to add that the Appellant herein was not present for the said public hearing and has neither raised any grievance by way of any written communication whatsoever, during the said period nor after the public hearing. This clearly highlights that the Appellant, being more than 500 kms away, is not impacted by the project and simply waited till the grant of Environmental Clearance, for reasons best known to them. The official minutes of the public hearing are annexed as **ANNEXURE R/8**.

D. Objections during and post Public Hearing were duly incorporated in the EIA/EMP Report

28. That in addition to the objections raised during the public hearing, the MoEF&CC on 31.10.2022, also received representations on the EIA Report of the proposed Soda Ash Project.

29. That the representations were duly responded to and suggestions and concerns were incorporated within the EIA report (Public Hearing Minutes and Action Plan are attached in Public Hearing Section (Section-1) of Parivesh Portal of Part-C) as a part of Public hearing action plan by the CSIR NEERI. Accordingly, the Final EIA and Risk Assessment Report was prepared by CSIR- NEERI in November 2022. Action plan is annexed in the EIA report at Annexure R/8.

30. That the Answering Respondent had also clarified that the EIA EMP has been prepared by CSIR NEERI at a time when there were no other accredited Consultants, apart from clarifying the mitigations measures

which will be incorporated for ensuring minimal impact of the project. The copy of the representations dated 31.10.2022 along with the response dated 10.01.2023 is marked and annexed as **ANNEXURE R/9 (Colly).**

31. That in the case of Ramesh Agarwal v. SEIAA & Ors (Appeal No. 20/2011), the Hon'ble Tribunal *inter alia* has held that the defects and deficiencies pointed out to a large extent have been rectified by the project proponent through the final EIA and dismissed the Appeal for want of merit. In Budhasen Rathore v. Union of India and Others [Appeal no. 06/2020] the Hon'ble NGT dismissed the Appeal on the ground that there was a due public consultation with intimation to all concerned and we see no irregularity or illegality in the order impugned. Thus, in the present case as well the Public Hearing and subsequent steps undertaken by the Answering Respondent were fully compliant with the EIA Notification,2006 and ensured that all public concerns were duly recorded, addressed, and incorporated into the final approved EIA/EMP Report. The abovesaid Orders have been compiled in a Convenience Compilation, which shall be referred to during the course of the hearing

E. Due process of appraisal was followed as per the EIA Notification, 2006

32. That after the public consultation, the Answering Respondent submitted Form 1 and the EIA and Risk Assessment Report on 30.11.2022, prepared by CSIR–NEERI, along with supporting studies from the NIO and the ZSI, all of which integrated the grievances raised during the public hearing.

33. That subsequently, on 07.12.2022, the MoEF&CC raised an EDS query regarding accreditation of the consultant, copies of the Coastal Regulation Zone ("CRZ') and Forest Clearances, among other clarifications, to which

the Answering Respondent responded comprehensively on 05.01.2023**.** Copy of the Response dated 05.01.2023 is marked and annexed as **ANNEXURE R/10**.

34. That subsequently, on 19.01.2023, the MoEF&CC raised an EDS query regarding, the copies of CRZ and Forest Clearances, among other clarification which also included clarifications regarding the accreditation of the consultant for Category 4e under the EIA Notification, 2006 and the details thereof. Again on 03.11.2023 the MOEF&CC raised an EDS for submission GCZMA Recommendations, CRZ report and NoC from SPCB, to which Answering Respondent responded comprehensively. Copy of the response dated 08.09.2023 and 27.12.2023 is marked and annexed collectively as **ANNEXURE R/11 (Colly).**

35. That the application for Environmental Clearance was first considered by the Expert Appraisal Committee ("EAC") in its 72nd Meeting on 02.01.2024, but deferred for additional clarifications, including a requirement from the Answering Respondent whether *"*baseline study was conducted during December 2019 – February 2020, which is more than three years old. As per OM, PP shall conduct fresh three months study". In response to the same, the Answering Respondent submitted that PP has already appointed TR Associates a NABET accredited Consultant, for conducting the three months baseline monitoring in November 2022 and the baseline study was conducted during the period December 2022 – February 2023. Also additional clarification included that the newly appointed consultant, T.R. Associates, was to undertake a site visit, and verify/check the entire data as well as EIA – EMP report. They should give undertaking that they are satisfied with data and own the data provided in the EIA - EMP report. PP was also required to submit the

authorization letter from the new Consultant. The Minutes of the 72nd EAC Meeting is marked and annexed as **ANNEXURE R/12**.

36. That in compliance with the recommendations of the 72nd meeting, the Answering Respondent wrote to T.R. Associates on 10.01.2024 to undertake the site visit and review and validate the report. Accordingly, T.R. Associates submitted an Addendum to the EIA/EMP Report prepared by CSIR-NEERI, on 30.01.2024 to the MoEF&CC. The Addendum to the EIA report by T.R. Associates, Authorization Letter to TR Associates and Undertaking by T.R. Associates are attached collectively as **ANNEXURE R/13 (Colly)**

37. That the EAC in its 74th Meeting on 06.02.2024 considered the proposal of the Answering Respondent including the EIA-EMP Report addendum prepared by TR Associates. However, the proposal was again deferred and the EAC recommended TR Associates to conduct a comparative analysis between the earlier baseline data (Dec 2019–Feb 2020) and updated data (Dec 2022–Feb 2023). The Committee also directed an additional one-month baseline study for conducting the trend analysis. Several representations, many even post-publics hearing were considered, by the EAC by taking a very liberal stand including e-mail representations. The Answering Respondent was asked to provide detailed responses to the said representations. The EAC also noted that in the next hearing they will go through the video of the Public Hearing. The 74th EAC Minutes are annexed as **ANNEXURE R/14**.

38. That thereafter, in the 78th EAC Meeting on 30.04.2024**,** after reviewing the Answering Respondent's responses and the video of the public hearing, the EAC acknowledged that the public grievances had been appropriately addressed and due opportunity was given to the public to

raise their grievances. However, the EAC deferred the proposal pending views from the CRZ Division as the proposal involves CRZ clearance. The minutes of the 78th EAC Meeting have been annexed as **ANNEXURE R/15**.

39. That in the 80th Meeting on 07.06.2024, the CRZ Division confirmed that the project activities were permissible under the CRZ Notification, 2011**,** and recommended verifying the adequacy of NIO's Marine Environmental Management Plan and GCZMA's conditions. The EAC accordingly recommended the project for EC, subject to twenty-five conditions. It is pertinent to mention that despite the recommendation of the EAC, the Environmental Clearance was not immediately granted to the Answering Respondent. The minutes of the 80th EAC Meeting have been annexed as **ANNEXURE R/16.**

40. That the EAC revisited the project of the Answering Respondent yet again in its 84th Meeting on 21–22.08.2024 in view of additional representations from the public to the EAC. To verify the allegations in the representations, the EAC decided to constitute a Sub-Committee comprising of officials from MoEF&CC's Integrated Regional Office, GPCB, to conduct a site inspection, which was carried out on 09.10.2024. The minutes of the 84th EAC Meeting have been annexed as **ANNEXURE R/17**.

41. That based on the Sub-Committee's findings, the 87th EAC Meeting on 21–22.10.2024 deliberated extensively and recommended Environmental Clearance, subject to additional mitigation measures. The minutes of the 87th EAC Meeting have been annexed as **ANNEXURE R/18.** That on 25.10.2024, the Answering Respondent submitted a letter to the Ministry of Environment, Forest and Climate Change clarifying its response to the

queries/suggestions of the EAC in its 87th Meeting. After due consideration of the response and the measures sought to be undertaken and incorporated by the Answering Respondent, the MoEF&CC finally granted the Environmental Clearance for the Soda Ash Project on 12.12.2024. Copy of the letter dated 25.10.2024 of the Answering Respondent is marked and annexed as **ANNEXURE R/19.**

42. That in view of the abovementioned appraisal process, it is clear that the EAC, apart from the scientific rigorous analysis, went beyond the mandate in the EIA Notification, 2006 perhaps based on abundant precaution, to consider the grievances of the public pertaining to air and water pollution, impact on flora and fauna of the area as well as impact on the nearby village community. However, the Appellant herein did not raise a single grievance during the three years of appraisal by the EAC from 2021 to 2024 and has now come at a belated stage challenging the Environmental Clearance of the Answering Respondent without submitting any studies or evidence to confirm the ill impacts of the project. This is in addition to another statutory appeal (Appeal No. 19 of 2025) that has been filed on the same environment clearance with almost the same grounds and prayer. Clearly, there is more than what meets the eye.

F. Additional Studies conducted by Experts for mitigating impact on flora and fauna

43. That further, in addition to the ZSI Report, the CSIR NEERI and the CSIR NIO Report, an Ecology Study and Wildlife Conservation Plan has been prepared by GUIDE and Dr. Bharat Jethva, a reputed regional environmental expert and NABET-accredited Functional Area Expert, in line with the ToR and the ZSI's earlier recommendations. The Plan was

submitted to the Principal Chief Conservator of Forest ("PCCF") on 09.11.2022 and subsequently approved by the Chief Wildlife Warden, Gujarat, on 24.04.2023 in about five months of examination. The copy of the Ecology Study and Wildlife Conservation Plan dated 09.11.2022 as well as the approval of the Chief Wildlife Warden, Gujarat dated 24.04.2023 is marked and annexed collectively as **ANNEXURE R/20.**

44. That to further supplement the study undertaken by ZSI, CSRI NEERI, CSIR NIO, the Gujarat Institute of Desert Ecology ("GUIDE") had also prepared an additional Conservation and Management Plan for Significant Species in February 2023 and clearly stated that during the study period, there was no presence of turtles. The copy of the said Report by GUIDE is marked and annexed as **ANNEXURE R/21.**

G. Consent to Establish Obtained- Never Challenged

45. That furthermore, the Answering Respondent has also been granted the Consent to Establish ("CTE") from the Gujarat Pollution Control Board on 04.09.2021, which has never been challenged either by the Appellant or any other person.

H. Coastal Regulation Zone Clearance obtained- Never Challenged

46. That for intake and outfall pipelines , the Answering Respondent applied to the ("GCZMA") on 11.10.2021 and obtained CRZ Clearance on 26.12.2023 after a detailed evaluation by the Anna University, Chennai. In January 2021 (based on Draft CZMP as per CRZ Notification 2011), March 2023 (based on approved CZMP as per CRZ Notification 2011), the Local Level Coastal Regulation Zone Map for the Proposed Greenfield Chemical Complex – Soda Ash and Associated Sea Water Intake and Outfall Pipelines in Bada Village Mandvi Taluka, Kachchh District,

Gujarat was prepared by the Anna University of Chennai by superimposing it on the approved Coastal Zone Management Plan as per the CRZ, 2011. The Map clarified that Out of 1342.96 acres, 2.96 acres falls in CRZ III (No Development Zone), 26.07 acres fall in CRZ III (200m to 500 m from HTL) and 1313.93 acres fall outside the approved CZMP as per the CRZ Notification, 2011. Thus, the area falling within the CRZ for the construction of the underground pipeline was duly within the permissible activities as per the CRZ Notification, 2011. The legality of pipelines in CRZ area has been affirmed by the Hon'ble Supreme Court and Bombay High Court in several judgments, including Essar Oil Ltd. v. Halar Ukarsh Samiti (AIR 2004 SC 1834), M. Nizamudeen v. Chemplast Sanmar Ltd. [(2010) 4 SCC 240], and Environsare Foundation v. Union of India [2003 (2) Bom CR 519]. The Judgments have been compiled in a separate Compilation of Judgments which will be used at the time of arguments.

47. That on 26.12.2023, the Gujarat Coastal Zone Regulatory Authority gave its final recommendation and clearance for the construction of the seawater intake system in CRZ III, intake pipeline in CRZ 1A, CRZ IB and CRZ IV and outfall pipeline in CRZ 1A, CRZ IB and CRZ IV as per the Coastal Regulatory Zone Notification, 2011. Incidentally the said pipelines are underground pipelines which opens further into the sea. The Copy of the Clearance dated 26.12.2023 is marked and annexed as **ANNEXURE R/22.** It is pertinent to mention that the Appellant herein under the guise of challenging the Environmental Clearance, is now challenging the CRZ Clearance, which is not permissible in law.

48. That the abovementioned position of facts and law demonstrates that the project underwent rigorous multi-stage evaluation by various statutory

authorities, supplemented by expert studies, multiple EAC deliberations, and a thorough legal and scientific scrutiny. None of the other statutory clearances including the CTE or CRZ approval or the forest clearances have ever been challenged by the Appellant herein before any competent forum. The EC of 12.12.2024 was thus the culmination of a transparent, lawful, and scientifically robust process. It is only when the final prior environment clearance was obtained, in an attempt to frustrate the project and certainly for oblique motives, which are writ large in the facts of the present case narrated hereinabove, that the present Appeal has been filed and thus should be dismissed with huge costs.

III. Para Wise Response on Merits

1. That the contents of para 1-6 are matters of record and to that extent do not merit any response from the Answering Respondent. However, specifically with respect to para 4, it is submitted that the bonafides of the Appellant organisation are denied since no certificate of registration has been put on record. Further, the Appellant organisation is more than 500 kms away from the project site and cannot be considered as an Aggrieved person under Section 18 of the NGT Act, 2010. The answering reiterates the content of para 2-6 of the Preliminary Submissions including the Judicial decisions relied upon in response to para 1-6 of the Appeal.

Response to – brief facts leading to file present Appeal

2. That the contents of para 7(a) to (v) are summarily rejected, except those that are matters of record. The detailed chronology or facts leading to the grant of Environmental Clearance has been provided in detail by the Answering Respondent in the Preliminary Submissions and the same is being reiterated in response as the correct position of facts and is not being

repeated for the sake of brevity. The Appellants claim regarding the presence of flap shell turtle, green sea turtle and other wildlife are denied as wrong, false and devoid of all merit and the Appellant is put to strict proof regarding the same. No maps, reports, photographs have been produced by the Appellant to substantiate the presence of turtles and other wildlife and the Appellant is making empty submissions and allegations against the reports and project of the Answering Respondent. Additionally, the Appellants have alleged that the Solvay process of the Answering Respondent will cause environmental damage, without again placing on record any evidence of the damage or degradation.

Para wise response to – The present Appeal is filed on the following the grounds:

A. Response to the Public hearing had not been conducted in accordance with law.

3. That the allegations of the Appellant that the public hearing was not conducted in accordance with law are wholly misconceived and denied. The Answering Respondent respectfully submits that all procedural requirements under the EIA Notification, 2006, as amended, were duly complied with.

4. That at the outset, it is pertinent to mention that the issue of the minimum number of 30 days' notice for the public hearing was duly considered by the High Court of Gujarat in WP (PIL) No. 85/2022 – Bharat Gangji Gala & Others v. Gujarat Pollution Control Board]. The Hon'ble High Court noted in its judgment dated 18.10.2022 that the Petitioners therein had suppressed the fact of the amended EIA Notification dated 09.05.2022, which clarified the procedural timelines for rescheduled hearings and the

hearing of 17.10.2022 was being conducted in accordance with the law. The Hon'ble Gujarat High Court, by a detailed order dismissed the Writ Petition with costs of Rs. 50,000, finding the challenge meritless. The public hearing was therefore conducted as scheduled on 17.10.2022, during which all public grievances, were duly recorded and later incorporated into the revised EIA/EMP report.

5. That the Appellant herein is again attempting to not only suppress the Order of the High Court of Gujarat, which is duly noted in the minutes of the public hearing but also the position of law as per the EIA Notification dated 09.05.2022 which clarifies the timelines for rescheduled public hearing. In the present case as well, the first public hearing was scheduled on 06.04.2022, after duly giving the notice of 30 days in both Gujarati and English newspapers on 04.03.2022 and circulation of the draft EIA/EMP Report. However, the hearing could not be concluded on 06.04.2022 due to disruptions, spread of false and misleading information about the project, leading to a potential law-and-order situation. Consequently, the Regional Office of GPCB and the Resident Additional Collector, Kutch, jointly decided to postpone the hearing in view of the hostile environment.

6. That subsequently, the GPCB on 30.09.2022 wrote to the District Collector and other officers for displaying the EIA/EMP Report of the Answering Respondent. The Notice for rescheduling the public hearing for 17.10.2022 was also issued and published in Gujarati newspapers on 30.09.2022 and in English on 01.10.2022. The public hearing was conducted as scheduled on 17.10.2022, during which all public grievances, were duly recorded and later incorporated into the revised EIA/EMP report. It is pertinent to add that the Appellant herein was not present for the said public hearing and has neither raised any grievance by way of any written communication during

the said period nor after the hearing. This clearly highlights that the Appellant, being more than 500 kms away, is not impacted by the project or waited till the grant of Environmental Clearance, for reasons best known to them. The Appellant is now raising issues of sea temperature and effluent discharge, which have been duly addressed and considered by the EAC as well as by the GPCB and the GCZMA. The Appellant is put to strict proof with respect to the allegations of misleading information. The Appellant themselves submit that the EAC undertook a site visit before granting the Environmental Clearance on 12.12.2024 thus affirming that the grievances of the public were duly verified before the recommendation and grant of Environmental Clearance. The report of the Sub Committee is part of the minutes of the 84th Meeting of EAC and is available on the public domain on the parivesh portal. Infact, a number of representations have also been received in favour of the project. The representations in favour of the project with english translations are marked and annexed herein as **ANNEXURE R/23 (Colly).** The contents of the Preliminary Submissions are reiterated and are not being repeated for the sake of brevity.

B. Response to the Existence of Schedule 1 (sic I) Animal

9. That the allegations of the Appellant that the project site is an ecologically sensitive area inhabited by Schedule-I species and that industrialisation would have an adverse impact on these species, are factually incorrect and legally untenable.

10. That the Answering Respondent had engaged six different experts of national and international repute to undertake detailed studies including on the presence as well as possible impact on turtle nesting, if any. The list of

expert institutions and individuals who have undertaken detailed studies since 2018 till 2024 (over a period of six years) include –

i. Council of Scientific and Industrial Research- National Environmental Engineering Research Institute ('CSIR-NEERI') – which prepared the Environment Impact Assessment Report containing comprehensive assessments and studies on the impact of the project on nearby wildlife, sand dunes, marine biodiversity.

ii. Council of Scientific and Industrial Research -National Institute of Oceanography ('CSIR-NIO') – which prepared the Marine Impact Assessment, which has analysed in detailed any impact which the underground inflow and outflow pipelines might have on marine biodiversity, including sand dune mapping.

iii. The Zoological Survey of India ('ZSI') prepared a specific report on status of survey and conservation plan for sea turtles.

iv. The Gujarat Institute of Dessert Ecology ('GUIDE') has prepared a detailed plan for the conservation of significant species & GUIDE report Status survey and Site-specific Conservation Plan for Sea Turtles for entire year (June 2022 – January 2023).

v. TR Associates have prepared an addendum to the EIA Report prepared by CSIR NEERI and reconfirmed the findings of CSIR – NEERI Report.

vi. Dr. Bharat Jethwa from Bhagwati Enviro Care Private Ltd., a functional area expert for ecology and biodiversity, also prepared a ecological study and wildlife conservation plan.

It is pertinent to mention that many of the abovementioned Institutes are relied upon by this Hon'ble Tribunal as well as the Hon'ble Supreme Court for fact checking and confirming allegations of pollution as well

as remedial measures and infact hailed and appreciated their expertise in nationally important projects such as the present one. (a case in point is the judgment dated 27.02.2025 of the Hon'ble Supreme Court in Chinmay Mishra v. Union of India and Others)

11. That specifically on the allegations of turtle nesting sites and the impact on turtles due to the inflow and outflow pipelines, it is also humbly submitted that the Zoological Survey of India Report, the Gujarat Institute of Dessert Ecology Report, TR Associates, CSIR NIO as well as NEERI reports confirm that there are no turtle nesting sites present at the site of the project, given that the site is not suitable due to a rocky beach. Any sporadic nesting happens in the 7 km stretch between Rukmavati river mouth (about 20 km from the proposed project site) and Mandvi Palace (about 16 km from the project site)

12. That however, as a matter of abundant precaution, a detailed conservation plan has been prepared by GUIDE and Dr. Bharat Jethwa, of Rs 136.50 lakhs to mitigate any potential ecological and biodiversity impacts and has also been approved by the Principal Chief Conservator of Forests (PCCF) and Chief Wildlife Warden of Gujarat, the highest statutory authority of the State from the wildlife perspective under the Wildlife Protection Act, 1972. The Conservation Plan encompasses the conservation of various Scheduled species which includes marine and terrestrial biodiversity. The application for approval of the Conservation Plan, dated November 9, 2022, submitted to the PCCF, underscores a proactive approach toward wildlife and biodiversity conservation. This Plan will play a crucial role in ensuring the protection of marine species, including turtles, reinforcing the commitment to ecological preservation while facilitating sustainable development.

13. That the concerns of presence of sea turtles and sea turtle nesting were duly addressed in the Action Plan for public hearing and have been reconfirmed by multiple site inspection reports including by the Sub Committee of EAC which confirmed the absence of sea turtles in the Project site. Over a period of seven years, not a single expert agency or statutory authority found the presence of turtles during the appraisal process of Environmental Clearance or other permissions pertaining to CRZ Clearance or Forest Clearance. This clearly establishes that there is no sea turtle nesting on the said project site. Further, the latest photographs of the site will clearly establish that the beach is rocky and during high tide, the water level reaches till the slope of the unclassed forest land thereby making it impossible for any sea turtle nesting to occur on the said site. The reliance on a belated study by Sunderraj is baseless and without any merit and does not pertain to the project site of the Answering Respondent. The copy of the latest photographs of 2025 of the beach of the project site is marked and annexed as **ANNEXURE R/24 (Colly).**

14. That in fact, the National Marine Turtle Action Plan (2021-2026), published by the MoEF&CC, does not identify the Kutch region, including Bada Village, as an important marine turtle nesting habitat. Instead, it recognises the Western Saurashtra Coast covering Junagadh, Jamnagar, and Porbandar districts as the significant nesting ground for Green and Olive Ridley Turtles. A copy of the relevant extracts of the National Marine Turtle Action Plan (2021-2026) is annexed as **ANNEXURE R/25**.

15. In light of the above, it is evident that, comprehensive biodiversity and marine ecology studies have been conducted by reputed institutions. A Schedule-I Species Conservation Plan valued at Rs. 136.50 lakhs has been prepared and approved by the highest competent authority of the State

(Annexure R/20) The site has been verified through multiple independent assessments and site visits to be unsuitable for sea-turtle nesting, and all statutory authorities, including the EAC, MoEF&CC, GCZMA, and the State Government of Gujarat have duly considered and addressed biodiversity concerns before granting clearance. Accordingly, the Appellant's allegations regarding the presence of Schedule-I species and the absence of adequate biodiversity assessment are devoid of merit and liable to be rejected, by this Hon'ble Tribunal.

C. Response to NABET Accreditation of The Consultant

16. That the Appellant's allegation that the Project Proponent authorised CSIR-NEERI to prepare the EIA/EMP for the Soda Ash Project despite NEERI not being a QCI/NABET-accredited consultant for soda ash are denied as wrong and submit an incorrect position of law vis a vis the facts.

17. That it is reiterated that in 2017, when the study for EIA-EMP report was sought to be commissioned, there were no NABET-QCI Consultants specifically accredited for soda ash projects. The list of accredited consultants uploaded on the NABET-QCI website as of August 2017 establishes this position. Prior to issuance of the work order to CSIR-NEERI in 2018, the Answering Respondent conducted due diligence and enquired from the MoEF&CC on 23.11.2017 whether any consultant had specific EIA accreditation for soda ash. However, no response was received from the MoEF&CC. Accordingly, and based on the then-available NABET list, the answering Respondent engaged CSIR-NEERI, which was accredited for Chlor-Alkali projects and had prior experience preparing EIAs for projects involving soda-ash related processes. The relevant correspondence in this regard is on record as ANNEXURE R/. It is pertinent to mention that NABET-QCI granted the first accreditation specifically for

soda ash to TR Associates only in December 2019, which was communicated to the Answering Respondent by NABET vide the letter dated 27.01.2023. Thus, at the time the work order was given to CSIR-NEERI there were no soda-ash-specific accredited consultants. The true copy of the Letter dated 27.01.2023 is marked and annexed as **ANNEXURE R/26.**

18. That thereafter, prior to the grant of Terms of Reference, the Answering Respondent in its application for ToR on 28.07.2021 and in the cover letter had disclosed the engagement of CSIR-NEERI to conduct the EIA study. The Answering Respondent received an EDS dated 30.07.2021 from MoEF&CC and replied on 06.08.2021, reiterating the appointment of CSIR-NEERI. Thereafter, the TOR was granted by MoEF&CC on 10.08.2021, after appraisal of the application and the EDS response, including the requirement of engagement of CSIR NEERI for the said project. However, subsequent to the accreditation of TR Associates, the Answering respondents in pursuance of the recommendation of the EAC got the EIA and EMP) Report verified by TR Associates, who further submitted an Addendum to the report as also confirming the findings of the CSIR -NEERI Report on its authenticity and content. The contents of preliminary submissions are reiterated and are not being repeated for the sake of brevity.

19. That it is important to add here that chlor-alkali is an industrial method or process for electrolysis of sodium chloride solutions or in other words, it is the technology used to produce chlorine and sodium hydroxide (caustic soda), which are commodity chemicals required by industry. Soda ash, also known as sodium carbonate, is a white, odourless, water-soluble powder that has many industrial–and household uses which is produced in large

quantities from sodium chloride and limestone by the Solvay process, as well as by carbonating sodium hydroxide which is made using the chlor-alkali process . In other words, accredited Consultants who are competent to prepare EIA for Chlor Alkali are also technically proficient to prepare such EIA reports for Soda Ash as in the case of NEERI in this case. They have been carrying out such studies for other Soda Ash plants which have stood the test of time and are running successfully.

20. That it is also significant to add that any derailment of this nationally important project will also hurt the economic interests of the State in particular and the Nation in general on account of the cheap / dumped imports of soda ash coming from neighbouring countries such as China which is already a drain on the foreign exchange reserves of our country apart from ruining the domestic soda ash industry. Establishing such projects like the Soda Ash Project here is a true reflection of "Atmanirbhar Bharat".

21. That in view of the abovementioned facts and position of law, it is humbly submitted that the EIA EMP Report has been prepared by CSIR NEERI, which is an accredited organization. Further, the Report has been additionally vetted and adopted by TR Associates, who has specific accreditation for the Soda Ash Sector. The lack of soda ash accredited agencies at the time of preparation of the EIA -EMP Report for the proposed Soda Ash Project of the Answering Respondent cannot prejudice the report prepared by CSIR NEERI, which has been often referred to and relied upon by this Hon'ble Tribunal as well as the Hon'ble Supreme Court for numerous site inspections, air, and water quality reports, among other forms of environmental assessment and reporting.

D. Response to Direct disturbance to nesting

22. The answering Respondent denies the allegation that construction activities for the proposed Soda Ash Project will cause any direct disturbance to sea-turtle nesting at the project site. On the record and after careful scientific study and site verification, the project location in Bada Village is not a recognized sea-turtle nesting ground. Infact available expert surveys and statutory reviews consistently show only sporadic and rare past occurrences and no confirmed nesting site at the Project site. The Appellants are put to strict proof for alleging disturbance of nesting sites without first proving the presence of the turtle nesting sites through any credible scientific evidence at the project location of the Answering Respondent.

23. That the Answering Respondent obtained a detailed survey from ZSI in April 2019. After daily monitoring of the 3 km beach between September 2018 and March 2019, ZSI concluded that the site exhibits only sporadic nesting habitats and that nesting is highly sporadic because many suitability factors (beach width, vegetation cover, rocky/pebbly substratum, steep slope in the intertidal/sub-tidal region, tidal inundation and presence of animals/predators) are not conducive for nesting. The ZSI expressly recorded that “we did not encounter any sea turtle and fresh/old nests or crawl marks of turtles on the beach” during that monitoring period.

24. That further, the Draft Environment Impact and Risk Assessment Study prepared by CSIR-NEERI in October 2021 clearly notes low density of turtle nesting on the coasts of Bada and Bambhdai villages and that out of the 23 km study area only 2 km of the coast falls within the Project area. Further, the Ecological Study & Wildlife Conservation Plan prepared by Dr. Bharat Jethwa / M/s Bhagwati Enviro Care Pvt. Ltd. (NABET-accredited FAE) similarly records no presence of turtle nesting sites at the proposed plant

location. The Conservation Plan application submitted on 09.11.2022 and its subsequent approval are on record (Annexure R/20**).**

25. That in addition to ZSI and CSIR-NEERI, multiple independent studies have assessed the area, the NIO undertook Marine EIA, the Addendum to the EIA was prepared by TR Associates, and GUIDE also prepared a specific Conservation & Management Plan. These reports were prepared at different intervals from 2019 through February 2024. None of these reports confirmed active turtle nesting at the Project site, they consistently report only past sporadic occurrences, and each report prescribes mitigation, monitoring and management measures to be implemented during construction and operation.

26. That the EAC Sub-Committee, on its site visit to the proposed project location, observed the steep slope and noted high tide water line reaching up to the sand-dune bottom. The Sub-Committee did not record any turtles, turtle eggs or nesting sites at Village Bada and expressly found the site unsuitable as a turtle-nesting ground. This independent site verification corroborates the scientific studies.

27. That it is also pertinent to reiterate that the National Marine Turtle Action Plan (2021–2026) published by MoEF&CC does not identify the Kutch region, including Bada, as an important marine turtle nesting habitat; instead, it recognises the Western Saurashtra coast (Junagadh, Jamnagar, Porbandar) as the significant nesting zone for Green and Olive Ridley turtles. A copy of the Action Plan is on record (See **ANNEXURE R/25**).

28. That in view of the foregoing, ZSI's daily monitoring (Sept 2018–Mar 2019) with no turtle sightings, the CSIR-NEERI EIA (Oct 2021) and Ecological/Conservation Plans submitted on 09.11.2022, and approval thereafter **ANNEXURE R/20,** corroborative studies by NIO, GUIDE and TR Associates (addendum and baseline revalidation up to Feb 2024), and the

EAC Sub-Committee site inspection of the allegation of direct disturbance to a turtle-nesting ground is without factual basis. Notwithstanding the absence of confirmed nesting, all the reports identify specific mitigation, monitoring and management measures which the Answering Respondent will implement during construction to avoid and minimise any disturbance to marine fauna, and to address any sporadic nesting that may be encountered.

E. Response to Two Water Bodies existing within distance of 1 Km and Diversion of Stream passing through Project site

29. That in response to the allegation in the said ground, it is humbly submitted, that the Appellant have submitted half-baked information before this Hon'ble Tribunal. It is also clear that the Appellant has not read the EIA Reports and is instead making incomplete submissions on Affidavit to mislead this Hon'ble Tribunal. At the outset it is pertinent to mention that none of the village ponds or the Vengadi seasonal river will be disturbed by the Answering Respondent during the construction or operational phase of the plant. The Hydrological study/assessment in the CSIR NEERI Report clearly states that the Answering Respondent in pursuance of its CSR obligations proposes to utilise the surface runoff of the buffer zone of the Soda Ash Plant for recharging the 12 existing village ponds as percolation tanks. Additionally, the rainwater harvested on the roof of the plant buildings will also be utilised for ground water recharge. The Appellant is put to strict proof for making bald allegations pertaining to the impact on village ponds by the project.

30. That only one stream of 1st order, which originates outside the plant area and is sought to be diverted to Vengadi river, where there are two check dams, one for salinity ingress and one upstream for storing fresh water. A detailed

Hydrological Assessment Report was prepared by Hydro Geo Survey Consultants Pvt Ltd. for conducting detailed drainage studies. The report clarifies that there is no possibility of overflow from the diversion of the said drain. Any overflow from the Vengadi river, flows directly into the Arabian Sea. The said issue was reverified by the TR Associates while preparing the Addendum to the EIA report and the Addendum notes the risk of impact from diversion to be low. It is also pertinent to mention that the Subcommittee of the EAC also verified the said issue during the site visit and only thereafter recommended the grant of Environmental Clearance.

F. Response to Activities in CRZ area and non-compliance with CRZ conditions.

31. That the Answering Respondent denies the allegation that the project's pipeline works, and movement of construction machinery will unlawfully impinge upon sand dunes or river mouths in a manner warranting cancellation of the CRZ clearance. The submissions in the preliminary submissions are reiterated and are not being repeated for the sake of brevity.

32. That however, it is pertinent to mention that the Appellant is challenging the CRZ Clearance at a belated stage in an Appeal challenging EC, which is not permissible in law. Further, the Appellant has clearly not read the EIA Report or the deliberations of the EAC or the GCZMA minutes, all of which will clarify that there is no impact on sand dunes as the pipelines are sought to be established 15 m below ground level through micro tunnelling. Additionally, there are numerous reports of CSIR NIO, CSIR NEERI, TR Associates, GUIDE which reconfirm that there will not be any adverse impact on sand dunes or the morphology of the coastal area. For abundant precaution, GUIDE has also prepared a detailed report delineating measures for mitigating any impact on the sand dunes. The answering Respondent is

bound by all the conditions of the statutory clearances obtained thus far and has been in the process of fulfilling the same in accordance with law.

I. Response to Emission of Air Pollutants like Sox and NOx and Pollution of the Coast

33. That the allegation that the proposed project will result in emissions of air pollutants such as SOx and NOx beyond permissible limits and that the baseline data provided by the Answering Respondent is misleading, is wholly baseless and contrary to the record. At the outset, it is pertinent to mention that the compliance with the NAAQs standards is being monitored by the GPCB vide the Consent to Establish, which has not been challenged by the Appellant herein and is now time-barred to do so. However, it is pertinent to reiterate that comprehensive studies were conducted by CSIR–NEERI and subsequently verified and supplemented by M/s TR Associates, an accredited consultant specifically qualified for soda ash projects, in strict adherence to the provisions of the EIA Notification, 2006 and the relevant guidelines issued by the MoEF&CC conducted baseline studies. The baseline studies undertaken by CSIR–NEERI during December 2019 to February 2020 were subsequently validated by TR Associates through additional baseline monitoring for three months (December 2022 – February 2023) and trend analysis. The addendum to the EIA Report prepared by TR Associates has incorporated the updated air quality data and trend analysis, demonstrating that ambient concentrations of SO2, NOx are well within the limits prescribed under the NAAQS. Infact, the report has also taken into consideration the increase in the baseline values post the commencement of the construction, which is again within the permissible limits. The Gujarat Pollution Control Board as well the MoEF&CC will be duly monitoring the impact of the project vide the compliance with consent conditions, Annual

Statements under the Environment Protection Rules, 1986 as well as the EC six monthly compliance reports as mandated by law.

34. That it is pertinent to mention that the concerns regarding emissions of SOx, NOx, particulate matter, and related impacts such as acid deposition and health effects were raised during the public hearing, particularly with respect to (i) the height of chimneys, (ii) emission levels of SOx and NOx, (iii) possible acid rain, (iv) particulate emissions during transportation, and (v) emission of heavy metals such as mercury. In response, the Answering Respondent has categorically assured that all requisite control measures would be implemented and that the emission levels would remain well within the prescribed NAAQS limits.

35. That to minimize air pollution, the Answering Respondent has proposed and committed to the installation of stacks of adequate height in accordance with the CPCB and NAAQS Guidelines, ensuring proper dispersion of pollutants. In addition, modern pollution control technologies such as Electrostatic Precipitators (ESP), scrubbers, and dust collectors will be installed and commissioned prior to the commencement of operations. Each of these control systems will be interlinked with operational units such that any malfunction of the control system will automatically result in the shutdown of the corresponding process unit.

36. That further, to control sulphur emissions, finely ground limestone will be injected into the boiler combustion zone along with coal/lignite, ensuring more than 90% capture efficiency of SO2. A dedicated limestone dosing system has been designed for this purpose. The air pollution monitoring system will include Continuous Emission Monitoring Systems (CEMS) with regular monitoring by agencies approved by CPCB and GSPCB, as detailed in Chapters 6 and 10 of the EIA Report **(ANNEXURE R/6).**

37. That a detailed Action Plan was submitted by the Answering Respondent, which includes implementation of a comprehensive greenbelt and plantation programme to ameliorate residual emissions and improve ambient air quality. The Answering Respondent, through its CSR arm, the GHCL Foundation, has undertaken to plant and maintain trees across Mandvi Taluka and nurture them for a minimum of five years. This initiative is in addition to greenbelt development around the project site and in adjoining villages, as detailed in Chapter 10 of the EIA Report.

38. That specifically with respect to emissions from transportation, it is clarified that there is presently no rail or waterway infrastructure available in the project region for raw material transport, therefore, road transport is currently unavoidable. However, a traffic impact assessment and air quality impact due to transportation have been thoroughly studied and presented in Section 3.2.3 of Chapter 3 and Sections 4.1.4.3 and 4.2.3 of Chapter 4 of the EIA Report. The study concludes that the incremental rise in pollutant concentrations due to transportation will remain negligible and within the permissible limits. The Answering Respondent has also undertaken to explore alternative modes of raw material including fuel transport as and when such infrastructure becomes available. Accordingly, the allegation that the emission data is misleading or that the baseline and trend analysis cannot be relied upon is unfounded and contrary to the verified record. The project's design, technology, monitoring framework, and greenbelt development plan collectively ensure that the air pollutant emissions, including SO_x and NO_x, will remain well within prescribed NAAQS limits and that all potential impacts have been adequately assessed, mitigated, and validated through scientific studies and regulatory review.

G. Response to Misleading Form 1

39. That at the outset, it is pertinent to highlight that the Appellant has made allegations of misleading information in Form 1 without producing the Form 1 of the Appellant. Further, the allegations are baseless and without any merit as the correct location of the project has been submitted in Form 1 in point no. 9 along with the kml file of the project. Furthermore, the Appellant is producing parts of Form 1 to allege illegality without producing the rest of the information submitted in the said Form. This Hon'ble Tribunal may take strict note of the conduct of the Appellant, who has clearly filed the present Appeal without any due diligence and infact by misrepresenting facts and position of law to this Hon'ble Tribunal. In point no. 1.22 as well as 1.23 , the Answering Respondent therein has duly clarified that no stream crossings are passing through the property, and one stream of 1st order originating outside the property is sought to be diverted to Vengadi River. Further, no borewells will be utilised for plant operations and only sea water is being utilised, as clarified in the Form as well as in the EIA Report. Infact, in the Hydrological study, it has been clarified that the Answering Respondent will undertake all possible efforts for the rejuvenation of groundwater in the area by channelling surface runoff as well as creating rainwater harvesting facilities over plant facilities. It is also pertinent to add that the Answering Respondent here is also willing to close all borewells on its plant facilities. Relevant extracts as quoted above is appended in the EIA report as Annexure R/6.

H. Response to Irreversible Damage to Sand dunes and Coastal Forest and changes in morphology of the coast

40. That the Answering Respondent denies the allegation that the project will cause irreversible or permanent damage to sand dunes and coastal forest. An Addendum to the Marine EIA/EMP for Seawater Intake and Effluent Disposal

for Greenfield Chemical Complex off Bada coast, Arabian Sea EIA Study was prepared by CSIR-NIO in March 2022, specifically for Seawater Intake and Effluent Disposal, which includes measures for the conservation of sand dunes near the coastline during the construction and operation of the intake and outfall pipeline of the Answering Respondent. Infact, GUIDE has undertaken a specific study to clarify that there will be no impact on sand dunes as the pipelines are being constructed through micro tunnelling 15 mt below ground level. The same is also noted by the Forest Department before granting Forest Clearance for the diversion of the land for the construction of the pipeline. The same has not been challenged by the Appellant herein. The Appellants are raising the grounds duly clarified during the public hearing as well as adjudicated upon by the EAC. The present Appeal is nothing but a tactic to delay the implementation of the project for reasons best known to the Appellant. The contents of the preliminary submissions are reiterated and are not being repeated for the sake of brevity. Copy of the Guide study and mitigation measures for sand dunes is annexed as **ANNEXURE R/27**.

I. Response to Adverse Impact on Marine Ecology, Degradation of natural resources and emission of greenhouse gases, Effect of saline water purification on effluent pollution, Effect of limestone calcination on effluent pollution, Effect of the waste from ammonia recovery on effluent pollution and Impact of effluent on environmental pollution

41. That the grounds raised by the Appellant, alleging pollution from limestone calcination, saline water purification, effluent pollution, waste from ammonia recovery, are baseless grounds, without any merit in facts and law. The Appellant has failed to highlight any discrepancy with the measures and methods being adopted for mitigating and minimizing the impact of any the soda ash project on the marine environment and ecology. The said measures

have been suggested by Institutes of National and International Repute, which this Hon'ble Tribunal as well as the Hon'ble Supreme Court has relied upon on numerous occasions for clarification and ascertainment of technical viability or adverse impact of a project /activity in a particular area. The Appellant, which is an NGO, and their technical expertise on the said issue cannot be relied upon against the opinion of the said experts, including regulatory authorities. Infact, on failing to highlight the technical discrepancy, Appellant has merely copy pasted grounds (N) to (R) from a Report dated 10.06.2024 prepared in University of Tabrez and Bonab in Iran, which is generic in nature and with no reference to the current project in question or projects in India. A copy of the said Report with the same extracts which is copied in the grounds, is appended as **ANNEXURE R/28**.

42. This clearly highlights the lackadaisical and callous attitude of the Appellant, who has drafted the present Appeal primarily to delay the implementation of the project. The methodology being criticised in Grounds N to R is not akin to the procedure being adopted by the Answering Respondent, and neither is the Answering Respondent disposing the effluent into lakes or rivers. The said grounds and findings being unrelated to the project of the Answering Respondent cannot be a basis to challenge the Environmental Clearance dated 12.12.2024 and thus be rejected as such by this Hon'ble Tribunal.

43. That the EIA reports, as well as the Expert Committee/Institution studies have clearly stated that the effluent discharge temperature as well as salinity will be similar to that of the sea water, as the same will be mixed with the effluent from the production process to maintain the norms. The effluent discharge will also be duly monitored by the GPCB in accordance with the conditions of the Consent. Further, rock salt is not being utilised by the Answering Respondent as alleged in the Grounds copied from the Iranian report,

especially Ground N and O. This Hon'ble Tribunal may take strict note of the conduct of the Appellant, who has approached this Hon'ble Tribunal without due perusal of the documents, the reports as well as the law and has submitted a plagiarised petition based on a foreign report for challenging a nationally important project part of vibrant Gujarat initiative. In addition to that the Answering Respondent will implement the Environmental Management Plan (EMP) with a budget of 320.73 Crore. The said EMP includes initiatives to minimize pollution level well within existing environmental norms.

J. Response to Base Line study not in accordance with law

44. That the allegation that the baseline study for the proposed project was not conducted in accordance with law is entirely misplaced and contrary to the facts on record. The Appellants have contended that the Project Proponent signed an agreement with CSIR–NEERI during the financial year 2017–18 and that baseline environmental data was collected between December 2019 and February 2020, i.e., prior to the grant of ToR on 28.07.2021. It is respectfully submitted that the baseline studies conducted by CSIR–NEERI between December 2019 to February 2020 were valid and in full conformity with the applicable regulatory framework. The Form–1 for obtaining EC was subsequently submitted on 30.11.2022, at which time the baseline data was well within the three-year validity period prescribed under the Office Memorandum (OM) dated 08.06.2022 issued by the MoEF&CC. Hence, the baseline data relied upon for the EIA report cannot be said to be outdated or invalid.

45. It is further submitted that the delay in the finalization and submission of the EIA report occurred due to unprecedented circumstances arising from the onset of the COVID-19 pandemic in early 2020, which caused widespread disruption to field activities, site inspections, and regulatory processes across

the country. These restrictions delayed field data collection, public consultations, and the overall timeline for submission of the EIA report and EC application, factors that were entirely beyond the control of the Project Proponent

46. It is also pertinent to mention that the MoEF&CC has issued several Office Memoranda clarifying the treatment of baseline data with respect to its age. The OM dated 07.11.2014 clearly provides that projects wherein the baseline data has become more than three years old after submission of the EIA/EMP report but before its appraisal by the EAC, shall still be considered by the EAC. The subsequent and more recent OM dated 08.06.2022 further clarifies that baseline data which is older than three years, but less than four years shall remain valid, subject to its revalidation with one season of fresh non-monsoon data collected after three years of the initial study. A copy of the said OMs dated 07.11.2014 and 08.06.2022 is appended collectively as **ANNEXURE R/29 (Colly).**

47. Accordingly, at the time of submission of the EC application on 30.11.2022, the baseline data was fully within the three-year validity window. However, by the time of appraisal before the EAC, the data had marginally exceeded the three-year period. In view of the OM dated 08.06.2022, the EAC, while examining the matter, directed the newly engaged consultant, M/s TR Associates, to undertake an additional three-month baseline study and comparative trend analysis. In compliance, TR Associates collected supplementary baseline data from December 2022 to February 2023 and in February 2024, which was duly incorporated in the Addendum to the EIA Report and comprehensively reviewed by the EAC. The EAC, after due consideration, found the baseline data, both that collected by CSIR–NEERI

and the additional dataset by TR Associates to be satisfactory, reliable, and compliant with the latest MoEF&CC guidelines and Office Memoranda.

48. Therefore, the contention of the Appellants that the baseline studies were not in accordance with law is wholly erroneous. The Answering Respondent has strictly adhered to the procedural and substantive requirements of the EIA Notification, 2006, read with the OMs dated 07.11.2014 and 08.06.2022.

K. Response to artificial illumination and sound pollution Response to Huge opposition from the Vipassana Centre

49. That the opposition from one Vipassana Centre cannot be a ground for cancellation of Environmental Clearance for a project, which is sought to benefit the entire Mandvi region by creating numerous job opportunities, establishment of schools among other vocational training centres. Further, the said objections were duly addressed during the public hearing as well as by the visit of the Sub Committee of the EAC , which has suggested an additional layer of an average 100mtr greenbelt around the plant area closer to Vipassana site thereby reducing any adverse impact, if any, of the project operations. The abovementioned facts and position of law clarifies that the present Appeal is a motivated Appeal, merely to derail and delay the project The callous and lackadaisical attitude of the Appellant is exacerbated in view of the misleading facts and position of law submitted in the Appeal. In fact, in another Appeal on similar grounds challenging the establishment of the soda ash unit of Saurashtra Chemical Division, this Hon’ble Tribunal vide Order dated 07.07.2021 dismissed the Appeal, noting that in the absence of any irreversible damage, the doctrine of proportionality has to be applied and quashing of the EC is not the only option. (Sayyed Mohd. v. Union of India and Others ,2021 SCC OnLine NGT 2143)

50. That the Questions of Law in para 9 (a) to (e) raise issues beyond the scope of Section 16 Appeal and are denied for want of merit. Be that as it may, the issues raised through the questions of law have been answered not only in the preliminary submissions but also in the preceding paragraphs and is not being repeated for the sake of brevity. The same may be treated as a response to the Questions of law.

51. That in response to the submissions of the Appellant with respect to their locus in para 10 (i) to (xvi), 11 and 12, the submissions in Preliminary Objections are reiterated and are not being repeated for the sake of brevity. It is however imperative to add that the absence of the Appellant in any of the proceedings pertaining to the project of the Answering Respondent, from 2018 to 2024, as well as when the issue of public hearing was being adjudicated upon by the Hon'ble High Court of Gujarat, clearly highlights that the present Appeal is but a tactic for reasons best known to the Appellant and which are clearly not for Bonafide environmental causes. The plagiarism of grounds, submission of half-baked information, clearly highlights the casual attitude of the Appellant in approaching this Hon'ble Tribunal and is a strong ground for dismissing the Appeal with huge costs. It is also pertinent to add that the Appellants have also challenged the validity of the CRZ clearance, compliance with conditions of the CRZ clearance, in an Appeal under Section 16(h), which is not permissible as per the NGT Act, 2010 as well as NGT Rules, 2011 and thus may be disregarded by this Hon'ble Tribunal at the threshold.

52. That the abovementioned factual and legal position in the preliminary submissions and the para-wise reponse vis a vis the Greenfield Chemical Complex of the Answering Respondent has been suppressed by the Appellants for reasons best known to them. In the humble submission of the Answering Respondent, the present Appeal should be dismissed with huge costs on the

Appellants for submitting half-baked facts and suppressing vital information such as the in-depth appraisal by the EAC vide physical site visits for recommending the grant of Environmental Clearance.

53. That for all the reasons set out above, in the alternative and without prejudice to one another, and other oral submissions to be advanced and judgments to be referred to and relied upon by the Answering Respondent at the time of arguments, the Answering Respondent most respectfully submits and prays that the present appeal, which is a gross abuse of the process of law, deserves to be dismissed in limine by this Hon'ble Tribunal with exemplary costs as any further delay would cause irreparable prejudice and hardship to the Answering Respondent which is setting up the Soda Ash Project at a huge cost of Rs.7,000 Crores with the fond hope that its Soda Ash Project would amongst other factors: (a) help generate huge employment opportunities both, direct and indirect, in the region (b) Implementation of Wild Life Conservation Plan and other bio diversity improvement projects by the Answering Respondent to improve bio diversity of the region, (c) help generate substantial revenue to the Central and State Exchequer in the form of direct and indirect taxes and (d) help bridge the demand supply gap present in the soda ash industry, all of which will cumulatively contribute to the growth and wealth of the Nation.

Date: 04.11.2025
Place: Pune

DRWAN AND FILED BY:



Mansi Bachani, Gitanjali Sanyal & Satvika Krishnan
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Nizammuddin East, New Delhi – 110013
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SETTLED BY:
Mr. Sanjay Upadhyay
[Senior Advocate]

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

WESTERN ZONE BENCH AT PUNE

APPEAL NO. 26 OF 2025

IN THE MATTER OF:

Go Green Foundation Trust ...Appellant

-Versus-

Union of India & Ors. ...Respondents

AFFIDAVIT

I, Ranjan Tiwari S/o Late Shri H.C. Tiwari aged about 56 years am the Authorized Signatory for GHCL Ltd., B-38, Institutional Area, Sector - 01 Noida, Uttar Pradesh - 201301, presently at New Delhi, do hereby solemnly affirms and declares as under:

1. That I am fully conversant of the facts and circumstances of the matter and am competent to swear this affidavit.
2. The contents of the accompanying Reply Affidavit are true and correct to the best of my knowledge and have been drafted by the counsel on my instructions and nothing material has been concealed therefrom.
3. That the Annexures in the accompanying Reply Affidavit are true and correct to the best of my knowledge.

NOTARY NEELAM SHARMA ADVOCATE DELHI REGD. NO. 8227 EXPIRY DATE 01/09/2030 GOVT. OF INDIA

I identified the deponent who has signed in my presence

For GHCL LIMITED
Authorised Signatory

DEPONENT

0 1 NOV 2025

VERIFICATION:

Verified at New Delhi on this.....day of....., 2025 that the contents of the above affidavit are true and correct to my knowledge and belief and nothing material has been concealed there from.

ATTESTED
NOTARY (Govt. of India)
Neelam Sharma, Advocate
Enrol. No.-D/1361/2001
Ch. No. 165A, Gate No. 11
Patiala House Courts,
New Delhi-110001
(M):9899406301

For GHCL LIMITED
Authorised Signatory

DEPONENT

0 1 NOV 2025

सत्यमेव जयते

Vibrant GUJARAT 10-13 Jan 2017

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding is entered on 12th January 2017 at Mahatma Mandir, in Gandhinagar (Gujarat) as part of Investment Promotion Activity for Vibrant Gujarat Summit 2017

between

GHCL Limited a company incorporated under the companies Act, 1956, having its Corporate Office at GHCL house, Opposite Punjabi hall, Near Navrangpura bus stand, Navrangpura, Ahmedabad, Gujarat

and

Gujarat Industrial Development Corporation (GIDC)

GHCL Limited wishes to establish the following project in Gujarat.

Sr. No.	Project	Location	Proposed Inv. (Rs. in Cr.)	Employment	Proposed Year of Commencement
1	Project Proposal for Greenfield Soda Ash Plant along with Salt Plant	Kachcch	4000	30000	2021

Government of Gujarat would facilitate **GHCL Limited** to obtain necessary permissions / registrations / approvals /clearances etc. from the concerned departments of the State, as per the existing policies / rules and regulations of the State Government.

सत्यमेव जयते

Vibrant GUJARAT 10-13 Jan 2017
Connecting India to the World | 8th Global Summit

This Memorandum of Understanding is made to facilitate **GHCL Limited** for establishment of the aforesaid Project(s) in Gujarat in a time bound manner.

For and on behalf of
Government of Gujarat

(AUTHORISED SIGNATORY)

Name: Shri G H Solanki

Designation : Executive Director

Contact no.: 079-23243571

E mail: ed@gidcgujarat.org

Contact address: GIDC, Udyog Bhavan Block no.4, 2nd Floor, Sector 11, Gandhinagar-382017

For and on behalf of **GHCL Ltd**

(AUTHORISED SIGNATORY)

Name: Shri Nishit N Radia

Designation: Chief Operating Officer

Contact no.: 02876-305412, 263401-2, 9327571402

Email: nradia@ghcl.co.in

Contact address: GHCL house, Opposite Punjabi hall, Near Navrangpura bus stand, Navrangpura, Ahmedabad, Gujarat

Department: Gujarat Industrial Development Corporation (GIDC)

-TRUE COPY-

[Colly]

GHCL Limited

GHCL/AHD/ENV/MOEF/VND/17-18/07 23rd November 2017

Member Secretary Industries 2
Ministry of Environment, Forest and Climate Change.
Indira Paryavaran Bhavan. Jorbagh Road
Aliganj, Lodhi Colony
New Delhi - 110 003
Ph: 011 24365199
E-mail: aksmree@yahoo.com/ sk.smree66@nic.in

Kind Attn: **Mr S K Srivastava.**
Sub: **Approved consultant for EIA/EMP Studies for Green Field Soda Ash Project.**

Dear Sir,

M/s GHCL Ltd is a reputed Soda Ash Manufacturing Heavy Chemical Unit incorporated in 1983 is located at Sutrapada, Gujarat. This is India's first integrated soda Ash Plant based on Akzo's Dry Liming Technology. Plant was commissioned in the year 1988 with 4,20,000 TPA capacity. Over the time capacity expanded to 11,00,000 TPA. This plant is the most energy efficient soda ash plant of the country.

GHCL is now planning for setting up a Green Field Chemical Complex in the Taluka of Mandvi, District of Kutch, State of Gujarat. For this project, M.O.U with Govt. Of Gujarat was signed during Vibrant Gujarat 2017 event. We have ambitious plans for Soda Ash Plant, Caustic Soda Plant, and Edible Salt etc. However to start with planning to set up a Green Field 5.00 Lac TPA Soda Ash Plant along with 60 MW C.P.P i.e solid fuel based Captive Power Plant. In future capacity expansion to take pace. The Captive Power Plant is a necessary as uninterrupted power and process steam at various operating pressures is the requirement. The Plant process being exothermic large quantity of sea water needs to be drawn from the sea. The entire plant treated effluent confirming to the laid down standards will be discharged in the sea at a recommended point. Further to meet process water requirement R.O./D.M will be installed. To draw water sea water, intake facilities will be set up.

Soda Ash integrated project being a mega project classified as category 4 (E) and 1 (D) by Project sector NABET/CIA, environment clearance for such project from M.O.E.F is mandatory .As per our understanding there is not a single environmental consultant of India registered/approved by quality council of India for soda Ash sector. For undertaking terrestrial / on shore environmental studies i.e EIA/EMP studies, we propose to engage the India's most reputed non controversial organizations like M/s NEERI/ M/s NIO / M/S I.R.S (if they agree to undertake the studies). We hope this will have your approval. In case if you have on approved list any other reputed consultant kindly share with us.

Thanking you,

Yours faithfully
For GHCL Ltd

V N Desai
Authorized Signatory

CC : Mr K C Mistry, Principal Secretary
G.P.C.B, Gandhinagar, Gujarat

-TRUE COPY-

List 'A' – Accredited EIA Consultant Organizations complying with Version 3 of the Scheme - as on August 08, 2017 (#)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
1	**Aadhi Boomi Mining and Enviro Tech Private Limited** (formerly known as Suriya Mining Services) **Address:**3/216, K.S.V.Nagar, Narasothipatti, Salem-636004 **Email:**suriyakumarsemban@gmail.com **Tel.:**09842729655, 09443290855 *Conditions apply*	1	Mining of minerals – opencast only	A	1 (a) (i)
			Mining of minerals – underground only	B	
		38	Building and construction projects	B	8(a)
2	**Aakhivi Consultants** **Address:**57 C, Block E5, Shatabdi Vihar, Sector 52, Noida, UP - 201 308 **Email:**aakhivi.2016@gmail.com	4	Thermal power plants	A**	1 (d)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.:08409580043; 07210434847 *** Though the EIA Coordinator for this sector was found suitable for Cat. A, the organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in this sector only for Cat. B as an organization.* *Conditions apply*				
3	**Aarvee Associates Architects Engineers & Consultants Pvt. Ltd.** **Address:** 8-2-5, Ravula Residency Srinagar Colony, Hyderabad **E.mail:** aarvee@aarvee.net, kprasad@aarvee.net, water@aarvee.net **Tel.:** 040-23737633	1	Mining of minerals including opencast/ underground mining	A	1 (a) (i)
		3	River Valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of	B	6 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply		MSIHC Rules 1989 amended 2000)		
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	B	7 (c)
		34	Highway	A	7 (f)
4	**ABC Techno Labs India Private Limited** (formerly known as ABC Environ Solutions Pvt. Ltd.) **Address:** # 400, 13th Street, SIDCO Industrial Estate (North Phase), Ambattur, Chennai - 600098 **E-mail:**abc@abctechnolab.com, info@abctechnolab.com **Tel.:** 044-26161123/24/25/26 91 95660 55555 and 91 95660 67777 *Conditions apply*	1	Mining of minerals - Opencast only	A	1 (a) (i)
			Mining of minerals – Underground only	B	
		2	Offshore and onshore oil and gas exploration, development & productions	A	1 (b)
		3	River Valley projects - Irrigation projects only	A	1 (c)
		4	Thermal power plant	A	1 (d)
		7	Mineral beneficiation	B	2 (b)
		8	Metallurgical industries (secondary ferrous only)	B	3 (a)
		10	Petroleum refining industry	A	4 (a)
		15	Leather/skin/hide processing industry	A	4 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		16	Chemical Fertilizers	A	5 (a)
		18	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and /or reforming to aromatics)	A	5 (c)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/sanctuaries/ coral reefs/ecologically sensitive areas including LNG terminal	A	6 (a)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		29	Air ports	A	7 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	B	7 (c)
		33	Ports, harbours, jetties, marine terminals, break waters and dredging	A	7(e)
		34	Highways	A	7 (f)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
5	**Aditya Environmental Services Pvt. Ltd.** **Address:** 107, Hiren Light Industrial Estate, Mogul Lane, Mahim, Mumbai – 400016 **Email:**rajiv@aespl.co.in **Tel:** 022- 24456473/ 42127500, 09821513367	1	Mining of minerals including opencast/ underground mining	A	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		9	Cement Plants	A	3(b)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		20	Petrochemical based processing (processes other than cracking &	A	5 (e)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply		reformation and not covered under the complexes)		
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		31	Industrial estates/ parks/ complexes/ Areas, export processing Zones (EPZs), Special economic zones (SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
6	**AECOM India Pvt. Ltd.**	1	Mining of minerals including Open	A	1 (a) (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Address: 9/F, Infinity Tower – 'C', DLF Cyber City, DLF Phase – II, Gurgaon – 122002 **E-mail:** Somnath.Mukherjee@aecom.com **Tel.:** 0124-2816000/36, 09810502990 *Conditions apply*		cast/ Underground mining		
		2	Offshore and onshore oil and gas exploration, development & productions	A	1 (b)
		3	River Valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		9	Cement plants	A	3 (b)
		16	Chemical Fertilizers	A	5 (a)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		29	Air ports	A	7 (a)
		31	Industrial estates/ parks/ complexes/ Areas, export processing Zones (EPZs), Special economic zones (SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
7	**Allied Engineering and Consultancy Services** **Address:** 95/S, Kankulia Road, Kolkata-700029 **E-mail:** spsengupta13@gmail.com **Tel.:** 94333-48858	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		6	Coal Washeries	A	2 (a)
		7	Mineral beneficiation including pelletisation	A	2 (b)
8	**Amaltas Enviro Industrial Consultants Ltd.** **Address:** B-1/1244, Vasant Kunj, New Delhi-110 070 **E-mail:** amaltascon@gmail.com , dev.env81@gmail.com	1	Mining of minerals including Open cast/ Underground mining	B	1 (a) (i)
		4	Thermal power plants	B	1 (d)
		9	Cement plants	B	3 (b)
		34	Highways	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.: 011-41848475/4188476/+919873991919 *Conditions apply*				
9	**Anacon Laboratories Pvt. Ltd.** **Address:** 60, Bajiprabhu Nagar, Nagpur – 440033 **E-mail:** anaconngp@gmail.com **Tel.:** 0712 – 2242077, 09373104416 *Conditions apply*	1	Mining of minerals - Open cast only	A	1 (a) (i)
		3	River Valley projects	B	1 (c)
		4	Thermal power plants	A	1 (d)
		6	Coal Washeries	A	2 (a)
		8	Metallurgical industries (ferrous only)- both primary & secondary	A	3 (a)
		9	Cement plants	A	3 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	B	5 (g)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		29	Air ports	A	7 (a)
		34	Highways	A	7 (f)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)
10	**Anand Consultants** **Address:** 16, Everest Tower, B/h Jain Temple, Nr. Ankur Society, Ahmedabad – 380013 **E-mail:** environment@dataone.in pollutioncontrol@dataone.in	4	Thermal power plants	A	1 (d)
		9	Cement Plant	A	3(b)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.: 09825011748 *Conditions apply*		drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		38	Building and construction projects	B	8 (a)
11	**Apex Mintech Consultants** **Address:** 21, Ravindra Nagar Opp. Working Women Old Hostel, 'C' – Class, Pratapnagar, Udaipur **E-mail:** rkminerals_udr@yahoo.com **Tel.:** 0294- 2490760/ 2490803 09829161803, 09352995558 *Conditions apply*	1	Mining of minerals (Open cast only)	A	1 (a) (i)
12	**Aplinka Solutions & Technologies Private Limited** **Address** -A-48, Ground Floor, Sector-64, Noida -201301	1	Mining of minerals (opencast only)	A	1 (a) (i)
		31	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones	B	7 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: director@aplinka.in info.aplinkasolutions@gmail.com **Tel.:** 0120-4540584 Mobile: +91-8375955991 *Conditions apply*		(SEZs), Biotech Parks, Leather Complexes		
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
13	**Aracadis India Pvt limited** (Formerly known as Senes Consultants India Pvt. Ltd.) **Address:** 1st Floor Tower B, Logix Techno Park, Plot No. 5, Sector 127, Noida **e. mail:** mhazra@senesindia.com **Tel.:** 0120 – 4368400 09810881710	2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		3	River Valley Projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		9	Cement plants	A	3 (b)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/ coral reefs/ ecologically sensitive Areas including LNG terminal	A	6 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply	31	Industrial estates/ parks/ complexes/Areas, export processing Zones(EPZs), Special economic zones(SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		33	Ports, harbors, break waters and dredging	A	7(e)
		34	Highways	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
14	**Ascenso Enviro Private Limited** (Earlier known as Ascenso Management & Consulting Services Pvt. Ltd.) **Address:**D-79, 2nd Floor, Sector - 6, Noida - 201 301 **E-mail:** purushottam@amcgroup.co.in	1	Mining of minerals - Open cast only	A	1 (a) (i)
		6	Coal washeries	B	2 (a)
		7	Mineral beneficiation including pelletisation	B	2 (b)
		9	Cement Plants	A	3 (b)
		22	Distilleries	A	5 (g)
		34	Highways	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.: 99581 49985 *Conditions apply*	38	Building and construction projects	B	8 (a)
		39	Townships and Area Development projects	B	8 (b)
15	**Asian Consulting Engineers (Pvt.) Ltd.** **Address:** 66, Hemkunt Colony, 2nd Floor, New Delhi – 110048 **e. mail:** amahajan@asianconsulting.org **Tel.:** 011- 41634926 09312693905 *Conditions apply*	2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		3	River valley projects	A	1 (c)
		7	Mineral beneficiation including pelletisation	A	2 (b)
		8	Metallurgical industries - (ferrous & nonferrous) - both primary & secondary	A	3 (a)
		16	Chemical Fertilizers	A	5 (a)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
16	**Aqura Enviro Projects Pvt. Ltd** (formerly Known as Aqura Labs Pvt. Ltd.) **Address:** Suit 414, 4th Floor, North Block Tower-1,World Trade Park, J.L.N. Marg, Malviya Nagar, Jaipur-302017 Tel::0141-2728123, 2728051 **E. mail**:prashant.wagh@aquralabs.com *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		3	Irrigation projects only	B	1 (c)
		4	Thermal Power Plant	B	1 (d)
		8	Metallurgical industries (ferrous & nonferrous)- both primary & secondary	B	3 (a)
		9	Cement Plants	A	3 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	B	5 (f)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		33	Ports, harbours, break waters and dredging	A	7(e)
		34	Highways	A	7 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
17	**B. S. Envi – Tech (P) Ltd.** **Address:**12-13-1270/71/73, 'Amity Ville', 4th Floor, St. Ann's Road, Tarnaka, Secunderabad – 500017 **e. mail:** bsenvitech@gmail.com **website:**www.bsenvitech.com **Tel.:** 040-49783062/27016806 **Fax :**040-49783063 *Conditions apply*	1	Mining of minerals including Open cast & Underground mining	A	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		7	Mineral Beneficiation including pelletisation	A	2 (b)
		8	Metallurgical industries (ferrous & non-ferrous) - both primary and secondary	A	3 (a)
		9	Cement plants	A	3 (b)
		11	Coke oven plants	B	4 (b)
		12	Asbestos milling and asbestos based products	A	4 (c)
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
18	**Bhagavathi Ana Labs Pvt. Limited**	1	Mining of minerals including Open cast/ Underground mining	A	1 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Address: Plot No. 7-2-C14, Industrial Estate, Sanath Nagar, Hyderabad-500018, Telangana **e.mail:** shyam.sundar@in.bureauveritas.com bhavna.polimera@in.bureauveritas.com **Tel.:** 91-40-23803800, +91-40-23803808, +91-40-23803813; 09391116139 *Conditions apply*	2	Offshore and Onshore oil and gas exploration, development & production	A	1 (b)
		4	Thermal power plants	A	1 (d)
		6	Coal washeries	B	2 (a)
		7	Mineral beneficiation including pelletisation	A	2 (b)
		8	Metallurgical industries (ferrous & non ferrous) - both primary and secondary	A	3 (a)
		9	Cement plants	A	3 (b)
		10	Petroleum refining industry	A	4 (a)
		11	Coke oven plants	B	4 (b)
		16	Chemical fertilizers	A	-
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including	A	6 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			LNG terminal		
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	A	7 (c)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
19	**Bhagwati Enviro Care Pvt. Ltd.** **Address:** 28, 29, 30, Parmeshwar Estate – II, Phase I, GIDC Estate, Vatva, Ahmedabad – 382445 **E-mail:** bhagwatienvirotech5@gmail.com bhagwatienviro@yahoo.com **Tel.:** 079- 40083051/ 25834567 09824051541 *Conditions apply*	1	Mining of Minerals- Open Cast only	B	1 (a) (i)
		8	Metallurgical industries (ferrous & non-ferrous)	B	3 (a)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		38	Building and construction projects	B	8 (a)
20	**Building Environment (India) Pvt. Ltd.** **Address:** Office no. 401, 4th Floor, Dakshana Building, Near Raigad Bhavan, Sector 15, CBD Belapur, Navi Mumbai 400 614. **E-mail:** hkolatkar@buildingenvironmentindia.com **Tel.:** 022-27578554 09820522779 *Conditions apply*	2	Offshore and Onshore oil and gas exploration, development & production	A	1 (b)
		4	Thermal power plants	A	1 (d)
		9	Cement plants	B	3 (b)
		10	Petroleum refining industry	A	4 (a)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	B	5 (f)
		24	Pulp & paper industry excluding manufacturing	A	5(i)
		25	Sugar Industry	B	5(j)
		31	Industrial estates/ parks/ complexes/ Areas, export processing Zones (EPZs), Special economic zones (SEZs), Biotech Parks, leather Complexes	A	7 (c)
		33	Ports, harbours, break waters and dredging	A	7(e)
		34	Highways	A	7 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
21	**Center for Environment, Health and Safety** **Address:** Department of Civil Engineering Faculty of Engineering and Technology Annamalai University, Annamalai Nagar – 608002 **E-mail:** centreforehs@gmail.com nehrukumar.v.158@annamalaiuniversity.ac.in **Tel:** 04144-238731, 09443223091 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		3	River Valley Projects	A	1 (c)
		9	Cement plants	A	3 (b)
		22	Distilleries	A	5 (g)
		31	Industrial Estates/ parks/ complexes/ Areas, export processing Zones (EPZs), Special economic zones (SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		33	Ports, harbours, break waters and dredging	B	7 (e)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
22	**Central Institute of Mining and Fuel Research**	1	Mining of minerals including Open	A	1 (a) (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			cast/ Underground mining		
	Address: Barwa Road, Dhanbad, Jharkhand- 826015 **E.mail:** kbsingh.cimfr@gmail.com **Tel.:** 0326-2296023, 2296021 09431910845 *Conditions apply*	6	Coal Washeries	A	2 (a)
23	**Central Mine Planning & Design Institute Limited** **Address:** Gondwana Place, Kanke Road, Ranchi, Jharkhand – 834031 **E-mail:** gmenv.cmpdi@yahoo.co.in **Tel.:** 0651- 2230055/ 2792339 09934010057 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		4	Thermal Power Plants	A	1(d)
		6	Coal Washeries	A	2 (a)
24	**Centre for Envotech and Management Consultancy Private Limited**	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
			Mining of minerals- open cast only	A	1 (a) (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Address: Plot No-N5/305, IRC Village, Nayapalli, Bhubaneswar – 751015 **E-mail:** cemc_consultancy@yahoo.co.in **Tel.:** 0674-2556444 09861032826 *Conditions apply*	3	Irrigation projects only	A	1 (c)
		4	Thermal power plants	A	1 (d)
		6	Coal Washeries	A	2 (a)
		7	Mineral beneficiation including pelletisation	A	2 (b)
		8	Metallurgical industries (ferrous & nonferrous) – both primary and secondary	A	3 (a)
		9	Cement plants	A	3 (b)
		33	Ports, harbours, break waters and dredging	B	7 (e)
		34	Highways	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
25	**Chandigarh Pollution Testing Laboratory –EIA Division** **Address:** E-126, Phase VII, Industrial Area, Mohali (Punjab), Pin- 160055 **E-mail:** cptleia@gmail.com cptle126@gmail.com	8	Metallurgical industries (ferrous only)	B	3 (a)
		9	Cement plants	B	3 (b)
		16	Chemical fertilizers	A**	5 (a)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates **excluding** drug formulations; synthetic rubbers; basic organic chemicals, other	B	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.: (+91) 0172 – 4669295, 5090312; Mobile: 99885-77295/99881-27295 *Conditions apply* *** Though the EIA Coordinator for these sectors were found suitable for Cat. A, the organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in these sectors only for Cat. B as an organization.*		synthetic organic chemicals and chemical intermediates)		
		22	Distilleries	A**	5 (g)
		24	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	A**	5 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8(b)
26	**Cholamandalam MS Risk Services** **Address:** Dare House, IInd Floor, 2-NSC Bose Road, Chennai- 600001 **e.mail:**subbaraoNV@cholams.murugappa.com **Tel.:** 044-30445620 09840018455	1	Mining of minerals Open cast mining only	B	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		9	Cement plants	A	3 (b)
		10	Petroleum refining industry	A	4 (a)
		16	Chemical Fertilizers	A	5 (a)
		18*	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	A	5 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply	21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		24	Pulp & paper industry excluding manufacturing of paper from waste paper and manufacture of paper from ready pulp without bleaching	A	5 (i)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		38	Building and construction projects	B	8 (a)
27	**Cognizance Research India Pvt. Ltd.** **Address:** GT – 20, Sector-117, Noida **E-mail**: criplindia@gmail.com **Tel.:** 9958486431,9953843815 *Conditions apply* *** Though the EIA Coordinator for these sectors*	1**	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		6**	Coal washeries	A	2 (a)
		7**	Mineral Beneficiation	A	2 (b)
		34	Highways	B	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	were found suitable for Cat. A, the organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in these sectors only for Cat. B as an organization.				
28	**Consulting Engineers Group Ltd.** **Address:** B-11(G), Malviya Industrial Area, Jaipur-302 017 **E-mail**: ceg@cegindia.com **Tel.:** 0141-2751801, 2751802 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		3	River Valley, Hydel, Drainage and Irrigation projects	A	1 (c)
		8	Metallurgical industries (non-ferrous) – both primary and secondary	B	3 (a)
		34	Highways	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
29	**Creative Engineers & Consultants** **Address:** 9 B/4, Bharathwajar Street, East Tambaram, Chennai – 600059 **E-mail:** cecgiri@yahoo.com	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		7	Mineral beneficiation including pelletisation	A	2 (b)
		9	Cement plants	A	3 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.: 044- 22395170 09444133619 *Conditions apply*				
30	**Creative Enviro Services** **Address:** SR – 4, Shri Ram Kunj, E – 8 Bharat Nagar, Shahpura, Bhopal (MP) – 462039 **E-mail:** creative5@rediffmail.com creative.bpl@gmail.com umeshmishra70@rediffmail.com **Tel.:** 0755 – 4299319, 4243510 09425009319 *Conditions apply*	1	Mining of minerals Underground mining	A	1 (a) (i)
		4	Thermal power plants	B	1 (d)
		7	Mineral Beneficiation	B	2 (b)
		8	Metallurgical industries (ferrous & nonferrous) – both primary and secondary	A	3 (a)
		9	Cement plants	A	3 (b)
		16	Chemical Fertilizers	B	5 (a)
		22	Distilleries	A	5 (g)
		38	Building and construction projects	B	8 (a)
31	**Crystal Consultants** **Address:** Kshitij, Kashyap Vihar, Opp. Ashok Nagar**,** Road No. 3, Ranchi-834002 **E-mail:**shishirkumar18@gmail.com;	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		34	Highways	A	7 (f)
		36	Common Effluent Treatment Plants (CETPs)	B	7 (h)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	crystalconsultants2006@gmail.com Tel.: 09661806121 *Conditions apply*	37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
32	**Desein Private Limited** **Address:** Consulting Engineers, Desein House, Greater Kailash – II, New Delhi - 110048 **E-mail:** pjha@deseinindure.com **Tel.:** 011 – 41891456 09810218464 *Conditions apply*	4	Thermal power plants	A	1 (d)
33	**Detox Corporation Pvt. Ltd.** **Address:** 3rd Floor, K. G. Chamber, Opp. Gujarat Samachar Press, Udhana Darwaja, Ring Road, Surat – 395002	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		2	Offshore & Onshore Oil and gas exploration, development & production	A	1 (b)
		4	Thermal power plants	A	(d)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	e. mail: info@detoxcorp.com **Tel.:** 0261 – 2351248 09824102866 *Conditions apply*	8	Metallurgical industries (Ferrous only) – both primary & secondary	A	3 (a)
		18	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	A	5 (c)
		19	Manmade fibers manufacturing	A	5 (d)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	B	5 (f)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	A	7 (c)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		33	Jetties and dredging	A	7 (e)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		39	Townships and Area development projects	B	8 (b)
34	**Development Consultants Private limited** **Address:** 24 Park Street, Kolkata – 700016 **E-mail:**swapanc@in.dclgroup.com; arindas@in.dclgroup.com **Tel.:** 033-4012-5448, 09830558701 *Conditions apply*	1	Mining of minerals - Open cast only	A	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (ferrous and non-ferrous) - both primary & secondary	B	3 (a)
		9	Cement plants	B	3 (b)
		18	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	A	5 (c)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		38	Building and construction projects	B	8 (a)
35	**Dr. Subbarao's Environment Centre** (formerly Known as Water and waste water research Centre) **Address:** "Arundhati", MSEB Rd, Opp., Sahyognagar, Vishrambag, Sangli- 416415	21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: bssubbarao@yahoo.com **Tel.:** 02332301857,09372109522 *Conditions apply*		synthetic organic chemicals and chemical intermediates)		
		22	Distilleries	A	5 (g)
		24	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	A	5 (i)
		25	Sugar Industry	B	5 (j)
36	**Earthcare Labs Private Limited** **Address:** "Nisarg", First Floor, Plot No. 16, Prashant Nagar, Near Ajni Square, Wardha Road, Nagpur – 440015 **E-mail:**earthcarelabs@rediffmail.com **Tel.:** 0712- 2251470 09822203750 *Conditions apply*	1	Mining of minerals	B	1 (a) (i)
		3	River Valley projects	B	1 (c)
		4	Thermal power plants	B	1 (d)
		8	Metallurgical industry (Ferrous only)	B	3 (a)
		9	Cement plants	B	3 (b)
		36	Common Effluent Treatment Plants (CETPs)	B	7 (h)
		39	Townships and Area development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
37	**Earth Protection Group Environmental Consultants Pvt Ltd.** **Address:** 4-D/620 B, Sector 4, Gomti Nagar Extension, Lucknow- 226010 **E-mail:** epgec@yahoo.co.in; epgec1@gmail.com **Tel.:** 09415011152 *Conditions apply*	15	Leather/ skin/ hide processing industry	A	4 (f)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		38	Building and construction projects	B	8 (a)
		40 (i)	Automobile and Auto Components	-	-
38	**Eco Chem Sales & Services** **Address:** Office Floor, Ashoka Pavillion-A, Opp. Kapadia Health Club, New Civil Road, Surat – 395001 **E-mail**: eco@ecoshripad.com **Tel.:** 0261 – 2231630, 2236223 09227934111	1	Mining of minerals (Open Cast only)	A	1 (a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (ferrous & nonferrous)	A	3 (a)
		9	Cement plants	B	3 (b)
		13	Chlor-alkali industry	A	4 (d)
		16	Chemical Fertilizers	A	5 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply	17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		19	Manmade fibers manufacturing	A	5 (d)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		23	Integrated paint industry	A	5 (h)
		24	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	A	5 (i)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/ coral reefs/ ecologically sensitive Areas including LNG terminal	A	6 (a)
		28	Isolated storage & handling of hazardous chemicals (As per	B	6 (b)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)		
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		36	Common Effluent Treatment Plants (CETPs)	B	7 (h)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
39	**Eco Foot Forward Environmental Consultancy & Engineers Pvt. Ltd**	1	Mining of minerals including opencast/ underground mining	B	1 (a) (i)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk	A	5 (f)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Address: D/318, Neelkanth Business Park, Ramdev Nagar, Vidyavihar (W), Mumbai – 400086 **E-mail:** amey@ecofootforward.com **Tel.:** 022-25144129; +91-9892814129 *Conditions apply*		drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		33	Ports, harbours, break waters and dredging	B	7 (e)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
40	**Eco Services India Private Limited** **Address:** 1/134, Dhanakotiraja Street, Sundar Nagar, Ekkaduthangal, Guindy, Chennai – 600032 **E-mail:**	21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	B	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	kalaiselvan@ecoservices.in **Tel.:** 044- 30683067/ 43102232 09383999109 *Conditions apply*	31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	B	7 (c)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development Projects	B	8 (b)
41	**Eco Tech Labs Pvt. Ltd.** **Address:** No.4, Manjolai 1st Main Road, Ekkaduthangal, Guindy, Chennai-600032 **E-mail:** dhamo@ecotechlabs.in **Tel**.: 044 – 22251228/43534036 09789906200/9600661191	4	Thermal power plants	B	1 (d)
		9	Cement plants	B	3 (b)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	B	7 (c)
		38	Building and construction projects	B	8 (a)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	*** The organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment.* *Conditions apply*	39	Townships and Area development Projects	B	8 (b)
42	**Ecomen Laboratories Pvt. Ltd.** **Address:** Flat No. 8, 2nd Floor, Arif Chamber – V,Sector –H, Aliganj, Lucknow – 226024 **E-mail:** ravi.bhargava@gmail.com **Tel**.: 0522 – 2761885 09335205453 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		4	Thermal power plants	B	1 (d)
		6	Coal washeries	A	2 (a)
		7	Mineral beneficiation including pelletisation	A	2 (b)
		9	Cement plants	B	3 (b)
		12	Asbestos milling and asbestos based products	A	4 (c)
		38	Building and construction projects	B	8 (a)
43	**EIA Project, Gauhati University** **Address:** C/o Department of Chemistry Gauhati University, Guwahati -781014	10	Petroleum refining industry	A	4 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail:bijoysgoswami@gmail.com **Tel.:** 0361-2570599/535, +919435368473 *Conditions apply*				
44	**Engineers India Limited** **Address:** Research & Development Complex, Sector – 16, Gurgaon - 122001 **e. mail:** rb.bhutda@eil.co.in **Tel.:** 0124 – 2391416 *Conditions apply*	1	Mining of minerals – Opencast only	A	1 (a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (non - ferrous only) - both primary & secondary	A	3 (a)
		10	Petroleum refining industry	A	4 (a)
		16	Chemical Fertilizers	A	5 (a)
		18	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	A	5 (c)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		28	Isolated storage & handling of	B	6 (b)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2& 3 of MSIHC Rules 1989 amended 2000)		
		29	Air ports	A	7 (a)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		39	Townships and Area development projects	B	8 (b)
45	**Enkay Enviro Services Pvt. Ltd.** (formerly known as Enkay Enviro Services) **Address:** # 24-B, Dadu Marg, Gopal Bari, Jaipur – 302001 **e.mail:** info@enkayenviro.com **Tel.:** 0141 – 4023996 09314363996	1	Mining of minerals - Open cast only	A	1 (a) (i)
			Mining of minerals - Underground mining	B	
		3	Irrigation and drainage projects only	A	1 (c)
		4	Thermal power plants	B	1 (d)
		7	Mineral beneficiation	A	2 (b)
		8	Metallurgical industries (ferrous & nonferrous) – both primary and secondary	A	3 (a)
		9	Cement Plants	A	3 (b)
		12	Asbestos milling and asbestos based products	A	4 (c)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply	16	Chemical Fertilizers	A	5 (a)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000) storage & handling of hazardous chemicals	B	6 (b)
46	**Enpro Envirotech & Engineers Pvt. Ltd.** **Address:** 306, Royal Park, Near Deepa Complex, Adajan Road, Surat-395009 **E-mail:** pareshmevawala@enpro.co.in **Tel.:** 0261-3295244 *Conditions apply*	8	Metallurgical Industries (ferrous & nonferrous)	A	3(a)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7(d)
		36	Common Effluent Treatment Plants (CETPs)	A	7 (h)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7 (i)
47	**ENV Developmental Assistance Systems (India) Pvt. Ltd.** **Address:** D-2247 Indira Nagar, Lucknow-226006 **E-mail:** admin@dasindia.org business@dasindia.org **Tel.:**0522 4007470/4107624 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		3	Irrigation Projects only	A	1 (c)
		9	Cement plants (Grinding units only)	B	3 (b)
		22	Distilleries	A	5 (g)
		24	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	A	5 (i)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
48	**Enviro Infra Solutions Pvt. Ltd.** **Address:** 301-302 & 305 – SRBC Complex, Plot No. INS-12, Sector – 9, Vasundhra, Ghaziabad - 201012 **E-mail:** eis.enviroinfra@gmail.com **Tel.:** 0120-4151183; 09654793036 *Conditions apply*	1	Mining of minerals - Open cast only	B	1 (a) (i)
		2	Onshore oil and gas exploration, development & production	A	1 (b)
		3	River Valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (ferrous only)	B	3 (a)
			Metallurgical industries (Non-ferrous only)	A	3 (a)
		9	Cement Plants	A	3 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		33	Ports, harbours, break waters and dredging	B	7 (e)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
49	**Enviro Techno Consult Pvt. Ltd.** **Address:** 68, Mahakali Nagar – 2, Near Manewada Square, Nagpur – 440024 **E.mail**: etcpl@envirotechnoconsult.in **Tel.:** 09595220277, 09326466633 *Conditions apply*	4	Thermal Power Plants	A	1 (d)
		9	Cement Plants	A	3 (b)
		19	Textile- cotton and manmade fibres	B	5 (d)
50	**Enviro Analysts & Engineers Pvt. Ltd.** **Address:**B-1003, Enviro House	21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding	B	5 (f)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Western Edge II, Behind Metro Mall Western Express Highway Borivali (E),Mumbai – 400066 **E-mail:** info@eaepl.com, consent@eaepl.com, hkdesai5@gmail.com **Tel. No.:** 022- 28541647-49/67/68, 09820280155, 9324430071 *Conditions apply*		drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		24	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	A	5 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development Projects	B	8 (b)
51	**Envirocare Technocrats Pvt. Ltd.** (formerly known as Enviro Care Engineers & Consultant) **Address:**201, New Opera house, Nr. Gurdev Petrol Pump & Harish Digg., Khatodara, Surat – 395002 **E.mail:** env_consultant@yahoo.co.in, info@envirocare.net.in **Tel.:** 0261-2630781/82, 09825125122 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		2	Offshore & Onshore Oil and gas exploration, development & production	A	1 (b)
		7	Mineral beneficiation	A	2 (b)
		19	Manmade fibers manufacturing	A	5 (d)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and	A	5 (f)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			chemical intermediates)		
		38	Building and construction projects	B	8 (a)
52	**Enviro Care India Private Limited** **Address:**43, 2nd street, First floor Harvey nagar, Madurai 625016 **E.mail:** eci@envirocareindia.com **Tel.:** 9843052103 *Conditions apply*	4	Thermal power plants	B	1 (d)
		8	Metallurgical industries (ferrous & nonferrous) – both primary and secondary	B	3 (a)
		22	Distilleries	B	5 (g)
		38	Building and construction projects	B	8 (a)
53	**Envirotech East Pvt. Ltd.** **Address:** Bengal Ambuja Coml. Complex, UN-F-13, 1050/1, Survey Park, Kolkata -700075 e. mail: eeplkol@gmail.com eeplkol2@gmail.com **Tel. :** 033-24188127/ 24188128 09331026867	7	Mineral beneficiation including pelletisation	A	2 (b)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (ferrous & nonferrous) - both primary & secondary	A	3(a)
		9	Cement plants	A	3 (b)
		10	Petroleum refining industry	A	4 (a)
		11	Coke oven plants	A	4 (b)
		20	Petrochemical based processing (processes other than cracking &	A	5 (e)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply		reformation and not covered under the complexes)		
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	B	5 (f)
		22	Distilleries	A	5 (g)
		24	Pulp & paper industry excluding manufacturing of paper from waste paper and manufacture of paper from ready pulp without bleaching	A	5 (i)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		38	Building and Construction Projects	B	8 (a)
		39	Townships and Area development Projects	B	8 (b)
54	**Environment Protection & Training Research Institute** **Address:** Sy. No. 91/4, Gachibowli, Hyderabad - 500032	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		3	River Valley projects	A	1 (c)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones	A	7 (c)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: sudhakargifs@yahoo.com **Tel.:** 040 – 23005628 09701420086 *Conditions apply*		(SEZs), Biotech parks, Leather complexes		
		38	Building and construction projects	B	8 (a)
55	**Environmental Health and Safety Consultants Private Limited** **Address:** # 13/2, 1st Main Road, Near Fire Station, Industrial Town, Rajajinagar, Bangalore – 560010 **E.mail:** ehscblr@yahoo.com ehscblr1974@gmail.com **Tel.:** 080-23012100/01, 09448094164 *Conditions apply*	3	River Valley, Hydel, Drainage and Irrigation projects	A	1 (c)
		8	Metallurgical industries - Secondary ferrous only	B	3 (a)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		39	Townships and Area development projects	B	8 (b)
56	**Environmental Engineers & Consultants Pvt. Ltd.** **Address:** A1-198, Janak Puri, New Delhi – 110058 Branch Office Address: - M/s Environmental Engineers & Consultants Pvt. Ltd. Apartment No. 306, Kanchanjunga Apartments, Palarivattom, Kochi, Ernakulam, Kerala-682025. **E-mail:** eecnewdelhi@yahoo.in eecnewdelhi@gmail.com **Tel.:** 011 - 25507190 09350873385 09811080469 *Conditions apply*	1	Mining of minerals – Opencast only	B	1 (a) (i)
		4	Thermal Power Plants	B	1 (d)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	B	5 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	B	5 (f)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		39	Townships and Area development Projects	B	8 (b)
57	**Environmental Research & Analysis** **Address:** 315, First Floor, Sahara Shopping Center, Near Lekhraj Crossing, Faizabad Road, Lucknow – 226016 **E-mail:**eraenvcle@gmail.com; info@eraconsultancy.in **Tel.:** 0522-4078000, 8423500351 **The organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment.* *Conditions apply*	1	Mining of minerals – opencast only	B	1 (a) (i)
58	**Environmental System Consultants & Ambiente Lab Solutions Pvt. Ltd.** **Address:** New No 14/Old No 7, Shanmuga Naicker Street, K.K.Nagar West, Chennai – 600 078	1	Mining of minerals (Open cast only)	A	1 (a) (i)
			Mining of minerals including Open cast/ Underground mining	B	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		9	Cement plants	A	3 (b)
		31	Industrial Estates/ parks/ complexes/	A	7 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: ensyscon@gmail.com ambientelab@gmail.com **Tel.:** 044-23643663, 09444990516 *Conditions apply*		Areas, export processing Zones (EPZs), Special economic zones (SEZs), Biotech Parks, Leather Complexes		
		33	Ports, harbours, break waters and dredging	A	7 (e)
		38	Building and construction projects	B	8 (a)
59	**Envirogreen Consultants (India) Pvt. Ltd** **Address:** 1-B, Macchla Marg, New Patel Circle, Hiren Magri, Udaipur- 313002 **Email:** egcipl@yahoo.co.in, **Tel.:**9352239829 *** Though the EIA Coordinator for this sector was found suitable for Cat. A, however, the organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in this sector only for Cat. B as an organization.*	1**	Mining of minerals - Open cast only	B	1 (a) (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
60	**Envisafe Environmental Consultants** **Address:**3rd floor, Akash Ganga Complex, Near Parimal Railway Underpass, Beside Suvidha Shopping Center, Paldi, Ahmedabad-380007. **Email:**envisafe@gmail.com , pushpinshah@gmail.com **Tel.:** 9825125278,9328961241 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	B	1 (a) (i)
		4	Thermal power plants	B	1 (d)
		8	Metallurgical industries (ferrous & non-ferrous)	B	3 (a)
		9	Cement plants	A	3 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		34	Highways	B	7 (f)
		38	Building and construction projects	B	8 (a)
61	**En-vision Environmental Service** **Address:** 201 & 301, Union Trade Center (UTC), Nr. Apple Hospital, Udhana Darwaja Surat 395 002	19	Manmade fibers manufacturing	B	5 (d)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel .: 0261-2344773, 2344774,9428001862 **Email:** shah.kunal@gmail.com , info@en-vision.co.in *Conditions apply*		synthetic organic chemicals and chemical intermediates)		
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development Projects	B	8 (b)
62	**Envision Enviro Technologies Pvt. Ltd.** **Address:** 2nd Floor, Shree Ram Complex, Above Bank of India, Near Kargil Chowk, Surat Dumas Road, Piplod, Surat- 395007 **Tel. No.:** +91 2612223003,2224004 **Email:** envision.surat@gmail.com *Conditions apply*	2	Offshore and onshore oil and gas exploration, development & productions	A	1 (b)
		8	Metallurgical industries (ferrous only)- both primary & secondary	A	3(a)
		9	Cement Plants	B	3 (b)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		18	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	A	5 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		20	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	A	5 (e)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		39	Townships and Area development Projects	B	8 (b)
63	**EQMS India Pvt. Ltd.** **Address:** 304-305, III Floor, Rishabh Towers, Plot No. 16, Community Centre, Karkardooma, Delhi – 110092 **e. mail:** eqms@eqmsindia.org skjain@eqmsindia.org **Tel.:** 011- 30003200/ 30003219 09810297612 *Conditions apply*	1	Mining of minerals – Open cast only	A	1 (a) (i)
		3	River Valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries(ferrous & nonferrous) - both primary & secondary	B	3 (a)
		9	Cement plants	A	3 (b)
		16	Chemical Fertilizers	A	5 (a)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates **excluding** drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of	B	6 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			MSIHC Rules 1989 amended 2000)		
		31	Industrial estates/ parks/ complexes/Areas, export processing Zones(EPZs), Special economic zones(SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		33	Ports, harbours, break waters and dredging	B	7 (e)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
64	**Equinox Environments (India) Private Limited** **Address:** F-11, Namdev Nest, 1160- B, "E" Ward, Skyes Extension, Opp. Kamala College, Kolhapur-416001 **e.mail:**projects@equinoxenvi.com, eia@equinoxenvi.com, eeipltd@equinoxenvi.com, **Tel.:** 0231-2531231/ 2526337 09822045083, 09881121522	1	Mining of minerals including opencast / underground mining	A	1 (a) (i)
		4	Thermal power plants	B	1 (d)
		8	Metallurgical industries(ferrous only) - both primary & secondary	B	3 (a)
		12	Asbestos milling and asbestos based products	B	4 (c)
		13	Chlor-alkali industry	A	4 (d)
		20	Petrochemical based processing (processes other than cracking &reformation and not covered under the complexes)	A	5 (e)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply	21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates **excluding** drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	B	7 (d)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
65	**ERM India Private Limited** **Address:** Building No. 10,Tower A, Fourth Floor, DLF Cyber City, Gurgaon - 122002 **e. mail:** subir.gupta@erm.com **Tel.:** 0124-4170300	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		2	Off shore and on-shore oil and gas exploration, development & production	A	1 (b)
		3	River valley Projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		8	Secondary Steel only	B	3 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	09810068161 *Conditions apply*	9	Cement plants	A	3 (b)
		13	Chlor-alkali industry	A	4 (d)
		16	Chemical Fertilizers	A	5 (a)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		18	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	A	5 (c)
		20	Petrochemical based processing (processes other than cracking &reformation and not covered under the complexes)	A	5 (e)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates	A	5 (f)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including	A	6 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			LNG terminal		
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		29	Air ports	A	7 (a)
		31	Industrial estates/ parks/ complexes/Areas, export processing Zones(EPZs), Special economic zones(SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		34	Highways	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
		40 (i)	Automobile and Auto Components	-	-
66	**Excel Enviro Tech**	1	Mining of minerals- Open Cast only	B	1 (a) (i)
		4	Thermal Power Plant	B	1 (d)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Address: TF-2, Sun House, Nr. Old High Court, Off. Ashram Road, Ahmedabad -380009 **Email:** excelenviro@yahoo.co.in **Tel.:**9825588910/9428592837 *Conditions apply*	6	Coal Washeries	B	2 (a)
		8	Metallurgical industries (ferrous)-secondary only	B	3 (a)
		9	Cement plants	B	3 (b)
		11	Coke oven plants	B	4 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates	B	5 (f)
		38	Building and construction projects including	B	8 (a)
67	**Feedback Infra Pvt. Ltd.** **(Formerly known as Feedback Infrastructure Services Private Limited)** **Address:** 15th Floor, Tower 9B, DLF Cyber City, Phase-III, Gurgaon 122 002 **Email:** rajeev.bhatnagar@feedbackinfra.com	4	Thermal Power Plants	B	1 (d)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel. 0124- 4316100, 0124- 4316693 *Conditions apply*	28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
68	**Fulgro Environmental & Engineering Services India Pvt. Ltd.** **Address-** 27,Ashok Vatika, Khatipura Road, Jhotwara, Jaipur, 302012, Rajasthan	1	Mining of minerals including Open cast/ Underground mining	A**	1 (a) (i)
		4	Thermal Power Plants	B	1 (d)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Email: fulgro.manish@gmail.com, ceo@fulgro.in **Mob.-** 094144 06025 *Conditions apply* ***Though the EIA Coordinator for this sector was approved for Cat. A. The organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in this sector only for Cat. B as an organization.*	9	Cement Plants	B	3 (b)
		34	Highways	A**	7(f)
		38	Building and construction projects	B	8(a)
69	**Gaurang Environmental Solutions** **Address-** 501, Soni's Paris Point, Collectorate Circle, Bani Park, Jaipur, Pin- 302016 E-mail: gaurangenviro@gmail.com; vipul.environ@gmail.com **Tel.:** 0141-4029115; 09782074776	1	Mining of minerals including Open cast/ underground mining	A	1 (a) (i)
		4	Thermal power plants	B	1 (d)
		8	Metallurgical industries(ferrous & nonferrous) - both primary & secondary	B	3 (a)
		9	Cement plants	B	3 (b)
		22	Distilleries	B	5 (g)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated	B	6 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply		in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)		
		29	Air ports	A	7 (a)
		32	Common hazardous waste treatment, storage and disposal facilities	B	7 (d)
		34	Highways	B	7(f)
		36	Common Effluent Treatment Plants (CETPs)	B	7 (h)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8(a)
		39	Townships and Area development projects	B	8 (b)
70	**Geological Exploration & Mining Solutions** **Address:** 95/1, Brindavan Road, 4th Cross East, Fairlands, Salem – 636 016. Tamilnadu. **E. mail:** ifthiahmed@gmail.com	1	Mining of minerals - Open cast only	A**	1 (a) (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.: +91 – 427 - 2431989 Mobile: +91 94422 78601 *Conditions apply* ***Though the EIA Coordinator for this sector was approved for Cat. A. The organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in this sector only for Cat. B as an organization.*				
71	**Geogreen Enviro House Pvt. Ltd.** **Address:** 403, Aiman Apartments 29 Chandralok Colony, Aliganj, Lucknow, U.P.226024 **e. mail:** vkm.geo@gmail.com **Tel.:** 05222 339000; 09415215163 *Conditions apply*	1	Mining of minerals - Open cast only	A	1 (a) (i)
		38	Building and construction projects	B	8(a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
72	**Ghosh, Bose & Associates (P) Ltd.** **Address:** 8, Harrington Mansion, 8, Ho Chi Minh Sarani, Kolkata – 700071 **e. mail:** ghoshbos@cal.vsnl.net.in **Tel.:** 033- 22827152/ 22827036 09831072110 *Conditions apply* ***Though the EIA Coordinators for these sectors were approved for Cat. A. The organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in this sector only for Cat. B as an organization.*	1**	Mining of minerals including Open cast/ underground mining	B	1 (a) (i)
		4**	Thermal power plants	B	1 (d)
		8**	Metallurgical industries(ferrous & nonferrous) - both primary & secondary	B	3 (a)
		31**	Industrial estates/ parks/ complexes/Areas, export processing Zones(EPZs), Special economic zones(SEZs), Biotech Parks, Leather Complexes	B	7 (c)
		33**	Ports, harbours, break waters and dredging	B	7 (e)
		34**	Highways	B	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
73	**GreenCIndia Consulting Private Limited** (formerly known as GIS Enabled Environment & Neo-graphic Centre)	1	Mining of minerals including opencast/ underground mining	A	1 (a) (i)
		3	River valley, Hydel, Drainage and Irrigation Projects	A	1 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Address: 905, 908, Devika Appartment, Sector – 4, Vaishali, NCR, Ghaziabad – 201012 **e. mail:** greenc.india@gmail.com nandini@greencindia.com **Tel.:** 0120 – 4568731 09891906015 *Conditions apply*	4	Thermal power plants	A	1 (d)
		6	Coal Washeries	A	2 (a)
		8	Metallurgical industries (ferrous & non-ferrous)	A	3 (a)
		9	Cement plants	A	3 (b)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		29	Air ports	A	7 (a)
		31	Industrial estates/ parks/ complexes/areas, export processing Zones(EPZs), Special Economic Zones(SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		34	Highways	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
74	**Green circle Inc.**	1	Mining of minerals – opencast only	B	1 (a) (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Address: Green Empire (Anupushpam), Above Axis bank, Near Yash Complex, Gotri Main Road, Vadodara, Gujarat – 390021 **E.mail:** pradeep.joshi@gccipl.net; info@greencircleinc.com **Tel.:** 0265- 2371269	4	Thermal power plants	B	1 (d)
		8	Metallurgical industries (ferrous & non-ferrous)	B	3 (a)
		9	Cement plants	B	3 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	B	5 (g)
		25	Sugar Industry	B	5 (j)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development	A	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			projects		
75	**GLOBAL Environment & Mining Services** **Address:** "Devakinandan", Opp. PLD Bank, Venkateshwara Talkies Road, Patel Nagar, Hospet Bellary **Email:**gems_hpt@yahoo.com **Tel.:** 09448479433,08394223755 *Conditions apply*	1	Mining of minerals- Open Cast only	A	1 (a) (i)
		7	Mineral beneficiation including pelletisation	A	2 (b)
76	**Global Enviro Labs** **Address:** 2-2-1075/ 14/ A/ 1, Thilaknagar "X" Roads, Baghamberpet, Hyderabad – 500013 **E-mail:**globalelabs@rediffmail.com **Tel.:** 040- 65582886/ 27407969 09849039741 *Conditions apply*	1	Mining of minerals including Open cast/ underground mining	A	1 (a) (i)
		4	Thermal power plants	B	1 (d)
		7	Mineral beneficiation including pelletisation	B	2 (b)
		8	Metallurgical Industry (Ferrous only)	A	3 (a)
		9	Cement plants (Grinding units only)	B	3 (b)
		16	Chemical Fertilizers (SSP only)	B	5 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
77	**Global Management and Engineering Consultants International** **Address:** Saharan Tower, 308, Officers Campus Extension, Sirsi Road, Khatipura (Near Sanskar School), Jaipur – 302012 (Rajasthan) **Email:** info@gmecinternational.com / saharan@gmecinternational.com **Tel.:** 0141-2353241 Mobile: 9928599571 / 9928793002 / 9414071334 *Conditions apply*	1	Mining of minerals including opencast/underground mining	A	1(a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		4	Thermal power plants	B	1 (d)
		8	Metallurgical Industry (ferrous & non- ferrous)	B	3 (a)
		9	Cement plants	A	3 (b)
		12	Asbestos milling and asbestos based products	A	4 (c)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		33	Ports, harbours, break waters and dredging	A	7(e)
		34	Highways	A	7(f)
		36	Common Effluent Treatment Plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		39	Townships and Area development projects	B	8 (b)
78	**GLOBALTECH Enviro Experts Pvt. Ltd.** **Address:** C- 23, BJB Nagar, Bhubaneshwar – 751014 **E-mail:** manojnayak333@yahoo.com globalexperts@rediffmail.com **Tel.:** 0674 – 2436853 09437033487 09937133487	1	Mining of minerals- Open cast only	A	1 (a) (i)
		4	Thermal power plants	B	1 (d)
		7	Mineral beneficiation including pelletisation	B	2 (b)
		8	Metallurgical industries(ferrous only) - both primary & secondary	A	3 (a)
		9	Cement plants	B	3 (b)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
79	**Goldfinch Engineering Systems Private Limited** (Formerly known as - Waste Encare (India) Pvt. Ltd.) **Address:** Plot no. A- 288, Road No. 16-Z, Thane Industrial Area, MIDC (Wagle Estate), Thane (West)-400604	1	Mining of minerals – open cast only	B	1 (a) (i)
		3	Irrigation projects only	B	1 (c)
		4	Thermal power plants	B	1 (d)
		8	Metallurgical industries (ferrous and non-ferrous)	B	3 (a)
		17	Pesticides industry and pesticide	A	5 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: anand.apte@goldfinchengg.com; info@goldfinchengg.com **Tel.:** 022-25801529, 9821812132 *Conditions apply*		specific intermediates (excluding formulations)		
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
80	**Grass Roots Research and Creation India (P) Ltd.** **Address:** F- 375, Sec – 63, Noida – 201301 **e. mail:** md@grc-india.com, info@grc-india.com **Tel.:** 0120 – 4044630, 4044660 09811554031, 09818184005 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		3	River Valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		6	Coal Washeries	A	2 (a)
		7	Mineral beneficiation including pelletisation	A	2 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		8	Metallurgical industries(ferrous and non-ferrous) - both primary & secondary	A	3 (a)
		9	Cement plants	A	3 (b)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	A	7 (c)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
81	**Gujarat Environment Management Institute** **Address:** 3rd floor, Block No. 13 Dr. Jivraj Mehta Bhavan, Old Sachivalaya, Sector 10B, Gandhinagar,	21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Gujarat 382010 **E-mail:** paresh.gemi@gmail.com, info@gemi-india.org **Tel.:** 079-23240964 *Conditions apply*		synthetic organic chemicals and chemical intermediates)		
		30	All ship breaking yards including ship breaking units	A	7 (b)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7(d)
		33	Ports, harbours, break waters and dredging	A	7(e)
		36	Common Effluent Treatment Plants (CETPs)	A	7(h)
82	**Hubert Enviro Care Systems** **Address:** No. 18, 92nd Street, 18th Avenue, Ashok Nagar, Chennai – 600083 **e. mail:** moses@hecs.in ceo.hecs@gmail.com **Tel.:**044 – 42985511, 09884390811 *Conditions apply*	1	Mining of minerals including Opencast/ Underground mining	A	1 (a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (ferrous & non-ferrous)	B	3 (a)
		9	Cement plants	B	3 (b)
		10	Petroleum refining industry	A	4 (a)
		18	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or	A	5 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			reforming to aromatics)		
		20	Petrochemical based processing	A	5 (e)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	B	7 (c)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
83	**Idma Laboratories Limited** **Address:** 391, Industrial Phase 1 , Panchkula-	1	Mining of minerals including Open cast/ Underground mining	B	1 (a) (i)
		22	Distilleries	B	5 (g)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	134113, Haryana **E-mail:** testing@idmagroup.co.in **Tel.:** 0172- 5064827 09888002605 **Though the EIA Coordinator for this sector was approved for Cat. A. The organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in this sector only for Cat. B as an organization.* *Conditions apply*	27*	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)
84	**Indomer Coastal Hydraulics (P) Ltd** **Address:** 63, Gandhi Road Alwar Thirunagar, Chennai 600 087 **Tel**:+91-44-2486 2482 to 84	27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal.	A	6 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	099401 41650 **E mail:** indomercoastalhydraulics@gmail.com *Conditions apply*	33	Ports, harbours, break waters and dredging	A	7 (e)
85	**In Situ Enviro Care** **Address:** 20-B, Zone-II, M.P. Nagar, Bhopal (M.P.) **E-mail:** admin@insituenvirocare.com ajay.mohan@insituenvirocare.com **Tel.:** 07555- 2577143/ 3914807 09425012465, 08878698002 *Conditions apply*	1	Mining of minerals - opencast only	B	1 (a) (i)
		4	Thermal power plants	B	1 (d)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (B)
86	**Ind Tech House Consult** **Address:**G-8/6, Ground Floor, Sector 11, Rohini, Delhi – 110 085 **E-mail:** suman.ithc@gmail.com, ithconsult@hotmail.com **Tel.:** 011-64607252,	1	Mining of minerals including Open cast/ Underground mining	B	1 (a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		3	River valley, hydel, Drainage and Irrigation projects	A	1 (c)
		27	Oil & gas transportation pipeline	A	6 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	09958499554 *Conditions apply*		(crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal		
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	A	7 (c)
		33	Ports, harbours, break waters and dredging	A	
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (B)
87	**IRG Systems South Asia Pvt. Ltd**. **Address:** E-16, 3rd Floor, Main Market, Hauz Khas, New Delhi – 110 016	3**	River valley projects	B	1 (c)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: amit@irgindia.com, ssanjeev@irgssa.com **Tel.:** 011-45974597, 9990418899, 9818518899 *** Though the EIA Coordinator for this sector was found suitable for Cat. A. The organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. He can take up projects in this sector only for Cat. B as an organization.* *Conditions apply*				
88	**Intercontinental Consultants & Technocrats Pvt. Ltd.** **Address:** A- 8, Green Park, New Delhi **E-mail:** pkapila@ictonline.com **Tel.:** 011 – 40863010 *Conditions apply*	29	Air ports	A	7 (a)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
89	**J. M. Environet Pvt. Ltd.** **Address:** 1st& 2nd Floor, SCO 16, Sector 10-A, Pace City, Gurgaon-122001 **e. mail:** jmenviron@hotmail.com, jmpkdeepa@hotmail.com **Tel.:**0124-4141926/ 3206559 09910494521 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		6	Coal Washeries	A	2 (a)
		7	Mineral beneficiation including pelletisation	A	2 (b)
		8	Metallurgical Industries (Ferrous & non ferrous)	A	3 (a)
		9	Cement plants	A	3 (b)
		11	Coke oven plants	A	4 (b)
		19	Manmade fibers manufacturing	A	5 (d)
		22	Distilleries	A	5 (g)
		24	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	A	5 (i)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones	B	7 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes		
		33	Ports, harbours, break waters and dredging	A	7 (e)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development	B	8 (b)
90	**JV Analytical Services** **Address:** Samay Building, Bhau Patil Road, Bopadi, Pune – 20 **E.mail**: jvlabpune@gmail.com; **sales@jvanalyticalservices.com** **Tel.:** 91- 7350658988,9921107215 *** Though the EIA Coordinator for these sectors was found suitable for Cat. A, the organization as a*	1**	Mining of minerals - Open cast only	A	1 (a) (i)
		3**	Irrigation Projects only	A	1 (c)
		4**	Thermal power plants	A	1 (d)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	B	5 (f)
		22**	Distilleries	A	5 (g)
		33**	Ports, harbours, break waters and dredging	A	7 (e)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in these sectors only for Cat. B as an organization. *Conditions apply*	39	Townships and Area development	B	8 (b)
91	**Kadam Environmental Consultants** **Address**: 871/B/3, GIDC Makarpura, Vadodara-390010,Gujarat **e. mail:** sangram@kadamenviro.com kadam@kadamenviro.com **Tel.:** 0265-6131000 09714861611 *Conditions apply*	1	Mining of minerals- Open cast only	A	1 (a) (i)
			Mining of minerals including Open cast/ Underground mining	B	
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (ferrous only-Secondary metallurgy)	A	3 (a)
		10	Petroleum refining industry	A	4 (a)
		13	Chlor-alkali industry	A	4 (d)
		16	Chemical Fertilizers	A	5 (a)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		18	Petro-chemical complexes (industries	A	5 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			based on processing of petroleum fractions & natural gas and/or reforming to aromatics)		
		19	Manmade fibers manufacturing	A	5 (d)
		20	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	A	5 (e)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		23	Integrated paint industry	B	5 (h)
		24	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	A	5 (i)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs	A	6 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			/ecologically sensitive Areas including LNG terminal		
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		30	All ship breaking yards including ship breaking units	A	7 (b)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	B	7 (c)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	B	7 (d)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area Development projects	B	8 (b)
92	**Kalyani Laboratories Private Limited**	1	Mining of minerals including Open	B	1 (a) (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			cast/ Underground mining		
	Address: Plot no. 1867, Bomikhal, Bhubaneswar **E-mail:** kalyanilab@yahoo.co.in, klaboratories@rediffmail.com **Tel.:** 0674-2585026/0674-2581992,09437306091 *The organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in these sectors only for Cat. B as an organization.* *Conditions apply*	4	Thermal power plants	B	1 (d)
		6	Coal Washeries	B	2 (a)
		7	Mineral beneficiation including pelletisation	B	2 (b)
		8	Metallurgical industries (ferrous & non ferrous)	A	3 (a)
		11	Coke oven plants	A	4 (b)
		38	Building and construction projects	B	8 (a)
93	**KITCO Ltd.** **Address:** Femith's PB No. 4407,Puthiya Road, NH Bypass, Vennala, Kochi- 682028 **E-mail:** mail@kitco.in, sindhunt@kitco.in **Tel.:** 0484-4129000/ 2805033	29	Air ports	A	7 (a)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply				
94	**KKB Envirocare Consultants Pvt. Ltd.** **Address:** Tarun Plaza, First Floor, 3-5-244, NFC Main Road, Krishna Nagar Colony, Moula Ali, Hyderabad- 500040 **E-mail:** kkbenviro@gmail.com **Tel.:** 040-65547107/ 39127107, 09391013686 *Conditions apply*	1	Mining of minerals- Open cast only	B	1 (a) (i)
		4	Thermal Power Plants	B	1 (d)
		8	Metallurgical industries (non-ferrous only)	B	3 (a)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	A	7 (c)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area Development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		40 (v)	Food Processing	-	-
95	**Kratin Solutions Pvt. Ltd.** **Address:** 47,B 2-1st Floor, Lambent IT Park, Harinagar, Besa Nagpur-440037 **E-mail:** snkatiyar@kratinsolutions.com, infor@kratinsolutions.com **Tel.:** 07103-281291 , Mob. No. 9881727702 *Conditions apply*	1	Mining of minerals including opencast/underground mining	A	1 (a) (i)
		6	Coal washeries	A	2 (a)
		7	Mineral beneficiation including pelletisation	A	2 (b)
96	**L & T Infrastructure Engineering Ltd.** **Address:** House No. 6-3-1192/1/1, 5th Floor, Block No. 3, White House, Kundan Bagh, Begumpet, Hyderabad – 500016 **E-mail:** Intielhyd@lntiel.com; cvs@intiel.com **Tel.:** 040 – 40354444, 040 - 40354431 09491035051	1	Mining of minerals- Open cast only	A	1 (a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		3	River valley, hydel, Drainage and Irrigation projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply		drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		29	Air ports	A	7 (a)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	A	7 (c)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
97	**Louis Berger Consulting Pvt. Ltd.** **Address:** Plot No. 3, 5th Floor, Tower B, Surinder Jakhar Bhavan (IFFCO), Sector 32, Gurgaon – 122001 **E-mail:** mdave@louisberger.com	29	Air ports	A	7 (a)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.: 0124-4044755/ 4578200 09717699584 *Conditions apply*				
98	**LEA Associates South Asia Pvt. Ltd.** **Address:** B-1/ E-27, Mohan Cooperative Industrial Estate **E-mail:** Chandra@lasaindia.com **Tel.:** 011 – 41678150 09910060789 *Conditions apply*	1	Mining of minerals - opencast only	A	1 (a) (i)
		3	River Valley projects	A	1 (c)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and area development projects	B	8(b)
99	**M. N. Dastur and Company (Pvt.) Ltd.** **Address:** P – 17, Mission Row Extension, Kolkata – 700013 **E-mail:** sandip.m@dasturco.in	1	Mining of minerals- Open cast only	A	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		6	Coal Washeries	B	2 (a)
		8	Metallurgical industries (ferrous & non-ferrous)	A	3 (a)
		11	Coke Oven Plants	A	4 (b)
		33	Ports, harbours, break waters and	A	7 (e)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel. : 033 – 22250500, 09433341156 *Conditions apply*		dredging		
100	**Mahabal Enviro Engineers Pvt. Ltd.** **Address:** Plot No. F-7, Road No. 21, Wagle Estate Thane-400604, Maharashtra **E-mail:** mahabal_thane@yahoo.in, thane@mahabal.com **Tel.:** 022- 25823154/ 0658/ 1663 09323058368 *Conditions apply*	1	Mining of minerals including opencast/underground mining	A	1(a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (ferrous & non-ferrous)	B	3(a)
		9	Cement plants	B	3(b)
		22	Distilleries	A	5(g)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		31	Industrial estates/ parks/ complexes/areas, export processing Zones(EPZs), Special Economic	A	7 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			Zones(SEZs), Biotech Parks, Leather Complexes		
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		38	Building and construction projects	B	8 (a)
		39	Townships and area development projects	B	8(b)
101	**Mantras Green Resources Ltd.(**formerly known as Mantras Resources) **Address:** Hall No. 1, 1st Floor, NICE Sankul, Plot No. A -9, Opp. Nashik Merchant Co- op Bank Ltd., ITI Signal, MIDC Satpur, Nasik-422007 **E-mail:** info@mantrasresources.com, uksharma@mantrasresources.com **Tel.:** 0253 2355665 / 2355086 *Conditions apply*	1	Mining of minerals including opencast/underground mining	A	1(a) (i)
		3	Irrigation projects only	A	1 (c)
		4	Thermal power plants	B	1 (d)
		6	Coal washeries	A	2(a)
		7	Mineral beneficiation including pelletisation	A	2 (b)
		8	Metallurgical industries(non ferrous only) - both primary & secondary	A	3 (a)
		9	Cement plants	A	3 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers;	B	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
102	**Mantec Consultants Pvt. Ltd.** **Address:** D- 36, Sector – 6, Noida – 201301 **E-mail:** envmantec@yahoo.co.in, mantec@vsnl.com; **Tel.:** 0120- 4215000, 4215804 09312284682; 07409574441 *Conditions apply*	1	Mining of minerals (Open cast only)	A	1 (a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		3	River valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		13	Chlor-alkali industry	A	4 (d)
		16	Chemical Fertilizers	A	5 (a)
		20	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	A	5 (e)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	B	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
103	**Mecon Limited**	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Address: Vivekanand Path, P.O. Ranchi – 834002 **E. mail:** envenggranchi@meconlimited.co.in **Tel.:** 0651- 2481314, 2483382 09470193680 *Conditions apply*	2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		3	River valley, hydel, Drainage and Irrigation projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		5	Nuclear power projects and processing of nuclear fuel	A	1(e)
		6	Coal washeries	A	2 (a)
		7	Mineral beneficiation including pelletisation	A	2 (b)
		8	Metallurgical industries(ferrous and non-ferrous)	A	3 (a)
		11	Coke oven plants	A	4 (b)
		8[#]	Induction/ arc furnaces/ cupola furnaces/ submerged arc furnace/ crucible furnace/ re-heating furnace of capacity more than 5Tonne per heat *[#]Sector 26 has been merged with sector 8 (for projects of induction furnace etc. > 30,000 t/y) vide AC MoM dated December 07, 2011*	B	5 (k)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical	A	6 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal		
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		30	All ship breaking yards including ship breaking units	A	7 (b)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	A	7 (c)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		39	Township and Area development projects	B	8 (b)
104	**Metamorphosis[SM] Project Consultants Pvt. Ltd.** (formerly known as Metamorphosis) **Address:** Prakruti Bhavan, # 200, 1st & 2nd Floor, 1st Cross, 40th Main, Behind	1	Mining of minerals (open cast only)	A	1 (a) (i)
		3	River Valley, Hydel, Drainage and Irrigation projects	A	1 (c)
		7	Mineral beneficiation including pelletisation	A	2 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Silk Board, BTM, Layout II Stage, Bengaluru- 560068 **E.mail:** mail@metamorphosis-india.com Dr.shanth@metamorphosis-india.com **Tel.:** 080-26783006 09845027475 *Conditions apply*	8	Metallurgical industries (ferrous only)- both primary and secondary	A	3 (a)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
105	**Mineral Engineering Services** **Address:** 25/ XXV, Club Road, Bellary – 583103 **E-mail:** sachinraju2000@yahoo.com **Tel.:** 080 – 25432968, 25432969 09448024304 *Conditions apply*	1	Mining of minerals including Opencast / Underground mining	A	1 (a) (i)
106	**MITCON Consultancy Services Ltd.** **Address:** Agriculture College Campus, Next to DIC Office, Shivajinagar, Pune – 411005 **E-mail:** eme@mitconindia.com mitconenviro@gmail.com **Tel.:** 020-66289400/ 66289406 09822451150, 09850724177 *Conditions apply*	1	Mining of Minerals including Open cast/ Underground mining	B	1 (a) (i)
		3	River linking & Irrigation projects only	A	1 (c)
		4	Thermal power plants	A	1 (d)
		7	Mineral beneficiation including pelletisation	B	2 (b)
		8	Metallurgical industries (ferrous only)	B	3 (a)
		9	Cement plants	B	3 (b)
		21	Synthetic organic chemicals industry	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			(dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		22	Distilleries	A	5 (g)
		24	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	A	5 (i)
		25	Sugar Industry	B	5 (j)
		31	Industrial estates/ parks/ complexes/areas, export processing Zones(EPZs), Special Economic Zones(SEZs), Biotech Parks, Leather Complexes	B	7 (c)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		36	Common Effluent Treatment Plants (CETPs)	B	7 (h)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		39	Townships and Area development projects	B	8 (b)
107	**National Environmental Engineering Research Institute** **Address:** Nehru Marg, Nagpur – 440020 **E-mail:** director@neeri.res.in; rj_krupadam@neeri.res.in **Tel.:** 0712-2249885, 07758079540 *Conditions apply*	1	Mining of minerals (Open cast only)	A	1 (a) (i)
		2	Offshore & Onshore Oil and gas exploration, development & production	A	1 (b)
		3	River valley, hydel, Drainage and Irrigation projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		10	Petroleum refining industry	A	4 (a)
		13	Chlor-alkali industry	B	4 (d)
		16	Chemical fertilizers	B	5 (a)
		18	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	A	5 (c)
		19	Textile – cotton and manmade fibers	B	5 (d)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		31	Industrial estates/ parks/	A	7 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			complexes/areas, export processing Zones (EPZs), Special Economic Zones(SEZs), Biotech Parks, Leather Complexes.		
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		36	Common Effluent Treatment Plants (CETPs)	B	7(h)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7 (i)
108	**National Institute for Interdisciplinary Science and Technology** **Address:** Council of Scientific & Industrial Research, Industrial Estate (PO), Pappanamcode, Thiruvanthapuram- 695019 **E-mail:** director@niist.res.in **Tel.:** 0471-2515226, 0471-2490324, 09447706202	1	Mining of minerals (Open cast only)	A	1 (a) (i)
		33	Ports, harbours, break waters and dredging	B	7 (e)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply				
109	**N.S. envirotech Laboratories & Consultants** **Address:** A-8, Neha Medical Building, Opp. ESI Hospital, Hasanpura Road, Sodala, Jaipur – 302006, Rajasthan **E-mail:** nsenvirotech@gmail.com **Tel.:** 0141-2451959 *** The organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment.* *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	B	1 (a) (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
110	**Oasis Environmental Foundation** **Address:**6, Kartik Apartments, Plot no. 75 + 76B, Shanti Sheela Society, Off Law College Road, Erandwane, Pune- 411004	8	Metallurgical industries (ferrous & nonferrous) - both primary & secondary	A	3 (a)
		21	Synthetic organic chemicals industry (dyes and dye intermediates; bulk drugs and intermediates excluding	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: oasisenv@vsnl.com **Tel.:** 020-25435691, 9822009923 *Conditions apply*		drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
111	**Oil and Natural Gas Corporation** **Address:**8th Floor, Core- 4, Scope minar, laxmi Nagar, Delhi -92 **E-mail:** sharmajswarup@hotmail.com **Tel.:** 011-22406031, 9868282044, 9868282230 *Conditions apply*	2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
112	**Overseas Min-Tech Consultants Pvt. Ltd.**	1	Mining of minerals - Open cast only	A	1 (a) (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Address: 5th Floor, Apex Tower, Tonk Road, P.O. Jaipur, Rajasthan – 302015 **E-mail**:arun.omtc@gmail.com **Tel.:** 09460221084 Conditions apply	3	Irrigation projects only	B	1 (c)
		4	Thermal power plants	B	1 (d)
		7	Mineral beneficiation	A	2 (b)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
113	**Paramarsh (Servicing Environment and Development** **Address:** 4/97, Viram Khand, Gomti Nagar, Lucknow – 226010, Uttar Pradesh **Email:** paramarsh.env@hotmail.com **Tel. No.** (0522) 4114250 Mobile: 09336348520 *** Though the EIA Coordinator for these sectors*	9	Cement plants (grinding units only)	B	3 (b)
		22**	Distilleries	B	5 (g)
		24**	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	B	5 (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	was found suitable for Cat. A, the organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in these sectors only for Cat. B as an organization. *Conditions apply*	38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
114	**Perfact Enviro Solutions Pvt. Ltd.** **Address:** 5th Floor, NN Mall, Sector – 3, Rohini, New Delhi - 110085 **E-mail:** info@perfactgroup.in; **Tel.:** 011 – 49281360 09871591330 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		7	Mineral beneficiation including pelletisation	A	2 (b)
		15	Leather/skin/hide processing industry	A	4 (f)
		21	Synthetic organic chemicals industry (dyes and dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather	A	7 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			complexes		
		32 A	Bio-Medical waste treatment Facilities	B	7(da)
		35	Aerial ropeways	A	7 (g)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
115	**Pioneer Enviro Laboratories & Consultants Pvt. Ltd.** **Address:** 6-3-652, Flat # 7-3, Dhruvatara Apartments, Amrutha Estates, Erramanjil, Somajiguda, Hyderabad- 500082 **E-mail:**pelcpl@yahoo.co.in, pelcpl@gmail.com **Tel.:**040-23314270, 9440677333	1	Mining of minerals- Open Cast only	A	1 (a) (i)
		3	River Valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		6	Coal Washeries	A	2 (a)
		7	Mineral beneficiation including pelletisation	B	2 (b)
		8	Metallurgical industries (ferrous & non-ferrous)	A	3 (b)
		9	Cements plants	A	3 (b)
		12	Asbestos milling and asbestos based products	A	4 (c)
		13	Chlor-alkali industry	A	4 (d)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply	16	Chemical Fertilizers- SSP only	B	5 (a)
		21	Synthetic organic chemicals industry (dyes and dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		31	Industrial estates/ parks/ complexes/areas, export processing Zones(EPZs), Special Economic Zones(SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
116	**Pollution Control Research Institute** **Address:** Bharat Heavy Electricals Limited (BHEL)Ranipur, Haridwar – 249403, Uttarakhand	4	Thermal power plants	A	1 (d)
		16	Chemical Fertilizers	A	5 (a)
		24	Pulp & paper industry excluding manufacturing of paper from waste paper and manufacture of paper	A	5 (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: ambrish@bhelhwr.co.in **Tel.:** 01334- 281872 09410395764 *Conditions apply*		from ready pulp without bleaching		
		40 (v)	Food processing	-	-
117	**Pollution and Ecology Control Services** **Address:** Near Dhantoli Police Station, Dhantoli, Nagpur – 440012 **E-mail:** pecs_nagpur@rediffmail.com **Tel.:** 0712-6504146, 09423683728, 09373128182 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		3	River Valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		6	Coal Washeries	A	2 (a)
		7	Mineral beneficiation	A	2 (b)
		8	Metallurgical industries (Ferrous & nonferrous)- both primary and secondary (including Induction &other furnaces > 30000 TPA)	A	3 (a)
		9	Cement plants	B	3 (b)
		11	Coke oven plants	A	4 (b)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
118	**Pragathi Labs & Consultants Pvt. Ltd.** **Address:** Plot No. 8, Temple Rock Enclave, Lane Opp. Linkwell Building, Tarbund 'X' roads, Secunderabad – 500009 **E-mail:**madala_r@yahoo.com **Tel.:** 040- 27897213; 09515121956 09849872272 *Conditions apply*	1	Mining of minerals including opencast/underground mining	A	1(a) (i)
		3	River Valley projects(Irrigation only)	A	1 (c)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries(Ferrous only)	A	3 (a)
		21	Synthetic organic chemicals industry	A	5 (f)
		27	Oil & Gas transportation pipeline	A	6 (a)
		32	Common hazardous waste treatment, storage and disposal facilities(TSDFs)	B	7 (d)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
		40(v)	Food Processing	A	-
119	**Precitech Laboratories Private Limited** (formerly known as Precitech Laboratories)	4	Thermal power plants	B	1 (d)
		9	Cement plants	B	3 (b)
		17	Pesticides industry and pesticide specific intermediates (excluding	A	5 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			formulations)		
	Address: 1st Floor Bhanujyot Complex, Plot No. C5/27, Opp Oriental Ins. Co. Ltd., Nr. GIDC Char Rasta Vapi - 396195 **E-mail:**vapi@precitechlab.com, dr.hmbhatt@precitechlab.com, rujul.h.bhatt@gmail.com **Tel.:** 0260-2425542, 2420995, 2424901, 3298985 09825121185, 9925008673 *Conditions apply*	19	Manmade fibers manufacturing	A	5 (d)
		20	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	A	5 (e)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		33	Ports, harbours, break waters and dredging	B	7 (e)
		38	Building and construction projects	B	8 (a)
120	**Pridhvi Envirotech (P) Ltd.** **Address:** 184/c,Lawn House, 4th floor, Vengalraonagar, Hyderabad - 500 038 **E-mail:** pvr@pridhvienviro.com **Tel.:** 040-40179770, 9849023662	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		4	Thermal power plants	B	1 (d)
		8	Metallurgical industries (ferrous & non-ferrous)	B	3 (a)
		9	Cement plants	B	3 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply		drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	A	7 (c)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7(i)
		38	Building and construction projects	B	8(a)
		39	Townships and Area development projects	B	8(b)
121	**Project & Development India Limited** **Address:** CIFT Building, PDIL, Sindri, Dhanbad, Jharkhand-828122 **E-mail:** Dhn_envpdil@bsnl.in , ajay15b@gmail.com **Tel.:** 03262350801, 09431777483 *Conditions apply*	10	Petroleum refining industry	A	4 (a)
		16	Chemical Fertilizers	A	5 (a)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quality indicated	B	6 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)		
		29	Air ports	A	7 (a)
122	**R. K. Consultants** **Address:**17-E/ 403, C. H.B, Jodhpur- 342008 **E.mail:**rpurohit2226@gmail.com, rkconsultants@sify.com **Tel.:**0291- 2706098, 09829021098 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		38	Building and construction projects	B	8 (a)
123	**R. S. Envirolinks Technologies Pvt. Ltd.** **Address:** 402, Radisson Suites Commercial Plaza, B Block, Sushant Lok 1, Gurgaon – 122009 **e. mail:** ravi@rstechnologies.co.in **Tel.:** 0124 – 4295383 09810136853	27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		33	Jetties only	B	7 (e)
		34	Highways	A	7 (f)
		40 (i)	Automobile and Auto Components	-	-

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Conditions apply				
124	**Ramans Enviro Services Pvt. Ltd.** **Address:** SF 23 & 24, Camps Corner, Nr. AUDA Garden, Prahladnagar, Ahmedabad – 380015 **e. mail:** ramans_consultancy@rediffmail.com samirchoksi88@yahoo.com **Tel.:** 079 – 26937472, 26937411 09824034495 *Conditions apply*	4	Thermal power plants	B	1 (d)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quality indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	B	7 (d)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area Development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
125	**Ramky Enviro Services Private Limited** **Address:** 2nd Floor, Ramky Grandiose, Ramky Towers Complex, Gachibowli, Hyderabd- 500032, Telangana **e. mail:** drchakradhar@ramky.com consultancy@ramky.com vvijaykumar@ramky.com **Tel.:** 0*40 2331 0091,* 09849597458 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		2	Offshore and onshore oil and gas exploration, development & productions	A	1 (b)
		3	River Valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		20	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	A	5 (e)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	A	7 (c)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		33	Ports, harbours, break waters and	B	7 (e)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			dredging		
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area Development projects	B	8 (b)
126	**Ramji Mine Envirotech** **Address:** Plot No.-21,I Floor, Aarna 2 Tower, Kartarpura, Industrial Area, 22 Godam Jaipur-302006 **E-mail:** rme.envirotech@gmail.com, mkguptarqp@gmail.com, **Tel.:** 0140-4036199, 9799744347 *Conditions apply* *** Though the EIA Coordinator for this sector was found suitable for Cat. A, the organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in these sectors only for Cat. B as an organization.*	1**	Mining of minerals including Open cast	A	1 (a) (i)
			Mining of minerals - Underground mining	B	
		6	Coal washeries	B	2 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
127	**Right Source Industrial Solutions Pvt. Ltd.** **Address:** Plot No.203, H.No.5-36/203, Prashanthi Nagar, Kukatpally, Hyderabad- 500072 **E.mail:** prasad@rightsource.co.in info@rightsource.co.in **Tel.:**04023070602/23075699/40126589/65873137, 09885560011 *Conditions apply*	1	Mining of minerals including opencast/underground mining	B	1(a) (i)
		17	Pesticides industry and pesticide specific intermediates(excluding formulation)	A	5 (b)
		21	Synthetic organic chemicals industry(dyes & dye intermediates bulk drug, and intermediates excluding drug formulation, synthetic rubbers, basic organic chemicals, other synthetic organic chemicals and chemical intermediates.	A	5 (f)
		38	Building and construction project	B	8 (a)
128	**Rites Limited** **Address:** RITES Bhawan, Plot no. 1, Sector 29,Gurgaon- 122001	3	River Valley projects	B	1 (c)
		29	Air ports	A	7 (a)
		34	Highways	A	7 (f)
		35	Aerial ropeways	A	7 (g)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: ue.rites@gmail.com, **Tel.:** 9810404276 *Conditions apply*	37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
129	**SBA Enviro Systems Pvt Ltd.** **Address**: 201, DDA Local Shopping Centre, E Block, Vikaspuri, New Delhi 110018 **E.mail:** sbaenvirosystems@ymail.com **Tel.:** 91 11 45118929 *** Though the EIA Coordinators for these sectors were found suitable for Cat. A, the organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in these sectors only for Cat. B as an organization.* *Conditions apply*	8	Metallurgical industries - (ferrous & nonferrous)	B	3 (a)
		15	Leather/ skin/ hide processing industry	A**	4 (f)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	B	5 (f)
		34	Highways	A**	7 (f)
		38	Building and Construction projects	B	8(a)
		39	Townships and Area development projects	B	8(b)
130	**SD Engineering Services Pvt. Ltd.**	3	River Valley, Hydel, Drainage and	A	1 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Address: 14, Age Arcade, New Osmanpura, Near Sant Eknath Rang Mandir, Aurangabad - 431 005 **E-mail:**sdesplinida@gmail.com, deepak.sanghai@gmail.com **Tel.:** 0240-2333622, 2333064 *Conditions apply*		Irrigation projects		
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries - (ferrous & nonferrous)	A	3 (a)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and Construction projects	B	8(a)
		39	Townships and Area development projects	B	8(b)
131	**Sadekar Enviro Engineers Pvt. Ltd.** **Address:** 310, Dempo Towers, EDC Patto, Panaji-403001	1	Mining of minerals (Open cast only)	A	1 (a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		17	Pesticide industry and pesticide	A	5(b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E.mail: sadekarenviro@rediffmail.com psadekar@yahoo.com prs@sadekarenviro.com **Tel.:** 02437048, 09423055718, 09423318140 09820144125/09423055718 *Conditions apply*		specific intermediates (excluding formulations)		
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates	A	5 (f)
		25	Sugar industry	B	5(j)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/ coral reefs/ ecologically sensitive Areas including LNG terminal	A	6 (a)
		3	Industrial estates/ parks/ complexes/Areas, export processing Zones(EPZs), Special economic zones(SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		33	Ports, Harbours, break waters and dredging	A	7 (e)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		39	Township and area development projects	B	8 (b)
132	**San Envirotech Pvt. Ltd.** **Address:**401/402/423/424/324, Medicine Market, Opposite Shefali Centre, Paldi, Cross road, Ahmedabad, Gujarat- 380007 **Email:**Mahendra.sepl@gmail.com **Tel.:** 07926583077, 09825007201, 09327637201 *Conditions apply*	1	Mining of minerals (Open cast only)	B	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (ferrous only) -both primary & secondary	B	3 (a)
		9	Cement plants	B	3 (b)
		13	Chlor-alkali industry	B	4 (d)
		16	Chemical Fertilizers	A	5 (a)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates	A	5 (f)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quality indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
133	**SGM Corporate Consultants Pvt. Ltd.** **Address**: Sahil Apartment, 1102/A/4B, Lakaki Road,Opp. Kirloskar Banglow, Model Colony, Shivaji Nagar , Pune -411016 **E-mail:** sgm_pune@yahoo.com, sgmcorporate@gmail.com **Tel.:** 020- 25822900 09822180803 *Conditions apply*	1	Mining of minerals - Open cast only	B	1 (a) (i)
		4	Thermal Power Plants	B	1 (d)
		9	Cement plants	A	3 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	B	5 (f)
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		38	Building and construction projects	B	8 (a)
134	**SAWEN Consultancy Services Pvt. Ltd.** **Address:** 409-A, 426-B, 417-A & B, Sahara Shopping Centre, Faizabad Road, Lucknow – 226016	7	Mineral Beneficiation	B	2(b)
		25	Sugar Industry	B	5 (j)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: consultancy_sawens@yahoo.co.in, **Tel.:** 0522- 7379444471-74 09450738044 *Conditions apply*	39	Townships and Area development projects	B	8 (b)
135	**SGS India Pvt. Ltd.** **Address:** 250, Udyog Vihar, Phase IV, Gurgaon - 122015 **E-mail:** sanjeev.kumar@sgs.com **Tel.:** 0124 – 2399990, 2399998 09871794706 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		2	Offshore and onshore oil and gas exploration, development & production	A	1 (b)
		3	River Valley	B	1 (c)
		4	Thermal power plants	A	1 (d)
		9	Cement plants	A	3 (b)
		10	Petroleum refining industry	A	4 (a)
		12	Asbestos milling and asbestos based products	A	4 (c)
		18	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	A	5 (c)
		20	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	A	5 (e)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quality indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		29	Air ports	A	7 (a)
		33	Ports, Harbours, Jetties, marine terminals, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			projects		
136	**Shivalik Solid Waste Management Limited** **Address:** (UPL Enviro Infrastructure Group Co.), 2nd Floor, SCO 20-21, near Hotel Dolphin,Zirakpur,Punjab-140604 **E-mail:** s.brahma@tatvaglobal.com **Tel.:** 08872028131, 08288079363, 09316028131 *Conditions apply*	1	Mining of minerals- Open cast only	A	1 (a) (i)
		3	River Valley projects	A	1 (c)
		4	Thermal power plants	B	1 (d)
		8	Metallurgical industries(ferrous & nonferrous) - both primary & secondary	A	3 (a)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	B	6 (a)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		32 A	Bio-medical waste treatment facilities	B	7 (da)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
137	**Shriram Institute for Industrial Research** **Address:** 19, University Road Delhi- 110007 **E-mail:** sridlhi@shriraminstitute.org **Tel.:** 011- 27667267 *Conditions apply*	27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quality indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		31	Industrial estates/ parks/ complexes/Areas, export processing Zones(EPZs), Special economic zones(SEZs), Biotech Parks, Leather Complexes	A	7 (c)
138	**Siddhi Green Excellence Private Limited** **(Earlier known as Siddhi Consultants)** **Address:** "Kamal Arcade", Shop No. 3, Comm. Plot No. C-3/3, Near State Bank of India, G.I.D.C, Ankleshwar – 393002	17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: siddhi_ank@rediffmail.com **Tel.:** 02646- 224805 09824345895 *Conditions apply*		synthetic organic chemicals and chemical intermediates)		
139	**Singareni Collieries Company Limited** **Address:** Kothagudem Collieries Bhadrachalam Road Rly. Station, Khammam District – 507101 **E-mail:**dpp@scclmines.com **Tel.:** 08744242328 09491144455 *Conditions apply*	1	Mining of minerals including Open cast and Underground mining	A	1 (a) (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
140	**S.M. Consultants** **Address:** S.M.Tower, Plot No.- 130,Mancheswar Industrial Estate, Rasulgarh, Bhubaneswar-751010, Odisha **E-mail:** qualitycontrol@smcindia.com Tel.: 08908215859 *** Though the EIA Coordinator for this sector was found suitable for Cat. A, the organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in these sectors only for Cat. B as an organization.* *Conditions apply*	34**	Highways	B	7 (f)
		38	Building and construction projects	B	8 (a)
141	**SMS Envocare Ltd.** **Address:** 301, Pentagaon, P3, Magarpatta City, Hadapsar, Pune - 411028	3	River Valley projects	B	1 (c)
		4	Thermal power plant	B	1(d)
		19	Man made fibre manufacturing	A	5(d)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	E-mail: nilesh.deshmukh@smsl.co.in **Tel.:** 020- 66801111 09922901511 *Conditions apply*		drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		36	Common Effluent Treatment Plants (CETPs)	B	7 (h)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	A	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
142	**Sneha Hi-Tech Products** **Address:** No.8 & 28, 4 th Cross, Maruthinagar	1	Mining of minerals - Open cast only	A	1 (a) (i)
		36	Common Effluent Treatment Plants (CETPs)	B	7 (h)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Chandra Layout, 80 feet road, Nagarabhavi, Bangalore-560072 **E-mail:** snehahitechproducts@gmail.com **Tel.:** 080-23180113/23390341 **The organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment.* *Conditions apply*	38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
143	**Srujan Research and Planning foundation** **Address:** Sharada Center, 11/1 Erandawane, Off Karve Road, Pune - 411004 **E-mail:** rahul.nawle@srujanfoundation.com, planning@srujanfoundation.com **Tel.:** 020-65333394/ 09970181813 *Conditions apply*	38	Building and construction projects	B	8 (a)
		39	Townships and Area Development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
144	**State Forest Research Institute** **Address:** State Forest Research Institute, Polipathar, Narmada Road, Jabalpur - 482008 (M.P) **E-mail:** pandeyrk1@yahoo.com **Tel.:** ***The organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in these sectors only for Cat. B as an organization.* *Conditions apply*	1	Mining of minerals including Open cast and Underground mining	B	1 (a) (i)
		3	River valley projects	B	1 (c)
145	**Sri Sai Manasa Nature Tech Pvt. Ltd.** **Address**: Plot No. 74/A, Flat No. 102, Central Bank Building, Kalyan Nagar, Hyderabad – 500038 **E-mail:**ssmntpl@gmail.com	1	Mining of minerals – Open cast only	A	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		6	Coal washeries	A	2 (a)
		8	Metallurgical industries (ferrous & non ferrous)	B	3 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.: 040- 23816333 09010548548 *Conditions apply*	9	Cement plants	A	3 (b)
		22	Distilleries	B	5 (g)
		31	Industrial estates/ parks/ complexes/Areas, export processing Zones(EPZs), Special economic zones(SEZs), Biotech Parks, Leather Complexes	B	7 (c)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
146	**Srushti Sewa** **Address:** Harihar Niwas, Agrasen Marg, Near Adivasi Bhavan, Giri Peth, Nagpur – 440010 (M.S.) **E-mail:** srushtisewa@sancharnet.in srushtisewa@yahoo.com **Tel.:** 0712- 6888545 09422108095, 08237002633 *** Though the EIA Coordinators for these sectors were found suitable for Cat. A, the organization as a*	1	Mining of minerals including underground mining	A**	1 (a) (i)
		3	River Valley Projects	A**	1 (c)
		4	Thermal power plants	A**	1 (d)
		6	Coal washeries	A**	2 (a)
		8	Metallurgical industries (ferrous & non-ferrous)	B	3 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in these sectors only for Cat. B as an organization. *Conditions apply*				
147	**SV Enviro Labs & Consultants** **Address:** B1-Block –B, IDA Auto Nagar, Visakhapatnam- 530012 **E-mail:** svenviro_labs@yahoo.co.in **Tel.:** 0891- 2797377 09440338628 *Conditions apply*	1	Mining of minerals (Open cast only)	A	1 (a) (i)
		3	River Valley Projects	A	1 (c)
		16	Chemical Fertilizers (SSP & DAP plants only)	A	5 (a)
		22	Distilleries	A	5 (g)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		33	Ports, Harbours, break waters and dredging	A	7 (e)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		39	Townships and Area development projects	B	8 (b)
148	**TATA Consulting Engineers Limited** **Address:** Matulya Center, A-249, Senapati Bapat Marg, Lower Parel (west), Mumbai – 400013 **E-mail:** vsbapat@tce.co.in; alokk@tce.co.in **Tel.:** 022- 66624743, 66624724 *Conditions apply*	1	Mining of minerals (Open cast only)	B	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (ferrous only) – both primary and secondary	A	3 (a)
		11	Coke oven plants	A	4 (b)
		16	Chemical Fertilizers	A	5 (a)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
149	**TEAM Institute of Science & Technology Pvt Ltd.** **Address:** E-65, Chittaranjan Marg, C-Scheme, Jaipur,Rajasthan-3020022 **e. mail:** eia@teamtesthouse.com	1**	Mining of minerals - Open cast only	A	1 (a) (i)
		36	Common effluent treatment plants (CETPs)	B	7(h)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.: 0141-2369980 ***Though the EIA Coordinator for this sector was found suitable for Cat. A, the organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in this sector only for Cat. B as an organization.* *Conditions apply*	38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
150	**TEAM Labs and Consultants** **Address:** B- 115 & 509, Annapurna Block, Aditya Enclave, Ameerpet, Hyderabad – 500038 **e. mail:**teamlabs@gmail.com **Tel.:** 040 – 23748666/ 23748616 09866415966 *Conditions apply*	1	Mining of minerals including Open cast / Underground mining	A	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries (ferrous only) – both primary and secondary	A	3 (a)
		9	Cement plants	A	3 (b)
		13	Chlor-alkali industry	A	4 (d)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		31	Industrial estates/ parks/ complexes/Areas, export processing Zones(EPZs), Special economic zones(SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8(a)
		39	Townships and Area development projects	B	8 (b)
151	**Terracon Ecotech Pvt. Ltd.** **Address:** 202, Kingston, Tejpal Road, Vile Parle (E), Mumbai 400057, India **e. mail:** info@terraconindia.com **Tel.:**022-2613939/40/41, 9820828087 *Conditions apply*	1	Mining of minerals- Open cast only	B	1 (a) (i)
		2	Off shore and on shore oil and gas exploration, development and production	A	1(b)
		3	River valley, hydel, drainage and irrigation projects	B	1 (c)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7(i)
		38	Building and Construction projects	B	8(a)
152	**T. R. Associates** Address: Ganesh Meridian, Block No - C, Office No - 605a, Opp. Kargil Petrol Pump,Nr. Sola Over Bridge, B/S. Shapath Hexa, S.G. Highway, Ahmedabad 380060 **E-mail:** trassociates@hotmail.com **Tel.:** 98253 71099	4	Thermal power plants	B	1 (d)
		9	Cement plants	B	3 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		38	Building and construction projects	B	8 (a)
153	**Udaipur Min-Tech Pvt. Ltd.** **Address:** 206, "Apeksha Complex", Sector 11, Hiran Magri, Udaipur- 313002 **E-mail:** ssbist@udrmintech.com	1	Mining of minerals - Open cast mining only	A	1 (a) (i)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.: 0294- 2489672 09414167672, 09950998672 *Conditions apply*				
154	**ULTRA-TECH** **Address:** 206, 224-225, Jai Commercial Complex, Eastern Express Highway, Opp. Cadbury, Khopat, Thane West - 400 601 **E-mail:** sawantkishor@ultratech.in **Tel.:** 020-25281338 09322917772 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		2	Offshore & Onshore Oil and gas exploration, development & production	A	1 (b)
		3	River Valley projects	A	1 (c)
		4	Thermal Power Plants	A	1 (d)
		7	Mineral beneficiation	A	2 (b)
		8	Metallurgical industries- (ferrous & nonferrous) - both primary and secondary	A	3 (a)
		9	Cement Plants	A	3 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
155	**Unistar Environment & Research Labs Pvt. Ltd.** **Address:** 215, Royal Arcade, Near GIDC Office, Vapi – 396195 **E-mail:** unistar@uerl.in	8	Metallurgical industries (ferrous only)	B	3 (a)
		19	Manmade fibers manufacturing	A	5 (d)
		20	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	B	5 (e)
		21	Synthetic organic chemicals industry	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Tel.: 0260 – 2435610, 2433966 09909946373 *Conditions apply*		(dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		23	Integrated paint industry	B	5 (h)
		38	Building and construction projects	B	8 (a)
156	**Vardan Environet** **Address:** D-142, Sushant-Lok III, Golf Course Extension Road, Sector- 57, Gurgaon, Haryana **E-mail:** vardanenviro165@gmail.com **Tel.:**09953147268, 09971684812 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		7	Mineral beneficiation	A	2 (b)
		8	Metallurgical industries (ferrous & nonferrous)- both primary & secondary	A	3 (a)
		9	Cement Plants	B	3 (b)
		11	Coke oven plants	B	4 (b)
		20	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	B	5 (e)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other	A	5 (f)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			synthetic organic chemicals and chemical intermediates)		
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		28	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	B	6 (b)
		34	Highways	A	7 (f)
		36	Common effluent treatment plants (CETPs)	B	7(h)
		37	Common municipal solid waste management facility (CMSWMF)	B	7(i)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
157	**Vasantdada Sugar Institute** **Address:** Manjari (BK), Taluka, Haveli, Pune-412307 **E-mail:** ds.nimbalkar@vsisugar.org.in **Tel.:** 020- 26902343 *Conditions apply*	4	Thermal Power Plants – Biomass based projects only	A	1 (d)
		22	Distilleries	A	5 (g)
		25	Sugar Industry	B	5 (j)
		39	Townships and Area development projects	B	8 (b)
158	**Vimta Labs Limited** **Address:** 142, IDA, Phase – II, Cherlapally, Hyderabad – 500051 **E-mail:** janardhan@vimta.com **Tel.:** 040- 27264141 09000711309, *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		2	Offshore & Onshore Oil and gas exploration, development & production	A	1 (b)
		4	Thermal power plants	A	1 (d)
		6	Coal Washeries	A	2 (a)
		8	Metallurgical industries- (ferrous & nonferrous) - both primary and secondary	A	3 (a)
		9	Cement plants	A	3 (b)
		12	Asbestos milling and asbestos based products	A	4 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	B	5 (f)
		27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A	6 (a)
		29	Air ports	A	7 (a)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	A	7 (c)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
159	**Vison Labs** **Address:** H.No. 16-11-23/37/A, Plot No. 205, Opp. RTA Office, Sagar Hotel Building, Malakpet, Hyderabad – 500036 **E-mail:** vison_labs@yahoo.co.in vison.labs@gmail.com **Tel.:** 040- 24544320 09849110019 *Conditions apply*	1	Mining of minerals - Opencast mining only	B	1 (a) (i)
		4	Thermal power plants	B	1 (d)
		8	Metallurgical Industries	B	3 (a)
		9	Cement plants	B	3 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		38	Building and construction projects	B	8 (a)
160	**Visiontek Consultancy Services Pvt. Ltd.** **Address:** Plot No.-108, District Center, Chandrasekharpur, Bhubaneswar, Khurda -751016 **e-mail:** p_kumar_ranjan@vcspl.org **Tel.:** 0674-2744594	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		3	River valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		6	Coal washeries	A	2 (a)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	09437179882, 9338770319 *Conditions apply*	7	Mineral beneficiation	A	2 (b)
		8	Metallurgical industries- (ferrous & nonferrous) - both primary and secondary	A	3 (a)
		9	Cement plants	A	3 (b)
		11	Coke oven plants	A	4 (b)
		15	Leather/ skin/ hide processing industry	A	4 (f)
		32	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	A	7 (d)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		34	Highways	B	7(f)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7 (i)
		38	Building and construction projects	B	8 (a)
161	**VITYA Consultants Pvt. Ltd.**	31	Industrial estates/ parks/ complexes/ Areas, export processing	A	7 (c)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
	Address: 4th Floor, Laxmi Plaza, Adj. Shenoy Nursing Home, East Marredpally , Secunderabad - 500 026 (India) **E-mail:**kk@vitya.in ed.vitya@gmail.com **Tel.:** 040 – 66233979 09989211387, 09000611387 *Conditions apply*		zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes		
		34	Highways	A	7 (f)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
162	**VK:e Environmental** **Address:** 73/2, Bhakti Marg, Off Law college Road, Erand wane Pune-411004 **E-mail:**aparanjape@vke-environmental.com, anaghap@gmail.com **Tel.:** 0120-66268888 Mob. No.9822013405 *Conditions apply*	38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
163	**Voyants Solutions Private Limited** **Address:** 403, 4th Floor, Park Centra Sector -30, NH-8 Gurgoan-122001 **E-mail:** info@voyants.in **Tel.:** 0124-4598200 /9599757300 *Conditions apply*	1	Mining of minerals (Open cast only)	A	1 (a) (i)
		3	River valley projects	A	1 (c)
		4	Thermal power plants	B	1 (d)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	B	7 (c)
		33	Ports, harbours break waters and dredging	A	7 (e)
		34	Highways	A	7 (f)
		37	Common Municipal Solid Waste Management Facility (CMSWMF)	B	7(h)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
164	**Wapcos Limited** **Address:** 76 – C, Institutional Area, Sector – 18, Gurgaon - 122015 **E-mail:**wapcos.cfe@gmail.com **Tel.:** 0124 – 2397396, 09811487830 *Conditions apply*	1	Mining of minerals (Open cast only)	A	1 (a) (i)
		3	River valley projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		33	Ports, harbours, break waters and dredging	A	7 (e)
		38	Building and construction projects	B	8 (a)
165	**Wolkem India Limited** **Address:** Consultancy Division, Post Box No. 21 E – 102 Mewar Industrial Area (Madri), Udaipur – 313003 Email: mahip@wolkem.com **Tel.:** 0294- 6452067 08890836012 *Conditions apply*	1	Mining of minerals including Opencast / Underground mining	A	1 (a) (i)
		7	Mineral beneficiation	A	2 (b)
		8	Metallurgical Industries (Secondary Ferrous)	B	3 (a)
		9	Cement plants	A	3 (b)
		16	Chemical Fertilizers	A	5 (a)
		17	Pesticides industry and pesticide specific intermediates (excluding formulations)	A	5 (b)
		21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk	A	5 (f)

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		As per NABET Scheme			Project or Activity as per Schedule of MoEFCC Notification dated September 14, 2006 and subsequent Amendments
		Sector Number	Name of Sector	Category	
			drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)		
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
166	**Yes Enviro Solutions** **Address:** G-256, Second Floor, Sec-63, Noida, 201301 **Email:** info@yesenviro.co.in **Tel:** 07838007393 ***Though the EIA Coordinator for this sector was found suitable for Cat. A, the organization as a whole was accredited for Cat. B, in view of their having scored less than 60% marks in Office Assessment. They can take up projects in this sector only for Cat. B as an organization.* *Condition Apply*	1	Mining of Minerals	B	1 (a) (i)
		3	River valley projects	B	1 (c)
		31	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	B	7 (c)
		34**	Highways	A	7 (f)
		38	Building and construction projects	B	8 (a)
		39	Townships and Area development projects	B	8 (b)

Note*:* Revision 56 (August 08, 2017): List of EIA Consultant Organizations

1. ***(#) includes Accredited EIA Consultant Organizations who have submitted requisite details which are under process***
2. **New Accredited EIA Consultant Organizations:** None
3. **Deletion from the list:** Envirochem Laboratories (P) Ltd. and Naik Environment Research Institute Limited
4. **The ACOs who have not taken requisite actions to comply with the requirements of Version 3 are mentioned in List 'B'**
5. **ACOs shifted to List 'B':** None
6. **While preparing this list, due care has been taken. However, any inadvertent error cannot be ruled out. In case any error is noticed, kindly intimate the same to QCI-NABET.**

No.IA-J-11011/293/2021-IA-II(I)

Goverment of India

Minister of Enviroment,Forest and Climate Change

Impact Assessment Division

***

Indira Paryavaran Bhavan,
Vayu Wing,3rd Floor,Aliganj,
Jor Bagh Road,New Delhi-110003
10 Aug 2021

To,

M/s GHCL LIMITED
GHCL HOUSE, OPPOSITE PUNJABI HALL, NAVRANGPURA,AHMEDABAD,
Ahmedabad-380009
Gujarat

Tel.No.079-26434100; Email:projectsodaash@gmail.com

Sir/Madam,

This has reference to the proposal submitted in the Ministry of Environment, Forest and Climate Change to prescribe the Terms of Reference (TOR) for undertaking detailed EIA study for the purpose of obtaining Environmental Clearance in accordance with the provisions of the EIA Notification, 2006. For this purpose, the proponent had submitted online information in the prescribed format (Form-1) along with a Pre-feasibility Report. The details of the proposal are given below:

1. Proposal No.:	IA/GJ/IND3/222096/2021
2. Name of the Proposal:	Greenfield Chemical Complex
3. Category of the Proposal:	Industrial Projects - 3
4. Project/Activity applied for:	4(e) Soda ash Industry
5. Date of submission for TOR:	06 Aug 2021

In this regard, under the provisions of the EIA Notification 2006 as amended, the Standard TOR for the purpose of preparing environment impact assessment report and environment management plan for obtaining prior environment clearance is prescribed with public consultation as follows:

4(e): STANDARD TERMS OF REFERENCE FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY FOR SODA ASH PROJECTS AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT

A. STANDARD TERMS OF REFERENCE

1) Executive Summary

2) Introduction

i. Details of the EIA Consultant including NABET accreditation

ii. Information about the project proponent

iii. Importance and benefits of the project

3) Project Description

i. Cost of project and time of completion.

ii. Products with capacities for the proposed project.

iii. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.

iv. List of raw materials required and their source along with mode of transportation.

v. Other chemicals and materials required with quantities and storage capacities

vi. Details of Emission, effluents, hazardous waste generation and their management.

vii. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)

viii. Process description along with major equipments and machineries, process flow sheet (quantative) from raw material to products to be provided

ix. Hazard identification and details of proposed safety systems.

x. Expansion/modernization proposals:

a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing Iexisting operation of the project from SPCB shall be attached with the EIA-EMP report.

b. In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification

2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.

4) Site Details

i. Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.

ii. A toposheet of the study area of radius of 10km 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)

iii. Details w.r.t. option analysis for selection of site

iv. Co-ordinates (lat-long) of all four corners of the site.

v. Google map-Earth downloaded of the project site.

vi. 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.

vii. Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.

viii. Landuse 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)

ix. A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area

x. Geological features and Geo-hydrological status of the study area shall be included.

xi. Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects)

xii. Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.

xiii. R&R details in respect of land in line with state Government policy.

5) Forest and wildlife related issues (if applicable):

i. Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable)

ii. Landuse 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)*

iii. Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.

iv. 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.

v. 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.

vi. 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

i. Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.

ii. AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, 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.

iii. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM 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 EIA Report.

iv. 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.

v. Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.

vi. Ground water monitoring at minimum at 8 locations shall be included.

vii. Noise levels monitoring at 8 locations within the study area.

viii. Soil Characteristic as per CPCB guidelines.

ix. Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.

x. 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.

xi. Socio-economic status of the study area.

7) Impact and Environment Management Plan

i. 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.

ii. Water Quality modelling - in case of discharge in water body.

iii. Impact of the transport of the raw materials and end products on the surrounding environment shall 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.

iv. 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.

v. Details of stack emission and action plan for control of emissions to meet standards.

vi. Measures for fugitive emission control

vii. 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.

viii. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.

ix. 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.

x. 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.

xi. Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.

xii. Action plan for post-project environmental monitoring shall be submitted.

xiii. 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

i. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers

ii. 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.

iii. Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved,

iv. Annual report of heath status of workers with special reference to Occupational Health and Safety.

9) Corporate Environment Policy

i. 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.

ii. 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.

iii. 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.

iv. 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)

i. Adequate funds (at least 2.5 % of the project cost) 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.

13) 'A tabular chart with index for point wise compliance of above TOR.

B. SPECIFIC TERMS OF REFERENCE FOR EIASTUDIES OF SODA ASH

1. Complete process flowdiag ram describing each unit, its processes and operations, alongwith material and energy inputs and outputs (material and energy balance).

2. Details on requirement of rawmaterials (sea water, lime-stone,coke, ammonia, additives, etc.), its source and storage at the plant.

3. Details of handling ammonia and risk assessment.

4. Details on water balance including water use, quantity of effluentgenerated, recycled and reused and its impact of discharge to receiving water body.

5. 5. Detail so effluent treatment plant, inlet and treated water quality with specific efficiency of each treatment unit in reduction in respect of all concerned/ regulated environmental parameters.

6. Details of CO2 emissions including its quantum per tone of soda ash.

7. Management plan for solid waste generation (fines of lime stone, grits, brine sludge etc.), storage, utilization and disposal modes.

8. In case of coast at plants details on extraction of seawater and effluent disposal, development of solar salt works based on sea water evaporation, etc,.

9. Details on ground water quality and surface water quality of near by waters ounces and other surfaced rains. The parameters of water quality may include Cl-*,Ca2+*, Na+*, SO42-*, NH4+, Suspended solids* etc. (*- Asapplicable)

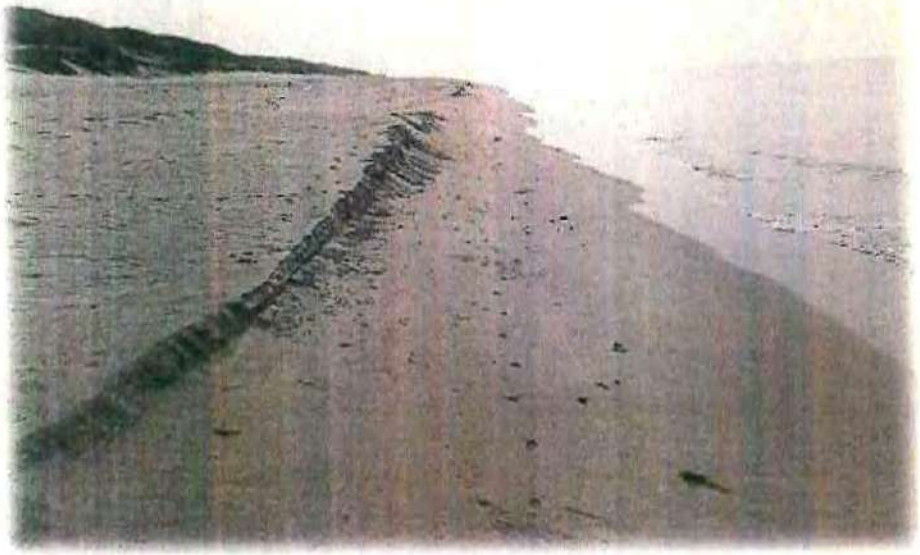
10. Ambient air quality should include NH3.

***

SURVEY OF INDIA
KOLKATA-700053

सत्यमेव जयते

A REPORT ON THE
" STUDY ON STATUS SURVEY AND CONSERVATION PLAN FOR SEA TURTLES ALONG MANDVI TALUKA OF BHUJ, GUJARAT"



Zoological Survey of India
M-Block, New Alipore,
Kolkata – 700 053

April 2019

Published:

Zoological Survey of India
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This report may be quoted freely but the source must be acknowledged and cited as:

Anonymous, 2019. Report of Study on STUDY ON STATUS SURVEY AND CONSERVATION PLAN FOR SEA TURTLES ALONG MANDVI TALUKA OF BHUJ, GUJARAT, Zoological Survey of India, Kolkata.

Published as Final Report of "Study on Status Survey and Conservation Plan for Sea Turtles along Mandvi Taluka of Bhuj, Gujarat" *by Zoological Survey of India, Kolkata for the M/s GHCL, Ahmedabad, Gujarat.*

Cover Photo: Beach at the Project Location

Back Cover Photographs: Beach during low tide at Project Location

Photographs © Basudev Tripathy

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DISCLAIMERS

1. The outcome of the STUDY ON STATUS SURVEY AND CONSERVATION PLAN FOR SEA TURTLES ALONG MANDVI TALUKA OF BHUJ, GUJARAT presented is based on the work done by ZSI as per the Scope of the study submitted to M/s. GHCL, Ahmedabad.
2. The Report submitted by ZSI to M/s. GHCL, Ahmedabad on the STUDY ON STATUS SURVEY AND CONSERVATION PLAN FOR SEA TURTLES ALONG MANDVI TALUKA OF BHUJ, GUJARAT is solely on the request of M/s. GHCL, Ahmedabad.
3. The report on the STUDY ON STATUS SURVEY AND CONSERVATION PLAN FOR SEA TURTLES ALONG MANDVI TALUKA OF BHUJ, GUJARAT submitted by ZSI to M/s. GHCL, Ahmedabad is not binding on the part of the State Environmental Impact Assessment Authority of Gujarat/ Gujarat State Coastal Zone Management Authority/National Coastal Zone Management Authority or any concerned agency to issue the NoC/ Environmental Clearance for the said project or any other statutory clearance of central and state government. Also there is no legal binding on the result of the report by ZSI submitted to GHCL, Ahmedabad.
4. All expenses related to the field/ office expenditure for the study were borne by M/s. GHCL, Ahmedabad, for the purpose.
5. There was no financial involvement from Zoological Survey of India, Kolkata for the study and there was no honorarium or otherwise raised by the study team from M/s. GHCL, Ahmedabad, for the study.

Zoological Survey of India,
Kolkata

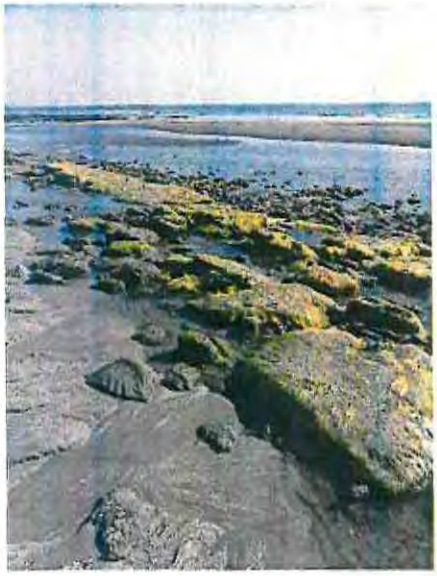
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1. INTRODUCTION

1.1. Background:

GHCL Limited is a leading company in the manufacturers of chemicals, textiles and edible salt and other consumer products. In chemical sector, the company manufactures Soda Ash (Anhydrous Sodium Carbonate). M/s. GHCL Ltd., Ahmedabad is now proposing for setting up a Green field Chemical Complex near village Bada, Taluka Mandvi, District Kutch, State Gujarat for which site has been identified near the stable coastal stretch along Arabian sea coast near village Bada, about 30 km from Mandvi (22°52'25.38"N, 69° 8'21.15"E - 22°52'57.10"N, 69° 7'33.09"E).



In this context, M/s GHCL, Ahmedabad requested the Director, Zoological Survey of India vide his email 14.08.2018 to undertake a study related to sea turtles (Green Sea Turtles, Olive Ridley Turtle) in the proposed project plot area of approx. 1350 acres and area facing the sea side, so that the suitability of the area from ecological point of view could be assessed and conservation and management plans could be taken up in coordination with the Gujarat State Forest Department.

1.2. Genesis for Sea Turtle Nesting study:

Accordingly, a proposal and scope of the study was sent to M/s GHCL and to undertake the work on sea turtle nesting in the project location and on the basis of the proposal submitted by ZSI to M/s GHCL, a Work Order was released by M/s GHCL for carrying out detailed study on "Status survey and Conservation plan for sea turtle" at the project location.

The above study was carried out in the proposed Green field Chemical Complex project location of M/s GHCL, LTD along the Arabian Sea Coast near village Bada district Kutch Gujarat on the status of sea turtle nesting and suggest conservation and management as part of

the wildlife conservation plan and company's approach to protect and support conservation of wildlife around the project as per below objectives:

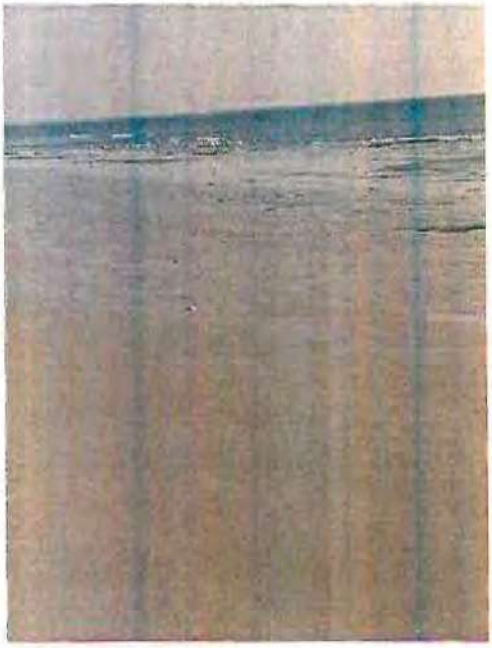
2. OBJECTIVES

1. Survey on the status of breeding / nesting ground of sea turtles at the project location.

2. Recommendation for action plan for conservation of sea turtle in the project location.

3. STUDY DURATION:

The olive ridley turtle reported to nest between June and early November on the Gujarat coast while green turtle nesting takes place between July and ends of January. However, the data sources silent on the exact nesting season. Moreover, olive ridley peak nesting occurs between July and November. Sporadic nesting takes place throughout the year along Gujarat coast (Sundarraj *et* al. 2013). Therefore, a rapid survey was done for duration of approx. six months from end of September 2018 to end of March 2019, so that sea turtle nesting activities during the peak breeding season, if any in the study area could be documented effectively.



The coastal stretch from Mota Layja end to the Bada village (upto the creek) beach was surveyed on foot by the field personnel engaged for the purpose for recording any nesting/crawl marks of turtles along the coastal stretch including stretches along which the project is proposed. Field visits to the project location was made by the ZSI team of scientists twice from last week of September 2018 and last week of March 2019. The team also made an assessment of the coastal and marine habitat along with overall biodiversity of the sites in line with the objectives.

The following were the team members for the study on assessment of sea turtle nesting.

1. Dr. Kailash Chandra, Scientist-G Director, ZSI.
2. Dr. Basudev Tripathy, Scientist-D, ZSI HQ, Kolkata
3. Dr. R. Chandran, DST-SERB-NPDF, ZSI

3.1. Description of the Project Location:

3.1.1. Location:

The location details of the project components are as follows:

As per the details submitted by M/s GHCL, the proposed site is recognised to set up a green field chemical complex with Soda Ash, Sodium bi carbonate manufacturing plant supported by utilities like solid fuel based captive co-generation power plant, sea water intake and effluent disposal system, RO system and associated infrastructure near village Bada, taluka Mandvi, District Kutch, Gujarat for which site has been identified near the stable coast off Bada stretch near Mandvi.

The Soda Ash process along with captive co-generation power plant in totality requires huge quantity of cooling water. The seawater requirement for process cooling, RO/DM plant, utilities and process plant effluent dilution etc. would be met by drawing seawater from the Arabian Sea coast in proximity to the project location.



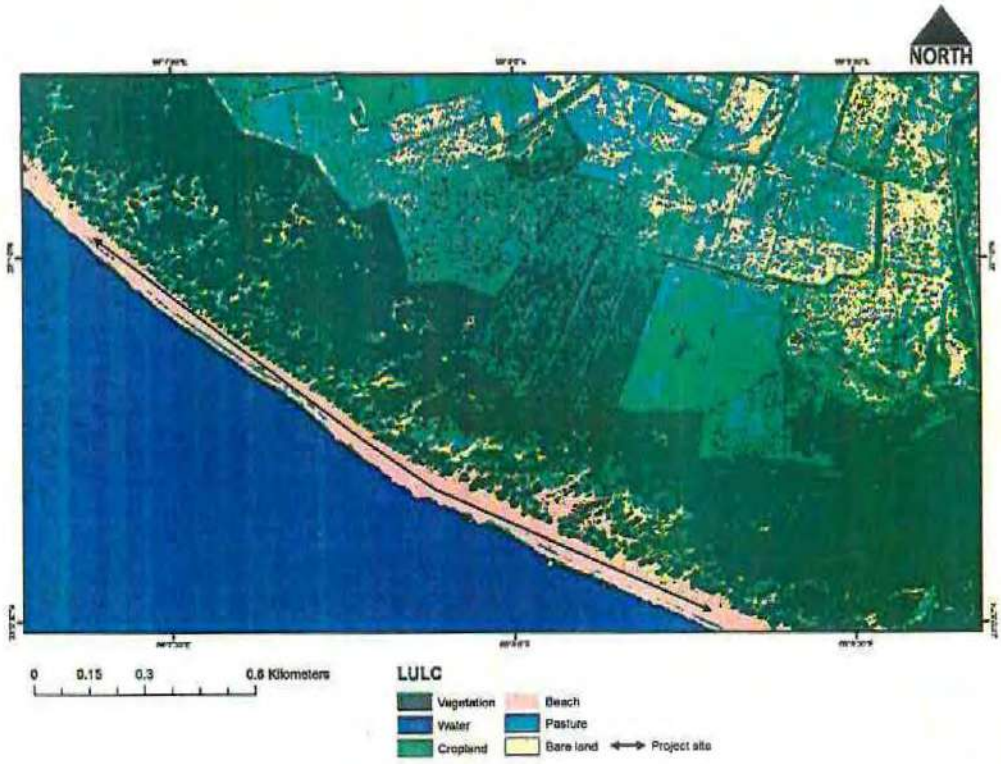
The diluted combined effluent generated from process, brine preparation/purification rejects, RO/DM plant rejects, utility rejects etc. after mixing/diluting with return cooling water/fresh seawater will be released at an appropriate location in the marine coastal zone of Arabian Sea meeting norms specified.

The pipelines for seawater intake and effluent disposal will be passed through the coastal stretch nearby project boundary. The pipeline will be laid underground to avoid any disturbance to sand dunes.



The geographical co-ordinates specified are as below:

Location: 22°52'25.38"N, 69° 8'21.15"E - 22°52'57.10"N, 69° 7'33.09"E



The project location and the adjacent coastal stretch does not fall within any notified eco-sensitive areas (ESAs) declared by state government / government of India. Also, there are no marine Protected Areas.

The plant/ complex will be set up away from the shore and sand dune area. The sand dune and shore area will be used for laying seawater intake and effluent disposal pipelines. The pipelines will be laid through tunneling in sand dune stretch to avoid and disturbance to sand dune area. The laying of pipeline will be one time activity and restricted to construction only. There will be no significant source of illumination for the pipelines.

4. METHODOLOGY

4.1. Coastal geomorphology and vegetation:

Data collections:

Table 1. Data collection on coastal geomorphology and vegetation at Project location

Habitat	Groups	Sampling	Remarks
beach profile	Length and width of beach	Measurement of beach width and height of dune from HTL to the vegetation line/sand dune at every 100 m of the project location buffering 1000 m on east and west	Measurement was taken on a weekly basis with a PVC tape, GPS and Range Finder and average of beach width was calculated
Coastal/sand dune vegetation	Flora on the beach/dune	Visual observation	Identification based on photograph
Background vegetation	Plantation/natural vegetation in the beach background	Visual observation	Identification based on photograph
Fauna (Vertebrates and Invertebrates), other than sea turtle	Coastal and marine animals, intertidal fauna	Direct sighting, evidence from pugmark, dead carcasses	Identified based on taxonomic characters

4.2. Literature review/secondary sources of information



Information on sea turtle nesting along the coastal stretch of Mandvi in Kutch district and especially in the project location was collated from secondary sources *viz.* unpublished and published literature by Gujarat State Forest Department on sea turtle nesting surveys and data on sea turtle hatcheries managed by GSFD and other government and non-government agencies on sea turtle nesting along Gujarat coast including Kutch. Local fisherfolks /villagers/coastal dwellers were interviewed for information if any on sea turtle nesting at the project location and adjacent coastal stretch.

4.3. Site specific survey:

For recording nesting of sea turtles, if any, along the proposed project site coastal stretch, the stretch west of Mota Lyaja, (Bhada) beach to Bada village (including approx. 1.4 km proposed site in the seafront [Sector-1 to 14], buffering 1000 m east and 1000 m west) was monitored on a daily basis by field personnel deployed for the purpose and information was also obtained on beach dynamics on the coastal area. The coastal stretch along proposed site and adjacent coastal areas were also visited during low tide. The beach profile viz. geomorphology, dune height, undulation, approach to HTL, width of the beach etc. were noted at every 300 m with the help of GPS (Garmin Inc.) and Range Finder. The 1.4 km coastal stretch from east to west was physically marked with a red ribbon in the background vegetation for subsequent monitoring and observations. For this the entire beach was divided into 14 sectors (Sector 0-14) (see Table 2). The detail beach profile of the coastal stretch surveyed is given in Table 2. The landuse pattern in the proposed site was assessed through Google earth imagery and by ground truth during field visits.



Table 2. beach profiling and vegetation composition of the project location

Beach Sector (300 m)	Distance from HTL to vegetation (in m)	Sand Dune Height (m)	Remarks
L-0 (Sector-0)	9.3	0.5	Flat beach with beach grass and binders
L-1 (Sector-1)	8.9	0.5	Flat beach with beach grass and binders
L-2 (Sector -2)	9.9	1.5	Dune approximately 1.5 m with beach grass and sand binders *viz.Launea sarmetosa, Cyperus arenarius, Fimbristylis miliacea, Ipomea pes-capre, Spinifex littoreus*
L-3 (Sector -3)	7.4	5	Dune approximately 5 m height with *Prosopis* vegetation mixed with beach grass and binder as above
L-4 (Sector -4)	7.8	10	HTL upto Vegetation (*Prosopis juliflora*)
L-5 (Sector -5)	11.8	3	Dune approximately 3 m with beach grass and sand binders *viz.Launea sarmetosa, Cyperus arenarius, Fimbristylis miliacea, Ipomea pes-capre, Spinifex littoreus*
L-6 (Sector -6)	13.8	1.8	Dune approximately 1.8 m with beach grass and sand binders *viz.Launea sarmetosa, Cyperus arenarius, Fimbristylis miliacea, Ipomea pes-capre, Spinifex littoreus*
L-7 (Sector -7)	9.3	2	Dune approximately 2 m with beach grass and sand binders *viz.Launea sarmetosa, Cyperus arenarius, Fimbristylis miliacea, Ipomea pes-capre, Spinifex littoreus*
L-8 (Sector -8)	14	7	HTL upto Sand dune approx. 7 m height and background vegetation (*Prosopis juliflora*)
L-9 (Sector -9)	15.8	2	Dune approximately 2 m height with *Prosopis* vegetation
L-10 (Sector -10)	14.1	3	Dune approximately 3 m height with *Prosopis* vegetation
L-11 (Sector -11)	8.2	5	HTL upto Vegetation (*Prosopis juliflora*)
L-12 (Sector -12)	12.8	5	HTL upto Vegetation (*Prosopis juliflora*)
L-13 (Sector -13)	16.5	0	HTL upto Vegetation (*Prosopis juliflora*)
L-14 (Sector -14)	25.5	0	Creek mouth towards Bada village



All potential habitats suitable for sea turtle nesting as per the literature published were surveyed and frequent field visits were made (on a fortnight basis by the scientists of ZSI and on a daily basis by the field personnel) and coastal /marine habitats of ecological and conservation importance was gathered during the field works were enumerated and taken into accounts.

Based on the information collated from field as well as from literature, a spatial data was generated with the help of a GPS (Global Position System, Garmin Inc.) and plotted in a map using GIS.

5. OBSERVATIONS

5.1. Sea turtle nesting along Gujarat (Kutch) Coast:

5.1.1. Information from secondary sources:

Four species of sea turtles are known to occur in the coastal waters of Gujarat of which two species are reported to nest along the Kachchh coastal stretches. Along the Kachchh coast, nesting of two species of sea turtle *viz.* olive ridley turtle (*Lepidochelys olivacea*) and Green turtle (*Chelonia mydas*) have been reported of which olive ridley turtle is known to be predominant (Sundarraj *et* al. 2002; based on Gujarat State Forest Department (GSFD) data on egg translocation and Sundarraj *et* al. 2013). Among four coastal districts (Jamnagar, Porbandar, Junagarh and Kutch), number of nests reported along the Kutch coast is less than the other districts. A summary of number of nests reported by studies conducted recently are presented in Table 3.

Table 3. Sea turtle nesting along Gujarat coast (4 districts) based on information from GSFD/GUIDE/GEC/WWF REPORT

District	GSFD/GUIDE/GEC REPORT				WWF REPORT
	Beach length (Potential sites) [in km]	No of Nests Observed			Number of Nests (Km)
		2000-01	2006	2011-12	
Kutch	73	61	17	68*	3 nests (15 km)
Jamnagar	92	250	1398**	91	53 nests (116 km)
Porbundar	83	155	494	53	74 (83 km)
Junagadh	98	124	508	61	104 (86 km)
TOTAL		590	1019	205	

* Based on GSFD data on nest translocation to hatchery at Mandvi/Nalia for 2007-08 to 2010-11.
** 1398 nests recorded in 12 years.

The Kachchh coast has a length of 300 km and average width of 10 m with 3-8 m tidal amplitude and soil type as silt/sandy. Of the nine Talukas in Kutch district, only the Mandvi takula is reported to have maximum sandy beaches and least mangrove area (0.27 sq. km). The Kutch coastline reported to have stabilized dunes especially around Mandvi.



Most of the studies on sea turtle nesting have been carried out along the Saurashtra coast and information available for Kachchh coast is only the data from state Forest Department. Except for one-time survey by Sundarraj et al. (2002), there is no long term data available for the coast. **The nesting of sea turtles along the coastal stretch Mandvi is quite sporadic as well as high nest predation and therefore it is possible that forest department translocated all the nests to the hatchery.**

Ex-situ conservation programme are in operation in Gujarat since 1985-86 and sea turtle hatcheries have been established in Nalia and Mandvi along Kachchh coast. Sea turtle eggs are reported to have been collected by the forest department staff and hired trained personnel. The published information on hatcheries managed by GSFD is presented in Table 4.

Table 4. Collection of sea turtle eggs and hatching success from 1985-2006 at Mandvi and Nalia hatcheries

Year	Site	No. of eggs collected	No. of successful hatchlings			Success Rate (%)
			Olive ridley	Green turtle	Leatherback	
1985-86	Mandvi	-	-	-	-	-
	Nalia	65	43	-	-	66
1986-87	Mandvi	-	-	-	-	-
	Nalia	134	100	-	-	74.62
1990-91	Mandvi	1271	778	-	-	61.25
	Nalia	-	-	-	-	-
1991-92	Mandvi	2038	1230	-	-	60.35
	Nalia	-	-	-	-	-
1992-93	Mandvi	3391	2251	-	-	66.39
	Nalia	-	-	-	-	-
2000-01	Mandvi	4399	1963	110	-	40.00
	Nalia	321	105	-	50	48.00
2001-02	Mandvi	1273	404	-	-	31.73
	Nalia	210	138	-	-	65.00
2004-05	Mandvi	1446	750	-	-	51.00
	Nalia	533	368	-	-	69.00
2005-06	Mandvi	556	416	-	-	75.00
	Nalia	135	-	72	-	53.33
TOTAL		**15637**	**8546**	**182**	**50**	**54.50**

Data source:* Meena *et* al. 2007, *Indian Ocean Turtle Newsletter No. 05, p.19-20.

The olive ridley turtle reported to nest between June and early November on the Gujarat coast while green turtle nesting takes place between July and ends of January. However, the data sources silent on the exact nesting season. Moreover, olive ridley peak nesting occur between July and November. Sporadic nesting takes place throughout the year along Gujarat coast, and therefore the nesting seasonality is not known. Based on the report of Sundarraj *et* al. (2002; 2004), 61 olive ridley turtle nests were reported along the entire coast. The Gujarat State Forest Department – Kachchh circle data of 2004-05 indicates 19 nests of both olive ridley (17) and green turtles (02). Thereafter, between 2007-08 and 2010-11, 68 nests were reported and all were of green turtles (Meena *et* al. 2007). The potential nesting site for sea turtles are reported to be available from Mandvi beach to Gundiyali, beach and from Ashapura Mandir to Pingaleshwar. Nevertheless, among the 10 stretches of Kachchh coast, seven stretches have been identified by Sundarraj *et* al. (2013). The beach between Layja Nana – Mandvi palace reported high threatened value and gained nesting site rank 1.0 and therefore it secured top conservation rank and given high conservation priority (Sundarraj *et* al. 2013). **However, due to the data deficiency and discrepancy, Sundarraj et al. (2013) could not ascertain on species specific nesting for Kachchh coast.**

There are only two reports available for Kachchh coast (Sundarraj et al. 2002; Gujarat State Forest Department). As per the forest department hatchery data available for the period 1985-86 to 2005-06 for 15637 eggs, 8546 successful hatchlings were of olive ridley turtles, 182 were of green turtles and 50 leatherback turtle hatchlings, that have been reared at Mandvi and Nalia (Meena *et* al. 2007). However, there is no separate figure available for Mandvi and Nalia. Also, the 8546 hatchlings of olive ridley reared from the hatcheries at Mandvi and Nalia indicate that olive ridley is predominately nests along the Kachchh (Mandvi-Nalia) coast. During the survey of 2000-2001 (Sundarraj *et* al. 2002) reported a total of 61 nests along Kachchh coast and all belonging to olive ridley turtles. The data of forest department for the year 2004-05 reported 19 nests, of which 17 were olive ridley turtles and 02 were green turtles. However, the nesting data available for the period from 2007-08 to 2011-12 reported 68 nests, and all were green turtles. **Therefore, it seems there is a discrepancy in the data collections in terms of season and there is no systematic long term survey and monitoring of the sea turtle nesting along the Kachchh coast.**



Nevertheless, the secondary information revealed from the data source of Gujarat State Forest Department, Kachchh circle, Sundarraj *et* al. (2013) identified five stretches along Kachchh coast with nesting of 68 green turtles based on the survey of 2000-2001 (Sundarraj *et* al. 2002) and among the stretches, a maximum of 29 nests were reported between Mandvi palace and Mandvi beach followed by Bada and Layja Nana with 27 nests. In contrast, the report of GOI-UNDP Sea Turtle Project on status of the breeding population of sea turtle along the Gujarat coast by Sundarraj *et* al. (2002), reported no nests of green turtle and 61 nests of olive ridley turtles of which highest of 22 nests along the 13 km stretch of Bada – Nana Layja (1.61 nest/km) and 21 nests along 13 km stretch of Layja Nana – Mandvi coastal stretch (1.69 nest/km). Nevertheless, the data is based only on 05 nests, crawl marks and information from local egg

collectors and not actual sighting of nests. Again as per the report of Sundarraj et al. (2013), the Forest Department identified 11.5 km along Bada – Nana Layja coastal stretch as potential for nesting with 27 nests (2.35 nests/km) and 6.0 km coastal stretch between Layja Nana–Mandvi palace with 6 nests (1.0 nest/km). Therefore, **comparison of the data and reporting of nesting of the two species of turtles along the Kachchh coast require corroboration.**



5.2. Status of sea turtle nesting at the proposed Project Location of M/s GHCL:

5.2.1. ZSI Observations:

The olive ridley turtle reported to nest between June and early November on the Gujarat coast while green turtle nesting takes place between July and ends of January although sporadic nesting have been reported to takes place throughout the year along Gujarat coast (Sundarraj *et* al. 2002; 2013). For documentation of nesting of sea turtles, if any, along the coastal stretch of the GHCL, the entire ~ 1.4 km beach surveyed (project location in the seafront (sector 1-14), ~ 1000 m buffer (Sector 1-3) on both east and west end of the project location) was monitored intensively by the field personnel deployed for the purpose and information was also obtained on beach dynamics on the coastal area on a weekly basis.

Data collected on the beach dynamics of proposed GHCL project site and adjacent coastal stretch indicate that average beach width is < 15 m and get inundated during high tide upto the *Prosopis* vegetation/dunes, except at creek mouth which is considerably widen (see Table 2). Therefore, **the entire coastal stretch of beach is narrow, varying in width with the backshore sandy ridge rising abruptly from 5-7 m above and dense *Prosopis juliflora* vegetation touching HTL.** In particular, the proposed project site has narrow width of beach except at the western end of creek mouth (> 10 m) and at middle (Sector 7-9; ~ 10 m). Also, the entire coastal stretch between sectors 4 to 11 **due to its narrow beach width, gets inundated during high tide and are not suitable/not preferred by sea turtle for laying eggs.**

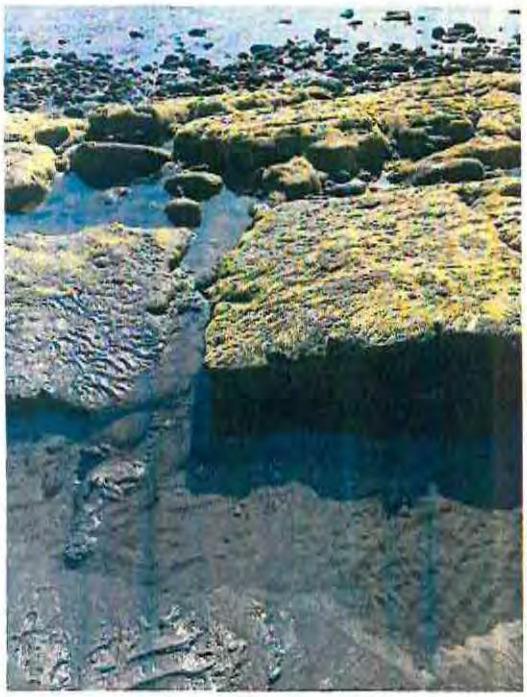
Apart from background dense vegetation of Babul (*Prosopis juliflora*) close to the high tide line (landuse pattern), the predominant floral beach composition are that of beach grass and

beach binding creekers *viz. Launea sarmetosa, Cyperus arenarius, Fimbristylis miliacea, Ipomea pes-capre* and *Spinifex littoreus*. Presence of animals in the coastal stretch of the proposed GHCL project site was assessed by direct sighting and tracks and signs. During the field visit, Feral dogs (*Canis familiaris*) were frequently observed canids on the beach, and common Jackal (*Canis aureus*) was encountered once. This could be due beach due to dense vegetation cover. Also, fecal pallets of Blue Bull (*Boselaphus tragocamelus*) observed on the beach indicating this animal visiting the coast during low tide. **Considering high level of presence of feral animals and carnivores all along the beach, Gujarat State Forest Department translocating all the nests to the turtle hatchery at Mandvi and Nalia.**



The selection of a suitable nesting site is very important at many levels: not only for the female turtle but also for a proper embryo development, and the subsequent hatchling survival (Miller *et* al., 2003). Nesting site selection is governed by a number of clues, depending on both internal physiological factors and external environmental factors. According to Mortimer (1990; 1995), environmental factors of a suitable nesting beach must have: easy accessibility to the beach, nest placement at enough height for avoiding tidal inundations, sand properly cohesive for building a nest and ease gas diffusion, and specific temperatures for a proper maturation of the egg. Wood and Bjorndal (2000), also suggested that the nest placement must avoid being too close (to avoid inundation or erosion). Beach slope, width and length Beach slope not only influences the female trying to ascend to the top of the beach but also the new hatchlings going all the way seawards. According to Wood and Bjorndal (2000), slope is the most important factor influencing the nest site selection in sea turtles. Studies by López-Castro *et* al. (2004), defined that the characteristics of olive ridley nesting sites include smooth-sloped beaches and without vegetation cover and determined an average of width of 17-65 m (López-Castro et al., 2004). Nest elevation is an important factor in order to isolate and protect the nest from tidal inundation. Green turtles tend to place their nests in elevations between 1-3 m (Johannes and Rimmer, 1984). Although no substantial information is available, the presence of beach vegetation seems to affect the choice of a nesting site (Mortimer, 1982) and so, vegetation is a factor that may affect sea turtle nesting also. Green turtles and loggerhead turtles prefer areas where supra-littoral vegetation occurs (Whitmore and Dutton, 1985; Hays and Speakman, 1993; Garmestani et al., 1997). According

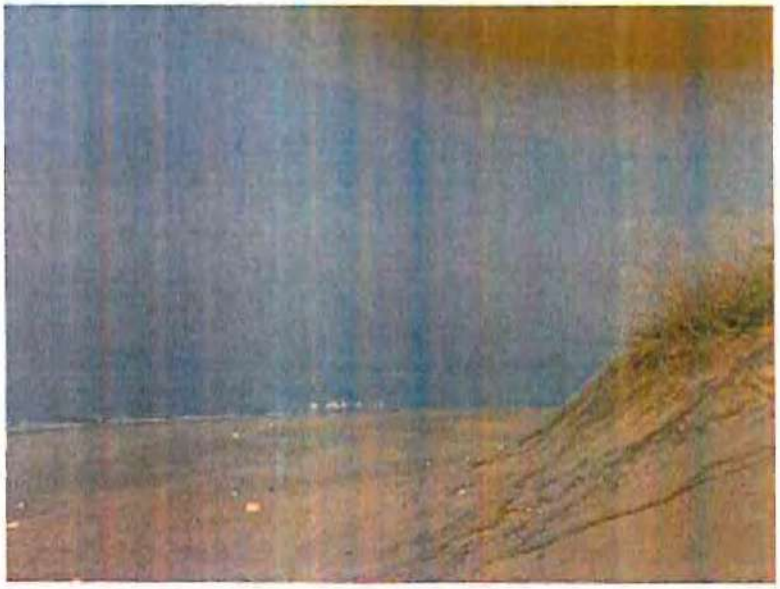
to Bilinski et al (2001) thick vegetation or refuse carried by tides (generally logs) can obstruct the nesting areas and thus reduce the hatchling success.



During the nearly six months daily monitoring of the ~ 3 km beach between September 2018 – March 2019 (from Mota Layja side to the Bada village creek), we did not encounter any sea turtle and fresh/old nests or crawl marks of turtles on the beach. Since many of the factor for selection of a suitable nesting site are not conducive (beach width, vegetation cover, rocky substratum and slope in the intertidal and subtidal region, tidal inundation, presence of animals on the beach), nesting, if all, occurring is therefore highly sporadic at the project location of GHCL and on occasionally. However, the ~ 7 km stretch between Rukmawati river mouth and Mandvi palace is sandy, vegetation to HTL is wide and much of the sporadic nesting could be taking along this coastal stretch.

The olive ridley and the green turtles are annual nesters and lay eggs more than once in a single season. The data of Gujarat Forest Department and Sundarraj *et* al. (2013) about 68 nests over five years (2007-08 to 2012-13) along the Mandvi coastal stretch (73 km) averages for 14 nests per year that implies 1 nest/5 km beach, which is highly sporadic and is a scenario of entire coastline of India, so far as sea turtle nesting is concern. Also, the 6 km beach between Mandvi palace and Nana Layja reported to be only 6 nests in five years in this coastal stretch.

The nesting of sea turtles along the coastal stretch Mandvi is highly sporadic as well as high nest predation and therefore it is possible that forest department translocated all the nests to the hatchery (Sundarraj *et* al. 2013). **During the present study, interview with local fisherman/coastal dwellers could not confirm the exact nesting location from which these coastal dwellers bring sea turtle eggs for translocation at hatchery maintained by Gujarat State Forest Department at Mandvi.**



There are smaller fishing hamlets present along the coastline of the study area. Although fishing is not rampant, but fishing is known to be a practice for local consumptions and for local demands. Discussion with them during field visits revealed that most of the nests are brought to Mandvi by fisherfolks/coastal dwellers within the coastal stretch of Madhva, Kathda, Mandvi palace and Mandvi beach as well as from Salaya side (Table 6). Therefore, sea turtle nesting on the coastal stretch of GHCL proposed project site is not observed during survey period, may be seldom, very low and considered to be quite sporadic.

Table 5. Details of sea turtle egg collections done and release of turtle hatchlings by fishermen/coastal dwellers of Mandvi coast (secondary sources of information from villagers through verbal discussion with them)

Place of Collection Location for turtle eggs* (2013 to 2015)	No. of eggs collected	Place of release of sea turtle hatchlings
Near to coast at Bhada-Aashar Mataji Temple	> 100	Windfarm Beach-Mandvi
Near to coast at Layja-Nana	> 80	Windfarm Beach-Mandvi
Near to last wind mill at Mandvi beach	> 100	Windfarm Beach-Mandvi
Near to coast at Mandvi-Ganganaal	> 90	Windfarm Beach-Mandvi
Near to coast between Nana Layja to Kathda	> 120	Windfarm Beach-Mandvi
Near to coast at Pingleshwar temple, Rampar (Gadhwali)	> 110	Windfarm Beach-Mandvi
Near to coast at Panchotiya temple	> 127	Windfarm Beach-Mandvi
Near to coast at Nana Layja	> 130	Windfarm Beach-Mandvi
Near coast at Maska-between Rawalpir to Mandvi	> 100	Windfarm Beach-Mandvi
Near coast at last wind mill at Mandvi beach	> 100	Windfarm Beach-Mandvi
Near coast at Dhabrudi	> 90	Windfarm Beach-Mandvi
Near coast at Mandvi-Ganganaal	> 120	Windfarm Beach-Mandvi

*Data available till 2015 only

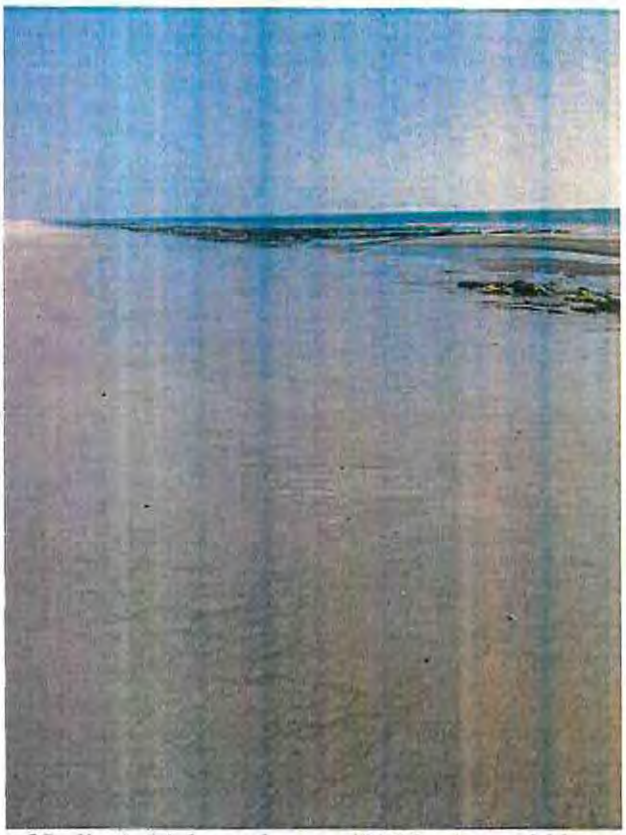
Table 6. Fishermen/coastal dwellers interview and their remarks on sea turtle nesting/egg translocation to Mandvi hatchery

Sl. No.	Name	Address	Response
01.	Abdu Rahman Vagher	Fishermanm Nana Layja	No nesting of sea turtle seen on Nana Layja beach
02.	Jurab Ismail Vagher	Fishermanm Nana Layja	No nesting of sea turtle seen on Nana Layja beach
03.	Abdul Kudan Taijab	Fisherman, Madhva	Nesting seen in Madhva beach, Mandvi Palace beach
04	Ismail Hussain	Fisherman, Madhva	Nesting seen in Madhva beach, Mandvi Palace beach and turtle eggs translocated to Forest Department hatchery at Mandvi, two years back
05	Mamud Hussain Isha	Fisherman, Madhva	Nesting seen in Madhva beach, Mandvi Palace beach and turtle eggs translocated to Forest Department hatchery at Mandvi, long back
06	Abdul Taijab	Fisherman, Madhva	Nesting seen in Madhva beach, Mandvi Palace beach
07	Hussain Taijab	Fisherman, Madhva	Nesting seen in Madhva beach, Mandvi Palace beach
08	Md. Taijab	Fisherman, Madhva	Nesting seen in Madhva beach, Mandvi Palace beach and turtle eggs translocated to Forest Department hatchery at Mandvi, two years back
09	Aubkhan Mubarak	Fisherman, Madhva	Nesting seen in Madhva beach, Mandvi Palace beach and turtle eggs translocated to Forest Department hatchery at Mandvi

Sea turtle nest all along the coast of India and its Bay Islands of Andaman & Nicobar and Lakshadweep archipelago. The olive ridley turtle is considered the most abundant sea turtle in the world, with an estimated 800,000 nesting females annually. Solitary nesting occurs extensively throughout this species' range, and nesting has been documented in approximately 40 countries worldwide. The olive ridley may be the most abundant sea turtle on the planet, but some argue that it is also the most exploited. Some nesting populations are currently stable and/ or increasing. The olive ridley and green turtles are reported share beaches for nesting in Andaman & Nicobar, Lakshadweep and in mainland Gujarat. The olive ridley is very oceanic in the Eastern Pacific and probably elsewhere too (http://seaturtlesofindia.org). Similarly, green turtles are found on large, open beaches to small coves covered with sea grasses, or in areas where seaweeds are found. The species (like the hawksbill turtle) is

also known to prefer nesting on island beaches mainly, the beaches of tropical and subtropical areas near continental coasts and around islands.

For regulating development activities, the coastal stretches within 500 metres of High Tide Line (HTL) on the landward side are classified as Category I (CRZ-I): (i) Areas that are ecologically sensitive and important, such as national parks/marine parks, sanctuaries, reserve forests, wildlife habitats, mangroves, corals/coral reefs, areas close to breeding and spawning grounds of fish and other marine life, areas of outstanding natural beauty/historically/heritage areas, areas rich in genetic diversity, areas likely to be inundated due to rise in sea level consequent upon global warming and such other areas as may be declared by the Central Government or the concerned authorities at the State/Union Territory level from time to time, (ii) Area between Low Tide Line (LTL) and the high Tide Line (HTL). However, using this logic, most sandy beaches on the east and west coasts of India (which total over 6000 km) would have to be designated as CRZ-I, simply by virtue of the low-density ridley nesting that occurs, and this hardly seems practical given human population densities along the Indian coast (Shanker, 2002) and will restricts the setting up and expansion of any industry, operations or processes.



The shoreline protection to be any defensive measures used to protect areas from inundation, the effects of waves on structures, beach erosion, salinity intrusion, and the loss of natural resources (Witham, 1990). Protection methods are often divided into two types: hard stabilization methods and soft stabilization methods. Soft stabilization methods include beach nourishment and dune construction. Beach nourishment is the most often utilized soft stabilization method. An important benefit of beach nourishment is that it can assist with replacing the sand supply along the shoreline, which the stabilization of navigational inlets often disrupts. Due to the popularity of beach nourishment as a shore protection method, it is important

to ensure that differences between the sand used for nourishment and the natural sand do not cause adverse impacts to nesting sea turtles.

Although some sand characteristics are crucial to nest survival (Packard and Packard 1988), females apparently choose nesting sites without control to most of them (i.e. sand grain size, shape, and distribution; hydric properties; pore spacing; and mineral content; Mortimer, 1982; Mortimer, 1990). Therefore, a beach can be attractive to females as a nesting site, but contain sands, which are less than optimal for nest survival (Steinitz *et al.* 1998).

Although, generalizations cannot be made on the effects of nourishment on nesting sea turtles, but nourishment appeared to have an immediate positive effect on turtle nesting success and turtle nesting habitat. Every nesting beach and nourishment project is unique; therefore assessments of nourishment's effect on turtles must be done on a case by case basis until more definitive data are available. Future studies should further evaluate the effects of sand compaction and sand temperature on sea turtle nesting activities.

Loggerheads and Green turtles maintain levels of fidelity to nesting beaches that vary over short timescales in response to beach dynamics (Godley *et al.* 2001). This suggests that when nourished beaches are unfavorable for nesting, sea turtles are capable of re-emerging on adjacent beaches that are favorable. Thus, a mosaic of nourished and non-nourished beach sections or adjacent nourished beach sections applied during different years would have a smaller impact on nesting.

The nourished beach did not significantly affect reproductive success as measured by hatching and emerging success for Loggerheads or Green turtles. These rates were nearly equal and not significantly different from those for the non-nourished area. This indicates that hatchlings did not encounter difficulties extricating themselves from the nourished substrate. The results indicate that the nourished beach provided an incubation microhabitat for Loggerhead and Green turtle reproduction similar to that of adjacent nonnourished areas.

In the present case, the intake and outfall pipeline of the GHCL proposed on the shore where sand/gravel/pebble filling if to be done should be replaced with sand of similar nature (grain size, organic content) to that which was dodged out, thereby maintaining the suitability of the beach for the incubation of sea turtle eggs. Restoration should not be during nesting and

hatching period since heavy equipment and activity can deter nesting, crush eggs, and/or prevent hatchlings from successfully emerging out of the nest from nearly shore.

Migration and movement of sea turtles from Indian coastal waters is not adequately known except for two studies by Wildlife Institute of India on olive ridley migration and movement in the Bay of Bengal based on satellite telemetry on turtles. Based on the study, WII has recommended that (a) inviolate onshore nesting areas that requires special protection, restoration and management approaches and (b) concentrated and diffused offshore breeding congregation zones in the marine habitat that requires different protection, monitoring and management strategies. Also, considering the fact that the olive ridley is Vulnerable and Green turtle is endangered species and included in the Schedule-I of the Wildlife (Protection) Act, 1972 as well as species of international conservation importance due to inclusion in CITES (Convention of International Trade in Wildlife Flora and Fauna) Appendix and CMS (Convention on Migratory Fauna), the following measures are suggested as recommendations.

6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion:

1. During approx. six months daily monitoring from September 2018 – March 2019, no sea turtle nest / fresh crawl marks were observed along the shore/beach surveyed. However, secondary sources of information revealed the coastline of Mandvi about 20 km form proposed site as important sea turtle nesting habitat along Kutch.

2. Based on the detailed field survey & monitoring of sea turtle nesting, due to its narrow width, the proposed GHCL site beach gets inundated during high tide and thereby unfavorable for sea turtles for laying eggs. It was observed that due to its narrow beach width, vegetation cover, slope, presence of pebbles and rubbles and presence of predators on the beach sea turtles may not favoring this area for laying eggs.

3. However the 7 km stretch between Rukmavati river mouth (about 20 km from proposed project site) and Mandvi palace (about 16 km from project site) is sandy, vegetation to HTL is wide and much of the sporadic nesting could be taking place along this coastal stretch.

6.2. Recommendations

1. Sandy beach of proposed GHCL site and adjoining areas have sporadic nesting habitats for sea turtles and nesting activities are quite rare. There is less probability of nesting in proposed project coastline considering the beach slope, availability of beach beyond HTL for nesting. Nevertheless, monitoring of sea turtle nesting along the coast is required and adherence to the precautionary principles.
2. Although sea turtle seems to avoid areas such as above being unsuitable for laying eggs, however M/s. GHCL should monitor the surrounding areas and nesting observed/reported if any, the same to be informed to the Forest Department officials and the eggs to be translocated immediately to the nearest hatchery at Mandvi/Naliya or along nearby beaches being maintained by Gujarat Forest Department, since they are as such is subjected to predation.
3. It is observed from the literature review that nesting data/hatchery data available for Kutch coast (Mandvi and Naliya) does not clearly record the exact species of sea turtle nesting (Green sea turtle/Olive Ridley sea turtle). Accurate information is highly important as green sea turtle numbers are declining worldwide and being migratory species, its conservation is of primary importance. The egg collectors may be trained to observe the turtle species while collecting and transporting the eggs to the hatchery. Towards this capacity building training programme on identification of species of sea turtles nesting in the area and hatchery management of sea turtles for stakeholders *viz.* fishermen/coastal dwellers may be organized by Gujarat Forest Department.
4. In-situ protection of nest by fencing or safe translocation of nests to hatchery at Mandvi or close-by areas being maintained by Gujarat State Forest Department be done immediately and further improvement in the hatchery development along Mandvi coast should be done.
5. Periodic monitoring of sea turtle nesting should be carried out by a scientific agency with credibility on coastal and marine faunal study.
6. M/s GHCL should prepare an Environment Management Plan and should support sea turtle conservation and management measures taken up by PCCF & Chief Wildlife Warden of Gujarat State Forest Department.

7. The M/s GHCL upon obtaining permission for the project should prepare a construction schedule taking care of the peak sea turtle nesting season of Kuchchh region for any direct or indirect impact on sea turtle for their breeding and the schedule to be efficiently followed.

8. The M/s GHCL upon obtaining permission for the project should prepared an excavation plan for the beachfront area and require to be kept minimum, so as not to cause direct or indirect impact on sea turtles and other intertidal marinelife. The excavated area to be properly restored as per the standard protocols available.

7. CONSERVATION PLAN FOR SEA TURTLES

Though sea turtle nesting at the project location seems to be rare and low probability, however considering that Mandvi beach seems to be an important sporadic sea turtle nesting site of Kutch, the following conservation plans are recommended:

I. Artificial illumination on the beach can affect the sea turtle nesting and hatchlings. Compared to any other kinds of coastal development, light pollution is probably one of the problems that can be solved with relative easy, if committed for conserving sea turtles. Using a smaller number or lower wattage of lights; repositioning, shielding, redirecting, lowering, or recessing fixtures are some of the available options for reducing illumination to the beach. Sea turtles are less affected by red, yellow, and low-pressure sodium-vapor lights, and therefore can be substituted with ordinary lights.

II. Creation of awareness among villagers and fishermen on the importance of turtle conservation is required. Proper identification of species of sea turtle nesting on a particular beach is important.

III. Monitor of shoreline for sea turtle nesting is required to assess nesting potential of the beach and any possible impact on nesting due to developmental activities.

IV. Any conservation and management plan for sea turtles should be developed in consultation with the Gujarat Forest Department.

* * * * *

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ANNEXURE R/4

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Studies on sand dune mapping and morphological changes of the river mouth at the proposed Greenfield Chemical Complex at District Kutch, Gujarat

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Final report

August 2020

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1. Introduction

M/s. GHCL, Ahmedabad, is a diversified company with the business area in heavy chemicals, textiles, and consumer products. The major business is from Soda Ash and Sodium bicarbonate manufacturing at Sutrapda, District Gir Somnath, Gujarat. It is one of the leading producers of Soda ash in the country since 1988.

Soda ash and Sodium bicarbonate is having huge demand and has application in the consumer industry. To meet the growing demand, GHCL proposes to set up a Greenfield chemical Complex near Village Bada, District, Kutch, Gujarat.

The Greenfield chemical complex will comprise of Light and Dense Soda ash manufacturing plants, Sodium bicarbonate manufacturing plant, Captive co-generation power plant, seawater intake, and effluent disposal system and associated infrastructure. In future company at the same complex may go in for Caustic soda and by-products like Chlorine, Hypo, Hydrogen, etc.

The Soda ash manufacturing being an exothermic process, requires a huge quantity of seawater for cooling and sweet water for process requirement. The proposed project site is in proximity to Arabian sea-coast off village Bada.

GHCL engaged CSIR - National Institute Oceanography (NIO), Goa for carrying out the morphological studies of the dunes near project location through which seawater intake and effluent disposal are planned.

CSIR- NIO as a Premier research institute of Oceanography in the Indian Ocean region has carried out many projects of this kind in the past. NIO has got the best talents of the world on various aspects of fundamental as well as applied oceanography fields. The objectives of the project after the discussion in the meeting are as follows.

2. Objectives and study area

a) To map and analyse the morphological changes of the seasonal river 'Vengadi' discharge mouth close to the proposed project site towards southwest for ten years at three seasons based on the archived satellite data.

b) Mapping of the sand dunes if any at the proposed site.

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c) To find out and recommend the suitable passage for seawater intake and effluent outfall pipeline corridor at the proposed location.

d) Observation of Suspended Sediment Concentration (SSC) at the recommended seawater intake points identified by CSIR –NIO, RC, Mumbai.

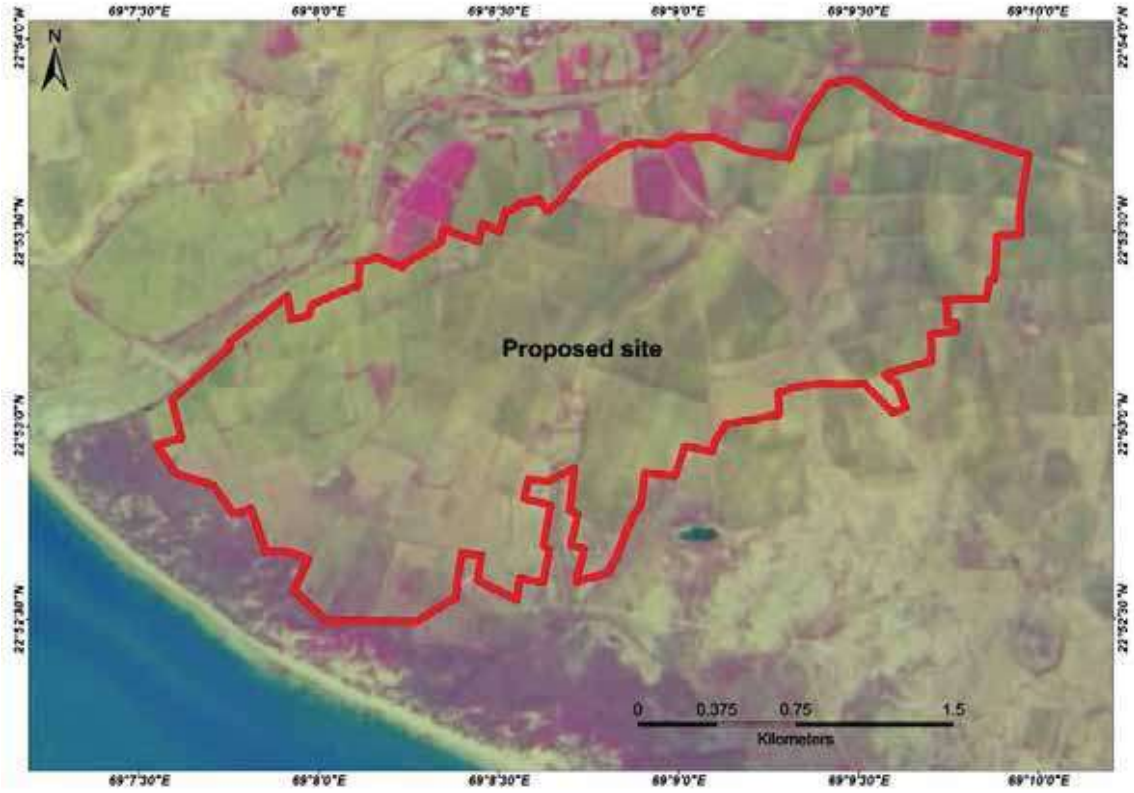


Figure 2.1 Study area

3. Data and Methodology

3.1. Morphological changes of the river mouth and sand dune analysis

The seasonal river Vengadi discharge mouth lies towards the southwest of the proposed complex and sand dune towards the south of the project boundary(Figure 2.1). Archived satellite imagery (Table 3.1) was used for the study area to address morphological changes of the river mouth in the study region. The latest satellite image on 30-09-2018 was used for mapping the present extent of a sand dune. That extent was used further for detailed analysis to find out the suitable passage for intake and outfall pipeline corridor. All data products were

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4.3. Objective 3 - To find out the suitable passage for intake and outfall pipeline corridor

The sand dunes and area adjoining GHCL boundary are considered for the study. As per the environment regulations, sand dunes can not be altered or dressed or flattened. Hence, the optimum solution to lay the intake and outfall pipelines are explored without disturbing the dunes with any of the alternate ways such as tunnelling etc. The selection of suitable corridor for the proposed pipelines over the dunes involved many criteria such as project site, the elevation of the dune(Fig 4.3.1), width of the dune, proximity to the landfall, intake and outfall points, etc. All the said parameters were used to finalise the efficient and optimum pipeline corridor in the dune area. Initially, the entire dune elevation was analysed through the contour map and elevation values provided by GHCL. The dune is having three patches with a maximum height to the tune of 18.5 m which is seen the map in dark brown as isolated patches(Figure 4.3.1). This high elevation regions are highly stabilised and have more stability. The dune has a gradual decrease of the height from the maximum elevation points and shows the gentle slope. Based on the GHCL boundary and dune characteristics, many landfall locations were selected under three categories. The transects are named T01, T02, T1toT8 and their respective landfall points(Table 4.1) are named as L0(1), L0, L1, L2, L3, L4, L5, L6, L7& L8 (Figure 4.3.2). LN is the point explored for the possibility close to Vengadi mouth but discorded due to shallow dune height. The landfall points were decided based on the following:

1. Elevation of dune area which is above 12 m which are supposed to be stable
2. High elevation of dune area with longer dune width
3. Closest landfall points to intake and outfall points in the sea

Regional Center, CSIR-NIO, Mumbai has suggested two intake and two outfall points in the Bada coast. The locations of these offshore points were also considered for arriving the landfall points and subsequent closest corridor for pipelines. Figure 4.3.3 shows the coastal bathymetry used for the study and location of intake, outfall and landfall points. Figure 4.3.4 shows the distance between the suggested landfall points (L1 and L2) and the proposed intake and outfall points (L5 and L6) for the final solutions of the proposed site. It also shows the distance of LFP and OF points from the river mouth.

Sand dune areas are declared as ecologically sensitive regions as per MOEF&CC notification and no development is permitted (MOEF&CC CRZ notification 2019). The whole exercise

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was to find out the natural passage where it can be used as a pipeline corridor. But, throughout the 6.8 km length dune, no natural passage was observed. Dune height was always observed above 1.5 m in the complete stretch. The observed vegetation indicates that the dunes are stable and more than 8000 years old. It is also observed that the dunes of different age formation at the backshore. Hence, the entire dune stretch at the vicinity of the proposed project site will be falling under the CRZ.

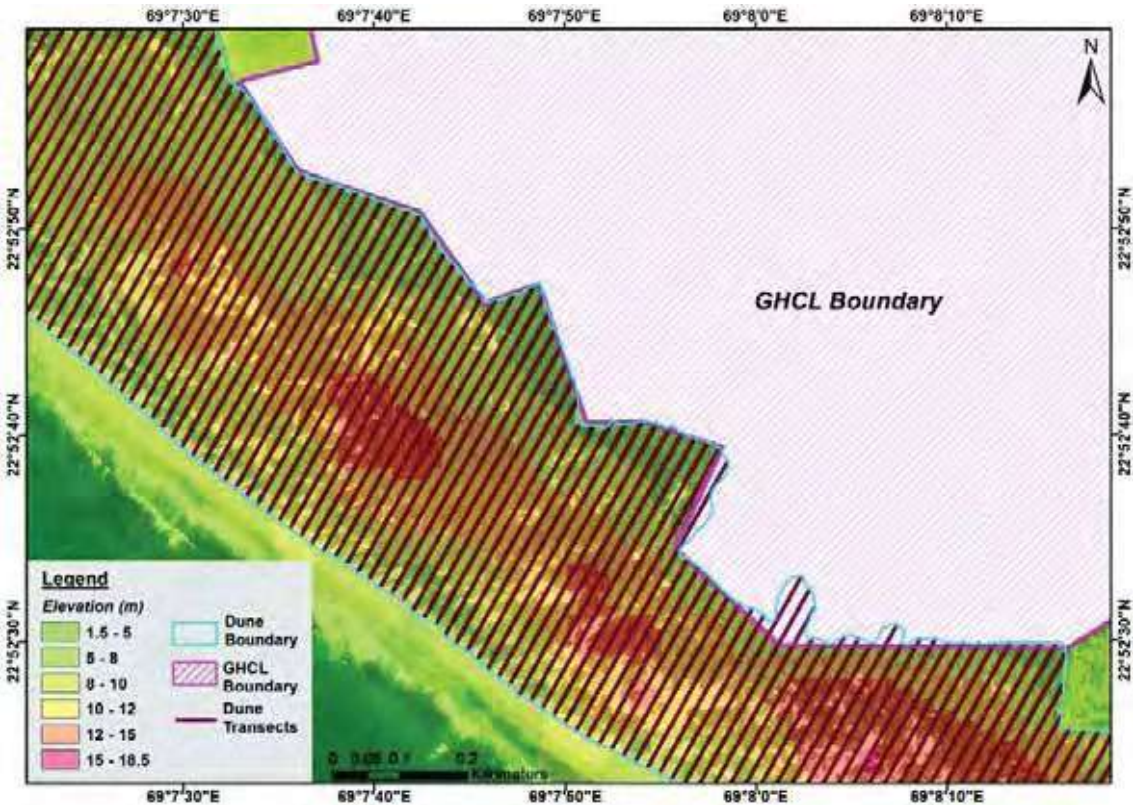


Figure 4.3.1 Elevation of the dune along with the project site boundary

As the sand dunes are within CRZ and no dressing or altering is allowed as per notification, it is suggested to lay the pipelines without disturbing the dune stretch through tunnelling or any other compatible method, etc. Based on the dune characteristics, vicinity of the project site, intake and outfall points, the stability of the coast, ten transects and corresponding landfall points were analysed individually. Based on the detailed analysis, L5 & L6 may be the better landfall points for the suggested intake points as they are at the closest vicinity to the intake points. Dune width and height is analysed for all the proposed transects (*Figure 4.3.6)* L1, L2 and L0 are comparatively better landfall points for the pipeline corridor from the plot

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boundary by considering the dune characteristics. They are lesser by distance to outfall points also. The distance to the outfall locations varies as per the sites of these landfall points. By considering the shortest distance from the coast to intake and outfall points, L5 &L6 is recommended as the first preference for intake point, which is around 1005 m away. But, the L1&L2 is considered as the better preference due to dune characteristics , but little longer by distance to outfall points (2371 and 2865 m). L0 and LO(1) are shorter by distance to outfall locations than L1 &L2 and almost having similar dune characteristics. L0 and LO(1) transects are little higher in dune slope than L1&L2 (*Figure 4.3.5*). However, in this case, the tunneling option at two different places in the dune stretch is enforced so that the distance in pipeline laying in the sea is reduced. The corresponding transects T5 &T6 and T01,T02,T1&T2 may be explored for the tunneling or any other better option. All the recommended options may be exercised after a detailed investigation with geotechnical and tunnelling experts. Depth to the bedrock, tunnelling distance and slope,etc., should be considered in detail. Hence, no damage would happen to surface dunes. It is strictly suggested that the dune stretch should not be disturbed at any cost during the pre and post-project activities.

Vengadi River mouth at the vicinity of the proposed project was also explored as it gives an option of not disturbing the dune complex at all. The stable river mouth was explored for the pipeline laying, and dredging option may be assessed during the pipeline laying time. As evidenced in the past, the pipeline will be covered by the sediments in the near future. As breached in 1988 and 1990, it may be breached, and pipelines may be exposed during a heavy natural disaster. Though the outfall points are closer than the proposed LFPs, because of the mentioned reasons, river mouth point is not considered. The economics of laying longer pipelines and two tunnellings in the dune stretch may be considered, and the optimum decision may be taken. The proposed options are provided by considering only the sensitivity of the environment around the proposed site, and the authorities may view the suggestions and can arrive at the final decision.

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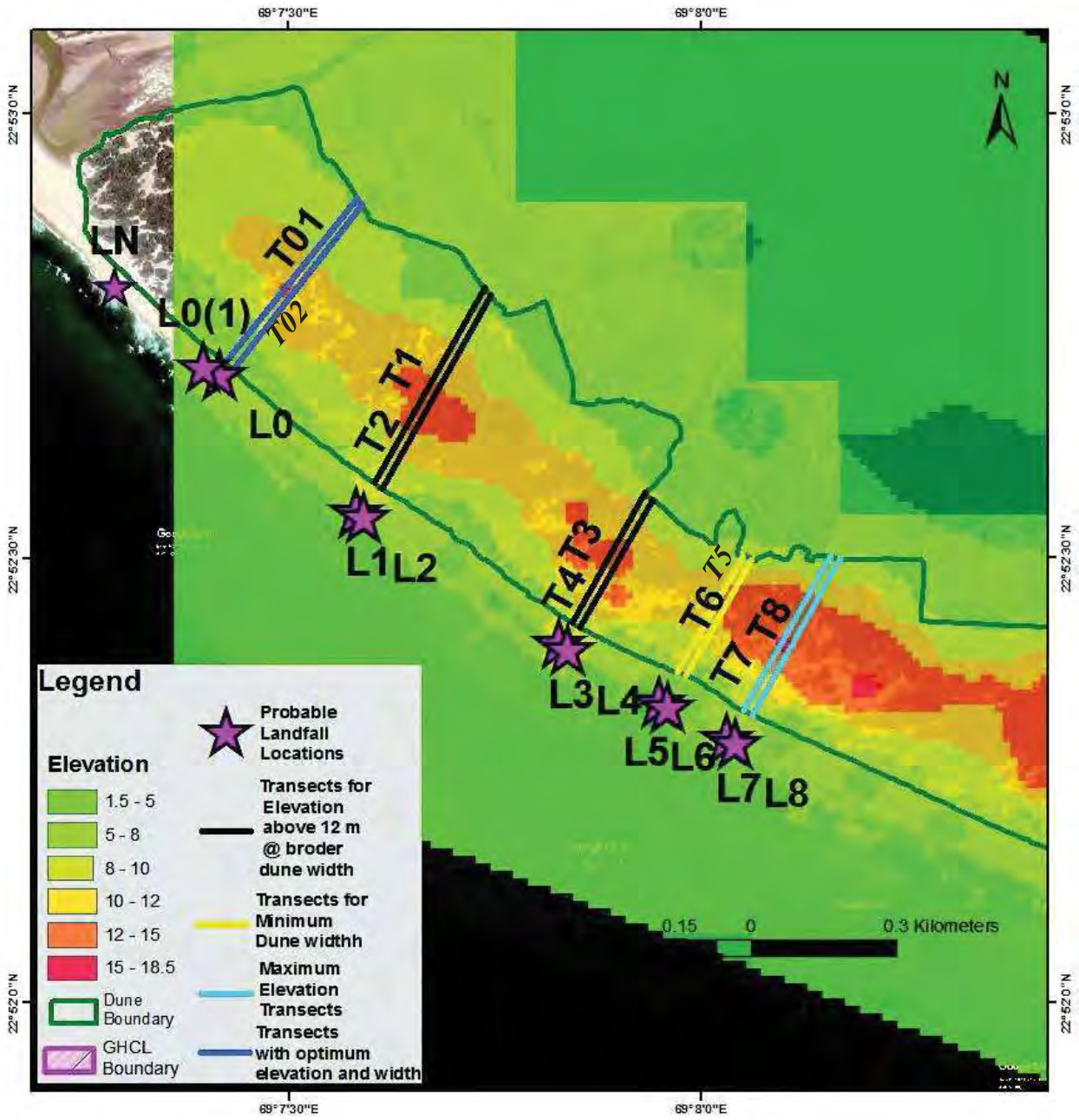


Figure 4.3.2 Landfall points based on dune characteristics

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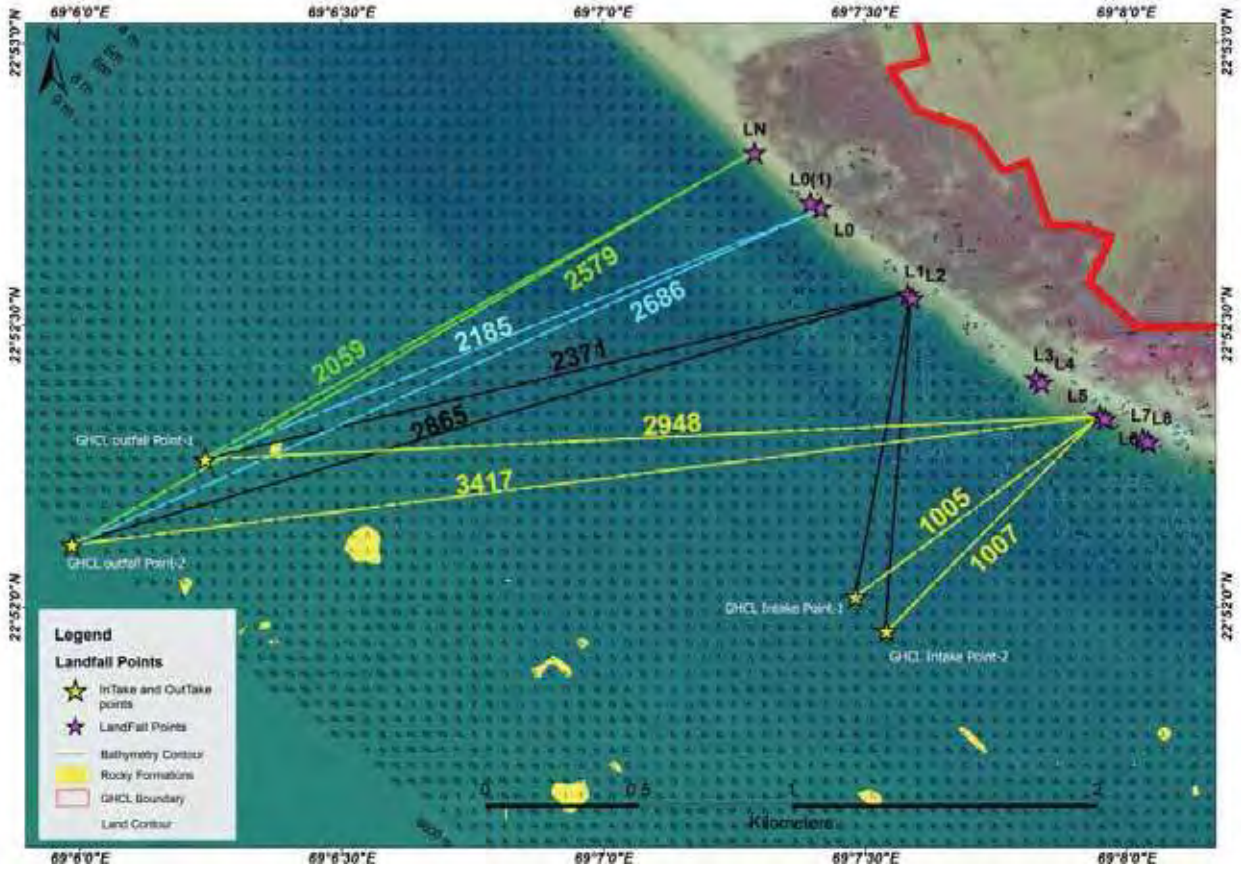


Figure 4.3.3 Coastal bathymetry,landfall, intake,outfall points of the proposed site

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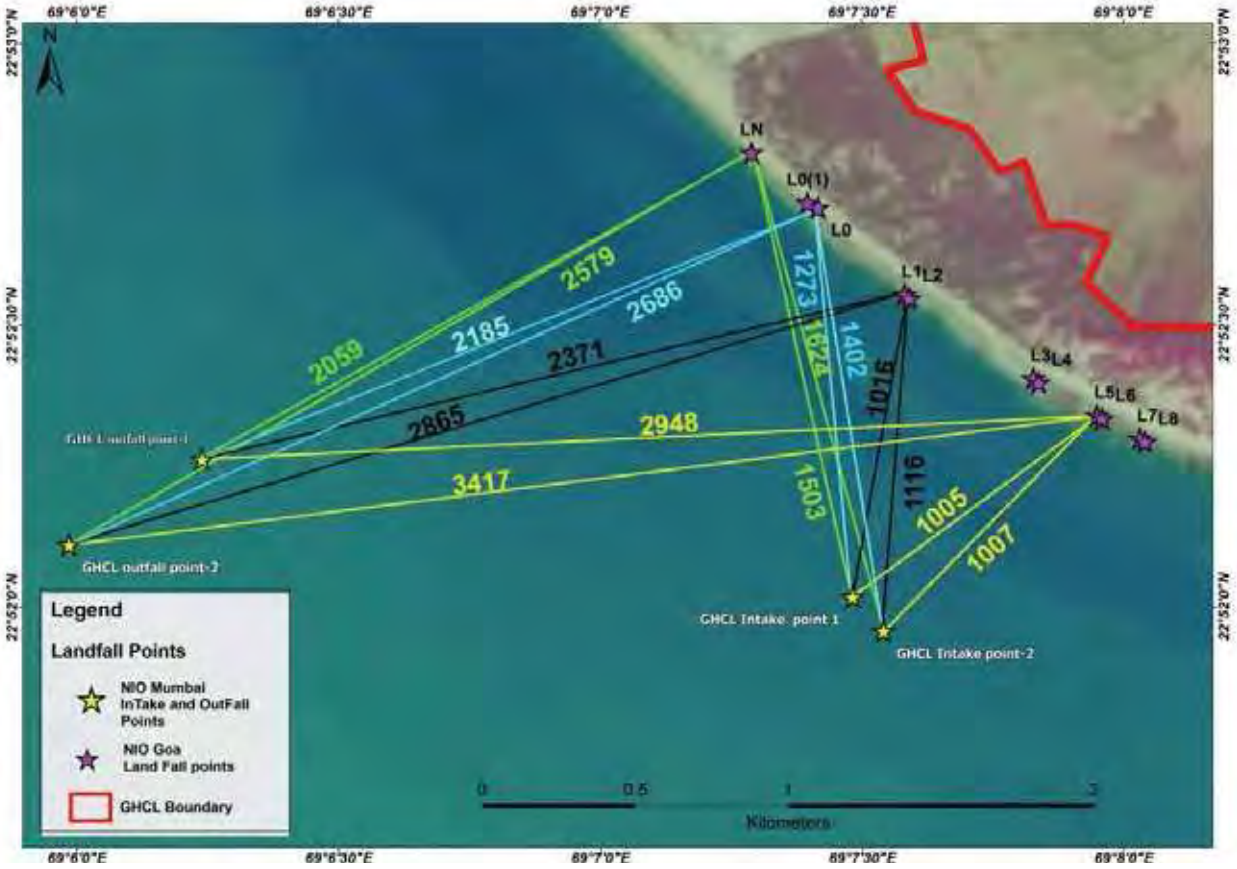


Figure 4.3.4 Distance between intake and outfall points and the suggested landfall points for the proposed site

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Table 4.1 Details of transects in the dune area for the proposed pipeline corridor

Transect	Transect Length / Dune Width (m)	Associated Landfall Point	Co-ordinates at Landfall Point	Reference boundary	Maximum Height along the Transect (m)
TN1 TransID-321	449	LN	69° 7' 19.00"E 22° 52' 49.06"N	69° 7' 33.12"E 22° 52' 56.77"N	8
T01 TransID-314	425	L0(1)	69° 7' 25.53"E 22° 52' 43.52"N	69° 7' 34.96"E 22° 52' 54.31"N	12.5
T02 TransID-313	425	L0	69° 7' 26.05"E 22° 52' 42.99"N	69° 7' 35.31"E 22° 52' 53.80"N	12.5
T1 TransID-300	466	L1	69° 7' 36.14" E 22° 52' 35.10" N	69° 7' 44.16"E 22° 52' 48.23"N	12.5
T2 TransID-299	460	L2	69° 7' 36.70" E 22° 52' 34.68" N	69° 7' 44.63"E 22° 52' 47.63"N	12.5
T3 TransID-275	311	L3	69° 7' 50.60" E 22° 52' 25.66" N	69° 7' 55.82"E 22° 52' 34.27"N	12.5
T4 TransID-274	305	L4	69° 7' 51.19" E 22° 52' 25.27" N	69° 7' 56.41"E 22° 52' 33.84"N	12.5
T5 TransID-263	274	L5	69° 7' 58.16" E 22° 52' 22.26" N	69° 8' 02.91"E 22° 52' 30.01"N	12

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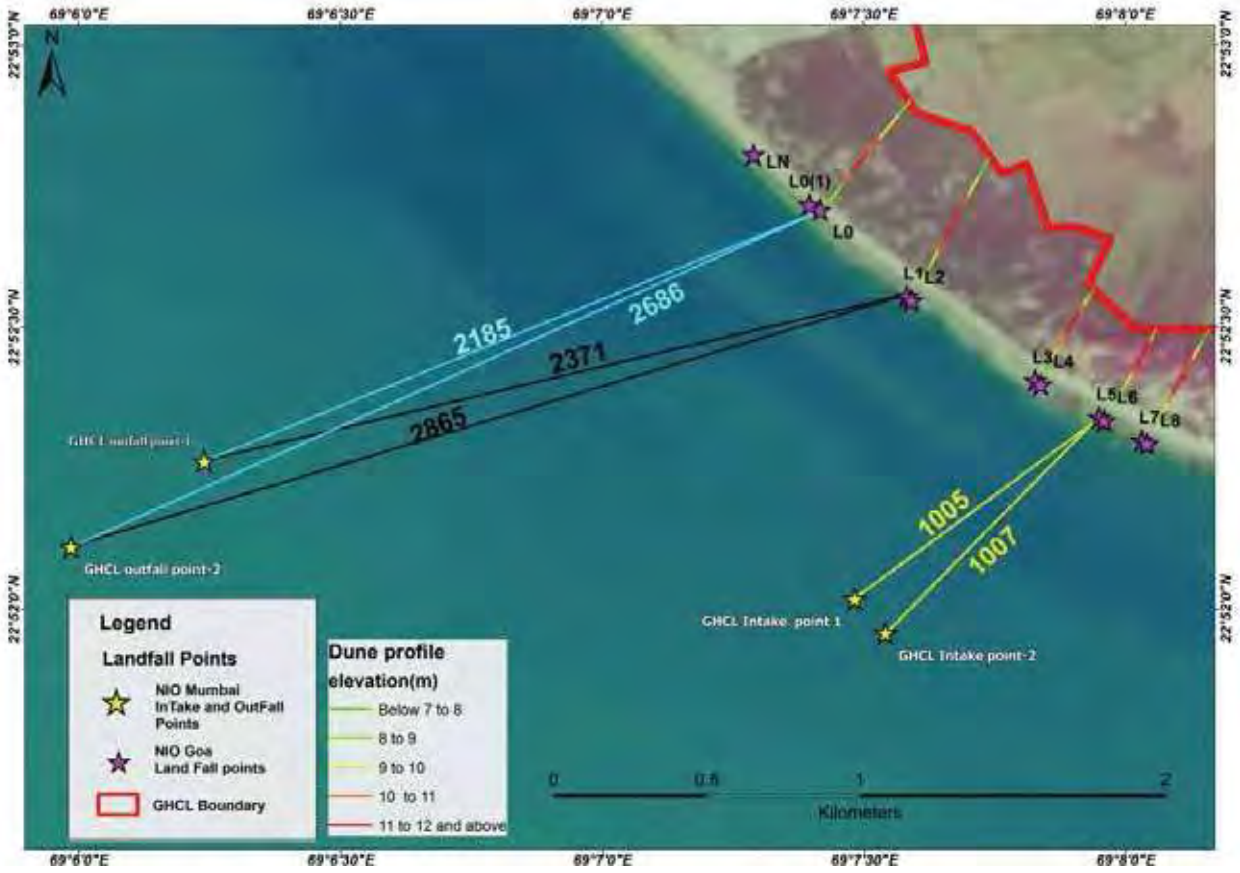


Figure 4.3.5 Dune passage to landfall points and landfall points to suggested Intake and Outfall points passage

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5. Conclusion and recommendations

- The Vengadi river discharge mouth, which was considered for the pipeline corridor, has not undergone significant morphological changes from 2008 to 2018.
- This study exhibits that the river mouth opened up only in the years 1988 and 1990, but the reasons could not be ascertained. After the construction of the tidewater barrier in 2005 across the river, river mouth has not been breached either by river water or by tides.
- Due to this, the river mouth is so stable that there is no inflow or outflow through this mouth observed. Hence, the option of considering this river mouth for laying the buried pipelines may be considered if dredging of the mouth is approved by the concerned authorities during the construction stage. It may refill again, as evidenced in the past. The risk of pipelines exposed may not be ruled out in case of any natural disaster, where appropriate precautionary measures should be taken at the planning stage. In this option, the outfall points are at 2045m and 2568m distance in the sea from the river mouth. But, the problems of bringing the pipelines upto the river mouth need to sort out.

- The economics of laying longer pipelines and two tunnellings in the dune stretch may be considered, and the optimum decision may be taken. As the shorter distance points (L0, L0(1), L1, L2, L5, L6) are available, it is recommended to prefer those points.
- The approximate area of this dune stretch is 302 ha. The dune extends from northwest to southeast for a length of 6.8 km without any break. If there would have been a break, it could have been used as a natural passage. The maximum observed width of the dune was 821 m, and the minimum observed width is 7 m. Dune height extends from 1.5 m to 18.5 m. Three different patches of dune reach up to 18.5 m.

- It is observed through digitization of historic shoreline that no significant erosion has occurred along the entire stretch of the Bada coast. This indicates that this coast has been stable for a long time. The proposed LF points are lying on the stable coast of this region.

- Based on the dune characteristics, vicinity of the project site, intake and outfall points, the stability of the coast, ten transects and corresponding landfall points were

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analysed individually. Based on this, L5 & L6 may be the better landfall points for the suggested intake and L0,L0(1), L1&L2 for outfall points. Intake point is around 1005 &1007 m , outfall is around 2185 & 2686 m from L0 &L0(1), and 2371& 2865 m away from L1&L2 respectively. Dune width is about 275 m from the L5 to the project plot boundary. Dune width is 425m, 425m, 466m and 466m in between the L0(1), L0, L1 &L2 respectively, to the plot boundary. The corresponding transects T01, T02, T1, T2, T5&T6, may be explored in detail for the alternate means of laying the pipeline such as tunnelling, etc.

- The minimum and maximum range of SSC at the intake point was 2.48 mg/l and 27.12 mg/l respectively during 1999-2003. The variations of SSC at intake point is due to various reasons. Values of SSC should be considered while planning the seawater intake and effluent disposal system.
- GHCL may conduct proper EIA study for predicting and mitigating impacts due to project activities and take all necessary environmental approvals from state and central environmental authorities for the project.

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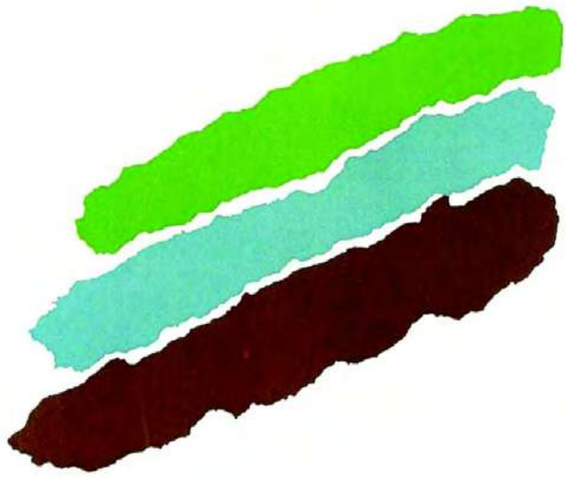
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Marine EIA/EMP for Seawater Intake and Effluent Disposal for Greenfield Chemical Complex off Bada coast, Arabian Sea

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December 2020



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December 2020

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EXECUTIVE SUMMARY

Introduction

M/s. GHCL Limited was incorporated in October, 1983. The company has established itself as a well-diversified group with an ascertained footprint in chemicals, textiles and consumer product segment. In chemicals, the company mainly manufactures Soda Ash (Anhydrous Sodium carbonate) that is major raw material for detergents and glass industries and Sodium bicarbonate (baking soda) which is mainly used in Food industry. To meet growing demand for Soda ash it now proposes Greenfield Chemical Complex with Soda Ash (11,00,000 TPA), Dense Soda Ash (5,00,000 TPA), Sodium bicarbonate (2,00,000 TPA) manufacturing plants supported by utilities like captive co-generation power plant (120 MW), seawater intake and effluent disposal system, RO-DM system and associated infrastructure at Village Bada, Taluka Mandvi, District Kutch, Gujarat. GHCL had signed an M.O.U in January, 2017 during Vibrant Gujarat Summit, 2017 for Greenfield Chemical Complex in the District Kutch of Gujarat state.

The Soda Ash process along with captive co-generation power plant in totality requires huge quantity of cooling water. The seawater requirement of about 16 x 10^5 m^3/day for process cooling, RO/DM plant, domestic use, utilities and dilution requirements etc. would be met from seawater from the Arabian Sea coast in proximity to the project location. The diluted combined effluent of about 15.8 x10^5 m^3/day generated from process, brine preparation/purification rejects, RO/DM plant rejects, utility rejects etc. after dilution with return cooling water/fresh seawater would be released at an appropriate location in the marine coastal zone of Arabian Sea meeting norms specified by Gujarat Pollution Control Board (GPCB)/ and/or Central Pollution Control Board (CPCB).

As per the Ministry of Environment Forests & Climate Change (MoEF&CC), Government of India (EIA), notification dated 14th September 2006 and Coastal Regulation Zone (CRZ) Notifications 2011 and 2019 Marine Environmental Impact Assessment (MEIA) study is required to be carried out for the proposed project. The main purpose of the report will be to establish baseline data, prediction of impacts and

suggests the measures required to minimize adverse impacts likely to be caused by the project activities on marine ecology.

M/s. GHCL limited had approached CSIR-NIO to assess the impacts (if any) of proposed project/activity on marine environment off Bada, Gujarat. Accordingly, baseline oceanographic data were collected during October, 2018 and March, 2019 by CSIR-NIO covering an area of more than 10 km^2 around the waters off Bada, Gujarat to meet the following objectives:

Objectives

a) To evaluate the prevailing hydrodynamics and ecological status off Bada coast.
b) To suggest suitable location for intake and mode for pumping seawater.
c) To suggest suitable location and mode of discharging of effluent.
d) To assess impact of seawater intake and outfall on coastal ecology.
e) To recommend suitable environmental management plan to Minimize any adverse impact on marine biota.

Project description

This section contains information regarding process, seawater intake system, quality and quantity of the effluent, effluent disposal system etc. as provided by M/s GHCL limited. Soda Ash (Na_2CO_3) is classified as a heavy chemical. The major raw materials for Soda Ash are salt and chemical grade limestone. Process requires uninterrupted supply of utilities such as steam at various pressures, electric power, seawater for cooling, freshwater for process etc. The dry liming energy efficient process will be used for manufacturing Soda Ash. To meet power and steam demand an integrated captive cogeneration power plant is proposed. Process being exothermic requires large quantity of water for process cooling requirement, seawater based once through cooling is necessary. Seawater intake system and effluent disposal system are proposed to meet the water requirement and effluent dispersion.

The proposed project site is located near Village Bada in Mandvi Taluka, District Kutch, Gujarat. It is located about 70 km from district headquarter Bhuj, 25 km from Mandvi. It is geographically located at the Arabian Sea coast off Bada village. The nearest broad gauge railway station and airport are at Bhuj. The road connectivity of Bada village is through NH 41 which is connecting Mandvi and Naliya. The nearest sea port is at Mundra about 70 km. The proposed project site is identified after evaluating 5 alternative sites based on various environmental parameters. The Soda ash manufacturing with Captive power generation requires huge quantity of water for cooling; this calls for site selection near to the sea coast.

The market of soda ash in India is anticipated to cross $2.8 billion by the end of 2025. Growing demand for soda ash from numerous industries such as glass, soap & detergents, pulp & paper, etc., is expected to drive the India soda ash market The Greenfield Chemical Complex is proposed to set up Soda ash and Sodium Bicarbonate manufacturing plants to achieve additional capacities. India's glass industry stood at USD3.9 billion in 2015, and the industry is forecast to grow at a CAGR of 13% during 2016-2025. Globally, glass industry accounts for more than 60% of soda ash consumption. However, in India detergent industry is the largest consumer. The detergent market is one of the segment of the FMCG market in India that has high growth potential. Increasing rate of modernization and improving living standards of consumers are positively influencing the demand for soda ash. The Soda Ash per capita consumption in India is 2.8 Kg only. If India has to reach to the level of per capita consumption of a developed nation, which is approximately 17 Kg of Soda Ash then addition of capacity is must.

The Soda ash manufacturing process being exothermic in nature large quantity of seawater which needs to be drawn from the nearby Arabian sea. As no sweet water source is available in project area which support uninterrupted water supply to process plants and utilities it is required to set up RO DM plant for making sweet water from seawater. The effluent from process plants and utilities required to be disposed off at a suitable location where effective dilution is available for dispersion. Thus, to meet the overall water requirement for proposed project seawater intake and effluent disposal is proposed for the Greenfield Chemical Complex.

On implementation of the proposed project, around 1,200 Nos of suitably qualified people direct employment to take place. Further, there will be also indirect jobs and business opportunities to the local people such as daily wage labourers, transporters and raw material suppliers. This may be of the order of 3,000 people. The project would increase and generate opportunities for ancillary and auxiliary business at the local and regional levels too.

Soda Ash: Soda ash (Na_2CO_3) is manufactured by the reaction between sodium chloride and limestone with ammonia as an intermediate carrier. The major steps involved in the process are as follows: (a) Brine purification in which the saturated brine is treated with soda ash and milk of lime to remove residual impurities. (b) Limestone calcination whereby limestone is mixed with coke and charged to lime kilns to produce CO_2 and CaO. Part of CaO is hydrated with sweet water to make milk of lime for treatment of brine. Major part of lime is ground and fed to Prelimer for release of ammonia. (c) Ammonia is absorbed in purified brine in absorber and thereafter CO_2 from compressors is fed in carbonation columns to obtain crude sodium bicarbonate as a solid phase which is filtered and decomposed to Soda Ash (Na_2CO_3) in calciner.

The filtrate containing NH_4Cl is reacted with $Ca(OH)_2$ in prelimer stills to recover NH_3 in ammonia still which is recycled. Ammonia still discharge is the major effluent from soda ash industry. This effluent contains high concentration of inorganic non-toxic solids and liquid is rich in salts with traces of NH_3. About 300 to 500 kg of solids are produced per tonne of soda ash manufactured. The effluent after removal of NH_3 is diluted with return cooling seawater to meet disposal norms of GPCB/CPCB.

Power plant: Circulating fluidized bed combustion (CFBC) technology will be adopted for the proposed captive power plant. A 120MW captive co-generation power plant consisting of Double extraction cum condensing turbo-alternator and required capacity lignite/coal/pet coke based CFBC Boilers; along with captive power plant machineries will be installed in order to meet internal steam and power requirement.

Studies conducted

The oceanographic investigations were conducted at 11 subtidal and 3 intertidal transects during October-November 2018 (postmonsoon) and March 2019 (premonsoon). The analyses were performed as per recommended oceanographic procedures.

Model studies

Predictions on dilution and dispersion of pollutants, SS transport and bed level changes were done on the basis of 2D models.

Prevailing marine environment

The coastal area off Bada in an area of about 180 km^2 was investigated for its environmental characteristics such as physical processes, water quality, sediment quality and biological characteristics. The status was evolved for 2 seasons namely postmonsoon and premonsoon during 2018-19.

Water quality

The average water temperature varied in accordance with the air temperature and was generally below 30°C. The average pH was between 7.9 and 8.4 and was in the range of seawater pH. The average SS varied (25-137 mg/l) as the sea bed is uneven rocky or sandy. Turbidity varied (1.1-53.1 NTU) in accordance with SS. High average salinity (37.5-38.1 ppt) indicated particular characteristic of the area between Okha and Jakhau where evaporation exceeds precipitation. The water was well mixed vertically as well laterally.

DO content, a vital water quality parameter influencing the health of aquatic biota, was in excess of 5 mg/l indicating the area well oxygenated. Consequently, BOD of the coastal water was low (av 0.7 – 2.9 mg/l). The average concentrations of PO_4^{3-}-P (0.1 – 2.5 µmol/l) and NO_3^--N (1.5 – 7.0 µmol/l) were in the range expected for the coastal area. Low levels of NH_4^+-N (av 0.4 – 1.8µmol/l) and NO_2^--N (av ND-0.5 µmol/l) indicated good oxidizing conditions in water.

The average concentrations of PHc (2.4 – 15.6 µg/l) and phenols (17.0 – 48.2 µg/l) were low and in the range commonly encountered in uncontaminated coastal waters.

The prevailing water quality off Bada compared well with that of the coastal waters off Okha and Jakhau which are adjacent to the study are.

Sediment quality

The surface sediment of the study area had variable texture but generally subtidal area dominated by silt. The subtidal as well as the intertidal sediments off Bada indicated considerable variation of trace metals but their values indicate lithogenic origin in the region and there is no indication of build-up of heavy metals in the region.

The Corg (<1 %; dry wt) and phosphorus (448 - 1841 µg/g; dry wt) contents in sediments were low and represented the baseline. The concentrations of PHc (0.1 – 0.3 µg/g; wet wt) in the sediment were also low and revealed uncontaminated status of the sediment with respect to PHc.

The prevailing sediment quality of the nearshore for premonsoon was comparable with that of the coastal waters off Okha and Jakhau.

Flora and fauna

Bacterial count like TVC in water and sediment was low and without any specific trend. Pathogens were rarely noticed suggesting clean and natural coastal system off Bada.

The concentration of chlorophyll a in the coastal water (0.4 – 1.4 mg/m^3) indicated variable and patchy phytoplankton biomass. The concentration of phaeophytin (0.1 – 0.9 mg/m^3) was low. The phytoplankton population was variable in accordance with the trend in phytopigments. Overall, 42 genera were recorded in the region with the common occurrence of Cylindrotheca, Navicula, Pseudo-nitzschia, Thalassiosira etc.

Mangroves were absent along the Bada coast. The intertidal rocky region however sustained marine algal species and well-established sand dunes are bordering the seashore of Bada region. The sand dune flora was dominated by babul and grass vegetation.

The zooplankton standing stock in terms of biomass (0.2 – 20.2 ml/100m^3) and population (1.4 – 193.3 × 10^3 no/100m^3) was indicative of an overall moderate secondary production and varied widely. The composition of zooplankton was fairly diverse and consisted mainly of copepods, decapods larvae, Chaetognaths and lamellibranchs. Overall 24 faunal groups were identified. Fish eggs and fish larvae though at a low percentage, occured in majority of the zooplankton collections. Decapod larvae occured in all zooplankton samples.

The intertidal macrobenthic standing stock in terms of population and biomass varied from 0 to 8150 no/m^2 and from 0 to 182.5 g/m^2; wet wt respectively. The fauna was mainly constituted by polychaetes and amphipods. The faunal group diversity varied between 0 and 15 groups. The subtidal benthic macrofaunal standing stock in terms of population and biomass varied from 0 to 1925 no/m^2 and from 0 to 6.04 g/m^2; wet wt with poor faunal group diversity (0 - 15 no). The faunal composition indicated overall dominance of Amphipods followed by Polychaetes.

The region has no established trawling grounds for fishery operations due to uneven bottom topography associated with rocky zones, hence, the trawlers operated at other areas for fishing. December to May is the peak fishing period while the period from June to August is the lean season. The common fishes in the landings of the Kutch District were Shrimps, Bombay duck, Small scieniedes, Coilia, Other clupeids, cat fish, Ribbon fish and Jew fish.

The Bada region does not sustain reef building corals as the intertidal area is largely sandy though intermittent rock exposures are there. Extensive survey was conducted during October, 2018 and March, 2019 in the intertidal regions of the proposed project area and corals were not sighted in the project area. The area is devoid of mangroves.

Reptiles

In the Gulf, the reptiles are mainly represented by marine turtles *Chelonia mydas* and *Lepidochelys olivacea* which have their breeding and spawning ground on the sandy beaches along the coast as well as on the islands particularly along the southern Gulf. No turtle however was sighted off Bada during `the study period.

Mammals

The mammals are chiefly represented by dolphin (*Delphinus delphis*), whale (*Balaenoptera* spp) and Dugong (Dugong dugon) in the Gulf especially along the Jamnagar coast. Whales and Dugong were not sighted in the study area during the study period. However, Dolphins were found sighted during field study in offshore regions.

Avifauna

The Bada coast offers different marine habitats like rocky and sandy intertidal areas for a variety of resident and migratory birds. The birds use these habitats as their active feeding ground especially during low tide. A total of 28 bird varieties were spotted during the field work from the study area. The most common birds recorded are herons, crows, cormorants, Plover, egrets, etc from the project vicinity.

Physical processes

During post monsoon season, the maximum tide was 4.06 m with an average of 2.4 m and during pre-monsoon season maximum tide was 3.5 m with an average tide of 2.46 m.

During the observation, the maximum current speed was 117 cm/s with an average of 62 cm/s in October 2018. Similarly, the maximum current speed was 35 cm/s with an average of 18 cm/s observed during March 2019 campaign. Most of the time, the current direction during flood phase was around 100^0 while that was around 300^0 during ebb phase in October 2018 as well as March 2019. The

direction varied between 100 to 300° which shows that the effluent possibly moves along the coast.

Modeling studies for marine facilities

GHCL proposes to establish marine facilities namely seawater intake and effluent disposal in the coastal waters off Bada. The suitability of these sites has been studied by using the numerical models. They are described below.

Hydrodynamic modeling

Numerical modeling was done using Hydrodyn-FLOSOFT, HydrodynPOLSOFT and Hydrodyn-SEDSOFT software for prediction of tides and currents; dilution and dispersion processes in marine areas; and sediment transport in tidally driven zones. The model runs were made for a period of 15 d for different seasons. The comparison of the observed and the computed tides as well as current components indicated good agreement between the two.

Seawater intake

It is proposed to withdraw seawater from the Arabian Sea by gravity through a submarine pipeline.

a) Locations of intake: It is proposed to establish the seawater intake site at one of the two sites given below.

IT1: 22°52'01.07"N; 69°07' 28.9" E (depth 3.3 m below CD). IT2: 22°51'57.44"N; 69°07' 32.44" E (depth 3.63 m below CD).

b) Behaviour at intake: From the model studies, it can be concluded that no significant changes in flow regime are expected due to continuous with-drawl of seawater at intake IT1 and IT2.

Effluent release

It is proposed to release the effluent at the bottom in the Arabian Sea through a submarine pipeline.

a) Locations of release: It is proposed to release the effluent into the sea at two sites given below.

OF2_1: 22°52'15.79"N; 69°06'14.35"E (depth 9.47 m below CD),

OF2_2: 22°52'6.65" N; 69°05' 59.08"E (depth 10.71 m below CD)

b) Behaviour of effluent: The effluent if released at OF2_1 and OF2_2, the levels of critical parameters in the effluent around the location and small central patch namely temperature: 5° C above ambient, SS: 1000 mg/l and ammoniacal Nitrogen as N: 50 mg/l attain the ambient levels of temperature: 28°C, SS: 93 mg/l and ammonia: 0.047 mg/l at 300 m (max) distance from the outfall.

Free form of ammonia is toxic to some marine organisms at low concentrations. The concentrations of ammonia predicted at OF2_1 and OF2_2 would be higher than the natural levels in a very narrow distance of disposal. However, at the ambient pH of seawater much of this ammonia is expected to be converted to NH_4^+-N, the form in which it is non-toxic to marine organisms.

Based on the results of numerical modelling it can be concluded that the water quality of the coastal area off Bada would not deteriorate with respect to temperature, SS and ammonia beyond 300 m distance from the outfall except in the immediate vicinity of the outfall where the temperature, SS and ammonia would be relatively higher but in the range considered tolerable to marine biota.

The bed level changes due to release of SS of 1000 mg/l from the effluent would be 0.002 - 0.028 m (max) at the outfall with no significant variation in the rate of erosion/deposition for both the locations. The deposited SS in the vicinity of the outfall would be advected to settle over a large area as the fine-grained SS erodes. This would reduce in time as the seabed gets re-established itself to a new hydraulic regime. In short term however there is a possibility of siltation due to continuous discharge of the effluent.

The output clearly shows that behaviour of the effluent released at OF2_1 and OF2_2 was similar. Also, the ambient condition would attain within 300 m (max) in both the cases. Presence of soft mud at OF2_1 and OF2_2 negates the

possibility of presence of subtidal corals. Hence both the locations are recommended suitable for the effluent release.

C) Near-field dilution: Based on the results of the Buoyant / Forced-Jet Model, it is suggested that the effluent should be released with a minimum initial jet velocity of 3.01 m/s through a 20 port diffuser at 9.47 m and 10.71 m below CD depth above 0.5 m from the bottom. As the effluent plume descends through the water column, it would attain initial dilution by 30-40 times.

Potential marine environmental impacts

Seawater intake

a) Scheme: The alignment for IT1 and is selected on the basis of lesser area and volume of excavation required to lay the pipeline and consequent reduction in benthic losses due to shorter length. Since the alignment corridor is devoid of mangroves and corals, their destruction due to the development is unlikely. The gradient of the buried pipeline will be so maintained that the seawater flows at a constant rate under gravity.

b) Potential marine environmental impacts: Major potential negative marine environmental impacts due to the proposed activities would be largely associated with (a) construction phase of laying of the intake pipelines and b) operational phase due to circulation pattern, changes in erosion-deposition processes, as well as impingement and entrainment of biota.

i) Construction phase: Adverse impacts of the proposed project on the marine environment during the construction phase could be due to modifications in the hydrodynamic characteristics of the area, degradation in water and sediment qualities and consequent impact on biota depending on the construction methodology selected and duration.

Hydrodynamic characteristics: As the trenching and burial of the pipeline would be across the intertidal zone with a sandy beach and subtidal zone with hard substratum, the construction if not conducted in a stipulated time and planning, there can be minor and local erosion both sides of the trench due to non-

compacted sand moving into the trench. However, due to the limited length of the trench and shallow excavation, this would not be significant. Apart from this, the coastal dynamics are unlikely to be influenced by the construction activities.

Water quality: The bed sediment disturbed at the excavation site would generate SS which may remain in suspension for some time at the construction site. However, considering the sandy nature of the sediment it is expected to settle fairly quickly. The impact would be localized, temporary and confined only to the construction phase of trenching, pipe laying and trench filling.

Sediment quality: Since the area that would be disturbed is small, the excavated sediment volume is unlikely to cause change in the sediment texture on a wider area of the seabed excepting in the close vicinity. Such impact would be negligible.

Flora and fauna: Construction activities in the corridor areas would influence the local biotic communities, particularly the macrobenthos along the corridors selected for laying the pipeline. As the sediment is not enriched in C_{org}, its suspension in the water column is unlikely to deplete DO in this dynamic marine area and DO availability would not constrain the biotic processes. The danger of biota getting exposed to pollutants released from the sediment interstitial water when the bed is disturbed, is low. The nearby zone are devoid of mangrove vegetation and corals. Hence, there would be no impact on these habitats.

The impact of turbidity due to enhanced levels of SS if any, would be local and temporary with the phytoplankton community structure remaining more or less unaltered as the enhancement in turbidity during the activity is expected to be low.

Since the pipe line through Sand duneswill be through tunnelling, the loss of sand dunes is not envisaged.

Miscellaneous: The aesthetics of the coastal zone off Bada would deteriorate temporarily due to the presence of construction machinery, materials and leftover solid waste.

c) Flora and fauna: Biological characteristics should be assessed based on primary productivity, phytopigments, phytoplankton populations and their generic diversity; biomass, population and group diversity of zooplankton; biomass, population and group diversity of benthos; seaweeds and fish quality.

Costs for Implementation of EMP

A provision of Rs. 10.0 million to be earmarked for the biodiversity management plan to be implemented in the project area during construction phase and operation phase.

For periodic monitoring of the marine area environment during project construction phase (considering 2 years), a provision of Rs. 5.0 million to earmarked. For operation phase, Rs. 3.0 million per year to be kept provision for the monitoring.

MARINE BIODIVERSITY CONSERVATION AND MANAGEMENT PLAN

Although maintenance of biodiversity cannot be the only goal for ecosystem-based management, it could provide a common currency for evaluating the impacts of different human activities on ecosystem functioning and can act as a critical indicator of ecosystem status. A management regime based on social acceptance, with the power of moral persuasion from within the group of participants, is the only way to manage widely dispersed resources which are shared by a multitude of small and large users.

Mitigation Measures

Mitigation measures are most successful when they are considered from the outset of the project rather than as a later stage solution to an identified problem. This can allow the design of the facility to include solutions to potential environmental problems rather than finding a solution, which fits with the design. Mitigation measures should therefore be considered from the outset of the project and discussions on the appropriate mitigation measures will likely to continue after submission of the Environmental studies as planning conditions are agreed upon. An appropriate specialist who has assessed the impacts usually suggests mitigation measures.

Mitigation can take varying forms including, in order of Best Practice, first:

A. **Avoidance –**This would require the project to be designed or the site selected to avoid any environmental impacts.

B. Reduction –This can be achieved by the addition of mitigation measures such as bunding, screening, or applying abatement technology;

C. Compensation – Where impacts have been unavoidable this method can be used and can involve the improvement of a related environmental issue for example replanting of a deforested area in an alternative location.

D. Remediation –This option would involve the cleanup and restoration of an area where the environmental impact is unavoidable; and

E. Enhancement –This method involves the improvement of the site beyond the existing baseline.

A management regime based on social acceptance, with the power of moral persuasion from within the group of participants, is the only way to manage widely dispersed resources which are shared by a multitude of small and large users. A national approach to address broad-scale threats to marine biodiversity requires effective management regimes that engender industry and community support.

Development of Plan

Improvement of baseline information

Methods and systems for the effective and efficient collection and utilization of information will be considered for a systematic accumulation of information and knowledge regarding marine biodiversity. Marine areas of particular importance for conserving biodiversity will be identified based on scientific knowledge.

Implementation of measures

Measures for conservation and sustainability of marine biodiversity will be implemented in accordance with the characteristics of the existing ecosystems and other significant influencing factors present in the nearshore coastal water.

Identification of factors and implementation of measures

To promote conservation of marine biodiversity and its sustainable use appropriately, causes of the problems and those responsible for actions to reduce their impacts will be identified. Measures will be conducted with methods and procedures suitable to solve these problems, under cooperation among relevant parties.

Enhancement of pristine areas

Designation of conservation zones in the area will be promoted appropriately using the existing systems to improve the local marine biodiversity in the region. For conservation and sustainable use of marine biodiversity, a concept of effective networking will be considered, and if required, an independent system will be considered as well.

Stakeholder's involvement

Scientific information and knowledge regarding the current status of marine biodiversity and its importance to humankind will be educated to the public. To establish a network for cooperation and coordination among various agencies, and awareness of conservation and sustainable use of marine biodiversity through social activities will be increased.

Significance of managing and conserving marine biodiversity:

Marine biodiversity broadly promotes the provision of marine ecosystem functions, including those critical to human survival and well-being.

Conservation of marine biodiversity increases the likelihood that marine ecosystems can continue to provide various services and serves as a hedge

against environmental change, increasing the chance that ecosystems can adapt and recover following disturbance.

Conserving marine biodiversity should become a common aim of marine as well as coastal ecosystem-based management for all agencies involved in regulating the marine environment.

Management for marine biodiversity may have to rely on, in part, on the management of surrogates, such as habitat types, population size, and related biodiversity characteristics.

Fishery management

The goal of this fishery management plan is to guide and manage fishing vessels inland waters in accordance with the principles of ecologically sustainable development. This includes maintaining fishing at sustainable levels, protecting habitats and aquatic environments on which fisheries resources depend and maintaining and where possible improving the social and economic benefits to all fishing community.

Biodiversity monitoring plan

The plan aims to create an enabling integrated coastal and marine biodiversity management and protection, and to mainstream marine and coastal biodiversity into national plans and coastal zone management plans, with particular focus on biodiversity. As such, it provides an opportunity to coordinate with past and new initiatives in the region to address gaps in assessments, and seek sustainable and economically viable policy and technological options for the protection of key marine and coastal biodiversity to be included in coastal zone management plans and integrated into national plans. General monitoring is needed to prevent the loss of existing biodiversity of the region.

Marine Biodiversity Conservation Plan

The conservation and restoration measures can be taken up individually by the project proponent and also can be carried out by constructing a consortium with all the adjoining industries. These measures should be executed in

collaboration and consultation with the experts in the field and authorities responsible as per the jurisdiction. The national and regional conservations efforts can also be supported as far the buffer zone is concerned. Several international bodies also carry out many conservation and restoration programs as well as the local and regional organization that are well versed with the present study area.

Environmental management cell (EMC)

Apart from having an Environmental Management Plan, it is so also necessary to have a permanent organizational set up charged with the task of ensuring its effective implementation of mitigation measures and to conduct environmental monitoring. Identify and list out environmental aspects due to the operation of the proposed project

The EMC's responsibility for implementing the EMP requires regular interaction with the environment regulatory authorities such as GPCB, GCZMA, MoEF & CC and the Indian Coast Guard.

Audits and inspections

EMC will be responsible for implementing Compliance Assurance activities, namely environmental audits. Internal audits and reviews of environmental procedures shall be conducted annually. Third party audits of environmental procedures shall be conducted periodically.

Project benefits

The Indian Subcontinent is one of the world's fastest growing Soda Ash markets, driven by India's booming economy. The Soda Ash per capita consumption in India is 2.8 kg only. If India has to reach the per capita consumption as of developed nations, which is approximately 17 Kg of Soda Ash then addition of capacity is must. The proposed project will cater to the growing demand of Soda ash and Sodium bicarbonate which is used in diversified sectors and industries ranging from chemicals, construction and FMCG. It will create direct and indirect employment generation during, planning, construction and operation phase of the project. This will lead to employment and uplifment of scio economic

activities and status in the region. It will also create supporting industries/businesses related to logistics, supply chain, manpower supply, construction equipments, hotels etc.

Recommendations

It is recommended that M/s GHCL can withdraw 16,00,000 M^3/day of water from two intake locations (IT1: 22º 52’ 1.07’’N; 69º 07’ 28.96’’E and IT2: 22°51’57.44” N; 69°07’32.44” E).

The disposal of 15,80,000 M^3/day of effluent at two out fall locations OF2_1: 22°52'15.79"N; 69°06'14.35"E (depth 9.47 m below CD), OF2_2: 22°52'6.65" N; 69°05' 59.08"E (depth 10.71 m below CD) will not impact the marine environment. The GHCL has to take approval from concerned authorities before commencement of the work.

3.3 FIELD INVESTIGATION

A total of 12 sub-tidal stations selected for marine environmental investigations during October-November 2018 (post monsoon) and March 2019 (pre monsoon) periods are listed below and shown in Figure 3.3.1 (a & b). Intertidal sediment was sampled along 3 transects at High Water Level (HWL), Mid Water Level (MWL) and Low Water Level (LWL) in the area. The details are given in Table 3.3.

Table 3.3 Geographical positions of the sampling stations around Bada.

Station	Latitude	Longitude	Area
1	22°52’33.97’’ N	69°5’28.13” E	Nearshore
2A	22°51’55.28’’ N	69°6’33.04” E	
4A	22°51’12.35’’ N	69°7’17.72” E	
4	22°51’0.39’’ N	69°8’25.90” E	
7	22°50’25.74’’ N	69°9’48.55” E	
2	22°51’33.44’’ N	69°4’15.46” E	Towards Offshore
3	22°50’21.06’’ N	69°2’48.15” E	
5	22°50’17.05’’ N	69°6’41.14” E	
6	22°49’21.77’’ N	69°4’40.86” E	
8	22°49’13.44’’ N	69°8’20.54” E	
9	22°47’55.60’’ N	69°7’23.38” E	
10	22°47’23.84’’ N	69°4’0.14” E	Offshore
TR 1A	22°52’57.70’’ N	69°7’12.70” E	Intertidal
TR I	22°49’13.44’’ N	69°8’20.54” E	
TR II	22°49’13.44’’ N	69°8’20.54” E	
TR III	22°49’13.44’’ N	69°8’20.54” E	

& (b)). Samples were collected in both the tides (high tide and low tide) with bottom trawl net having a wingspread area of 8 m and cod end mesh size of 10 mm in 1 transect. The duration of fishing was 60 min, timed from the completion of wrap-out to the start of hauling.

The results of experimental trawling conducted at the study area indicated very poor catch rate (av.1.3 kg/h) and species composition (av. 5 species). Major species encountered during the study are *Rastrelligar kanagurta, Harpadon nehereus, Arius sp., Trichiurus lepturus, Thryssa mystax, Parapenaeopsis stylifera* and *Solenocera crassicornis*. The details of the fish catch and species composition during the post monsoon seasons of 2018 is given in the table below:

Period	Catch rate (kg/h)	Species (no)	Species composition
November 2018	1-1.6 (1.3) *	4-6 (5) *	*Rastrelligar kanagurta, Harpadon nehereus, Arius sp., Trichiurus lepturus, Thryssa mystax, Parapenaeopsis stylifera, Solenocera crassicornis*

*Average value

Overall, the above results revealed a poor catch and species diversity from the study area.

3.6.6 Corals and associated biota

The inter tidal area of Bada is sandy in nature. There are some patches of rocky substratum, mainly of sandstone origin were found in the study region, which is extending from the intertidal area to subtidal region. No live reef building hermatypic and non-reef building ahermatypic corals and other types of corals were not observed from the study area. Extensive survey was conducted during October, 2018 and March, 2019 in the intertidal regions and observed some dead coral species, washed ashore. The washed ashore dead coral specimens observed in the beach are dirty and eroded in nature and hence not treated as a fresh coral community. Rocks and exposed sandy beach during October 2018 and March 2019 are presented in Plate 6.

4.5 Discharge of Effluents

The cumulative discharge from the proposed Chemical Complex – Soda Ash effluents will be higher in SS, NH_4^+-N and Temperature as compared with the ambient values as per CPCB/GPCB norms. The critical water quality parameters considered for the modelling study are SS, NH_4^+-N and Temperature for total effluent discharge of 15,80,000 m³/day. The ambient value of SS, NH_4^+-N and Temperature are considered as 93.0 mg/l, 0.047 mg/l and 28˚C respectively.

The details of proposed optional outfall locations and landfall points are furnished in the Table 4.5.1, 4.5.2 and 4.5.3:

Land Fall Point (L0): 22°52' 33.23"N, 69° 07' 34.92" E
(UTM:512936.07 E 2529787.29 N)
Land Fall Point (L6): 22°52' 20.36"N, 69° 07'56.93" E
(UTM: 513589.55 E 2529392.09 N)

However, CSIR-NIO Goa has carried out morphology studies and recommended following LFP corridors L0, L1 L2 for outfall and L5 L6 for intake locations.

After the detailed hydrodynamic modelling studies, three alternative optional outfall locations were identified and to be tested for suitability based on near field and far field dispersion modelling studies. Figures 4.0.1 (a), (b) & (c) show the selected optional outfall locations based on hydrodynamic modelling studies.

In option-1, two locations i.e. OF1_1 & OF1_2 were selected for discharge of effluents 1580000 m³/day continuously. The details of selected locations including the water depth at intake & outfall locations and distance from Land Fall Points are furnished in Table-4.5.1. The distance between OF1_1 and OF1_2 is around 470m and the distance between IT1 and IT2 is around 150m. The distance between intake and outfall locations is more than 2000 m.

The effluent quantity of 1580000 m³/day disposal will be tested with two locations i.e. OF2_1 & OF2_2, which are selected at little deeper than Option-1 locations. The intake locations IT1 & IT2 are selected more than 2000 m. away

from outfall locations. The details of selected locations including the water depth at intake & outfall locations and distance from Land Fall Points are furnished in Table-4.5.2. The distance between OF2_1 and OF2_2 is around 520 m and the distance between IT1 and IT2 is around 150m. The distance between intake and outfall locations is more than 2000 m.

In Option-3, two locations i.e. OF3_1 & OF3_2 were selected for discharge effluents quantity of 1580000 m³/day continuously. The details of selected locations including the water depth at intake & outfall locations and distance from Land Fall Points are furnished in Table-4.5.3. The distance between OF3_1 and OF3_2 is around 201m and the distance between IT1 and IT2 is around 150m. The distance between intake and outfall locations is more than 2000 m.

4.6 Water quality Dispersion Studies

Model study was carried out for predicting dispersion at the Bada to release the treated effluent of 1580000 m³/day generated by M/s GHCL Ltd.

Basic Governing Equation

The basic governing equation effluent transport is solved numerically in predicting the effluent variation at different locations. This equation is coupled with flow equations and solved numerically. The basic governing equations of effluent transport can be written as follows:

$$\frac{\partial}{\partial t}(HC_i)+\frac{\partial}{\partial x}(UHC_i)+\frac{\partial}{\partial y}(VHC_i)=\frac{\partial}{\partial x}\left(D_x H\frac{\partial C_i}{\partial x}\right)+\frac{\partial}{\partial y}\left(D_y H\frac{\partial C_i}{\partial y}\right)$$

where, t = time; C_i = Water Quality Parameter; x, y are Cartesian co-ordinates; u and v are depth averaged velocity components in the x and y directions, respectively; D_x, D_y diffusion coefficients in the x and y directions, respectively; H-total depth of water.

concentration in sea water beyond 300m. The shoreline is not impacted significantly due to the proposed outfall locations for various hydrological and metrological conditions.

4.7.3 Morphological changes

The model has been run continuously for 15 days taking account of neap and spring tide conditions and the morphological changes due to erosion and deposition of the proposed intake and outfall discharges during October 2018 and march 2019. The variation of bed morphology was calculated based on result of sediment rate of erosion and deposition for entire simulation period of neap and spring tide conditions in the study domain during October 2018 and march 2019 for outfall discharge (effluent having 1000 mg/l suspended solids concentration) of 790000m³/day at each outfall point locations OF2_1 & OF2_2 as shown in Figures 4.7.2 and 4.7.3 respectively. From the figure, it can be seen that the variation of bed morphology in the study domain is in the range of 0.002m to 0.028m and also noted that the deposition does not happens at the outfall point location and negligible level of bed level increment around the outfall location OF2_1 and OF2_2. From the model results, it can be concluded that there is no significant impact on sea water due to continuous effluent outfall discharge.

From the above figures, it can be said that the sediment subsequently is not deposited in the vicinity of outfall location and may not result in significant changes in bed morphology. These predictions are in response to the change in the tidal currents and would reduce in time as the seabed gets re-established itself to the new hydraulic regime. In the short-term, however, it should be noted that the possibility of siltation is less due to discharge of continuous outfall discharges at OF2_1 and OF2_2 locations and no significant changes in the shoreline due to the proposed intake and outfall system.

7 MITIGATION MEASURES

The marine segments through which the proposed intake and effluent disposal pipelines would pass is a typical segment of the Arabian Sea coast of Bada, consisting of a sandy pocket beach with an underlying rocky substratum. Northern boundary of Arabian Sea is protected with well-established sand dune with different variety of vegetation. Hence, adequate precautions are required to prevent deterioration in marine environmental quality beyond the pipeline corridor.

7.1 Construction phase

As discussed under Section 3.6 the area is free from corals and mangroves. However, seaweeds and macrobenthos along the corridors would be destroyed due to excavation/trenching. Adequate precaution is necessary to minimize this damage. Therefore, the construction activities should be confined to the pre-determined corridors taking care to avoid use of intertidal area beyond the width of the corridors.

The impact on marine and terrestrial ecology during the construction phase would be largely confined to the duration over which the activities are spread. Hence, the key factor in minimising the adverse impacts would be reduction in the construction period at the site and avoidance of spillage of activities beyond the specified geographical area which should be kept to a minimum. Sometimes different contractors are engaged for jobs such as fabrication and supply of pipeline, installation etc. Lack of proper understanding and coordination among contractors often leads to time overruns. This should be avoided by taking up the scheme as a single integrated project with proper coordination among contractors as well as the GHCL personnel.

The soil side-cast during trenching should not be left on the intertidal zone to avoid being washed away and settling on nearby areas. It should be removed and temporarily stored above the high tide level and used for backfilling later.

There is a distinct advantage of reduction in time of marine construction operations, by prefabricating the components wherever possible and transporting

them to the site. However, the fabrication yard should be located sufficiently away from the shore and transport of pipes, machinery etc to the site should be through a pre-decided corridor.

To prevent the misuse of the intertidal and supra littoral areas, the makeshift facilities for workers should be established beyond the CRZ zone on the landward side and proper sanitation should be provided to them.

The northern boundary of the sea off Bada near project site has stable and more than 8000 years old sand dune. Sand dunes come under CRZ-IA (MoEF & CC 2019) and no activities are allowed in this area. Hence care is to be taken not to disturb sand dunes. Area between sand dune and GHCL is forest land, hence special permission to carry any activities to be taken from Department of Forest.

The noise level during transport and construction of marine facilities should be kept to a minimum.

The intertidal, subtidal and nearshore areas should be restored to their original contours once the marine construction activities are completed. General clean-up along the corridor areas, and intertidal segments etc should be undertaken and discarded materials including left-over excavated soil should be removed to restore the aesthetic quality of the surroundings on completion of the construction phase.

7.2 Operational phase

7.2.1 Seawater intake

For well-designed and constructed gravity seawater intake systems, only a few mitigation measures listed below are required.

Appropriate screens and bars should be provided in the intake to avoid the large marine organisms entering the intake system.

The efficiency of the intake system might decrease over a period of time due to the settlement of bio-fouler such as barnacles, at and inside the pipe openings, entry of sediment into the sump etc. Periodic removal of these materials

will be required. The cleared material should not be dumped to sea or intertidal areas.

As a navigational safeguard, the seawater intake location should be adequately protected and identified with a marker buoy.

7.2.2 Effluent disposal

Predictions of impacts of release of the effluent on the marine ecology are made based on the assumption that the effluent meets the GPCB /CPCB norms. Hence, it should be ensured that the effluent released to the sea meets the prescribed GPCB /CPCB norms at all times.

It is predicted that the effluent would attain 30-40 times initial dilution when released through a multiport diffuser (Chapter 4). Such calculations are based on average environmental conditions and some assumptions which cannot be easily verified. Hence, the actual dilution attained should be measured through tracer studies after the outfall becomes operational. The effluent release scheme can then be adequately modified to ascertain necessary dilution, if required.

The efficiency of diffuser might decrease over a period time due to the settlement of biofoulers at the port openings, entry of sediment in the diffuser etc. Hence, the efficiency of the diffuser must be checked periodically (once in 2 y or so) and if necessary, it should be cleaned to revert back to the dilution ascertained through initial tracer studies.

As a navigational safeguard, the effluent release location should be adequately protected and identified with a marker buoy.

8 MARINE BIODIVERSITY CONSERVATION AND MANAGEMENT PLAN

The Indian subcontinent is bordered by the tropical seas which include an extensive coastal zone and the deep seas. Within the coastal zone there are a number of sensitive habitats including the estuaries, mangroves, coral reefs, sea-grass beds, rocky intertidal and oceanic islands. These habitats support a wide spectrum of biota whose abundance varies both spatially and temporally. These habitats have been exploited for food and aesthetic purposes with no apparent ill effects till large scale mechanization began to be introduced. Increasing human population coupled with the greater need for development has led to intensive exploitation of coastal areas and various fisheries resources and has caused considerable stress to many habitats.

Several of the Indian estuaries and coastal waters have become danger-prone zones. Stress due to damming the rivers, fishing pressure and pollution is the principle cause of biodiversity degradation and ecosystem deterioration. Coastal areas are veritable nurseries for many marine animals, but their fisheries have declined considerably due to overexploitation.

Managing a complex ecosystem to balance delivery of all of its services is at the heart of ecosystem-based management. But how can this balance be accomplished amidst the conflicting demands of stakeholders, managers, and policy makers? In marine ecosystems, several common ecological mechanisms link biodiversity to ecosystem functioning and to a complex of essential services. As a result, the effects of preserving diversity can be broadly beneficial to a wide spectrum of important ecosystem processes and services, including fisheries, water quality, recreation, and shoreline protection. A management system that conserves diversity will help to accrue more “ecoservice capital” for human use and will maintain a hedge against unanticipated ecosystem changes from natural or anthropogenic causes. Although maintenance of biodiversity cannot be the only goal for ecosystem-based management, it could provide a common currency for evaluating the impacts of different human activities on ecosystem functioning and can act as a critical indicator of ecosystem status (Palumbi et al, 2009).

8.4 Marine Biodiversity Conservation Plan

The conservation and restoration measures can be taken up individually by the project proponent and also can be carried out by constructing a consortium with all the adjoining industries. These measures should be executed in collaboration and consultation with the experts in the field and authorities responsible as per the jurisdiction. The national and regional conservations efforts can also be supported as far the buffer zone is concerned. Several international bodies also carry out many conservation and restoration programs as well as the local and regional organisation that are well versed with the present study area.

Conservation and Restoration Plan	• Alternative livelihood measures for the foot fishers, so as to reduce the pressure on the natural resources and give recovery time for the slow growing species. • Creation of bunds and embankments wherever shoreline changes have occurred or saltwater intrusion has occurred. • All care such as full-time observation and monitoring for sand dune should take place during construction specially tunnelling of proposed project.

8.5 Stakeholder's / Community involvement

Scientific information and knowledge regarding the current status of marine biodiversity, various values associated with it, and the necessity for its conservation will be distributed for publicity among the public. To establish a network for cooperation and coordination among various relevant actors will be enhanced, and awareness of conservation and sustainable use of marine biodiversity in social activities will be raised.

9. ENVIRONMENT MANAGEMENT PLAN (EMP)

The guiding principle of marine environment management is to ensure that the perturbations due to the proposed coastal activities are within the assimilative capacity of the marine zone. This is best done by integrating into the project itself, a plan of actions for mitigating predicted adverse effects as discussed in Chapter 7.

It is necessary to verify the predicted environmental changes from the pre-project baseline apart from ascertaining and periodically checking the efficiency of the diffuser by post-project monitoring as described below.

9.1 Pre – Project monitoring for baseline quality

In Sections 3.4 to 3.6 baseline settings of relevant environmental components with respect to the marine environment off bada are discussed pertaining to short-term measurements conducted during the field studies. Like all natural ecosystems, the marine environment also undergoes seasonal variations. To understand these variations, it is necessary to conduct periodic investigations, at carefully selected monitoring locations. These should include subtidal as well as intertidal segments. In the present case, the stations 1 to 9 should be adequate to represent the subtidal environment, while, the intertidal transects I to III can be selected for evaluation of the intertidal ecology. Till a proper baseline is established, the data presented in this report can be considered for comparing the results of future monitoring studies. The monitoring however should be confined preferably to the months in which the data are collected.

Many coastal areas which are under profound tidal influence reveal diurnal changes particularly when anthropogenic contaminants are introduced in excess of their assimilative capacity. Hence, selected stations should be sampled diurnally during monitoring programmes. The parameters to be monitored are listed below.

a) Water quality: Water samples obtained from 2 levels in the vertical when the depths exceed 3 m, should be studied for temperature, SS, turbidity, pH, salinity,

DO, BOD, dissolved phosphate, nitrate, nitrite, ammonia, PHc and phenols. For shallower waters, surface samples can be analysed.

b) Sediment quality: Sediment from subtidal and intertidal regions should be analysed for texture, C_{org}, phosphorus, chromium, nickel, copper, zinc, cadmium, lead, mercury and PHc.

c) Flora and fauna: Biological characteristics should be assessed based on primary productivity, phytopigments, phytoplankton populations and their generic diversity; biomass, population and group diversity of zooplankton; biomass, population and group diversity of benthos; seaweeds and fish quality.

9.2 ENVIRONMENTAL MANAGEMENT CELL (EMC)

Apart from having an Environmental Management Plan, it is so also necessary to have a permanent organizational set up charged with the task of ensuring its effective implementation of mitigation measures and to conduct environmental monitoring. Identify and list out environmental aspects due to the operation of the proposed project

- Determine the key operations that have significant environmental impacts
- Identify and track environmental legislations, policies, codes and other relevant requirements
- Establish objectives and targets (Environmental Management Plan)
- Formulate an Environmental Management System.

The EMC is responsible for overall environmental activities of the proposed facility and implementation of the Environmental Management Plan (EMP) and coordination with GHCL in case of any requirements. The EMC's responsibility for implementing the EMP also requires regular interaction with the environment regulatory authorities such as GPCB, GCZMA, MoEF & CC and the Indian Coast Guard.

The major duties and responsibilities of Environment Management Cell are:

- To implement the environmental management plan

- Timely submission of environment compliance reports to statutory authorities.
- Obtain NOC and Consent to oeprate from State Pollution Control Board.
- Risk identification and control of environmental problems
- Evaluating the efficacy of the EIA, mitigation measures, as stipulated in the EMP.
- Coordination with GHCL, MoEF&CC and GPCB for prevention and control of pollution.
- To assure regulatory compliance with all relevant rules and regulations
- To ensure regular operation and maintenance of 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 of monitored results are above the specified limit
- Maintain documentation of good environmental practices and applicable environmental laws as ready reference
- Maintain environmental related records
- Coordination with regulatory agencies, external consultant, monitoring laboratories
- Maintain log of public complaints regarding environmental issues and the action taken

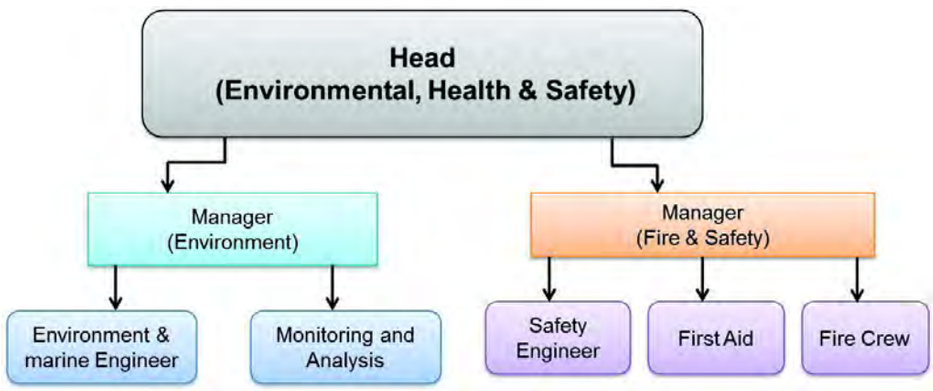
The proposed Environmental Management Cell should have all basic record keeping facilities such as hard ware/software facilities, adequate space, vehicle (transport) and basic furniture and all simple instruments such as GPS, Digital camera, Hand held noise metre etc. The cell should have all basic environmental management data of the project that includes but not limited to the following;

- Environmental Impact Assessment Report (both soft and hard copy)
- All valid and up to date environmental clearances papers

- All latest Environmental legislations, policies, codes and manuals for ready references
- A list of consultants on environmental management need to be kept with yearly revision of the list. This will help to receive proper advice in case of an emergency or a requirement and also to implement day to day environmental management activities. Over a period of time a system to understand and absorb the new revisions and changes in the environmental requirements and practices are to be established.

9.3 AUDITS AND INSPECTIONS

EMC will be responsible for implementing Compliance Assurance activities, namely environmental audits. Internal audits and reviews of environmental procedures shall be conducted annually. Third party audits of environmental procedures shall be conducted periodically. EMC also serves as a resource for GHCL employees regarding environmental compliance issues. The EHS Steering Committee, made up of Management Team members, shall conduct quarterly EHS performance reviews. Inputs to their review process are provided from monitoring programs, audits and inspections conducted by staff and contractors with specialised expertise in operations and EHS.



In addition to internal audits, there shall be external audits conducted by the regional office, Ministry of Environment, Forests &CC (MoEF&CC), Government of India to oversee compliance to conditions laid down by regulatory authorities. Any impact to the environment is identified, same shall be evaluated and corrective actions shall be taken.

9.4 Post-project monitoring for assessment

A comprehensive marine quality monitoring programme with periodic investigations at predetermined locations (These should preferably coincide with those used for baseline quality) by a specialised agency is a practical solution to ensure quality data acquisition. This can be a continuation of the study designed for baseline quality and some parameters listed above should be included in the post-project monitoring programme. The post-project monitoring can be as follows:

a) Just prior to the commencement of operation of marine facilities.

b) After 6 months of commencement of operations.

c) Once a year from the commencement of operation preferably in the premonsoon period or as recommended by MoEF & CC.

The results of each monitoring should be carefully evaluated to identify changes if any, beyond the natural variability identified through baseline studies. Gross deviation from the baseline may require a thorough review of the effluent disposal scheme to identify the causative factors leading to these deviations and accordingly, corrective measures to reverse the trend would be necessary.

9.5 Costs for Implementation of EMP

A provision of Rs. 10.0 million to be earmarked for the biodiversity management plan to be implemented in the project area during construction phase and operation phase.

For periodic monitoring of the marine area environment during project construction phase (considering 2 years), a provision of Rs. 5.0 million to

earmarked. For operation phase, Rs. 3.0 million per year to be kept provision for the monitoring.

10. PROJECT BENEFITS

Soda Ash is having significant importance because of its applications in major sectors i.e. Manufacturing of Glass, Usage in chemical industry, Paper and Detergent manufacturing, whereas baking Soda is mainly used by food industry. However in India Detergent industry is largest consumer of Soda ash. India is one of fastest growing economies in the world. Considering the rising population and growth of urbanisation has increased consumption of industrial products, which has resulted the increase in demand of housing, transportation, consumer product, processed foods, beverages, driving growth in glass, soaps / detergents and various other chemicals directly or indirectly for production of chemicals.

The Indian Subcontinent is one of the world's fastest growing Soda Ash markets, driven by India's booming economy. The Soda Ash per capita consumption in India is 2.8 Kg only. If India has to reach the per capita consumption as of developed nations, which is approximately 17 Kg of Soda Ash then addition of capacity is must. The proposed project will cater to the growing demand of Soda ash and Sodium bicarbonate which is used in diversified sectors and industries ranging from chemicals, construction and FMCG. It will create direct and indirect employment generation during, planning, construction and operation phase of the project. This will lead to employment and uplifment of scio economic avtiviite sand stratus in the region. It will also create supporting industries/businesses related to logistics, supply chain, manpower supply, construction equipments, hotels etc.

11 CONCLUSION and RECOMMENDATION

The entire sea shore boundary of project is well protected by continuous sand dune. Sand dune areas are declared as ecologically sensitive as per CRZ notification and no disturbance is permitted. Based on our survey and report prepared by CSIR-NIO, Goa (Annexure-I), no natural passage to lay the pipeline was observed. On the basis of above findings, it is proposed to lay the pipelines through tunnelling without disturbing sand dune. Two land fall points (LFP, L5: 22° 52' 22.26" N; 69° 07' 58.16" E and L6: 22° 52' 22.09" N; 69° 07' 58.85" E) are considered for intake and discussed accordingly.

For the continuous withdrawal of seawater quantity of 16,00,000 M³/day two intake locations (IT1: 22º 52’ 1.07’’N; 69º 07’ 28.96’’E and IT2: 22°51’57.44” N; 69°07’32.44” E) have been selected on the basis of lesser area and volume of excavation required to lay the pipeline and consequent reduction in benthic losses due to shorter length. Since the alignment corridor is devoid of mangroves and corals, their destruction due to the development is unlikely.

Hydrodynamic Modelling Studies

- Modelling was carried out for 15 days period in neap and spring phases at low water, high water, peak ebb, and peak flood conditions during October 2018 and March 2019 in the coastal water off Bada around the proposed alternative optional outfall locations (OF1_1& OF1_2, OF2_1 & OF2_2 and OF3_1&OF3_2).

Water Quality Modelling studies

- The dispersion of Suspended Solids, NH_4^+-N and Temperature in the treated waste water were studied for the proposed three optional outfall locations for waste water discharge for neap and spring tide conditions.
- The variation of the excess Suspended Solids, NH_4^+-N and Temperature at the **Option-1** outfall locations “OF1_1 & OF1_2” varies in the range of 9.6 mg/l to 13.99 mg/l, and 0.46 mg/l to 0.71 mg/l and 0.077 to 0.1^{0}C respectively during the different tide conditions for October 2018 and 9.48

mg/l to 13.55 mg/l, and 0.47 to 0.69 mg/l and 0.077 to 0.1^0C for month of march 2019. From the above studies, it can be concluded that the Option-1 outfall locations “OF1_1 & OF1_2” are suitable for all tidal conditions in terms of dilutions attained.

- The variation of the excess Suspended Solids, NH_4^+-N and Temperature with twenty ports diffuser ports at the Option-2 outfall locations “OF2_1 & OF2_2” varies in the range of 9.0 to 12.8mg/l, 0.5 to 0.71 mg/l and 0.069 to 0. 1^0C respectively during the different tide conditions for October 2018 and 8.51 to 12.45 mg/l, and 0.56 to 0.69 and 0.069 to 0.099^0C for month of march 2019. From the above studies, it can be concluded that Option-2 outfall locations “OF2_1 & OF2_2” are also suitable for all tidal conditions in terms of dilutions attained. But, based on dilution analysis Option-2 outfall locations are more suitable as compared to Option-1 outfall locations.
- The variation of the excess Suspended Solids, NH_4^+-N and Temperature at **Option-3** outfall locations “OF3_1 & OF3_2” varies in the range of 8.51 to 12.98 mg/l, 0.46 to 0.71 mg/l and 0.069 to 0.103^0C respectively during the different tide conditions for October 2018 and 8.95 to 11.29 mg/l, and 0.48 to 0.66 and 0.076 to 0.098^0C for month of march 2019. From the above studies, it can be concluded that Option-3 outfall locations “OF3-1 & OF3_2” are not suitable for all tidal conditions in terms of dilutions attained.
- It has been observed that the treated waste water quantity of 1580000 m³/day (1580 MLD**)** with Suspended Solids, NH_4^+-N and Temperature of 1000 mg/l, 50 mg/l and 33^0C respectively at the Option-2 outfall locations OF2_1, OF2_2 attained ambient conditions at 150 m radial distance from the disposal location. Based on dilution zones calculated for various options of outfall locations, Option 2 outfalls are better than Option-1 outfall locations “OF1_1 and OF1_2” even though they are suitable. Option 3 outfall are not suitable since the dilution zones of outfall are overlapped.

Sediment Modelling studies

- Sediment modelling studies were made for the domain with an outfall and intake during October 2018 and March 2019.
- The variation of bed level due to resultant of erosion and deposition over 15 days is found to be around 0.002 to 0.028m for 1000 mg/l suspended sediment concentration of outfall discharge of 1580000 m³/day at OF2_1 & OF2_2
- It can be concluded that there is no impact on intake of sea water for the plant and effluent discharge around the outfall location.
- It can be said that the sediment subsequently is not deposited in the vicinity of outfall location and may not result in significant bed level changes and no significant changes in the shoreline due to the proposed intake and outfall system.

Hence, it is recommended that M/s GHCL can withdraw 16,00,000 M³/day of water from two intake locations (IT1: 22º 52’ 1.07’’N; 69º 07’ 28.96’’E and IT2: 22°51’57.44” N; 69°07’32.44” E).

The disposal of 15,80,000 M³/day at two out fall locations OF2_1: 22°52'15.79"N; 69°06'14.35"E (depth 9.47 m below CD), OF2_2: 22°52'6.65" N; 69°05' 59.08"E (depth 10.71 m below CD) will not impact the marine environment. The GHCL has to take approval from concerned authorotoes before commencement of the work.

12 DISCLOSURES OF CONSULTANTS ENGAGED

CSIR-National Institute of Oceanography; a constituent laboratory of the Council of Scientific & Industrial Research under Ministry of Science and Technology, Government of India; is a premier oceanographic research institute of the country. Institute has the necessary expertise supported by equipment and infrastructural facilities to carry out the marine survey and EIA studies. EIA consultants are the regular staff of CSIR-NIO and are listed below.

Name of consultant	Specialization	Nature of consultancy rendered
Dr. Anirudh Ram S Jaiswar	Chemical Oceanography and Marine Pollution	Project leader and coordinated the work components related to water and sediment quality
Dr. Rakesh P.S	Biological Oceanography, Marine Pollution and Ecotoxicology	Associate project leader, co-ordinated work related to zooplankton parameters
Dr. Udhaba Dora	Physical oceanography and Modeling	Associate project leader and coordinated the work related to Physical oceanographic measurements and modeling
Dr. Umesh Kumar Pradhan	Chemical Oceanography and Marine Pollution	Associate project leader and coordinated the work components related to water and sediment quality
Dr. Soniya Sukumaran	Biological oceanography, Benthic Biodiversity & Ecology	Team Member coordinated the work components related to macro benthic ecology of the area
Dr. Haridevi C.K.	Biological Oceanography, Phytoplankton Ecology	Team member and co-ordinated the work part related to biology & phytoplankton ecology
Dr. Abhay Fulke	Marine Microbiology, & Molecular Biology	Team member, co-ordinated marine microbial biodiversity studies

ANNEXURE R/5 [Colly]

GHCL Limited

Ref: GHCL/AHD/ENVMOEF&CC/VND/21-22/01 **28th July 2021**

Director and Member Secretary,
(IA Division- Industry Committee-3)
Ministry of Environment, Forest & Climate Change,
3rd Floor, Vayu Wing, Indira Paryavaran Bhavan,
Jor Bagh Road, Ali Ganj,
New Delhi – 110 003

SUBJECT: **Submission of Application for Terms of Reference (TOR) for proposed Green field Chemical complex – Soda Ash Manufacturing and associated utilities.**

REF: **Our letter No. GHCL/AHD/ENV/MOEF/VND/17-18/07 dtd. 23.11.2017**

Dear Sir,

M/s GHCL is a leading company in the manufacturing of chemicals, textiles, edible salt and other consumer products. In chemical sector, the company manufactures Soda Ash (Anhydrous Sodium Carbonate), a major raw material for detergents, glass & ceramics industries and the other product Sodium Bicarbonate (baking soda). The company caters to about 25% of domestic Soda Ash demand in the country.

GHCL has signed an MoU during Vibrant Gujarat, 2017 to set up a Greenfield Chemical Complex in district Kutch, Gujarat. GHCL proposes to set up 11,00,000 TPA Light Soda Ash, 5,00,000 TPA Dense Soda Ash, 2,00,000 TPA Sodium Bicarbonate manufacturing plants, solid fuel based 120 MW Captive Co-generation Power plant, RO-DM plant, other utilities, Seawater intake and effluent disposal facilities near village Bada, Taluka Mandvi, District Kutch, State Gujarat.

The proposed project falls under project activity item no 4 (e) Category 'A' as stated in EIA notification, 2006 and hence the project needs to obtain Environment Clearance from MOEFCC, New Delhi. Keeping this in consideration we had informed MOEFCC regarding appointment of EIA consultants vide letter NO. GHCL/AHD/ENV/MOEF/VND/17-18/07 dtd. 23.11.2017 as at that time no consultant specifically accredited for Soda Ash sector.

We have appointed M/s CSIR- NEERI, Nagpur and M/s CSIR-NIO, Mumbai for carrying out terrestrial and marine environment impact assessment studies. The terrestrial EIA and marine EIA studies have been almost completed and data collected is valid till 2022-2023. We have kept in mind the provisions of Standard TOR prescribed for Soda Ash Industry by MOEFCC. We will also conduct any additional study if suggested by MOEFCC for inclusion in EIA. We had aimed to start site activities by 2020 however due to COVID19 business activities and acquisition process got impacted.

GHCL Limited AHMEDABAD

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Head Office : GHCL House, B - 38, Institutional Area, Sector - 1, Noida, Uttar Pradesh - 201301, India. Ph. : +91-120-2535335, 3358000, Fax : +91-120-2535209

GHCL Limited

:2:

CSIR-NIO, Goa has carried out sand dunes mapping and morphological changes, Zoological Survey of India (ZSI) had conducted Status survey and Conservation plan for Sea turtle, M/s STUP consultants had carried out Pre-feasibility study for seawater intake and effluent disposal, Ecological and wild life Assessment study was conducted by NABET accredited Functional Area Expert.

The area identified for setting up the proposed project is about 1481.48 acres (599.54 Ha.). The proposed site was selected after examining 5 alternative sites along Gujarat coast. We have already applied to District Collector for allotment of Govt. Land and Industries Commissioner for allotment of Private and Govt. Land.

Industries Commissioner, Govt. of Gujarat has grant the approval for Bonafied Industrial Purpose to GHCL Ltd. vide letter UF/Infra/Land/Tr-131/IC Office dtd. 27.07.2021.
We are enclosing herewith Form-I along with Pre-feasibility Report for the proposed project, seeking grant of ToR under EIA Notification, 2006.

We request you to kindly process the application for grant of TOR at the earliest.

Thanking You,

Yours faithfully,
FOR GHCL Ltd.

NISHIT NARBHERAM RADIA
Digitally signed by NISHIT NARBHERAM RADIA
Date: 2021.07.28 12:14:19 +05'30'

N N Radia
Chief Operating Officer

Encl: Form – I, Pre-feasibility Report

GHCL Limited AHMEDABAD

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GHCL Limited

GHCL/AHD/ENVMOEF/VND/2021-2022/02 **6th August 2021**

The Member Secretary (Industry-III)
Ministry of Environment, Forest & Climate Change
Indira Paryavaran Bhavan
Jor Bagh Road, Ali Ganj
New Delhi – 110003

Sub: Reply to Essential Details Sought (EDS) by the Member Secretary for Proposed Greenfield Chemical Complex at Village Bada, Taluka Mandvi, Gujarat.

Ref: EDS sought by Member Secretary on Proposal No: IA/GJ/IND3/222096/2021 dt. 28.07.2021

Dear Sir,

With reference to above mentioned subject, we hereby submit reply to the EDS by your office, towards the issue of TOR for proposed Greenfield Chemical Complex.

SN	Essential Details Sought	Clarification/Reply
1	It is informed that, complete application is processed online, and hence accurate data needs to be provided in the Form 1/PFR. Please recheck the application accordingly.	Form I and PFR has been further updated for your consideration. Detailing is done at relevant section for better clarity..
2	The PP shall provide correct corresponding address along with valid phone number and email. In the case of new projects, address for correspondence shall not be the proposed site address, as there shall be no facilities available in the site.	Correspondence address with valid phone nos and email address has been updated for ease of reference.
3	Form 1/PFR shall be filled in line with the EIA Notification, 2006 providing all the scientific/technical details.	Form I and PFR has been revisited in line with EIA Notification 2006 with all the scientific and technical details incorporated.
4	Whether light soda ash and Dense soda ash productions are independent activities or dense soda ash production includes light soda ash production.	Dense Soda Ash is a conversion from Light Soda Ash . Thus the total Soda Ash production capacity is 11,00,000 MT per annum and 5,00,000 MTA max can be converted to Dense soda ash.

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5	Details of land available with the PP and permission for its industrial use.	The land admeasuring 599.54 Ha is identified for setting up of proposed project. The Industrial Commissioner vide letter No UK/INFRA/JAMIN/TR-131 office dtd. 27.07.2021 has approved proposal based on which company can now aquire land for industrial purpose.
6	Details of habitation within immediate vicinity of the project site along with risk and safety plan.	The village Bada is the nearest habitation (<1 km) from the proposed project boundary. GHCL will comply with the risk mitigation measures suggested in Risk Assessment Studies of EIA by NEERI, Nagpur. For Ammonia storage and handling Industrial practice will be adopted and statutory design considerations will be followed. Based on terms of TOR, CSIR-NEERI will incorporate its assessment study as part of terrestrial EIA. This will also include on site and off site Disaster Management Plan.
7	The proposed project includes activities requiring CRZ clearance, while submission of EIA/EMP report, additional studies for CRZ clearance (Marine EIA/EMP, Map etc) along with SCZMA recommendations shall be provided.	The seawater intake and effluent disposal system and pipelines attracts provision of CRZ due to site proximity to Arabian Sea. CSIR NIO, Mumbai had conducted baseline environment data collection for marine EIA and conducted numerical modelling studies for seawater intake and effluent

		disposal system vide their letter no. NIO/B-2018/GHCL Mandvi/SSP329/1292 dated 05.01.2021 An additional study has been conducted by CSIR NIO Goa for morphology assessment for Sand dunes(which are outside plant boundary) for seawater intake and effluent pipeline corridor vide Report No. NIO/ SSP3268. Refer attached duly signed CRZ map as **Enclosure I**. vide Ref. No. AU/ IRS/SSR/ 221-2021 dated 18.01.2021. On receipt of terms of TOR, GHCL will finalise and submit GCZMA application.
8	Whether the proposed project (project site and/or pipeline) are located in the Forest or Wildlife area?. Status of Forest clearance and wildlife clearance may be provided.	There is a Un Class forest outside project boundary. Seawater intake and effluent pipelines are required to be laid through Unclass forest area for which forest clearance will be sought after obtaining TOR terms. Wild Life Clearance is not applicable as project site and pipeline not falling within 10 km of any notified Protected area.
9	Whether the proposed project falls in coral reef/sea grass/mangrove area? Whether any changes in these landscape proposed?	NO. Project does not fall in coral reef/ sea grass/mangrove areas. As these are absent in proposed site no changes anticipated.
10	Please provide Ecologically Sensitive Areas within 10 km radius of the project site.	As per the available records there are no notified

GHCL Limited

		protected areas such as National Park, Wild Life Sanctuary, Biosphere Reserve, Notified Wetlands etc. within 10 km radius of the project site. Sand dunes are present out side project boundary along the coast which can be referred in CRZ Map given in Enclosure-I.

We hope that the above clarifications are in line with requirement and request for considerations of project proposal for issuance of TOR.

Thanking you,

Yours faithfully
For GHCL Ltd

NISHIT NARBHERAM RADIA
Digitally signed by NISHIT NARBHERAM RADIA
Date: 2021.08.06 14:08:45 +05'30'

N N Radia
Chief Operating Officer

GHCL Limited AHMEDABAD

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Final Environmental Impact and Risk Assessment Study for "Greenfield Chemical Complex" of GHCL Ltd.

(Light Soda Ash Plant of Capacity 3000 TPD, Dense Soda Ash 1500 TPD, Sodium Bicarbonate 600 TPD with Solid Fuel based Captive Co-generation Power Plant (120 MW capacity), Seawater Intake and Effluent Disposal System)

Village Bada, Taluka Mandvi, District Kutch, Gujarat"

Sponsor:
GHCL Limited,
GHCL House,
Opp. Punjabi Samaj Seva Hall, Navrangpura
Ahmedabad

Schedule: 4(e), Category A
TOR Letter: IA-J-11011/293/2021-IA-II(I)
Baseline Period: December 2019 – February 2020

Council of Scientific and Industrial Research (CSIR)
National Environmental Engineering Research Institute (NEERI)
Nehru Marg, Nagpur 440 020 (Maharashtra)

November 2022

Final Environmental Impact and Risk Assessment Study for "Greenfield Chemical Complex" of GHCL Ltd.

(Light Soda Ash Plant of Capacity 3000 TPD, Dense Soda Ash 1500 TPD, Sodium Bicarbonate 600 TPD with Solid Fuel based Captive Co-generation Power Plant (120 MW capacity), Seawater Intake and Effluent Disposal System)

Village Bada, Taluka Mandvi, District Kutch, Gujarat"

Sponsor

GHCL Limited,

Ahmedabad

Council of Scientific and Industrial Research (CSIR)

National Environmental Engineering Research Institute (NEERI)

Nehru Marg, Nagpur 440 020

(QCI/NABET Accreditation letter no. NABET/EIA/2124/RA0227)

November 2022

National Environmental Engineering Research Institute (NEERI)

I, Dr. R.J. Krupadam, **Senior Principal Scientist, National Environmental Engineering Research Institute (NEERI)** located at Nehru Marg, Nagpur, Maharashtra 440020, **do hereby give undertaking** with reference to MoEF&CC O.M. No. J-11013/41/2006-IA. II. (I) dated 04th August 2009, that we have prepared EIA report M/s. GHCL Limited. located at **Village Bada, Taluka Mandvi, District Kutch, Gujarat** as per Terms of Reference (ToR) prescribed wide letter no.: **No. IA-J-11011/293/2021-IA-II(I)** dated **10th August 2021**. The stated ToR have been complied with and the data mentioned in the EIA report are factually correct. CSIR-NEERI is a NABET accredited for materials manufacturing sector such as chlor-alkali. This undertaking is subjected NABET clearance on this project.

The above stated fact is true to the best of my knowledge.

Date: 29.11.2022
Place: Nagpur

For, M/s. **National Environmental Engineering Research Institute (NEERI)**

Dr. R.J. Krupadam
Senior Principal Scientist &
Project Leader

डॉ. आर. जे. कृपादम
एम.एससी.(टेक), पी.एच.डी., एफ.आर.एस.सी.
वरिष्ठ प्रधान वैज्ञानिक एवं प्राध्यापक
समन्वयक, ए.सी.एस.आई.आर.
सी.एस.आई.आर.-राष्ट्रीय पर्यावरण अभियांत्रिकी अनुसंधान संस्थान(नीरी)
नेहरू मार्ग, नागपुर-440 020 (भारत)

Declaration by Experts Contributing to the *Environmental Impact and Risk Assessment & Risk Assessment Study for Greenfield Chemical Complex of GHCL Ltd. At Village Bada, Taluka Mandvi, District Kutch, Gujarat.*

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA coordinator : **Dr R.J. Krupadam**

Signature & Date : 11.8.2021

Period of involvement : **April 2019 – July 2021**

Contact information : **Senior Principal Scientist,**
CSIR-NEERI, Nehru Marg, Nagpur 440020
Ph: +91 712 2249884, Fax: +91 712 2249896

EIA Co-coordinator : Dr. M. Suresh Kumar

Functional Area Experts/TM :

Sr. No.	Functional Areas	Name of the Expert/s	Involvements (period and task**)	Signature and Date
1	Air pollution Monitoring Prevention and Control (AP)/Air Quality Modeling and Prediction (AQ)	Dr. T.V.B.P.S. Rama Krishna	Air Quality AQ	
2	Water Pollution Monitoring Prevention and Control(WP)	Dr. R. J. Krupadam Er. M. Karthik Mr. Y.J Baseshankar (TM)	Water Quality ETP Evaluation, Water EMP Marine Water Quality Water Quality Monitoring	
3	Noise & Vibration (NV)	Dr. G.L. Bodhe Mr. Guddu Kumar (TM)	Noise Monitoring Prediction of Impacts and EMP	
4	Socio-economic Aspects (SE)	Dr. G.K. Khadse Mr. Sanjay Bodhale	Socio-economic Status Quality of Life	
5	Soil Conservation (SC)and Hydrogeology (Hg)	Dr. R.J. Krupadam Ms. Pravin Naoghare (TM)	Soil Conservation Soil Quality	
6	Land-use & Land cover (LULC)	Dr. Ritesh Vijay	Remote Sensing & GIS for LU/LC	
7	Risk Assessment & Hazard Management (RH)	Dr. R. J. Krupadam Dr. Santosh Ghuge	Risk Assessment Hazard Management	

Declaration by the Head of the accredited consultant organization

I, Dr. Sadhana S. Rayalu, hereby, confirm that the above-mentioned experts prepared the "Environmental Impact and Risk Assessment study for Greenfield Chemical Complex of GHCL Ltd., at Village Bada, Taluka Mandvi, District Kutch, Gujarat State. I also confirm that the consultant organization shall be fully accountable for any mis-leading information mentioned in this statement.

Signature	:	06/10/2021
Name	:	Dr. Sadhana S. Rayalu
Designation	:	Senior Most Scientist/In-charge
Name of the EIA Consultant Organization	:	CSIR-NEERI
NABET Certificate No & Issue date	:	NABET/EIA/1821/SA 0119, 01.07.2021 (Renewal applied)

निदेशक / Director
सी.एस.आई.आर.-राष्ट्रीय पर्यावरण अभियांत्रिकी अनुसंधान संस्थान
CSIR-National Environmental Engineering Research Institute
नेहरू मार्ग/, नागपुर-440 020 (भारत)
Nehru Marg, Nagpur-440 020 (India)

GHCL Officials

GHCL Limited,
Ahmedabad

Shri NN Radia	Chief Operating Officer (COO)
Shri VN Desai	Advisor
Ms. Priyakanchini Gupta	Manager QHSE
Mr. Prayuddh Suthar	Manager Projects
Mr. Sankalp Bhatt	Sr. Manager Projects

Disclaimer

The information contained in the report is based on the scientific analysis of data / information / drawing provided by the sponsor as also collected from other sources during the time of the study. While efforts have been made to ensure accuracy of information in the report, CSIR-NEERI shall not own, in any manner, any legal, financial or consequential responsibility for any event of occurrence of any accident / hazard or direct or indirect damage/loss to any third party or to sponsor due to the use or inability to use the information contained in the report.

The sponsor shall exercise due diligence and make their own decision to implement the contents of the report. The report shall not be constructed as any guarantee or warranty from CSIR-NEERI.

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List of Annexures

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I.	Terms of Reference issued for Greenfield Chemical Complex by MOEF&CC
II.	CSIR-NIO (RC) Mumbai Report: Marine EIA/EMP for Seawater Intake and Effluent Disposal for Greenfield Chemical Complex off Bada Coast, Arabian Sea.
III.	Ecological Study & Wildlife Conservation Plan for Proposed Greenfield Chemical Complex by Dr. Bharat Jethva NABET Accredited FAE
IV.	Comprehensive Hydrogeological assessment studies and designing of rain water harvesting program by Hydro-Geosurvey Consultants Private Limited, Jodhpur (HCPL).
V.	CRZ map prepared by Institute of Remote Sensing (IRS), Chennai.
VI.	Study on Status Survey and Conservation Plan for Sea Turtles along Mandvi Taluka, Bhuj, Gujarat by Zoological Survey of India (ZSI), Kolkata were attached with this EIA report
VII.	Letter for Lignite Allocation Support letter from GMDC
VIII.	Letter for Use of Fly Ash and under size limestone in cement Industries.
IX.	HSE Policy
X.	Raw Data of AAQ measurement
XI.	Public hearing minutes with action plan

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Executive Summary

"Greenfield Chemical Complex" of GHCL Ltd.

(Light Soda Ash Plant of Capacity 3000 TPD, Dense Soda Ash 1500 TPD, Sodium Bicarbonate 600 TPD with Solid Fuel based Captive Co-generation Power Plant (120 MW capacity), Seawater Intake and Effluent Disposal System)

Village Bada, Taluka Mandvi, District Kutch, Gujarat"

Sponsor

GHCL Limited

Ahmedabad

Council of Scientific and Industrial Research (CSIR)

National Environmental Engineering Research Institute (NEERI)

Nehru Marg, Nagpur 440 020 (Maharashtra)

(QCI/NABET Accreditation letter no. QCI/NABET/EIA/1821/SA 0199)

Executive Summary

1. Introduction

M/s GHCL Limited is an existing reputed soda ash manufacturing chemical company, incorporated in 1983. It operates India's first integrated soda ash plant based on Akzo's dry liming technology at Sutrapada at Dist. Gir Somnath in the Gujarat state. The Sutrapada plant was commissioned in the year 1988 with the production capacity of 4,20,000 tons per annum (TPA) capacity. Over the time, the capacity of the plant has been expanded up to 11,00,000 TPA. With the experience and expertise in soda ash and allied production and also to meet the industrial demand of the country, GHCL Limited proposed a Greenfield Chemical Complex project for soda ash production initially and for salt-based derivatives in future. M/s GHCL Limited, Ahmedabad is proposing to set-up a greenfield chemical complex to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity and 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) near village Bada, Taluka — Mandvi, District Kutch in the Gujarat state. In this regard, the GHCL Limited is seeking environment clearance (EC-CRZ) from the State/Central environmental ministry.

In the proposed project, along with above products (LSA, DSA and SBC), 120 MW solid fuel based captive cogeneration power plant is proposed to meet the uninterrupted and stable power supply. The entire envisaged capacity of the project will be achieved in phased manner.

As per the EIA notification 2006, the proposed project falls under the "Category A" under Schedule 4(e) - Soda ash industry. M/s GHCL Ltd. has obtained the Terms of Reference (ToR) from MOEF&CC for EIA. The EIA report is prepared based on the Standard ToR issued by MOEF&CC vide letter no. IA-J-11011/293/2021-IA-II(I) dtd. 10th August 2021. In line with requirements of TOR granted by MoEF&CC, the Final EIA report has been prepared for the purpose of EC appraisal. The comments and concerns during Public Consultation shall be addressed suitably in EIA report before submission of Final EIA report to MOEF&CC for Environment Clearance.

The major raw materials are solar salt, chemical grade limestone, Coal, lignite and few others. The process being exothermic large quantity of seawater will be required for cooling purpose. Seawater will be withdrawn from nearby Arabian sea. The other associated utilities will be part of the project. The effluents generated from various process units of entire complex will be discharged through marine outfall system in the Arabian Sea at a location identified by scientific modeling studies. Identification of marine outfall location for effluent disposal using scientific tools and modeling is the integral part of the project, for which, CSIR-NIO (RC Mumbai) has conducted detail study.

M/s GHCL has also applied to MoEF&CC for Forest Diversion of 0.9689 Ha. of Unclass forest land vide' proposal no. FP/GJ/Others/147527/2021 as some part of seawater intake and effluent disposal pipelines are required to be laid through Unclass Forest. Consent To Establish (CTE) for the projects is obtained from Gujarat Pollution Control Board (GPCB). Application to Gujarat Coastal Zone Management Authority (GCZMA) is made for obtaining CRZ recommendations for Seawater Intake and Effluent Disposal System.

1.2 Location of Project

M/s GHCL proposes of setting-up Chemical Complex consists of soda ash and sodium bicarbonate plants with captive cogeneration power plant and other related utilities near Village Bada, Taluka - Mandvi, District -Kutch in Gujarat State. The estimated land for the project proposal is around 1350 acre. The site is well connected to SH 6 and in proximity to availability of raw materials i.e salt, coke, lignite, limestone etc. The site at village Bada of Mandvi Taluka, Bhuj District in Gujarat State is selected based on the environmental and logistic advantages over other four sites evaluated as alternatives. The approximate geographical locations with four corners of the plant site are as follows:

(A) 22°53’53.19”N & 69°09’26.63”E

(B) 22°53’41.63”N & 69°09’58.16”E

(C) 22°52'29.66"N & 69° 8'16.32"E

(D) 22°52’57.10”N & 69°07’33.09”E

The study area of 10 km radius from the project site is primarily located within a rural area with lesser developed and sparsely distributed population / installations. The general environmental features within the study area are given in Table 1.1. Field visits indicated that the soils contain high sand content. Cotton was observed as a standing crop while the other crops grown in this area includes sesame, bajara, castor, and groundnut. Horticulture was observed in few locations with a few crops including pomegranate, papaya, and banana. Due to water scarcity, only rain-fed agriculture is mostly practiced in the region. The project site also falls near the coast of the Arabian Sea.

Table 1.1 Environmental Settings in the 10 km Study Area of the Proposed Project

Sr. No.	Particulars	Details
1	Plant Location	Village Bada, Taluka Mandvi, District Bhuj, State Gujarat
2	Latitude and Longitude	Approx. (A) 22°53’53.19”N & 69°09’26.63”E (B) 22°53’41.63”N & 69°09’58.16”E (C) 22°52'29.66"N & 69° 8'16.32"E (D) 22°52’57.10”N & 69°07’33.09”E
3	Toposheet	F42J1
4	Topography	Undulated terrain
5	Elevation	Varying, 5-20 MSL
6	Nearest villages	Bada, Panchotiya, Bhada, Bhisra
7	Nearest Highway	NH-41 Bada - Bishra – Mota Layja road at Mota Layja Chowkdi
8	Nearest Railway station	Bhuj, ~87 km
9	Nearest Airport	Bhuj Airport, ~85 km

10	Nearest Port	Adani Port, Mundra, ~70 km
11	Nearest Water bodies	Seasonal River Vengadi and Arabian Sea coast
12	National Park / Wildlife Sanctuary	• Marine National Park and Sanctuary, Jamnagar are located at 75 Km aerial distance in south directions • Narayan Sarovar Sanctuary is located at more than 100 km aerial distance in North-West direction
13	Seismic Zone	The proposed project site falls in Seismic Zone – V (Highest Risk Zone) as per Seismic Zones Map of India
14	Wetlands & Important Bird Areas	No Notified wetlands present in study area, No Important Bird area present in Study Area.

1.3 Production Capacity

The proposed project aim to produce light soda ash and dense soda ash with Captive coal/lignite based power plant and allied facilities like RO/DM plant, raw material handling, sea water intake and effluent outfall pipelines and emergency DG sets. The production capacity of the proposed project is given in **Table 1.2**:

Table 1.2: Soda ash Production capacity and other facilities

Sr. No.	Product Name	Proposed Production Capacity
1.	Soda Ash Light Soda Ash Dense Soda Ash Sodium bicarbonate	 11,00,000 TPA 5,00,000 TPA 2,00,000 TPA
2.	Power Steam (CFBC boilers)	120 MW 150 TPH x 6 Nos.
3.	Emergency DG Set (total no. of sets can be 2/3)	5 MVA

The major raw materials required for soda ash production are solar salt and chemical grade limestone. Other raw materials are ammonia, sodium sulphide, coke. For CPP, lignite and/or coal/pet coke will be used as the fuel. Further, a very stable utility i.e. Steam, Power, Air (Instrument and Service), large amount of cooling water (Seawater) and Process Water (Sweet Water) are the essential requirement. The seawater required for the plant of around 16,00,000 m³/d shall be sourced through adequately sized Seawater Intake system. Total combined effluent estimated for project is 15,80,000 m^3/day. Approximate requirement of treated / process water, for various purposes is approx. 42000 m^3/d for soda ash plant and associated facilities.

1.4 Need for the Project

GHCL Ltd. had signed a memorandum of understanding (M.o.U) with the Government of Gujarat during Vibrant Gujarat Summit 2017 for this project. The proposed development operation is aimed to honour the commitment made in M.o.U. This project will produce additional capacity of soda ash to meet the demand of domestic and global markets.

The primary consumers of soda ash are glass, detergent, laundry soap, sodium silicate, cotton yarn, dyes and dye stuff, paper board and other chemical industries. In India detergent industry is the largest consumer of soda ash. Sodium Bicarbonate (Baking soda) is mainly used by food industry.

The Indian subcontinent is one of the world's fastest growing soda ash markets, driven by India's growing economy. The soda ash per capita consumption in India is 2.8 kg only. If India has to reach the per capita consumption of developed nations which is approximately 17 kg of soda ash than addition of capacity is essential.

2.0 Process Description

Soda Ash: Soda ash is the common name given to anhydrous sodium carbonate (Na_2CO_3). Soda ash is a white, fine crystalline hygroscope powder and moderately soluble in water. The proposed project evaluates both Dry Lime and Wet Lime process for soda ash manufacturing.

The major raw materials required for soda ash manufacturing are: i) Limestone ii) Coke or Briquettes or Anthracite (in Lime kiln) iii) Solar Salt and iv) Lignite /Coal/ Pet-coke (in Boiler fuel).

Solvay process also known as ammonia soda process was developed in 19th century and has been developing since many decades. The Soda Ash sector's experience in investment planning, process design, plant construction, start-up, operation, optimization, shut-down and decommissioning has allowed for building up these steps into plant's life cycle, leading to minimization of cost of production, efficiency of raw material and energy use leading to reduction of pollution loads and impacts. The important Process steps are Brine Preparation & Purification, Lime Kilns and gas cleaning, Lime Grinding, Absorption & Distillation, Carbonation and Compression, Filtration & Calcinations, Densification of Soda Ash, Product storage & handling.

Sodium bicarbonate: Refined sodium bicarbonate manufactured by dissolution of dry soda ash in previously de-carbonated circulating mother liquor and subsequent carbonation of obtained soda solution with compressed CO_2 gas, separation of formed bicarbonate slurry and drying of separated sediment.

Captive Power Plant: Circulating fluidized bed combustion (CFBC) technology for boilers is adopted for the proposed captive power plant. The turbo-alternators will be double extraction cum condensing type. Lignite/Coal/Petcoke will be used as Fuel. Initial



startup power will be by setting up of 66.0 KV substation with Gujarat Electricity Board grid connection.

3.0 Description of the Environment

The baseline environmental quality has been carried out during Winter Season between December 2019 to February 2020 in the study area of 10 km radius from project site for various environment components namely air, water, land, soil, ecology and socio-economics.

3.1 Ambient Air Quality

The PM_{10} concentration range was 19-53 µg/m³ for 24 hourly while $PM_{2.5}$ levels were in the range of 8-17 µg/m³ during the study period. The highest PM_{10} concentration among the monitored locations was found at Bhambdai and Bhishra and lowest at Mota Laysa whereas the highest $PM_{2.5}$ concentration among the monitored locations was found at Mapar and lowest at Mota Laysa and Bada. The particulate matter concentrations observed were below stipulated standards of NAAQS (24 h; PM10=100µg/m^3 and $PM_{2.5}$=60µg/m^3).

The minimum and maximum concentrations of SO_2 were observed in the range of 1-4 µg/m³ and 9-14 µg/m³ respectively. Similarly, for NOx varied in the range of 5-9 µg/m³ and 9-16 µg/m³ respectively. The highest concentration among all the locations of SO_2 was found to be in Bhambdai and Bhada and lowest concentration of SO_2 was found to be in project site area and highest NOx concentration was found in Bhishra and lowest was found in Mota Laysa and Padampur villages. The levels of gaseous pollutants were below the stipulated CPCB standards (24 hourly SO_2 is 80µg/m^3 and for NOx is 80 µg/m^3).

The concentration of total hydrocarbons was ranged between 0.23 – 1.27 µg/m³ during study period. The highest concentration was found in Dedhiya and lowest concentration was found in Bhishra.

The mono-aromatic hydrocarbons like Benzene, Toluene, Ethyl-benzene and Xylene (BTEX) are representative chemicals of volatile organic compounds (VOCs). Among the VOCs, benzene is regarded as carcinogen to humans. The observed concentration range of benzene was 0.11-0.16 µg/m^3 during the study period which is below the NAAQS prescribed limit of 5 µg/m^3.

In addition to the above air pollutants, other parameters were also monitored and given in the EIA report.

3.2 Noise

The equivalent noise levels of villages varied in the range 44-52 dB(A) and 38-44 dB(A) during day and night, respectively.

Noise levels in residential areas were observed to be 46-52 dB (A) in day time and 43-44 dB (A) in night time. The noise levels during the day and night were below the stipulated noise levels in residential areas (day time= 55 and night time 45 dB (A)).

Noise levels in commercial zone, silence zone and Industrial zone were within the CPCB standards for respective areas.

3.3 Water Quality

Six sampling locations were selected to collect surface water samples at 0.25 m depth below the water surface while the groundwater samples collected from dug wells (5-10 m depth)/tube wells/tank water in 11 villages to assess the drinking water quality. In addition, one coastal water sample was also analyzed. The important findings are listed below:

The physico-chemical characteristics of surface water were pH 6.9-7.9, turbidity 17-238 NTU and TSS 28-257 mg/l. Nutrients content in the form of nitrate-nitrogen and total phosphates were found to be 1.44-2.90 mg/l and 0.5-6.0 mg/l respectively. COD was observed in the range 29-86 mg/l, whereas oil and grease concentration was found to be 0.16-0.87 mg/l. Total coliforms count in the surface water was found to be in the range ND-800 CFU/100 ml and there was no faecal contamination.

The physico-chemical characteristics of ground water were pH 6.9-8.9, turbidity 1-34 NTU total dissolved solids (inorganic) 458-4246 mg/l, Nutrient contents in the form of nitrate-nitrogen and total phosphates were found to be 1.61-7.81 mg/l and 0.8-8.8 mg/l respectively. Oil and grease concentration was found to be <1 mg/l. Total coliforms count in surface water was found to be in the range 40-240 CFU/100 ml and the groundwater was free of faecal coliform.

The maximum concentration of heavy metals found in groundwater were as follows: Copper: 0.043 mg/l, Iron: 1.881 mg/l, Manganese: 0.413 mg/l, Molybdenum: 0.148 mg/l, Lead: 0.091 mg/l, Vanadium: 0.204 mg/l and Zinc 0.169 mg/l, while heavy metals cobalt and mercury were not detectable.

3.4 Marine Quality

M/s GHCL Limited engaged Council of Scientific and Industrial Research-National Institute of Oceanography (CSIR-NIO) to carry out Marine EIA/EMP related studies. The study report is separately enclosed. The marine water quality at twelve (12) locations covering nearshore (considered as stations 1, 2A, 4, 4A and 7), toward offshore (considered as stations 2, 3,5,6,8 and 9) and offshore (considered as station 10) were chosen for establishing baseline marine water quality. Intertidal sampling was conducted at 3 transects (TR I – TR III). Water quality recorded during post-monsoon (October 2018) and pre-monsoon (March 2019) seasons. The summary of the findings is as follows reported below:

The physical water quality parameters namely pH, temperature and suspended solids were found in the range 8.3-8.4, 28.5-32.8°C and 25-124 mg/l respectively during the study period. Salinity values were found to vary between 37.5 – 38.2 ppt.

Coastal waters had an average DO in excess of 4 mg/l, the coastal waters were well oxygenated, indicating healthy environment for biological growth. BOD of the coastal waters in the study area was 0.4-3.5 mg/l.

Phosphate (PO_4^{3-}-P), NH_4^+-N and NO_2^--N were found to be 0.1-1.7 μmol/l, 0.3-2.7 μmol/l, and 0.1-0.6 μmol/l respectively, indicating good oxidizing conditions in water.

The results of experimental trawling conducted at the study area indicated very poor catch rate. The region has no established trawling grounds for fishery operations due to uneven

bottom topography associated with rocky zones, hence, the trawlers operated at other areas for fishing

Coastal area of Bada is well protected by well-developed and stable sand dunes dominated by babul and grass

Mangroves were absent along the Mandvi-Bada coast.

No turtle was sighted off Bada during the study period.

Extensive survey was conducted during Oct 2018 - March 2019 in the intertidal region of proposed project area. Corals were not sighted in the project area. No turtles were sighted off Bada during the study period. It is suggested to lay the pipelines without disturbing the dune stretch through tunnelling.

Based on the above studies, it can be concluded that there will not be any significant impact due to seawater intake facilities and minor impacts will be limited to small well-defined area around the intake. Further, due to outfall facilities the water quality of the coastal area off Mandvi would not deteriorate with respect to temperature, salinity and ammonia except in the immediate vicinity of the outfall where, the temperature, salinity and ammonia ccould be relatively high but within the range considered tolerable to marine biota. The impacts of development, mitigation measures and the recommendations for the general monitoring of the area and the parameters to be monitored are incorporated in detailed Marine EIA/EMP report.

CSIR-NIO has recommended suitable seawater intake and effluent disposal locations after carrying out numerical model study and consideration of Sand Dune morphology study carried out by CSIR NIO, Goa.

3.5 Soil Quality

- Ten (10) villages were identified for soil quality assessment.
- The texture of the soil is sandy and sandy loam. The clay contain in the soils of the study area varies from 38-52%.
- The soil being of friable consistency, the bulk density of the soil is in the range 1.00 to 1.60 g/cm³ whereas the porosity and water holding capacity are in the range of 38.8-66.9% and 18.5-47.2% respectively.
- The pH of the soil in the study area was slightly to moderately alkaline in reaction, having pH in the range 7.4-8.2. EC of the soil extract in the study area ranges from 0.2 to 0.7 dS/m.
- Organic carbon, available nitrogen, and phosphorous of the soil samples were found to be in the range 0.2-0.8%, 25.3-139.2 kg/ha, and 64.1-187.8 kg/ha, respectively. The soil in the study area has poor fertility level with respect to available nitrogen and phosphorus.
- Total viable microbial population per gram of soil varied from $10x10^6$ to $48x10^6$ CFU. Different microflora observed per gram of soil samples were Actinomycetes ($22×10^5$ - $24×10^6$ CFU), fungi ($14×10^5$ to $60×10^6$ CFU), Rhizobium ($17×10^5$ to $50×10^6$ CFU) and Azotobacter ($16×10^6$ - $54×10^6$ CFU).

- Fertility status of soil found to be mostly poor in study area.

3.6 Ecology

The ecological study has been carried out for identification of ecologically sensitive receptors (species, habitats & eco-systems) based on field investigations and literature survey to propose appropriate wildlife conservation plan. The study was carried out in project area i.e., 10 km from the project site and its nearby areas.

The study was carried out by following standard procedures and scientifically using primary observations in the field and secondary data collected from the authenticated sources to derive factual information on the ecological status of the project site and its surroundings.

Several field visits were carried out between month of October-2018 to January 2019 to understand and assess the impacts of proposed project activities on flora and fauna and natural habitats.

The study involved assessment of general habitat type, vegetation pattern, preparation of inventory flora and fauna of terrestrial ecosystem in 10 km radius from the boundary of proposed plant. The proposed project area land does not have dense vegetation, sparse clumps of thorny scrub mostly in the form of invasive species i.e. *Prosopis juliflora* exists.

Biological assessment of the site was done to identify whether there are any Rare, Endemic or Threatened (RET) species of flora or fauna in the core area as well its buffer zone and to identify whether there is any ecologically sensitive area within buffer zone that is likely to be impacted.

After identification of significant impacts of the project, on flora, fauna or any key habitats of any important species or their corridors, a comprehensive wildlife conservation action plan is proposed to be implemented within 10 years, with monitoring mechanism and financial projections.

Our field survey in the project area suggest that there are no endangered, endemic, rare plant species present within the project boundary i.e. core area. However we found two important species i.e. *Commiphora wightii*, and *Tribulus terrestris* in the buffer area with low abundance and frequency of occurrences.

No endangered, rare, threatened or endemic species of reptiles was reported from the project core area

Inventory of birds reported from study are and their conservation status included in EIA report.

As per our data collected from open sources and survey, there are no sanctuary, national park, or notified wildlife corridors, notified wetland, and important bird areas within the project study area (10 km from the project site).

No protected area or eco-sensitive zones are present within 10 km periphery of the proposed project site.

The major land-use features are agriculture, sea, beach, water bodies, built up areas, and wasteland (consisting of scrubland & plantation).

3.7 Socio-economic Status

Socio economic survey was conducted in the villages thin study area.

Structured interview method is used to collect data regarding awareness and opinion.

Information on socio-economic profile was collected from the Primary Census Abstract CD 2011, including the population details of the region and Village Directory CD 2011, having the details of basic amenities available in the region.

Total geographical area is 182.7767 km^2 and population density is 65 persons/km^2

Total population of the region as per 2011 Census was 11956out of which 6001 (50.19%) were male and 5955 (49.81%) female.

Sex ratio (number of males per thousand female) in the region was 992, showing that male and female population are comparable.

Out of the total population, Scheduled Caste population was1586 (13.27%) and Scheduled Tribe population 609 (5.09%)

According to 2011 Census, total worker population in the study area was 5031(42.08%). Main workers were 4324(36.17%) and marginal workers were 707(5.91%). Total non-working population was 6925(57.92%)

Overall literate population was 7130 (59.64%) and illiterate population was 4826(40.36%)

The average QoL index values are estimated as:

- $QoL_{(s)} = 0.51$
- $QoL_{(o)} = 0.53$
- $QoL_{(c)} = 0.52$

The average QoL Index value for the study area is leaning towards neutral and satisfactory level due to good economic status like income, employment, educational facilities and also availability of basic needs, viz. food, clothing, and housing.

4.0 Anticipated Environmental Impacts and Mitigation

The anticipated environmental impacts due to the proposed project and the suggested mitigation measures are given below:

- During construction phase, 24 hourly average maximum GLCs of PM_{10} will be around 33.4 µg/m^3. A marginal increase in the levels of oxides of nitrogen, carbon monoxide and hydrocarbons is envisaged due to the movement of vehicles for transportation of construction materials and diesel generators required during construction phase.
- The predicted 24 hourly incremental concentrations of SO_2, NO_x and PM_{10} are 10.98 µg/m^3, 11.37 µg/m^3 and 3.05 µg/m^3 respectively, occurring at a distance of 0.95 km for SO_2 and NO_x and 0.85 km for PM_{10} in SE sector respectively (considering CPP emissions using lignite as the fuel).
- The predicted 24 hourly. incremental concentrations of SO_2, NO_x and PM_{10} will be 2.55 µg/m^3, 7.3 µg/m^3 and 3.05 µg/m^3 respectively, occurring at a distance of 0.95

km for SO_2 and NO_x and 0.85 km for PM_{10} in SE sector respectively (considering CPP emissions using 100% coal as the fuel). For pet coke, the incremental concentrations of SO_2, NO_x and PM_{10} will be 13.26 $\mu g/m^3$, 5.62 $\mu g/m^3$ and 3.05 $\mu g/m^3$ respectively, occurring at a distance of 0.95 km for SO_2 and NO_x and 0.85 km for PM_{10} in SE sector.

- The incremental GLCs for captive co-gen power plant with various solid fuels are within NAAQS and no significant impact are predicted for nearby man-made sensitive installations Vipasana Centre and habitations.
- The predicted 24 hourly incremental concentrations of NH_3 will be 3.66 $\mu g/m^3$ occurring at a distance of 0.7 km in ESE - SSE sector.
- The traffic volume along with emissions factors of pollutants CO, HC, NO_x and PM (source: ARAI, Pune) were considered for computing the pollutant concentrations using line source option in AERMOD. The maximum pollutant concentrations of CO, HC, NO_x and PM are predicted as 15.76 $\mu g/m^3$, 3.57 $\mu g/m^3$, 18.01 $\mu g/m^3$ and 2.60 $\mu g/m^3$ respectively. These concentrations are well within NAAQS.
- From the baseline data and the maximum incremental GLCs in respect of all the pollutants, it is evident that the ambient air quality shall be well within the NAAQS given by CPCB.

4.1 Mitigation Measures

By adopting suitable measures and use of appropriate equipment, air quality impacts would be reduced. Some of the important mitigation measures are suggested for the project proponent to follow during project construction and operational phase.

Construction Phase

- Methods for controlling dust emission by water spraying in the construction site, use of proper transport methods like closed transport for excavated material and screens around the construction site
- Periodic checking of vehicles and construction machinery to ensure compliance to emission standards
- Ensure periodical washing of construction equipment and transport vehicles to prevent accumulated dust
- Nose masks or earmuff to be provided to construction workers, while carrying out operations that may entail potential for dust inhalation
- No on-site burning of any waste arising from any construction activities
- Engines and exhaust systems of all vehicle and equipment to be maintained so that exhaust emissions do not reach statutory limits (set for that vehicle / equipment type and mode of operation by CPCB), and that all vehicles and equipment are maintained in accordance with manufactures guidance

Operation Phase

- Lime stone injection and suitable de-sulphurisation system for reducing the SO_2 emissions
- Adequate stack height for lime kilns and for captive power plant are proposed to maintain SO_2 emissions below the standard limits
- Air quality surveillance program should be under taken regularly as per the CPCB/GPCB norms and regular monitoring of air polluting concentrations through continuous ambient air quality stations (CAAQMS) at specified locations along the plant boundary.
- Online stack monitoring to be carried out through CEMS
- Attenuation of pollution/protection of receptor through green belts/green cover development
- Greenbelt to be maintained as per the norms by periodically planting additional local species to mitigate impacts from fugitive emissions
- All vehicles to be covered during transportation of raw materials and finished products
- Fly ash generated will be supplied to identified cement industries as per the Fly ash utilization plan

Table 4.1: The air emissions control systems for proposed project

Stack No.	Stack attached to	Air pollution control System	Expected Pollutants to monitor & control.
1	Lime Kilns	Scrubber & Dust collector system	PM, SO_2, NO_x
2	Ammonia Recovery system	Water Scrubber	Ammonia
3	Lime Grinding System/Slaker	Bag Filter/adequate stack height	PM/water vapour
4	Calciner Unit	Scrubber, Bag Filter	PM
5	Densification	Scrubber	PM
6	Sodium Bi- Carbonate Unit	Bag filter	PM
7	CPP	ESP, Desulphurization system, Bag Filter	PM, So_2, NO_x, Hg

There is no continuous emission expected from the lime kiln stack. Calcium oxide (CaO) and Carbon di oxide is produced by decomposition by burning of limestone and Coke; CO_2 after passing through Scrubber and Wet ESP will be sent to compressor for further use in process. At the time of process start up and disturbances CO2 will be released in to the atmosphere. Incase of wet lime process instead of stacks of lime grinding unit stacks (20 m) of slaker unit will be there.

4.2 Noise Pollution

- The plant work area will be able to maintain noise levels below 85 dB(A) during operations.

- The in-plant workers, particularly working near higher noise sources, may be exposed up to 75 dB (A). This exposure is well below the exposure limit of occupational safety and health administration (OSHA) i.e. 90 dB (A) for 8 hour shift and 6 working days.
- Restricted areas will be those locations where it is not reasonably practicable to reduce the noise level below the work area limit; where practicable, all attempts to be made to reduce the noise level below 80 dB(A).
- There can be an increase in noise levels in the residential areas situated close to the road due to movement of trucks and other vehicles. However, the impact of such traffic movements on noise level in the residential areas, situated at 50 meter and beyond from the road, will be insignificant, considering the excess attenuation and will be below the stipulated standard of CPCB.

Mitigation Measures

- Some of the important mitigation measures to be followed are given below to control noise pollution:
- Restricting the movement of vehicles and noise prone activities during night, as night-time noise levels will be more sensitive.
- Ambient noise levels to be regularly monitored at critical locations, such as construction sites, before start of work so that increased ambient load can be estimated.
- Employees/workers to be regularly subjected to medical check-up for detecting any adverse impacts on their TLV of hearing.
- The proposed greenbelt help to prevent noise generated within the plant from spreading beyond the plant boundary.

4.3 Water Requirement and Wastewater Generation

The water requirement for the proposed project will be met from the Arabian Sea located nearby the proposed site. Total seawater withdrawl will be around 16,00,000 m³/d. Continuous uninterrupted water supply is required to meet process, cooling, utility and to meet dilution requirement for effluent. Since, groundwater abstraction is not proposed for the project, impact on groundwater quality and quantity is not envisaged.

The soda ash effluent streams, brine preparation/purification rejects, boiler blow-down from captive power plant, RO/DM plant rejects etc. will be mixed with once through return cooling seawater/fresh seawater to meet the criteria laid down by GPCB/CPCB for releasing the treated effluent in the sea. The effluent will be transported within the plant premises and thereafter in closed above or underground pipelines up to land fall point (LFP). From there through submarine pipeline it will be released at a designated point having diffuser system in the sea off Bada to achieve further dispersion/dilution in the Arabian Sea. This will be in conformity to prevailing norms by ensuring the requirements of minimum depth and the exit velocity. Domestic wastewater will be treated in septic tank and soak pit systems. However, STP will be established.

Mitigation Measures

- Proper seawater intake and treated effluent disposal (ensure maximum dilution) to be done as per Marine EIA report prepared by CSIR-NIO
- Surface run-off during the construction to be suitably embanked, so that it does not go to the course of any water body in the study area. Special care to be taken during construction work during monsoon, spillage of construction debris should be avoided so as not to pollute the water.
- During rainy seasons, maximum rain water to be harvested; and well-designed water flow paths/drainage to be prepared to avoid water clogging.
- The surface water run-off to be collected and used for plant activities; the proposed rainwater harvesting near the percolation tank to be constructed.

4.4 Land / Soil and Greenbelt

- The land chosen for the proposed project comprises Government wasteland and private un-irrigated agricultural land. The existing land is wasteland land with only shrubs/bushes and some agriculture fields present on the land. During construction, the site will be leveled and prepared for construction.
- The possible solid waste generated from the project includes, undersized limestone from the lime kilns, sludge from brine purification plant, and collection pond, Fly ash/Bottom ash from boilers, and used/waste oil. Sludge, if any, generated will have no hazardous characteristics and the same will be used for filling the low-lying areas. The ash (fly ash and bottom ash) from boilers will be sent to nearby Cement Manufacturing/ Brick Manufacturing units. The used oil will be disposed-off by way of sale to the reprocessing units approved by MoEF&CC/GPCB for its further processing and reuse. Limestone rejects will be used in boilers for desulphurization, and if in excess, as a sweetener in cement industry, road and pavement making. The hazardous waste generated will be handled, transported and managed as per HWM Rules 2016 and its subsequent amendments. The details of solid/hazardous wastes and its mode of disposal are summarized in the below.
- Potential sources of impacts on soil are accidental discharge of effluents, handling of raw materials, storage of raw material, disposal of solid wastes generated in the plant. There is no effluent discharge on to the soil, hence impact on soil is not envisaged.
- Developing greenbelt / green cover in the plant premises (about 33% of the total area) to mitigate soil erosion and the soil to be fully stabilized without any adverse change in erosion potential of the area.

4.5 Ecology and Biodiversity

The proposed project construction activities may involve removal of vegetation from the project site. Since the project site does not have important plant species, the unavoidable removal of vegetation during the construction activity could be considered



negligible impact on flora. Since no rare or high conservation significance species of reptiles is present in the core and immediate buffer area of the proposed project site, the impacts on the reptiles could be low. There is no Important Bird Area (IBA) present in the study area. The impact of proposed project on mammals also involves displacement of the mammalian species occurring in the core area. As per our field survey, we observed that width of supra tidal areas on the coast near the proposed project boundary is narrow and has dense vegetation and steep slope. These conditions may not be very suitable for nesting activities of sea turtle on the coastal stretch of 2.0 km that is located south of the proposed project boundary.

Mitigation Measures

- Minimum vegetation shall be removed from the project site and the important plant and tree species on the periphery of the project site be left as part of green belt development.
- In order to control dust and fugitive emissions, it is strongly recommended that proponent shall grow thick green belt on the periphery of the project site.
- Project proponent shall take all possible measures to control pollution during construction and operation phases.
- Recommendation given in Conservation Plan will be followed.

4.6 Socio Economic Aspects

- Development of Proposed project will have positive impact on study area due to generation of direct and indirect employment oppourtunities.
- Preference should be given to local population
- Identify skill gap and provide training to local youths
- The environmental management and emergency preparedness plans are proposed to ensure that the probability of undesired events and consequences are greatly reduced, and adequate mitigation is provided in case of an emergency.
- Provide Health services through mobile dispensary in surrounding wards/villages in the study area

5.0 Analysis of Alternatives

- Consideration of alternatives to a project proposal is a requirement of the EIA process.
- After examining 5 alternative sites on various environment parameters site near Village Bada is selected on merit for setting up of proposed project.

6.0 Environment Monitoring

- The environmental quality-monitoring programme will be carried out in the impact zone with suitable reference sampling stations and frequency for environmental parameters with respect to different environmental components.
- Ambient air quality monitoring for conventional pollutants such as Particulate Matter 2.5 ($PM_{2.5}$), Particulate Matter 10 (PM_{10}), Oxide of Sulfur (SOx) and Oxides

of Nitrogen (NOx), and ammonia as per the requirements of Gujarat State Pollution Control Board.

- Installation of stack monitoring system for the sampling and monitoring of gaseous pollutants effluents on a continuous basis.
- Environment components like air quality, water quality, noise levels, marine water quality, soil and ecology should be monitored during construction phase and operations phase.
- The conditions stipulated in environmental clearance will be adhered and compliance reports will be submitted to GPCB/Regional Office MoEF & CC as per the prescribed time schedule.

7.0 Risk Assessment

- Risk assessment was carried out for the proposed plant operations under abnormal conditions. Maximum Credible Accident (MCA) analysis was carried out at various wind velocities and atmospheric stability classes to estimate the maximum effective distances, in case of partial and catastrophic rupture scenarios. The risk has been quantified in terms of iso-contours and F/N curves. Risk has also been quantified in terms of individual and societal risk contours for process equipment and storage tanks for partial and full rupture scenarios. The maximum individual risk generated in the plant site is of 10^{-6} level. This level risk is acceptable as per the international standards.
- The F/N curves for Liquid Ammonia Storage, Ammoniated Brine Tank, Free Ammonia Still Tank, A Liquor Tank, Diesel Storage and Chlorine Tonner are all broadly in the acceptable region. The societal risks from other process equipment are also within the acceptable region. Mitigative measures have been recommended to tackle the emergencies. Disaster Management Plan (DMP) has been delineated including the roles and responsibilities of key persons.
- Addition studies for Hydrogeology assessment, CRZ Map, Sea Turtle Status survey and conservation, were also carried out and enclosed as part of EIA report.
- All the rivers and streams are seasonal and flow only in direct response to rainfall and remain dry for rest of the year.
- For channelizing the monsoon run off from the area adjacent to plant it is required to construct a peripheral drain along the plant boundary so that the flooding is avoided and run off find its way to the natural slope towards Arabian Sea.
- GHCL proposes to take up a rainwater harvesting program as part of it's CSR activities by deepening the existing village ponds to store surplus surface runoff from its catchment area.
- The GHCL proposes to take up rain water harvesting by harnessing the roof top rain water from different buildings and proposes to collect it in water tank and use it for general plant purposes.

8.0 Project Benefits

The proposed project has a potential for employment of skilled, semi-skilled and unskilled employees during construction phase as well as operational phase.

The plant will create direct employment in phased manner for about 1200 (operational phase) skilled as well as semi-skilled staff and indirectly large number of unskilled manpower will be engaged for the project.

The project will contribute additional revenue to the State and Central exchequer in the form of royalty, cess and other taxes.

Create opportunities for indirect employment on account of new trucks, company's vehicles and hired vehicles

Create opportunities for indirect employment through stockiest and retailers in Gujarat and also in other states

- Overall, development of area in terms of infrastructure will improve the indirect and direct job opportunities which would finally result in improvement in the quality of life of people in the region and especially in the area around the Bada project site.
- As Soda Ash is used widely in many industries like glass, construction, water treatment, detergents etc. proposed capacities will further cater to the Demand Supply requirements of the nation.

During year 2020-2021 GHCL has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. For the year 2021-2022 total budget for CSR activities under implementations is about 10.06 Cr.

Under CSR, the company aims at strengthening the bond between the project authorities and the local population in the vicinity of the project. At the project site, GHCL would carry out number of community welfare activities in the following areas:

- Health and Family Welfare
- Education
- Social development activities
- Environmental activities
- Sanitation, Water supply and Fodder for animals etc.

9.0 Environment Cost Benefit Analysis

- Proposed plant land near village Bada comprises government waste land and private un-irrigated agricultural land. Most of the private un-irrigated land is used for single crop (seasonal crop).

- The project site supports only a few plant species of lesser conservation significance. The proposed plant and related construction activities may involve removal or thinning of some vegetation which is mainly Prosopis juliflora within the proposed area.
- The forest area required for laying of pipelines mainly consists of prosopis juliflora and scrub vegetation. The pipeline route will be selected in such a way that the removal of important floral species, if any, will be minimal or avoided.
- Besides the tangible benefits, the project also has a number of intangible benefits like energy efficient, water conservative, no adverse impact on environment, socio-economic benefit of the local people and the region. Therefore, the loss to the environment will be negligible.
- The establishment of Soda Ash plant would benefit to the industries and consumers and development of industries, overall development of area and consequent indirect and direct job opportunities.

10.0 Environmental Management Plan

10.1 Construction Phase

- Environmental impacts during the construction phase can be due to the site preparation, civil construction, erection & mechanical fabrication, welding operations, non-destructive testing and other operations and provision of civic amenities to the construction work-force.
- The environmental components impacted during construction phase include deterioration of air quality, contamination of surface water and noise generation.
- The land use change and any associated loss of flora is permanent.
- The construction area to be secured by fencing and only authorized personnel to be allowed to avoid accidents and unto do incidents.
- To arrest resuspension of dust during construction phase, specifically excavation, levelling and other operations, water sprinkling to be practised.
- The runoff water from the construction area to be channelled through sedimentation tanks to remove suspended solids and to avoid contamination of nearby waterbodies.
- Suitable water supply and sanitation facilities to be provided to the labour colonies/housing during the construction work-force. The sanitary waste to be routed to septic tanks and soak pit.
- Well maintained diesel operated construction equipment to be used to minimize the exhaust and subsequent atmospheric pollutants.
- Safety equipment such as earplugs and earmuffs, helmet, face shields, safety goggles and other related gadgets to be provided to workers engaged in high-risk areas.
- All construction equipment shall be properly maintained and greased to minimize noise generation and vibration.
- Development of green belt to be started along with the construction activities itself.

- Adequate supply of fuel to be provided for the construction activities. Required fuels, acetylene cylinders, compressed gases and paint materials shall be stored as per accepted safety standards.
- Strict instructions will be given to contractor/construction agency to maintain construction vehicles and other materials transport vehicles with minimal pollution with proper and up to date PUC certification. Vehicles carrying solid raw materials/fuels should be covered to avoid fugitive dust.
- The medical facility to be adequately provided, in particular, immediate medical aid to the workers and their family members. An ambulance provision to be made to transport injured workers to nearby hospitals during the construction.
- No construction materials like earth, stone, ash or appendage disposed off to prevent any blockage in the flow of water of any water course, and cross drainage channels. Proper drainage system (open or closed) to be prepared.
- All vehicle/machinery and equipment operation, maintenance and re-fuelling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the water.
- Contractor will arrange for collection, storing and disposal of oily wastes to the approved disposal sites. All spills and collected petroleum products will be disposed off in accordance with the GPCB guidelines.
- The project area to be protected by proper embankment to prevent flooding.
- During construction phase, the air emissions with reference to dust will be monitored. The surface water quality with reference to total dissolved solids (TDS), pH, oil & grease and faecal coliform will be monitored for the nearby surface water bodies. Noise quality will be measured during construction phase and recorded at 0.5 km and 1 km from the project site. The quantity of paints, oil & grease and other construction materials will be recorded and kept at elevated room to avoid contact with rain water. For this purpose, a new storage room/shed will be constructed. All the parameters of air, water and wastewater and solid/hazardous wastes will be measured using CPCB approved test methods. This monitoring will be conducted by the GPCB approved laboratories for every 6 months during the entire construction period.

10.2 Operational Phase

- To ensure that all the pollution control / environment management systems are commissioned as part of main plant equipment, before the commencement of operation of the project. Regular performance evaluation of the control systems to be undertaken to ensure their optimum performance.
- The EMPs suggested by CSIR-NIO to be strictly followed to mitigate marine impacts due to the project activities.
- The surface water run-off to be collected and used for plant activities; the proposed rain water harvesting near the percolation tank to be constructed.
- The water monitoring results of (terrestrial and marine) to be carefully evaluated to identify significant changes, if any, from the baseline and accordingly, corrective measures to reverse the trend would be necessary.
- Proper solid/hazardous waste handling practices to be followed as [er the Hazardous Wastes Management Rules and its amendments.

- Provision of Personal Protection Equipment (PPEs) need to be arranged and their proper usage should be ensured for protection from high noise for the workers as well as visitors.
- Adopt proper housekeeping procedures and devices, including dedicated (covered) skips for different types of domestic wastes.
- Used/waste oil generated to be carefully handled and stored in an environment friendly manner and disposed-off by way of sale to the reprocessing units approved by the MoEF&CC/GPCB for its further processing and reuse.
- Adequate stack height and SO_2 control measures to be adopted.
- Fly ash utilisation to be implemented as per provision of Fly Ash Notification. Fly Ash will be utilised in Cement Industries. Letter from Sanghi Industries for use of Fly Ash is provided in EIA report.
- Implement Health Safety & Environment (HSE) awareness/information programs for the nearby communities in collaboration with the local administration. Issues to be dealt with may include HSE aspects of project, environmental conservation and sustainable development, personal hygiene and sanitation awareness programs etc.

10.3 Post-Project Monitoring

To evaluate the effectiveness of environmental management program, regular monitoring of the important environmental parameters of VECs will be carried out. Monitoring of various environmental parameters will be carried out on a regular basis to ascertain the following;

- Pollution status within the plant and in its vicinity
- Generate data for predictive or corrective purpose in respect of pollution
- Effectiveness of pollution control measures and control facilities
- To assess environmental impacts
- To follow the trend of parameters which have been identified as critical

Monitoring is as an important activity for pollution control, since the efficiency of the control measures can only be determined by monitoring. The schedule, duration and parameters to be monitored will be as per GPCB/MoEF&CC directives. A table showing environmental parameters proposed to be monitored are given in **Table 10.1**

Table 10.1: Post-project Environmental Monitoring

Sr. No.	Environmental Component	Parameters to be analyzed
1.	Meteorology	Wind Speed, Wind direction, Temperature, Relative Humidity, Rainfall
2.	Ambient Air Quality	PM_{10} and $PM_{2.5}$, SO_2 ,NOx,NH_3
3.	Stack Emission	SPM, SO_2, NO_X, NH_3,
4.	Water quality of surface and ground water	Physical and chemical parameters
5.	Ecology	Density and diversity flora and fauna
6.	Liquid effluent	Parameters as per GPCB consent

7.	Noise Quality	Sound Pressure Levels (L_{eq}) during day and night times.
8.	Coastal/Marine Monitoring	Sediment, water, flora, fauna and other parameters as per CRZ Clearance

The various components of the environment needs to be monitored on regular basis as per the requirements of regulating agencies as well as for trend monitoring of the pollutants levels in various environmental matrices. Environmental Management System (EMS) will have schedules for various monitoring and to review the effectiveness of the EMP implementation. The data collected on various EMP measures would be reviewed and if needed corrective action will be formulated for implementation. The proponent will form short-term and long-term plans for environmental issues, which require monitoring and effective implementation.

10.4 Budget Allocation for EMP

The total capital cost/investment on environmental protection/ improvement measures is envisaged to be around Rs. 200 Cr. The budget will be used for various installations for Air Pollution (ESPs, Scrubbers, Dust extraction and suppression systems, Stacks), Water Pollution, Noise Control (Acoustic enclosures), Greenbelt Development, Occupational Health and Safety and other related activities. The annual recurring cost during the operations will be around 3% of operating cost.

CSIR NIO recommended a provision of Rs. 10.0 million to be earmarked for the biodiversity management plan to be implemented in the project area during construction phase and operation phase.

For periodic monitoring of the marine area environment during project construction phase (considering 2 years), a provision of Rs. 5.0 million to be earmarked. For operation phase, Rs. 3.0 million per year to be kept provision for the monitoring.

11. Conclusion

In view of state-of-the-art technology adopted for manufacturing processes, present status of the environment established through field studies (primary data) and secondary sources, and the control/mitigation measures proposed for environmental management during construction and operation phases, it is concluded that the project will not have any significant negative impact on environment. All best available technology for process, effluent treatment, air pollution control or any other environmental pollution control will be implemented in the plant for creating better environment in the plant and nearby environment. All emissions, discharges and disposals will be in conformity with the statutory norms. Further, in view of creation of direct as well as indirect additional employment opportunities during construction and operation phase, the project would have positive impact on the economy of the area, the state, the nation and the company.

The process being exothermic large quantity of seawater will be required for cooling purpose and for diluting process effluent to meet statutory norms before discharging into the Arabian sea. The source of seawater is from nearby Arabian Sea near the project site. The other associated utilities will be part of the project. The effluents generated from various process units of the proposed entire plant will be dispersed through marine outfall system at a suitable location in the Arabian Sea identified by scientific modeling studies (details are given in **Chapter 8**).

2.2 Need for the Project

Soda Ash is one of the important raw materials in various industrial process such as manufacturing of glass, usage in chemical industry, paper and detergent manufacturing, and food industry. In India detergent industry is the largest consumer of soda ash. At present, the light soda ash demand across the globe is decreasing due to increase in demand of liquid detergent. Whereas, the dense soda ash demand is increasing with demand of glass worldwide. As such demand of soda ash is shifting to dense soda ash especially in developed economies.

The Indian subcontinent is one of the world's fastest growing soda ash markets, driven by India's growing economy. The soda ash per capita consumption in India is 2.8 kg only. If India has to reach the per capita consumption as of a developed nations which is approximately 17 kg of soda ash then addition of capacity is essential and this demand imply about 19 million MT of additional annual demand. Indian soda ash market is getting ready to meet this demand growth and GHCL is focusing on becoming Industry leader in soda ash and allied products manufacturing.

India witnessed soda ash demand growth of 11% in 2017-18. India will continue to have robust growth and we expect demand growth of around 5 to 6% in the coming years. This will be further augmented by continuing urbanization which will have a further positive impact on glass and detergents.

The estimated demand growth for bicarbonate would be around 10%. It is expected an annual growth of 8-9% growth in the coming years where the primary demand would be food and beverages, animal feed, fire extinguishers, personal care, flue gas desulfurization and other industrial applications.

2.3 Project Location

The selection of appropriate site for project development is an important issue. Many of the environmental problems related to air, water, land, flora and fauna, human settlements and health of people can be avoided by judicious siting of the industry. Taking necessary steps during setting-up the industry will minimize the possible adverse effects on the environmental resources and quality of life.

M/s GHCL proposes of setting-up Chemical Complex consists of soda ash and sodium bicarbonate plants, with captive cogeneration power plant and other related utilities near Village Bada, Taluka-Mandvi, Dist. Kutch in Gujarat (**Figure 2.1**).

The approx. geographical locations with four corners of the plant site are as follows:

(A) 22°53'53.19"N & 69°09'26.63"E

(B) 22°53'41.63"N & 69°09'58.16"E

(C) 22°52'29.66"N & 69° 8'16.32"E

(D) 22°52’57.10”N & 69°07’33.09”E

The Ministry of Environment formulated guidelines for siting industries; and three important criterions applicable to the proposed chemical complex project. They are:

(i) There are no metropolitan cities nearby the new proposed plant site

(ii) Availability of raw materials and transport systems are very favourable and environmentally sensitive areas/zones such as mangroves, protected wildlife are not in the plant site and

(iii) Plant site will need EC from regulatory agencies before establishment of industry.



Figure 2.1: Project Location Village Bada, Dist. Kutch, Gujarat



Figure 2.2: Google image showing the project location

- The estimated land for the project proposal is around 1350 acre. The site at Village Bada is considered based on the environmental and logistic advantages over other four sites. The merit of the selected site is as follows:
- Availability of adequate and continuous land parcel for setting up of soda ash, bicarbonate plant, captive cogeneration power plant, establishing sea water/effluent disposal facilities along with other essential associated facilities. The land consists of Government land / Sarkarshree/and private unirrigated agricultural land.
- No notified ecologically sensitive area within radius of 10 km.
- No mangroves vegetation near the project site coastline/estuary
- Sparsely populated surroundings, nearest village Bada has population of 2719 as per Census, 2011.
- No forest land within identified project site. However, for seawater intake and outfall, pipeline will pass through adjoining forest land. Prior to undertake any permanent construction activities, necessary permissions / approval shall be obtained.
- The Arabian Sea is located at a distance of around 0.8 km of western side of the proposed project site.
- No perennial river within the vicinity, only seasonal River 'Vengadi' near North/West boundary of plant land.
- State Highway No. 6 is about 6 km from proposed project site and easily accessible.
- Proximity to availability of raw material i.e. salt, coke, lignite, limestone etc.

In summary, the ecologically sensitive zones/areas such as wildlife sanctuaries are not located in the plant site and the site is barren land with scatter shrubs. Regulated CRZ buffer will be maintained. Sea water intake and outfall systems are permitted activity as per CRZ notification, 2018. There are no habitants existences in the plant site. The available raw materials such as limestone, salt, lignite/coal and coke can be easily transported and required quantity of seawater can be drawn from the Arabian sea due to its proximity. There is no issue of rehabilitation and resettlement as there is no habitation in the plant site. Based on above merits, 'Bada' site has been chosen as the most suitable for setting up of proposed Chemical Complex. The preliminary project lay-out is given in **Figure 2.3**. The land use pattern in the proposed project site is given below:

Sr. No.	Category	Approx. Area allocation (Ha.)
1.	Process Plant Units	29.9550
2.	Utilities	15.4500
3.	RM & Fuel Handling & Storage	47.6745
4.	Storage Finish Goods	3.7500
5.	ETP	8.0000
6.	Non Plant Building	56.2875
7.	Green Belt	180.2856
8.	Open area for plant use like truck parking, equipment storage, water reservoir	31.9214
9.	Open Vacant area	87.4460
10.	Open area temporary reserve for Construction stage, fabrication, storage etc.	70.000
11.	Future Development	15.5500
Total		546.3200 Ha.
		(1350) acres

2.4 Project Operations and Production Capacities

Setting up of a greenfield chemical complex with soda ash and sodium bicarbonate manufacturing plant along with integrated captive cogeneration power plant with necessary facility e.g., sea water intake, RO/DM plant, effluent out fall facility and other associated utilities.

The soda ash process along with captive co-generation power plant in totality requires huge quantity of cooling water. Thus, to meet the overall water requirement for proposed project & operation, sea water from Arabian sea is best option. The proposed site location is very close proximity of the Arabian sea.

The soda ash process requires uninterrupted and stable power supply, which will be met from the proposed 120 MW solid fuel based captive cogeneration power plant.

The facilities for sea water intake withdrawal and effluent disposal in Arabian Sea will be developed based on scientific modeling studies. Based on the pre-feasibility study by leading marine consultants, laying of pipeline for sea water intake and effluent disposal will be carried out by the experienced agencies. Since the activity attracts provision of CRZ Notification, 2011 required statutory approvals will be obtained from GCZMA and MoEF&CC.

Proposed Production capacities are as below:

- Light Soda Ash: 11 lakh TPA
- Dense Soda Ash: 5 lakh TPA
- Sodium Bicarbonate: 2 lakh TPA
- Seawater Intake system for: 16 lakh m^3/day
- Effluent Disposal System: 15.8 lakh m^3/day
- Solid Fuel Based Captive Co-gen power plant: 120 MW
- DG Sets: 5 MVA
- Associated support infrastructure and utilities.

2.5 Proposed schedule for Approval and Implementation

- Start date of Basic Engineering: September 2021
- Start Date of Detailed Engineering: March 2022
- Start of construction (i.e., after obtaining the Environmental Clearance from MoEF&CC): July 2022
- Project completion date: June 2025

The overall project duration up to Mechanical Completion (Plant ready for commencing pre commissioning activities) in 32 months from the zero date is considered based on the following:

- The zero date is considered as readiness of the basic engineering package /Initial clearance from Statutory authority
- Land acquisition, followed by soil investigation/contour survey within 3 months from the zero date.

- Process Data sheets and specifications of the following long delivery critical items shall be made available by consultant within 2 months from the zero date.

- RO-DM unit
- Boilers
- T.G Sets
- Calciner
- Filters
- Lime Kilns
- All Cast Iron/CS/Non-metallic columns
- Carbonation Towers
- CO_2 Compressors
- Lime Kiln
- Lime Grinding (in case of Dry Lime process) / slakers (in case of wet lime process)

- Process data sheets for all balance equipment shall be made available within five months from the zero date.

A. Estimated Project Cost along with Analysis in Terms of Economic Viability of the Project

The estimated capital cost, including foreign exchange component, for the proposed Soda Ash Plant Phase 1: Capacity 5,50,000 TPA Light Soda Ash, and 2,50,000 TPA Dense Soda Ash, 1,00,000 TPA Sodium Bi-carbonate and CPP 60 MW is Rs 3550 crores.

2.6 Technology and Process Description

Soda ash is the common name given to anhydrous sodium carbonate (Na_2CO_3). Soda ash is a white, fine crystalline hygroscope powder and moderately soluble in water. The primary consumers of soda ash are glass, detergent, laundry soap, sodium silicate, cotton yarn, dyes and dye stuff, paper board and other chemical industries. Sodium Bicarbonate (Baking soda) is mainly used by food industry. The proposed project evaluates both Dry Lime and Solvay Wet Lime process for Soda Ash manufacturing.

Raw Materials:

The major raw materials required for soda ash manufacturing are: i) Limestone ii) Coke or Briquettes or Anthracite (in Lime kiln) iii) Solar Salt and iv) Lignite /Coal/ Pet-coke (in Boiler fuel).

i) Limestone: The high content $CaCO_3$ and minimum content of silica in the limestone are important parameter to avoid difficulties related to the limestone Calcination and improves the production efficiency. The cost to transport the inert part of the limestone from the quarry to the plant is also to be minimized. A limestone rich in $CaCO_3$ will reduce solid unreacted matters in the effluent of the unit. Particle size distribution of the limestone is between 20 to 120 mm; the more uniform it is, the better the limekiln will perform. The limestone fines generated at quarry will be properly handled during transportation and handling and after grinding to 1 mm size or so, it will be utilised in CFBC. Boilers as sorbent for capturing sulfur. The proper unloading, screening, sizing, storage, feeding facilities for boilers and limekilns up to day bunkers will be created. All the transfer towers of lime stone handling system will have dust suppression to ensure that the dust is controlled/ minimized. Chemical grade lime stone shall be sourced from local market/ captive mines or from imported

source. The lime stone from captive mines and local source will be transported to plant site through surface transport and the trucks will be covered with tarpaulin. Whereas the imported lime stone will be received at the nearby port, unloaded and stored for certain period. From the port limestone will be transported to plant by covered trucks.

In the dry process, the lime produced in the kilns is entirely milled to obtain a fine powder, including the unburnt limestone. In the wet process, the lime is used to produce a lime milk and most of the unburnt limestone is screened and recycled to the kilns.

ii) Coke or Briquettes or Anthracite: For efficient burning of limestone to get burnt lime and CO_2 gas, either coke or bbriquettes made out of coke and lignite breeze or anthracite is used as a fuel in kiln. Other type of fuels, natural gas or fuel oil, would result in a too low CO_2 concentration in the kiln gas. This is important because the kiln gas is used further in the process. Higher CO_2 concentration enables reduction of the equipment size and increases process efficiency as well as lower raw material consumption.The distribution of limestone and fuel inside the kiln has to be in a way to create a proper temperature profile. The high calorific non-coking coke is generally used in the lime kilns and considering the cost and availability briquettes and anthracite are also used as a substitute. Based on the operating load the quantity requirements are decided. The material handling facilities will be are created for proper unloading, screening, storage, and feeding.

iii) Solar Salt: The salt, i.e. NaCl is added to process water to prepare brine. The brine contains impurities, mainly magnesium, calcium, sulfates and clay. Solar salt from captive salt works and from various suppliers will be transported by surface transport. The salt will be unloaded, washed in a scientific manner and conveyed to either directly to salt dissolver or stored in the yard. The salt is fed through proper mechanized system in a controlled manner as per process requirement.

Table 2.1: Requirement of Raw Materials for Total Project, MT/Annum

Sr. No.	Raw material	Approx. Quantity TPA	Source	Mode of Transport
1	Salt	20,00,000	From captive salt works and markets	By Road/Sea
2	Lime stone (for Lime Kiln and for De-sulphurisation in Boiler)	20,00,000	Captive limestone mines and from domestic and international market	By Road/Sea
3	Coke or Briquette or Anthracite (for kilns)	13,00,000 1,10,000	Open market for coke, coke breeze, lignite breeze. For anthracite imported from Russia, Vietnam and Peru	BY Road /Sea
4	Ammonia	2740	Open Market	By Road
5	Sodium Sulphide/ Sodium hydrogen sulfide	4,050	Open Market	By Road
6	Coal/Lignite/ Petcoke (for captive power plant)	Coal: 13,14,000/- Lignite :19,71,000/- Petcoke: 9,12,500/-	GMDC and Imported coal e.g., Indonesia/Australia/ South Africa etc.	By Road/Sea
7	High Speed Diesel (HSD)	Only required during Start-up & for emergency power requirement	Open Market	BY Road

Facilities for Storage of Goods and Materials

1. For 3000 TPD Soda Ash Plant

Raw Material Storage:

SN	Particular	Qty. at Storage	Storage Facility Type
1	Limestone	6,00,000 MT	Open Storage with RMH system
2	Salt	6,00,000 MT	Open Storage with RMH system
3	Coke/Anthracite	20000 Ton /20000 Ton	Covered Storage with RMH system
4	Briquette	20000 Ton	Through Silo/Open
6	Ammonia	45 Tons*3 (2W+1S)	Bullets

Product Storage:

Sr.	Particular	Qty at Storage
1	Soda Ash	Product Storage in Silo – 30000 MT (phase wise installation) Go-down – 45000 MT
2	Sodium Bi-carbonate	6000 Tons

2. For 120 MW Captive Power Plant

Raw Material:

Sr.	Particular	Qty at Storage	Storage Type
1	Lignite	25000 Ton	Covered storage with RMH
2	Coal	60000 Ton	Covered storage with RMH
3	Pet Coke	12500 Ton	Covered storage with RMH
3	HSD	60 KL	Tanks

Storage Hazardous Chemicals:

SN	Name of Hazardous Chemical	Storage Capacity of Hazardous Chemical
1	Liquid Ammonia	45 MT x 3 (i.e. 2Working +1Stand by)
2	Liquid Chlorine	4500 kg
3	HCl	300 MT
4	HSD	60 KL (3 Tanks of 20 KL each)
5	Sodium sulphide / Sodium hydrogen sulphide	200 MT
6	NaOH	100 MT

There will be high pressure CFBC boilers to meet the steam requirement of entire plant. The fuels generally considered are lignite or coal or pet coke or a mixture with suitable ratio. The quantity of fuel requirement depends upon calorific value and is estimated to be around 2500 to 5400 TPD, depending on the category of fuel and plant load. The lignite will be sourced from G.M.D.C mines and transported by covered trucks. The imported Coal and Pet Coke will be received in big parcel at the port, unloaded, stored and then transported to plant site. At plant site, suitable and desired unloading, screening, sizing, storage and conveying facilities shall be created. The Fuel stock piles will be covered from environment point of view. The schematic showing the materials consumption and waste generation is depicted in **Figure 2.4**.

v) Ammonia: The Soda ash process requires ammonia to act as a catalyst. To compensate for inherent unavoidable losses of ammonia from the process, make up is required through properly designed auto charging system. The adequate size of ammonia storage bullets with safety provisions will be installed and through the road tankers ammonia is brought and unloaded.

Process Description:

The process includes steps for Soda Ash manufacturing considering Dry lime and Wet lime process. The major difference in both the process is for Dry lime process burnt lime from lime kiln is taken to Lime Grinding unit for making Dry Lime powder which take further part in reaction while for Wet Lime process the burnt lime is taken to slakers for preparation of milk of lime which further takes part in reaction. Lime Grinding Unit is not required for Wet Lime process as it is not required to form dry powder of burnt lime coming out of lime kiln. However wet lime process requires Slakers in place of lime grinding.

Unit Operation 101 : Brine Preparation and Purification

Unit Operation 102 : Lime Kilns and Gas Cleaning, Briquette manufacturing.

Unit Operation 103 : Lime Grinding, Absorption and Distillation (Dry lime process

Slaking of lime to make milk of lime (Wet lime process)

Unit Operation 104 : Compression and Carbonation

Unit Operation 105 : Filtration and Calcination

Unit Operation 106 : Densification

Unit Operation 107 : Product Storage and Handling

Unit Operation 108 : Sodium Bi-Carbonate Manufacturing

The schematic of the processes of Soda ash (Scheme I; **Figure 2.5**) is given for better clarity of the processes.

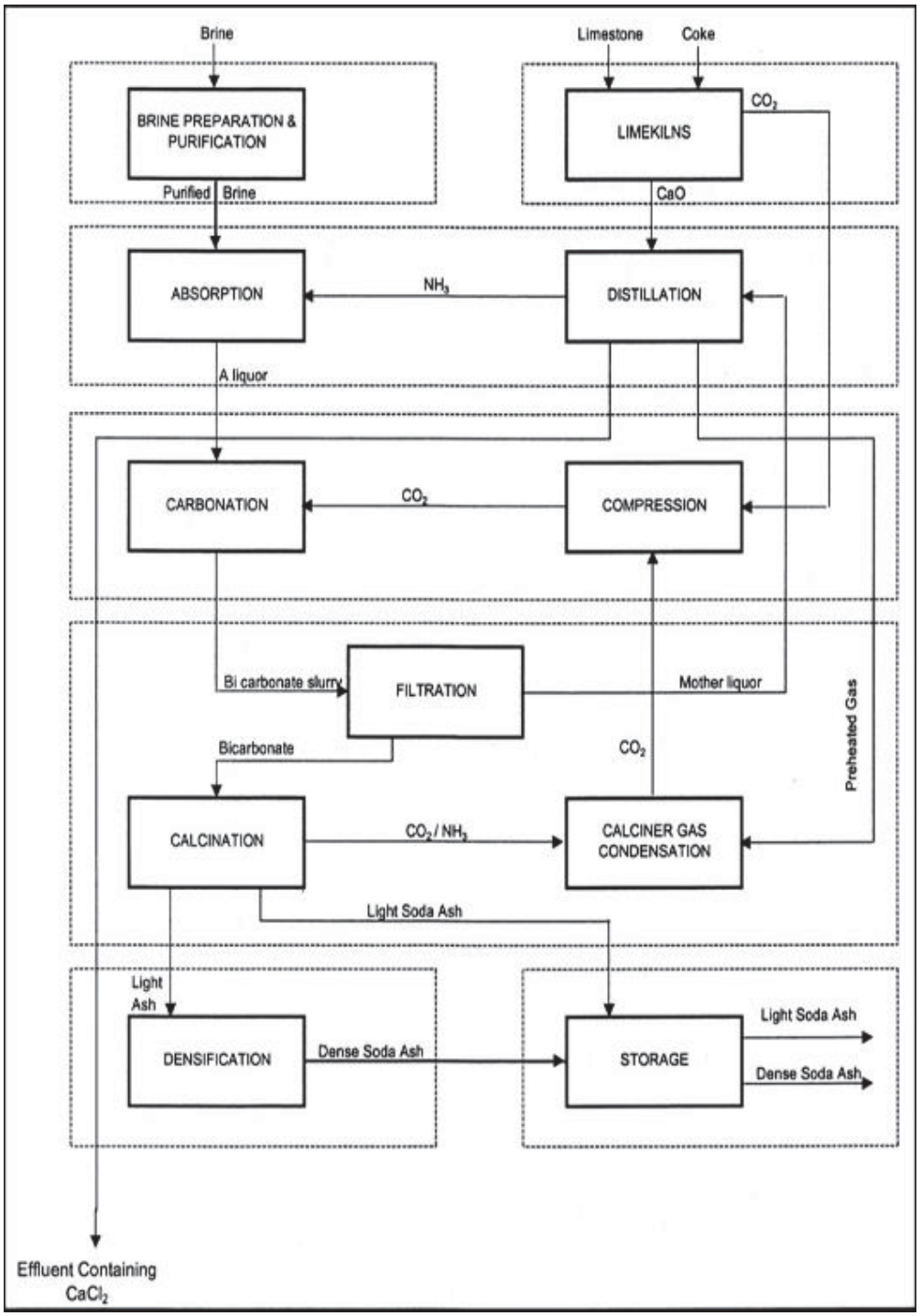
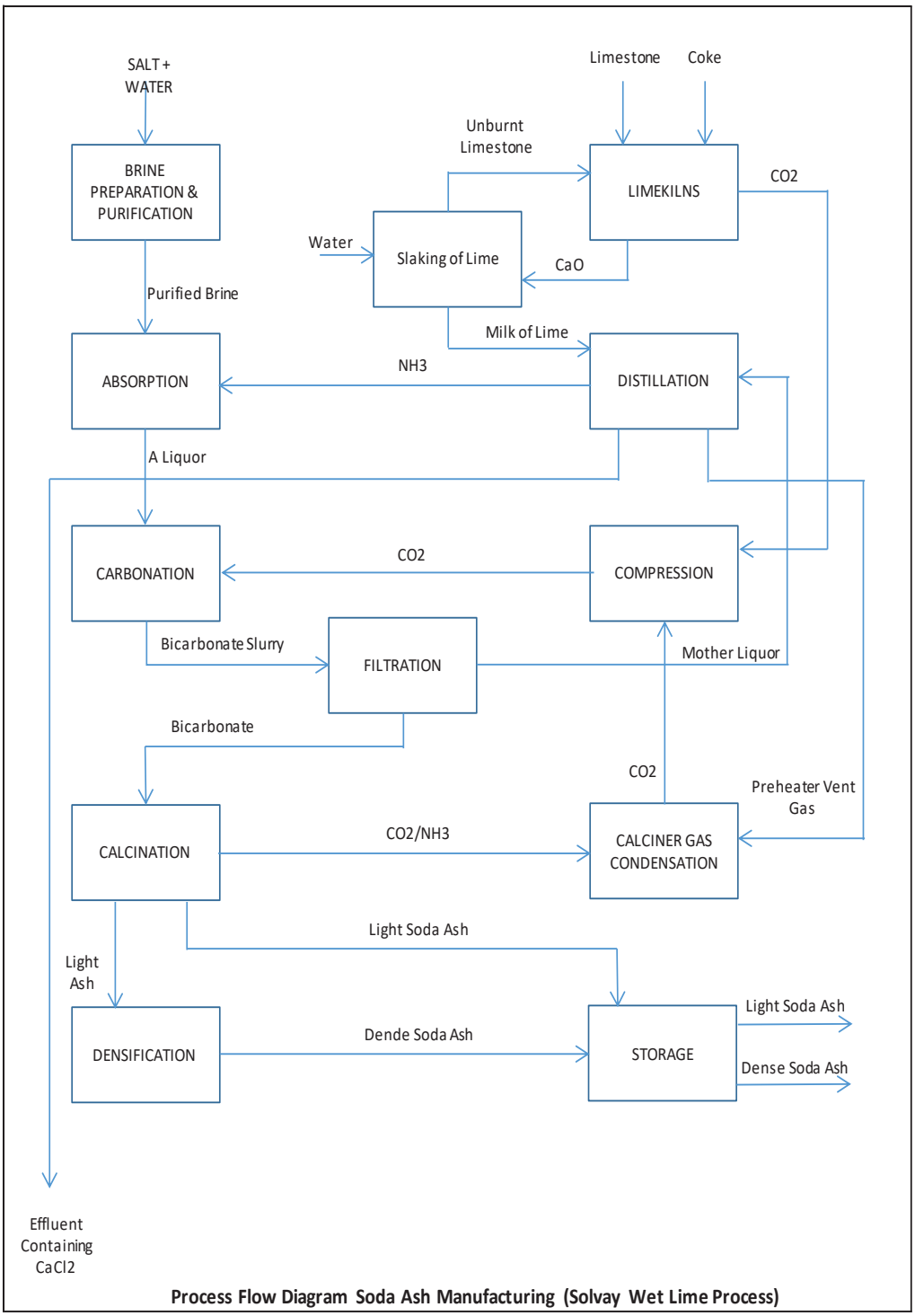


Figure 2.5 Process Flow Diagram for Soda Ash Manufacturing Process



Process Flow Diagram Soda Ash Manufacturing (Solvay Wet Lime Process)

Soda Ash Manufacturing Wet Lime Process

		consumption.
8	Settled sludge	Since settled sludge, non-hazardous in nature, it is proposed to be disposed off in Nearby landfill site.

(A) Details of Liquid Effluent Treatment and Disposal:

The main raw water source for water for soda ash plant, other ancillary facilities as well as captive power plant will be seawater and allotted sweet water if available and hence the wastewater generation quantity is based on water input. Table 2.4 and Table 2.5 give the quantity of fresh water requirement and the quantitate of effluent generated during processing.

Table 2.4: Water Requirement for the Proposed Project for the Soda Ash Capacity of 3000 TPD

Sr. No.	Use	Approx. Water Quantity in m^3/d		Source
		Dry Lime	Wet Lime	
1.	Domestic	200	200	Desalinated Seawater (Seawater feed @ 660 m^3/day)
2.	Industrial - Process water in Soda Ash Plant and Captive Power Plant	34,000	42,000	RO/DM Plant (Seawater feed for RO/DM plant will be @1,12,290 m^3/d for dry lime and 1,38,700 m^3/day for wet lime)
3.	a.) Seawater for once through Cooling in Soda Ash Plant, CPP etc., b.) fresh seawater for dilution	8,07,000 6,78,860	8,07,000 5,14,678	Source Seawater

Table 2.5: Wastewater Generation from the Proposed Project / 3000 TPD Capacity of Soda Ash

Sr.No.	Use	Effluent Generation Quantity- KL/Day		Mode of Utilization/ Disposal
		Dry Lime	Wet Lime	
1.	Domestic	160	160	Domestic wastewater will be treated with septic tank and soak pit system. In case of STP treatment, treated water will be reused for Greenbelt development.
2.	Industrial			
a	Processing	21000	27000	The Process effluent generated i.e. from distiller waste, brine purification reject, RO/DM rejects will be disposed off along with once through return cooling water/fresh seawater into Arabian Sea as per recommendation of NIO. The characteristics of the discharge water are within the norms prescribed by CPCB.
b	Brine preparation reject	2550	2550	
c	RO/DM Reject	78890	97310	
d	Seawater once through return system, fresh seawater for dilution	14,85,860	13,21,678	
e	Boiler(Blow down)	110	120	

The wastewater generation streams will be from soda Ash plant and Captive Co-generation power plant. The main effluent parameter to be ensured with respect to the GPCB/CPCB standards will be pH, temperature and suspended solids.

The Soda ash effluent stream will be mixed with brine treatment plant reject, Boiler blow down from CPP and once through return cooling Seawater which in turn will bring down the temperature, pH as well as to reduce concentration of suspended solids. Online pH, NH3 and temperature monitoring system will be provided to maintain the records.

The treated effluent conforming to the prescribed norms will travel through a channel and ultimately will be disposed into Arabian sea at a designated disposal point as per recommendation of CSIR-NIO through a submerged pipeline. A diffuser system for proper dispersion of effluent will be laid in the Arabian Sea ensuring the requirement of minimum depth and the exit velocity. The Effluent treatment scheme for Soda ash plant is shown in below **Figure 2.8**.

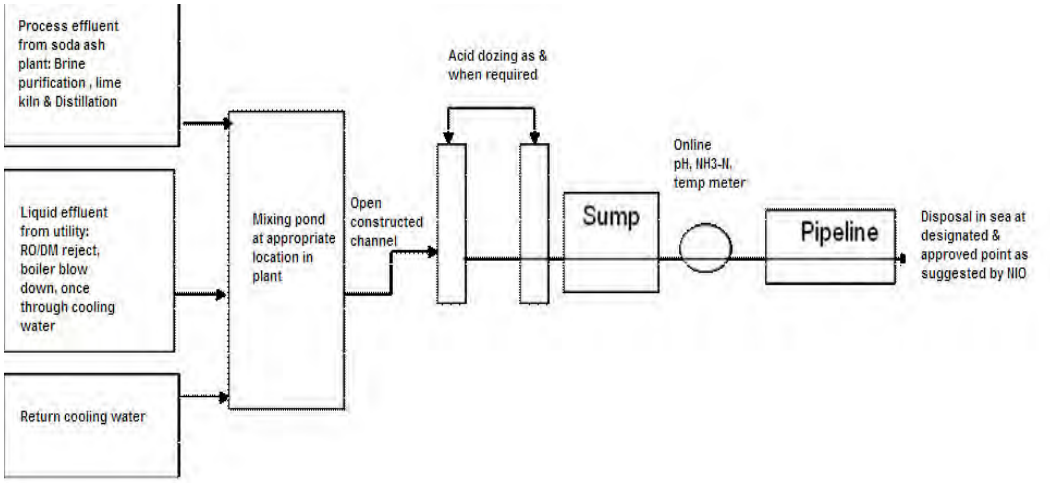


Figure 2.8: Process Flow Diagram of Effluent Treatment for the Proposed Soda Ash Plant

Domestic Effluent:

Domestic waste water will be treated in Sewage Treatment Plant (STP) and treated water will be used for plantation / Greenbelt development around the Plant premises. The Sewage will be first passed through a Bar Screen Chamber and An Oil & Grease Trap where any extraneous / floating matter would get trapped. The sewage would then be collected in a receiving sump where the variation in flow and characteristics are dampened, which otherwise can lead to operational problems and moreover it allows a constant flow rate downstream. Here, the sewage is kept in mixed condition by means of coarse air bubble. The schematic of sewage treatment plant is given in **Figure 2.9**. The equalized sewage will then be pumped for necessary treatment of BOD/COD reduction. The clear supernatant after disinfection shall be used for landscaping/gardening. The Biological sludge generated will be

Chapter 3
Description of Environment

This chapter illustrates the description of the existing environmental status of the study area with reference to the prominent environment attributes to assess environmental impacts due to proposed Greenfield chemical complex. Baseline environmental quality in the study area was determined through collection of samples followed by quantifying the environmental indicators of air, noise, water, land, ecology and socio-economic status. The baseline environmental quality has been determined for winter season (December 2019 – February 2020) by following guidelines prescribed in MoEF&CC, EIA notification 2006, standard ToR and subsequent amendments.

3.1 Ambient Air Quality

3.1.1 Reconnaissance

The proposed project site is located in coastal belt of Gulf of Kutch near Mandvi in the Kutch district of Gujarat state. The proposed project site is almost flat terrain with ground elevation varying from ~5 m to 20 m m.s.l. The study area i.e., 10 km radial distance from the proposed project site near Bada village, consists of flat hilly terrain with elevation varying from sea level in the western part as high as 10-20 m m.s.l in NE direction. The project site falls between the Arabian sea (on the Western side) and scattered villages (on the East side). The predominant wind direction is NW during winter and occasionally the wind direction is under the influence of cyclonic winds. The local influence of sea/land breeze phenomena is also significant in the study area.

3.1.2 Ambient Air Quality Monitoring Network and Analytical Methods

The ambient air quality around the proposed project within 10 km radius was monitored at ten stations. To establish the baseline ambient air quality in the study area during winter (December 2019 – February 2020); Ambient Air Quality Monitoring stations (10 Nos.) were selected using network design criteria and monitored as per CPCB guidelines. The monitoring stations in the study area with respect to the project site are depicted in **Figure 3.1.1** and the geographical location and other details of the sampling stations are given in **Table 3.1.1**. Out of the 10 stations, 4 stations were within 3 km radial distance from the proposed project site and the remaining 6 stations were in nearby villages with in the 10 km radius. The sampling stations Mapar, Bhambdai and Dedhiya are located upwind direction while Panchotiya, Bhada and Nanalyza are located in the downwind direction with reference to project site, near Bada village. The sampling stations were selected based on guidelines of air monitoring network siting criteria such as:

- Topography of the study area
- Persistence of wind direction and speed
- Representation of regional background
- Location of industries and their emission magnitude
- Screening of maximum ground level concentrations and distances of their likely occurrences as per climatological normal
- Representation of valid cross-sectional distribution in down-wind direction

As per NAAQS (2009) the pollutants viz., particulate matters (PM_{10} and $PM_{2.5}$), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO) and ammonia (NH_3) were stipulated parameters for air quality monitoring. All the parameters were monitored on 24 hourly while CO and O_3, were monitored on hourly basis. Furthermore, particulate matter associated metals (As, Ni, and Pb) were analyzed. Benzene and Benzo[a]pyrene (BAP) will be also monitored. Standard analytical procedures were used for analysis and quantification of air quality parameters and the details are given in **Table 3.1.2**. The photographs showing sampling stations/locations are given in the **Figure 3.1.2**.

3.1.3 Micro-meteorology

The micro-meteorological data collection is an important part in air pollution studies regarding prediction of impacts. The baseline studies for air quality within the study area were carried out through reconnaissance survey followed by ambient air quality monitoring program and micro-meteorological study. An automatic weather station was installed at Bada village where the proposed project site is located (**Figure 3.1.3**). The weather station records all micro-meteorological parameters like wind speed, wind direction, ambient temperature, rainfall, relative humidity and atmospheric pressure. The collected micrometeorological data like wind speed and wind direction have been processed to draw wind-roses. The predominant winds are observed from NW, N and NE directions and the wind speeds are ranging between 0.5 and 5.8 m/s.

The collected data indicate that during study period the temperature and relative humidity varied in the range of 27°- 35°C and 50%-81% respectively. Calm conditions (wind speed <0.5 m/s) prevailed for more than 55% of the time. The air temperature reported from 5 - 41^{o}C with relative humidity varies from 80 - 90% during monsoon season. Visibility is good throughout the field studies. The average visibility is more than 1 km; however, few days in winter reported lower than 1 km visibility. The meteorological data shows that the mid-November to February is the winter season of the year; December is the coldest month with the average temperature 9^{o}C. The mean annual rainfall of Mandvi taluka is 426 mm

and average number of rainy days are less than 25 in a year. (Revenue Department of Gujarat State, 2020).

3.1.4 Baseline Air Quality Status

From the selected AAQM stations, air samples were collected in Winter (December 2019 - February 2020) and analyzed for air quality parameters such as particulate matter (PM_{10} and $PM_{2.5}$), particulate associated pollutants (Heavy metals - Pb, Ni, As, and Benzo[a]pyrene) and gaseous pollutants (SO_2, NO_X, NH_3, CO, O_3, and hydrocarbons) and volatile compounds (VOCs) as per the Standard ToR issued by MoEF&CC for Soda Ash industry. The data collected was subjected to statistical analysis like minimum, maximum, average and standard deviation. The observed ambient air quality data within the study area from the project site is reported in **Tables 3.1.3 - 3.1.7** and described briefly below:

Gaseous Pollutants:

Sulfur dioxide and Oxides of Nitrogen: The minimum and maximum concentrations of SO_2 were observed in the range of 1-4 µg/m^3 and 9-14 µg/m^3 respectively (**Table 3.1.4**). Similarly, for NO_x varied in the range of 5-9 µg/m^3 and 9-16 µg/m^3 respectively. The concentrations of SO_2 and NO_x were observed below the stipulated standards of NAAQS, 2009; i.e., 80 µg/m^3.

Ammonia: To assess the levels of ammonia in air, samples were collected by passing air through absorbing media and analyze by wet chemical method. The observed minimum/maximum and average concentration at all locations ranged between 6-13 µg/m^3 and 13-19 µg/m^3 respectively (**Table 3.1.5**). All these values are well within the stipulated standards (400 µg/m^3). Due to high solubility of ammonia (NH_3) in water, it easily sinks in the atmosphere by wet deposition. Ammonia is the major alkaline molecule in the atmosphere which neutralizes acidic species such as SO_2, H_2SO_4, HNO_3 and HCl.

Ozone: Ground level ozone concentration was measured by installing an ozone analyzer (O_3 41M; Environment s.a., France) based on absorption of UV radiation at 253.7 nm by ozone molecules. The minimum detection limit of the analyzer is about 1 ppbv and its response is about 10 s. The observed minimum and maximum at all the locations ranged between 2-4 µg/m^3 and 4-8 µg/m^3 respectively (**Table 3.1.6**), the values were below the stipulated standards for the designated areas (8 h =100 µg/m^3). Ozone (O_3) is a secondary air pollutant formed by photochemical reactions involving oxides of nitrogen (NOx) and VOCs, mainly hydrocarbons. In the presence of solar radiation, nitrogen dioxide (NO_2) dissociates to form nitric oxide (NO) and an oxygen atom (O). Ozone (O_3) is then formed by molecular oxygen (O_2) reacting with the oxygen atom (O). However, when hydrocarbons are present, NO is converted to NO_2, thus leaving little NOx to react with O_3. This reaction leads to a build-up of O_3 in the atmosphere. Sources of NO_2 and VOCs are primarily anthropogenic, generally produced during combustion processes from automobile emissions and industrial activities.

Carbon Monoxide: To measure the concentration of carbon monoxide, samples were collected in Tedlar bags and analyzed within 24 h by carbon monoxide

analyzer based on the principle of infrared (IR) radiation at wavelength ~4.7 microns. The observed carbon monoxide concentration in the study area varied between 0.09 and 0.21 mg/m^3 (**Table 3.1.7**) and concentrations would be due to vehicular traffic, woods used for cooking activities and industrial emissions in the study area. The values are within the permissible limit 4.0 mg/m^3 of National Ambient Air Quality Monitoring (NAAQM) standards for the respective designated areas.

Hydrocarbons: On-site hydrocarbon analyzer was used to record concentration of methane (MHC) and non-methane hydrocarbons (NMHC) in the study area. The concentration of MHC and NMHC concentrations ranged between 0.23 – 1.27 µg/m³ and 0.11-0.19 µg/m³, respectively (**Table 3.1.7**).

Particulate Matter: The minimum and maximum concentration of 24 hourly average PM_{10} ranges between 19-39 µg/m^3 and 30-53 µg/m^3, respectively (**Table 3.1.3**). The minimum concentration was observed at Bada and Motalyja; and Bhishra and Bambhdai stations reported maximum. Such variation in PM_{10} concentration would be due to wind-blown dust and unpaved roads. The concentration of $PM_{2.5}$ varies between 8-12 µg/m^3 and 10-17 µg/m^3 for minimum and maximum values. The concentration of particulate matter both PM_{10} and $PM_{2.5}$ are well within the stipulated standards set by CPCB.

Particulate Associated Pollutants: Airborne particles are important carriers of metals and organic pollutants. The concentration and size distributions of trace metals are governed by the nature of emissions to the atmosphere, as well as rates of wet and dry deposition, cloud processing, and exchange of air between the boundary layer and the free troposphere, and chemical transformations. The elevated metal concentrations, can pose a serious risk to human health. Fossil fuel utilization, such as liquid fuel for vehicular exhaust and lubricant residues are considered as important contributor of particulate associated pollutants.

Lead (Pb): This metal originates both from natural and anthropogenic sources. The major sources of Pb are vehicular emissions and industrial sources such as near lead smelters, waste incinerators, utilities, and lead- acid battery manufacturers. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system. Another adverse effect of Pb is reduction of oxygen carrying capacity of the blood. Lead is persistent in the environment and accumulates in soils and sediments through deposition from air sources, and direct discharge of waste streams to water bodies. The observed minimum and maximum Pb concentration associated with particulate matter ranged from 0.05 to 0.27 µg/m^3 (**Table 3.1.8**) and the values are well within the prescribed limit of 1.0 µg/m^3.

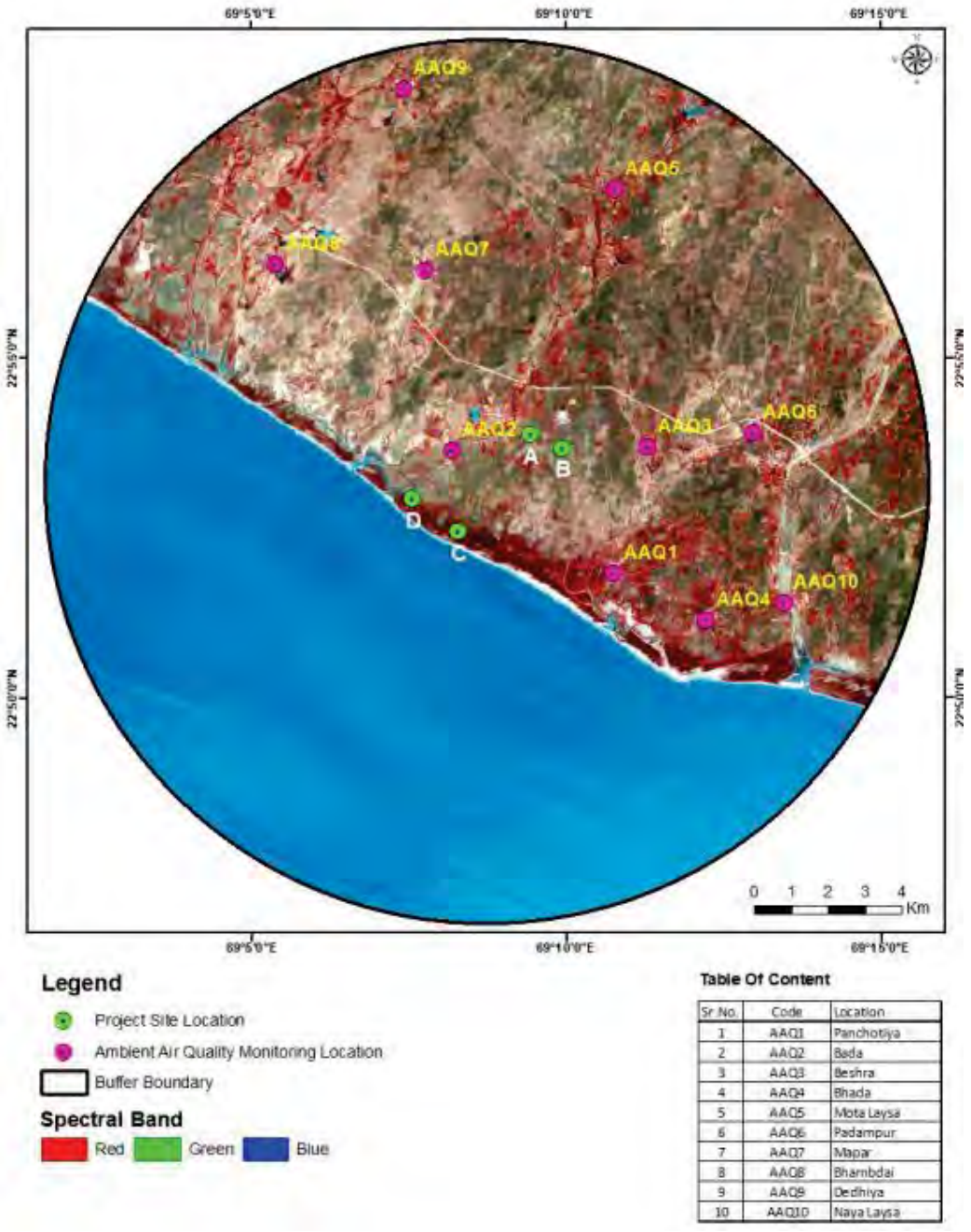
Arsenic (As): Arsenic (As) is a naturally occurring element widely distributed in the earth's crust. Inorganic forms of arsenic are found throughout the environment; it is released into the air by volcanoes, weathering of arsenic-containing minerals and ores, and commercial or industrial processes. Acute (short-term) high-level inhalation exposure to arsenic dust or fumes can cause gastrointestinal effects (nausea, diarrhea, abdominal pain) and nervous system disorders. Chronic (long-term) inhalation exposure to inorganic arsenic can cause irritation of the skin and

mucous membranes and lung cancer. In the study area, As associated with particulate matter was quite low i.e., 0.02-.11 ng/m^3.

Nickel (Ni): Nickel is a naturally occurring element and can be combined with other metals to form indispensable industrial catalyst. Nickel can be released into ambient air from oil and coal combustion and sewage sludge incineration. It is reported that workers who breathed very large amounts of nickel compounds developed chronic bronchitis and lung and nasal sinus cancers. The minimum and maximum observed for Ni concentration at all the locations varied between 0.11 and 0.18 ng/m^3 (**Table 3.1.7**) were within the permissible limits (20 ng/m^3) of National Ambient Air Quality Monitoring (NAAQM) standards of India.

Benzo(α)pyrene(B[a]P): The 5-membered polycyclic aromatic hydrocarbon, B[a]P is a carcinogenic and mutagenic organic pollutant. The primary source of this pollutant in the atmosphere is combustion of fossil fuels (auto-exhausts) and industrial emissions such as refineries. Due to flatness of molecular structure of B[a]P will easily stack on the surface of particulate matter and then enrich during its residence in the atmosphere. This pollutant is highly persistent and hydrophobic in nature. The observed B[a]P concentration in the study area varied between ND-0.03 ng/m^3 (**Table 3.1.7**). The levels of B[a]P in the study area is within the permissible limit (1 ng/m^3) of National Ambient Air Quality Monitoring (NAAQM) standards of India**.**

Volatile Organic Compounds (VOCs): They are released from burning fuel, such as gasoline, wood, coal, or natural gas. They are also released from solvents, paints and glues. VOCs are typically not acutely toxic but have chronic effects. Due to high vapor pressures VOCs disperse quite fast in the ambient air. VOCs containing sulfur or nitrogen cause strong odors. There are hundreds of VOCs are reported in the atmosphere; however, benzene, toluene, ethylbenzene and xylene (BTEX) are considered as the representative of VOCs. Benzene is considered as the marker molecule of VOCs. The samples were collected in Tedlar bags and analyzed by BTEX analyzer within 24 hours. The total VOCs also measured with the VOCs analyzer as spot concentration at selected locations. The concentration of VOCs ranged between 0.11-0.23 µg/m^3 at selected locations within the study area. The levels of VOCs are presented in **Table 3.1.5**. As seen the observed benzene concentration ranged between ND – 0.16 µg/m^3 and is below the NAAQS, 2009 of 5 µg/m^3.



Sr No.	Code	Location
1	AAQ1	Panchotiya
2	AAQ2	Bada
3	AAQ3	Beshra
4	AAQ4	Bhada
5	AAQ5	Mota Laysa
6	AAQ6	Padampur
7	AAQ7	Mapar
8	AAQ8	Bhambdai
9	AAQ9	Dedhiya
10	AAQ10	Naya Laysa

Fig. 3.1.1. Ambient Air Quality Monitoring Locations



Fig. 3.1.2. Photographs showing the Installation and Functioning of Air Samplers at Few Representative Sampling Locations

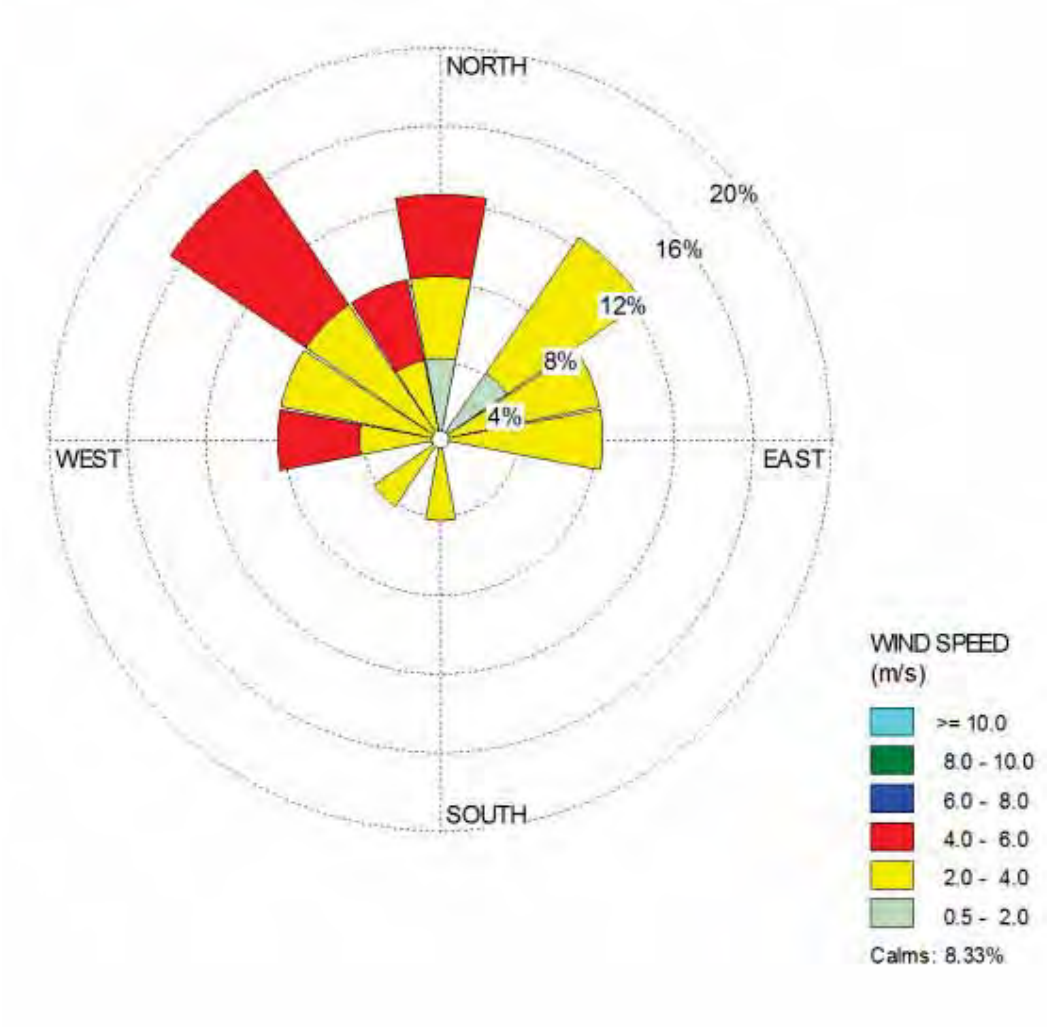


Fig. 3.1.3. Windrose Diagram at Project Site, Bada Village in Winter Season (2019-20)

Table 3.1.1: Geographical Location of Air Quality Monitoring Locations (Winter: Dec 2019 - Feb, 2020)

Sr. No.	Sampling Location	Geographical Position
1.	Panchotiya	22°51'49.9"N 69°10'46.9"E
2.	Bada	22°53'38.7"N 69°08'12.8"E
3.	Bhishra	22°53'41.8"N 69°11'18.5"E
4.	Bhada	22°51'09.0"N 69°12'14.4"E
5.	Mota Layja	22°57'28.7"N 69°10'47.3"E
6.	Padampur	22°53'53.7"N 69°12'58.9"E
7.	Mapar	22°56'17.8"N 69°07'47.3"E
8.	Bhambdai	22°56'23.5"N 69°05'23.7"E
9.	Dedhiya	22°58'58.6"N 69°07'26.4"E
10.	Naya Laysa	22°51'24.5"N 69°13'28.4"E

Table 3.1.2: Standard Methods for Ambient Air Quality Parameters

Sr. No.	Air Quality Parameter	Unit	Analytical Method used for Testing/Analysis	Analytical Measurement Range	Standard value as per NAAQ 2009 and Monitoring duration
1	Particulate Matter size < 10 microns or PM_{10}	µg/m³	Gravimetric IS-5182: Part-23, 2006	5-5000	100 (24 h)
2	Particulate Matter size < 2.5 microns or $PM_{2.5}$	µg/m³	Gravimetric U.S.EPA EQM-0308-170	5-500	60 (24 h)
3	Sulphur Dioxide (SO_2)	µg/m³	EPA Improved West and Gaeke Method IS-5182: Part-2, 2001	5-1000	80 (24 h)
4	Nitrogen Dioxide (NO_2)	µg/m³	Modified Jacobs-Hachheiser Method IS-5182: Part-6, 2006	7-750	80 (24 h)
5	Carbon Monoxide (CO)	mg/m³	Non Dispersive infra red (NDIR) Spectroscopy	50-1000	2.0 (8 h) 4.0 (1 h)
6	Ozone (O_3)	µg/m³	In-situ Monitoring using O_3 Analyzer	5-1000	100 (8 h) 180 (1 h)
7	Ammonia (NH_3)	µg/m³	Indophenol Blue method Method 401: Methods of Air Sampling and analysis, James P. Lodge	5-1000	400 (24 h)
8	Lead (Pb)	µg/m³	AAS/ICP method for sampling on EPM 2000 IS-5182: Part-22, 2004	0.04-10	1.0 (24 h)
9	Arsenic(As)	ng/ m³	AAS/ICP Method for sampling on EPM 2000 or equivalent filter paper Method 822: Methods of Air Sampling and analysis, James P. Lodge	0.01-10	6.0 (Annual)
10	Nickel (Ni)	ng/ m³	AAS/ICP Method for sampling on EPM 2000 or equivalent filter paper	0.01-10	20.0 (Annual)
11	Benzene (C_6H_6)	µg/m³	GC based continuous analyzer IS-5182: Part-11, 2006	0.01-10	5.0 (Annual)
12	Benzo-a-Pyrene (BaP)	ng/ m³	Solvent extraction followed by GC analysis IS-5182: Part-12, 2004	0.001-10	1.0 (Annual)
13	Hydrocarbons	µg/m³	HC Analyzer for Spot Concentration	0.01 – 10	-

Table 3.1.3: Air Quality Status within the Study Area (Winter: Dec 2019 -Feb 2020)

Unit: µg/m³ Average: 24 h

Sr. No.	Sampling Location	PM_{10}				$PM_{2.5}$			
		Min	Avg± SD	Max	98th %	Min	Avg± SD	Max	98th %
1	Panchotiya	29	38±7	46	43	9	11±2	12	11
2	Bada	21	34±4	39	36	8	9±2	11	10
3	Bhishra	34	36±4	53	49	11	13±2	15	13
4	Bhada	21	38±6	41	39	10	14±2	13	11
5	Mota Laysa	19	23±3	30	28	8	9±1	10	8
6	Padampur	23	41±3	41	40	11	14±2	16	14
7	Mapar	25	38±3	43	41	10	10±2	17	15
8	Bambhdai	39	46±4	52	50	9	13±3	15	14
9	Dedhiya	22	33±5	43	41	10	12±2	14	13
10	Naya Laysa	26	35±6	47	45	12	13±2	16	15

Min max Avg±SD 98%

Table 3.1.4: Ambient Concentration of SO_2 and NO_2 in the Study Area (Winter: Dec 2019-Feb 2020)

Unit: µg/m³ Average: 24 h.

Sr. No.	Sampling Location	SO_2				NO_2			
		Min	Avg± SD	Max	98th %	Min	Avg± SD	Max	98th %
1	Panchotiya	1	5±2	9	8	6	8±1	11	9
2	Bada	4	8±1	11	10	7	11±2	14	11
3	Bhishra	3	7±2	10	9	9	14±2	16	14
4	Bhada	2	8±1	13	11	8	11±2	15	13
5	Mota Laysa	3	6±2	12	10	7	8±1	9	7
6	Padampur	1	6±1	9	7	5	7±2	10	8
7	Mapar	4	7±2	10	9	6	8±1	11	10
8	Bhambdai	3	9±2	14	12	7	11±2	13	11
9	Dedhiya	2	9±1	12	10	8	14±2	15	13
10	Naya Laysa	1	6±4	12	12	9	11±2	14	12

Table 3.1.5: Ambient Concentration of Ammonia and VOCs in the Study Area (Winter: Dec 2019-Feb 2020)

Unit: µg/m³ Average: 24 h

Sr. No.	Sampling Location	NH_3				VOCs, ppm
		Min	Avg± SD	Max	98%	
1	Panchotiya	7	11±2	14	13	0.67
2	Bada	6	12±1	16	14	0.53
3	Bhishra	9	9±2	19	16	0.42
4	Bhada	8	10±1	13	10	0.39
5	Mota Laysa	10	13±2	15	12	0.51
6	Padampur	7	11±2	13	12	0.42
7	Mapar	8	12±1	15	13	0.38
8	Bhambdai	10	13±2	14	12	0.41
9	Dedhiya	13	14±2	16	14	0.39
10	Naya Laysa	11	13±2	15	12	-
Permissible Limits		**400**				

Table 3.1.6: Ambient Concentration of Ozone in the Study Area (Winter: Dec 2019-Feb 2020)

Unit: µg/m³ Average: 1 h

Sr. No.	Sampling Location	O_3			
		Min	Avg± SD	Max	98%
1	Panchotiya	2	3±1	5	4
2	Bada	2	3±1	4	3
3	Bhishra	4	5±2	8	6
4	Bhada	3	4±2	5	4
5	Mota Laysa	2	3±1	4	3
6	Padampur	3	5±1	7	6
7	Mapar	2	4±1	5	3
8	Bhambdai	2	4±1	6	5
9	Dedhiya	4	6±3	8	6
10	Naya Laysa	3	4±2	6	4
Permissible Limits		**180**			

Table 3.1.7: B[a]P, Benzene, CO and hydrocarbons in the ambient air (Winter: Dec 2019-Feb 2020)

Unit: μg/m³ **Average: 1 h**

Sr. No.	Sampling Location	B[a]P (ng/m³)	Benzene (μg/m³)	CO mg/m³	THC μg/m³	NMHC μg/m³
1	Panchotiya	0.01	0.13	0.13	1.03	0.13
2	Bada	0.03	ND	0.11	1.11	0.16
3	Bhishra	0.01	0.16	0.09	0.23	0.12
4	Bhada	ND	0.13	0.17	1.09	0.19
5	Mota Laysa	0.01	0.11	0.21	1.11	0.14
6	Padampur	0.02	ND	0.18	1.23	0.12
7	Mapar	ND	ND	0.16	1.16	0.11
8	Bhambdai	ND	0.16	0.11	1.05	0.16
9	Dedhiya	0.01	0.11	0.14	1.27	0.13
10	Naya Laysa	0.03	0.12	0.16	1.18	0.16
Permissible Limits		**1**	**5**	**4**	**-**	**-**

Table 3.1.8: Particulate Associated Metals (As, Pb, and Ni)

Sr. No	Sampling Location	As ng/m3			Pb (µg/m³)			Ni (ng/m³)		
		Min	Max	Avg	Min	Max	Avg.	Min	Max	Avg.
1	Panchotiya	0.05	0.07	0.06	0.07	0.08	0.07	0.13	0.15	0.14
2	Bada	0.03	0.05	0.04	0.08	0.21	0.17	0.12	0.17	0.15
3	Bhishra	0.06	0.08	0.07	0.05	0.15	0.11	0.11	0.16	0.13
4	Bhada	0.05	0.11	0.08	0.08	0.23	0.17	0.12	0.18	0.15
5	Mota Laysa	0.04	0.07	0.07	0.13	0.27	0.19	0.13	0.15	0.14
6	Padampur	0.03	0.06	0.05	0.09	0.25	0.18	0.12	0.15	0.14
7	Mapar	0.02	0.05	0.04	0.11	0.26	0.17	0.11	0.13	0.12
8	Bhambdai	0.03	0.07	0.05	0.13	0.25	0.19	0.12	0.14	0.13
9	Dedhiya	0.04	0.08	0.06	0.16	0.27	0.18	0.13	0.15	0.14
10	Naya Laysa	-	-	-	0.07	0.21	0.15	0.12	0.14	0.13

3.2 Noise Environment

3.2.1 Selection of Sampling Stations for Noise Monitoring

To quantify noise levels in the study area i.e., 10 km radius from the proposed project, the following criteria was followed to select sampling stations during field reconnaissance.

Human settlements near the proposed project site, which can be affected

Locations of residential, commercial, and silence zones in the study area, as per the CPCB guidelines.

The topography of the study area is flat with significant elevation difference. i.e. 5-20 msl. In addition, being the coastal area (Arabian sea coast is about 1.0 km from the proposed project site), the wind velocity is too high. These two factors have major impact on the noise propagation in the study area. It is expected that the large variations, both temporal and spatial scales, due to these two factors. Based on the reconnaissance, the noise quality monitoring stations were identified within the study area outside the plant as shown in **Figure 3.2.1**; the details of the locations are given in **Table 3.2.1**.

3.2.2 Noise Monitoring and Measurement

The noise monitoring was carried out using Cirrus Sound level meter (Integrating-Averaging Type), at height of 1.5 m from ground level. The levels of noise monitored in the sampling stations are given in the **Table 3.2.1**. The noise levels in residential area were found to be ranging from 52 to 46 dB(A) during the day and 43 to 44 dB(A) during night. In commercial zone, noise levels varied between 49 and 52 dB(A) during day, and 41 and 43 dB(A) during night. In silence zones noise levels recorded were between 44 and 47 dB(A) during day and 38 and 40 dB(A) during night. All the categories of sampling locations noise levels were within the Ambient Air Quality Standards in respect of Noise (henceforth Noise Standards 2000) as given in Noise Rules 2000. The background noise levels in the study area are due to transport and animal activity (e.g., barking of dogs, chirping of insects). Many of the activities such as construction, bus/auto station and traffic causing noise are temporary in nature.

3.2.3 Traffic Study

The proposed site for Greenfield Chemical Complex to produce Light Soda Ash Plant of capacity 11,00,000 TPA, dense soda ash plant of capacity 5,00,000 TPA and sodium bicarbonate plant of capacity 2,00,000 near village Bada, Taluka – Mandvi, District Kutch in Gujarat state is about 6.8 km away from the NH41 as shown in the **Fig.3.2.2**. Approach road towards the proposed site having width about 4 m. The road is connect to Bada - Bishra – Mota Laysa road at Mota Laysa Chowkdi on NH41, Site is situated near Bada village.The bituminous road is available in the beginning as an approach to the proposed site up to a certain distance.

There is one nearest road approach to the proposed site for GHCL, Bada-Bishra-Mota Laysa road is from the NH to the site which passes through Bishra

village nearby, which is much suitable and beneficial for public transport and there is no pavement laid up to a certain distance beyond the work site. Another approach is from the NH to the site via Pass through Bada village and connect NH41 at near Bayat. The road up to the Bada village is good.

Traffic volume study was carried out at NH41 and the approach road to GHCL proposed site. Images of study are provided in **Fig. 3.2.3**. Hourly traffic volume at NH41 is given in **Table 3.2.1 and 3.2.2**. Variation of motorized vehicle counts are also given in **Fig. 3.2.2**. In order to find the traffic volume, all the data were converted to passenger car unit (PCU). For this purpose, PCU factors recommended by IRC 64: 1990 were used. The same is provided in **Table 3.2.3**. Hourly variation of calculated PCU at NH41 is shown in **Fig. 3.2.4.**

The hourly variation of the motorized vehicles passing through the NH41 from Mandvi and towards the Mandvi with reference to Narayan Sarovar has been studied at 2 locations and also at the approach road to proposed project site from NH. This study was carried out in an interval of 1 hr each starting from 6 am to next day 6 am. From the figure it can be inferred that the flow of traffic from Narayan Sarovar, towards the Mandvi was high with an average hourly traffic value PCU of 312.062 than the opposite direction, i.e., from Mandvi to Narayan Sarovar (for this route an average hourly traffic PCU was f 261.9583). The PCU value consider all types of vehicles such as two-wheeler, car, and heavy truck. From Mandvi to Narayan Sarovar, the peak time of two-wheeler was during the time period of 10-11am of count 123 and the peak time of Car was during the time period of 5-6pm 38. Heavy truck was maximum during 12am-1am, 71 in count. City bus was maximum in 9-10 am, which counts to 5 and the mini buses were maximum during 9am-10am, having a count of 6. Medium truck was having a peak time of 12-1am, which having a count of 33, while small truck was maximum during 9am-10am and 5pm-6pm, with a count of 21. 23 van was there during 10-11am. Auto rickshaw has a peak time 9-10am, 32 in count. Similarly, from Narayan Sarovar to Mandvi, the peak time for majority of the vehicles were in afternoon, 2-wheeler was maximum during 6-7pm which has a count of 98. Car was maximum during 10-11am and 6-7pm, with a count of 38. Heavy truck was maximum during 12-1am, with a count of 86. City bus was maximum during 4-5pm, with a count of 16, where mini buses were maximum during 7-8pm, having a count of 7. Medium truck was at its peak during 7-8am, with a count of 14, while small truck was maximum during 9-10am, having a count of 38. 22 van each was there during 4-5pm, Auto-rickshaw was in its maximum during 10-11am, with a count of 24. The count of the vehicles from NH to the proposed site of GHCL and back was lesser and the PCU values for GHCL approach road was found as 7.625 (from NH to GHCL) and 9.069 (from GHCL to NH) (**Table 3.2.4**).

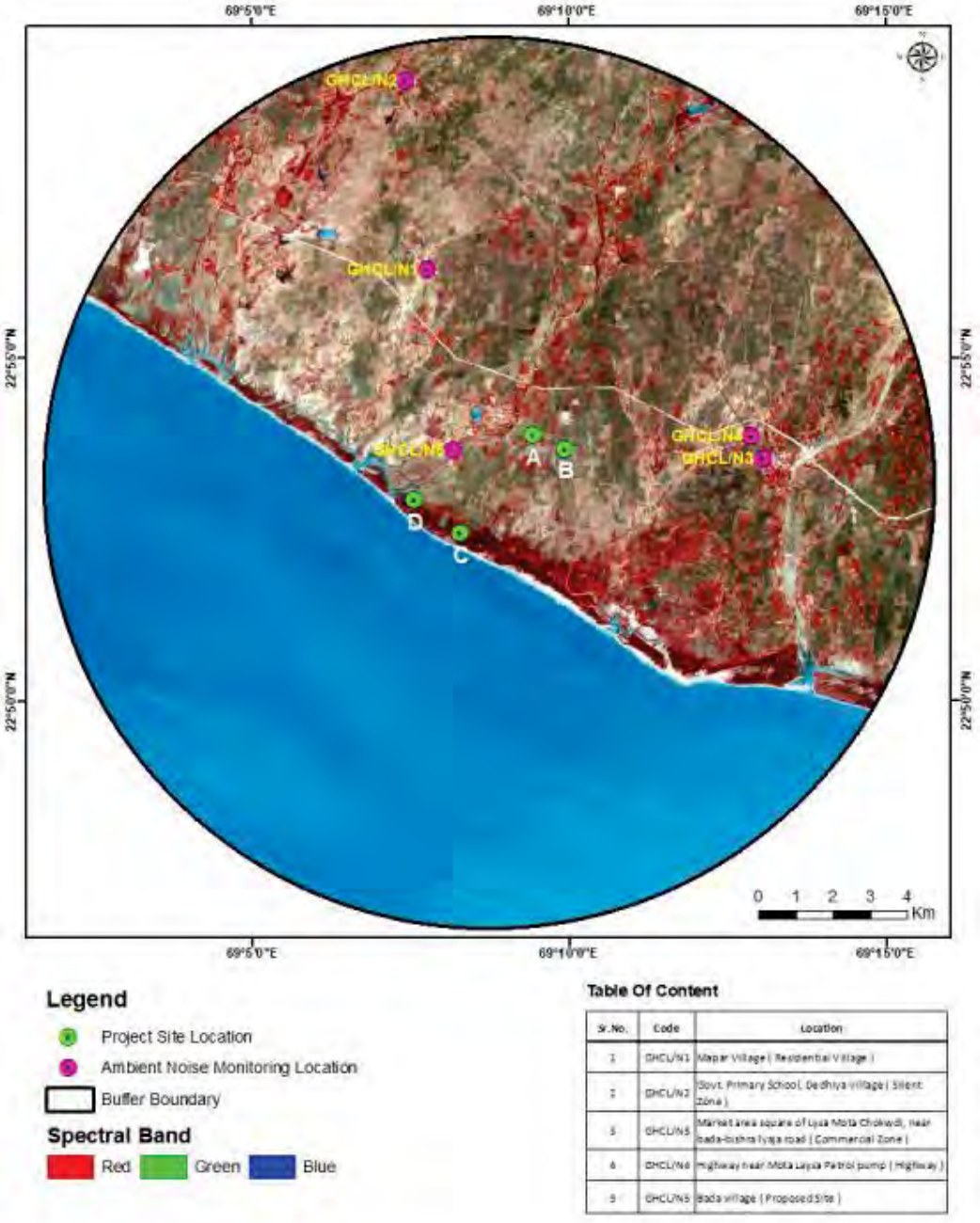


Table Of Content

Sr.No.	Code	Location
1	GHCL/N1	Mapar Village (Residential Village)
2	GHCL/N2	Govt. Primary School, Dedhiya village (Silent Zone)
3	GHCL/N3	Market area square of Lyja Mota Chokwdi, near bada-bishnoi lyaja road (Commercial Zone)
4	GHCL/N4	Highway near Mota Layja Petrol pump (Highway)
5	GHCL/N5	Bada village (Proposed Site)

3.2.1. Noise Levels in the Monitoring Stations in the Study Area (Winter: Dec 2019 - Feb 2020)



Fig. 3.2.2. Approach Road to Proposed Site



Fig.3.2.3. Field Observations during Traffic Study

Table 3.2.1. Ambient Noise Monitoring in the Study Area

Sr. No	Sampling Location	Zone/Standard	Day time Leq. dBA	Night time, Leq. dBA
1	Panchotiya	***Residential*** Day time, 55 dBA Night time, 45 dBA	49	43
2	Bada		46	44
3	Bhishra		52	43
4	Bhada	***Commercial*** Day time, 65 dBA Night time, 55 dBA	50	42
5	Mota Laysa		52	41
6	Padampur		49	43
7	Mapar		52	42
8	Bhambdai	***Silent*** Day time, 50 dBA Night time, 40 dBA	47	39
9	Dedhiya		45	40
10	Naya Laysa		44	38

Table 3.2.4. PCU Factors Recommended by IRC 64: 1990

Si. No	Vehicle Type	Equivalency Factor
Fast Vehicles		
1.	Motor cycle or Scooter	0.50
2.	Passenger car, pick-up van, auto-rickshaw	1.00
3.	Agricultural tractor, light commercial vehicle	1.50
4.	Truck or bus	3.00
5.	Truck-trailer, agricultural tractor trailer	4.50
Slow vehicles		
6.	Cycle	0.50
7.	Cycle-rickshaw	2.00
8.	Hand cart	3.00
9.	Horse-drawn vehicle	4.00
10.	Bullock cart	6.00-8.00

Average hourly variation PCU at NH 41 was found as 312.062 (from Narayan Sarover to Mandvi) and 261.9583 (From Mandvi to Narayan Sarovar). At the same time, PCU values for GHCL approach road was found as 7.625 (from NH to GHCL) and 9.069 (from GHCL to NH). The representative traffic volume changes at the junction is depicted in **Fig. 3.2.4**.

3.3.3 Sampling Details and Field Observations

Surface water samples (SW)

Sample No. SW/1: Surface water collected from pond near Bada village. This water is used for domestic purpose such as washing and cleaning. Sometimes with scarcity of water, this pond water used for drinking purpose after filtration.

Sample No. SW/2: Another surface sample was taken from small pond near Jankakpur village. This water is used for domestic purpose such as washing and cleaning.

Sample No. SW/3: A surface water sample was collected from Bhishra village. Water is visibly clear and this water is used for drinking, cleaning and other domestic purposes.

Sample No. SW/4: The surface water sample was collected from a pondnear Layja-Mota village and this water was visibly clear. This water is used for domestic purpose.

Samples No. SW/5: Sample was taken from the pond near Bambhdai village. Water appeared light yellowish-brown in color and this colour may be due to leaching of natural minerals/substances. This water is used for domestic purpose. Probable reason, yellowish brown or muddy

Sample No. SW/6: Sample was collected from Mapar village the water is colorless and clear. This water is used for domestic purpose.

Groundwater Samples (GW)

Sample No. GW/1: Water sample collected from dug well in Bhada village which is about 4 km from the proposed project site. Rusting was observed on the bore well.

Sample No. GW/2: Water sample collected from dug well near Panchotiya village.

Sample No. GW/3: A groundwater sample was collected from a dug well near Bada village and the sampling location is 0.5 km from the project site. Dug well water after the treatment was being used for drinking purpose.

Sample No. GW/4: Water sample collected from dug well in Bhisra village area and this water is used for bathing and gardening purpose and not for drinking. Vegetation growth observed on dug well walls.

Sample No. GW/5: Water sample was collected from dug well located in the agriculture field which is primarily used for cultivation of vegetables and crops. Water is being used for drinking purpose also.

Sample No. GW/6: Water sample collected from dug well from Layja-Mota village which is used for drinking and the well is very old as informed by villagers.

Sample No. GW/7: A groundwater sample was collected from a dug well in village Bayat is used for drinking. Vegetation was observed on the walls of well.

Sample No. GW/8: Water sample was collected from dug well located in the village Bambhdai. Water is not used for drinking. Dug well depth is 30 feet and the water is used for domestic purposes.

Sample No. GW/9: Water sample collected from bore well from Nana-Layja village which is used for drinking purpose.

Sample No. GW/10: A groundwater sample was collected from a bore well in village Padampur and the water is used for drinking.

Sample No. GW/11: Water sample was collected from bore well located in the village Dedhiya. Water is not used for drinking. Bore well depth is 40 feet and the water is used for domestic purposes.

3.3.4 Physico-chemical Characteristics

3.3.4.1 Surface Water Quality

The physico-chemical characteristics of surface water samples collected from six locations within study area in February 2020 and the water quality data is given in **Tables 3.3.3** to **3.3.6**.

- The pH values range between 6.9-7.9.
- The total dissolved solids were observed as 326-954 mg/l.
- The water samples in few locations were turbid in nature. The nephelometric values of turbidity recorded between 14 and 238. The concentration of suspended solids ranges between 28 and 257 mg/l.
- The concentration of nutrients nitrates and phosphate was measured as 1.44-2.90 mg/l and 0.50-6.00 mg/l respectively.
- The level of Dissolved Oxygen (DO) was found between 5.2-6.9 mg/l, indicating sufficient oxygen for aquatic life.
- Fluoride were found to be 0.4-1.5 mg/l. Oil & grease was reported as 0.16-0.87 mg/l; whereas Phenol was found to be 0.10-0.56 µg/l respectively.
- Some of the important heavy metals found in water samples are Chromium (0.022 mg/l), Copper (0.014 mg/l), Iron (0.183-4.849 mg/l), Manganese (0.109-0.322 mg/l) and other metals such as Nickel, Selenium, Vanadium and Mercury were not detectable by the ICP-OES.
- The results of bacteriological analysis of surface water samples are presented in **Table 3.3.6**. The total coliform counts ranges from 200-800 CFU/100 ml and the faecal coliform are not detectable in the surface water samples. Three sampling stations reported no coliform.

3.3.4.2 Groundwater Quality

Ground water samples were collected from 11 locations including 8 dug well and 3 bore well samples within study area. The physico-chemical characteristics of the ground water are presented in the **Table 3.3.3** to **3.3.6**.

- The pH values ranged between 6.9 and 8.9.
- Nutrients as nitrate-NO3 and total phosphates were found as 1.61-10.10 and 0.8-8.8 mg/l respectively.
- The ground water samples are clear and only at Bhishra, the dug well water reported turbidity 34 NTU.
- The Total Dissolved Solids (TDS) of the ground water sample ranged between 458-4246 mg/l; and their values are higher than the drinking water quality standard (500 mg/l) at most of the locations. Higher values of TDS may be due to the proximity of the study area with the coastal region.
- The concentration of heavy metals found in groundwater are Copper: 0.043 mg/l, Iron: 1.881 mg/l, Manganese: 0.413 mg/l, Molybdenum: 0.148 mg/l, Lead: 0.091 mg/l, Vanadium: 0.204 mg/l and Zinc 0.169 mg/l, while heavy metals cobalt and mercury were not detectable.
- The dug well samples at village Bayat reported total coliform counts 240 CFU/100 ml. The other sampling locations reported total coliforms were Panchotiya (70 CFU/100 ml), Bhishra (100 CFU/100 ml), and Bambhdai (40 CFU/100 ml). The fecal coliforms are not detectable also in the ground water samples.

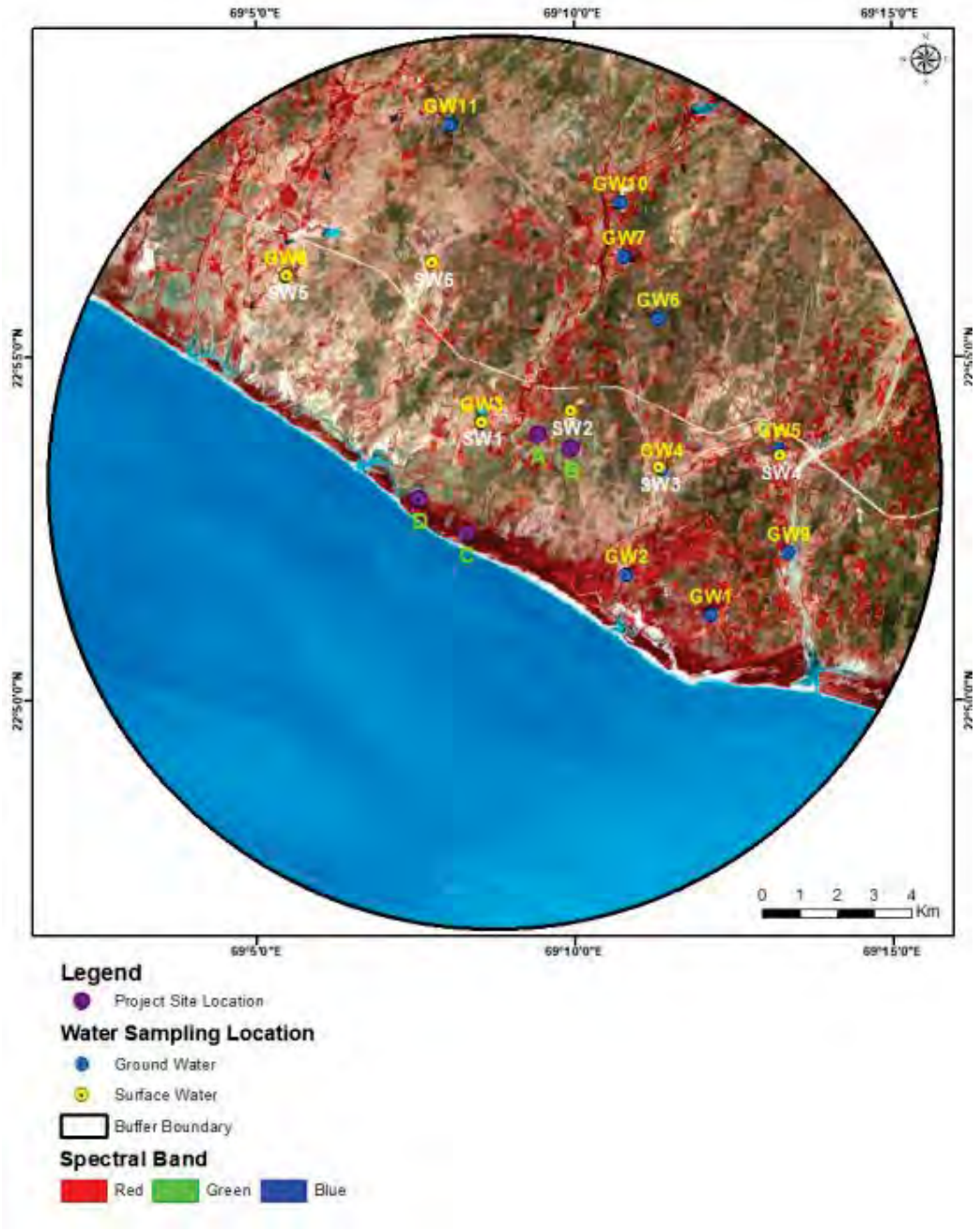


Fig. 3.3.1: Sampling Locations for Water Quality Monitoring

(a) Surface Water Sampling



Surface water sample collected from a lake near Bishra village

(b) Ground Water Sampling



Groundwater sample collected from tube-well in the village Bada

Fig. 3.3.2: Photographs Showing Water Quality Sampling in the Study Area

Both the cases of water samples, the water is used for domestic purposes. The ground water sample was used for drinking purpose also.

Table 3.3.1. Water Quality- Sampling Location Details (February 2020)

Sr. No.	Sample Code	Sampling Locations	Geographical Position	
			Latitude	Longitude
Surface Water (pond Water)				
1	SW1	Bada	N 22°54'04.0"	E 69°08'33.3"
2	SW2	Janakpur	N 22°54'13.8"	E 69°09'57.3"
3	SW3	Bhishra	N 22°53'24.6"	E 69°11'20.9"
4	SW4	Layja-Mota	N 22°53'34.8"	E 69°13'15.4"
5	SW5	Bambhdai	N 22°56'12.0"	E 69°05'28.8"
6	SW6	Mapar	N 22°56'23.2"	E 69°07'47.0"
Ground Water				
Dug Well				
1	GW1	Bhada	N 22°51'14.6"	E 69°12'08.7"
2	GW2	Panchotiya	N 22°51'50.4"	E 69°10'49.9"
3	GW3	Bada	N 22°54'02.8"	E 69°08'33.5"
4	GW4	Bhisra	N 22°53'22.1"	E 69°11'22.5"
5	GW5	Layja-Mota-I	N 22°53'39.6"	E 69°13'14.2"
6	GW6	Layja-Mota-II	N 22°55'34.0"	E 69°11'19.5"
7	GW7	Bayat	N 22°56'28.2"	E 69°10'47.4"
8	GW8	Bambhdai	N 22°56'11.2"	E 69°05'27.6"
Bore Well				
9	GW9	Nana-Layja	N 22°52'09.6"	E 69°13'22.8"
10	GW10	Padmpur	N 22°57'16.1"	E 69°10'43.9"
11	GW11	Dedhiya	N 22°58'11.1"	E 69°08'25.0"

Table 3.3.2. Water Quality Monitoring Parameters and Analytical Methods

Sr. No.	Parameter	Method of Analysis (APHA 23rd Eds., 2017/ IS Standard)
1	pH	APHA-4500-H+ B
2	Temperature (°C)	APHA - 2550 B
3	Turbidity (NTU)	APHA-2130 B
4	TSS (mg/L)	APHA-2540 D
5	TDS (mg/L)	APHA 2540 C
6	EC (µS/cm)	APHA 2510 B
7	Total Alkalinity as CaCO3 (mg/L)	IS 3025-23 (1986)
8	Total Hardness as CaCO3 (mg/L)	APHA - 2340 C
9	Calcium Hardness as $CaCO_3$ (mg/L)	APHA - 2340 C
10	Chlorides (mg/L)	APHA -4500 B
11	Sulphates (mg/L)	IS 3025-24 (1986)
12	Sodium (mg/L)	APHA - 3500 B
13	Potassium (mg/L)	APHA - 3500 B
14	Nitrates as NO_3 (mg/L)	APHA - 4500 B
15	Total Phosphates (mg/L)	IS 3025-31 (1988)
16	DO (mg/L)	APHA - 4500 C
17	COD (mg/L)	IS 3025-58 (2006)
18	BOD (mg/L)	IS 30256-44 (1993)
19	Oil & Grease (mg/L)	APHA - 5520 B
20	Phenolic Compounds	APHA - 5520 B
21	Fluoride (mg/l)	APHA -4500 C
22	Heavy Metals (mg/L)	APHA - 3030 E
23	Total Coliform (CFU/100 ml)	APHA – 9222 B
24	Feacal Coliform (CFU/100 ml)	APHA – 9222 B

Table 3.3.3. Water Quality - Physical Parameters (February 2020)

Sr. No.	Sample Code	Sampling Locations	pH	Temp. (°C)	Turbidity (NTU)	TSS (mg/l)	TDS (mg/l)	Conductivity (µS/cm)	Total Hardness (mg/l)	Chlorides (mg/l)
Surface Water (pond Water)										
1	SW1	Bada	7.1	29.4	52	92	362	612	120	30
2	SW2	Janakpur	7.6	29.5	17	38	853	1410	236	161
3	SW3	Bhishra	6.9	29.1	238	257	326	554	96	24
4	SW4	Layja-Mota	7.5	30.7	14	44	954	1586	216	206
5	SW5	Bambhdai	7.0	29.5	71	138	486	825	172	55
6	SW6	Mapar	7.9	28.3	19	28	811	1340	176	149
Ground Water										
Dug Well										
1	GW1	Bhada	6.9	26.8	6	19	458	773	158	48
2	GW2	Panchotiya	8.2	28.3	1	7	853	1411	196	66
3	GW3	Bada	7.8	27.9	2	20	569	936	144	36
4	GW4	Bhisra	7.8	29.9	34	44	1015	1670	252	199
5	GW5	Layja-Mota-I	8.9	30.1	<1	14	1812	2986	428	289
6	GW6	Layja-Mota-II	8.9	28.7	1	20	2067	3426	312	470
7	GW7	Bayat	7.9	27.9	<1	4	644	1065	240	42
8	GW8	Bambhdai	7.7	26.9	1	17	570	936	168	34
Bore Well										
9	GW9	Nana-Layja	8.8	29.9	<1	7	1741	2923	236	407
10	GW10	Padmpur	8.5	30.1	5	36	4002	6658	772	1509
11	GW11	Dedhiya	8.3	30.5	<1	12	4246	7062	780	1652

Table 3.3.3 (a) Ground water quality results compared with Drinking water standards IS 10500

pH		Min	Max	Acceptable Limit	Permissible Limit in absence of alternate source
Temp	°C	6.9	8.9	6.5-8.5	No relaxation
Turbidity	NTU	<1	34	1	5
TDS	mg/l	458	4246	500	2000
Fluoride	mgl	0.3	1.5	1.0	1.5
Heavy Metal Fe	mg/l	0.006	1.881	0.3	No relaxation
Total Hardness	mg/l	144	780	200	600
Chloride	mg/l	34	1652	250	1000

Table 3.3.4. Water Quality - Nutrient and Demand Parameters (February 2020)

Sr. No.	Sample Code	Sampling Locations	Nitrate as NO_3	Total Phosphates	DO	COD	BOD	TKN	Fluoride	Oil & Grease	Phenol µg/l
			mg/l								
Surface Water (pond Water)											
1	SW1	Bada	2.35	6.0	5.4	35	<3	36	0.6	0.38	0.10
2	SW2	Janakpur	1.61	1.0	5.2	42	<3	48	0.4	0.16	0.32
3	SW3	Bhishra	2.38	0.5	6.3	38	<3	36	0.5	0.47	0.28
4	SW4	Layja-Mota	1.44	0.6	5.6	29	<3	14	0.6	0.74	0.56
5	SW5	Bambhdai	2.80	0.6	6.1	86	<3	62	0.9	0.87	0.47
6	SW6	Mapar	2.90	1.0	6.9	42	<3	25	1.5	0.67	0.55
Ground Water											
Dug Well											
1	GW1	Bhada	1.88	8.4	-	-	-	39	0.5	0.18	0.28
2	GW2	Panchotiya	4.03	2.5	-	-	-	31	0.6	0.68	ND
3	GW3	Bada	1.62	2.6	-	-	-	22	1.5	0.38	ND
4	GW4	Bhisra	2.72	2.7	-	-	-	62	0.5	0.21	0.26
5	GW5	Layja-Mota-I	1.61	8.8	-	-	-	31	0.4	0.10	ND
6	GW6	Layja-Mota-II	7.81	7.7	-	-	-	76	0.8	0.05	ND
7	GW7	Bayat	2.34	4.3	-	-	-	36	0.3	0.06	ND

8	GW8	Bambhdai	2.77	0.8	-	-	-	50	0.8	0.08	0.63
Bore Well											
9	GW9	Nana-Layja	3.53	5.2	-	-	-	115	1.5	0.10	ND
10	GW10	Padmpur	10.10	1.8	-	-	-	25	0.5	0.08	ND
11	GW11	Dedhiya	1.93	2.5	-	-	-	34	0.6	0.07	0.76

Table 3.3.5 (i). Water Quality-Heavy Metals (February 2020)

Sr. No.	Sample Code	Sampling Locations	As	Cd	Co	Cr	Cu	Fe	Mn	Mo
			mg/l							
Surface Water (pond Water)										
1	SW1	Village Bada	ND	ND	0.001	ND	ND	0.183	0.109	ND
2	SW2	Janakpur	0.001	ND	ND	0.001	0.014	0.345	0.322	ND
3	SW3	Bhishra	ND	0.001	0.003	0.014	0.006	3.559	0.293	0.023
4	SW4	Layja-Mota	ND	ND	0.001	0.022	0.000	0.544	0.116	ND
5	SW5	Bambhdai	ND	ND	0.003	0.017	0.007	4.849	0.224	ND
6	SW6	Mapar	ND	ND	0.001	0.003	0.001	0.858	0.218	ND
Ground Water										
Dug Well										
1	GW1	Bhada	0.012	0.004	ND	0.001	0.015	ND	0.059	0.012
2	GW2	Panchotiya	0.008	0.000	ND	0.002	0.005	0.403	0.067	0.148
3	GW3	Bada	0.001	0.005	ND	0.009	ND	0.996	0.112	0.010
4	GW4	Bhisra	0.000	ND	ND	0.006	0.004	1.199	0.274	ND
5	GW5	Layja-Mota-I	ND	ND	ND	ND	ND	ND	0.048	ND
6	GW6	Layja-Mota-II	ND	ND	ND	0.001	0.018	0.006	ND	0.010
7	GW7	Bayat	ND	ND	ND	0.05	ND	ND	0.024	ND
8	GW8	Bambhdai	ND	ND	ND	0.006	0.014	0.500	0.413	0.003
Bore Well										
9	GW9	Nana-Layja	0.028	0.004	ND	0.026	0.043	1.881	0.088	0.044
10	GW10	Padmpur	ND	0.001	ND	0.007	ND	0.982	0.063	ND
11	GW11	Dedhiya	ND	ND	ND	ND	ND	ND	0.029	ND

ND: Not Detectable

Table 3.3.5 (ii). Water Quality-Heavy Metals (February 2020)

Sr. No.	Sample Code	Sampling Locations (near/in the village)	Ni	Pb	Se	V	Zn	Hg
			mg/l					
Surface Water (pond Water)								
1	SW1	Bada	ND	ND	ND	ND	ND	ND
2	SW2	Janakpur	ND	ND	ND	ND	ND	ND
3	SW3	Bhishra	ND	0.004	ND	ND	ND	ND
4	SW4	Layja-Mota	ND	0.001	ND	ND	ND	ND
5	SW5	Bambhdai	ND	0.004	ND	ND	0.004	ND
6	SW6	Mapar	ND	0.003	ND	ND	ND	ND
Ground Water								
Dug Well								
1	GW1	Bhada	ND	0.087	0.012	0.009	0.106	ND
2	GW2	Panchotiya	ND	0.006	0.010	0.017	0.011	ND
3	GW3	Bada	0.007	0.091	0.001	ND	ND	ND
4	GW4	Bhisra	ND	0.002	ND	ND	0.042	ND
5	GW5	Layja-Mota-I	ND	0.001	ND	0.051	ND	ND
6	GW6	Layja-Mota-II	ND	0.004	0.006	ND	ND	ND
7	GW7	Bayat	ND	0.003	ND	0.080	ND	ND
8	GW8	Village Bambhdai	ND	ND	ND	0.004	ND	ND
Bore Well								
9	GW9	Village Nana-Layja	ND	0.034	0.013	ND	0.169	ND
10	GW10	Village Padmpur	ND	ND	ND	0.204	ND	ND
11	GW11	Village Dedhiya	ND	ND	ND	0.134	ND	ND

ND: Not Detectable

Table 3.3.6. Water Quality – Bacteriological Parameters (February 2020)

Sr. No.	Sample Code	Sampling Locations (near/in the village)	Total Coliform	Feacal Coliform
			CFU/100 ml	
Surface Water (pond Water)				
1	SW1	Bada	100	ND
2	SW2	Janakpur	ND	ND
3	SW3	Bhishra	ND	ND
4	SW4	Layja-Mota	800	ND
5	SW5	Bambhdai	ND	ND
6	SW6	Mapar	200	ND
Ground Water				
Dug Well				
1	GW1	Bhada	ND	ND
2	GW2	Panchotiya	70	ND
3	GW3	Bada	ND	ND
4	GW4	Bhisra	100	ND
5	GW5	Layja-Mota-I	ND	ND
6	GW6	Layja-Mota-II	ND	ND
7	GW7	Bayat	240	ND
8	GW8	Bambhdai	40	ND
Bore Well				
9	GW9	Nana-Layja	ND	ND
10	GW10	Padmpur	ND	ND
11	GW11	Dedhiya	ND	ND

CFU: Colony Forming Unit; ND- Not Detectable

3.4 Marine Water and Sediments Quality

CSIR-NIO have conducted preliminary marine environmental survey during the post-monsoon season (October) of 2018 & Summer season March 2019 in order to examine prevailing environmental setting and following are the few of initial findings based on the results of physical and chemical parameter measurement.

3.4.1 Physical Processes:

The tide off Bada was measured by deploying the Sea Guard Tide Gauge at 22°49′ 43.58″ N 69° 07′ 15.02″ E during 24 October to 2 November 2018. Maximum tide was 5.6 m and minimum tide was 1.6 m with an average tide of 3.9 m. The Currents off Bada were measured by deploying an Aanderaa current meter (RCM 11) at 22° 49′ 44.47″ N 69° 07′ 13.67″ E during 24 October to 2 November 2018. Currents in the coastal region off Bada are mainly caused by tides, though winds can also make some contribution. During the observation, the maximum current speed was 117 cm/s with an average current speed of 62 cm/s. Most of the time, the current direction during flood phase was around 100° while that was around 300° during ebb phase. The direction varied between 100° to 300°, which shows that the seawater possibly moves along the coast.

3.4.2 General Marine Water Quality near the Project Site

The annual variation of water temperature is between 23°C and 30°C though localised higher temperatures up to 35°C can result in isolated water pools formed in shallow intertidal depressions, during low tide. SS is highly variable (5-700 mg/L), spatially as well as temporally, and largely result from the dispersion of fine sediment from the bed and the intertidal mudflats, by tidal movements. Evidently, nearshore shallow regions invariably sustain higher SS as compared to the central portions. Average pH of the water is remarkably constant (8.0-8.3) and is within the range expected for the coastal tropical seas. The evaporation exceeds precipitation leading to salinities markedly higher than that of the typical seawater (35.5 ppt). This is particularly evident in the inner Gulf of Kutch where salinities as high as 40 ppt have been reported to commonly occur off Kandla and Navlakhi. Although the salinities decrease considerably for a brief period in some creeks of the Little Gulf of Kutch under the influence of monsoonal runoff, the impact of this decrease in salinity in the Gulf proper is small and salinities exceed 36 ppt off Mundra during normal monsoon periods. The sampling locations selected for the study are depicted in **Fig. 3.4.1**. The average DO is fairly good (4.3-7.1 mg/l) and the BOD is low (<0.1-4.0 mg/l) indicating good oxidizing conditions. Hence, the organic load in the water column is considered to be effectively oxidized. The nutrients (PO_4^{3-}-P, NO_3^--N, NO_2^--N, NH_4^+-N) are more or less uniformly distributed in the Mundra and Kutch segment and their concentrations indicate healthy natural waters. Their levels however are marginally high in the Kandla-Navlakhi segment. The networks of creeks in the region sustain high natural concentrations of nutrients perhaps due to high regeneration rates. As expected for an unpolluted coastal environment, the concentration of PHc is low.

3.4.2.3 Marine Baseline Water Quality

The marine water quality at twelve (12) locations covering nearshore (considered as stations 1, 2A, 4, 4A and 7), toward offshore (considered as stations 2, 3,5,6,8 and 9) and offshore (considered as station 10) were chosen for establishing baseline marine water quality. Intertidal sampling was conducted at 3 transects (TR I – TR III). Water quality recorded during post-monsoon (October 2018) and pre-monsoon (March 2019) seasons are presented in **Tables 3.4.1 and 3.4.2**. The results are discussed below as follows:

Temperature: Water temperature is an important parameter, which influence chemical processes such as dissolution-precipitation, adsorption-desorption, emulsification -flocculation, oxidation-reduction etc. As a result of absorption of solar radiation, the temperature of a well-mixed shallow water body varies in accordance with the prevailing air temperature, while that of waters having restricted vertical mixing in a thermal gradient may prevail. Due to natural changes in climatic conditions the temperature of water fluctuates daily as well as seasonally. These changes often influence the physiological processes and reproductive cycles of aquatic organisms and may affect the prevailing community structure and the geographical distribution of species. An upper threshold limit of 35°C is considered for tropical aquatic species though some may be less tolerant. The average air temperature varied between 28.5°C and 32.8°C during October 2018, whereas temperature was between 23.3°C and 28.0°C during March 2019. The temperature in all the three zone were lower during March 2019 as compared to that in October 2018 and remained less than 35°C. Such disparity in temperature may prevalent due to localized weather change, which is short term in nature.

pH: The pH of seawater is largely controlled by the $CO_3^{2-}/HCO_3^{-}/CO_2$ system. The pH of seawater generally varies between 7.6 and 8.3. However, pH of coastal and estuarine water receiving anthropogenic wastes may vary. When the primary productivity is high, CO_2 is consumed during photosynthesis, which shifts the equilibrium that favors higher pH. The range of pH in surface and bottom were identical (8.3-8.4; average, 8.4) during October 2018 and were slightly higher than the pH in surface (7.9-7.9; average, 7.9) and bottom (7.9-8.0; average 7.9) water in March 2019. The range of pH observed during this study closely followed the historical range of water pH measured at various locations within Gulf of Kutch.

Suspended Solids (SS): Suspended Solids (SS) in water include a wide variety of material, such as silt, decaying plant and animal matter, fishing industrial wastes, and sewage, an inorganic and organic fraction (algae, zooplankton, bacteria, and detritus) carried by water runoffs from land. They contribute to turbidity of the water and higher concentrations of SS can affect health of the aquatic animals and submerged vegetation by reducing the photosynthesis. The reduced rates of photosynthesis cause less dissolved oxygen production by the plants. In case of complete blockage of light by turbidity the photosynthesis activity by bottom dwelling plants will be ceased, therefore they die and start to degrade. SS in the water column

also adversely affects certain sensitive populations through mortality, reducing growth rate and resistance to diseases, preventing proper development of fish eggs and larvae, modifying natural movement and migration and reducing abundance of available food. SS settling on the bed can damage the benthic invertebrate population, block spawning etc.

The SS concentration during October 2018 and March 2019 was more or less similar. Briefly, the mean SS during October 2018 varied from 25-93 mg/l in surface and 38-160 mg/l in bottom, whereas during March 2019 it varied from 25-124 mg/l in surface and 55-194 mg/l in bottom. The ranges of SS observed during this study are in line with the historical SS limits found in various locations within Gulf of Kutch. There was no marked spatial and vertical variation of SS recorded during both the sampling campaigns of this study.

Turbidity: Turbidity of water relates to optical clearness of seawater and is affected by dissolved matter and SS. In general turbidity has direct relationship with SS present in water. The measurement of turbidity is one of key parameters in deciding the quality of water as high turbidity can harm fish and other aquatic life by reducing food supplies, degrading spawning beds, and affecting gill function. The average value of turbidity in surface water (1.1-30.3 NTU) and bottom water (1.2-33.7 NTU) during October 2018 were lower than the range of turbidity in surface (12-33.2 NTU) and bottom (16.1-53.1 NTU) water column during March 2019. The water column turbidity decreased from nearshore to offshore during both the sampling campaigns, which is characteristic feature in coastal region.

Salinity: Salinity is an indicator of freshwater incursion in near shore coastal waters as well as excursion of salinity in inland water bodies such as estuaries, creeks and bays. Normally seawater salinity is 35.5 ppt which may vary depending on competition between evaporation and precipitation and freshwater addition. Salinity is an ecological factor of considerable importance, influencing the types of organisms that live in a water body. Biota is generally acclimatized to a certain range of salinity where they thrive. Sudden changes in salinity may cause high mortality of biota including fish due to salinity shock. The range of salinity in surface (37.5-38.2 ppt; av. 37.9) and bottom (37.5-38.2 ppt; av. 37.8 ppt) water during October 2018 were closely similar to salinity of surface water (37.8-38.0 ppt; av. 37.9 ppt) and bottom water (37.7- 38.9 ppt; av. 37.9 ppt) during March 2019 (**Table 3.4.1 and 3.4.2**). The ranges of salinity observed during this study are in line with the historical limits of salinity recorded in various locations within Gulf of Kutch. Overall, the average salinity values were 38.0 ppt, 37.7 ppt and 37.6 ppt in nearshore, towards offshore and offshore regions of this study during October 2018. Similarly, the average values of salinity in nearshore, towards offshore and offshore regions was identically 37.9 ppt. The temporal variation in salinity at all the four locations (St. 2, 2A, 4 and 5) during October 2018 and March 2019 did not show any marked variation with respect to each other, however the salinity during flood condition was higher at stations 2 and 5. The salinity difference between surface and bottom water over the tidal cycle is low, which indicate towards well-mixed water column.

DO and BOD: The health of aquatic life is closely linked with the level of DO in water thereby making it the most critical parameter while assessing the water quality. Much of the dissolved oxygen in water comes from the atmosphere. After dissolving at the surface, oxygen is distributed by current and turbulence. Algae and rooted aquatic plants also deliver oxygen to water through photosynthesis. The main factor contributing to changes in dissolved oxygen levels is the build-up of organic wastes. Oxidation of organic wastes consumes oxygen, thus decreasing its level in the aquatic environment. Depletions in dissolved oxygen can cause major shifts in the kinds of aquatic organisms found in water bodies. In natural waters rate of consumption of DO is less than the rate of replenishment resulting in its adequate level in water which is often more than the saturation value. Consumption of DO during heterotrophic oxidation of oxidizable organic matter and respiration by aquatic flora and fauna gives high concentration of BOD. It is difficult to attain the threshold limit of DO for aquatic life, since environmental conditions, waste loading and natural levels of DO vary considerably and the existent composite aquatic life has variable demand for DO depending on their composition, age, activity and nutritional status. However, it has been observed that below 3 mg/L concentration of DO, good and diversified aquatic life may not be sustained since feeding of many organisms is diminished and/or stopped and their growth is retarded at low DO levels. Embryonic and larval stages of aquatic life are especially vulnerable to reduced conditions and may also result in retarded development and even partial mortality. Although there is no unanimity on the level of DO to be maintained in coastal waters, but it is considered that the level should not fall below 4 mg/L consistently for a longer period of time. The ranges of DO in surface water (6.1-7.4 mg/L; average, 6.5 mg/L) and bottom water (5.8-6.7 mg/L; average, 6.1 mg/L) during October 2018 were similar to the values of DO observed in surface (5.1-7.6 mg/L; average, 6.8 mg/L) and bottom (5.4-7.4 mg/L; average, 6.5 mg/L) water during March 2019. On an average, DO values were comparable in both the season with minor fluctuations. Average DO values at nearshore (6.2 mg/L), towards offshore (6.4 mg/L)) and offshore (6.2 mg/L) were almost identical during October 2018. However, it was marginally lower when compared to the average DO values at nearshore (6.5 mg/L), towards offshore (6.6 mg/L) and offshore (7.1 mg/L) during March 2019. Temporal variation of DO indicated mostly higher DO in surface water, without any marked fluctuation in DO during ebb and flood condition of the sea. The ranges of DO obtained during both the sampling period in this study indicated a well oxygenated water column prevailed for the healthy aquatic life to sustain.

The ranges of BOD in surface water (0.4-3.5 mg/L; average, 1.9 mg/L) and bottom water (0.4-2.0 mg/L; average, 1.1 mg/L) during October 2018 were identical with the ranges of BOD observed in surface (1.0-3.5 mg/L; average, 1.9 mg/L) and bottom (0.6-2.3 mg/L; average, 1.4 mg/L) water during March 2019. Distribution of BOD indicated apparently increased mean BOD values from nearshore to offshore during October 2018, with mean values observed at nearshore, towards offshore and offshore regions were 1.0 mg/L, 1.8 mg/L and 2.1 mg/L, respectively. The trend was opposite in March 2019 campaign, which showed mean BOD concentrations as 1.8 mg/L, 1.6 mg/L and 1.4 mg/L, respectively at nearshore, towards offshore and offshore regions. The ranges of DO and BOD observed during present study are in

line with the historical limits recorded in various locations within Gulf of Kutch. The changing trend in BOD from nearshore region to offshore indicated consumption of oxidizable organic matter, which has changed in accordance with season and potentially related with the availability of heterotrophic organisms during that particular period, but without much depleting DO in the system.

Nutrients: The compounds of phosphate, nitrogen and silicon, along with trace metals are prime nutrients consumed by phytoplankton during primary productivity. The nutrients, nitrogen and phosphorus occur in estuarine and coastal water in many forms, which can be described in terms of oxidation states, solid-liquid-gas phase, chemical structure, or the analytical methods used for detection. The forms of nitrogen are diverse, ranging from nitrate (NO_3^-; oxidation state +5) to ammonium (NH_4^+; oxidation state -3) and other compounds exist in all states. However, the dominant forms of nitrogen exist in seawater are nitrate (NO_3^--N), nitrite (NO_2^--N) and ammonium (NH_4^+-N). NH_4^+-N is produced during the oxidation of organic matter and is oxidized to NO_3^--N via NO_2^--N where the sufficient quantity of DO is present. NO_2^--N is an intermediate product of oxidation of NH_4^+-N and reduction of NO_3^--N and is thermodynamically unstable. Nitrogen cycle involving elementary dissolved nitrogen; oxides: NO_3^-, NO_2^- and reduced forms: NH_4^+, plays a significant role in sustaining life within aquatic environment. NO^{3-} is the end product of oxidation and most stable form at pH 7. The principal source of nitrogen in marine environment is fixation of atmospheric N_2. NO_2^- occur in seawater as an intermediate product of $_{NO3}^-$ reduction in microbial processes i.e. denitrification at low oxygen level at which NO_2^- is further transformed into N_2 under anoxic conditions. Inorganic phosphorus occurs most often as the phosphate (PO_4^{3-}-P). Though these nutrients are essential for life support in the aquatic environment, their enrichment in nearshore regions may hamper the coastal nutrient status and in extreme cases it can lead to eutrophication.

Phosphate ($PO4^{3-}$ −P): Phosphorus as phosphate (PO_4^{3-}−P) is an essential nutrient required for plant nutrition. Anthropogenic sources of PO_4^{3-}−P in coastal marine environment include domestic sewage, detergents, effluents from agro-based and fertilizer industries, agricultural runoff, organic detritus such as leaves, cattle waste etc. The PO_4^{3-}−P concentrations in the surface water off Bada during October 2018 was in the range of ND and 1.6 µmol/L, (av 0.9 µmol/L) and 0.1-1.7 µmol/L (average, 1.0 µmol/L) in the bottom. During March 2019, PO_4^{3-}−P concentrations ranged between 0.6 µmol/L and 2.9 µmol/L averaged at 1.5 µmol/L in surface layer, whereas it ranged 0.6 µmol/L and 3.6 µmol/L, averaged at 1.8 µmol/L in bottom layer. The average PO_4^{3-}−P concentrations in surface as well as bottom water during March 2019 were higher than that during October 2018 may be due to sedimentary re- suspension, which is indicated by higher turbidity during March 2019. The ranges of PO_4^{3-}−P observed during this study are in line with the historical limits of PO_4^{3-}−P recorded in various locations within Gulf of Kutch. Distribution of PO_4^{3-}−P indicated increase in the concentrations from nearshore to offshore region, with average values 0.4µmol/L, 1.2µmol/L and 1.5 µmol/L in nearshore, towards offshore and offshore region respectively during October 2018. The mean PO_4^{3-}−P values were 1.8µmol/L, 1.5µmol/L and 1.6 µmol/L in nearshore, towards offshore and offshore region respectively during March 2019. Variation of PO_4^{3-}−P over a period of

tidal cycle was not significant and without any significant differences between flood and ebb tidal condition as well as surface and bottom waters.

Nitrate (NO_3^-–N): The ranges of NO_3^-–N in surface water (1.4-7.7 µmol/L; average, 4.0 µmol/L) and bottom water (0.7-7.7 µmol/L; average, 4.0 µmol/L) during October 2018 were higher than the ranges of NO_3^-–N observed in surface (1.4-4.1 µmol/L; average, 2.9 µmol/l) and bottom (1.7-3.5 µmol/L; average, 2.6 µmol/L) water during March 2019. The ranges of NO_3^-–N observed during this study are in line with the historical limits of NO_3^-–N recorded in various locations within Gulf of Kutch. Distribution of NO_3^-–N indicated increase in the concentrations from nearshore to offshore region, with average values 2.2 µmol/L, 5.0 µmol/L and 6.8 µmol/L in nearshore, towards offshore and offshore region respectively during October 2018. The mean NO_3^-–N values were lower in March 2019 and were 2.6 µmol/L, 2.9 µmol/L and 2.9 µmol/L in nearshore, towards offshore and offshore region respectively. The lower NO_3^-–N during pre-monsoon period was comparable with previous studies along the surrounding region and related with seasonal characteristics of NO_3^-–N variation in coastal waters around the Arabian Sea. Long term study of NO_3^-–N distribution can reveal the mechanism of seasonal changes and trends such as roughly consistent along the longitudinal cross section of the study area. The concentrations of NO_3^-–N over tidal cycle indicated inconsistent variation without any significant trend during both the sampling periods.

Nitrite (NO_2^- –N): The ranges of NO_2^-–N in surface water (ND - 0.4 µmol/L; average, 0.2 µmol/L) and bottom water (ND-0.5 µmol/l; average. 0.2 µmol/L) during October 2018 were similar to the ranges of NO_2^-–N observed in surface (0.1-0.6 µmol/L; average, 0.3 µmol/L) and bottom (0.1-0.8 µmol/L; average 0.3 µmol/L) water during March 2019. The distribution of NO_2^-–N showed inconsistent trend of variation between both the seasons and nearshore stations have higher values than the towards offshore and offshore stations during the study period. The mean water column NO_2^-–N values in nearshore, towards offshore and offshore stations during October 2018 were 0.2 µmol/L, 0.1 µmol/L and 0.2 µmol/L, respectively. Similarly, the mean NO_2^-–N values were 0.4 µmol/L, 0.2 µmol/L and 0.1 µmol/L, respectively in nearshore, towards offshore and offshore stations during March 2019. Temporal variation of NO_2^-–N did not show any significant pattern of variation over the period of tidal cycle during both the sampling period of this study. Overall, ranges of NO_2^-–N observed during this study are in line with the historical limits of NO_2^-–N recorded in various locations within Gulf of Kutch.

Ammonium (NH_4^+ –N): The NH_4^+-N is unstable in natural surface waters, therefore further oxidized to NO_3^--N via NO_2^--N. The concentration of NH_4^+-N were ranged at 0.3–2.2 µmol/L (average, 0.9 µmol/L) in surface water and 0.3-2.7 µmol/L (average, 0.9 µmol/L) in bottom water during October 2018. Similarly, NH_4^+-N concentrations were 0.5–2.6 µmol/L (average, 1.5 µmol/L) in surface and 0.7-2.6 µmol/L (average, 1.2 µmol/L) in bottom water during March 2019. The ranges of NH_4^+-N observed during this study are in line with the historical limits of NH_4^+-N recorded in various locations within Gulf of Kutch. Distribution of average NH_4^+-N indicated higher concentration during March 2019 as compared to the October 2018. The average water column NH_4^+-N values in nearshore, towards offshore and

offshore region were almost similar and is 0.9 µmol/L in October 2018. The average values of NH_4^+- N were 1.5 µmol/L, 1.3 µmol/L and 1.5 µmol/L around nearshore, towards offshore and offshore region respectively during March 2019. The variation in concentration of NH_4^+-N over the tidal cycle were inconsistent, without much difference between surface and bottom NH_4^+-N levels during both the sampling campaign of this study. Overall assessment indicated that the concentrations of nutrients in waters off Bada during both the sampling campaign (post-monsoon and pre-monsoon) of this study were broadly comparable with each other as well as with the historical limits. The seasonal fluctuations in the concentrations of nutrients such as NH_4^+-N and NO_3^--N were subjected to their natural variation as in coastal and nearshore waters of Arabian Sea, which can be studied over a period of time.

Petroleum hydrocarbons (PHc): Naturally occurring hydrocarbons in aquatic environment are in trace amounts of simple forms produced by microbes. PHc derived from crude oil and its products are added to marine environment by anthropogenic activities namely production of crude oil and its products, their transport, ship traffic and others. Prominent land-based sources are domestic and industrial effluents, atmospheric fallout of fuel combustion products, and condensed vapors. PHc can cause severe damage to the aquatic life when there are sudden discharges in large quantities during accidents such as tanker collision, pipeline rupture, fire and others. The concentration of PHc measured in surface layer (1m water depth) ranged at 1.7–11.9 µg/L (average, 6.1 µg/L) during October 2018 and 2.8–20.0 µg/L (average, 9.2 µg/L) during March 2019. The ranges of PHc observed during this study are in line with the historical limits of PHc recorded in various locations in Gulf of Kutch. The distribution of PHc indicated apparently consistent and lower value in offshore regions during both the seasons, whereas the PHc in nearshore as well as towards offshore region were higher in March 2019 as compared to October 2018. The average PHc concentrations during October 2018 in nearshore, towards offshore and offshore regions were 6.2 µg/L, 5.8 µg/L and 7.5 µg/L respectively. Similarly, the PHc values in nearshore, towards offshore and offshore regions were higher 9.3 µg/L, 9.5 µg/L and 7.0 µg/L, respectively in March 2019.

Phenols: Phenols of anthropogenic origin exist in the environment due to the activity of the chemical, petrol, tinctorial or pharmaceutical industries. The compounds penetrate ecosystems as the result of drainage off the municipal or industrial sewage to surface water. Moreover, the occurrence of phenols in the environment stems from the production and use of numerous pesticides, in particular phenoxy herbicides. Some phenols may be formed as a result of natural processes like the formation of phenol and p-cresol during decomposition of organic matter or synthesis of chlorinated phenols by fungi and plants. The concentration of phenols measured in at surface water were in the range of at 19.2–62.9 µg/L (average, 37.5 µg/L) during October 2018 and 13.2– 41.0 µg/L (average, 25.6 µg/L) during March 2019. The distribution of phenols in surface water indicated apparently consistent and lower value in offshore regions during both the seasons, whereas the phenols in nearshore as well as towards offshore region were higher in October 2018 as compared to that in March 2019.

(a)



(b)



Fig. 3.4.1 (a & b). Location map for water and sediment observationaround (a) subtidal as well as (b) sediment collection in inter-tidal regions off Bada.

3.6. Ecology and Biodiversity

3.6.1 Description of the Study Area

For the convenience of the ecology and biodiversity study and the user agencies, the study area was divided in two major parts i.e. (1) core area/project area and (2) buffer area i.e. 10.0 km periphery of the project boundary (**Figure 3.6.1**). Core area is proposed land area for establishing the project which covers about 1350 Acre of private unirrigated agriculture land, Sarkarshree land/Govt. land, near village Bada, of Mandvi Taluka in Kutch District of Gujarat. The proposed project area land does not have dense vegetation. Sparse clumps of thorny scrub mostly in the form of invasive species i.e., *Prosopis juliflora* are scattered in the core area. No major rivers, drainage passes through the project area. Nearest habitation is at about 1.0 km north from the proposed project site.



Fig. 3.6.1. Geographical Location of Core and Buffer Area of the Proposed Soda Ash Plant in Kutch, Gujarat

The Arabian Sea coast is located south of the proposed boundary of the project. The area is located at 6.0 km distance from the National Highway NH-41. No major natural vegetation or any human settlements present within the proposed land, therefore there is no need for rehabilitation of any human settlements from the project site. The project site does not fall in 10.0 km periphery of any National Park or Sanctuary or their eco-sensitive zones.

The Buffer Area mainly consists of revenue areas 20 villages that fall in 10 km periphery of the project site.

Majority of the land of the buffer area is occupied by the private unirrigated agriculture fields, forest area, open scrub vegetation, sandy beach, pond/ reservoir, roads & Canal network, village habitations and wind turbines. Most importantly there are no Wildlife Sanctuaries or National Parks located in the 10.0 Km periphery of the proposed project area. Due to close proximity of Arabian Sea coastal stretch the activities are regulated as per Coastal Regulation Zone.

3.6.2 Methodology

The prediction of impacts of industries on flora and fauna depends on understanding of the proposed activities, its magnitude/extent, scale and ecological conditions in the surrounding area. Collection of comprehensive baseline information on flora and fauna is therefore a prerequisite for assessment of impacts of industrial development activities. It would also help in advance planning and mitigate the impacts and ultimately maintaining the natural habitat and resources. The methodology followed for obtaining baseline of ecology and biodiversity include field surveys, interviews, and reviews of literature.

Field Surveys: Several field visits were carried out between month of October-2018 to January 2019 to understand and assess the impacts of proposed project activities on flora and fauna and natural habitats. We evaluated the distribution and abundance of flora and fauna in project area and in buffer area separately.

Identification of Important Ecological Habitats: The important ecological habitats and features were identified based on our field visits and also mapping of landuse types in the study area. These important ecological habitats and features were then identified on landuse map that is prepared for the study area.

Flora: Assessment of flora was carried out in core project and buffer area during the study period. Study of flora involved simple, systematic and standard techniques. Due to lack of rain in the monsoon, plants such as annual grasses, herbs and few shrub species were located very sparsely. Except some of the common species of trees, shrubs identification of the species was difficult during quadrate sampling. It is therefore, the data of quadrate sampling was not useful in quantifying the species such as grasses and herbs. Therefore, the study was carried out qualitative assessment of flora in the study areas through ad libitum sampling. During surveys, our team continuously searched for plant species and identified them to prepare a checklist of plants in the respective study area. Various habitats of the study area i.e., drainage, ponds, check dams, agriculture fields, coastal area, sand dunes, dense scrubland, and reserve forests were surveyed on foot and qualitative

checklists of plants were made. Information on occurrence of plants, their species names, floral phenotypes, life forms etc. were collected continuously during the field trips in the study area from morning to evening hours. The collected data was then systematically used to synthesize a comprehensive checklist of flora that provides baseline information of the representative vegetation community of the study area.

Fauna: We mainly studied the fauna of higher trophic levels which acts as indicator of the type and health of eco-systems.

Reptiles: Majority of the reptile species are fossorial in habit therefore the assessment of reptiles and their diversity holds special significance for any development projects. We relied on qualitative observations. We carried out study based on interview survey, secondary literature as well as direct observation on road killed reptiles. We randomly looked for various reptiles and their presence i.e. lizards, snakes etc. in the study areas. Therefore, only a check list of reptiles observed during the study period was prepared.

Birds: Birds, occupying higher trophic levels in the ecosystems, respond quickly to the changes in the habitats and therefore serve as one of the best indicators for evaluating the status of the area. Therefore, we created baseline data on birds by systematically and collected data on their occurrence i.e. presence or absence in the buffer and core areas of the study area.

For creating baseline data on birds we randomly walked in the study area during early morning i.e. 6:00 AM to 9AM and 5:00PM to 7:00 PM. These time periods of the day are when maximum bird movements are expected. We walked randomly in the study area carried out sightings of birds ad libitum and recorded species based on their identification. Special reference books for bird species identification were used. Apart from walking randomly, we also relied on specific habitat search for different species i.e., dense bushes, creeks, wetlands, ponds, big trees, and open fallow agriculture areas in order to accomplish the inventorization of the bird species found in the study area. All the bird species are classified based on their conservation status, their schedule under Wildlife Protection Act 1972, their migratory status, habitats and their feeding guilds. This was further used for finding out important bird species in the study area i.e. rare, endangered or species of high conservation significance.

Mammals: Like birds, mammals are also occupying higher trophic levels in many ecosystems and respond quickly to the changes in their habitats therefore, serves as best indicators of the ecosystem health. We therefore, chose to create qualitative baseline information on presence and absence of mammals in the study area. Since the presence of mammalian species is low affecting probability of their sightings, in the study area, it was difficult to estimate their population using line transect method. More importantly, it was difficult to accommodate the sightings of nocturnal and diurnal animals in the study. Therefore, we prepared a qualitative check list of mammals based on their presences and absence using direct and indirect evidences and signs such as footprints, dens, droppings, diggings, scrap marks, etc. in the project area.

Apart from these, search efforts were also made for various signs of important wildlife species in the study area which includes looking for wildlife signs such as dens, diggings, scrap marks, droppings etc. The sites where likelihood of animals is higher such as shady trees, waterholes, dense and undisturbed bushes etc. were surveyed intensively during the survey in the study area. This survey has helped us in identifying various species of mammals in the study area. For mammal inventory, both direct sightings and indirect evidences (like dung, scats, pellets, foot prints, nests, dens etc.) were accounted.

Important Wildlife Habitats and Protected Areas

We assessed the presence and distances of important wildlife habitats and hotspots such as protected areas, breeding and nesting habitats, coastal habitats, important wetlands, and grassland area from core area. These important areas such as Protected areas (National Park, Wildlife Sanctuaries and Conservation Reserves), wetlands of national importance, Ramsar sites, Important bird areas (IBAs) classified by the Birdlife International and other organizations.

Rare, Threatened & Endemic Wildlife Species and Their Corridors

We also assessed the presence of rare, endangered, endemic wildlife species in the project area/core area and buffer area. Special search efforts were made during the field visits to identify any such sensitive species or their corridors in the project area and buffer area. Apart from field visits we relied on interview surveys of local people, consultation with local biologists and naturalists.

Literature Review

Considering the limitation to undertake statistically rigorous data gathering system, study also relied on existing knowledge about the ecology and biodiversity of the region. Importantly, there are few studies undertaken in the past dealing with the impacts of soda ash plants on flora and fauna and other concerns of biodiversity conservation. Literature on Soda Ash projects and associated environmental issues were downloaded and collated through internet. Various relevant literatures were surveyed during the study for collection of baseline information. Maps, reports and documents collected from the project proponent were also reviewed and used in the present study. Books on flora, fauna and wildlife were also studied in order to understand the biology of several species.

Consultations

During the study, series of consultations were made with both technical and non-technical stakeholders to get better picture on the project area/core area and buffer zone habitats. In order to know more about the seasonal presence of several faunal species and their movement, study team informally consulted and discussed with local naturalists and local people, from the villages, herders and farmers who inhabit close to the proposed project area.

Supplementary Information

Other than the above, for the purpose of this study, relevant information was also collected from following sources:

- Research papers and reports on flora and fauna of Kutch, Mandvi coast
- Google imageries/Google Maps
- Project related Maps provided by GHCL Limited
- Communications with subject experts

3.6.3 Ecology and Biodiversity Status

The observations of overall ecological elements were presented in this portion include details of flora, fauna, natural habitats, protected areas, wildlife species and their migration corridors. Such baseline information provides better understanding of the situation and overall ecological importance of the area. This baseline information viewed with reference to proposed project activities help in predicting their impacts on the wildlife and their habitats in the region. Data collected and information gathered from secondary literature on flora, fauna, protected area, natural habitats, and wildlife species were analyzed and results are presented as follow.

3.6.3.1 Biogeographic Zone

The region falls in Indo-Malay Realm (IM 1303) and Deserts and Xeric Shrublands Biome as defined by WWF. The North-western Thorn Scrub Forests [IM1303] ecoregion represents a large expanse of degraded dry forest surrounding the Thar Desert. Neither exceptionally species-rich nor high in endemism, the ecoregion nevertheless harbours viable populations of antelopes.

As per classification of Indian Biogeographic zones by Rodgers et al. (2000), Kutch district falls under Biogeographic Zone 3 - the Indian Desert and the Biogeographic Province Kutch Desert- 3B. The project site also falls on coast which is Biogeographic Zone-8 Coasts.

3.6.3.2 Protected Areas

As per our information and survey there is no Sanctuary, National Park, or notified wildlife corridors within the core area and buffer area (10 km) of the project site. Marine National Park and Sanctuary areas are located at 40 Km distance in south directions, whereas Narayan Sarovar Sanctuary is located at more than 75 km in North-West direction, Kutch Desert Wildlife Sanctuary is situated in the Great Rann of Kutch at more than 85km in North East direction. The Wild Ass Sanctuary is located in the Little Rann of Kutch at more than 150 km distance, Kutch Bustard Sanctuary at more than 50 km in North-West direction and Chari-Dhand Wetland Conservation Reserve is located at beyond 75 Km north**.** Majority of the protected

areas and their eco-sensitive zones are located beyond 50 km distance from the project site (**Table 3.6.1, Figure 3.6.2**).

Table 3.6.1. Protected Area and their Distances from Proposed Project Site

No	Protected Areas	Distance	Direction
1	Marine National Park	40 Km	South
2	Marine Sanctuary	40 Km	South
3	Narayan Sarovar Sanctuary	75 Km	North-West
4	Kutch Bustard Sanctuary	50 Km	North-West
5	Wild Ass Sanctuary	150 Km	East
6	Kutch Desert Sanctuary	85 Km	North-East
7	Chhari Dhandh Conservation Reserve	75 Km	North



Fig. 3.6.2. Aerial Distances of Protected Areas in Kutch Region with Reference to Proposed Project Site

3.6.3.3 Important Ecological Habitats

Based on our field visits and literature survey we identified three important ecologically sensitive habitats that are located within 10.0 km buffer zone. They are (i) Forest Areas (ii) Sea-turtle nesting site and (iii) Sand dunes

Waterbodies: Our observation and literature review suggest that there are no major wetlands present within the study area i.e. 10.0 km buffer area of the project site. However, there are total 6 seasonal drainages that run North to South in the study area. These drainages have small check dams built on them which are known to accumulate overflowing runoff water for a short period. Apart from being important hydrological features in the semi-arid area, these check dams provide important habitat for many bird species and water source for wildlife in the region. One such seasonal drain is known as Vengdi River which flows from North to South adjacent to project site in Western side of proposed project site (**Fig.3.6.3**). There is one check dam on this river adjacent to project site boundary of the proposed project site. However, all such drainages are seasonal in nature and flows only during rainy days. These drainages flow water from main land to Arabian sea on Kutch coast. Apart from drainages and check-dams, there are number of ponds located in the study area. These ponds mostly have smaller catchment areas and are located near villages, wastelands, forests, or in the agriculture areas to hold rainwater for domestic use such as drinking for human as well as cattle, washing clothes and irrigation. One of the closest small minor seasonal ponds is located at 250 m in South-East direction from the proposed project boundary. A village pond is located at Bada village in north-east direction. These ponds may not be important hydrological features but they provide crucial source of drinking water for wildlife in the region. The coastal habitats in the region are depicted in **Fig.3.6.4**.

Sea turtle Nesting Beach: The sandy stretches of Kutch district are known for sporadic nesting of two species of sea turtles i.e. Olive ridley (*Lepidochelys olivacea*) and Green Seaturtle (*Chelonia mydas*). Gujarat Ecology Commission a Government of Gujarat Organization has carried out a study as part of World Bank aided Integrated Coastal Zone Management (ICZM) Project titled "*Evaluation of Sea Turtle Nesting Population and Threats to Nesting Beaches: Suggest Conservation and Management Strategies*" (also referred as Sunderraj et al 2013). The study based on secondary data (from Gujarat Forest Department and Sunderraj et al 2002) identified total 10 stretches of Seaturtle nesting beaches on Kutch coast.

The study based on available data sources for 10 stretches (**Table 3.6.2**) concluded that Bada-Layja Nana, Layja Nana-Mandvi Palace and Mandvi Palace-Mandvi beach were found to be the potential beaches on Kutch coast (Sunderraj et al 2013). According to Sunderraj et al 2013, sandy beach between Bada to Layja nana having length of 11.5 km is first rank beach for seaturtle nesting whereas beach between Bambhdai to Bada of 8 km length ranks 3rd most important nesting beach of Kutch coast.



Fig. 3.6.3. Waterbodies in the Study Area

Table 3.6.2. Potential Seaturtle Nesting Beaches Identified on Kutch Coast (*source Sunderraj et al 2013*).

No	Stretch	e (Km)	Nests- 1	(RO)	nests - 2	(RO)	O	
1	Pingleshwer – Kamond	4.0	4	1.0 (3)	1	0.25 (8)	5.5	4
2	Kamond – Suthri	5.6	0		2	0.36 (6)	6.0	5
3	Suthri – Chhachhi	10.5	0		3	0.29 (7)	7.0	6
4	Chhachhi – Bambhdai	10.5	0		1	0.09 (9)	9.0	7
5	Bambhdai – Bada	8.0	0		7	0.87 (5)	5.0	3
6	Bada –Layja Nana	11.5	27	2.35 (2)	21	1.82 (2)	2.0	1
7	Layja Nana – Mandvi Palace	6.0	6	1.0 (3)	11	1.83 (1)	2.0	1
8	Mandvi Palace –Mandvi	6.5	29	4.46 (1)	11	1.69 (3)	2.0	1
9	MandviE– Gundiali	6.0	0		0	0	0	
10	Gundilai – Tragadi	4.0	2	0.50(4)	4	1.0(4)	4.0	2
	Total	**72.6 km**	**68**		**61**	**100**		

Data Sources: 1-GSFD-Kachchh Circle, 2- Sunderraj et al 2002,
Rank Order, MRO-Mean Rank Order, FR-Final Rank

According to above mentioned study, density of seaturtle nests is higher (1.8 to 2.3 nest/km) on the coastal stretch between Bada and Nana Layja villages, however, nest density is relatively lower on the coast of Bada and Bambhdai villages (0 to 0.8/km). This difference in nesting could be due to difference in the beach morphology i.e., available beach width, beach slope, vegetation type, disturbance level, predators etc.

The length of the coast in the study area is 23.0 km East to West. Only 2.0 km area falls near the proposed project site. During our field visits we did not observe direct or indirect signs of nesting of seaturtle on the coast near project site. However, sandy beach on the coast of Bambhdai, Pachotiya, Bhada and Nana Layja are likely to have sea turtle nesting activity due to its suitable morphology and past records.

In general, all sea turtle species tend to nest above the high-water mark to reduce the risk of tidal inundation or egg wash out (Fowler 1979; Mortimer 1982). During our field visits we observed that the open sandy beach width decreases as we travel on the coast from Nana Layja village (east) to Bada village coast (west). Even bare perusal of 'Google Earth' image reveals that the open beach width is higher on the coast of Bhada and Panchotiya villages which decrease on Bada village coast. Moreover, the width of sandy beach in the supra tidal region near proposed project site is very narrow due to presence of dense *Prosopis juliflora* vegetation on stabilized sand dunes. Also, during our visits we observed that there is a steep slope and dense vegetation in the supra tidal region on the beach near proposed project site. Presence vegetation such as *Prosopis juliflora* is seen to hold sand and stabilized sand dunes. We also observed higher presence of predators such as jackals and dogs.

Therefore, our primary observations suggests that the coast near the proposed project site may not be suitable for sea turtle nesting due to narrow supra tidal region, steep slope, dense vegetation and presence of predators such as dogs and jackals. Though, our observations suggests that there may be no or negligible probability of sea turtle nesting, a proper systematic study was carried out by an expert and the report is enclosed in Chapter 8.



Fig. 3.6.4. Coastal Habitats near the Coastal Areas of the Project Study Area

Sand dunes

During our field survey, we observed presence of sand dunes along the Arabian Sea coast. Presence of sand dunes in the study area suggests high energy wave dominated sea coast. The sand dunes are also present southern side of the proposed project site. These sand dunes are formed due to deposition of fine to medium, well sorted sand particles. Sediments of the dunes consist of windblown deposits of fine to very fine sand and silt. Majority of the part of the sand dunes are having dense vegetation in the form of *Prosopis juliflora, Acacia nilotica, Acacia leucophloea, Salvadora persica, Caparis decidua, Ipomoea pes-caprae, Suaeda nudiflora* and other species *with* salt tolerant grasses such as *Cenchrus biflora, Cenchrus Ciliaris, Urochondra setulosus*, *Dactyloctenium indicum, Cynodon dactylon, Aleurops lagopoides* etc.

Presence of dense vegetation suggests stabilized status of sand dunes. The North-South width of the sand dunes varies from 500 mtrs to 200 mtrs The North-South sand dune height profile studied suggest that the height of the dunes varies from 4 mtrs on fore shore area and landward side to 13 mtrs in the central area. The East-West sand dune height profiling suggests that it varies from 5-13 mtrs with undulating deposits. We also observed directs and indirect signs of variety of animals starting from reptiles, birds and mammal species.

3.6.3.4 Floral Diversity and Vegetation Type in Core & Buffer Area

We evaluated biodiversity and abundance parameters of vegetation/plant species in the core area and in the buffer area of the project site. The flora observed in the study area is given in **Table 3.6.3**.

Vegetation Type & Community in Core Area & Buffer Area:

Core area: The proposed project site falls in the arid-semi arid climatic condition. Our field survey and literature review suggest that the vegetation types and community in the project area is that of semi-arid regions. It is represented by sparse thorny scrub vegetation. The major part of the project area is devoid of large trees and mainly consists of highly scattered and sparse shrubs i.e. *Prosopis juliflora, date palm, Prosopis cineraria, Acacia nilotica, Casia auriculata* and *Zizyphus numularia, Caparis deciduas etc.* the major grasses include several species of *Cyperus* and herbs *Indigofera*. Details of vegetation survey results are discussed in forth coming sections.

Buffer area: The buffer area (10.0 km periphery) comprises mainly of agriculture fields, wastelands, forest plantation patches by forest department, scattered bushes of *Prosopis juliflora, Prosopis cineraria, Acacia nilotica, Azadirachta indica. Prosopis juliflora* and *Zizyphus numularia* among the wild plants and cotton among the cultivated crops are the most dominant plants in the buffer area. Except for highly scattered and small plants of *Commiphora wightii*, there were no rare, endangered or conservation concern species present in the close vicinity of the project area in the buffer zone.

Major part of the buffer area is agriculture fields particularly on the Eastern side of the project area. Since ground water is saline up to 15 km from the coast and highly saline up to 4 km from the coast. Thus, dry land farming is practiced near the coast and irrigated farming is practiced in the farms that are 5-6 km away from the coast. Cotton, Jowar, Bajra, Isabgol, Groundnut, Green gram etc are the main crops grown here. Some villages, especially in the central corridor are endowed with good surface water facilities, and irrigated agriculture is possible in these villages. Being semi-arid, arid zone, this region support low plant growth and therefore, not many large trees with sizable canopies are present in the buffer zone. However, at every village local people have managed to grow trees for shade, aesthetic and religious values.

Dominant Plant Species

Our qualitative survey suggests that the study area is dominated by few species such as *Prosopis juliflora* & *Zizyphus numularia* in shrubs and *Sporolobus maderaspatensiss* & *Cymbopogon martinii* in grasses and *Casia auriculata & Aerva javanica in herbs* are the most dominant species in the region (**Table 3.6.3**).

Invasive or Exotic Species

Prosopis juliflora is an evergreen tree native to South America, Central America and the Caribbean. In the United States, it is well known as mesquite. It is fast growing, nitrogen-fixing and tolerant to arid conditions and saline soils. *Prosopis julifl*ora is an exotic and invasive widespread, multi-branched shrub/tree species in the India. It has been invading grasslands, native scrubland and forests of Gujarat and India.

3.7 Socio-economic Environment

3.7.1 Introduction

A prosperous nation needs well-developed industries to provide the amenities of life to its citizens. Industrial development has had an important role in the socio -economic growth of countries. Rapid economic growth is often essential for achieving a reduction in absolute poverty. Industrialization is often essential for economical and social growth.

Poverty reduction the pattern of industrialization, however, impacts remarkably on how the poor benefit from growth. Pro-poor economic and industrial policies focus on increasing the economic returns to the productive factors that the poor possess, e.g. raising returns to unskilled labour, whereas policies promoting higher returns to capital and land tend to increase inequality, unless they also include changes in existing patterns of concentration of physical and human capital and of land ownership. Use of capital-intensive methods instead of labour-intensive ones tends to increase employment, labour regulation, social protection, health, education, etc.

Where the level of education is low and human capital concentrated. Income disparities, as does the employment of skill-based technologies, especially Also, the location of industrial facilities has an impact on overall poverty reduction and inequality. As enterprises are often concentrated in urban areas. The industrial revolution led to the development of factories for large-scale production, with consequent changes in society like Growth and structure of employment, impact of Socio-economic reforms and globalization trade and employment, labour regulation, social protection, health, education, etc. In this manner all developmental projects have direct as well as indirect relationship with socio-economic aspect, which also include public acceptability for new developmental projects. Thus, the study of socio-economic component incorporating various facets related to prevailing social & cultural conditions and economic status of the project region is an important part of EIA study.

3.7.2 Project Description

Any developmental activity exerts a direct impact on the socio-economic environment of the region. Usually, the beneficial impacts such as better job opportunities, improved education, communication, energy, housing, health, transportation facilities etc. outweighs the adverse impacts, if any.

Soda ash is the trade name for sodium carbonate, a chemical refined from the mineral trona or sodium-carbonate-bearing brines (both referred to as "natural soda ash") or manufactured from one of several chemical processes (referred to as "synthetic soda ash"). Soda ash, which is one of the most important of all chemical products and is a starting material in producing many other chemicals, is produced in the largest amounts compared with other soda products. It is an essential raw material in glass, chemicals, detergents, and other important industrial products.

The study of socio-economic component of environment incorporates various facets, viz. demographic structure, availability of basic amenities such as housing, education, health and medical services, occupation, water supply, sanitation, communication and power supply, prevailing diseases in the region as well as features such as places of tourist attraction and monuments of archaeological importance. The study of these parameters helps in identifying predicting and evaluating the likely impacts due to project activity in the surrounding region.

3.7.3 Project Influence Area

The study area for the project has been considered 10 km peripheral from the project boundary. Ten villages are falling from Mandvi tehsil under district of Kachchh in the study area.

The parameters selected for the baseline information on socio-economic components were demographic structure, infrastructure base in the area, economic structure, health status, and cultural attributes, socio-economic status in relation to quality of life and public awareness & public concern about the project. Relevant information was collected from randomly selected villages.

The salient features of the demographic and socio-economic aspects in study area have been described in the following sections. Similarly, village wise demographic data as per 2011 census is presented in subsequent sections. Study area map of 10km radial distance with demarcated survey location is given in **Figure 3.7.1.**

3.7.4 Demographic Structure

Details regarding the demographic structure of the region were collected from Primary Census Abstract of Kachchh district for the year 2011.

Demographic details such as number of persons per household, total area, population density, sex ratio, SC and ST population, and literacy rate and employment pattern are summarized. The salient observations are as follows:

3.7.4.1 Population Structure

As per 2011 Census, total population of the study area was 11956, out of which male population was 6001(50.19%) and female population was 5955(49.81%)

- Total number of households were 2504 with average occupancy of 4.77 persons per household
- Total geographical area of the study area was 182.7767 sq.km and its density was 65 person/per sq.km.
- Total child (below 6 years of age) population was 1715 (14.34%)
- Total SC population was 1586(13.27%), ST population was 609(5.09%) in the study area
- Sex ratio (number of females per 1000 males) of total population was 992.

Tehsil and village wise demographic details are given in **Table 3.7.1** and **Figure 3.7.2.**

3.7.4.2 Literacy Details

According to census 2011, in the study area,

- Overall literate population 7130(59.64%) and illiterate population was 4826(40.36%)
- Out of total literates, male literates were 4078(57.19%) and female literates were 3052(42.81%)
- Out of total illiterates, male illiterates were 1923(39.85%) and female illiterates were 2903(60.15%)

Tehsil and village wise literacy details are given in **Table 3.7.2** and **Figure 3.7.3.**

3.7.4.3 Employment Pattern

Economic resource base of any region mainly depends upon its economically active group i.e. the working population involved in productive work. Work may be defined as participation in any economically productive activity. Such participation may be physical or mental in nature. Work not only involves actual work but also effective supervision and direction of work. It also includes unpaid work on farm or in family enterprise.

There are different types of workers that may be classified as - those persons who had worked for at least six months or 183 days are treated to be Main Workers, on the other hand if person categorized as worker has participated in any economic or productive activity for less than six months or 183 days during the last one year is treated as Marginal Worker. Non–workers are those who have not worked any time at all in the year preceding the enumeration.

The workers coming under the main and marginal workers category are those involved in activities such as cultivation, agriculture, livestock, forestry, fishing, hunting, plantations, orchards and allied activities, mining and quarrying, manufacturing, processing, servicing and repairs in household industry, construction, trade and commerce, transport, storage and communication and other services.

- According to 2011 Census, total worker population in the study area was 5031(42.08%).
- Main workers were 4324(36.17%) and marginal workers were 707(5.91%). Total non-working population was 6925(57.92%**)**

Tehsil and village wise details of employment pattern are given in **Table 3.7.3** and **Figure 3.7.4.**

3.7.4.4 Main Workers Employment Pattern

Main workers are classified in four categories as cultivators, agricultural workers, household industry workers and other workers. As per 2011 Census, Out of total 4324 main workers in the study area, there were total 1036 cultivators (23.96%), 2148 agricultural workers (49.68%), 19 household industry workers (0.44%) and other workers 1121(25.92%). Mostly in main workers population other workers were highly found in study area. Tehsil and village wise details of main workers employment pattern, is given in **Table 3.7.4** and **Figure 3.7.5**

3.7.5 Infrastructure 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. The significant features of these important parameters for each study area are discussed as follows and summarized at **Table 3.7.5.**

- **Education:** As per 2011 village directory record, almost all villages having education facility in the form of primary schools, and middle school.
- **Medical/Primary Health Care**: Medical facilities in terms of community health workers are available in some of the villages. Only primary health sub centers are available in few villages. **Drinking Water:** The water supply in the region is through dug wells, hand pumps, taps and other allied sources. The quality of the drinking water is poor due to high TDS.
- **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. **Communication:** Communication facility is fairly good in this region. Near about 50% villages having telephone connectivity and having post office.
- **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.
- **Road Approach:** Roads are the basic means of communication for the development of any economy. All type of roads was present in the study area.
- **Bank Facilities:** Banking and credit society facility was not found in village. Self help group activities were performed by the women groups.

- **Power Supply:** Almost all villages are electrified in the region and electricity is available for both domestic and agriculture.

3.7.6 Land Use Pattern of the Study Area

3.7.6.1 Land use as per Census Records

As per 2011 Census records, land use pattern in different villages falling within 10 km radial distance from the project site has been classified under the following categories:

- Forest Area
- Area under Non-Agricultural Uses
- Barren & Un-cultivable Land Area
- Permanent Pastures and Other Grazing Land Area
- Land under Miscellaneous Tree Crops etc. Area
- Culturable Waste Land Area
- Fallows Land other than Current Fallows
- Current Fallows Area
- Net Area Sown

Village-wise details of land use are summarized in as this. Out of the total geographical area (18277.67 hector), Major part of the study area is dominated by forest area (4.69%) followed by 54.88% of total net sown land area. Total Area under non-agricultural uses area and total culturable waste land area is 0.46 % and 5.03% respectively. Barren and un-cultivable lands are confined to 26.95%. The study area is covered with 6.24% permanent pasture and other grazing land. No any land under miscellaneous tree crops etc. land area is found in study area. Fallows land other than current fallows area and current fallows area is 0.21% and 1.54% respectively. The percentage distribution of land under different categories is depicted in **Table 3.7.6** and **Figure 3.7.6.**

3.7.6.2 Main Commodities

Main commodities details have been taken from DCHB 2011 of Gujarat. Cotton is major crop in the study area **Table 3.7.7**

3.7.7 Health Status

Government health institution is connected with district level, rural hospital, Primary health center and sub center. A district hospital typically is the major health care facility in this region, with large numbers of beds for intensive care and long-term care; and specialized facilities for surgery, plastic surgery, childbirth, bioassay laboratories, and so forth make treatment facilities available to the public-at-large.

PHCs remain the first contact between village community and medical officer. Medical officer supported by 14 Paramedical and other staffs. It acts as a referral unit for 6-sub center. It has 4-6 beds for patient.

Sub-centers: The sub-center is the most peripheral health unit and first contact point between the primary health center system and the community. Each sub-center has one female health worker. One female assistant and male health assistant supervise six-sub center. During the field survey, villagers revealed that the general prevailing diseases are malaria, Skin diseases, gastroenteritis, inching, diarrhea, dysentery, viral fever, respiratory infection and jaundice etc. The health problem as reported could be attributed to improper sanitation and salty water in the survey villages. The diseases prevailing in the region has increased due to air pollution caused by the industries in the region, vehicular pollution due to heavy traffic creating unsanitary conditions. In the surveyed area sufficient health services are available in the area like Asha worker, nurses, community health worker, primary health center, primary sub center, government hospital and private clinics.

3.7.8 Methodology used for the Field Survey

In order to access and evaluate likely impacts arising out of any development projects on socio-economic environment, it is necessary to gauge the apprehensions of the people in the study areas.

3.7.8.1 Methodology Applied for Selection of Sample & Data Collection

The methodology which is applied for primary source of data collection i.e. gathering data through field survey for socio-economic environment.

Level of Consultation

Level	Type	Key participants
Individual	Household survey	People including those are impacted directly or indirectly
Settlement	FGD	Villagers and Village Leader etc.
Govt. office	Discussion	Gram Panchyat Sarpanch, Gram Panchyat Secretary,

3.7.8.2 Site Visit

The site visit was done by CSIR- National Environmental Engineering Research Institute (NEERI) experts for socio-economic studies between December 2019- February 2020 and systematic survey was conducted for socio- economic aspects. In study area, random sampling was conducted and 10 villages were selected for socio-economic survey. The list of the survey villages is given in **Table 3.7.8.**

3.7.8.3 Sampling Method

A judgmental and purposive sampling method was used for choosing respondents of various sections of the society i.e. Sarpanch, adult males and females, teachers, medical practitioners, businessmen, agriculture labourers, unemployed group etc. Judgmental and purposive sampling method includes the right cases from the total population that helps to fulfil the purpose of research needs.

3.7.8.4 Data Collection Method

For the process of data collection through primary source farming methods are used:

3.7.9 Field Survey and Observations

Field survey and observations is made at each sampling village and the socio-economic status of that region is studied.

3.7.9.1 Interview Method

Structured interview method is used to collect data regarding the awareness and opinion from the samples selected of the various socio- economic sections of the community. Structured interviews involve the use of a set of predetermined questions that includes fixed and alternative questions. The questionnaire mainly highlights the parameters such as income, employment and working conditions, housing, food, water supply, sanitation, health, energy, transportation and communication, education, environment and pollution to assess the standard of living of that particular region and general awareness, opinion and expectation of the respondents about the proposed project. Interview method helps to collect more correct and accurate information as the interviewer is present during the field survey.

Socio-economic survey was conducted in the villages within the study areas located in all directions with reference to the project site.

The respondents were asked for their awareness / opinion about the plant and also of their opinion about the positive and negative impacts of the plant activities viz. job opportunities, education, health care, housing, transportation facility and economic status etc.

Public consultation meeting was organized at 10 villages. The number of participants in consultation was 200-250 including all categories.

3.7.9.2 Data Collection and Quality Assurance

The latest available data have been complied to generate the existing socio-economic scenario of the study area. Information on socio-economic profile was collected from the Primary Census Abstract CD 2011, including the population details of the region and Village Directory CD 2011, having the details of basic

amenities available in the region. In the 10 km radial study area 10 villages are falling from the study area.

3.7.9.3 Salient Observation of the Survey/ Study Area

- House pattern: Quality of houses is in well condition and mostly people have permanent cemented (pucca) constructed houses few villagers are having kaccha houses
- Employment: Most of the population is depend on agriculture which is mainly depends on rain, the area receives erratic rainfall. Some population is engaged in business activities such as land dealer, fishing, shops etc. peoples having their own land engaged in farming in a rainy season. The district is mainly produced cotton, but because of insufficient irrigation facility farmers get only one season crop in one year. Fishing activities carried out by the number of fishermen and their percent population was about 18-29%. The labours were getting daily wage in the range of Rs. 200-250, depending on type of work involved.
- Fuel: Most of the villagers use fire woods and LPG for cooking purpose
- Language: The main language as mother tongue in the district is Katchchhi and Gujarati but Hindi, and English speaking population is increased also because of industrialization
- Migration: During survey it was found that local population were migrating for employment purpose.
- Sanitation: Sanitation facilities are in good condition, 90% villagers are using toilets, it shows that villagers are aware about sanitation, but some villages which are near by the industry, there population is increasing day by day because of migration of other states labor in the study area and they are living in any unsettled condition they couldn't get sufficient facility because of shortage of place for their daily needs and therefore creating unhygienic condition
- Drinking Water Facilities: Well and Tap water is a major source of drinking purpose. The main problem regarding to the drinking water is saltiness, scarcity in summer season.
- Education Facilities: Anganwadi Centers are available in most of the villages. The survey data indicated that most of the villages are having primary school facility while for further education people have to travel about 20 km. highest educational level in the study area is up to 10th class. The scope for higher and technical education is existing only at the district place and only few people are able to take benefits of these educational institutions
- Road Connectivity & Transportation Facility: Approach roads are mainly damber roads. Bus services and other private sources for transportation are available for villagers; Roads are well connected

with main district. Villagers who are deprived from transportation facility in their village, they have to walk down 1 to 3 km.

- Communication Facilities: Communication facility is good in the study area. Every villager is having mobile phone, television, newspaper facility. It indicates that the study area is well developed in communication.
- Medical Facilities: Most of the village residents have to travel an approximate distance of 5-10km to get medical facilities in tehsil place, as there is no such availability of PHC/CHC. During the site visit it was understood through public consultation with stakeholders that Anganwadi and ASHA workers are available in most of the villages of the study area. There are no chronic or epidemic diseases reported/or observed during the course of site visit of the study area except general cases of fever and cough.
- Electricity: Electricity is available in almost all the villages, however most of the villages are having only for domestic and other purposes.
- Market Facility: Study area was predominantly semi urban type. In villages, small shops were available for daily needs. Weekly market facility was available in some villages. Wholesale markets were available at town place.

3.7.9.4 Consultation with Women

- CSIR-NEERI officials have also consulted with women groups and asked them about their education, employment opportunity, health and position in the society. In addition to their household works, their secondary involvement is limited to agricultural works which is seasonal in nature. They are comparatively less educated with respect to male and have limited opportunity of employment but they are aware about their rights.

3.7.9.5 Consultation with Youth of the Study Area

- A consultation was conducted with youths to record their perception and the opinion about the project. NEERI team has discussed the developmental issues and employment opportunity in the region. They are very hopeful with the proposed project and its positive impacts in future. It is observed that youth in the study area are much conscious with their education, career and also seeking employment opportunities in proposed project and metropolitan cities like Mumbai and abroad.

3.7.9.6 Consultation with Fisherman Community

About 30% of the population in Bada and Bambhadai villages belongs to Fisherman Community (Census Record, Bhuj Sub District 2011). The main source of livelihood of the community is fishing and fishing allied activities. The area has limited

fishing potential due to uneven bottom topography and fishing by trawler is not done. During the course of interaction with the community it has been observed that they are seeking for the health and hygiene facilities as a basic need of daily living. The unavailability of drinking water is the main concern of people interacted during group discussion. There is limited source of water available within the village and the quality of drinking water is not good for their health also.

They are deprived of many Government support schemes like the Sagar Khedut Yojana, which is operative in other talukas of Kachchh District.

Details of interaction with different groups with village speciality and major problems of the villagers are discussed at **Table 3.7.9** Public consultation photographs at **Fig. 3.7.7 to 3.7.12.**

3.7.9.7 Awareness and Opinion of People about the Project

During the visit to villages, some persons from general population, farmers and Gram Panchayat officials were contacted informally to find out their awareness about the soda ash project and attitude towards the project. People in the study area are aware of the coming up of soda ash project but not known about the magnitude of the project. Hence, they are not able to fully assess the possible positive and negative impacts. The similar perception was found from Gram Panchayat official who were aware of the project but not about the likely impact on the local people, cattle and agriculture.

Kuchchhis are known to be progressive. They are hardworking, business minded and believe in self-employment. Generally, all the people contacted welcomed the soda ash project though some of them feared some harm to plantations, land and agriculture due to ash pollution during captive power generation. They are therefore happy about the upcoming soda ash plant, as it will fetch yet more money for the land owned by them, which they can use for some investment and alternative livelihood.

An attempt was made to know the awareness and opinion of the people about the project.

- Some respondents were happy to know about the proposed project and they opined positively because any industrial development activity would definitely contribute to development towards improvement in the local as well as regional economy and creation of job opportunities. Some respondent asked for better health services and better transportation facilities.
- Respondents suggested for local technically qualified persons for job in the plant based on their qualifications and preference should be given to those who lost land and other resources during upcoming of the industry.
- During the survey villagers requested us to recommend prohibitory rules for illegal activities and strict action should be taken for industries.

- Drinking water should be provided by the plant to nearby villages.
- Interaction with respective village Sarpanch/Society Heads/villagers was done to understand the socio-economic issues of the region and their needs.

3.7.10 Conclusion

On the basis of interpretation made above, primary survey (interaction with stakeholders, FGD, community consultation and discussion with influential person of the study area) and secondary sources, the major outcomes specify the following observations and gap in the study area Sanitation and Drainage system is very poor of the study area. Approx.80.05% no drainage system in the study area. Drinking water and employment is major problem seen in the study area.

Livelihood of the most of the people of the study area depends on jobs, fishing, fishing allied, Agriculture, and cattle rearing. Tap water and wells are the source of drinking water in the study area. There are no any chronic or epidemic disease has been reported in the study area except general cases of cough and fever.

The main problem of study area is having higher TDS and saline soil and high chloride water and poor rainfall in past years which impacts the agricultural activities and livelihood dependent on it. In this way, industrial activities provide livelihood and improves the quality of life in the vicinity of the project. For earning daily some people / labour have to go to Mundra daily as they are no such oppurtunities nearby due to lack of industrial activities. The proposed soda ash project in vicinity these people expect better livelihood option and also save money spent for transportation.

Mix opinion about proposed of new plant. People want employment for local people in industry. Benefits from CSR activities for the development to villages both social and economic point of view through the industry-support is desirable. According to villagers, industry will take a proper action to address air, water, noise and land pollution.

Table 3.7.9 Details of Interaction with Different Groups in the Study Area

Sr. No.	Name of Village	Gram Panchayat & Under Villages	Tehsil & District	Brief Information of Village	Major Issues
1)	Bada	Bada	Mandvi, District-Kachchh, Gujarat	Major Drinking water source of well and tap water, Sub post office and ration shop available in the village, PHSC also available, Cotton and Till is major crops. Masjid and Shiv temple is ancient.	Water, Health problems and Employment etc.
2)	Bhinsara	Bhinsara	Mandvi, District-Kachchh, Gujarat	Village dominant caste is Gadvi(OBC) , major occupation of the village of agriculture and Labour work. Major Drinking water source of well and tap water, Sub post office and ration shop available in the village, SPO also available, Cotton, Groundnut and Till is major crops	Drinking water, Healthcare facilities and employment etc.
3)	Panchatiya	Panchatiya	Mandvi, District-Kachchh, Gujarat	Village dominant caste is Gadvi(OBC) , major occupation of the village of agriculture and Labour work. Major Drinking water source of well and tap water, Sub post office and ration shop available in the village, Cotton, Groundnut and Till is major crops	Water, Health problems and Employment etc.
4)	Layja Mota	Layja Mota	Mandvi, District-Kachchh, Gujarat	Village dominant caste is Gadvi(OBC) and Muslim, major occupation of the village of agriculture and Labour work. Major Drinking water source of well and tube well, ration shop available in the village, SPO and PHSC also available, Cotton is major crops	Drinking water, Employment, etc.
5)	Layja Nana	Layja Nana	Mandvi, District-Kachchh, Gujarat	Village dominant caste is Gadvi(OBC), major occupation of the village of agriculture and Labour work. Major Drinking water source of well and tube well, ration shop available in the village, SPO also available, Cotton is major crops	Transportation, School, Drinking water, Employment, Health Care Facilities, Communication Facilities etc.

Sr. No.	Name of Village	Gram Panchayat & Under Villages	Tehsil & District	Brief Information of Village	Major Issues
^6)	Bhada	Bhada	Mandvi, District-Kachchh, Gujarat	Village dominant caste is Gadvi(OBC), major occupation of the village of agriculture and Labour work. Major Drinking water source of borewell and well, ration shop available in the village, SPO also available, Cotton is major crops	Water, Cattelyard, Employment and Transportation facilities etc.
7)	Bayath	Bayath	Mandvi, District-Kachchh, Gujarat	Village dominant caste is Gadvi(OBC), major occupation of the village of agriculture and Labour work. Major Drinking water source of borewell and well, ration shop available in the village, SPO also available, Cotton is major crops	College problem, Educational facilities problem, Power Supply, Communication facilities, Employment, Sanitation and Drinking water etc.
8)	Mapar	Mapar	Mandvi, District-Kachchh, Gujarat	Village dominant caste is SC, major occupation of the village of agriculture and Labour work. Major Drinking water source of tap water, only SPO also available, Cotton is major crops, Motiyabad temple is famous here which was Lord Krishna	Educational facilities(Teacher) problem, Communication facilities, Employment and Drinking water etc.
9)	Bambhadai	Bambhadai	Mandvi, District-Kachchh, Gujarat	Village dominant caste is Koli, major occupation of the village of fishing and Labour work. Major Drinking water source of tap water, only SPO also available,	Transportation, Drinking Water, Health, and Employment etc.
10)	Padamapar	Padamapar	Mandvi, District-Kachchh, Gujarat	Village dominant caste is SC, major occupation of the village of agriculture and Labour work. Major Drinking water source of tap water, ration shop and bank also available, Cotton is major crops,	Wildlife, Drinking Water, Health, and Employment etc.



Fig. 3.7.1. Socio-economic Survey Locations in the Study Area

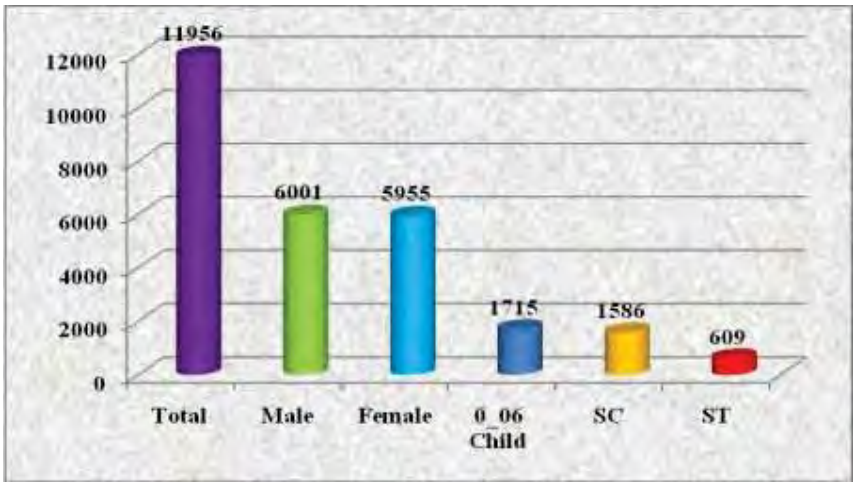


Fig. 3.7.2. Population Details



Fig. 3.7.7: Focus Group Discussion with Villagers



Fig. 3.7.8. Interaction with Village Sarpanch/Leader



Fig. 3.7.9. Temples in Study Area



Fig. 3.7.10. Mobile Clinic & Sanitation Facilities in the Study Area



Fig. 3.7.11. Roads & Housing Pattern of the Study Area



Fig. 3.7.12. Drinking Water Facilities in the Study Area

Chapter 4
Anticipated Impacts & Mitigation Measures

4.1 Prediction of Impacts

The impact of project activities on valued environmental components (VECs) needs to be assessed. The value may be considered in terms of environmental, economic, social, aesthetic or ethical reasons or values. The indirect and/or cumulative effects can be considered with indirect, additive or even synergistic effects due to other projects or activities or induced developments on the environmental components in the study area. In fact, the proposed project site is located in no industrial zone/area. The appropriate VECs were identified and appropriate indicators were selected for impact assessments on the respective VECs.

There are various factors, which influence the approach adopted for the assessment of direct, indirect and cumulative impacts for the project. Three methods were followed in this study, based on the practicality and suitability for the project, given the data, time and available financial resources. The advantages and disadvantages of these methods are given in **Table 4.1**. Key points to consider, when choosing the method(s) include (i) nature of the impact(s) (ii) availability and quality of data and (iii) availability of resources (time, finance and staff). The methods chosen for the study are matrix method, GIS and expert system and these methods facilitate in presenting the results in a way that can be easily understood by the project proponent, regulators and the people living nearby the project. The impact matrix for the proposed project was developed based on the project and site-specific criteria given in **Table 4.2**. This matrix facilitates the stakeholders in identifying a set of components and phase-specific project activities for the determination of likely impacts.

The scientific and technical credibility of an EIA relies on the use of appropriate models and experience in the estimation of the nature, extent, and magnitude of change (both positive and negative) in VECs that may result during project construction and operation. Information about predicted changes is needed for assigning impact significance, prescribing mitigation measures, designing & developing EMPs and monitoring programs. The more accurate the predictions can be expected from the experienced consultant to quantify the impact and then proposed suitable project and site-specific measures to eliminate or minimize the adverse impacts of the proposed project. Choice of models/methods for impact predictions in respect of air, noise, water, land, biological and socio-economic environment are of immense importance in the EIA reports.

Evaluating the significance of environmental effects is perhaps the most critical component of impact analysis. The interpretation of significance is also a contentious process. The interpretation of significance bears directly on the subsequent EIA process and also during prior environmental clearance on project approvals and condition setting. At an early stage, it also enters into screening and scoping decisions on what level of assessment is required and which impacts and issues will be addressed.

Impact significance is also a key to choosing among alternatives. In total, the attribution of significance continues throughout the EIA process, from scoping to EIS review, in a gradually narrowing "cone of resolution" in which, one stage sets up the next. But at this stage it is the most important as better understanding and quantification of impact significance is required.

An important approach to determine the significance of predicted changes in the baseline environmental quality and compares these changes with reference to regulatory guidelines and 'thresholds' as eco-sensitivity and cultural /religious values. But at this stage, the practice of formally evaluating significance of residual impacts, i.e., after predicting the nature and magnitude of impacts based on before-versus-after-project comparisons, and identifying measures to mitigate these effects is not being followed in a systematic way by adapting compliance monitoring based evaluation.

Overall, the prediction of impacts is the most important activity in environmental impact assessment process. Several mathematical/statistical techniques and methodologies are available for predicting the impacts due to developmental activities on physico-ecological and socio-economic environment. The results obtained from predictions are superimposed over the baseline (pre-project) status of environmental quality to derive the ultimate scenario of environmental conditions. The quantitative prediction of impacts is also essential to delineate pragmatic environmental management plan (pollution control measures) for implementation during and after the commissioning of proposed activities for minimizing the adverse impacts on environmental quality.

Table 4.1.4: Maximum GLCs (µg/m^3) due to Proposed GHCL Units Coordinates of Incremental GLC to be mentioned

Pollutant	Max Incremental GLC Predicted (A)	Max GLC Ambient (B)	Resultant Max GLC Cumulative (C = A+B)	Distance & Direction w.r.t Plant	NAAQS
Scenario I: CPP Emissions calculated with Lignite Characteristics					
SO_2	10.98	9 - 14	19.98 - 24.98	0.95 km SE	80
NO_x	11.4	9 - 16	20.4 - 27.4	0.95 km SE	80
PM_{10}	3.1	30 - 53	33.1 - 56.1	0.85 km SE	100
NH_3	3.7	13 - 19	16.7 - 22.7	0.80 km SE	400
Scenario II: CPP Emissions calculated with Coal Characteristics					
SO_2	2.6	9 - 14	11.6 - 16.6	0.95 km SE	80
NO_x	7.3	9 - 16	16.3 - 23.3	0.95 km SE	80
PM_{10}	3.1	30 - 53	33.1 - 56.1	0.85 km SE	100
NH_3	3.7	13 - 19	16.7 - 22.7	0.80 km SE	400
Scenario III: CPP Emissions calculated with Petcoke Characteristics					
SO_2	13.3	9 - 14	22.3 - 27.3	0.95 km SE	80
NO_x	5.6	9 - 16	14.6 - 21.6	0.95 km SE	80
PM_{10}	3.1	30 - 53	33.1 - 56.1	0.85 km SE	100
NH_3	3.7	13 - 19	16.7 - 22.7	0.80 km SE	400

4.1.5 Mitigation Measures for Impact on Air Quality

Construction Phase:

- Controlling dust emissions include water spraying in the construction site, use of proper transport methods like closed transport of excavated material and screens around the construction site
- Periodic checking of vehicles and construction machinery to ensure compliance to emission standards
- Ensuring periodical washing of construction equipment and transport vehicles to prevent accumulated dust
- Nose masks or earmuff should be provided to construction workers, while carrying out operations that may entail potential for dust inhalation
- No on-site burning of any waste arising from any construction activities
- Maintaining engines and exhaust systems of all vehicle and equipment in accordance with manufacturers guidance so that exhaust emissions do not reach statutory limits (set for that vehicle / equipment type and mode of operation by CPCB)
- Allowing vehicles with pollution check certificates

Operation Phase

- Lime stone injection for reducing the SO_2 emissions
- Adequate stack height of 68 m for lime kilns and 130 m for captive power plant are proposed to maintain SO_2 emissions below standards
- Suitable technique for desulphurization of stack emissions
- Online stack monitoring should be carried out regularly
- Air quality surveillance program should be under taken regularly as per the GPCB/CPCB norms and regular monitoring of air polluting concentrations through continuous ambient air quality stations (CAAQMS) at specified locations along the plant boundary.
- Ensure that vehicles should be covered during transportation
- Attenuation of pollution/protection of receptor through green belts/green cover development
- Greenbelt should be maintained as per the norms by periodically planting local species to mitigate impacts from fugitive emissions
- Fly ash generated will be supplied to identified cement industries as per the Fly ash utilization plan

4.2 Noise Pollution: Sources, Predictions and Mitigation

4.2.1 Construction Phase

Noise generating sources during construction phase will be construction equipment, dozer, scrapers, concrete mixers, DG sets, pumps and land piling for foundation and fabrication activities. The noise generation and its impacts may be mostly temporary in nature. The nearby villages are at a distance of 1.0 km away from the project site which will have minimum noise impact on the nearby population in the project area.

Mitigation Measures:

- Proper maintenance of construction equipment/machinery for controlling excessive noise levels.
- Use of silencers/mufflers for high noise generating equipment.
- All the workers engaged at and around high noise generating sources shall be provided with ear protection devices like ear mufflers/plugs. Their place of attending the work will be changed regularly so as to reduce their exposure duration to high levels.

- Most of construction work shall be undertaken through contract work, and therefore, project authorities should put clauses in the contractual agreement and ensure their implementation during construction work.

4.2.2 Operational Phase

The in-plant workers, particularly working near higher noise sources, may be exposed to higher level up to 75 dB (A) for longer durations. These exposures are well below the exposure limits of occupational safety and health administration, (OSHA) i.e., 90 dB (A) for 8 hour per shift for 6 working days. However, provision of ear plugs or ear muffs shall be made for in-plant workers working at such locations in order to avoid exposure to high levels whenever they come near the high noise generating sources. The work area is defined as any position not less than 1 m from equipment surfaces accessible to personnel, or any position where a worker's ear may be exposed in the normal course of duty.

The steam generator and auxiliaries will perform continuously within noise limits as per relevant standard specification but not more than 85 dB (A) at 1 m from any equipment or sub-equipment. The machines and equipment shall have noise arresting system/ low noise levels to limit noise level. Furthermore, all noise generating equipment shall be housed within acoustic enclosures (where ever possible), to ensure attenuation of noise. The employees shall be trained on the mitigation measures and personal protection measures to prevent noise related health impacts.

Restricted areas will be those locations where it is not reasonably practicable to reduce the noise level below the work area limit; where practicable, attempts shall be made to reduce the noise level below 80 dB(A).

The noise impact due to transportation will occur during the construction phase when around 100 trucks operated daily for transporting construction materials to the project site. The equivalent noise level due to traffic is predicted using Federal Highway Administration (FHWA) noise model and results conclude that the maximum contribution at 10 m and 20 m from the center of the road will be 70 dB(A) and 66 dB(A) respectively. Considering the background noise levels of 60 dB(A) and 45 dB(A) at 10 m and 20 m respectively, the incremental increase in noise level will be only 1.5 dB(A)-2dB(A). There will be an increase in noise levels in residential areas situated close to the road due to movement of trucks. However, the impact of truck movements on noise level in residential areas situated at 50 meter and beyond from the road will be insignificant considering the excess attenuation and will be below the stipulated standard of CPCB, i.e., 55 dB(A) during day time.

In case of noise levels exceed 80 dB(A) a hearing conservation program is essentially required for implementation. The equipment will be chosen in such a way that the above noise limit is not exceeded.

Mitigation Measures: Some of the important mitigation measures to be followed are given below to control noise pollution:

- Restricting the movement of vehicles and noise prone activities during night as night-time noise levels will be more sensitive.

- Ambient noise levels should be regularly monitored at critical locations such as construction sites before start of work so that increased ambient load can be estimated.

- Employees/workers will be regularly subjected to medical check-up for detecting any adverse impact on their TLV of hearing.

- The proposed green belt will also help to prevent noise generated within the plant from spreading beyond the plant boundary.

4.2.3 Traffic Study

The proposed project site is 6.8 km away from the NH41 as shown in the **Figure 4.2.1**. The approach road of width about 4 m connects Bada - Bishra – Mota Layja road at Mota Layja Chowkdi on NH-41. The project site is situated near Bada village. Another approach is from the NH to the site via Pass through Bada village and connects NH41 at near Bayat. This road is constructed up to the Bada village.

The traffic study was carried out at NH41 and the approach road to GHCL proposed site. Images of study are provided in **Figure 4.2.2.** Hourly traffic at NH41 is given in **Table 4.2.1** and **Table 4.2.2**. In order to find the traffic, the data was converted to passenger car unit (PCU). For this purpose, PCU factors recommended by IRC 64: 1990 were used. Hourly variation of calculated PCU at NH41 is shown in **Figure 4.2.3**. The hourly variation of the motorized vehicles passing through the NH41 from Mandvi and towards the Mandvi with reference to Narayan Sarovar has been studied at 2 locations. This study was carried out in an interval of 1 h each starting from 6 am to next day 6 am. It was found that the flow of vehicles from Narayan Sarovar, towards the Mandvi was higher with an average hourly variation PCU of 312 (**Figure 4.2.4**). The count of two-wheeler, car, heavy-truck was very much higher comparing to other vehicles during forenoon hours. From Mandvi to Narayan Sarovar, the peak time of two-wheeler was during the time period of 10-11am of count 123 and the peak time of car was during the time period of 5-6 pm was 38. Heavy truck was maximum during 12 am-1 am, 71 was the count. City bus was highest in 9-10 am, which counts to 5 and the mini buses were maximum during 9am-10am, having a count of 6. Medium truck was having a peak time of 12-1am, which having a count of 33, while small truck was maximum during 9 am -10am and 5pm-6pm, with a count of 21. About 20 vans were operated during 10 am -11 am. Auto rickshaw has a peak time 9-10 am with the count of 32. This data collected was given in **Table 4.2.1**.

Similarly, from Narayan Sarovar to Mandvi, the peak time for majority of the vehicles was in afternoon, two-wheeler was maximum during 6-7pm which has a count of 98. Car running on the road was highest during 10-11am and 6-7 pm, with a count of 38. Heavy truck was maximum during 12-1am, with a count of 86. City bus was operated maximum during 4-5pm, with a count of 16, where mini buses were high during 7-8pm, having a count of 7. Medium truck was at its peak during 7-8am, with a count of 14, while small truck used to run highest between 9 am and 10 am, having a count of 38 vans each was there during 4-5pm, Auto-rickshaw was in its maximum during 10-11am, with a count of 24. The data was given in **Table 4.2.2**.

The count of the vehicles from NH to the proposed site of GHCL and back was lesser and the PCU values for GHCL approach road was found as 7.625 (from NH to GHCL) and 9.069 (from GHCL to NH). The PCU values for different values are given in **Table 4.2.3**. This indicates that the vehicles used to carry raw materials and products from the project will have impact on the public transport. There is a need to either widening the roads or dedicated roads may be planned to avoid interference to the public transport.

Impact due to Traffic

There will be increase in traffic density on NH-41 for carrying raw materials and product of the proposed soda ash project, it is expected to be about 600 trucks (maximum number of 900 trucks). The proposed increase in traffic density will cause moderate impact. The existing road network is adequate for accommodating additional traffic. Due to lack of industrial infrastructure the contribution from industrial traffic is very minimal.

Strict vigilance/ instructions will be given to truck operators to properly cover with tarpaulin and no overloading will be allowed to avoid spillage of loose material on roads. Regular maintenance and washing of vehicles will be done and the emissions from the vehicles will be kept as per norms by conducting regular PUC checks.



Figure 4.2.1: The approach Road to Proposed Site from the NH 41



Figure 4.2.2: Collection of Primary Data related to Traffic Study

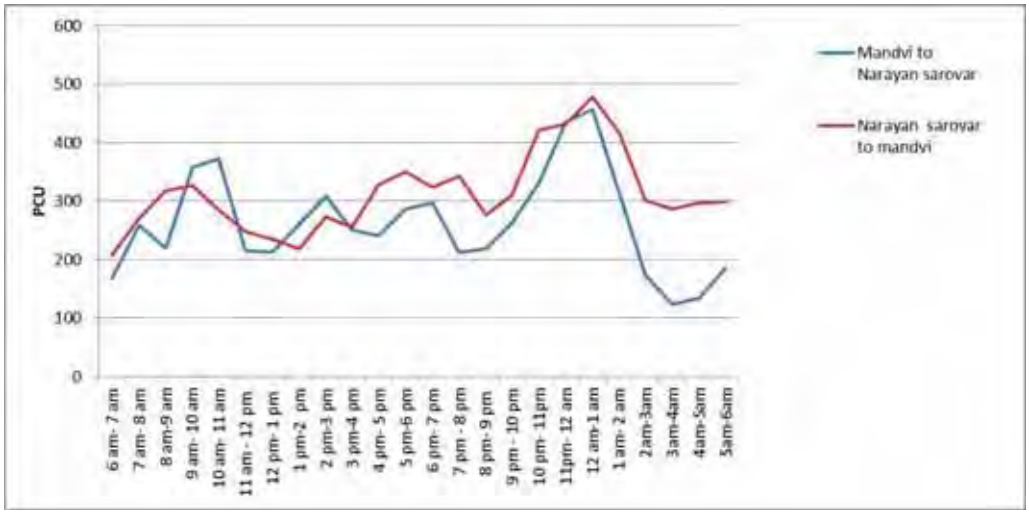


Figure 4.2.3: Hourly variation of motorized vehicles at NH-41

Table 4.3: PCU Factors Recommended by IRC 64: 1990

Sr. No	Vehicle Type	Equivalency Factor
Fast Vehicles		
1	Motor cycle or Scooter	0.50
2	Passenger car, pick-up van, auto-rickshaw	1.00
3	Agricultural tractor, light commercial vehicle	1.50
4	Truck or bus	3.00
5	Truck-trailer, agricultural tractor trailer	4.50
Slow vehicles		
1	Cycle	0.50
2	Cycle-rickshaw	2.00
3	Hand cart	3.00
4	Horse-drawn vehicle	4.00
5	Bullock cart	6.00-8.00

4.3 Water Requirement and Wastewater Generation

4.3.1 Water Requirement

The water requirement for the proposed project will be met from seawater. Also, groundwater resources will be planned with the approval of concerned authorities. The Arabian Sea is located nearby (within 1.0 km) from the proposed project site. An estimated seawater intake will be approx. 16 lakh m^3/day for the entire project. The seawater intake point has been recommended by CSIR-NIO EIA report based on the numerical modeling studies and this seawater will be utilized for the following purposes:

Soda ash plant: process, cooling, desalination (RO/DM) and domestic and other activities

Power plant: Cooling and desalination (RO/DM)

Miscellaneous and domestic use

Seawater for dilution of process effluent

The break-up of water requirement is given in **Table 4.3.1**.

Table 4.3.1: Water Requirement Details

Sr. No.	Use	Approx. Water Quantity in m³/d		Source
		Dry Lime	Wet Lime	
1.	Domestic	200	200	Desalinated Seawater (Seawater feed @ 660 m³/day)
2.	Industrial - Process water in Soda Ash Plant and Captive Power Plant	34,000	42,000	RO/DM Plant (Seawater feed for RO/DM plant will be @1,12,290 m³/d for dry lime and 1,38,700 m³/day for wet lime)
3.	a.) Seawater for once through Cooling in Soda Ash Plant, CPP etc., b.) fresh seawater for dilution	8,07,000 6,78,860	8,07,000 5,14,678	Source Seawater

4.3.2 Wastewater Generation and Disposal

The sources of liquid effluents from the soda ash process includes - wastewater from distillation, brine purification and cooling waters from lime kiln gas washers, adsorption, distillation towers and calcination.

The typical effluents from distillation primarily contain chlorides, calcium, sodium and sulfates. The suspended solid (SS) is an important parameter of distillation water; however, SS is classified as non-hazardous. The size distribution of SS particle is typically characterized by an average particle size between 5 and 10 µm, 85% of particles are smaller than 50 µm and 100% smaller than 1.25 mm. Traces of heavy metals originating natural from raw materials are related to limestone, coke and slat composition. Given the alkaline nature of wastewater, metals are insoluble and are included as part of SS.

Wastewater from brine purification is basically brine with suspended precipitated $CaCO_3$ and $Mg(OH)_2$ in variable proportions according to the nature of salt deposits. These solids can be treated separately or can be deposited together with liquid effluent from the distillation unit for solid removal and treatment.

The treated/diluted effluents will be disposed-off into the Arabian Sea at a designated point, as per the dispersion modelling studies, through a submerged pipeline. Effluent disposal location has been recommended by CSIR NIO EIA report, based on dispersion modelling studies. A diffuser system for proper dispersion will be installed in the Arabian Sea in compliance with the State Pollution Control Board and CRZ Notification 2011 and its recent amendment (2018) by ensuring the required minimum depth and the exit velocity of treated effluents. A detail report of CRZ and mapping is submitting as separate report along with the EIA report.

Domestic wastewater treatment requires sewage treatment plant (STP) and it would be possible to use the treated water for plantation/greenbelt development around the plant premises, if the quality meets the regulatory standard of the purpose. The sewage treatment, in general, includes bar screen chamber, oil and grease trap and treated sewage receiving sump. The ration of BOD/COD will be

monitored for evaluation of performance of STP. The biological sludge generated can be used for suitable disposal after testing sludge samples for solid waste parameters.

Overall, the sources of wastewater from the project activity are broadly classified into the following types:

- Soda ash plant: Process diluted distiller waste effluent, brine preparation/purification reject, once through return cooling water, floor washing
- Power plant: once through return cooling water, boiler blow-down
- RO/DM Plant rejects
- Sewage from domestic sources

The characteristic of combined effluents (except sewage) from the plants will be diluted with once-through return cooling water / fresh seawater to maintain suspended solids, pH of the wastewater. The major required effluent disposal facilities besides pumping system and pipeline are collection sump, Acid/Alkali dosing for pH correction, if required. The total effluent for discharge through at suitable disposal location recommended by CSIR NIO-Mumbai is 15,80,000 m3/day. The expected effluent characteristics are given below **Table 4.3.2**.

Table 4.3.2: Soda Ash Effluent Characteristics

Parameters	**Before Treatment**	**Will be achieved after treatment** (MoEF&CC Effluent Standards issued for Soda Ash Industry effluent disposal in marine coalstal zone vide its notification dated 01.06.2011
pH	11.0-12.0	6.5- 9.0
Temperature, °C	95-105	Not to exceed 5°C above the ambient temperature of the receiving water body
Suspended Solids (mg/l)	40000-90000	<1000
Oil & Grease (mg/l)	5.0 max	< 5.0
Ammonical Nitrogen as N (mg/l)	< 50.0	< 50.0

The soda ash effluent streams, brine preparation/purification rejects, boiler blow-down from captive power plant and RO/DM plant rejects will be mixed with once through return cooling seawater/fresh seawater to meet the criteria laid down by GPCB/CPCB/MoEF&CC for releasing the treated effluent in the sea. The effluent will be transported within the plant premises and thereafter in closed above/ underground pipelines up to Land Fall Point (LFP). From there through submarine pipeline it will be released at a designated point having diffuser system in the sea to achieve further dispersion/dilution in conformity to the CRZ Notification by ensuring the requirements of minimum depth and the exit velocity. Online pH and temperature monitoring system will be provided to maintain the records. The details of effluent disposal are given in **Table 4.3.3**.

Table 4.3.3: Effluent Generation and Disposal

Sr.No.	Use	Effluent Generation Quantity- KL/Day		Mode of Utilization/ Disposal
		Dry Lime	Wet Lime	
1.	Domestic	160	160	Domestic wastewater will be treated with septic tank and soak pit system. In case of STP treatment, treated water will be reused for Greenbelt development.
2.	Industrial			
a	Processing	21000	27000	The Process effluent generated i.e. from distiller waste, brine purification reject, RO/DM rejects will be disposed off along with once through return cooling water/fresh seawater into Arabian Sea as per recommendation of NIO. The characteristics of the discharge water are within the norms prescribed by CPCB.
b	Brine preparation reject	2550	2550	
c	RO/DM Reject	78890	97310	
d	Seawater once through return system, fresh seawater for dilution	14,85,860	13,21,678	
e	Boiler(Blow down)	110	120	

For necessary dilution to meet the GPCB/CPCB norms, additional fresh sea water will be added in the discharge streams. Storm water shall be collected through a dedicated storm water drainage network.

Effluent treatment and disposal

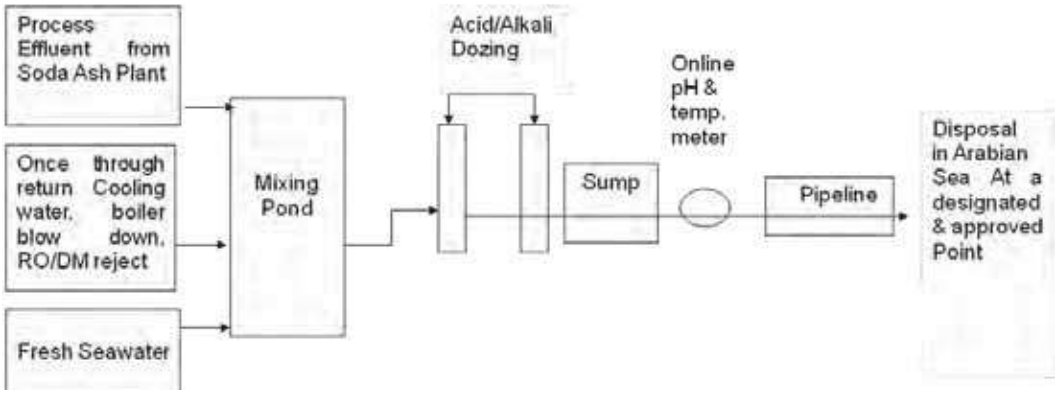


Table 4.6.2: Mitigation Measures Proposed for the Project Impacts on Socio-Economic Aspects

Impact	Mitigation Measures
Employment	❖ Preference should be given to local population ❖ Identify skill gap and provide training to local youths ❖ Provide vocational training to local youths
Health	❖ Health services through mobile dispensary in surrounding wards/villages in the study area ❖ Timely valued different awareness programme (sanitation and health) must be arranged by the project proponent based on the common health problems caused in the region that may help to reduce the lower status of the study area
Pollution	❖ Adequate air pollution, water and noise control measures will be undertaken during operation phase ❖ The environmental management and emergency preparedness plans are proposed to ensure that the probability of undesired events and consequences are greatly reduced, and adequate mitigation is provided in case of an emergency.
Transportation	❖ Appointment of trained drivers, decide speed limit ❖ Proper sign, barriers near to project site ❖ Permanent road maintenance, try to avoid internal village roads
Agriculture/Livestock	❖ Try to minimize air pollution ❖ Construction of temporary boundary wall to restrict local villagers and livestock entry

4.6.1 Socio-economic Impact Matrix

The assessment of the impact of the general activities on the below parameters of socio-economic indices can be done by establishing a prediction of likely impacts matrix. Predication impacts, on socio-economic environment presented in **Table 4.6.3**.

Chapter 5
Analysis of Alternatives

M/s GHCL Limited, Ahmedabad is proposing to set-up a greenfield chemical complex with 120 MW Captive Power plant (CPP), RO-DM Plant , seawater intake and effluent disposal system and associated infrastructure near village Bada, Taluka – Mandvi, District Kutch in the state of Gujarat. With this respect, the GHCL Limited is seeking environmental clearance (EC) from the State/Central environmental ministries.

Consideration of alternatives to a project proposal is a requirement of the EIA process. During the scoping, alternatives to a proposal in terms of project site and technologies can be considered or refined, either directly or by reference to the key issues identified. A comparison of alternatives helps to determine the best options to achieve the project development minimum environmental impacts and sustainability of the project. This exercise will able to identify the most environmentally friendly and cost-effective option from the available options. The alternatives analysis is one of the pre-requisite for EIA reports. In this project the following alternatives were examined and reported the best option based on the environment friendly process, ecologically suitable site and process technology which use low energy, low emissions and cost-effective.

- Alternative project site analysis (e.g. advantage of proposed site, details of any other sites, if explored)
- Technology alternatives (e.g. feasibility of different technologies available and advantage of proposed technology)
- Requirement of raw materials and inputs

After analysis of the various options, the project site was selected based on the least environmental impact envisaged during project construction and operation and the process technology was chosen based on the least energy demand, low consumption of raw materials, efficient process and technical feasibility of the process. In this Chapter, various scenarios is examined and alternatives, if any, are discussed.

5.1 No Project Scenario

With no project scenario, dependence of the country on import of soda ash and allied products worsen foreign exchange and many detergents and glass industry sector in India demanding the soda-ash based products. In recent reports from Government of India indicated the need of high soda ash and allied products. It is welcoming decision of the project proponent, GHCL Ltd., to come forward to establish Soda ash chemical complex in Bada village, Mandvi Taluka, Kutch district of Gujarat. The project is essentially needed to meet the increasing demand on soda ash products to reduce stress in the Indian context.

5.2 Alternative Location for the Project

M/s GHCL proposes of setting-up Chemical Complex mainly consists of soda ash and sodium bicarbonate plants with captive cogeneration power plant and other related utilities near Village Bada, Taluka - Mandvi, District -Kutch in Gujarat State (**Fig.5.1**). The approx. geographical locations with four corners of the plant site are as follows:

(A) 22°53’53.19”N & 69°09’26.63”E

(B) 22°53’41.63”N & 69°09’58.16”E

(C) 22°52'29.66"N & 69°8'16.32"E

(D) 22°52’57.10”N & 69°07’33.09”E

The Ministry of Environment formulated guidelines for siting industries; and three important criterions applicable to the proposed chemical complex project. They are:

(i) There are no metropolitan cities nearby the new proposed plant site

(ii) Availability of raw materials and transport systems are very favourable

(iii) Environmentally sensitive areas/zones such as mangroves, protected wildlife is not in the plant site and

(iv) Plant site will need EC from regulatory agencies before establishment of industry.

During the site selection, the alternative sites considered for setting-up of the proposed chemical complex project are given below and the locations were depicted in **Figure 5.2**:

- Site 1 – Village Pingleswar, Taluka – Abdasa, Dist. Kutch
- Site 2 – Village Suthri, Taluka – Abdasa, Dist. Kutch
- Site 3 – Village Bambhdai, Taluka – Mandvi, Dist. Kutch
- Site 4 – Village Bada, Taluka – Mandvi, Dist. Kutch
- Site 5 – Village Modhva, Taluka Mandvi, Dist. Kutch

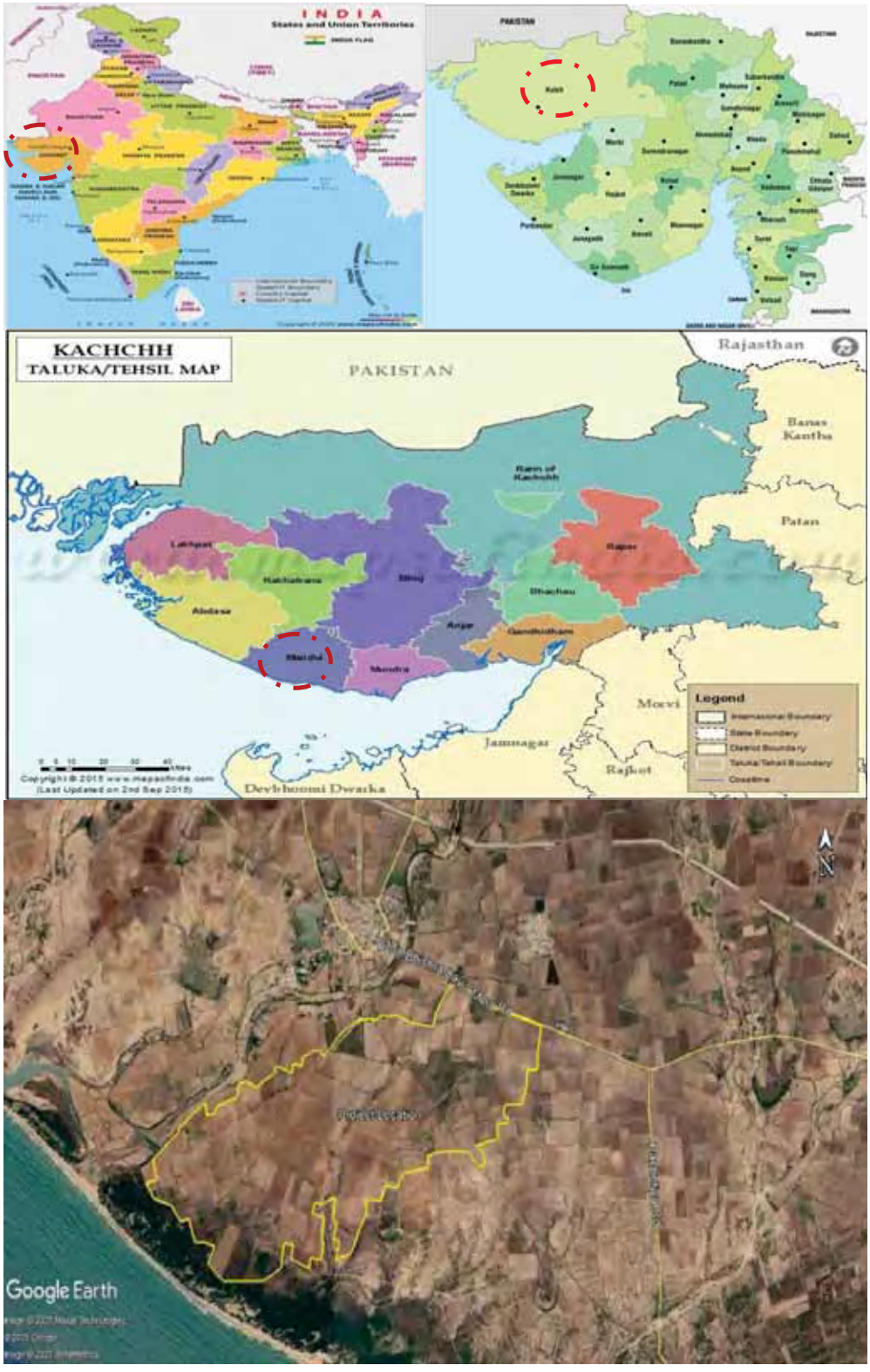

INDIA
States and Union Territories
PAKISTAN
KACHCHH
TALUKA/TEHSIL MAP
PAKISTAN
Rajasthan
Banas Kantha
Patan
Morvi
Jamnagar
Rajkot
Devbhoomi Dwarka
Legend
Google Earth

Figure 5.1: Proposed Project Location



Figure 5.2: Alternative analysis of selection of Project Site

Based on the comparative alternative site analysis given below, the site at Bada village in the Taluka - Mandvi, Dist - Kutch in the State of Gujarat is selected for establishing Greenfield Chemical Complex project.

Table 5.1: Comparative Statement of Project Site Selection

Sr. No.	Environmental & Social Dimensions	Pingleshwar	Suthri	Bambhdai	Bada	Modhva
Location		Taluka: Abdasa, District: Kutch	Taluka: Abdasa, District: Kutch	Taluka: Mandvi, District: Kutch	Taluka: Mandvi, District: Kutch	Taluka: Mandvi, District: Kutch
Coordinates		1) 23°06'23.03"N 68°44'21.83"E 2) 23°07'22.66"N 68°45'31.14"E 3) 23°06'48.34"N 68°46'20.38"E 4) 23°06'16.27"N 68°46'17.92"E 5) 23°04'36.30"N 68°46'53.33"E	1) 22°59'41.12"N 68°58'31.97"E	1) 22° 56'3" N 69°04'55.1"E 2) 22° 55'57" N 69°05'48.8"E 3) 22° 55'27" N 69°05'47"E 4) 22° 55'17" N 69°05'46"E 5) 22° 55'17" N 69°05'42"E 6) 22° 55'02.0" N 69°05'42"E 7) 22° 54'32.4" N 69°05'45.1"E 8) 22° 54'20" N 69°05'10"E 9) 22° 54'43" N 69°05'02"E	1) 22°53'53.19"N 69° 9'26.63"E 2) 22°53'41.63"N 69° 9'58.16"E 3) 22°52'29.66"N 69° 8'16.32"E 4) 22°52'57.10"N 69° 7'33.09"E	1) 22°47'06.02"N 69°28'44.14"E 2) 22°49'24.26"N 69°30'17.58"E 3) 22°48'25.27"N 69°26'30.78"E 4) 22°48'08.36"N 69°25'26.10"E
1.	Presence of ecologically sensitive areas/zone					
	Mangroves	Scattered locally	Nil	Nil	Nil	Nil

Sr. No.	Environmental & Social Dimensions	Pingleshwar	Suthri	Bambhdai	Bada	Modhva
	Turtle /nesting ground or hatchery / Sand dune	Turtle hatchery near Pingleshwar Beach	Sandy beach and hence turtle / Sand dune studies may be necessary	Sandy beach and hence turtle / Sand dune studies may be necessary	Sandy beach and hence turtle / Sand dune studies may be necessary. Presence of rocks in intertidal and subtidal region creates unfavorable approach towards shore.	Sandy beach and hence turtle / Sand dune studies may be necessary
	Wild life sanctuaries and distance from plant site	Kutch Bustard Sanctuary is located about 6 km.	No wild life sanctuary within 10 km of plant site	No wild life sanctuary within 10 km of plant site	No wild life sanctuary within 10 km of plant site	Nesting ground of flamingos in winter
	Rivers/Riverlets/Stream within plant.	Nairo Seasonal River	Nil	One River and stream	Nil	Nil
	Forest/ Any Reserve forest	Yes, Rapar Ghadvali, 2-2.5 Km, Ashirwandh, 10-15 Km scrub forest	Reserve Forest ~ 1 km.	Reserve Forest near about 0.5 km	Near by but outside plant boundary. Unclass forest	Reserve Forest ~ 1 km
	Distance from Sea	~ 1 km	1 km (Further there is in between creek also)	1.5 km (Further there is in between creek also)	~ 0.8 km	~ 1.2 km
2.	Cultural Attributes					
	Religious structures, Ancient buildings identified by Archaeological Society of India	Pingleshwar Temple located at 7 km distance	Small mosque is located about 0.5 km	Shiva Temple ~ 0.5 km	Vipassana Centre ~ 0.6 km	Nil

Sr. No.	Environmental & Social Dimensions	Pingleshwar	Suthri	Bambhdai	Bada	Modhva
3	Public Utilites					
	Highways	- GJ SH 6 at 110 km away - NH41 at 15 km,	- GJ SH 6 at 110 km away - NH41 at 2-3Km.	- GJ SH 6 50 km - NH41 at 11 km,	- GJ SH 6 at 6km - NH41 at 6 km	- GJ SH 6 at 7 km
	Port	Jakhau Port ~30 km	Mundra Port ~ 97 km	Mundra Port ~ 80 km	Mundra Port ~ 55 km	Mundra Port ~ 50 km
	Railway station	Adipur ~ 138 km Bhuj ~ 108 km	Adipur ~ 116 km Bhuj ~ 100 km	Adipur ~ 100 km Bhuj ~ 97 km	Adipur ~ 116 km Bhuj ~ 66 km	Adipur ~ 92 km Bhuj ~ 62 km
	Power station/Sub station	~ 8 km	~ 10 km	~ 15 km	~ 10 km	~ 15 km
	Nearby Village, distance from the plant site, km	~ 2 km	~2 km	~ 1.2 km	~ 1 km	~ 2 km
	Fishing	No	Yes	No	No	Yes
	Any dams/check dams	~ 1 km	Check dam Sandhog River ~ 3 km	Two check dam and & culverts in northern side	Salinity ingress protection – Check dam of Vengadi (seasonal river) within 0.5 km from northern boundary.	No
	Approx. proximity to nearest City (Bhuj), km	100	120	90	70	90
4	Mineral deposits and mining activities	River sand	No	No	No	No

Sr. No.	Environmental & Social Dimensions	Pingleshwar	Suthri	Bambhdai	Bada	Modhva
	General Soil/Appearance	Intertidal / sandy /expansive alluvial	Expansive alluvial nature soil	Dry and Alluvial nature soil	Sandy Loamy	Dry, Marshy suitable for Salt work expansive of alluvial soil.
5	Plant site Classification as per Land Records of Gujarat State	Private Land of GEDA and Govt. Land	Private Land / Waste land / Gauchar/ Forest Land	Private Land/ Sarkar shree land/ Govt waste/ Santhali land	Private unirrigated agriculture land/ Shri Sarkar land/Govt Land	Private Land & Govt. Land

The estimated land for the project proposal is around 1350 acre. The site at village Bada is considered favourable based on the environmental and logistic advantages over other four sites. The merits of the selected site are as follows:

- Availability of adequate and continuous land parcel for setting up of soda ash, bicarbonate plant, captive cogeneration power plant, other salt derivative plants in future, establishing sea water/ effluent disposal facilities, along with other essential associated facilities. The land is comprised of Government land /Sarkarshree/ and private unirrigated agricultural land.
- No notified ecologically sensitive area within radius of 10 km. The unclassforest area (outside the plant boundary) is mainly covered with *Prosopis juliflora* and there is no significant vegetation of ecologically sensitive found in the study area.
- No mangroves vegetation near the project site coastline
- Sparsely populated surroundings, nearest village Bada has population of 2719 as per Census, 2011.
- No forest land within identified project site. However for seawater intake and outfall, pipeline will pass through adjoining forest land. Prior to undertake any permanent nature construction activities necessary permissions / approval shall be obtained.
- Arabian Sea is located at a distance of around 0.8 km of western side of the proposed project site.
- No perennial river within the vicinity, only seasonal river 'Vengadi' near North/West boundary of plant land.
- State Highway No 6 is appx. 6 km from proposed project site and easily accessible.
- Proximity to availability of raw material i.e. salt, coke, lignite, limestone etc.

In summary, the ecologically sensitive zones/areas such as wildlife sanctuaries are not located in the plant site and the site is barren land with scatter shrubs. Regulated CRZ buffer will be maintained. Sea water intake and outfall systems are permitted activity as per CRZ notification, 2011 & 2019. There are no habitants in the plant site. The available raw materials such as limestone, salt, lignite/coal and coke can be easily transported and required quantity of seawater can be drawn from the Arabian sea due to its proximity. There is no issue of rehabilitation and resettlement as there is no habitation in the plant site.

Based on above merits, 'Bada' site has been chosen as the most suitable for setting up of proposed Chemical Complex.

5.3 Process Technologies

Standard Solvay and modified Solvay are the basic processes for the manufacture of synthetic Soda Ash. These two processes are basically same except for the utilization/recovery of the ammonia.

- This project is of national importance as it contributes to address the demand of soda ash and allied products. The project will generate revenue to Gujarat State and Government of India and also create about 3000 jobs directly and indirectly.
- Project site at Bada Village in Mandvi taluka of Kutch district of Gujarat is ideal based on important criteria, such as, away from urban areas, availability of resources (e.g., sea salt from Arabian Sea) and not in proximity to ecologically sensitive locations.
- Use of alternative technology with low emissions/ low generation of wastes and better energy efficiency and commercially available based on experience of soda ash industry in India.
- The process technology adoption depends on various parameters like ease of operation/maintenance, cost, pollution control, space available, equipments reliability and process optimization, supply chain, etc. We have evaluated both Solvay ammonia i.e Wet Lime process and Modified Solvay process i.e Dry Lime process, it appears that Wet Lime process has an upper edge over Dry Lime process as the former comparatively uses lesser resources and has lower pollution potential mainly in terms of effluent discharge.

In addition, M/s GHCL Limited will consider all possible options to ensure that the project site will be environment friendly and technically feasible and also support local public to improve their quality of life.

Chapter 6
Environmental Monitoring Programme

Monitoring refers to the collection of data using a series of repetitive measurements of environmental parameters with some specific objectives. The environmental quality monitoring programme design depends on the objective of the monitoring in a specified area of interest. The monitoring activities in EIA can be grouped as follows:

Baseline monitoring is the measurement of environmental parameters during the pre-project period for the purpose of determining the range of variation in the concentration of environmental indicators of VECs. This monitoring establishes baseline environmental quality at defined reference points against the changes envisaged in the project area.

The effects monitoring is the measurement of environmental parameters during project construction and operation to detect change in parameters useful (i) to verify the accuracy of EIA predictions and (b) to determine the effectiveness of measures to mitigate adverse effects of projects on the environment. The feedback from effects monitoring will improve the predictive capacity of EIAs and also determine whether more or less stringent mitigation measures are required.

Compliance monitoring is the periodic sampling and continuous measurement of environmental parameters to ensure that regulatory requirements and standards are being met.

The compliance monitoring required during the project construction, operation and abandonment stages. The resources and institutional set-up should be available for the monitoring at these stages. GHCL should establish effective system in place for environmental monitoring.

Based on the baseline data collected on various environmental parameters and with the prediction of impacts, it is desirable to have an environmental monitoring programme to establish the trend of various environmental parameters and their compliance with the emission/ discharge limits specified by the regulating agencies. The detail of the proposed environmental monitoring programme is summarized below:

6.1 Monitoring Schedule and Parameters

To evaluate the effectiveness of environmental management programme, regular monitoring of the important environmental parameters of VECs will be carried out. Monitoring of various environmental parameters will be carried out on a regular basis to ascertain the following;

- Pollution status within the plant and in its vicinity
- Generate data for predictive or corrective purpose in respect of pollution
- Effectiveness of pollution control measures and control facilities
- To assess environmental impacts
- To follow the trend of parameters which have been identified as the critical.

Monitoring is as an important activity for pollution control since the efficiency of the control measures can only be determined by monitoring. The schedule, duration and parameters to be monitored will be as per GPCB/MoEF&CC directives. A table showing environmental parameters proposed to monitor are given in **Table 6.1**.

Table 6.1: Environmental Monitoring

Sr. No.	Environmental Component	Parameters to be Analyzed
1.	Meteorology	Wind Speed, Wind direction, Temperature, Relative Humidity, Rainfall
2.	Ambient Air Quality	PM_{10} and $PM_{2.5}$, SO_2 ,NOx,NH_3
3.	Stack Emission	SPM, SO_2, NO_X, NH_3, CO_2 and CO
4.	Water quality of surface and ground water	Physical and chemical parameters
5.	Ecology	Density and diversity flora and fauna
6.	Liquid effluent	Parameters as per GPCB consent
7.	Noise Quality	Sound Pressure Levels (L_{eq}) during day and night times.
8.	Coastal/Marine Monitoring	Sediment, water, flora, fauna and other parameters as per CRZ Clearance

The various components of the environment need to be monitored on regular basis as per the requirements of regulating agencies as well as for trend monitoring of the pollutant levels in various environmental matrices. Environmental Management System (EMS) will work out a schedule for monitoring and will meet regularly to review the effectiveness of the EMP implementation. The data collected on various EMP measures would be reviewed and if needed corrective action will be

formulated for implementation. EMS will form short term & long-term plans for environmental issues, which require monitoring and effective implementation.

The environmental quality-monitoring programme will be carried out in the impact zone with suitable reference sampling stations and frequency for environmental parameters with respect to different environmental components. Conventional parameters will be monitored by GHCL or other GPCB/NABL approved laboratory, which will be set up at the site before operation of the plant units. For conventional pollutants, the methods prescribed in "Standard Methods for Water and Wastewater Analysis" published by APHA (American Public Health Association), AWWA (American Water Works Association) will be followed.

6.2 Environmental Monitoring during Construction Phase

- During construction phase, certain environmental parameters will be examined. Initially, the locations will be identified for setting-up temporary workers camps, waste collection and storage locations, drinking water storage and wastewater collection and storage of solid waste generated during construction. A record will be maintained all these inspection setups.
- Ambient air quality will be monitored by using high volume samplers and the air quality parameters PM_{10}, $PM_{2.5}$, SO_2, CO, NO_x and ammonia will be monitored during construction phase. The report will provide information about the dust emissions and other pollution during the construction phase. Noise levels at the project site will be monitored during the noise meter and noise generating equipment will be checked weekly. Ambient noise will be monitored twice a year at the project circumference at three locations the nearest habitation. The noise level should be recorded by 24 hourly.
- Surface water samples will be collected and tested for any contamination from the construction work and compared to the baseline water quality. Also, few groundwater samples in the nearby villages will be collected and analyzed for their use in domestic purposes including drinking water. A quarterly monitoring report will be prepared to know the probability of contamination of water resources during construction phase.
- Solids and hazardous waste generation will be recorded, specifically, the quantities of excavated materials generated and materials obtained from outside during the site preparation. Solid waste quantities and destination will be documented. The chemicals such as paints and varnishes, oil & grease, lubricants and other materials received to the project site and disposal of wastes should be recorded in a logbook.
- During the construction phase, trucks and construction machinery require pollution certified which shall be mandatory to entry the project site. The movement of construction vehicles in the public places should be avoided. The transport vehicles should be covered during transport

of materials to avoid dust emission. Records of all workplace accidents will be documented and archived.

- Medical check-up for all the construction employees will be conducted monthly or bi-monthly and the health record of the employed shall be maintained.

6.3 Air Quality Monitoring

The following measures would be taken up for air quality monitoring on a regular basis after plant become operational:

- Installation of stack monitoring system for the sampling and monitoring of gaseous pollutants effluents on a continuous basis.
- Monitoring of air emissions in and around the project as per the stipulations of GPCB.
- Ambient air quality monitoring for conventional pollutants such as Particulate Matter 2.5 ($PM_{2.5}$), Particulate Matter 10 (PM_{10}), Oxide of Sulfur (SOx) and Oxides of Nitrogen (NOx), and ammonia as per the requirements of Gujarat State Pollution Control Board.

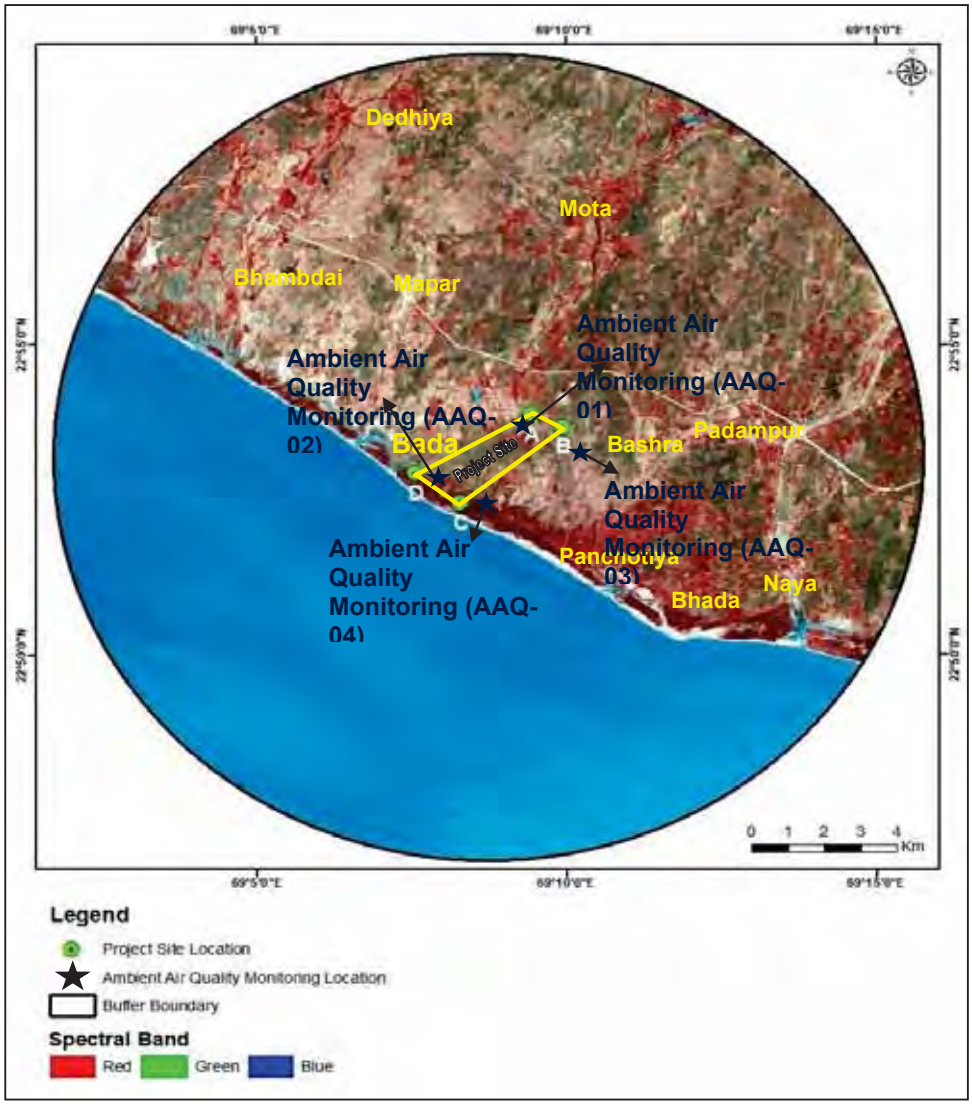


Figure 6.1.1: Post Project Air Quality Monitoring Stations

6.4 Marine Water Quality Monitoring

Marine water quality is to be monitored for temperature, suspended solids, pH and ammonia at discharge point of mixing zone during operation phase.

Monitoring of conventional pollutants prescribed by Gujarat SPCB in wastewater discharge will be monitored at regular intervals.

6.5 Land Environment Monitoring

Monitoring and review of the greenbelt/green cover condition and steps will be taken to ensure improvement in development of greenbelt/green cover in and around the project site.

6.6 Noise Environment Monitoring

Monitoring of noise levels will be undertaken as per the requirements of OSHA and the CPCB guidelines. The noise monitoring results will be utilized to assess the efficacy of maintenance schedules of noise protection measures undertaken to reduce noise levels within the plant boundary. Provision will be made to attenuate noise level by providing suitable enclosures.

6.7 House Keeping

The house keeping at the project site and residential complex will be monitored on a regular basis.

6.8 Environmental Management Cell

A full-fledged Environment Management Cell is proposed with multidisciplinary team of professionals, technical staffs with all necessary infrastructure and budgetary allocation. This team will be also be responsible for all environment management activities including environmental monitoring, greenbelt development, ensuring good housekeeping, ensuring statutory compliance as well as creating environmentally awareness in public related to the proposed project. The organizational chart of Environment Management Cell is shown in **Chapter 10**.

The said team will be responsible for:

- Monitoring and analysis of air quality, noise levels, meteorology, water quality and other environmental parameters
- Implementation and monitoring of the pollution control and protective measures/ devices
- Co-ordination of the environment related activities within the project as well as with outside agencies
- Collection of health statistics of the workers and population of the surrounding villages
- Green belt development
- Monitoring the progress of implementation of the environmental management programmes
- Identifying measures to prevent or reduce the wastes itself in the factory
- Compliance to statutory provisions, norms of Gujarat State Pollution Control Board, Ministry of Environment, Forests & Climate Change, Government of India; and also, the conditions given in the environmental CRZ clearance and consents to establish and operate.

6.9 Budgetary Provisions

The budgetary provisions towards environmental monitoring programme for the proposed project will be maintained. The details of the same are provided in the **Chapter 10**.

6.10 Submission of Monitoring Reports to GPCB/MoEF

As per the requirement, the conditions stipulated in environmental clearance will be adhered and compliance reports will be submitted to GPCB/Regional Office MoEF&CC as per the prescribed time schedule. M/s GHCL will submit half-yearly compliance reports in respect of the stipulated prior environmental clearance terms and conditions in hard and soft copies to the regulatory authority concerned on 1st June and 1st December of each calendar year. The GPCB/Regional Office MoEF&CC shall incorporate EIA clearance conditions into consent conditions and in parallel monitor and enforce the same. The consented parameters for air and water quality will be monitored and submitted to GPCB as per the timelines.

Chapter 7
Additional Studies

In this chapter, details on the investigation on the risk assessment of the proposed project activities are described. A summary of additional studies is also given and the detailed reports are submitted along with this EIA report.

7.1 Hydrogeological Assessment

The comprehensive hydrological and hydrogeological studies conducted for the plant area and its buffer zone, have revealed that there are adequate surface and groundwater resources which are currently being utilised for irrigation and drinking purposes in the buffer zone. There is an intensive groundwater development in the inland areas of buffer zone for irrigation by open dug wells and bore wells. The quality of groundwater is potable and suitable for drinking and irrigation purposes, particularly in the inland area of buffer zone. It has been observed that the status of ground water development of buffer zone as well as of Mandvi Taluka has been found (>100%) and declared as over-exploited by CGW, GHCL realising its national obligation, proposes to utilise the surface runoff of the buffer zone of the Soda Ash plant, by deepening the 12 existing village ponds for use as percolation tanks and recharge the ground water basin by 0.126 Mm^3/year. The ground water recharge by utilising the roof top rainwater of the plant buildings and paved roads cannot be taken up, as the depth to ground water table is within 5 m bgl. Accordingly, it is proposed that roof top rain water of 11 plant buildings having total roof top area of 61050 m^2 may be harvesting by cemented drains releasing 21,195 m^3/year and collected in cemented water tank of 1250 m^3 capacity and utilised for the plant for general purposes.

Through drainage studies of the area, it was observed that there is one stream of 1st order entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, may be diverted to nearby passing Vengadi River in the west, which has two check dams, one for salinity ingress check and on upstream side for storing fresh water. This will not cause any adverse impact on the downstream. For channelizing the monsoon run off from the area adjacent to plant it is required to construct peripheral drain along plant boundary so that flooding is avoided and run off find its way to the natural slope towards Arabian Sea.

It is proposed that this pond may be deepened by 2 metres so as to store entire annual surface runoff for ground water recharge and for plant use. With the proposed deepening, there will not be any possibility of any overflow in the plant. While the other two rivers will continue to flow as these are not being affected by the setting up of the plant. So, the present hydrological setting of the area will remain unaffected.

However, being a coastal area, there may be possibility of sea water ingress but it is not expected as there is no proposal of any groundwater abstraction from the plant area and its entire water requirement will be met by desalination of sea water. The groundwater flow of the main land is still towards the sea thereby keeping the fresh water / sea water interface away from the plant and near the high tide area. Moreover, ground water recharge in inland area of the buffer zone will always keep the ground water at higher elevation and ground water movement will be towards the sea with no possibility of sea water ingress.

It is therefore concluded that with setting up of the plant, which will be meeting its water requirement by desalination and would not affect the surface water resources, there are no chances of any adverse impact on the groundwater regime of the area.

The above conclusion was made based on the detailed report of hydrogeological and rainwater harvesting study conducted by Hydro-Geosurvey Consultants Private Limited, Jodhpur, who is a NABET Accredited consultant.

7.2 Ecological Study and Wildlife Conservation Plan

The ecological study has been carried out for identification of ecologically sensitive receptors (species, habitats and eco-systems) based on field investigations and literature survey to propose appropriate wildlife conservation plan. The study was carried out in the project area i.e., 10 km from the project site and its nearby areas. The study was carried out by following standard procedures and scientifically using primary observations in the field and secondary data collected from the authenticated sources to derive factual information on the ecological status of the project site and its surroundings. Several field visits were carried out during October-2018 to January 2019 to understand and assess the impacts of proposed project activities on flora and fauna and natural habitats.

The study involved assessment of general habitat type, vegetation pattern, preparation of inventory flora and fauna of terrestrial ecosystem in 10 km radius from the boundary of proposed plant. Biological assessment of the site was done to identify whether there are any Rare, Endemic or Threatened (RET) species of flora or fauna in the core area as well its buffer zone and to identify whether are there any ecologically sensitive areas within buffer zone that are likely to be impacted.

After the identification of significant impacts of the project, on flora, fauna or any key habitats of any important species or their corridors, a comprehensive wildlife conservation action plan is proposed to implement within 10 years with monitoring mechanism and financial projections. As per our information and survey there is no sanctuary, national park, or notified wildlife corridors within the project study area (10 km from the project site). The major land-use features are agriculture, sea, beach, waterbodies, built up areas, and wasteland (consisting of scrubland and plantation). There are no major wetlands present within the study area However, there are total 6 seasonal drainages that run north to south in the study area.

Important ecologically habitats observed in the study area include forest area, sea turtle nesting and sand dunes. There is no classified forest as such falling within the boundary of proposed project site. However, some part of the non-classed

forest area located south of the project site boundary; and this area will be required for laying sea water intake and effluent disposal outfall pipelines. The permission from the Forest Department will be obtained before project construction. The sandy stretches of Kutch District are known for sporadic nesting of two species of sea turtles i.e., Olive ridley (*Lepidochelys olivacea*) and Green Sea turtle (*Chelonia mydas*). Based on the detailed study on sea turtles, it was concluded that due to narrow supra tidal region, steep slope, dense vegetation and presence of predators such as dogs and jackals, the location is not likely to be suitable for sea turtles nesting. Presence of sand dunes in the study area suggests high energy wave dominated sea coast and dense vegetation indicates the highly stabilised status of sand dunes. The major part of the project area is devoid of large trees and mainly consists of highly scattered and sparse shrubs *Prosopis juliflora. Prosopis juliflora* and *Zizyphus numularia,* among the wild plants, and cotton among the cultivated crops are the most dominant plants in the buffer area. Except for highly scattered and small plants of *Commiphora wightii*, there were no rare, endangered or conservation concern species present in the close vicinity of the project area in the buffer zone. During field studies, it was observed that two important species i.e. *Commiphora wightii*, and *Tribulus terrestris* are located with low abundance and frequency of occurrences in the study area.

There are common 4 species of reptiles, 7 species of birds but one species of mammals (Chinkara) belongs to Schedule-I of IWPA 1972. Out of 13 species, 1 species of plant and 12 species of fauna are identified. Of these fauna 2 species belong to Threatened Categories (Vulnerable and Endangered) by IUCN which are Olive Ridley Seaturtle and Green Seaturtle. Total 12 species belong to Schedule-I of under Wildlife Protection Act 1972. No Threatened or Schedule-I mammal species reported from the core area of the project site. Conservation plan for Schedule I species has been prepared focused on mitigation, recommendations and financial allocations.

The detail study report on “Ecological Study and Wildlife Conservation” was conducted by Dr. Bharat Jethva, NABET Accredited FAE (Cat-I) Ecology and Biodiversity of Bhagwati Enviro care Pvt. Ltd.

7.3 Sand Dunes Study

The Vengadi River discharge mouth, which was considered for the pipeline corridor, has not undergone significant morphological changes from 2008 to 2018. This study reveals that the river mouth opened up only during 1988 and 1990, but the reasons could not be ascertained. After the construction of the tidewater barrier in 2005 across the river, river mouth has not been breached either by river water or by tides. Due to this, the river mouth is so stable that there is no inflow or outflow through this mouth was observed. Hence, the option of considering this river mouth for laying the buried pipelines may be considered if dredging of the mouth is approved by the concerned competent authorities during the construction stage. The economics of laying longer pipelines and two tunnelling in the dune stretch may also be considered, and the optimum and final decision may be taken.

Based on the dune characteristics, vicinity of the project site, intake and outfall points and the stability of the coast, ten transects and corresponding landfall

points were analysed individually. Accordingly, L5 & L6 may be the better landfall points for the suggested intake and L0,L0(1), L1&L2 for outfall points.

The approximate area of this dune stretch is 302 ha. The dune extends from northwest to southeast for a length of 6.8 km without any break. If there would have been a break, it could have been used as a natural passage. The maximum observed width of the dune was 821 m, and the minimum observed width is 7 m. Dune height extends from 1.5 m to 18.5 m. Three different patches of dune reach up to 18.5 m. It is observed through digitization of historic shoreline that no significant erosion has occurred along the entire stretch of the Bada coast. This indicates that this coast has been stable for a long time. The proposed LF points are lying on the stable coast of this region. Based on the dune characteristics, vicinity of the project site, intake and outfall points, the stability of the coast, ten transects and corresponding landfall points were analysed individually and recommended the suitable landfall locations. The minimum and maximum range of SSC at the intake point was 2.48 mg/l and 27.12 mg/l respectively during 1999-2003. The variations of SSC at intake point is due to various reasons. Values of SSC should be considered while planning the seawater intake and effluent disposal system.

The detailed Studies on sand dune mapping and morphological changes of the river mouth near the project site was carried by National Institute of Oceanography (NIO), Goa. This report can be referred from CSIR NIO Marine EIA.

7.4 Other Studies

The other studies

(i) CRZ map by IRS, Anna University, Chennai: The CRZ map showing CRZ I, CRZ II and CRZ III areas along with project features is enclosed as Annexure V.

(ii) Marine EIA carried out by CSIR-NIO, Mumbai and

(iii) Study on Status Survey and Conservation Plan for Sea Turtles along Mandvi Taluka, Bhuj, Gujarat by Zoological Survey of India, Kolkata were attached with this EIA report.

(iv) Public Consultation

The Public Hearing earlier was scheduled to be held on 16-04-2022 at 11:00 Hrs, Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch, Public hearing was then time being postponed due to unavoidable circumstances and now the public hearing was completed on 17-10-2022 at 11.00 Hrs. Venue: Project Site, Survey no . 432, Village: Bada, Taluka: Mandvi, District: Kutch, Gujarat. Public Hearing Minutes and action plan are attached as Annexure – XI.

7.5 Risk Assessment

Risk Assessment (RA) primarily aimed to identify and mitigate risk arise during project construction and operation. The study involves identification of hazards, consequence analysis accidental release of hazardous chemicals,

Chapter 8
Project Benefits

8.1 Economical Benefits of the Project

The proposed project has a potential for employment of skilled, semi-skilled and unskilled employees during construction phase as well as operational phase. The plant will create direct employment in phased manner for about 1200 (operational phase) skilled as well as semi-skilled staff and indirectly large number of unskilled manpower will be engaged for the project. People will also get employed by the contractors and patta contractors for various project related activities.

The project will contribute additional revenue to the State and Central exchequer in the form of royalty, cess and other taxes.

- Create opportunities for indirect employment on account of new trucks, company's vehicles and hired vehicles
- Create opportunities for indirect employment through stockiest and retailers in Gujarat and also in other states
- Market area of finished Product: Soda Ash

Sr. No	Application Sector	Nature of Application
1	Soap and Detergents	Manufacture of detergents and saponification of fats
2	Glass Industry	Raw material for the glass melt and for reacting with sand
3	Chemical Industry	Used in the production of many products including the followings. Perborates, Phosphates, Soluble Silicates, Metal Carbonate, Sodium Nitrate Chromates and Dichromate, Bleaching Agents, Borax, Fertilizers, Dyes, Tanning Agents, Catalysts, Cryolite, Adhesives, Ultramarine pigments.
4	Pulp and Paper industry	Used for cooking wood, neutralization, cleaning, bleaching and treatment of recycled paper.

Sr. No	Application Sector	Nature of Application
5	Pharmaceutical	Ultra pure soda ash is used as an excipient in the production of medicines.
6	Petrochemicals	Neutralization aid
7	Artificial Silk industry/ Textile industry	De-acidification of artificial silk Dyeing, bleaching and finishing of wool and cotton.
8	Coke ovens, Gas Works	Gas purification (desulphurization) and hydrogenation plants.
9	Iron and Steel Industry	Removal of Sulphur and Phosphorous from pig iron, Cast Iron and Steel. Ore beneficiation used as floatation agent and fluxing agent.
10	Heavy Metal Industry	Digestion and beneficiation of ore e.g. antimony, lead, chrome, cobalt, Nickel, bismuth and tin.
11	Aluminium Industry	Reaction with Bauxite
12	Ceramic Industry	Production of refractory materials and glass
13	Enamel Industry	As a flux
14	Food Industry	Hydrolysis of proteins, production of margarine and starch and softening of sugar beet juice.
15	Environmental Protection	Purification of flue gases by injecting Soda Ash (Dry) Regeneration of acidic lakes by the introduction of briquettes of Soda Ash, so that organic sediments exhibit an alkaline reaction over a long period.
16	Miscellaneous	Water treatment, metal degreasing, general cleanser in photography. As reagent in analytical chemistry, pharmaceutical aid (alkaliser). In veterinary treatment, soda ash has

Sr. No	Application Sector	Nature of Application
		been used as an emetic. In solutions, it is used to cleanse skin and in eczema to soften scabs of ringworm.

8.2 Social and Environmental Benefits (Proposed Under Corporate Social Responsibility of GHCL)

The establishment of Soda Ash complex would benefit to the industries in the state of Gujarat. Overall, development of area in terms of infrastructure will improve the indirect and direct job opportunities which would finally result in improvement in the quality of life of people in the region and especially in the area around the Bada project site.

Under CSR, the company aims at strengthening the bond between the project authorities and the local population in the vicinity of the project. At the project site, GHCL would carry out number of community welfare activities in the following areas:

- Health and Family Welfare
- Education
- Social development activities
- Environmental activities
- Sanitation, Water supply and Fodder for animals etc.

For its work towards CSR Excellence and Sustainability GHCL Ltd. awarded with prestigious Mahatma Award 2021.

8.2.1 Health & Family Welfare

- In alignment of Sustainable Development Goals (No 3: Good Health and Wellbeing), we extend primary health care services in the communities of our operation. We run Mobile Health Care, Health Camps, and Specialized Cancer Check Up Camps (For females) in nearby villages. Necessary support and help will be extended for advanced diagnosis and treatment wherever identified.
- Arrangement of free of cost medical checkup camps for the employees, which will be also extended to nearby villagers to the extent possible
- In emergency, plant ambulance facilities will be extended to villagers
- Health check-up camps in participation with the Government as well as NGOs will be organized and expenditure will be borne by GHCL

8.2.2 Education

- Our interventions are directed at two levels viz. school and skill building to improve employment opportunities. At school level we intend to promote quality of education and learnability amongst rural kids. Under vocational training we impart necessary skill sets amongst rural and tribal population which can reduce possibility of migration and make them employable in areas close to their homes.
- A school support programme will be put in place in which the government schools in the nearby villages will be supported by GHCL in terms of infrastructure and quality of education, which ultimately will upgrade schools
- School will be set up for the children of the employees, which will be also extended for the villagers to the extent possible

8.2.3 Social Development Activities

- Our interventions are directed towards improving the farmer's incomes and resource efficiency. It includes promoting environment friendly and nature-based solutions to enhance productivity of farming activities. It covers capacity building on farming techniques, provision of high-quality seeds/manure, efficient irrigation solutions, etc. While Animal Husbandry efforts are directed towards improving milk yield through better cattle management practices.
- The village nearest the proposed project site i.e., Bada village will be benefited for the purpose of development
- Employment opportunities for local people will be preferred based on the basic requirements related to qualification and experience
- Development of facilities within villages such as roads
- Supply of drinking water in the period of scarcity to the nearby villages
- Deepening of nearby village ponds for storage of rainwater for domestic use of villagers
- Animal husbandry promotion through providing support for breed improvement, animal health care, fodder improvement and others
- Partnering with the Government and other NGOs to bring resources and expertise for the benefit of the community
- Relief work will be provided during natural calamities by extending immediate necessary help to the affected villages and people
- The company will provide funds for the various development activities of the nearby villages as and when community development activity is the motto.
- Promotion of festivals and other cultural activities in nearby villages/schools

8.2.4 Environmental Activities

- Rooftop rain water harvesting structures will be constructed within the plant premises which will recharge groundwater
- Air pollution control measures like ESPs, bag house filters will be installed to nullify the effect on the habitats, if any
- After necessary domestic wastewater treatment, treated domestic effluent will be used for gardening, developing green belt/green cover and sanitation purpose.
- Greenbelt/ canal will be developed in 33% of the total area to minimize the air impact and noise impact on the surrounding area. The number of trees to be planted as a part of the plantation programme will be taken as 1000 trees per acre for green belt as well as along roads/ canals.

8.3 CSR Activities Roles and Responsibility

- The CSR activities will be implemented through a dedicated team in collaboration with the EMC of GHCL.

Table 8.1: Team and its responsibility for CSR activities of GHCL

Sr. No.	Staff	Roles and Responsibility
01.	Project Coordinator	• Overall in-charge for all the CSR activities • Keeping liaison with all stakeholders for the services • Compile and send progress report to all concerned • Arranging training as and when required for staff and families
02.	Field Officers (2)	• Will identify and implement the socioeconomic activities in nearby areas • Carry out need assessment surveys
03.	Accounts Assistant	• To maintain accounts, keep update and facilitate • Procurement of inputs.

CSR Review Committee:

To achieve the desired impact of these development activities, a review committee will be constituted. The ccommittee will meet at least quarterly to deliberate on matters relating to implementation of CSR activities which will cover following aspects:

- Review the progress
- Approval of the action plan and budget
- Advise on-going and new activities
- Recommend, if any, changes or additional budget needed to meet the field needs.
- Quarterly activity report will be prepared.

8.4 GHCL's Social Responsibility & Commitment for Sustainable Development

- GHCL's commitment towards the development of weaker sections of society has been a continuous initiative for more than two decades. Through its "GHCL Foundation Trust", GHCL has upgraded its CSR activities to cover a larger section of the society to provide support to the downtrodden, needy and marginalized citizens and also to create a social infrastructure for their sustenance. GHCL Foundation serves as the Corporate Social Responsibility arm of GHCL Limited and represents our commitment to the holistic development of our surrounding community. During year 2020-2021 GHCL has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years.
- CSR Project/ activity implemented during year 2020-2021 for GHCL Areas of Operation:
- Roof Rain Water Harvesting and Village water Distribution System.
- Drip Irrigation, Sprinkler irrigation, Training and other activities
- Vocational Training Centre
- Animal Treatment Camp and Artificial Insemination Centre
- Mobile Dispensary, Health Camps, Vaccination and Eye camps
- Site school near mining area, uniform, scholarship and financial support for higher studies
- Formation of Self Help Groups and training programme
- Street light, road repairing, construction of school boundary
- Distribution grocery kits, masks, support to Govt. Hospital & PM care fund.
- GHCL Bal Vibhushit Scholarship Project caters to meritorious students. More than 6600 students have benefited from it and a total scholarship mount of INR 26,08,500 have been rolled for them.
- GHCL believes in the principle of wellbeing of every human being which is precisely elaborated in following words.

"May all be happy. May all be healthy. May all see auspiciousness. May none suffer from sorrows."

Objectives:

- To ensure an increased commitment at all levels in the organization, to operate its business in an economically, socially, & environmentally sustainable manner, while recognizing the interests of all its stakeholders
- To take initiatives, directly or in association with other organizations, and organize programs that benefit the communities in and around its areas of operations to enhance the quality of life and economic wellbeing of the locals.

- To generate, through its CSR initiatives, a community goodwill for GHCL and help reinforce a positive & socially responsible image of GHCL as a corporate entity

Table 8.2: Proposed Implementation Schedule for Activities under Corporate Social Responsibility

Activities	Implementation schedule
Road repairing work	prioritize with commencement of project
Assistance in various community development works like Renovation of Temple, community halls, anganwadis, village common property and others	Will be done on start of operation and continued annually as per the requirement of the villagers
Supply of drinking water to villagers during scarcity	As and when required after the plant construction starts and GHCL has establishment
Assistance in up gradation of school	Take up with commencement of project after necessary need base feedbacks
Any other development activities in nearby villages	As and when required

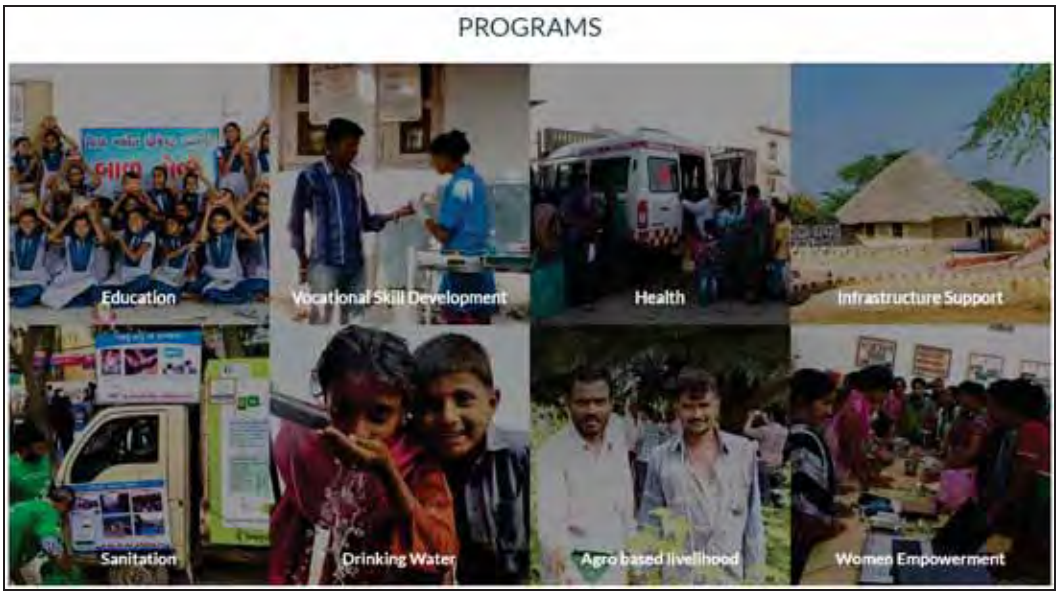


Figure 8.1: Overall Social Responsibility Programs of GHCL towards Sustainable Development

Table 8.3: CSR Budget proposed for FY 2021-2022

Sr.	Programmes	CSR Funds Rs in lacs

No.		GHCL	Others funds for CSR	Total
1	Agriculture	378.45	559.85	938.30
2	Animal husbandry	74.79	299.24	374.03
3	Health	79.34	-	79.34
4	Education	109.19	-	109.19
5	Vocational Training Centre	89.94	3.36	93.30
6	Women Empowerment	38.44	0.00	38.44
7	Water Resource Development Program	81.19	1396.11	1477.30
8	Rural Development Project	12.70	-	12.70
9	Covid-19 relief fund	14.00	-	14.00
10	Establishment & others	102.99	-	102.99
11	Fixed Assets	1.95	-	1.95
Total		**982.97**	**2258.56**	**3241.53**
Plan of Unspent 20-21		**77.42**	**217.49**	**294.90**
Grand Total		**1060.38**	**2476.04**	**3536.43**

Key Focus Areas for FY 2021-2022

- **Impact Assessment:** Completion of agriculture project assessment and incorporation in to impelmentation strategy.
- **Animal Husbandry:** Women SHGs will be involved in the distribution of nutritional supplements of the Animal Husbandry Project.
- **Skill Training:** Complete NSDC Certification, Streamline and achieve success indicators for all vocational training institute.
- Agriculture: (i) Streamline output marketing to get a prime rate of agricultural produce (ii) Decentralization of the project to effective extension.

Our Associates



HEALTH - HFI PAGE INDIA

Hanumant Hospital	Mahuva
RNC Eye Hospital	Valsad
Ranchhoddas Eye Hospital	Valsad
Blood Bank	Bhavanagar

ANIMAL HUSBANDRY

Bharatiya Agro Industries Foundation, BAIF

SANITATION

SBM, Tata

EDUCATION

Dr. K.R.Shroff Foundation

SWAADEEP

WATER

WASMO,

Costal Salinity Prevention Cell (CSPC)

Swachh Bharat Mission

Tata Water Mission

AGRICULTURE

Junagadh Agricultural University,

Krishi Vigyan Kendra, Kodinar

Gujarat Green Revolution Company

WOMEN EMPOWERMENT

Dhruva- BAIF

- As per MoEF&CC Office Memorandum F.NO. 22-67/2017-IA III, MoEF&CC, New Delhi, dated 1st May 2018 and OM no. 22-65/2017-IA.III dated 25th February 2021 GHCL Ltd. has earmarked 0.5 % of capital investment (Approx Rs. 18.04 crores) towards the Corporate Environment Responsibility. CER activities such as promoting renewable energy, skill development Programme, Organic farming, water conservation, forestry etc and develop infrastructure of schools, health facilities, Fishing activities, roads in nearby villages, including the issues raised during the public hearing.

Chapter 9
Environmental Cost Benefit Analysis

GHCL Ltd is a reputed Soda Ash manufacturing chemical unit, incorporated in 1983 which is located at Sutrapada at Dist. Gir Somnath in the State of Gujarat. This was India's first integrated Soda Ash plant based on Akzo's Dry Liming Technology. The Sutrapada plant was commissioned in the year 1988 with the production capacity of 4,20,000 tons per annum (TPA) capacity. Over the time, the capacity has been expanded up to 11,00,000 TPA. It caters to almost 25% of the country's annual domestic demand. It has a clear competitive advantage due to its captive raw material sources. Its lignite mines, located at Khadsaliya in the Bhavnagar District of Gujarat supply the raw material needed for the production of Soda ash. Limestone mines at Sutrapada, Veraval and Talala Taluka of Gir-Somnath District have an average production 45 MT to 500 MT per day of chemical grade limestone. GHCL Soda Ash is available in 2 categories-Light Soda Ash, Dense Soda Ash. It also produces Sodium Bicarbonate and these products are marketed in India under the brand name 'LION'. Soda ash an important raw material in the production of soaps, detergents, glass, pulp and paper, chemicals, textiles and a host of other industries. GHCL's commitment towards the development of weaker sections of society has been a continuous initiative for more than two decades. Through its "GHCL Foundation Trust", GHCL has upgraded its CSR activities to cover a larger section of the society to provide support to the downtrodden, needy and marginalized citizens and also to create a social infrastructure for their sustenance.

GHCL, is now proposing to set-up a Greenfield Chemical Complex to produce Light Soda Ash Plant of 11,00,000 TPA capacity and 5,00,000 TPA of Dense Soda Ash and 2,00,000 TPA Sodium Bicarbonate, 120 MW Captive Co gen power plant and associated infrastructure near village Bada, Taluka – Mandvi, District Kutch in Gujarat state. Along with above products, salt based derivative plants will also be planned in future. The Soda Ash process requires uninterrupted and stable power supply, which will be met from the proposed 120 MW solid fuel

based captive cogeneration power plant. This project is proposed to execute in phased manner.

Proposed plant land near village Bada comprises government waste land and private un-irrigated agricultural land. Most of the private un-irrigated land is used for single crop (seasonal crop). The proposed project site falls in the semi-arid

climatic condition. No mangrove eco-system and notified ecologically sensitive places are falling in the plant area.

The project site supports only a few plant species of lesser conservation significance. The proposed plant and related construction activities may involve removal or thinning of some vegetation which is mainly *Prosopis juliflora* within the proposed area. As such *Prosopis juliflora* is being removed from main road sides across the country to produce charcoal. Further, it grows on its own even after removal. There are no rare, endangered or conservation concern plant species present in the close vicinity of the project area in the buffer zone. Hence there will be negligible impact on the floral species. Some of the scattered trees falling in the plant site area may be required to be cut or relocated in the exclusion zone of the project area. This will minimize the impact in terms of net productivity of the project area.

Further, seawater Intake and effluent disposal pipelines may pass through forest area for which Right of Use (RoU) /Right of Way (RoW) may be required. The forest area required for laying of pipelines mainly consists of prosopis juliflora and scrub vegetation. The pipeline route will be selected in such a way that the removal of important floral species, if any, will be minimal or avoided.

Therefore, the loss to the environment will be negligible. The same will be enhanced by development of Greenbelt/plantation which in turn will mitigate the environmental impact on the area.

The cost of the project and expenditure on the implementation of the environment protection measures are presented in **Chapter 10** of the report. Besides the tangible benefits, the project also has a number of intangible benefits like energy efficient, water conservative, no adverse impact on environment, socio-economic benefit of the local people and the region. The details of the same are given in **Chapter 8**. The establishment of Soda Ash plant would benefit to the industries and consumers and development of industries, overall development of area and consequent indirect and direct job opportunities which would finally result in improvement in the quality of life of people in the region.

Chapter 10 Environmental Management Plan

10.1 Introduction

In **Chapter 4** of this EIA report, impacts assessed during the construction and operations phases of the project have been identified, predicted and evaluated. Where potential sources of environmental impacts are discussed and impacts could not be managed as per the prevailing procedures /mitigation measures then the control measures are required to address the adverse impacts of the project. In this Chapter, project specific Environmental Management Plan (EMP) is proposed to enlist those measures; they are either of an organization, procedural or technical/instrumental nature to minimize the magnitude of adverse environmental impacts.

The primary object of EMP is to ensure a safe and clean environment in the project area/region. The desired results from the environmental mitigation measures proposed in the project may not be obtained without a management plan to assure its proper implementation and function. The EMP envisages the plans for the proper implementation of mitigation measures to reduce the adverse impacts arising out of the project activities. EMP has been prepared addressing the issues like:

- Pollution control/mitigation measures for abatement of the undesirable impacts caused during the construction and operation phase of the project.
- Details of management plans (landscape plan, solid waste management plan etc.).
- Institutional set up identified/recommended for implementation of the EMP.
- Post project environmental monitoring programme to be undertaken
- Expenditures for environmental protection measures and budget for EMP.

The EMP is prepared for construction phase, post-construction phase (commissioning) and for post-project phase. The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment. The social upliftment and improving the quality of the life of people living nearby the industry are proposed by allocating sufficient funds under CSR program of the GHCL Improvement Fund.

10.2 Environmental Management for Construction Phase

10.2.1 Summary of Potential Impacts

Environmental impacts during the construction phase can be due to the site preparation, civil construction, erection and mechanical fabrication, welding operations, non-destructive testing and other operations and provision of civic amenities to the construction work-force.

The environmental components impacted during construction phase include deterioration of air quality, contamination of surface water and noise generation.

The land use change and any associated loss of flora are permanent.

10.2.2 Mitigation Measures

- The construction area shall be secured by fencing and only authorized personnel will be allowed to avoid accidents and unto do incidents.
- To arrest resuspension of dust during construction phase, specifically excavation, levelling and other operations, water sprinkling will be practiced.
- The runoff water from the construction area shall be channelled through sedimentation tanks to remove suspended solids and to avoid contamination of nearby waterbodies.
- Suitable water supply and sanitation facilities shall be provided to the labour colonies/housing during the construction work-force. The sanitary waste shall be routed to septic tanks and soak pit.
- Well maintained diesel operated construction equipment shall be used to minimize the exhaust and subsequent atmospheric pollutants.
- Safety equipment such as earplugs and earmuffs, helmet, face shields, safety goggles and other related gadgets shall be provided to workers engaged in high-risk areas.
- All construction equipment shall be properly maintained and greased to minimize noise generation and vibration.
- Development of green belt shall be started along with the construction activities itself.
- Adequate supply of fuel shall be provided for the construction activities. Required fuels, acetylene cylinders, compressed gases and paint materials shall be stored as per accepted safety standards.
- Strict instructions will be given to contractor/construction agency to maintain construction vehicles and other materials transport vehicles with minimal pollution with proper and up to date PUC certification. Vehicles carrying solid raw materials/fuels should be covered to avoid fugitive dust.

- The medical facility shall be adequately provided, in particular, immediate medical aid to the workers and their family members. An ambulance provision shall be made to transport injured workers to nearby hospitals during the construction.
- No construction materials like earth, stone, ash or appendage disposed off to prevent any blockage in the flow of water of any water course, and cross drainage channels. Proper drainage system (open or closed) shall be prepared.
- All vehicle/machinery and equipment operation, maintenance and re-fuelling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the water.
- Contractor will arrange for collection, storing and disposal of oily wastes to the approved disposal sites. All spills and collected petroleum products will be disposed off in accordance with the GPCB guidelines.
- The project area shall be protected by proper embankment to prevent flooding.

10.2.3 Monitoring Plan

- During construction phase, the air emissions with reference to dust will be monitored. The surface water quality with reference to total dissolved solids (TDS), pH, oil & grease and faecal coliform will be monitored for the nearby surface water bodies. Noise quality will be measured during construction phase and recorded at 0.5 km and 1 km from the project site. The quantity of paints, oil & grease and other construction materials will be recorded and kept at elevated room to avoid contact with rain water. For this purpose, a new storage room/shed will be constructed. All the parameters of air, water and wastewater and solid/hazardous wastes will be measured using CPCB approved test methods. This monitoring will be conducted by the GPCB approved laboratories for every 6 months during the entire construction period.

10.2.4 Resource allocation and Responsibility

- The resource such as human resources, financial assistance and other resource will be provided by GHCL for implementation of EMP during construction phase. The construction phase is a temporary activity and the environmental impacts are time-bound in nature.
- The responsibility of execution of EMP is under the guidance of GHCL management.

10.2.5 Schedule of Action

- The construction phase spread for about 1-2 years and the EMP will be implemented during this period.

10.3 Environmental Management for Operational Phase

10.3.1 Summary of potential impacts

10.3.1.1 Air Quality

The emissions from the stacks of proposed project are likely to contain pollutants gases such as PM_{10}, $PM_{2.5}$, NO_x, SO_2 and NH_3.

Atmospheric emissions may be either due to point sources, e.g., utility stacks, process stacks or due to fugitive emissions from storage tanks and process leaks.

- Fugitive/dust emission during raw materials transport during manufacturing process
- Vehicles used for raw materials and product transport.

10.3.1.2 Water Quality

- Contamination of surface waterbodies
- Contamination of groundwater resources
- Process wastewater treatment and disposal
- Sewage treatment plant to address the domestic wastewater

10.3.1.3 Solid & Hazardous Wastes

- Solid waste generation from the proposed soda ash complex and captive power plant mainly consists of undersized limestone from the lime kilns, sludge from brine purification plant, flyash/bottom ash from boilers which use coal/lignite as fuel and waste/used oil.
- Sludge, if any generated will have no hazardous characteristic and the same is used for filling the low-lying areas.
- The ash (fly ash and bottom ash) from boilers using coal as fuel will be sold/used for cement manufacturing/ brick manufacturing. If, from lignite only, it will be used for road making, pavement and flooring.
- Hazardous waste such as oil & grease, paints and varnishes, spent catalysts other chemicals will be stored at an elevated room until disposed off into the nearby TSDF

10.3.1.4 Noise

The design of the project should be such that the sound pressure level in the work area will not exceed 90 dB(A).

Noise generated during equipment operation will be designated as rrestricted areas, where it is not reasonably practicable to reduce the noise level below the work area limit.

- The equipment will be chosen in such a way that the above noise limit will not be exceeded.

- Green belt/green cover will be developed around the periphery of the plant to control noise levels.
- The noise levels at the nearest habitation after proposed project commissioned will be less than the stipulated standards of GPCB/CPCB

10.3.1.5 Ecology & Biodiversity

In the project area, no tthreatened and eendangered species are present but they are present in the study area of the proposed project.

Though there are no major direct impacts envisaged on these species, however on the long run such large scale project may have some cumulative impacts on them.

These impacts on above mentioned species are less likely to be severe to affect their populations in the region.

10.3.1.6 Socio-economic Aspects

The average QoL index value for the study area is leading to satisfactory level due to satisfactory status like, educational facilities, roads also availability of basic needs viz., food, clothing & housing. Medical and communication facilities were not adequate in the study area; Improvement in these fields will help to increase quality of life of the study area.

10.3.2 Mitigation Measures

10.3.2.1 General

The process technology selected for the industry is low-emission and low waste generating category and subsequent environmental impacts during the operational phase are at the lowest level possible.

The best available technology-based pollution prevention and control shall used to meet the regulatory standards and these pollution control systems will be commissioned before commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the operational units, so that failure of the control system shall shut down the respective operational unit.

- Regular performance evaluation of the control systems shall be undertaken to ensure their optimum performance. As per the guidelines of Gujarat State Pollution Control Board energy and environmental audits will be conducted.
- Preventive maintenance is an important management strategy which will be implemented to control systems matching with that of the respective operational unit.
- Regular monitoring for various components of environment shall be undertaken to ensure effective functioning of pollution control measures as well as to safe guard against any unforeseen changes in environment.

10.3.2.1 Air Quality

- The pollutants in stack emission will observe the norms and as such GLC in surrounding areas will not be adversely affected. However, in order to improve the ambient air quality, GHCL will implement greenbelt /plantation program to ameliorate the pollutants and improve the aesthetics and ambient air quality.
- High efficiency ESPs shall be provided in the flue gas path of the CFBC boilers for control of particulate matter.
- Finely ground limestone will be added to the boiler combustion zone together with coal/lignite to arrest the SO_2 formed during combustion. Lime stone dozing system to the furnace to be designed to achieve higher than 90% capture of SO_2. Monitoring system of air pollutants SO_2, NO_x, NH_3, PM_{10} and $PM_{2.5}$ will be implemented.
- A stack of 130 m height has been considered for CPP to meet the present GPCB/CPCB emission norms of air pollutants. Stacks of sufficient dimensions shall be provided for process emissions control and effective atmospheric dispersion.
- All conveyor transfer points will be identified and properly sealed to prevent fugitive dust emissions.
- Raw materials and product handling places will be provided with proper dust management systems with appropriate capacities. The dust collected in the extraction system shall be recycled to the process based on the dust characteristics.
- Mechanical seals shall be provided for all transfer points. Preventive maintenance of valves and other equipment shall be undertaken as per pre-defined schedule. All critical storage tanks shall be subjected to regular non-destructive testing to ensure the integrity of containment.
- The control measures (maintenance) and good housekeeping will considerably reduce the fugitive emissions; and hence high priority will be given for good housekeeping practices as per the Industry-specific standards.
- Regular monitoring of shop floor environment is to be carried out to control the fugitive emissions as well as shop floor safety.
- Leakages (gases / liquids/ dust) should be checked and promptly attended.
- Vehicles carrying solid raw materials / fuels should be covered to avoid fugitive dust. Internal unpaved roads and transportation roads will be sprayed with water to minimize dust reborn in to the atmosphere.
- Tree plantation in and around the project site shall be carried out to reduce the dust emissions and minimize adverse aesthetic impacts. The greenbelt also helps to attenuate noise pollution.

- Monitoring of the operational performance of the various mitigation /enhancement measures shall be carried out as a part of this project.
- Air pollution control devices shall be regularly checked for effective performance to reduce the emissions.
- The air quality monitoring will be carried out on regular basis by approved agencies by CPCB/GSPCB and the air quality data will be used to assess efficiency of the pollution control devices and to check the effectiveness of EMP.

10.3.2.3 Water Quality

- During operational phase the water requirement will be met from Arabian sea. No ground water will be used to meet the plant requirement.
- The probability of water pollution is negligible, as all relevant effluent streams from the proposed units shall be treated/diluted suitably before disposal.
- The surface water run-off will be collected and used for plant activities; the proposed rain-water harvesting near the percolation tank should be constructed. Further, roof top rainwater harvesting structures will be constructed on main buildings /offices of plant to recharge groundwater.
- Proper seawater intake and treated effluent disposal (ensure maximum dilution) shall be done as per Marine EIA report prepared by NIO.
- It is necessary to verify the predicted environmental changes from the pre-project baseline apart from ascertaining and periodically checking the efficiency of the diffuser through periodic monitoring.
- The water monitoring results of (surface and groundwater and marine) should be carefully evaluated to identify significant changes, if any, adverse change from the baseline accordingly, corrective measures will be taken to ensure the sustenance of water quality.

10.3.2.4 Solid/Hazardous Waste

- Proper handling practices to be followed in line with the Hazardous Waste Management Rules 2016 and its amendments.
- Fly ash and bottom ash will be disposed in identified areas shall be sprinkled with water to control dust emission. The same shall be utilized for bund preparation, road making and brick manufacturing and cement manufacturing.
- The used oil likely to be generated from the proposed plant is required to be carefully handled and stored in an environment friendly manner. Such oil needs be finally disposed-off by way of sale to the reprocessing units approved by the Ministry of Environment, Forests and Climate Change, Govt. of India/GPCB for its further processing

and reuse. GHCL will adhere to the 'Authorisation' granted by GPCB for disposal of hazardous waste.

- Provisions shall be made for periodic monitoring of soil and sub-soil characteristics in and around the plant area. The important physico-chemical and biological parameters of the soil will be monitored to evaluate the impact on the soil quality and land environment.
- Land environment related management plan pertains to plantations on various sites such as green belt around the project, around the workshop, administrative wing along the roads within and outside the project premises.
- A certificate from the TSDF will be procured for disposal of hazardous waste. An M.o.U for use of fly ash in cement manufacturing and road networks will be obtained.

10.3.2.5 Noise Management

- The major areas of concern for noise generation shall be identified and adequately addressed by considering better control equipment during procurement of the machinery from vendors at project implementation stage.
- Project proponent will consider procurement of low noise generating equipment, wherever feasible, for proposed project
- Either Acoustic barriers/ shelter shall be developed in noisy workplaces or acoustic enclosures shall be provided for the high noise generating equipment
- The operator's cabins (control rooms) will be properly acoustically insulated with special automatic doors and observation windows.
- Monitoring job and location specific noise levels for compliance with HSE regulations will be undertaken.
- Periodic audiometric tests for employees working close to equipments with high noise levels, such as compressors, turbines, blowers etc. will be undertaken.
- Provision of Personal Protection Equipments (PPEs) need to be arranged and their proper usage should be ensured for protection from high noise for the workers as well as visitors.
- Noise generating sources in the plant areas should be monitored regularly. Monitoring of ambient noise levels should also be carried out regularly at the periphery of the complex.

10.3.2.6 Ecology & Biodiversity

- GHCL will ensure in implementation of mitigation measures and environmental management/conservation plans reported separately captioned "Biological Assessment and Wildlife Conservation Plan"

prepared by Dr. Bharat Jethva, Approved QCI-NABET Functional Area Expert (FAE) for Ecology.

10.3.2.7 Socio-economic aspects

In order to mitigate the adverse impact likely to arise in social, cultural and economic aspects in the surrounding region and the expansion of the project is expected to contribute towards enlistment of local people quality of life; certain line of action should be adopted related to:

- Preference shall be given to local people for employment, considering their skills and abilities
- Health camps in surrounding villages, Health services through mobile dispensary, free medicine to BPL, vulnerable population
- Timely valued different awareness programs (sanitation, health, education) must be arranged by the project proponent based on the common health problems caused in the region that may help to reduce the lower status of the study area
- Try to minimize the disturbance to the local community by the construction activities, Apply safe measures during loading-unloading of the construction material
- Try to minimize the transportation activities in day time, ensure roads would not be affected due to heavy transportation
- Appoint local workers in both construction and operation phase as much possible, proper training to workers about safety and technical issues during operation
- Regular meetings, discussions with village Sarpanch, Villagers by Project Proponent in

The responsibility of project proponents to 'internalize' the full environmental costs of development proposals is now widely accepted under "Polluter Pay" principle. In addition, many proponents have found that good design and impact management can result in significant savings applying the principles of cleaner production to improve their environmental performance. The predicted adverse environmental as well as social impacts for which mitigation measures are required were identified and quantified the impact wherever possible. Each mitigation measure is briefly described with reference to the impact of significances to which it relates and the conditions under which it is required.

10.3.3 Monitoring Compliance

- The monitoring of all valued environmental components will be monitored as per the norms prescribed by GPCB/CPCB and the time-to-time guidelines issued for soda ash manufacturing industry.
- Generally, annual environmental quality reports will be submitted to GPCB and also on-line display indicating environmental pollution status will be planned near the proposed project site.

- Monitoring will be performed as per the guidelines given by GPCB and parameters prescribe in Consent of Operation.

10.3.4 Resource allocation and Responsibility

- The resource such as human resources, financial assistance and other resource will be provided by GHCL for implementation of EMP during operational phase. The EMP will be overseen by the Environmental management Cell of the Industry. All programs related environmental protection will be taken care by the Cell and this Cell reports to highest management of the industry. GHCL should formulate and implement well laid Environment Policy for the proposed project to meet the requirement of statutory compliances and effective implementation of EMP objectives and making business more sustainable and safe.
- The responsibility of execution of EMP is for Environmental Management Cell under the guidance of GHCL management.

10.3.5 Schedule of Action

- As per the compliance prescribed by the GPCB/CPCB, timely reports will be submitted.

10.4 Post-Project Monitoring

To evaluate the effectiveness of environmental management program, regular monitoring of the important environmental parameters will be done. Monitoring of various environmental parameters will be carried out on a regular basis to ascertain the following;

- Pollution status within the plant and in its vicinity
- Generate data for predictive or corrective purpose in respect of pollution
- Effectiveness of pollution control measures and control facilities
- To assess environmental impacts
- To follow the trend of parameters which have been identified as critical.
- The environmental monitoring activities should be recorded, hence, the following documents are suggested for record maintenance:
- Log sheets for operation and maintenance of pollution control facilities/ equipment
- Instruction manuals for operation and maintenance of pollution control facilities/ equipment
- Manuals for monitoring of air, water and soil quality in and around factory
- Manuals for monitoring of water, solid and gaseous discharges from the factory

- Statutory records as per the environment related legislations
- Monthly and annual progress report
- Bi-annual compliance statement for Regional office, MoEF&CC, Government of India.
- Annual Environmental audit statements and compliance to NOC conditions for State Pollution Control Board

10.4.1 Air Environment

- Ambient Air Quality monitoring will be done regularly for monitoring PM_{10}, $PM_{2.5}$, NO_x, SO_2 and ammonia
- Ambient air quality monitoring to be carried out in nearby villages as per the recommendations of GPCB/MOEF&CC.
- Sampling and analysis shall be carried out in accordance with Indian legislative requirements and Group control framework requirement.

10.4.2 Water Environment

Effluent will be monitored for all parameters as stipulated by Gujarat Pollution Control Board (GPCB).

10.5 Waste-minimization, Recycle / Reuse / Recover Techniques, Energy Conservation and Natural Resource Conservation

The following practices will be adopted towards waste-minimization, recycle/reuse/recover techniques, eenergy conservation and natural resource conservation:

- The under-size limestone reject from the plant will be used for desulphurisation of flue gases and surplus will be used for road making.
- The limestone dust extracted through efficient air pollution control system such as bag filters will be recovered and the recovered limestone dust will be used in boilers for desulphurisation of the gases.
- Coke/coal dust extracted will be recovered and used in the boilers/kilns.
- Fly ash will be used in pavements/flooring/cement industries /brick manufacturing units.
- Sweep soda from the soda handling section will be used in the brine treatment.
- Rain water storage pond will be built for harvesting rainwater. Roof top rain water harvesting will be done in major buildings with RCC structures for groundwater recharge.
- Good housekeeping practices will be adopted.

- Paper waste will be minimized by adopting intra-office network and the waste paper will be sold to authorized vendors.
- Sufficient workspace and proper lighting will be provided, wherever possible solar lighting will be provided.

10.6 Greenbelt/Plantation Development Plan

An important aspect of a greenbelt is that the plants should have their varied tolerance limit towards the air pollutants. A green belt is effective when the pollution sink only within the tolerance limit of constituent plants. Planting few, known pollutant sensitive species along with the tolerant species within a green belt however, do carry out an important function of indicator species Apart from function as pollution sink, greenbelt would provide other benefit like aesthetic improvement of the area and providing suitable habitats for birds and animals.

The efficiency of greenbelt in pollution abatement mainly depends on the width of the green belt and height of the tree. Further, the distance and direction of source of pollution as well as the focal points of noise emitting plant/machinery Installations are also considered for the preparation of Greenbelt Plan.

As per the guidelines, GHCL will develop green belt in 33% of total plant area in and around the plant in a phased manner. The plantation will be done all along the periphery of the plant and on the sides of internal roads. The local forest authorities, experts of horticulture and other experts will be consulted. The efforts shall be made to plant local plant species. The green belt development requires first soil top layer treatment / replacement and also treated water for irrigation. GHCL to plant the species which are tolerant and having scavenging potential and suitable to the soil and climate of the area with the availability of rain water from the harvesting ponds. It is a gradual process and will be developed in a planned manner.

GHCL, if required, will establish a full-fledged nursery with necessary infrastructure facilities water availability, covered shade-net etc. Saplings will be prepared in polythene bags at nursery. Saplings of various indigenous plants and ornamental plants to be developed in the nursery for the purpose of plantation in and around project site.

At least 100 m wide area on periphery of project site boundary may be developed for creation of greenbelt plantation of local species. The plantation will be done in parallel linear lines running along the periphery of the plant area. 2500 plants will be planted per ha. At least 75% survival of the plantation will be maintained.

Criteria for selection of species for greenbelt will include fast growing, thick canopy cover, perennial and evergreen, high sink potential, wind breaking, etc. Combination of local species such *Acacia Senegal, Euphorbia, Salvadora persica,* and *Butea monospermeaw* would be planted. These species are more dust tolerant and would easily grow in dry region even with shallow soil depth. The green belt of these species would also stop the spread of dust as well as act as wind barrier.

Table 10.1: List of Greenbelt Development Plants*

1	Acacia leucophloea	9.	Ficus bengalensis
2	Acacia senegal	10	Moringa oleifera
3	Azadirachta indica	11	Phoenix sylvestris
4	Balanites aegyptica	12	Pithecellobium dulce
5	Butea monospermea	13	Prosopis cineraria
6	Cocus nucifera	14	Salvadora persica
7	Ficus relegiosa	15	Salvadora oleoides
8.	Tamarindus indica	16	Casuarina equisetifolia

Other herbs/trees will be considered during development and establishment of greenbelt circumference of the project.

Further, minimum of two rows of plants will be developed on roadsides to minimize the pollution effects. While planting, care should be taken to ensure that plants in second row fall in between the two plants of first row.

Protection & Precautionary Measures:

- Barbed wire fencing around the plantation area may be provided to protect the plants during grazing of animals.
- Plantation activity will be carried out in monsoon season.
- The height of plants should not be less than 1 ft.
- Plants must be watered daily in initial stages; watering 2-3 times a week and this will be followed.
- Compost / manure will be added for each pit before plantation.
- To ensure better growth and survival of plants, surface should have sufficient soil.
- Continuous monitoring of plant growth, immediate replacement of causalities, supplementation of nutrients, rescheduling watering regime are important aspects for survival of the plantation will be strictly followed.

Green Belt/Plantation Development Plan (Five-year Plan)

Year	Area to be Planted (ha)	Number of Plants/ Saplings
I	30	75000
II	30	75000
III	30	75000
IV	30	75000
V	30	75000
VI	30	75000
	180	450000

10.7 Health, Safety and Environmental (HSE) Management System

This procedure will be aimed at line managers, company personnel, HSE advisers and contractor personnel working under direct control and influence of the company. The procedure will be applicable for the operational activities of the company at project site. The company will implement the Environment Policy duly signed by the Director, GHCL Limited.

The actions, activities and responsibilities concerning environmental officials of GHCL will be assigned and sufficient funds will be allocated on priority basis. The legal compliance involved in operating the plant, must be clearly understood and properly undertaken so as to ensure compliance for effective environmental management. The following are the areas of activity in which there are environmental risks which require particular actions, activities and responsibilities to be understood and undertaken as part of the day-to-day operation of the plant:

- Operation of the chemical plant
- Once through circulation of sea water
- Operation of boilers/turbines
- Operation of effluent disposal
- Operation of the waste segregation & storage area
- Diesel unloading and
- Maintenance of the plant drainage system

The Environment Management Cell must be empowered by all the agencies at the plant site to address pollution issues. The cell must co-ordinate with the contractors for waste minimization and identification of buyers for recycling of waste material.

The issues such as green belt development, oil spill management; health and safety will be coordinated by this nodal agency thus being solely responsible for the environmental quality.

Environmental monitoring in the plant area shall be undertaken by the cell of the company. Annual monitoring of air, water and sediment quality shall be carried out on regular basis.

- Treated wastewater, air emissions shall be sampled and tested in conformance with the permits granted by various Regulatory Authorities and all relevant records shall be maintained by the Laboratory In-charge / Ops. Dept. The same shall be made available to the HSE dept. to enable them for reporting into the Regulatory authorities.
- For the waste categories, the records related to type and quantity of waste generated, stored at site, transported / disposed as per the Authorization granted by GPCB should be maintained.

- The site clinic shall maintain the records of medical wastes generated and transported for disposal at designated site and shall communicate to the HSE dept.
- The waste management procedure shall be made available to the company and contractor staff and the HSE manager shall make them aware about individual responsibility in-line with the procedure.

Any non-compliance/violations of environmental norms noticed by the HSE cell will bring to the notice of plant head through the functional operation/unit head along with necessary documents. Plant head will have power and be responsible to take necessary corrective steps to attend the non-compliance /violations on immediate basis. The non-compliance/violation and action taken report will be reported to Directors on quarter basis.

10.8 Environmental Management Cell

A full-fledged Environment Management Cell is proposed with multidisciplinary team of professionals, technical staffs and all necessary infrastructures. This team will be also be responsible for all environment management activities including environmental monitoring, greenbelt development, ensuring good housekeeping, ensuring statutory compliance as well as creating environmentally aware work-forces for proposed project. The organizational chart of Environment Management Cell is shown in **Figure 10.1**. The said team will be responsible for:

- Monitoring and analysis of air quality, noise levels, meteorology, water quality and other environmental parameters.
- Implementation and monitoring of the pollution control and protective measures/ devices etc.
- Co-ordination of the environment related activities within the project as well as with outside agencies.
- Collection of health statistics of the workers and population of the surrounding villages.
- Green belt development.
- Monitoring the progress of implementation of the environmental management programme.
- Identifying measures to prevent or reduce the wastes itself in the factory.
- Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

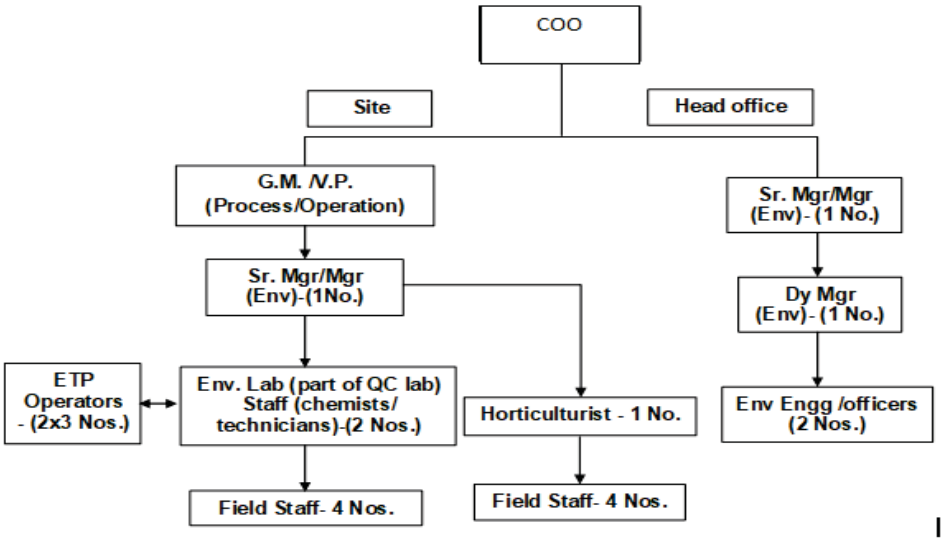


Figure 10.1: Environmental Cell for Proposed Soda Ash Project

10.9 Budget Allocation for EMP

The total capital cost / investment on environmental protection/ improvement measures is envisaged to be around Rs. 200 Cr. The budget will be used for various installations for Air Pollution (ESPs, Scrubbers, Dust extraction and suppression systems, Stacks), Water Pollution, Noise Control (Acoustic enclosures), Greenbelt Development, Occupational Health and Safety and other related activities. The annual recurring cost during the operations will be around 3% of operating cost.

Table 10.2: Budget Allocation for EMP

Aspect of Environmental Management	Cost in Crore [Rs.]	Recurring Cost (Crore /Annum) [Rs.]	Remarks
Air Pollution	**89.28**	**1.50**	Capital cost would include air pollution control devices like ESPs, Scrubbers, Dust extraction and suppression systems, Stacks, Dry Fog system, Wind screen and the recurring cost would include operation and maintenance of pollution control devices
Water Pollution	**14**	**0.12**	Capital cost would include cost of ETP, STP and recurring cost would include operation and maintenance of pollution control devices
Noise Pollution	**2.9**	**--**	Capital cost would include providing adequate sound enclosures for TG, CO- compressor, DG Set

Aspect of Environmental Management	Cost in Crore [Rs.]	Recurring Cost (Crore /Annum) [Rs.]	Remarks
Hazardous / Solid Waste Management	**1.05**	**1.0**	Capital cost would include expense for providing storage area for hazardous waste and membership charges of TSDF/CHWIF Site and recurring cost would be for solid/ hazardous waste disposal charges and Sampling & analysis charges of solid waste.
Environmental monitoring Programme	**3.4**	**0.95**	Capital cost would include expense OCEMS, Online weather station, online pH, NH3-N, Temp meter and recurring cost would include monitoring and analysis of noise level., Sample analysis charges & ambient air & fugitive emission sampling & analysis charges etc., Fresh water & wastewater sample analysis charges etc. Soil: recurring cost would be for Soil Sample analysis., Marine area environment monitoring
Green Belt	**20**	**0.5**	Capital cost would include development of green belt within the project premises and recurring cost would include maintenance charges and manpower salary etc.
Fire safety & Occupational Health & Safety	**3.4**	**0.35**	Capital cost would include cost of OHS center, PPEs, fire & safety instruments and recurring cost would include maintenance charges and training, audit & health check-up etc.
Miscellaneous	**53**	**2.56**	Miscellaneous activity such as development of rain water harvesting system, Drainage Network for rain water, Environmental laboratory, Environmental Management system, miscellaneous study, statutory application fees, audit, training cost etc. and recurring cost would include biodiversity management plan, hiring of EMC and Conservation Plan for Schedule 1 species.
CER	**18.04**	**--**	Capital cost would include cost of CER activities such as promoting renewable energy, skill development Programme, Organic farming, water conservation (like village pond deepening), forestry etc and develop infrastructure of schools, health facilities, Fishing activities, roads in nearby villages
Total (EMP + CER)	**205.07**	**6.98**	

Chapter 11 Summary and Conclusions

11.1 Introduction

M/s GHCL Limited is an existing reputed soda ash manufacturing chemical company, incorporated in 1983. It operates India's first integrated soda ash plant based on Akzo's dry liming technology at Sutrapada at Dist. Gir Somnath in the Gujarat state. The Sutrapada plant was commissioned in the year 1988 with the production capacity of 4,20,000 tons per annum (TPA) capacity. Over the time, the capacity of the plant has been expanded up to 11,00,000 TPA. With the experience and expertise in soda ash and allied production and also to meet the industrial demand of the country, GHCL Limited proposed a Greenfield Chemical Complex project for soda ash production initially and for salt based derivatives in future. M/s GHCL Limited, Ahmedabad is proposing to set-up a greenfield chemical complex to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity and 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) near village Bada, Taluka — Mandvi, District Kutch in the Gujarat state. In this regard, the GHCL Limited is seeking environment clearance (EC) from the State/Central environmental ministry.

In the proposed project, along with above products (LSA, DSA and SBC), 120 MW solid fuel based captive cogeneration power plant is proposed to meet the uninterrupted and stable power supply. The entire envisaged capacity of the project will be achieved in phased manner.

As per the EIA notification 2006, the proposed project falls under the "Category A" under Schedule 4(e) - Soda ash industry. M/s GHCL Ltd. has obtained the Terms of Reference (ToR) from MOEF&CC for EIA. The EIA report is prepared based on the Standard ToR issued by MOEF&CC vide letter no. IA-J-11011/293/2021-IA-II(I) dtd. 10th August 2021. In line with requirements of TOR granted by MoEFCC, the Final EIA report has been prepared for the purpose of EC appraisal. The comments and concerns during Public Consultation shall be addressed suitably in EIA report before submission of Final EIA report to MOEF&CC for Environment Clearance.

The major raw materials are solar salt, chemical grade limestone and few others. The process being exothermic large quantity of seawater will be required for cooling purpose. Seawater will be withdrawn from nearby Arabian sea. The other associated utilities will be part of the project. The effluents generated from various process units of entire complex will be discharged through marine outfall system in the Arabian Sea at a location identified by scientific modeling studies. Identification of marine outfall location for effluent disposal using scientific tools and modeling is the integral part of the project, for which, CSIR-NIO (RC Mumbai) has conducted detail study.

M/s GHCL has also applied to MoEFCC for Forest Diversion of 0.9689 Ha. of Unclass forest land vide' proposal no. FP/GJ/Others/147527/2021 as some part of seawater intake and effluent disposal pipelines are required to be laid through Unclass Forest. Consent To Establish (CTE) for the projects is obtained from Gujarat Pollution Control Board (GPCB). Application to Gujarat Coastal Zone Management Authority (GCZMA) is being made for obtaining CRZ recommendations for Seawater Intake and Effluent Disposal System.

11.1.2 Location of Project

M/s GHCL proposes of setting-up Chemical Complex consists of soda ash and sodium bicarbonate plants with captive cogeneration power plant and other related utilities near Village Bada, Taluka - Mandvi, District -Kutch in Gujarat State. The estimated land for the project proposal is around 1350 acre. The site is well connected to SH 6 and in proximity to availability of raw materials i.e salt, coke, lignite, limestone etc. The site at village Bada of Mandvi Taluka, Bhuj District in Gujarat State is selected based on the environmental and logistic advantages over other four sites evaluated as alternatives. The approximate geographical locations with four corners of the plant site are as follows:

(A) 22°53'53.19"N & 69°09'26.63"E

(B) 22°53'41.63"N & 69°09'58.16"E

(C) 22°52'29.66"N & 69° 8'16.32"E

(D) 22°52'57.10"N & 69°07'33.09"E

The study area of 10 km radius from the project site is primarily located within a rural area with lesser developed and sparsely distributed population / installations. The general environmental features within the study area are given in **Table 1.1**. Field visits indicated that the soils contain high sand content. Cotton was observed as a standing crop while the other crops grown in this area includes sesame, bajara, castor, and groundnut. Horticulture was observed in few locations with a few crops including pomegranate, papaya, and banana. Due to water scarcity, only rain-fed agriculture is mostly practiced in the region. The project site also falls near the coast of the Arabian Sea.

11.1.3 Production Capacity

The proposed project aim to produce light soda ash and dense soda ash with Captive coal/lignite based power plant and allied facilities like RO/DM plant, raw material handling, sea water intake and effluent outfall pipelines and emergency DG sets. The production capacity of the proposed project is given in **Table 1.1**:

Table 11.1: Soda ash Production capacity and other facilities

Sr. No.	Product Name	Proposed Production Capacity
1.	Soda Ash Light Soda Ash Dense Soda Ash Sodium bicarbonate	 11,00,000 TPA 5,00,000 TPA 2,00,000 TPA
2.	Power Steam (CFBC boilers)	120 MW 150 TPH x 6 Nos.
3.	Emergency DG Set (total no. of sets can be 2/3)	5 MVA

The major raw materials required for soda ash production are solar salt and chemical grade limestone. Other raw materials are ammonia, sodium sulfide, coke. For CPP, lignite and/or coal/pet coke will be used as the fuel. Further, a very stable utility i.e. Steam, Power, Air (Instrument and Service), large amount of cooling water (Seawater) and Process Water (Sweet Water) are the essential requirement. The seawater required for the plant of around 16 x 10^5 m³/d shall be sourced through adequately sized Seawater Intake system. Total combined effluent estimated for project is 15,80,000 m^3/day. Approximate requirement of treated / process water, for various purposes is approx. 42000 m^3/d for soda ash plant and associated facilities.

11.1.4 Need for the Project

GHCL Ltd. had signed a memorandum of understanding (M.o.U) with the Government of Gujarat during Vibrant Gujarat Summit 2017 for this project. The proposed development operation is aimed to honour the commitment made in M.o.U. This project will produce additional capacity of soda ash to meet the demand of domestic and global markets.

The primary consumers of soda ash are glass, detergent, laundry soap, sodium silicate, cotton yarn, dyes and dye stuff, paper board and other chemical industries. In India detergent industry is the largest consumer of soda ash. Sodium Bicarbonate (Baking soda) is mainly used by food industry.

The Indian subcontinent is one of the world's fastest growing soda ash markets, driven by India's growing economy. The soda ash per capita consumption in India is 2.8 kg only. If India has to reach the per capita consumption of developed nations which is approximately 17 kg of soda ash than addition of capacity is essential.

11.2 Process Description:

Soda Ash: Soda ash is the common name given to anhydrous sodium carbonate (Na_2CO_3). Soda ash is a white, fine crystalline hygroscope powder and moderately soluble in water. The proposed project evaluates both Dry lime and wet lime process for Soda ash manufacturing.

The major raw materials required for soda ash manufacturing are: i) Limestone ii) Coke or Briquettes or Anthracite (in Lime kiln) iii) Solar Salt and iv) Lignite /Coal/ Pet-coke (in Boiler fuel).

Solvay process also known as ammonia soda process was developed in 19th century and has been developing since many decades. The Soda Ash sector's experience in investment planning, process design, plant construction, start-up, operation, optimization, shut-down and decommissioning has allowed for building up these steps into plant's life cycle, leading to minimization of cost of production, efficiency of raw material and energy use leading to reduction of pollution loads and impacts. The important Process steps are Brine Preparation & Purification, Lime Kilns and gas cleaning, Lime Grinding, Absorption & Distillation, Carbonation and Compression, Filtration & Calcinations, Densification of Soda Ash, Product storage & handling.

Sodium bicarbonate: Refined sodium bicarbonate manufactured by dissolution of dry soda ash in previously de-carbonated circulating mother liquor and subsequent carbonation of obtained soda solution with compressed CO_2 gas, separation of formed bicarbonate slurry and drying of separated sediment.

Captive Power Plant: Circulating fluidized bed combustion (CFBC) technology for boilers is adopted for the proposed captive power plant. The turbo-alternators will be double extraction cum condensing type. Lignite/Coal/Petcoke will be used as Fuel. Initial startup power will be by setting up of 66.0 KV substation with Gujarat Electricity Board grid connection.

11.3 Description of the Environment

The baseline environmental quality has been carried out during Winter Season between December 2019 to February 2020 in the study area of project site for various environment components namely air, water, land, soil, ecology and socio-economics.

11.3.1 Ambient Air Quality

- The PM_{10} concentration range was 19-39 µg/m³ for 24 hourly while $PM_{2.5}$ levels were in the range of 8-17 µg/m³ during the study period. The highest PM_{10} concentration among the monitored locations was found at Bhambdai and lowest at Mota Laysa whereas the highest $PM_{2.5}$ concentration among the monitored locations was found at Mapar and lowest at Mota Laysa and Bada. The particulate matter concentrations observed were below stipulated standards of NAAQS (24 h; PM10=100µg/m^3 and $PM_{2.5}$=60µg/m^3).

- The minimum and maximum concentrations of SO_2 were observed in the range of 1-4 µg/m³ and 9-14 µg/m³ respectively. Similarly, for NOx varied in the range of 5-9 µg/m³ and 9-16 µg/m³ respectively. The highest concentration among all the locations of SO_2 was found to be in Bhambdai and Bhada and lowest concentration of SO_2 was found to be in project site area and highest NOx concentration was found in Bhishra and lowest was found in Mota Laysa and Padampur villages. The levels of gaseous pollutants were below the stipulated CPCB standards (24 hourly SO_2 is 80µg/m^3 and for NOx is 80 µg/m^3).
- The concentration of total hydrocarbons was ranged between 0.23 – 1.27 µg/m³ during study period. The highest concentration was found in Dedhiya and lowest concentration was found in Bhishra.
- The mono-aromatic hydrocarbons like Benzene, Toluene, Ethyl-benzene and Xylene (BTEX) are representative chemicals of volatile organic compounds (VOCs). Among the VOCs, benzene is regarded as carcinogen to humans. The observed concentration range of benzene was 0.11-0.16 µg/m^3 during the study period which is below the NAAQS prescribed limit of 5 µg/m^3.
- In addition to the above air pollutants, other parameters were also monitored and given in the EIA report.

11.3.2 Noise

- The equivalent noise levels of villages varied in the range 44-52 dB(A) and 38-44 dB(A) during day and night, respectively.
- Noise levels in residential areas were observed to be 46-52 dB (A) in day time and 43-44 dB (A) in night time. The noise levels during the day and night were below the stipulated noise levels in residential areas (day time= 55 and night time 45 dB (A)).
- Noise levels in commercial zone, silence zone and Industrial zone were within the CPCB standards for respective areas.

11.3.3 Water Quality

Six sampling locations were selected to collect surface water samples at 0.25 m depth below the water surface while the groundwater samples collected from dug wells (5-10 m depth)/tube wells/tank water in 11 villages to assess the drinking water quality. In addition, one coastal water sample was also analyzed. The important findings are listed below:

- The physico-chemical characteristics of surface water were pH 6.9-7.9, turbidity 17-238 NTU and TSS 28-257 mg/l. Nutrients content in the form of nitrate-nitrogen and total phosphates were found to be 1.44-2.90 mg/l and 0.5-6.0 mg/l respectively. COD was observed in the range 29-86 mg/l, whereas oil and grease concentration were found to be 0.16-0.87 mg/l.

Total coliforms count in the surface water was found to be in the range ND-800 CFU/100 ml and there was no faecal contamination.

- The physico-chemical characteristics of ground water were pH 6.9-8.9, turbidity 1-34 NTU total dissolved solids (inorganic) 458-4246 mg/l, Nutrient contents in the form of nitrate-nitrogen and total phosphates were found to be 1.61-7.81 mg/l and 0.8-8.8 mg/l respectively. Oil and grease concentration was found to be <1 mg/l. Total coliforms count in surface water was found to be in the range 40-240 CFU/100 ml and the groundwater was free of faecal coliform.
- The maximum concentration of heavy metals found in groundwater were as follows: Copper: 0.043 mg/l, Iron: 1.881 mg/l, Manganese: 0.413 mg/l, Molybdenum: 0.148 mg/l, Lead: 0.091 mg/l, Vanadium: 0.204 mg/l and Zinc 0.169 mg/l, while heavy metals cobalt and mercury were not detectable

11.3.4 Marine Quality

M/s GHCL Limited engaged Council of Scientific and Industrial Research-National Institute of Oceanography (CSIR-NIO) to carry out Marine EIA/EMP related studies. The study report is separately enclosed. The marine water quality at twelve (12) locations covering nearshore (considered as stations 1, 2A, 4, 4A and 7), toward offshore (considered as stations 2, 3,5,6,8 and 9) and offshore (considered as station 10) were chosen for establishing baseline marine water quality. Intertidal sampling was conducted at 3 transects (TR I – TR III). Water quality recorded during post-monsoon (October 2018) and pre-monsoon (March 2019) seasons. The summary of the findings is as follows reported below:

- The physical water quality parameters namely pH, temperature and suspended solids were found in the range 8.3-8.4, 28.5-32.8°C and 25-124 mg/l respectively during the study period. Salinity values were found to vary between 37.5 – 38.2 ppt.
- Coastal waters had an average DO in excess of 4 mg/l, the coastal waters were well oxygenated, indicating healthy environment for biological growth. BOD of the coastal waters in the study area was 0.4-3.5 mg/l.
- Phosphate (PO_4^{3-}-P), NH_4^+-N and NO_2^--N were found to be 0.1-1.7 μmol/l, 0.3-2.7 μmol/l, and 0.1-0.6 μmol/l respectively, indicating good oxidizing conditions in water.
- The results of experimental trawling conducted at the study area indicated very poor catch rate. The region has no established trawling grounds for fishery operations due to uneven bottom topography associated with rocky zones, hence, the trawlers operated at other areas for fishing
- Coastal area of Bada is well protected by well-developed and stable sand dunes dominated by babul and grass
- Mangroves were absent along the Mandvi-Bada coast.

- No turtle was sighted off Bada during the study period.
- Extensive survey was conducted during Oct 2018 - March 2019 in the intertidal region of proposed project area. Corals were not sighted in the project area. No turtles were sighted off Bada during the study period. It is suggested to lay the pipelines without disturbing the dune stretch trough tunnelling.
- Based on the above studies, it can be concluded that there will not be any significant impact due to seawater intake facilities and minor impacts will be limited to small well-defined area around the intake. Further, due to outfall facilities the water quality of the coastal area off Mandvi would not deteriorate with respect to temperature, salinity and ammonia except in the immediate vicinity of the outfall where, the temperature, salinity and ammonia ccould be relatively high but within the range considered tolerable to marine biota. The impacts of development, mitigation measures and the recommendations for the general monitoring of the area and the parameters to be monitored are incorporated in detailed Marine EIA/EMP report.
- CSIR-NIO has recommended suitable seawater intake and effluent disposal locations after carrying out numerical model study and consideration of Sand Dune morphology study carried out by CSIR NIO, Goa.

11.3.5 Soil Quality

- Ten (10) villages were identified for soil quality assessment.
- The texture of the soil is sandy and sandy loam. The clay contain in the soils of the study area varies from 38-52%.
- The soil being of friable consistency, the bulk density of the soil is in the range 1.00 to 1.60 g/cm³ whereas the porosity and water holding capacity are in the range of 38.8-66.9% and 18.5-47.2% respectively.
- The pH of the soil in the study area was slightly to moderately alkaline in reaction, having pH in the range 7.4-8.2. EC of the soil extract in the study area ranges from 0.2 to 0.7 dS/m.
- Organic carbon, available nitrogen, and phosphorous of the soil samples were found to be in the range 0.2-0.8%, 25.3-139.2 kg/ha, and 64.1-187.8 kg/ha, respectively. The soil in the study area has poor fertility level with respect to available nitrogen and phosphorus.
- Total viable microbial population per gram of soil varied from $10x10^6$ to $48x10^6$ CFU. Different microflora observed per gram of soil samples were Actinomycetes (22×10^5 - 24×10^6 CFU), fungi (14×10^5 to 60×10^6 CFU), Rhizobium (17×10^5 to 50×10^6 CFU) and Azotobacter (16×10^6 - 54×10^6 CFU).

- Fertility status of soil found to be mostly poor in study area.

11.3.6 Ecology

- The ecological study has been carried out for identification of ecologically sensitive receptors (species, habitats & eco-systems) based on field investigations and literature survey to propose appropriate wildlife conservation plan. The study was carried out in project area i.e., 10 km from the project site and its nearby areas.
- The study was carried out by following standard procedures and scientifically using primary observations in the field and secondary data collected from the authenticated sources to derive factual information on the ecological status of the project site and its surroundings.
- Several field visits were carried out between month of October-2018 to January 2019 to understand and assess the impacts of proposed project activities on flora and fauna and natural habitats.
- The study involved assessment of general habitat type, vegetation pattern, preparation of inventory flora and fauna of terrestrial ecosystem in 10 km radius from the boundary of proposed plant. The proposed project area land does not have dense vegetation, sparse clumps of thorny scrub mostly in the form of invasive species i.e., *Prosopis juliflora* exists.
- Biological assessment of the site was done to identify whether there are any Rare, Endemic or Threatened (RET) species of flora or fauna in the core area as well its buffer zone and to identify whether there is any ecologically sensitive area within buffer zone that is likely to be impacted.
- After identification of significant impacts of the project, on flora, fauna or any key habitats of any important species or their corridors, a comprehensive wildlife conservation action plan is proposed to be implemented within 10 years, with monitoring mechanism and financial projections.
- Our field survey in the project area suggests that there are no endangered, endemic, rare plant species present within the project boundary i.e. core area. However, we found two important species i.e. *Commiphora wightii*, and *Tribulus terrestris* in the buffer area with low abundance and frequency of occurrences.
- No endangered, rare, threatened or endemic species of reptiles was reported from the project core area
- Inventory of birds reported from study are and their conservation status included in EIA report.
- As per our data collected from open sources and survey, there are no sanctuary, national park, or notified wildlife corridors, notified wetland, and

important bird areas within the project study area (10 km from the project site).

- No protected area or eco-sensitive zones are present within 10 km periphery of the proposed project site.
- The major land-use features are agriculture, sea, beach, water bodies, built up areas, and wasteland (consisting of scrubland & plantation).

11.3.7 Socio-economic Status

- Socio economic survey was conducted in the villages thin study area.
- Structured interview method is used to collect data regarding awareness and opinion.
- Information on socio-economic profile was collected from the Primary Census Abstract CD 2011, including the population details of the region and Village Directory CD 2011, having the details of basic amenities available in the region.
- Total geographical area is 182.7767 km^2 and population density is 65 persons/km^2
- Total population of the region as per 2011 Census was 11956out of which 6001 (50.19%) were male and 5955 (49.81%) female.
- Sex ratio (number of males per thousand female) in the region was 992, showing that male and female population are comparable.
- Out of the total population, Scheduled Caste population was1586 (13.27%) and Scheduled Tribe population 609 (5.09%)
- According to 2011 Census, total worker population in the study area was 5031(42.08%). Main workers were 4324(36.17%) and marginal workers were 707(5.91%). Total non-working population was 6925(57.92%**)**
- Overall literate population was 7130 (59.64%) and illiterate population was 4826(40.36%)
- The average QoL index values are estimated as:
  - $QoL_{(s)} = 0.51$
  - $QoL_{(o)} = 0.53$
  - $QoL_{(c)} = 0.52$
- The average QoL Index value for the study area is leaning towards neutral and satisfactory level due to good economic status like income, employment, educational facilities and also availability of basic needs, viz. food, clothing, and housing.

11.4 Anticipated Environmental Impacts and Mitigation

11.4.1 Air Quality: The anticipated environmental impacts due to the proposed project and the suggested mitigation measures are given below:

- During construction phase, 24 hourly average maximum GLCs of PM_{10} will be around 33.4 $\mu g/m^3$. A marginal increase in the levels of oxides of nitrogen, carbon monoxide and hydrocarbons are envisaged due to the movement of vehicles for transportation of construction materials and diesel generators required during construction phase.
- The predicted 24 hourly incremental concentrations of SO_2, NO_x and PM_{10} are 10.98 $\mu g/m^3$, 11.37 $\mu g/m^3$ and 3.05 $\mu g/m^3$ respectively, occurring at a distance of 0.95 km for SO_2 and NO_x and 0.85 km for PM_{10} in SE sector respectively (considering CPP emissions using lignite as the fuel).
- The predicted 24 hourly. incremental concentrations of SO_2, NO_x and PM_{10} will be 2.55 $\mu g/m^3$, 7.79 $\mu g/m^3$ and 3.05 $\mu g/m^3$ respectively, occurring at a distance of 0.95 km for SO_2 and NO_x and 0.85 km for PM_{10} in SE sector respectively (considering CPP emissions using 100% coal as the fuel). For pet coke, the incremental concentrations of SO_2, NO_x and PM_{10} will be 13.26 $\mu g/m^3$, 5.62 $\mu g/m^3$ and 3.05 $\mu g/m^3$ respectively, occurring at a distance of 0.95 km for SO_2 and NO_x and 0.85 km for PM_{10} in SE sector.
- The incremental GLCs for captive co-gen power plant with various solid fuels are within NAAQS and no significant impact are predicted for nearby man-made sensitive installations Vipasana Centre and habitations.
- The predicted 24 hourly incremental concentrations of NH_3 will be 3.66 $\mu g/m^3$ occurring at a distance of 0.7 km in ESE - SSE sector.
- The traffic volume along with emissions factors of pollutants CO, HC, NO_x and PM (source: ARAI, Pune) were considered for computing the pollutant concentrations using line source option in AERMOD. The maximum pollutant concentrations of CO, HC, NO_x and PM are predicted as 15.76 $\mu g/m^3$, 3.57 $\mu g/m^3$, 18.01 $\mu g/m^3$ and 2.60 $\mu g/m^3$ respectively. These concentrations are well within NAAQS.
- From the baseline data and the maximum incremental GLCs in respect of all the pollutants, it is evident that the ambient air quality shall be well within the NAAQS given by CPCB.

Mitigation Measures

By adopting suitable measures and use of appropriate equipment, air quality impacts would be reduced. Some of the important mitigation measures are suggested for the project proponent to follow during project construction and operational phase.

Construction Phase

- Methods for controlling dust emission by water spraying in the construction site, use of proper transport methods like closed transport for excavated material and screens around the construction site
- Periodic checking of vehicles and construction machinery to ensure compliance to emission standards
- Ensure periodical washing of construction equipment and transport vehicles to prevent accumulated dust
- Nose masks or earmuff to be provided to construction workers, while carrying out operations that may entail potential for dust inhalation
- No on-site burning of any waste arising from any construction activities
- Engines and exhaust systems of all vehicle and equipment to be maintained so that exhaust emissions do not reach statutory limits (set for that vehicle / equipment type and mode of operation by CPCB), and that all vehicles and equipment are maintained in accordance with manufactures guidance

Operation Phase

- Lime stone injection and suitable desulphurisation system for reducing the SO_2 emissions
- Adequate stack height for lime kilns and for captive power plant are proposed to maintain SO_2 emissions below the standard limits
- Air quality surveillance program should be under taken regularly as per the CPCB/GPCB norms and regular monitoring of air polluting concentrations through continuous ambient air quality stations (CAAQMS) at specified locations along the plant boundary.
- Online stack monitoring to be carried out through CEMS
- Attenuation of pollution/protection of receptor through green belts/green cover development
- Greenbelt to be maintained as per the norms by periodically planting additional local species to mitigate impacts from fugitive emissions
- All vehicles to be covered during transportation of raw materials and finished products
- Fly ash generated will be supplied to identified cement industries as per the Fly ash utilization plan

Table 11.2: The air emissions control systems for proposed project

Stack No.	Stack attached to	Air pollution control System	Expected Pollutants to monitor & control.
1	Lime Kilns	Scrubber & Dust collector system	PM, SO_2, NO_x
2	Ammonia Recovery system	Water Scrubber	Ammonia
3	Lime Grinding System/Slakers	Bag Filter/adequate stack height	PM/water vapour
4	Calciner Unit	Scrubber, Bag Filter	PM
5	Densification	Scrubber	PM
6	Sodium Bi- Carbonate Unit	Bag filter	PM
7	CPP	ESP, Desulphurization system, Bag filters	PM, So_2, NO_x, Hg

There is no continuous emission expected from the lime kiln stack. Calcium oxide (CaO) and Carbon di oxide is produced by decomposition by burning of limestone and Coke; CO_2 after passing through Scrubber and Wet ESP will be sent to compressor for further use in process. At the time of process start up and disturbances CO_2 will be released in to the atmosphere. Incase of wet lime process instead of stacks of lime grinding unit stacks (20 m) of slaker unit will be there.

11.4.2 Noise Pollution

Simulation models were used for the prediction of noise propagation and attenuation in the study area.

- The plant work area will be able to maintain noise levels below 85 dB(A) during operations.
- The in-plant workers, particularly working near higher noise sources, may be exposed up to 75 dB (A). This exposure is well below the exposure limit of occupational safety and health administration (OSHA) i.e. 90 dB (A) for 8 hour shift and 6 working days.
- Restricted areas will be those locations where it is not reasonably practicable to reduce the noise level below the work area limit; where practicable, all attempts to be made to reduce the noise level below 80 dB(A).
- There can be an increase in noise levels in the residential areas situated close to the road due to movement of trucks and other vehicles. However, the impact of such traffic movements on noise level in the residential areas, situated at 50 meter and beyond from the road, will be insignificant, considering the excess attenuation and will be below the stipulated standard of CPCB.

Mitigation Measures

Some of the important mitigation measures to be followed are given below to control noise pollution:

- Restricting the movement of vehicles and noise prone activities during night, as night-time noise levels will be more sensitive.
- Ambient noise levels to be regularly monitored at critical locations, such as construction sites, before start of work so that increased ambient load can be estimated.
- Employees/workers to be regularly subjected to medical check-up for detecting any adverse impacts on their TLV of hearing.
- The proposed greenbelt to help to prevent noise generated within the plant from spreading beyond the plant boundary.

11.4.3 Water Requirement and Wastewater Generation

The water requirement for the proposed project will be met from the Arabian Sea located nearby the proposed site. Total seawater withdrawl will be around 16 x 10^5 m^3/d. Continuous uninterrupted water supply is required to meet process, cooling, utility and to meet dilution requirement for effluent. Since groundwater abstraction is not proposed for the project, impact on groundwater quality and quantity is not envisaged.

The soda ash effluent streams, brine preparation/purification rejects, boiler blow-down from captive power plant, RO/DM plant rejects etc. will be mixed with once through return cooling seawater/fresh seawater to meet the criteria laid down by GPCB/CPCB for releasing the treated effluent in the sea. The effluent will be transported within the plant premises and thereafter in closed above or underground pipelines up to land fall point (LFP). From there through submarine pipeline it will be released at a designated point having diffuser system in the sea off Bada to achieve further dispersion/dilution in the Arabian Sea. This will be in conformity to prevailing norms by ensuring the requirements of minimum depth and the exit velocity. Domestic wastewater will be treated in septic tank and soak pit systems. However, STP will be established.

Mitigation Measures

- Proper seawater intake and treated effluent disposal (ensure maximum dilution) to be done as per Marine EIA report prepared by CSIR-NIO
- Surface run-off during the construction to be suitably embanked, so that it does not go to the course of any water body in the study area. Special care to be taken during construction work during monsoon, spillage of construction debris should be avoided so as not to pollute the water.

- During rainy seasons, maximum rain water to be harvested; and well-designed water flow paths/drainage to be prepared to avoid water clogging.
- The surface water run-off to be collected and used for plant activities; the proposed rainwater harvesting near the percolation tank to be constructed.

11.4.4 Land / Soil and Greenbelt

- The land chosen for the proposed project comprises Government wasteland and private un-irrigated agricultural land. The existing land is wasteland land with only shrubs/bushes and some agriculture fields present on the land. During construction, the site will be levelled and prepared for construction.
- The possible solid waste generated from the project includes, undersized limestone from the lime kilns, sludge from brine purification plant, and collection pond, Fly ash/Bottom ash from boilers, and used/waste oil. Sludge, if any, generated will have no hazardous characteristics and the same will be used for filling the low-lying areas. The ash (fly ash and bottom ash) from boilers will be sent to nearby Cement Manufacturing/ Brick Manufacturing units. The used oil will be disposed-off by way of sale to the reprocessing units approved by MoEFCC/GPCB for its further processing and reuse. Limestone rejects will be used in boilers for desulphurization, and if in excess, as a sweetener in cement industry, road and pavement making. The hazardous waste generated will be handled, transported and managed as per HWM Rules 2016 and its subsequent amendments. The details of solid/hazardous wastes and its mode of disposal are summarized in the below.
- Potential sources of impacts on soil are accidental discharge of effluents, handling of raw materials, storage of raw material, disposal of solid wastes generated in the plant. There is no effluent discharge on to the soil, hence impact on soil is not envisaged.
- Developing greenbelt / green cover in the plant premises (about 33% of the total area) to mitigate soil erosion and the soil to be fully stabilized without any adverse change in erosion potential of the area.

11.4.5 Ecology and Biodiversity

- The proposed project construction activities may involve removal of vegetation from the project site. Since the project site does not have important plant species, the unavoidable removal of vegetation during the construction activity could be considered negligible impact on flora.
- Since no rare or high conservation significance species of reptiles is present in the core and immediate buffer area of the proposed project site, the impacts on the reptiles could be low.
- There is no Important Bird Area (IBA) present in the study area.

- The impact of proposed project on mammals also involves displacement of the mammalian species occurring in the core area.
- as per our field survey, we observed that width of supra tidal areas on the coast near the proposed project boundary is narrow and has dense vegetation and steep slope. These conditions may not be very suitable for nesting activities of sea turtle on the coastal stretch of 2.0 km that is located south of the proposed project boundary.

Mitigation Measures

minimum vegetation shall be removed from the project site and the important plant and tree species on the periphery of the project site be left as part of green belt development.

In order to control dust and fugitive emissions, it is strongly recommended that proponent shall grow thick green belt on the periphery of the project site.

- Project proponent shall take all possible measures to control pollution during construction and operation phases.
- Recommendation given in Conservation Plan should be followed.

11.4.6 Socio Economic Aspects

Development of Proposed project will have positive impact on study area due to generation of direct and indirect employment oppourtunities.

Preference should be given to local population

- Identify skill gap and provide training to local youths
- The environmental management and emergency preparedness plans are proposed to ensure that the probability of undesired events and consequences are greatly reduced, and adequate mitigation is provided in case of an emergency.
- Provide Health services through mobile dispensary in surrounding wards/villages in the study area

11.5 Analysis of Alternatives

- Consideration of alternatives to a project proposal is a requirement of the EIA process.
- After examining 5 alternative sites on various environment parameters site near Village Bada is selected on merit for setting up of proposed project.

11.6 Environment Monitoring

- The environmental quality-monitoring programme will be carried out in the impact zone with suitable reference sampling stations and frequency for environmental parameters with respect to different environmental components.

- Ambient air quality monitoring for conventional pollutants such as Particulate Matter 2.5 ($PM_{2.5}$), Particulate Matter 10 (PM_{10}), Oxide of Sulfur (SOx) and Oxides of Nitrogen (NOx), and ammonia as per the requirements of Gujarat State Pollution Control Board.
- Installation of stack monitoring system for the sampling and monitoring of gaseous pollutants effluents on a continuous basis.
- Environment components like air quality, water quality, noise levels, marine water quality, soil and ecology should be monitored during construction phase and operations phase.
- the conditions stipulated in environmental clearance will be adhered and compliance reports will be submitted to GPCB/Regional Office MoEF & CC as per the prescribed time schedule.

11.7 Risk Assessment

- Risk assessment was carried out for the proposed plant operations under abnormal conditions. Maximum Credible Accident (MCA) analysis was carried out at various wind velocities and atmospheric stability classes to estimate the maximum effective distances, in case of partial and catastrophic rupture scenarios. The risk has been quantified in terms of iso-contours and F/N curves. Risk has also been quantified in terms of individual and societal risk contours for process equipment and storage tanks for partial and full rupture scenarios. The maximum individual risk generated in the plant site is of 10-6 level. This level risk is acceptable as per the international standards.

- The F/N curves for Liquid Ammonia Storage, A Liquor Tank, , Diesel Storage and Chlorine Tonner are all broadly in the acceptable region. The societal risks from other process equipment are also within the acceptable region. Mitigative measures have been recommended to tackle the emergencies. Disaster Management Plan (DMP) has been delineated including the roles and responsibilities of key persons.
- Addition studies for Hydrogeology assessment, CRZ Map, Sea Turtle Status survey and conservation, were also carried out and enclosed as part of EIA report.
- All the rivers and streams are seasonal and flow only in direct response to rainfall and remain dry for rest of the year.
- For channelizing the monsoon run off from the area adjacent to plant it is required to construct a peripheral drain along the plant boundary so that the flooding is avoided and run off find its way to the natural slope towards Arabian Sea.

- GHCL proposes to take up a rainwater harvesting program as part of it's CSR activities by deepening the existing village ponds to store surplus surface runoff from its catchment area.
- The GHCL proposes to take up rain water harvesting by harnessing the roof top rain water from different buildings and proposes to collect it in water tank and use it for general plant purposes.

11.8 Project Benefits

- The proposed project has a potential for employment of skilled, semi-skilled and unskilled employees during construction phase as well as operational phase.
- The plant will create direct employment in phased manner for about 1200 (operational phase) skilled as well as semi-skilled staff and indirectly large number of unskilled manpower will be engaged for the project.
- The project will contribute additional revenue to the State and Central exchequer in the form of royalty, cess and other taxes.
- Create opportunities for indirect employment on account of new trucks, company's vehicles and hired vehicles
- Create opportunities for indirect employment through stockiest and retailers in Gujarat and also in other states
- Overall, development of area in terms of infrastructure will improve the indirect and direct job opportunities which would finally result in improvement in the quality of life of people in the region and especially in the area around the Bada project site.
- As Soda Ash is used widley in many industries like glass, construction, water treatment, detergents etc. proposed capacities will further cater to the Demand Supply requirements of the nation.
- During year 2020-2021 GHCL has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. For the year 2021-2022 total budget for CSR activities under implementations is about 10.06 Cr.
- Under CSR, the company aims at strengthening the bond between the project authorities and the local population in the vicinity of the project. At the project site, GHCL would carry out number of community welfare activities in the following areas:
  - Health and Family Welfare
  - Education
  - Social development activities
  - Environmental activities

- Sanitation, Water supply and Fodder for animals etc.

11.9 Environment Cost Benefit Analysis

- Proposed plant land near village Bada comprises government waste land and private un-irrigated agricultural land. Most of the private un-irrigated land is used for single crop (seasonal crop).
- The project site supports only a few plant species of lesser conservation significance. The proposed plant and related construction activities may involve removal or thinning of some vegetation which is mainly Prosopis juliflora within the proposed area.
- The forest area required for laying of pipelines mainly consists of prosopis juliflora and scrub vegetation. The pipeline route will be selected in such a way that the removal of important floral species, if any, will be minimal or avoided.
- Besides the tangible benefits, the project also has a number of intangible benefits like energy efficient, water conservative, no adverse impact on environment, socio-economic benefit of the local people and the region. Therefore, the loss to the environment will be negligible.
- The establishment of Soda Ash plant would benefit to the industries and consumers and development of industries, overall development of area and consequent indirect and direct job opportunities.

11.10 Environmental Management Plan

11.10.1 Construction Phase

Environmental impacts during the construction phase can be due to the site preparation, civil construction, erection & mechanical fabrication, welding operations, non-destructive testing and other operations and provision of civic amenities to the construction work-force.

The environmental components impacted during construction phase include deterioration of air quality, contamination of surface water and noise generation.

The land use change and any associated loss of flora is permanent.

- The construction area to be secured by fencing and only authorized personnel to be allowed to avoid accidents and unto do incidents.
- To arrest resuspension of dust during construction phase, specifically excavation, levelling and other operations, water sprinkling to be practised.
- The runoff water from the construction area to be channelled through sedimentation tanks to remove suspended solids and to avoid contamination of nearby waterbodies.

- Suitable water supply and sanitation facilities to be provided to the labour colonies/housing during the construction work-force. The sanitary waste to be routed to septic tanks and soak pit.
- Well maintained diesel operated construction equipment to be used to minimize the exhaust and subsequent atmospheric pollutants.
- Safety equipment such as earplugs and earmuffs, helmet, face shields, safety goggles and other related gadgets to be provided to workers engaged in high-risk areas.
- All construction equipment shall be properly maintained and greased to minimize noise generation and vibration.
- Development of green belt to be started along with the construction activities itself.
- Adequate supply of fuel to be provided for the construction activities. Required fuels, acetylene cylinders, compressed gases and paint materials shall be stored as per accepted safety standards.
- Strict instructions will be given to contractor/construction agency to maintain construction vehicles and other materials transport vehicles with minimal pollution with proper and up to date PUC certification. Vehicles carrying solid raw materials/fuels should be covered to avoid fugitive dust.
- The medical facility to be adequately provided, in particular, immediate medical aid to the workers and their family members. An ambulance provision to be made to transport injured workers to nearby hospitals during the construction.
- No construction materials like earth, stone, ash or appendage disposed off to prevent any blockage in the flow of water of any water course, and cross drainage channels. Proper drainage system (open or closed) to be prepared.
- All vehicle/machinery and equipment operation, maintenance and re-fuelling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the water.
- Contractor will arrange for collection, storing and disposal of oily wastes to the approved disposal sites. All spills and collected petroleum products will be disposed off in accordance with the GPCB guidelines.
- The project area to be protected by proper embankment to prevent flooding.
- During construction phase, the air emissions with reference to dust will be monitored. The surface water quality with reference to total dissolved solids (TDS), pH, oil & grease and faecal coliform will be monitored for the nearby surface water bodies. Noise quality will be measured during construction phase and recorded at 0.5 km and 1 km from the project site.

The quantity of paints, oil & grease and other construction materials will be recorded and kept at elevated room to avoid contact with rain water. For this purpose, a new storage room/shed will be constructed. All the parameters of air, water and wastewater and solid/hazardous wastes will be measured using CPCB approved test methods. This monitoring will be conducted by the GPCB approved laboratories for every 6 months during the entire construction period.

11.10.2 Operational Phase

- To ensure that all the pollution control / environment management systems are commissioned as part of main plant equipment, before the commencement of operation of the project. Regular performance evaluation of the control systems to be undertaken to ensure their optimum performance.
- The EMPs suggested by CSIR-NIO to be strictly followed to mitigate marine impacts due to the project activities.
- The surface water run-off to be collected and used for plant activities; the proposed rain water harvesting near the percolation tank to be constructed.
- The water monitoring results of (terrestrial and marine) to be carefully evaluated to identify significant changes, if any, from the baseline and accordingly, corrective measures to reverse the trend would be necessary.
- Proper solid/hazardous waste handling practices to be followed as [er the Hazardous Wastes Management Rules and its amendments.
- Provision of Personal Protection Equipment (PPEs) need to be arranged and their proper usage should be ensured for protection from high noise for the workers as well as visitors.
- Adopt proper housekeeping procedures and devices, including dedicated (covered) skips for different types of domestic wastes.
- Used/waste oil generated to be carefully handled and stored in an environment friendly manner and disposed-off by way of sale to the reprocessing units approved by the MoEF/GPCB for its further processing and reuse.
- Adequate stack height and SO_2 control measures to be adopted.
- Fly ash utilisation to be implemented as per provision of Fly Ash Notification. Fly Ash will be utilised in Cement Industries. Letter from Sanghi Industries for use of Fly Ash is provided in EIA report.
- Implement Health Safety & Environment (HSE) awareness/information programs for the nearby communities in collaboration with the local administration. Issues to be dealt with may include HSE aspects of project, environmental conservation and sustainable development, personal hygiene and sanitation awareness programs etc.

11.10.3 Post-Project Monitoring

To evaluate the effectiveness of environmental management program, regular monitoring of the important environmental parameters of VECs will be carried out. Monitoring of various environmental parameters will be carried out on a regular basis to ascertain the following;

- Pollution status within the plant and in its vicinity
- Generate data for predictive or corrective purpose in respect of pollution
- Effectiveness of pollution control measures and control facilities
- To assess environmental impacts
- To follow the trend of parameters which have been identified as critical

Monitoring is as an important activity for pollution control, since the efficiency of the control measures can only be determined by monitoring. The schedule, duration and parameters to be monitored will be as per GPCB/MoEF directives. A table showing environmental parameters proposed to be monitored are given in **Table 10.1**

Table 11.3: Post-project Environmental Monitoring

Sr. No.	Environmental Component	Parameters to be Analyzed
1.	Meteorology	Wind Speed, Wind direction, Temperature, Relative Humidity, Rainfall
2.	Ambient Air Quality	PM_{10} and $PM_{2.5}$, SO_2 ,NOx,NH_3
3.	Stack Emission	SPM, SO_2, NO_X, NH_3,
4.	Water quality of surface and ground water	Physical and chemical parameters
5.	Ecology	Density and diversity flora and fauna
6.	Liquid effluent	Parameters as per GPCB consent
7.	Noise Quality	Sound Pressure Levels (L_{eq}) during day and night times.
8.	Coastal/Marine Monitoring	Sediment, water, flora, fauna and other parameters as per CRZ Clearance

The various components of the environment needs to be monitored on regular basis as per the requirements of regulating agencies as well as for trend monitoring of the pollutants levels in various environmental matrices. Environmental Management System (EMS) will have schedules for various monitoring and to review the effectiveness of the EMP implementation. The data collected on various EMP measures would be reviewed and if needed corrective action will be formulated for

implementation. The proponent will form short-term and long-term plans for environmental issues, which require monitoring and effective implementation.

11.10.4 Budget Allocation for EMP

- The total capital cost/investment on environmental protection/ improvement measures is envisaged to be around Rs. 200 Cr. The budget will be used for various installations for Air Pollution (ESPs, Scrubbers, Dust extraction and suppression systems, Stacks), Water Pollution, Noise Control (Acoustic enclosures), Greenbelt Development, Occupational Health and Safety and other related activities. The annual recurring cost during the operations will be around 3% of operating cost.
- CSIR NIO recommended a provision of Rs. 10.0 million to be earmarked for the biodiversity management plan to be implemented in the project area during construction phase and operation phase.
- For periodic monitoring of the marine area environment during project construction phase (considering 2 years), a provision of Rs. 5.0 million to be earmarked. For operation phase, Rs. 3.0 million per year to be kept provision for the monitoring.

11.11 Conclusion

In view of state-of-the-art technology adopted for manufacturing processes, present status of the environment established through field studies (primary data) and secondary sources, and the control/mitigation measures proposed for environmental management during construction and operation phases, it is concluded that the project will not have any significant negative impact on environment. All best available technology for process, effluent treatment, air pollution control or any other environmental pollution control will be implemented in the plant for creating better environment in the plant and nearby environment. All emissions, discharges and disposals will be in conformity with the statutory norms. Further, in view of creation of direct as well as indirect additional employment opportunities during construction and operation phase, the project would have positive impact on the economy of the area, the state, the nation and the company.

Chapter 12
Disclosure of Consultants Engaged

12.1 CSIR-NEERI Profile

CSIR-NEERI (National Environmental Engineering Research Institute) is a Constituent Laboratory of CSIR (Council of Scientific & Industrial Research), India (Website: www.neeri.res.in) was established in 1958.

12.1.1 CSIR-NEERI Mission and Vision

CSIR-NEERI Mission:

The Institute dedicates itself in the service of mankind by providing innovative and effective solutions to environmental and natural resource problems. It strives to enable individuals and organizations to achieve productive and sustainable use of natural resources on which all life and human activity depend. Highly skilled and motivated, the Institute strives for excellence in environmental science, technology and management by working hand in hand with its partners.

CSIR-NEERI Vision:

CSIR-NEERI envisions a world in which;

- All individuals and Institutions have capacity to act in a manner that ensures achievement of sustainable environmental and economic goals.
- The natural balance is no longer threatened and all share the benefit of a healthy environment.

CSIR-NEERI would continue to strive for;

- Leadership in environmental science, technology and management domestically and worldwide.
- Strong and effective working relationship with its partners in ensuring ecological health of all regions in India.

12.1.2 Mandate of CSIR-NEERI

- To conduct R&D studies in environmental science and engineering.
- To render assistance to the industries of the region, local bodies etc. in solving the problems of environmental pollution.
- To interact and collaborate with academic and research institutions on environmental science and engineering for mutual benefit.
- To participate in CSIR thrust area and mission projects.

12.1.3 CSIR-NEERI Activities

R&D Thrust Areas:

- Environmental Monitoring
- Environmental Modeling
- Environmental Impact & Risk Assessment
- Environmental System Design
- Environmental Biotechnology
- Environmental Genomics
- Environmental Policy Analysis

Advisory:

- Central Govt. Ministries
- State Govt. Ministries
- Industries
- Judiciary

12.1.4 CSIR-NEERI Services and Goods

Research Intensive Areas:

- Air, Water, Wastewater, Soil (Land), Solid & Hazardous Waste
- Environmental Biotechnology & Genomics
- Environmental Materials

Public and Strategic Areas:

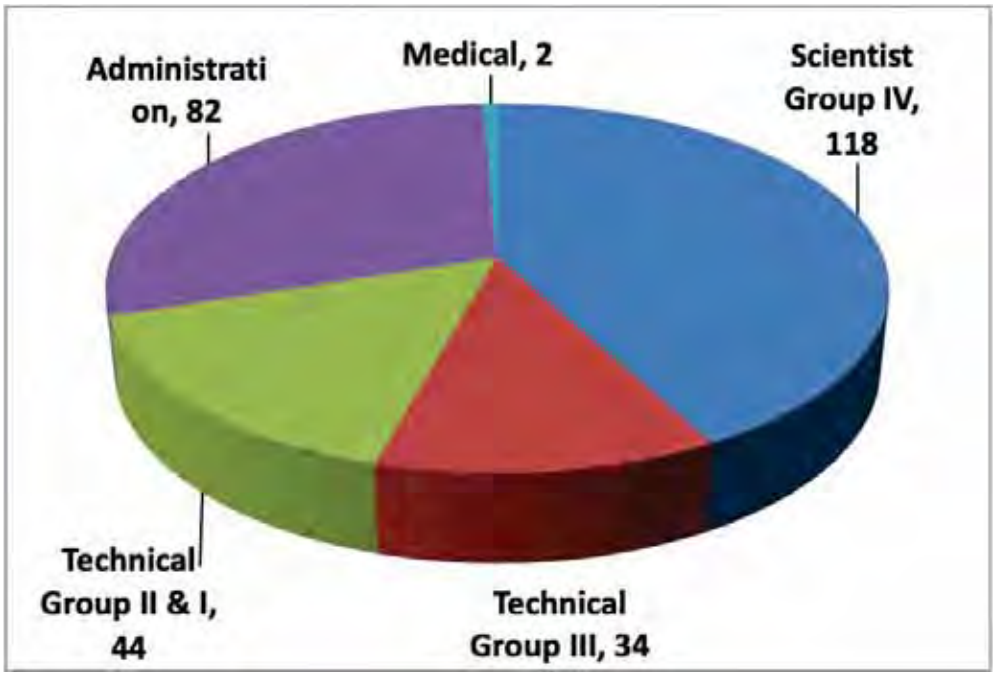
- Environmental Monitoring
- Environmental Policy Analysis

Socio-economic Areas (Urban & Rural):

- Drinking water
- Clean Air
- Environment & Health
- Advice to Central & State Government Agencies
- Judiciary

Industry Focus:

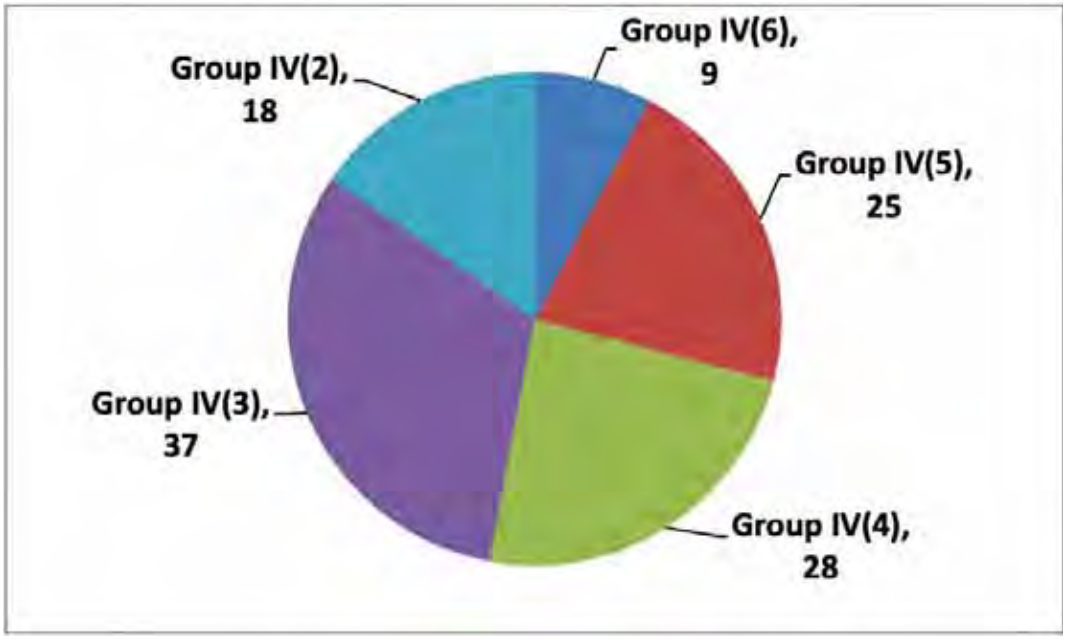
- Environmental Monitoring, Management and Audit
- Environmental Technology Assessment
- Environmental Impact & Risk Assessment



CSIR-NEERI: Human Resources (Total Manpower)

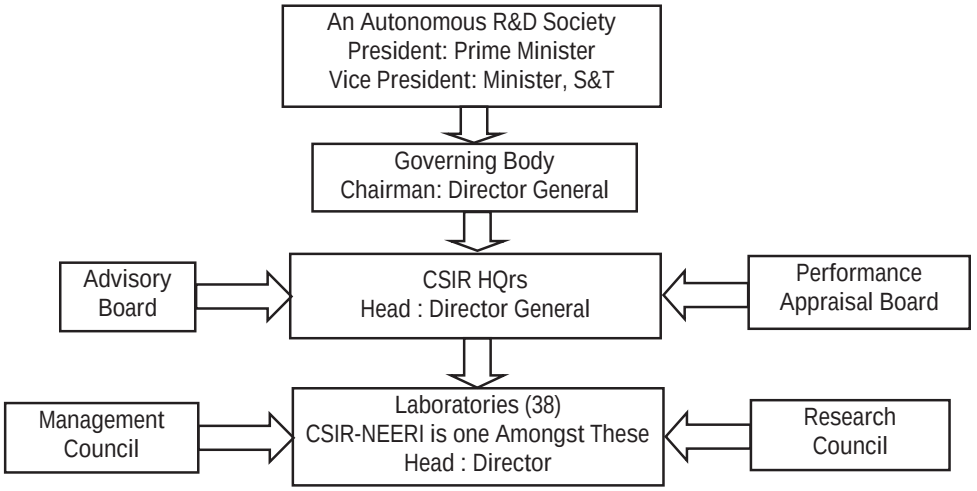
Total: 280 (As on March 2021)

12.1.5 CSIR-NEERI Human Resources

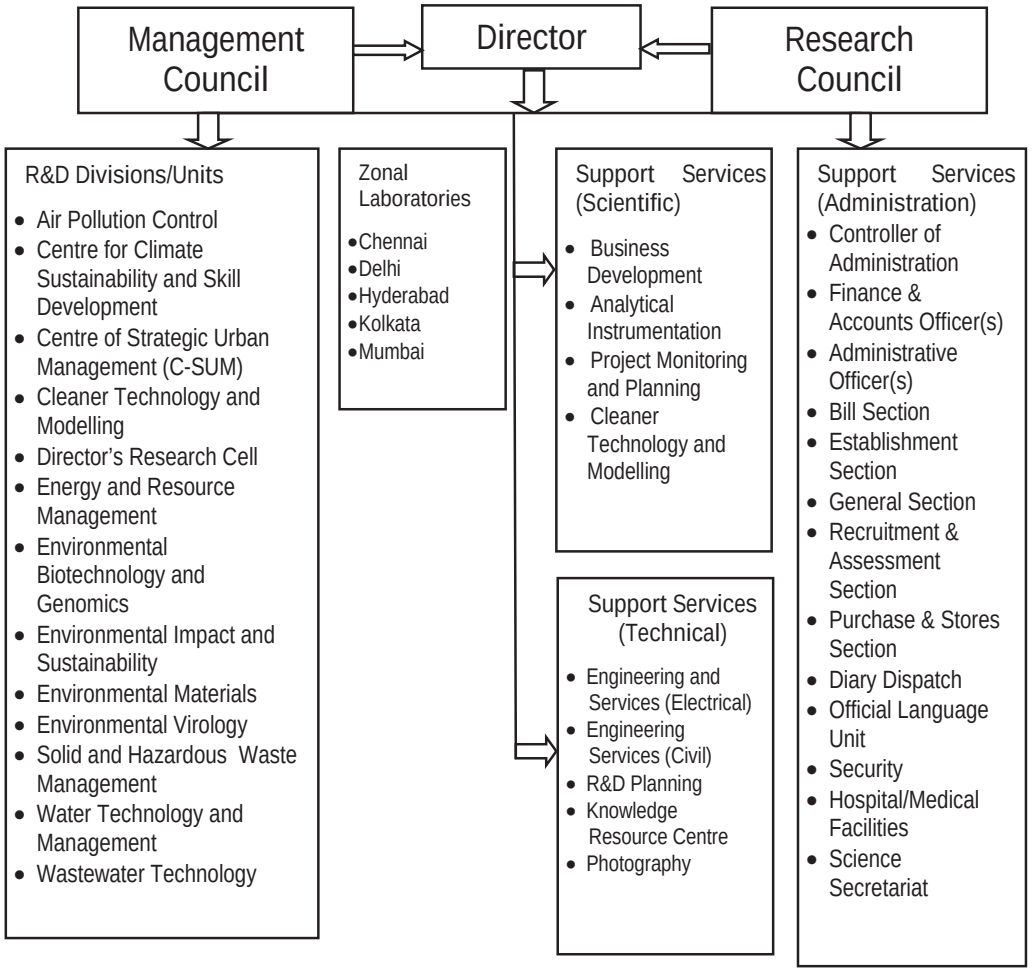


CSIR-NEERI: Human Resource – Scientific Staff
Total: 117 (As on March, 2021)

12.1.6 Organizational Chart of CSIR and CSIR-NEERI

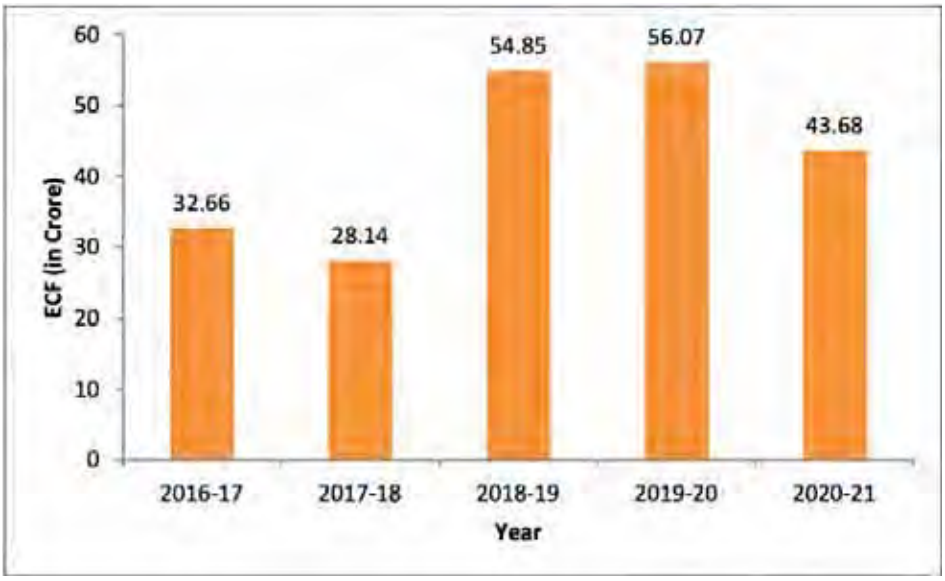


CSIR, India (Organizational Chart)



CSIR-NEERI: Organization Chart

12.1.7 Financial Resources of CSIR-NEERI



Financial Resources (2017-2021) (in Crore) (ECF- External Cash Flow)

12.1.8 Analytical Instruments, Computer Systems and Software at CSIR-NEERI

12.1.8.1 Analytical Instrumentation Resource

- UV-VIS-NIR Spectrophotometer: Hitachi 330
- Atomic Absorption Spectrophotometer: GBC 904 A
- Fluorescence Spectrophotometers: Hitachi F-4000 & Hitachi F-4500
- Mercury Analyzers: Perkin Elmer MAS-50 A and MAS-50 B
- Gas Chromatographs: Perkin Elmer Auto system – 5 nos.
- High Performance Liquid Chromatographs: Waters 204 and 501; Shimadzu-LC10
- Gas Chromatograph-Mass Spectrometer: Varian Saturn III
- Liquid Chromatograph-Mass Spectrometer-Mas Spectrometer: Quattro Ultima
- Ocean related studies: ADCP, CODAR, GPS, Ekmen Dredge, Reversible sampler, (Nishkin type) DRDF, Reversible thermometer, Tide Gauges
- Doppler SODAR
- Mini Sonde
- Microscopes
- Biolistic particle delivery system with accessories
- Gene Pulser II System with accessories & consumables

- Membrane Bioreactor Assembly
- Wet air Oxidation High pressure reactor
- Ground Penetrating Radar
- Multi Electrode resistivity Imaging system
- Ambient Ozone Analysers
- Eight Stage Cascade Impactor
- Microwave Furnace
- CHNS Analyser Vario ELIII
- Porosimeter Quanta Chrome PM33-7
- Mercury Analyser – Milestoen DMA80
- FTIR Spectrometer – Bruker Vertex 70

12.1.8.2 Computer Hardwares & Peripherals

Computer Hardware

- High performance computer systems configures around RISC workstations
- Sun Ultra Sparc Computer Station: Sun Ultra 1 Model 170
- Silicon Graphics 02 Workstations
- Silicon Graphics 2000 Workstations
- HP APOLLO 90001730 Workstations
- Personal Computers
- Laptop Computers
- Local Area Network

12.1.8.3 Supporting Software

- Geographic Information Systems – ARC INFO, MAP INFO
- Knowledge Based System – Prokappa
- Digital Image Processing – ERDAS, EASIPACE, PCI WORKS
- INGRES
- CADCORE
- SPSS
- IMSL
- COMPLIERS
- GRAPHICS
- MATLAB
- DIVAST

12.1.8.4 Software for Mathematical Modeling (Available at CSIR-NEERI)

Air Environment:

Model	Used for Predicting Impacts due to
PAL-DS	Point (stacks), area (quarry) and line (vehicular) sources in short range
ISCST-3	Point and area sources in short range
CALINE 4	Vehicular sources close to road
RTDM3.2	Point and area sources existing at rough terrain in short range
VALLEY	Point and area sources existing in valley in short range
MESOPUFF	Point and area sources in long range
CDM	Point and area sources in short range
RAM	Point and area sources in short range
BLP	Point and line sources in short range
SDM	Point and area sources existing in coastal region in short range
CAL3QHC	Vehicular sources close to road for Hydrocarbon Levels
ADAM	Point and area sources in long range
ADMS-3	Point and area sources in long range
PANACHE	Meteorological data and point, area & line sources in any range
MTDDIS	Point and area sources in long range
TAPM	Meteorological data and impacts due to point, area and line sources in short and long range

Noise Environment:

Model	Used for Predicting Impacts due to
FHWA	Vehicular sources
Wave Divergence	Stationary sources

Aquatic Environment – Ground Water:

Model	Used for Predicting Impacts due to
GMS	Flow, direction, contaminant transport in saturated and unsaturated zones, subsurface solute transport with aerobic and sequential anaerobic bio-degeneration, remediation
FEMWATER/ LEWASTE	Stable contaminant transport & pollution, groundwater pollution and remediation
PATRIOT	Hydrology, stable contaminant transport & pollution and landuse management
PRZM3	Stable contaminant transport & pollution and landuse management, consequence of surface water pollution on groundwater
WhAEM2000	Risk of groundwater contamination, hydrology, stable contaminant transport & pollution

Aquatic Environment – Surface Water:

Model	Used for Predicting Impacts due to
MIKE 11	One dimensional model for dam break analysis, sediment transport, ecological and water quality assessments in rivers and wetlands
MIKE 21	Two dimensional model for Environmental Impact Assessment of marine infrastructure, sediment and mud transport, spill analysis
MIKE 3	Three dimensional model for various applications in different water bodies for water pollutions studies
MIKE SHE	Integrated surface and groundwater modeling
ECO LAB	For ecological modeling in rivers wetlands, lakes, reservoirs, estuaries, coastal waters and sea
CORMIX	Software for simulation for fluid-flow mixing in different water bodies
EXAMS	Aquatic Chemistry & Biology in streams and sea
GCSOLAR	Photolysis, half life
HSCTM2D	Hydrology, sediment & contaminant transport in river and estuary
HSPF	Aquatic chemistry and biology sediment transport and deposition in rivers
OXYREF	Dissolved oxygen, respiration, ventilation
PLUMES	Available dilution, design of marine outfall
PRZM3	Hydrology, metals and pesticides prediction in surface water
QUAL2EU	Water quality in stream, planning, non-point sources
SED3D	Hydrodynamics, sediment transport, 3-D, lakes, estuary, harbour, coastal
SMPTOX3	Toxic-chemicals in streams, aquatic biology, combined sewers
SWMM	Aquatic biology, combine sewers, community discharge, rivers, streams
TMDL USLE	Soil and sediment loss, watershed management
Visual Plumes	Surface water, contaminant transport
WASP	Hydrodynamics, aquatic biology, toxicant dispersal, hydrology

Surface Water Runoff:

Model	Used for Predicting Impacts due to
HEC-5	Flood hydrography, runoff estimation, catchment area treatment
HSPF	Hydrologic simulation in reservoir, nutrient growth
STORM	Urban watershed, storage/reservoir routing, sedimentation, erosion, reservoir chemistry

Ecology:

Model	Used for Predicting Impacts due to
ECOMOD	Estuary linked reservoirs, tidal action, saltwater intrusion, in-stream and in-reservoir dissolved oxygen primary and secondary productivity estimation
LAKE-I	Thermal stratification primary and secondary productivity

Food Chain:

Model	Used for Predicting Impacts due to
EGETS	Exposure levels and effects of contaminants on organisms which make food chain
LC50	Lethal concentration, LC50 toxicity levels

Multimedia:

Model	Useful for Predicting Impacts due to
3MRA	Multimedia pathway, receptor exposure, risk assessment
MINTEQA2	Aquatic biology, multimedia pathway
MMSOILS	Multimedia pathway, exposure assessment
MULTIMED (1.01)	Environmental effects of waste disposal in one media to another surface & ground water

Dam Break Analysis:

Model	Useful for Predicting Impacts due to
DAMBRK	Downstream flow simulation consequent to dam break

Risk Assessment:

Model	Useful for Predicting Impacts due to
SAFETI 6.21 & 6.42V	Complete package for consequence analysis and risk analysis in onshore process engineering
PHAST 6.21 V & 6.42V	Complete package for consequence analysis in onshore process engineering

12.1.9 Clients of CSIR-NEERI

12.1.9.1 Clients: International



- The World Bank
- Asian Development Bank
- United Nations Development Programme
- United Nations Environment Programme
- World Health Organization
- International Union of Conservation for Nature
- Danish International Development Agency
- Global Scan Technologies, Dubai
- Global Tech Safety & Environmental Consultancy, Dubai
- Dept. of Public Works and Highways (DPWH) / Environment and Social Services Office (ESSO), Philippines

12.1.9.2 Clients: Central Government

- Atomic Energy Regulatory Board
- Bharat Oman Refineries Limited
- Bharat Petroleum Corporation Limited
- Department of Science and Technology
- Gas Authority of India Limited
- Hindustan Organic Chemicals Limited
- Hindustan Petroleum Corporation Limited
- Indian Navy, Ministry of Defence
- Indian Oil Corporation Limited
- Indian Petrochemicals Corporation Limited
- Jawaharlal Nehru Port Trust
- Madras Refineries Limited
- Mangalore Refinery and Petrochemicals Limited
- Mumbai Port Trust
- National Aluminium Corporation Limited
- National Hydroelectric Power Corporation
- National Thermal Power Corporation Limited
- Nuclear Power Corporation India Limited
- Numaligarh Refineries Limited
- Oil India Limited
- Oil and Natural Gas Corporation Limited
- Rashtriya Chemicals & Fertilizers Limited
- Tuticorin Port Trust

- Western Coal Field

12.1.9.3 Clients: State Government

- Gujarat Industrial Development Corporation Limited
- Gujarat Narmada Valley Fertilizers Company Limited
- Gujarat State Petroleum Corporation Limited
- Gujarat State Petronet Limited
- Kudremukh Iron Ore Company Limited
- Maharashtra State Electricity Board
- Maharashtra Pollution Control Board
- Tamilnadu Industrial Development Corporation
- Chattisgarh State Electricity Board
- Narmada Water Resources, Water Supply & Kalpasar Deptt.
- Karnataka State Industrial Infrastructure Development Corporation Ltd.
- Steel Authority of India

12.1.9.4 Clients: Private Industries (National)

- ABG Cement
- Adani Ports and SEZ Limited
- Alembic Pharmaceuticals Ltd.
- Amanora Park Town
- Asian Paints India Ltd.
- Andhra Sugars
- Ballarpur Industries Ltd.
- Chhindwara Plus Developers Ltd.
- Cochin Port Trust
- Dighi Port Pvt. Ltd.
- Dony Polo Petrochemicals Ltd.
- Electrosteel Castings Ltd.
- ESSAR Oil Ltd.
- Grasim Industries Ltd.
- Green Environment Services Co-op. Soc. Ltd.
- Gujarat Pipavav Port Ltd.
- Gujarat Positra Port Infrastructure Ltd.
- Hazira Port Pvt. Ltd.
- Hindustan Oil Exploration Company Ltd.

- Hindustan Waste Treatment Pvt. Ltd., Goa
- Jindal Vijaynagar Steel Pvt. Ltd.
- Khemani Distilleries Pvt. Ltd.
- Lavasa Corporation Ltd.
- Nagarjuna Fertilizer and Chemicals
- NCTL Pvt. Ltd.
- Paradeep Phosphates Ltd.
- Paradip Port Trust
- Pipavav Ship Dismantling & Engineering Ltd.
- Reliance Petrochemical Ltd.
- Reliance Industries Ltd.
- Sahara India Pvt. Ltd.
- Saint-Gobain India Pvt. Ltd.
- Saurashtra Chemicals Ltd.
- Saurashtra Cement Limited, Gujarat
- Search Chem Industries Ltd.
- Tata Petrodyne
- United Phosphorus Ltd.
- Zuari Industries Ltd.

12.1.9.5 Clients: Private Industries (Multi-National)

- British Gas International (India)
- Cairn Energy India Pty. Limited
- Command Petroleum, Australia
- Enron Oil & Gas India Limited
- Hindustan Oil Exploration Company Limited
- Hindustan Oman Petroleum Company Limited
- Niko Resources Limited
- Petro Energy Products Company India Limited
- Rio Tinto Orissa Mining Limited
- Shell India Private Limited
- South Asia LPG Company Ltd., (a JV of M/s Total Gas & Power India)
- Mitsui & Company, Japan
- OAO Gazprom, Russia
- Mosbacher India L.L.C

12.1.10 Studies with International Funding

- Construction of Middle Vaitarna Dam for Augmentation of Water Resources and Irrigation near Mumbai (WB) (1990-1993)
- Augmentation of Chennai Water Supply – a Project at New Veeranam, Tamilnadu (WB) (1994-1995)
- Construction of Aerated Lagoons and Selection of Marine Outfall Location (Worli) off Mumbai Coast (WB) (1994-1995)
- Water Quality Studies for Hyderabad Water Supply and Sanitation Project (WB) (1995-1990)
- Oceanographic Modeling Studies for Sewage Outfall Location (Bandra) off Mumbai Coast (WB) (1995-1998)
- Strengthening EIA capacity and environmental legislation in India (ADP) (1998-2000)
- Implementation off Master Tourism Plan in Andaman Islands (UNDP) (1999-2000)
- Design & Implementation of Information Network for Indian Centre for Cleaner Technologies (WB) (1999-2002)
- Planning for Coastal and Marine Environment under Gujarat State Environmental Action Programme (WB) (1999-2000)
- Development of National Guidance Manual & Support Manual on EIA Practices for Enhancing the Quality & Effectiveness of Indian EIA's (WB) (2002-2004)
- Water needs of Brahmani & Sabrmati river basins (ICID) (2002-2004)
- Technical Assistance to ESSO to Enhance the Management of Social and Environmental Safeguards for DPWH Projects, Manila, Philippines (WB) (2005-2007)

12.1.11 US-AEP AWARD TO CSIR-NEERI



UNITED STATES - ASIA ENVIRONMENTAL PARTNERSHIP

ENVIRONMENTAL LEADERSHIP AWARD

This award recognizes outstanding contributions made through working in partnership to improve the environment and quality of life for the people of Asia.

PRESENTED TO:

NATIONAL ENVIRONMENTAL ENGINEERING RESEARCH INSTITUTE

US AEP

Winston Bowman
Regional Environmental Director
USAID Regional Development Mission/Asia

USAID | ASIA

Kris Easter
India Country Manager
US Asia Environmental Partnership

Suneel Parashis
India Western Region Director
US-Asia Environmental Partnership

12.1.12 NABET Accreditation

QUALITY COUNCIL OF INDIA
QCI Creating an Ecosystem for Quality

NABET

National Accreditation Board for Education and Training

NABET

Certificate of Accreditation

CSIR- National Environmental Engineering Research Institute

Nehru Marg, Wardha Road Nagpur- 440020

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2	Offshore and onshore oil and gas exploration, development & production	2	1 (b)	A
3	River Valley projects	3	1 (c)	A
4	Thermal power plants	4	1 (d)	A
5	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
6	Petroleum refining industry	10	4 (a)	A
7	Chlor-alkali industry	13	4 (d)	A
8	Chemical fertilizers	16	5 (a)	A
9	Pesticides industry and pesticide specific intermediates	17	5 (b)	A
10	Petro-chemical complexes	18	5 (c)	A
11	Manmade fibers manufacturing	19	5 (d)	A
12	Petrochemical based processing	20	5 (e)	A
13	Synthetic organic chemicals industry	21	5(f)	A
14	Oil & gas transportation, passing through national parks/ sanctuaries/coral reefs / ecologically sensitive areas including LNG terminal	27	6 (a)	A
15	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	A
16	Ports, harbours, break waters and dredging	33	7 (e)	A
17	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
18	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Dec 14, 2021 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/21/2191 dated Dec 29, 2021. The accreditation needs to be renewed before the expiry date by CSIR- National Environmental Engineering Research Institute following due process of assessment.

Sr. Director, NABET
Dated: Dec 29, 2021

Certificate No.
NABET/EIA/2124/RA 0227

Valid up to
July 01, 2024

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

12.1.13 Contact Persons

Senior Most Scientist/
In-charge : Dr. Sadhana S. Rayalu
Phone : +91 712 2249999
Fax : +91 712 2249900
Email : director@neeri.res.in







Plate 6: Intertidal area at the project site.

Ecological Study & Wildlife Conservation Plan for Proposed Greenfield Chemical complex

(Soda Ash & Sodium Bi-carbonate plants, Captive Co- generation Power Plant, Seawater Intake and effluent disposal)

at Village Bada, Taluka - Mandvi, District - Kutch, Gujarat



SUBMITTED BY
M/S. GHCL LIMITED
JULY-2019

Ecological Study & Wildlife Conservation Plan for Proposed Greenfield Chemical complex

(Soda Ash & Sodium Bi-carbonate plants, Captive Co- generation Power Plant, Seawater Intake and effluent disposal)

at Village Bada, Taluka - Mandvi, District - Kutch, Gujarat

Submitted by

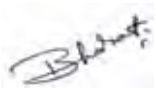
M/s. GHCL Limited

Study by
Dr. Bharat Jethva
NABET Accredited FAE
Cat-I, Ecology & Biodiversity
Bhagwati Enviro Care Pvt. Ltd.

July-2019

CERTIFICATE

This report has been prepared by us based on extensive field visits and data collected, review of published literature, information and maps furnished by M/s GHCL Limited, and data available in public domain. The study was restricted to project area and its 10 km periphery from the project area. The study undertaken is structured around the project information as provided by the project proponent, any change in the proposed activities may result in variation of outcome.



Dr. Bharat Jethva
NABET Accredited FAE
Cat-I, Ecology & Biodiversity
Bhagwati Enviro Care Pvt. Ltd.
Ahmedabad

22nd July 2019
Ahmedabad

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1. INTRODUCTION

1.1. Background

GHCL Limited was incorporated in year 1983 and since then it has established itself as a well-diversified group with a market capitalisation of almost Rs 3000 Crores. It has ascertained its footprints in Chemicals, Textiles and Consumer Products segments.

In the Chemicals sector, the company manufactures Soda Ash (Anhydrous Sodium Carbonate), a major raw material for detergents, glass & ceramics industries and Sodium Bicarbonate (baking soda). The manufacturing facility of Soda As plant is located at Sutrapada of District Gir-Somnath in the state of Gujarat, India. The region is famously known as the Saurashtra coastal belt region and is one of the ideal locations for the manufacturing of Soda Ash.

GHCL Limited at Sutrapada, is one of the leading manufacturers of Soda Ash in India, with annual production capacity of 11,00,000 metric tons. This contributes to almost 25% to 29% of the annual domestic requirements.

GHCL Soda Ash is available in two grades –light and dense grade. Soda Ash and Sodium bicarbonate is marketed in India under the brand name 'LION'. GHCL also has lignite mines at Khadsaliya in the Bhavnagar district of Gujarat to supply the raw material needed for the production of Soda ash. GHCL produces 60 Thousand MTPA of Sodium Bicarbonate which is an important raw material for industries like bakery, pharma, fire extinguisher manufacturing, cleaning agents etc.

The Textile operations at Vapi is an integrated set up commencing from spinning of yarn to weaving, dyeing, printing and processing till the finished products like sheets & duvets take shape and are primarily exported worldwide. It is one of India's leading manufacturers of Home Textiles with an in-house spinning unit at Madurai, Tamil Nadu and a state-of-the-art

home textile facilities at Vapi, Gujarat with a weaving and processing capacity of 45 million meters of fabric up to made ups. A perennial innovator in bed linen category, it has the flexibility to process both cotton and blended fabrics. GHCL's Home Textiles products are predominantly exported worldwide to countries like United Kingdom, United States of America, Australia, Canada, Germany and other European Union countries as well.

Consumer Products operation is another business for GHCL, where it is a leader in manufacturing and selling premium Edible salt, Industrial grade salt and Honey domestically.

Based on the growing demand of Soda Ash and Sodium Bi-carbonate, the GHCL proposed a Greenfield project near coast of Bada village in Mandvi Taluka of Kutch district in Gujarat.

GHCL Ltd. entrusted NABET Accredited Category A Functional Area Expert on Ecology and Biodiversity for assessment of Bio diversity and ecological status within core and buffer zones of the proposed site and also suggest conservation plan and measures to mitigate impacts due to proposed activities, if any.

The Soda Ash process along with captive co generation power plant in totality requires huge quantity of cooling water. To meet overall water requirement for proposed Greenfield chemical complex, sea water intake from Arabian Sea in proximity is the best suitable option. The effluent generated from various process units from entire plant will be dispersed through outfall system at a suitable location in to Arabian Sea. For laying sea water intake and effluent disposal pipelines suitable stretch of nearby forest area will be utilised after taking applicable approvals from statutory authorities.

As a prerequisite (prior environmental clearance) for the proposed development, GHCL shall submit the Form-1, prepared Prefeasibility Report,

to the Environment Appraisal Committee (EAC), Ministry of Environment Forests and Climate Change (MoEF&CC) at New Delhi. As per standard Terms of Reference (ToR) a rapid ecological study for the proposed site is carried out. The study would cover aspects of terrestrial ecological status of the study area such as habitat type and quality, species, diversity, rare, threatened and endemic species, habitat fragmentation, ecological linkage, species of higher conservation significance etc. In case of schedule-I fauna reported in the study area, conservation measures would be proposed. And a detailed study to assess the wildlife habitats, their migration route, etc. and measures to mitigate impacts of the proposed activities.

Therefore, the present study is carried out to fulfil requirement of Standard ToR issued for the sector. The present study is a detailed account of flora, fauna, wildlife habitats present in 10 km radius of the proposed project area.

1.2. Legal Framework

GHCL proposes to set up a green field Chemical complex consisting of Light Soda Ash 11,00,000 TPA capacity and 5,00,000 TPA Dense Soda Ash 2,00,000 TPA Sodium Bi-carbonate along with utilities like, Sea water intake, effluent disposal system, water treatment, RO-DM unit and captive co-generation power plant of 120 MW near Bada village in Mandvi Taluka, in Kutch District of Gujarat.

The proposed Soda Ash project activities fall in 4 (e), Category ‘A’ as per EIA Notification, 2006 and its subsequent amendments. The seawater intake from Arabian Sea and outfall for effluent disposal at a suitable point in Arabian Sea attracts provision of CRZ, Notification 2019. Recommendations from State Coastal Zone Management Authority (CZMA) will be required for the project. GHCL shall apply for ToR under ‘A’ category from EAC. The present study is to fulfil the requirements of studies mentioned under the standard ToR conditions.

1.3. Scope of Work

Scope of work for this study is in line with the standard ToR which includes 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 schedule fauna, conservation measures should be proposed, And a detailed study to assess the wildlife habitats, their migration route, etc. and measures to mitigate impacts of the proposed activities.

The present study has carried out identification of ecologically sensitive receptors (species, habitats& eco-systems) based on field investigations and literature survey along with their mitigation with conservation action plan. The study was carried out in core area (project site) and in buffer area i.e. 10.0km periphery from the project site. The study was carried out systematically and scientifically using primary and secondary data in order to bring out factual information on the ecological conditions of the project site and its surroundings.

The study involved assessment of general habitat type, vegetation pattern, preparation of inventory flora and fauna of terrestrial ecosystem in 10 km radius from the boundary of proposed plant. Biological assessment of the site was done to identify whether there are any Rare, Endemic or Threatened (RET) species of flora or fauna in the core area as well its buffer zone and to identify whether there are any ecologically sensitive area within buffer zone that is likely to be impacted. The study also designed to suggest suitable mitigation measures if necessary for conservation of important species and their habitats etc.

1.4. Objectives of the Study

The major aim of the present study is to avoid any impact of proposed project activity on important natural habitats or species in the study area. Therefore, the study is carried out with following objectives.

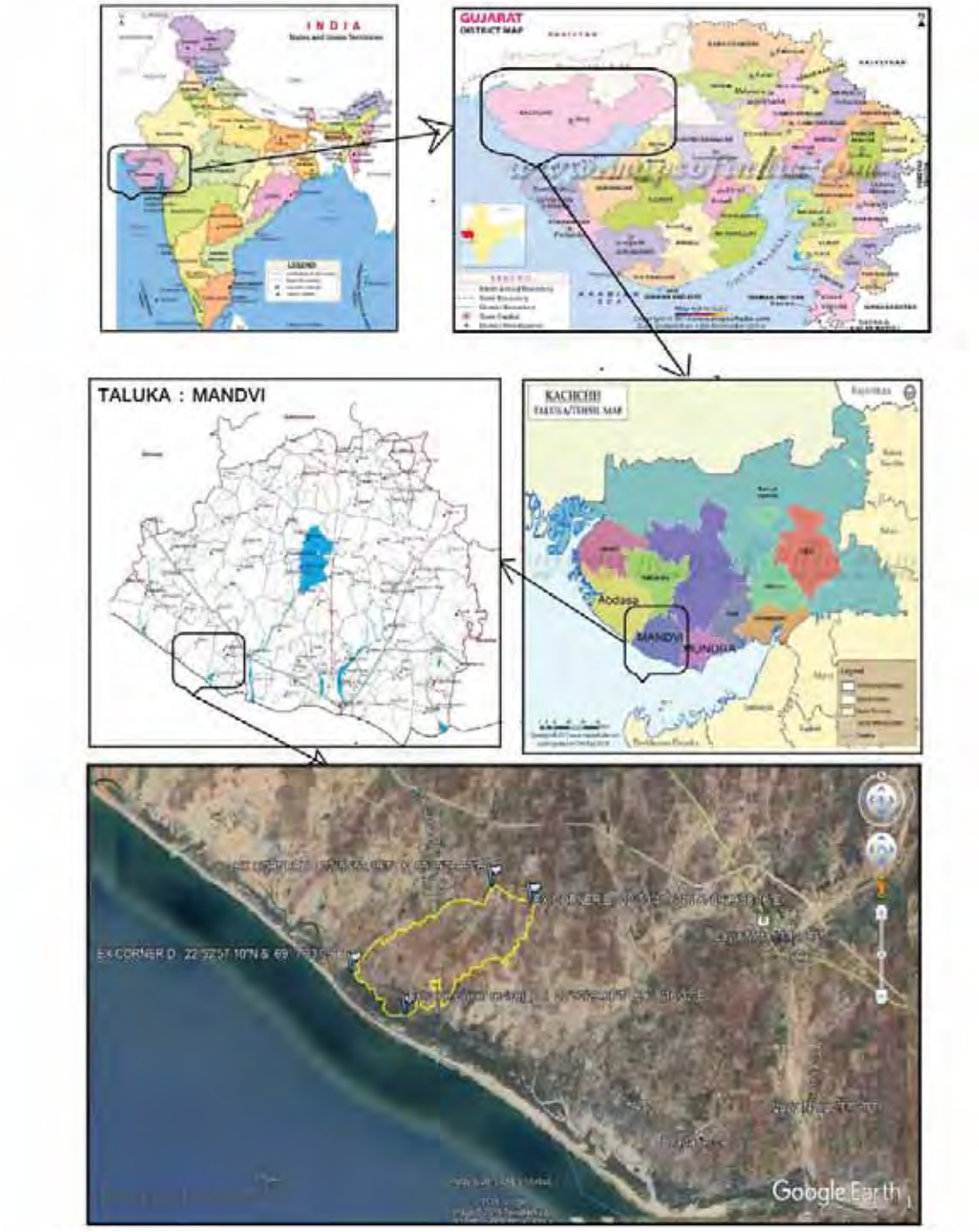
- To evaluate the ecological status of the study area with respect to important flora, fauna and ecologically sensitive habitats etc.
- Assessment of any impacts of the project activities on ecologically sensitive habitats and species.
- Recommend mitigation measures in the form of wildlife conservation plan for Schedule-I species with an in-built monitoring mechanism and schedule of implementation along with financial budget.

2. STUDY AREA

2.1. Project Location

Proposed Project site and the study area are located on the coast of Bada village, in Mandvi Taluka of Kutch district in Gujarat state (Map-2.1).

Map- 2.1: Proposed project location near Bada village of Mandvi Taluka of Kutch district in Gujarat.



2.2. Study Area

For the convenience of the study and the user agencies, the study area was divided in two major parts i.e. 1) Core area/project area and 2) Buffer area i.e. 10.0 km periphery of the project boundary (Map-2.2, Map-2.3).

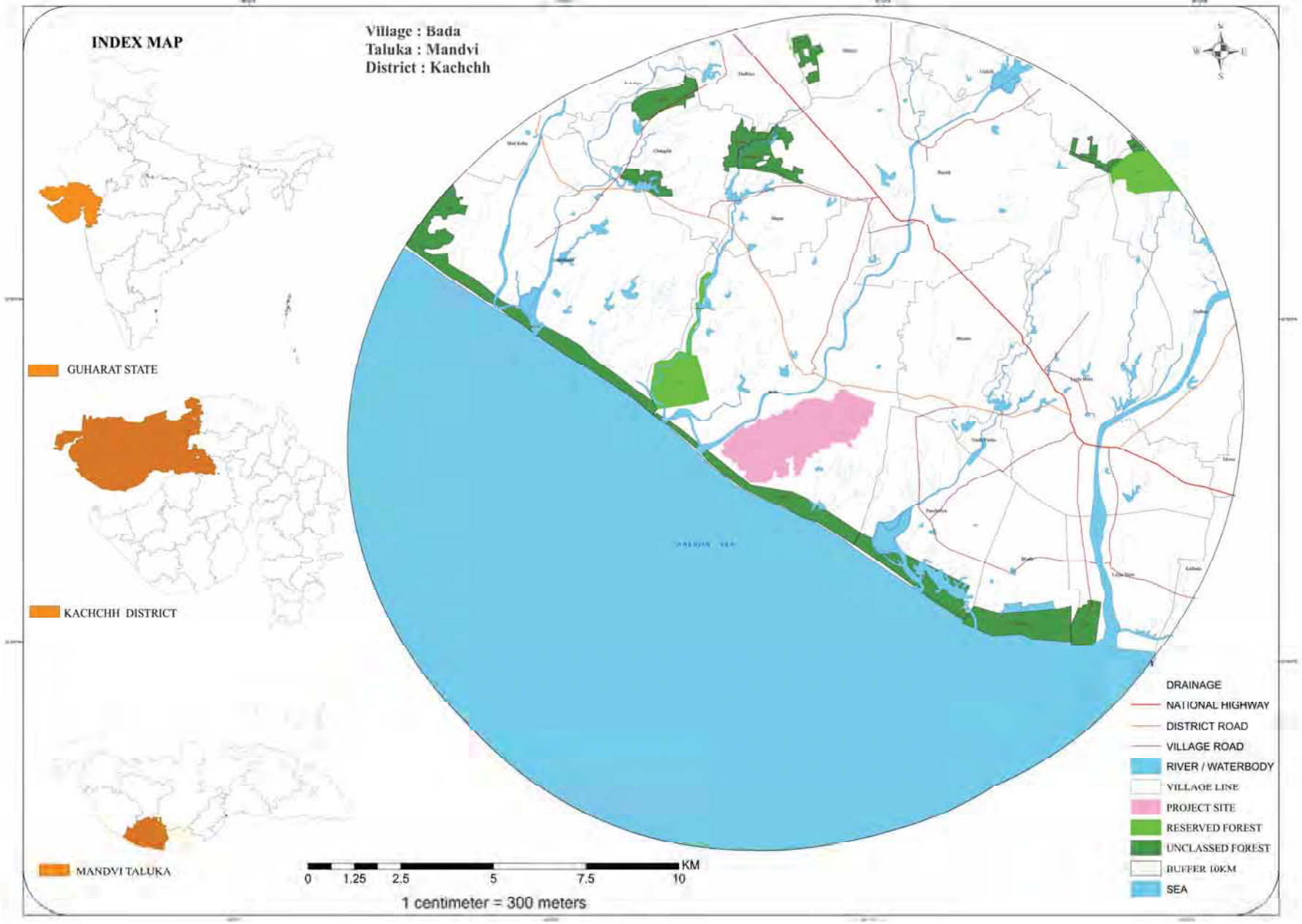
2.2.1. Core Area

Core area is proposed land area for establishing the project Plant (Map-2.2) that covers about 1350 Acre of private unirrigated agriculture land, Sarkarshree land/Govt. land, near village Bada, of Mandvi Taluka in Kutch District of Gujarat. The proposed project area land does not have dense vegetation, sparse clumps of thorny scrub mostly in the form of invasive species i.e. *Prosopis juliflora* exists. No major rivers, drainage etc. passes through the project area. Nearest habitation is at about 1.0 km north from the proposed project site.

Map-2.2: Core and Buffer area location of proposed plant in Kutch, Gujarat.



Map- 2.3: Project location (core area) with 10.0 Km buffer (study area) in Gujarat.



The Arabian Sea coast is located south of the proposed boundary of the project. The area is located at 6.0 km distance from the National Highway NH-41. No major natural vegetation or any human settlements present within the proposed land, therefore there is no need for rehabilitation of any human settlements from the project site. The project site does not fall in 10.0 km periphery of any National Park or Sanctuary or their eco-sensitive zones.

2.2.2. Buffer Area

The Buffer Area mainly consists of revenue areas 20 villages that fall in 10.0 km periphery of the project site (Map-2.2). The list of villages is given in Table-2.1.

Table-2.1: List of villages falling in 10 km buffer area. (To be finalized after project boundary finalized).

No	Village	No	Village	No	Village
1	Bada	8	Panchatiya	15	Dedhiya
2	Bambhdai	9	Bhada	16	Bayath
3	Mod Kuba	10	Layja Nana	17	Bhojay
4	Kokaliya	11	Kathada	18	Undoth
5	Changdi	12	Merau	19	Godhra
6	Mapar	13	Janakpar	20	Layja Mota
7	Bhisara	14	Vindh Timbo		

Majority of the land of the buffer area is occupied by the private unirrigated agriculture fields, forest area, open scrub vegetation, sandy beach, pond/ reservoir, roads & Canal network, village habitations, wind turbines etc. Most importantly there are no Wildlife Sanctuaries or National Parks located in the 10.0 Km periphery of the proposed project area. Due to close proximity of Arabian Sea coastal stretch the activities are regulated as per Coastal Regulation Zone.

3. METHODOLOGY

3.1. Basic frame work of data collection

The prediction of impacts of industries on flora and fauna depends on understanding of the proposed activities, its magnitude/extent, scale and ecological conditions in the surrounding area. Collection of comprehensive baseline information on flora and fauna is therefore a prerequisite for assessment of impacts of industrial development activities. It would also help in advance planning and mitigate the impacts and ultimately managing the natural habitats and resources. The approach to achieve the stated objectives within defined scope of work, include field surveys, interviews, and reviews of literature. Following was the basic fame work of the data collection and analysis for the present study.

3.2. Field Surveys

Several field visits were carried out between month of October-2018 to January 2019 to understand and assess the impacts of proposed project activities on flora and fauna and natural habitats. We evaluated the distribution and abundance of flora and fauna in project area and in buffer area separately.

3.3. Identification of Important Ecological Habitats

The important ecological habitats and features were identified based on our field visits and also mapping of landuse types in the study area. We identified ecologically important habitats through primary survey, literature survey and consulting local naturalists etc. These important ecological habitats and features were then identified on landuse map that is prepared for the study area. Land use map of 10 km radius of the proposed project site is prepared using open source QGIS platform and Google earth. Prominent landuse features such as, roads, rivers/waterbody/drainages, agriculture, sea, sandy beach, village habitation and built up areas, forest area, scrubland etc. were digitized using open source software such as QGIS and their areas were calculated. There may be acceptable margin of

errors in the final map however, locations and important features are identified and shown on map.

3.4. Study of Flora

Assessment of flora was carried out in core project and buffer area during the study period. Study of flora involved simple, systematic and standard techniques. Due to lack of rain in the monsoon, plants such as annual grasses, herbs and few shrub species were located very sparsely. Except some of the common species of trees, shrubs identification of the species was difficult during quadrate sampling. It is therefore, the data of quadrate sampling was not useful in quantifying the species such as grasses and herbs. Therefore, we carried out qualitative assessment of flora in the study areas through ad libitum sampling. During surveys, our team continuously searched for plant species and identified them to prepare a checklist of plants in the respective study area. Various habitats of the study area i.e. drainage, ponds, check dams, agriculture fields, coastal area, sand dunes, dense scrubland, reserve forests etc. were surveyed on foot and qualitative checklists of plants were made. Information on occurrence of plants, their species names, floral phenotypes, life forms etc. were collected continuously during the field trips in the study area from morning to evening hours. The collected data was then systematically used to synthesize a comprehensive checklist of flora that provides baseline information of the representative vegetation community of the study area.

3.5. Study of Fauna

We mainly studied the fauna of higher trophic levels which acts as indicator of the type and health of the eco-systems.

Reptiles: Majority of the reptile species are fossorial in habit therefore the assessment of reptiles and their diversity etc. holds special significance for any development projects. It is difficult to conduct quantitative study on reptiles within a short period of time. Therefore, we relied on qualitative observations only. We carried out study based on interview survey, secondary literature as well as direct observation on road killed reptiles. We

randomly looked for various reptiles and their presence i.e. lizards, snakes etc. in the study areas. Therefore, only a check list of reptiles observed during the study period was prepared.

Birds: Birds, occupying higher trophic levels in the ecosystems, respond quickly to the changes in the habitats and therefore serve as one of the best indicators for evaluating the status of the area. Therefore, we created baseline data on birds by systematically and collected data on their occurrence i.e. presence absence in the buffer and core areas in the study area.

For creating baseline data on birds we randomly walked in the study area during early morning i.e. 6:00 AM to 9AM and 5:00PM to 7:00 PM. These time periods of the day are when maximum bird movements are expected. We walked randomly in the study area carried out sightings of birds ad libitum and recorded species based on their identification. Special reference books for bird species identification were used. Apart from walking randomly, we also relied on specific habitat search for different species i.e. dense bushes, creeks, wetlands, ponds, big trees, open fallow agriculture areas etc. in order to accomplish the inventorization of the bird species found in the study area. All the bird species are classified based on their conservation status, their schedule under Wildlife Protection Act 1972, their migratory status, habitats and their feeding guilds. This was further used for finding out important bird species in the study area i.e. rare, endangered or species of high conservation significance.

Mammals: Like birds, mammals are also occupying higher trophic levels in many ecosystems and respond quickly to the changes in their habitats therefore, serves as best indicators of the ecosystem health. We therefore, chose to create qualitative baseline information on presence and absence of mammals in the study area. Since the presence of mammalian species is low affecting probability of their sightings, in the study area, it was difficult to estimate their population using line transect method. More importantly, it was difficult to accommodate the sightings of nocturnal and diurnal animals in the

study. Therefore, we prepared a qualitative check list of mammals based on their presences and absence using direct and indirect evidences and signs such as footprints, dens, droppings, diggings, scrap marks, etc. in the project area.

Apart from these, search efforts were also made for various signs of important wildlife species in the study area which includes looking for wildlife signs such as dens, diggings, scrap marks, droppings etc. The sites where likelihood of animals is higher such as shady trees, waterholes, dense and undisturbed bushes etc. were surveyed intensively during the survey in the study area. This survey has helped us in identifying various species of mammals in the study area. For mammal inventory, both direct sightings and indirect evidences (like dung, scats, pellets, foot prints, nests, dens etc.) were accounted.

3.6. Important Wildlife Habitats and Protected Areas

We assessed the presence and distances of important wildlife habitats and hotspots such as protected areas, breeding and nesting habitats, coastal habitats, important wetlands, and grassland area from core area. These important areas such as Protected areas (National Park, Wildlife Sanctuaries, Conservation Reserves etc.), Wetlands of national importance, Ramsar sites, Important Bird Areas (IBAs) classified by the Birdlife International etc.

3.7. Rare, Threatened & Endemic Wildlife Species and Their Corridors

We also assessed the presence of rare, endangered, endemic wildlife species in the project area/core area and buffer area. Special search efforts were made during the field visits to identify any such sensitive species or their corridors etc. in the project area and buffer area. Apart from field visits we relied on interview surveys of local people, consultation with local biologists and naturalists etc.

3.8. Literature Review

Considering the limitation to undertake statistically rigorous data gathering system, study also relied on existing knowledge about the ecology and biodiversity of the region. Importantly, there are few studies undertaken in the past dealing with the impacts of Soda Ash Plants on flora and fauna and other concerns of biodiversity conservation. Literature on Soda Ash projects and associated environmental issues were downloaded and collated through internet. Various relevant literatures were surveyed during the study for collection of baseline information. Maps, reports and documents collected from the project proponent were also reviewed and used in the present study. Books on flora, fauna and wildlife were also studied in order to understand the biology of several species.

3.9. Consultations

During the study, series of consultations were made with both technical and non technical stakeholders to get better picture on the project area/core area and buffer zone habitats. In order to know more about the seasonal presence of several faunal species and their movement, study team informally consulted and discussed with local naturalists and local people, from the villages, herders and farmers who inhabit close to the proposed project area.

3.10. Supplementary Information

Other than the above, for the purpose of this study, relevant information was also collected from following sources:

Research papers and reports on flora and fauna of Kutch, Mandvi coast

Google imageries/Google Maps

Project related Maps provided by GHCL Limited

Communications with subject experts

3.11. Analysis to Evaluate the Potential Impacts

The information collected on status of flora and fauna and, their spatio-temporal distributions, hotspots, and potential impacts of proposed project development were logically analyzed and conclusions were extracted for preparation of conservation plan for the project proponent to implement.

3.12. Preparation of Wildlife Conservation Action Plan:

After identification of key impacts of the project, on flora, fauna or any key habitats of any important species or their corridors, a comprehensive wildlife conservation action plan was prepared for 10 years with monitoring mechanism and financial projections.

3.13. Limitations of the Study

The study undertaken is structured around the project information as provided by the project proponent, any change in the proposed activities may result in variation of outcome. The study is based on field visits, literature survey, consultation with local people etc. Professional judgment and subjective interpretation of facts have been applied for this study. All information's and inferences presented herein are based on the specifics currently available within the limits of the scope of work, information provided by the client or its representative, existing secondary data and schedule.

4. Ecological Assessment

The observations and assessment of overall ecological scenario presented in this chapter include details of flora, fauna, natural habitats, protected areas, wildlife species and their migration corridors etc. Such baseline information provides better understanding of the situation and overall ecological importance of the area. This baseline information viewed against proposed project activities help in predicting their impacts on the wildlife and their habitats in the region. Data collected and information gathered from secondary literature on flora, fauna, protected area, natural habitats, wildlife species etc., were analyzed and results are presented as follow.

4.1. Biogeographic Zone

The region falls in Indo-Malay Realam (IM 1303) and Deserts and Xeric Shrublands Biome as defined by WWF. The North-western Thorn Scrub Forests [IM1303] ecoregion represents a large expanse of degraded dry forest surrounding the Thar Desert. Neither exceptionally species-rich nor high in endemism, the ecoregion nevertheless harbours viable populations of antelopes.

As per classification of Indian Biogeographic zones by Rodgers et al. (2000), Kutch district falls under Biogeographic Zone 3 - the Indian Desert and the Biogeographic Province Kutch Desert- 3B. The project site also falls on coast which is Biogeographic Zone-8 Coasts.

4.2. Protected Areas

As per our information and survey there is no Sanctuary, National Park, or notified wildlife corridors within the core area and buffer area (10 km) of the project site. Marine National Park and Sanctuary areas are located at 40 Km distance in south directions, where as Narayan Sarovar Sanctuary is located at more than 75 km in North-West direction, Kutch Desert Wildlife Sanctuary is situated in the Great Rann of Kutch at more than 85km in North East direction. The Wild Ass Sanctuary is located in the Little Rann of Kutch at

more than 150 km distance, Kutch Bustard Sanctuary at more than 50 km in North-West direction and Chari-Dhand Wetland Conservation Reserve is located at beyond 75 Km north**.** Majority of the protected areas and their eco-sensitive zones are located beyond 50 km distance from the project site (Table-4.1, Map-4.1).

Table-4.1: Protected area and their distances from proposed project site.

No	Protected Areas	Distance	Direction
1	Marine National Park	40 Km	South
2	Marine Sanctuary	40 Km	South
3	Narayan Sarovar Sanctuary	75 Km	North-West
4	Kutch Bustard Sanctuary	50 Km	North-West
5	Wild Ass Sanctuary	150 Km	East
6	Kutch Desert Sanctuary	85 Km	North-East
7	Chhari Dhandh Conservation Reserve	75 Km	North

4.3. Landuse Types in the Study Area

We mapped various landuse types of the study area using field surveys and various references available online. The major landuse features are agriculture, sea, beach, waterbodies, built up areas, wasteland (consisting of scrubland & plantation) etc. (Table-4.2 & Figure-4.1).

Table-4.2: Area & percentages of various landuse types in the study area.

No	Land use	Area in Ha.	Percentage
1	Forest	1779.0	4.15
2	Sea	17830.0	41.64
3	Agriculture	16185.0	37.80
4	Builtup	196.0	0.46
5	Wasteland	5465.0	12.76
6	Low-lying Areas	54.0	0.13
7	Waterbody	740.0	1.73
8	Scrub & Plantation	369.0	0.86
9	Beach	205.0	0.48

Map-4.1: Project site location vs. protected areas in Kutch district.



Map-4.2: Landuse in the study area (10 km from project site) in Kutch district.

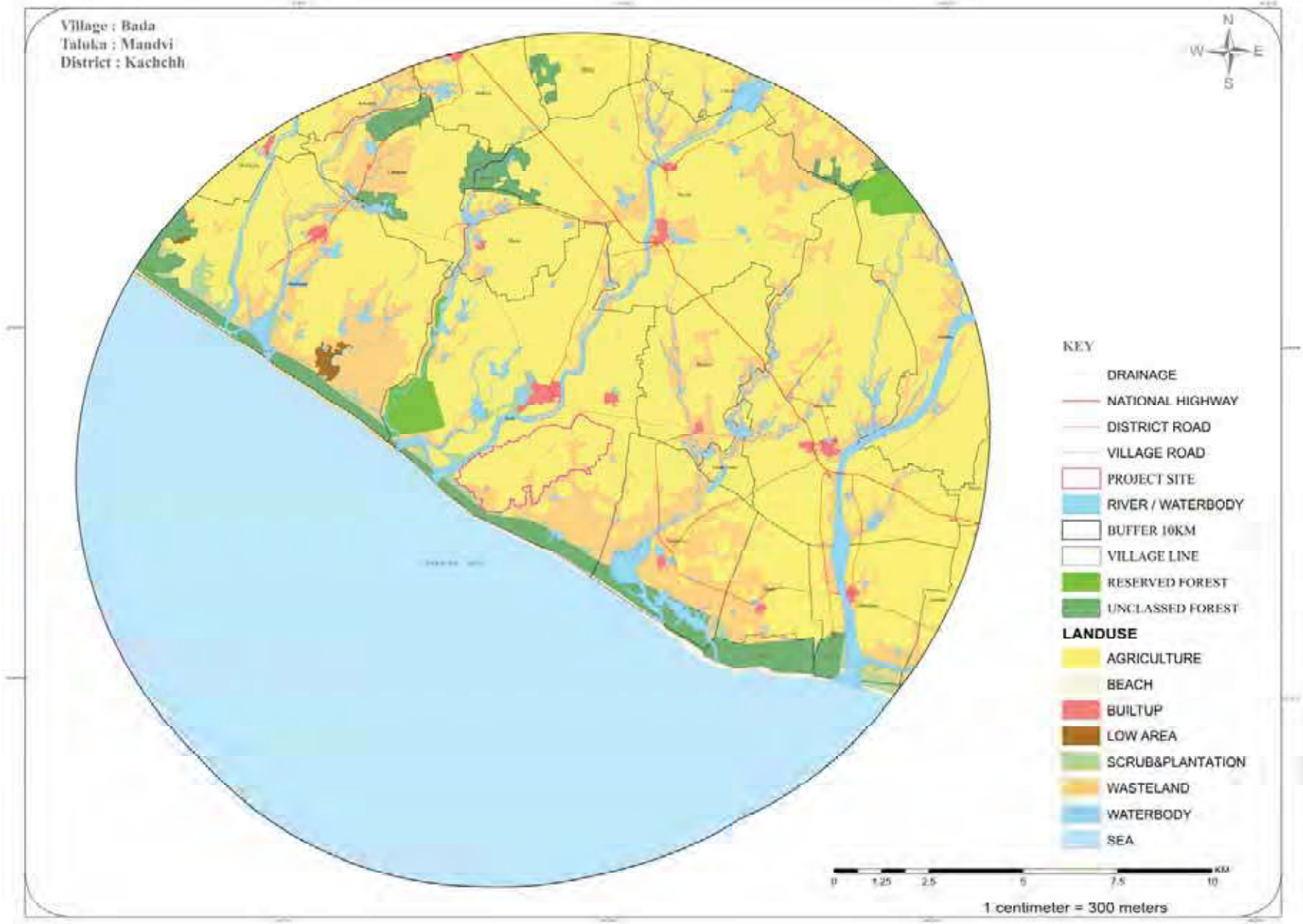
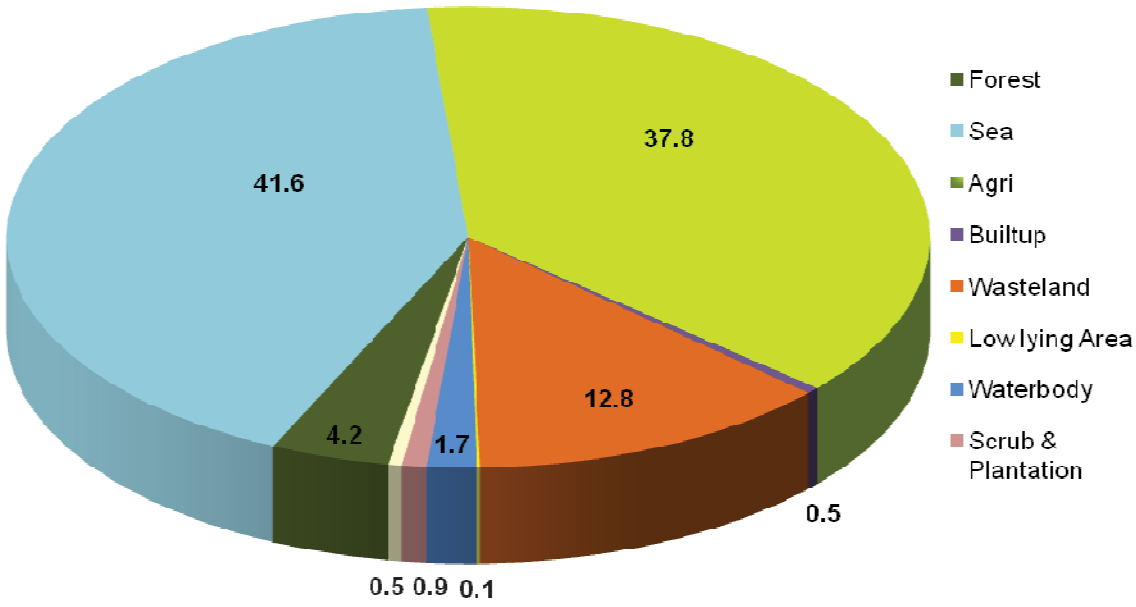


Figure-4.: Percentage of various landuse classless in the study area.



4.4. Important Ecological Habitats

Based on our field visits and literature survey we identified three important and ecologically sensitive habitats that are located within 10.0 km buffer zone. These habitats are listed below

i. Forest Areas
ii. Seaturtle nesting site
iii. Sand dunes

4.4.1. Forest Area & Forest Type

As per the forest classification of Champion and Seth (1968), forest of Kutch district classified under the “Northern Tropical Thorn Forest”. Our field observation suggests that total 4.7% of the study area has presence of forest area in the form of unclassed and reserve forests (Map-4.2, Map-4.4, Figure-4.1). Our field observation suggests that there is no classified forest as such falling within the boundary of proposed project core area. However some part of the unclassed forest area located south of the project boundary would be required for laying sea water intake and effluent disposal outfall pipelines.

Prior to commencing any construction work in forest stretch for intake and outfall pipelines, due approval from forest authorities will be obtained by the project proponent. During field visits we noticed presence reserve forest areas in the buffer zone which are under the jurisdiction of Kutch West Forest Division of Gujarat Forest Department (Table-4.3). These forest areas are well marked with a boundary wall indicating its possession by the forest department. These forest areas are of two types Unclassed (Section 4, transferred land or unsurveyed land) and Reserve forests declared under section 20 of Indian Forest Act 1980.

The thorn forests are dominated with dense patches of *Prosopis juliflora* along with scattered plants of *Acacia nilotica*, *Prosopis cineraria*, *Zizyphus numularia, Salvadora persica, Salvadora oliodes, Capparis decidua, Calotropis procera, Acacia leucophloea, Casia auriculata etc.* The vegetation type of these forest areas are representative of Semi arid, desert eco-system. The details of the forest areas are given in Table-4.3.

Table-4.3: Details of Forest area and forest types in study area.

No	Village	Survey No.	Area (ha.)	Forest Type
1	Bada	633	182.61	Unclassed
2	Bada	639	181.59	Reserved Forest
3	Bada	683	30.62	Unclassed
4	Bambhdai	482/12	235.84	Unclassed
5	Bambhdai	482/12	100.64	Unclassed
6	Bayat	607/p	113.43	Unclassed
7	Bhada	Unsurveyed	196.50	Unclassed
8	Bhojay	391/p	49.28	Unclassed
9	Changdai	215/1	99.63	Unclassed
10	Changdai	215/2	58.33	Unclassed
11	Changdai	215/3	58.71	Unclassed
12	Godhra	694	132.91	Reserved Forest
13	Nana Layja	192/p	75.70	Unclassed
14	Panchatiya	264	214.74	Unclassed
15	Undoth	427	48.47	Unclassed

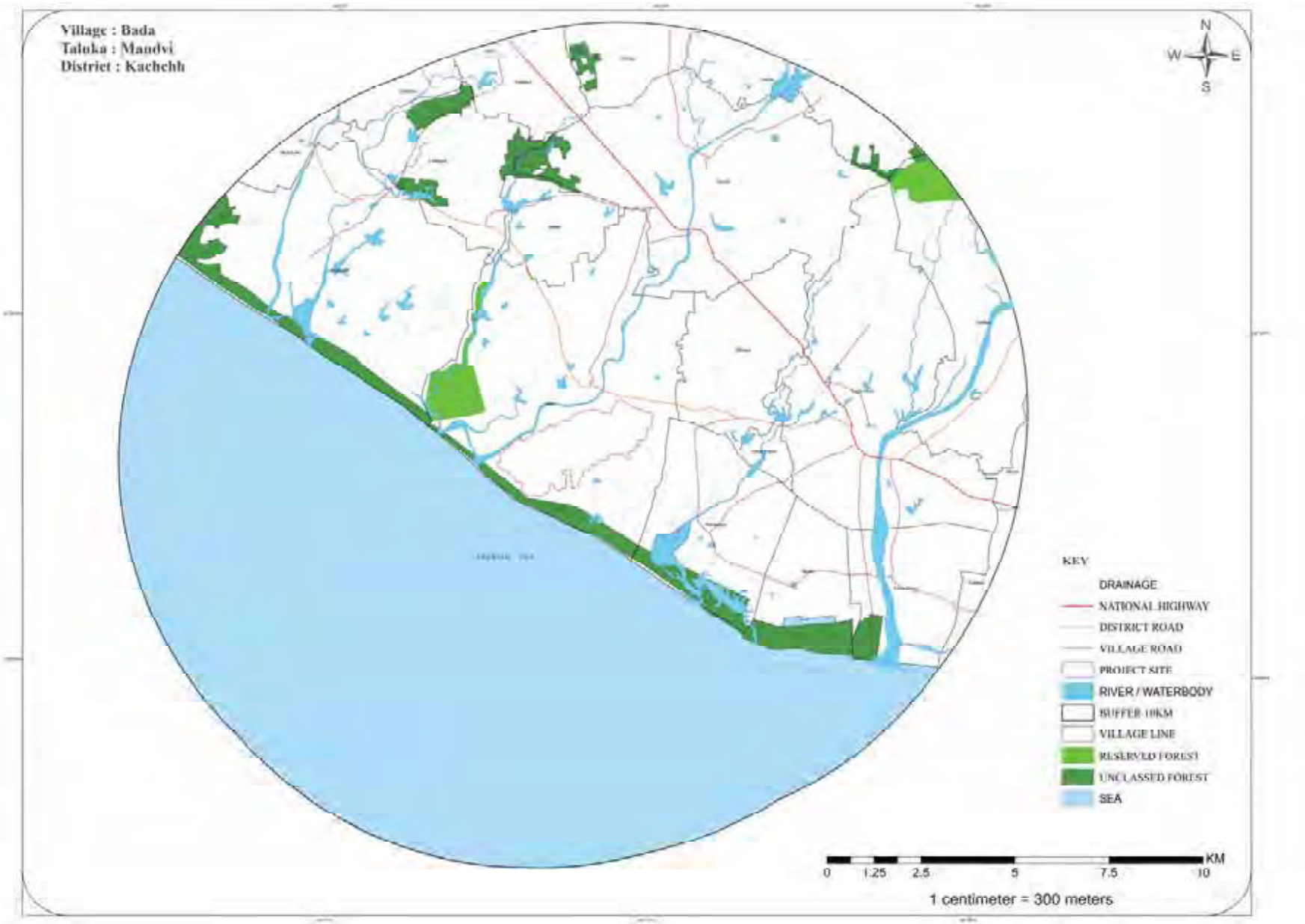
4.4.2. Waterbodies

Our observation and literature review suggests that there are no major wetlands present within the study area i.e. 10.0 km buffer area of the project site. However, there are total 6 seasonal drainages that run north to south in the study area. These drainages have small check dams built on them which are known to accumulate overflowing runoff water for a short period. Apart from being important hydrological features in the semi-arid area, these check dams provide important habitat for many bird species and water source for wildlife in the region. One such seasonal drain is known as Vengdi River which flows from North to South adjacent to project site in western side of proposed project site (Map-4.3). There is one check dam on this river adjacent to project site boundary of the proposed project site. However, all such drainages are seasonal in nature and flows only during rainy days. These drainages flows water from main land to Arabian sea on Kutch coast. Apart from drainages and check-dams, there are number of ponds located in the study area. These ponds mostly have smaller catchment areas and are located near villages, wastelands, forests, or in the agriculture areas to hold rainwater for domestic use such as drinking for human as well as cattle, washing clothes, irrigation etc. One of the closest small minor seasonal ponds is located at 250 mtrs. in south-east direction from the proposed project boundary. A village pond is located at Bada village in north-east direction. These ponds may not be important hydrological features but they provide crucial source of drinking water for wildlife in the region.

4.4.3. Seaturtle Nesting Beach

The sandy stretches of Kutch district are known for sporadic nesting of two species of sea turtles i.e. Olive ridley (*Lepidochelys olivacea*) and Green Seaturtle (*Chelonia mydas*). Gujarat Ecology Commission a Government of Gujarat Organization has carried out a study as part of World Bank aided Integrated Coastal Zone Management (ICZM) Project titled "*Evaluation of Sea Turtle Nesting Population and Threats to Nesting Beaches: Suggest*

Map-4.3: Locations of River, Waterbodies, ponds etc. in the study area.



Conservation and Management Strategies" (also referred as Sunderraj et al 2013). The study based on secondary data (from Gujarat Forest Department and Sunderraj et al 2002) identified total 10 stretches of Seaturtle nesting beaches on Kutch coast.

The study based on available data sources for 10 stretches(Table-4.4) concluded that Bada-Layja Nana, Layja Nana-Mandvi Palace and Mandvi Palace-Mandvi beach were found to be the potential beaches on Kutch coast (Sunderraj et al 2013). According to Sunderraj et al 2013, sandy beach between Bada to Layja nana having length of 11.5 km is first rank beach for seaturtle nesting whereas beach between Bambhdai to Bada of 8 km length ranks 3rd most important nesting beach of Kutch coast.

Table-4.4: Potential Seaturtle nesting beaches identified on Kutch coast (*source Sunderraj et al 2013*).

S. No	Coastal Stretch	Distance (Km)	No of Nests- 1	D/km (RO)	No of nests - 2	D/km (RO)	MRO	FR
1	Pingleshwer – Kamond	4.0	4	1.0 (3)	1	0.25 (8)	5.5	4
2	Kamond – Suthri	5.6	0		2	0.36 (6)	6.0	5
3	Suthri – Chhachhi	10.5	0		3	0.29 (7)	7.0	6
4	Chhachhi – Bambhdai	10.5	0		1	0.09 (9)	9.0	7
5	Bambhdai – Bada	8.0	0		7	0.87 (5)	5.0	3
6	Bada –Layja Nana	11.5	27	2.35 (2)	21	1.82 (2)	2.0	1
7	Layja Nana – Mandvi Palace	6.0	6	1.0 (3)	11	1.83 (1)	2.0	1
8	Mandvi Palace –Mandvi	6.5	29	4.46 (1)	11	1.69 (3)	2.0	1
9	MandviE– Gundiali	6.0	0		0	0	0	
10	Gundilai – Tragadi	4.0	2	0.50(4)	4	1.0(4)	4.0	2
	Total	**72.6 km**	**68**		**61**	**100**		

Data Sources: 1-GSFD-Kachchh Circle, 2- Sunderraj et al 2002,
Rank Order, MRO-Mean Rank Order, FR-Final Rank

According to above mentioned study, density of seaturtle nests is higher (1.8 to 2.3 nest/km) on the coastal stretch between Bada and Nana Layja villages, however, nest density is relatively lower on the coast of Bada and

Bambhdai villages (0 to 0.8/km) (Table-4.4). This difference in nesting could be due to difference in the beach morphology i.e. available beach width, beach slope, vegetation type, disturbance level, predators etc.

The length of the coast in the study area is 23.0 km east to west. Only 2.0 km area falls near the proposed project site. During our field visits we did not observe direct or indirect signs of nesting of seaturtle on the coast near project site. However, sandy beach on the coast of Bambhdai, Pachotiya, Bhada and Nana Layja are likely to have sea turtle nesting activity due to its suitable morphology and past records.

In general, all sea turtle species tend to nest above the high water mark to reduce the risk of tidal inundation or egg wash out (Fowler 1979; Mortimer 1982). During our field visits we observed that the open sandy beach width decreases as we travel on the coast from Nana Layja village (east) to Bada village coast (west). Even bare perusal of 'Google Earth' image reveals that the open beach width is higher on the coast of Bhada and Panchotiya villages which decrease on Bada village coast. Moreover, the width of sandy beach in the supra tidal region near proposed project site is very narrow due to presence of dense *Prosopis juliflora* vegetation on stabilized sand dunes. Also, during our visits we observed that there is a steep slope and dense vegetation in the supra tidal region on the beach near proposed project site. Presence vegetation such as *Prosopis juliflora* is seen to hold sand and stabilized sand dunes (Plate-4.1). We also observed higher presence of predators such as jackals and dogs on the beach.

Therefore, our primary observations suggests that the coast near the proposed project site may not be suitable for seaturtle nesting due to narrow supra tidal region, steep slope, dense vegetation and presence of predators such as dogs and jackals. Though, our observations suggests that there may be no or negligible probability of seaturtle nesting, a proper systematic study shall be carried out to find out the exact status of seaturtle nesting in the study area through an expert.

Map- 4.4: Coastal habitats around project area in the study area.



4.4.4. Sand dunes

During our field survey, we observed presence of sand dunes along the Arabian Sea coast. Presence of sand dunes in the study area suggests high energy wave dominated sea coast. The sand dunes are also present south of the proposed project site boundary. These sand dunes are formed due to deposition of fine to medium, well sorted sand particles. Sediments of the dunes consist of windblown deposits of fine to very fine sand and silt. Majority of the part of the sand dunes are having dense vegetation in the form of *Prosopis juliflora, Acacia nilotica, Acacia leucophloea, Salvadora persica, Caparis decidua, Ipomoea pes-caprae, Suaeda nudiflora etc. with* salt tolerant grasses such as *Cenchrus biflora, Cenchrus Ciliaris, Urochondra setulosus*, *Dactyloctenium*s *indicum, Cynodon dactylon, Aleurops lagopoides* etc.

Presence of dense vegetation suggests stabilized status of sand dunes. The North-South width of the sand dunes varies from 500 mtrs to 200 mtrs The North-South sand dune height profile studied suggest that the height of the dunes varies from 4 mtrs on fore shore area and landward side to 13 mtrs in the central area. The East-West sand dune height profiling suggests that it varies from 5-13 mtrs with undulating deposits. We also observed directs and indirect signs of variety of animals starting from reptiles, birds and mammal species.

4.5. Floral Diversity and Vegetation Type in Core & Buffer Area

We evaluated biodiversity and abundance parameters of vegetation/plant species in the core area and in the buffer area of the project site.

4.5.1. Vegetation Type & Community in Core Area & Buffer Area:

Core area: The proposed project site falls in the arid-semi arid climatic condition. Our field survey and literature review suggest that the vegetation types and community in the project area is that of semi arid-arid regions. It is represented by sparse thorny scrub vegetation. The major part of the project

area is devoid of large trees and mainly consists of highly scattered and sparse shrubs i.e. *Prosopis juliflora, date palm, Prosopis cineraria, Acacia nilotica, Casia auriculata* and *Zizyphus numularia, Caparis deciduas etc.* the major grasses include several species of *Cyperus* and herbs *Indigofera*. Details of vegetation survey results are discussed in forth coming sections.

Buffer area: The buffer area (10.0 km periphery) comprises mainly of agriculture fields, wastelands, forest plantation patches by forest department, scattered bushes of *Prosopis juliflora, Prosopis cineraria, Acacia nilotica, Azadirachta indica. Prosopis juliflora* and *Zizyphus numularia* among the wild plants and cotton among the cultivated crops are the most dominant plants in the buffer area. Except for highly scattered and small plants of *Commiphora wightii*, there were no rare, endangered or conservation concern species present in the close vicinity of the project area in the buffer zone.

Major part of the buffer area is agriculture fields particularly on the Eastern side of the project area. Since ground water is saline up to 15 km from the coast and highly saline up to 4 km from the coast. Thus, dry land farming is practiced near the coast and irrigated farming is practiced in the farms that are 5-6 km away from the coast. Cotton, Jowar, Bajra, Isabgol, Groundnut, Green gram etc are the main crops grown here. Some villages, especially in the central corridor are endowed with good surface water facilities, and irrigated agriculture is possible in these villages. Being semi-arid, arid zone, this region support low plant growth and therefore, not many large trees with sizable canopies are present in the buffer zone. However, at every village local people have managed to grow trees for shade, aesthetic and religious values.

4.5.2. Dominant Plant Species

Our qualitative survey suggests that the study area is dominated by few species such as *Prosopis juliflora* & *Zizyphus numularia* in shrubs and *Sporolobus maderaspatensiss* & *Cymbopogon martinii* in grasses and *Casia*

5. Potential impacts & Mitigations

Impacts of proposed Soda Ash and Sodium Bicarbonate Plant on flora and fauna of surrounding area were identified mainly by using information presented in previous Chapter-4. The baseline information was collected through field visits and was also substantiated through secondary information. Finally, the baseline ecological information was juxtaposed with the project activities and impacts arising due to its construction and operation phases. Specific impacts were visualized in terms of seasonal issues related with the ecology of important species, their habitats and issues related with their breeding.

Following the above mentioned approach, impacts on various components of biodiversity were assessed. The component wise identification of potential impacts is deliberated below.

5.1. Anticipated Ecological Impacts of Proposed Project Activity

The general ecological impacts during the erection stage will be short term, temporary in nature and will be confined to the close boundary of the project site. Following are the general ecological impacts anticipated from the construction and operation phases of the proposed Soda ash and Sodium bicarbonate Plant.

- Change in landuse worth the project area and removal of vegetation from the project site.
- The major impact on terrestrial ecology is due to emission of dust which will settle on surrounding area soil and vegetation and it would gradually decrease biomass productivity of the surrounding eco-systems.
- During the construction work, the excavation of the soil take place and construction wastes such as oil, grease and debris may pollute the soil and decrease its productivity.
- The impact on the terrestrial ecology could be due to the emission of pollutants due to dusting like Particulate Matter.

- Chronic fugitive emissions and the material flow through drainage could potentially choke hydrology and degrade aquatic eco-systems.

- Chronic spillage and flow of raw materials, fly ash or sediments from the project site through runoff could alter the texture of soil in surrounding areas. This in long term potentially affects the vegetation and biotic components of the surrounding area.

5.2. Impacts on Terrestrial Flora

Baseline status of terrestrial vegetation clearly suggests that the project sites falls in semi-arid biogeographic zone with low floral density and diversity. The proposed Soda ash and Sodium bicarbonate Plant construction activities may involve removal of vegetation from the project site. Since the project site does not have important plant species, the unavoidable removal of vegetation during construction activity could be considered negligible impact on flora. However, it is recommended that minimum vegetation shall be removed from the project site and the important plant and tree species on the periphery of the project site be left as part of green belt development.

There are patches of forest plantations located in buffer area, company should take utmost precautions not to degrade these areas by constructing temporary roads, dumping materials, solid wastes, garbage or any other form of materials within these forest areas. The fugitive emission from the construction and operation activities shall be strictly controlled so that it does not affect the growth of vegetation in these forest areas. In order to control dust and fugitive emission, it is strongly recommended that company shall grow thick green belt on the periphery of the project site.

The study area supports only a few plant species of higher conservation significance (e.g. *Commiphora wightii*). *Commiphora wightii* is medicinally and economically important plant which has very slow growth rate in semi-arid zones. However, their population is quite small and isolated in the buffer area. Also they are found in quite stunted stage.

5.3. Impacts on Fauna

Though, the impacts of proposed plant and related construction activities may be on several faunal taxa, but for the present study we focused mainly on vertebrate classes i.e. reptiles, birds and mammals for identification of impacts and future monitoring purpose. Therefore, in the present study we identified impacts on the reptiles, birds and mammals particularly important and threatened species of the landscape.

5.3.1. Impacts on Reptiles

The baseline study has reported total 15 species of reptiles reported from the study area and 6 species from core area. No rare, endangered or Schedule-I species are reported from the core area i.e project site. However, Flap shell Turtle, Indian Monitor Lizard, Green Seaturtle and Olive Ridley Seaturtle are reported from the buffer area which belongs to Schedule-I of Wildlife Protection Act or listed as Threatened as per IUCN Red list categories. Since no rare or high conservation significance species of reptiles is present in the core and immediate buffer area of the proposed project site, the impact on the reptiles could be low. Impact and mitigation on Seaturtles are given in separate section.

However, a species i.e. *Uromastix hardwickii* belong to Schedule-II which is reported form buffer area. This is a resident and most vulnerable species as it is localized and sedentary unlike other reptiles such as snakes and lizards. This species is often hunted or poached for their oil and meat. Therefore, it is recommended that during construction phase no construction workers shall be involved in poaching of such species.

5.3.2. Impacts on Birds

We observed total 105 species of birds in the study area. There is no Important Bird Area (IBA) present in the study ara. During our study we reported total 7 species of birds that belong to Schedule-I in Buffer area of the proejct site. We also observed 7 near thereatened species of birds the study area. During our study we did not report any Schedule-I species or Threatned species from the project core project site area.

Occurrences of birds in the study area are mainly due to the overall ecological condition which provides them habitats where they obtain their food and safety for their breeding or wintering in the region. Intertidal sandy beach, wetlands in the form of tidal creek, checkdams, ponds, reserve forest areas etc. provide habitats to number of resident and migratory birds. Any changes or degradation of air, soil and water quality could lead to degradation of vegetation and habitats of birds. If by any activities of the project, such areas are lost, damaged or degraded then it can have negative impacts on the present distribution and density of birds in the study ara. Increased noise levels and disturbance levels could also result in their displacement form the core area and its immediate surroundings. Direct disturbance by presence of people, vehicle, their noise, vibrations, lights etc. can potentially displace most of the birds' species.

It is therefore, recommended that project proponent shall all possible measures to control pollution during construction and operation phases. It is also often noticed, that construction workers engage in poaching of wild animals particularly the birds which are easy to trap using various methods. It is therefore, recommended that construction workers shall be strictly instructed so that they don't engage in such acts. It is also recommended that project proponent shall monitor the ecological status including the density and diversity of birds in the study area at a periodic intervals.

5.3.3. Impacts on Mammals

We observed a total of 16 mammal species in the buffer area and 7 in the core area of the project site. No Threatened or Schedule-I species reported from the core area of the project site. There is only one Schedule-I species of mammals (Chinkara) in the buffer area i.e. Chinkara was directly sighted in the study area during our field visit.

Occurrences of mammals in the study area are mainly due to the overall ecological condition which provides them suitable habitats where they feed, rest and breed in the region. Moreover, unlike birds most of the mammals except bats are terrestrial in habits therefore, terrestrial land environment i.e. their habitats is of utmost importance to them. Therefore, degradation of air, soil and

water quality would lead to degradation of vegetation and the overall quality of their habitats. Increased noise levels and disturbance levels would also result in their displacement form the core area and its immediate surroundings. Direct disturbance by presence of people, vehicle, their noise, vibrations, lights etc. can potentially displace most of the mammalian species. It is noticed, that construction workers also sometime engage in poaching of wild animals particularly the chinkara, Nilgai, hare, pigs etc. using various methods.

The impact of proposed project on mammals also involves displacement of the mammalian species occurring in the core area. We recorded presence of Nilgai, Common Mongoose, Wild Pig and Long eared Hedgehog within the core area of the proposed project site. These species would be displaced from the project core area during the project operation. These species are most common mammalian species which are found throughout semiarid, non-forested, open scrubland, non protected areas and even in the periphery of most of the villages in Kutch region.

There is one Schedule-I mammalian species reported in the study area landscape i.e. Chinkara. According to local people and local cattle herders, this species has scattered presence in the most part of the Kutch region. Since Chinkara is a Schedule-I mammal species which exist in the entire study area, it requires attention of the project authority to ensure minimum impacts are caused to the species. Project proponent shall ensure that all types of impacts due to project construction and operation on the surrounding vegetation and the forest areas are minimized through strict pollution control measures. Details of the conservation actions for the species are mentioned in the forth coming chapter.

5.3.4. Impacts on Seaturtles

A coastal beach admeasuring total 23 km lies in the study area on the coast of Bambhdai-Bada-Pachotiya-Bhada–Nana Layja villages. Most part of the coastal area falling in the study area is sandy and has presence of sand dunes of varying height and width. The southern boundary of proposed project site is located near the sea coast of Bada village which covers a stretch of

approximately 2.0 km length. The proposed project boundary is near and along the nearby coast.. Our field observations, literature review and consultation with local NGOs suggest presence of sporadic nesting activities of 2 species of Seaturtle on 19.5 km long sandy coastal stretch from Bambhdai to Nana Layja. According to literature survey (*Sunderraj et al 2013*) the coastal stretch between Bambhdai –Bada-Nana Layja has reported density of 1.4 seaturtle nests per kilometre. This density of nests could be considered sporadic in nature compared to mass seaturtle nesting activities occurring on eastern coast of India. Moreover, as per our field survey, we observed that width of supra tidal areas on the coast near the proposed project boundary is narrow and has dense vegetation and steep slope. These conditions may not be very suitable for nesting activities of seaturtle on the coastal stretch of 2.0 km that is located south of the proposed project boundary. However, the proposed project in absence of mitigation measures could result in following impacts on seaturtle.

Direct loss of habitat: The project facilities would include laying of intake and outfall pipelines from the southern boundary of the project area into the Arabian Sea. The laying of seawater intake and outfall pipelines corridors would require to be carried out through the coastal forest (mainly *Prosopis juliflora*) patch, sand dune area and the intertidal area on the coast. The area required/occupied (approximately 50 mtrs width) for laying of pipelines each for intake and effluent disposal corridor could result in the direct loss of coastal habitat i.e. sand dunes and intertidal areas if not planned properly.

Changes in morphology of coast: The activity of laying of intake and outfall pipeline corridors may involve use of heavy machines that may damage or change the morphology of the sand dunes and the intertidal areas on the coast. This might affect the nesting activities of seaturtle.

Direct disturbance to nesting: The construction activities would enhance presence of people, machines, lightings etc. These activities may deter the females approaching for nesting on the beach during breeding season. This may affect nesting activity of two species of seaturtle if appropriate mitigation measures are not considered.

Increase in artificial illumination on the coast: The proposed project boundary lies north off the Bada village coast. The industrial development on the coast also results in higher illumination near beach areas, this is one of the major impacts of coastal development known to disturb and distract seaturtle nesting and hatchlings.

Pollution on coast: Since the proposed project lies at near the coast, the airborne fugitive dusts and other pollutants during construction and operation phases could pollute coast and cause changes in physical and chemical property of coast.

6. Conservation Plan for Schedule-I Species

Based on our field observations and literature survey we found several species important plant species as well as Schedule-I wildlife species in the study area (Table-6.1). We reported one plant species and 13 animal species. The faunal wildlife species include 4 species of Reptiles, 7 species of birds and 1 species of mammals.

Table-6.1: Schedule-I fauna and Critically Endangered plant species reported from the study area.

No.	Taxa	Name of Species		IWPA Status	IUCN Status
		Common Name	Scientific Name		
1	Reptile	Flap shell Turtle	*Lissemus punctatea*	Sch-I	LC
2	Reptile	Green Seaturtle	*Chelonia mydas*	Sch-I	**EN**
3	Reptile	Indian monitor lizard	*Varanus bengalensis*	Sch-I	LC
4	Reptile	Olive Ridley Seaturtle	*Lepidochelys olivacea*	Sch-I	**VU**
5	Bird	Black shoulder kite	*Elanus caeruleus*	Sch-I	LC
6	Bird	Eurasian Spoonbill	*Platalea leucorodia*	Sch-I	LC
7	Bird	Indian Peafowl	*Pavo cristatus*	Sch-I	LC
8	Bird	Marsh Harrier	*Circus aeruginosus*	Sch-I	LC
9	Bird	Oriental Honey Buzzard	*Pernis ptilorhyncus*	Sch-I	LC
10	Bird	Shikra	*Accipiter badius*	Sch-I	LC
11	Bird	Short-toed Snake Eagle	*Circaetus gallicus*	Sch-I	LC
12	Mammal	Chinkara	*Gazella bennettii*	Sch-I	LC
13	Plant	Gugal	*Commiphora wightii*	--	CR

6.1. Impact – mitigation matrix

Based on our observation, literature review and consultation with local people, and NGO, we formulated following impact vs mitigation matrix. It is advised that company shall follow the suggestions provided in the following Table-6.2.

Table-6.2: General Impacts vs. mitigation matrix & Conservation plan.

Issues		Risk level	Reason/Status in relation to project site	Suggestions
Species	Rare/ Threatened	Med	Threatened species (Green Seaturtle, Olive Ridley Turtle and *Commiphora wightii*) are reported from the study area.	• Ensure no damage or disturbance is caused to these species and their habitats by project activities or people involved in project. • Take up conservation, protection and propagation measures for these species in the study area. • Periodically monitor these areas for their status as part of comprehensive biodiversity monitoring plan.
	Endemic Species	Low	No endemic species of any fauna or flora were recorded during study in the core area and buffer area.	Nil
Important Natural Habitats	Protected Areas	Nil	No protected area present in close vicinity	Nil
	Eco-sensitive zone identified by government	Nil	No protected area or their eco-sensitive zones are present within 10 km periphery of the proposed project site	Nil
	Important Bird Areas	Nil	No Important Bird Area (Birdlife International) is present in core or buffer area.	Nil
	Ramsar site	Nil	No Ramsar sites present in Kutch	Nil
	Wetlands of National Importance	Nil	Great Rann, Little Rann of Kutch and Chharidhandh are located at more than 75 km distances	Nil
	Wetlands of international Importance	Nil	No wetlands of international importance present in 70 km periphery of the project site	Nil
	Wildlife Corridors	Nil	No notified or officially identified wildlife corridor present in and around project site.	Nil
	Forest Area	Med	Patches of open tropical thorn forest or scrub forest are present in the buffer area of the proposed project site.	• Ensure no damage is caused to forest area due to pollution, dust, movement of vehicle, people through forest areas. • Ensure thick green belt on project site periphery to control pollution.

	Mangroves	Nil	No mangroves are present on the coast due to sandy beach. In the study area.	• Nil
	Corals	Nil	No coral reef area present on the coast falling in the study area.	Nil
	Breeding/ nesting areas	Med	Sandy beach stretch between Nana Layja to Bambhdai falling in the buffer area /study area is known for sporadic nesting of two species of Seaturtles.	• Ensure no damage, disturbance is caused due to any of the project activities, pollution, dusting, material flow etc. during construction or operation phase. • Promote conservation, protection and propagation of these species . • Monitor status of this habitat as part of comprehensive biodiversity monitoring plan.

6.2. Conservation Plan for Schedule-I species

6.2.1. Conservation Plan for Critically Endangered Plant Species:

Gugal: (*Commiphora wightii*)

Status: Our field survey in the proposed project area revealed that there is a critically endangered plant species present in the open scrubland as well as forest areas present in the buffer area. This plant was found with low density in the buffer area. This plant has high medicinal values and is facing the threats of extinction by overexploitation for commercial purpose (Silori et al., 2004; Joshi, 2002; GUIDE 2009) from Kutch. However, recently Gujarat Forest Department has accomplished a large scale project on plantation of *Commiphora wightii* in Gujarat. Through this project thousands of plants were raised and planted in entire Kutch region.



iii. Strict control on dust pollution using various methods and technologies shall be carried out.
iv. During construction water sprinkling on roads and soil dumps shall be carried out to control dust pollution.
v. During operation phase Air quality standards (emission of pollutants like Particulate Matter) must be maintained as per GPCB/CPCB norms in and around the project site.
vi. Ambient noise pollution and vibrations during construction and operation phases shall be within limits of the standards mentioned.
vii. Plantation of thick green belt on periphery of the project site shall be created using local and hardy species.
viii. Ensure minimum movements of vehicles or people on the coast and no unauthorized movement through the Forest Areas located nearby in the study area.
ix. Ensure safe passage of runoff through drainages located nearby the project area.
x. Ensure no fly ash, sediments, pollutants, or any raw materials are spill out and flow into nearby drainage during construction or operation phase of the project.
xi. GHCL shall ensure that their construction workers and other workers during construction or operational phase shall not be involved in chasing, teasing, poaching and hunting activities of birds, reptiles or mammals around the project site.
xii. All other general measures to keep environmental parameters within permissible standards.

6.4.2. Compensatory Measures & Recommendations

There are few ecologically important habitats and Threatened species of plants and animals are present in the study area. Therefore, GHCL shall take utmost care during construction and operation phases so that these areas and species are not affected by their activities. Following are some of the recommendations that would help in propagation, protection and conservation of such habitats and species in the study area.

xiii. In order to compensate for the potential degradation of *Commiphora wightii* habitats GHCL shall carry out its plantation through Kutch-West Forest Division, Bhuj.

xiv. Sandy coastal stretch of Nanalayja to Bambhdai villages has been identified as an important Seaturtle nesting beach in the study area. Since coast near proposed project area is less likely to support nesting activities of seaturtles, no significant impacts are envisaged. However, GHCL shall ensure that no materials (dust, fly Ash or sediments) form their premises flows through air to the coastal areas and alter the texture of sandy beach. It is recommended that GHCL through their CER budget shall financially support Seaturtle conservation activities being carried out by the forest department.

xv. Since India Peafowl and other Schedule-I bird species are recorded in the study area, GHCL shall carryout tree plantation in the surrounding villages, schools, roads so that these species are provided with more safer roosting places in the study area.

6.4.3. Monitoring Measures & Recommendations

xvi. After commencement of the project GHCL shall carryout ecological & biodiversity monitoring at every 5 years for 10 years and take necessary corrective measures accordingly. GHCL shall bear the cost of third party monitoring. Monitoring of status of biodiversity and wildlife shall be monitored with specific emphasis on status of Seaturtle nesting, sand dunes, *Commiphora wightii*, forest areas, waterbodies in the study area.

6.5. Implementation of Mitigation Plan

Since the project is located outside the protected areas and their eco-sensitive zones in Kutch, most of the wildlife mitigation recommendations are self regulatory for user agency, therefore the implementation of these mitigation measures shall be carried out by the project proponent (GHCL) through their own staff and CER budget. However, there are several recommended activities which would be carried out by Kutch West Forest Division, Bhuj. GHCL shall

provide financial support through their CER budget to Kutch West Forest Division to carry out these recommended ecology/wildlife mitigation activities.

A special emphasis on ecological conservation shall be given by extending special responsibility to senior environment authority within the management of the proposed project authority. A senior ecologist shall be consulted on regular basis to oversee ecological/wildlife conservation activates under CER/CSR. The senior personal responsible for the conservation of ecology shall report directly to the head of the organization.

6.6. Monitoring of Mitigation Plan & Compliances

Though, most of the recommendations are self regulatory for user agency, monitoring of these recommendations and other conditions imposed by various agencies towards wildlife mitigation measures shall be monitored by a third party agency. Third party monitoring would involve ecological/biodiversity study at interval of 5 years for 10 years. These studies shall be carried out to evaluated long term impacts of the proposed project activities on the wildlife, biodiversity, waterbody, ecology and forest areas present in the 10 km periphery of the project site. Therefore, as per guidelines issued by the Principle Chief Conservator of Forests, Wildlife dated 13th August 2018, user agency shall allocate up to 5% of the total cost of mitigation plan as third party monitoring cost. Total Rs. 10.0 Lakh shall be allocated by the GHCL for monitoring of mitigation plan for the period of 10 years.

Since the area falls under the jurisdiction of Kutch West Forest Division, the overall official monitoring of the implementation of mitigation plan would be carried out by the Kutch West Forest Division, Bhuj. Therefore, as per guidelines issued by the Principle Chief Conservator of Forests, Wildlife dated 13th August 2018, user agency shall allocate and pay the monitoring and administrative cost to the forest department. For carrying out overall monitoring activities, user agency shall pay Rs. 10.0 Lakh for monitoring and administrative cost to the Kutch West Forest Division.

6.7. Financial Allocation for Wildlife Conservation Activities

Following is the proposed budget allocation for 10 years after approval from all statutory bodies permitting the construction and commencement of the project (Table-6.3). GHCL shall make financial allocations for taking up wildlife mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife from their CER budget. GHCL shall also carry out several activities through their own budget and staff.

Table-6.3: Proposed financial allocation for mitigation and conservation measures.

S. No	Activity	Implemen-ting Agency	Duration Years	Rate/Year (Lakh)	Total Amount (Lakh)
A	**Implementation Activities**				
1	Carryout Tree plantation in the villages, schools roadsides etc. areas in study area.	GHCL	10 years	5.0	50.0
2	Carryout plantation of *Commiphora wightii* in RF areas and maintenance (to be paid by GHCL)	KWFD	5 yeas	2.0	10.0
3	Contribution to Forest department for Sea Turtle Conservation Activities (to be paid by GHCL)	KWFD	10 years	2.0	20.0
				Subtotal	**80.0**
B	**Monitoring & Compliances Activities**				
6	Ecological & Biodiversity monitoring by third party once every 5 years for 10 years after commencement of project	GHCL	At every 5 year for 10 years	7.5	15.0
7	Monitoring and administrative activity (to be paid by GHCL) by Kutch West Forest Division	KWFD	First year		10.0
8	Documentation and preparation of Annual compliance report. 10 years	GHCL	Annual	2.0	20.0
				Subtotal	**45**
				Total (A=B) Amount in Lakh	**125.0**

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Annexure- I:
Curriculum Vitae of the Expert, Dr. Bharat Jethva (Wildlife Biologist)

Academic qualification:

Ph.D. in Ecology & Environment -FEB-2003 from Wildlife Institute of India-FRI Deemed University-. Thesis title: 'Feeding Ecology and Habitat Needs of Wolves in the *Bhal* Area of Gujarat'.

M.Phil., Zoology, 1995 Department of Zoology, School of Sciences, Gujarat University Ahmedabad.

M.Sc., Zoology 1994., Department of Zoology, School of Sciences, Gujarat University Ahmedabad. India

B.Sc., Zoology, 1992 from Bahauddin College-Junagadh, Saurashtra University Gujarat, India.

Work experience:

1. Currently working as Category-A Accredited Expert for Ecology & Biodiversity, by National Accreditation Board Government of India and Recognized by Ministry of Environment Forests & Climate Change for Environment Impact Assessment (EIA) experts.

2. More than **20 years of experience** in the field of Wildlife Research and Conservation with special emphasis on Endangered species, Conservation and research on Endangered Birds (ornithological), Environment Impact Assessment, Wetlands, Coastal and Marine Ecosystems, Grasslands and Desert Ecosystems.

3. Worked as **Asian Waterbird Census Coordinator** with Wetlands International-South Asia, New Delhi from September 2008 to June 2011. Coordinated Asian Waterbird Counts in Asian region.

4. Worked as **Scientist** for 5 years (1st September 2003 to 31st August 2008) at GEER Foundation (an autonomous institute under Gujarat Forest Department), Gandhinagar.

5. As **Senior Research Fellow** in the Conservation of the India Wolf Research Project at Wildlife Institute of India from January-2000 to August 2003.

6. As **Junior Research Fellow,** in the Conservation of the India Wolf Research Project at Wildlife Institute of India. From December-1997 to December-1999.

7. As **Technical Assistant** on Conservation of the Indian Wolf Research Project at Wildlife Institute of India. From November 1995 to December 1997.

Memberships:

1. Member of IUCN-Flamingo Specialist Group.
2. Member Bird Conservation Society of Gujarat
3. Executive Committee member Mangrove Society of India –Goa,
4. Member- International Society for Mangrove Ecosystems-Japan
5. Member Sirenian International, USA

Technical reports published:-

1. Status, distribution and habitat Survey of **Great Indian Bustard** *Ardeotis nigriceps* in Gujarat, 2008. Project sponsored by Ministry of Environment and Forests, Government of India.

2. Status of ***Gyps* Vultures in Gujarat, 2007**- A comprehensive state-wide survey of vulture nests and population. Project sponsored by Ministry of Environment and Forests, Government of India. Published by GEER Foundation.

3. **Biodiversity of Purna Wildlife Sanctuary** a comprehensive ecological and socio-economic study. Mammals and socio-economic studies 2007.

4. **Biodiversity of Jessore Wildlife Sanctuary** a comprehensive ecological and socio-economic study. Contribution in studies on mammals 2008.

5. Movement Pattern of **Wild Ass Across the Proposed Kachachh Branch Canal** (Sardar Sarovar Narmada Nigam Limited) on the Northern Fringe of Wild Ass Sanctuary in Gujarat, 2006.

6. Status of ***Gyps* Vultures in Gujarat, 2005-** A comprehensive state-wide survey of vulture nests and population. Published by GEER Foundation

7. **Proceedings** of the workshop on **"Cranes and Community in Gujarat**-a holistic conservation strategy for future" held on 23rd November-2004 at GEER Foundation, Gandhinagar, Gujarat, India.

8. Ecological Impacts of **Lignite Mining in Kutch** with Special Emphasis on the Indian Grey Wolf and its Habitats, 1997. WII-EIA Technical Report No-19, Wildlife Institute of India.

Peer reviewed scientific publications:-

1. Jethva B. D. and Jhala Y. V. 2004. Computing biomass consumption from prey occurrences in Indian wolf scats. **ZooBiology**, Volume 23, Issue 6, Pages 513 - 520.

2. Jethva B. D. and Jhala Y. V. 2003. Foraging Ecology, Economics and Conservation of Indian Wolves in the Bhal Region of Gujarat, Western India. **Biological Conservation:** 116: 351-357.

3. Jethva B. D. and Jhala Y. V. 2003. Sample Size Considerations for Food Habits Studies of Wolves from Scats: **Mammalia** 67: 589-591

4. Sankar K, Jethva B. 2002. Notes on Food habits of Stripped Hyena (*Hyena hyena*) in Sariska Tiger Reserve: short note in **Journal of Bombay Natural History Society**.

5. Ramesh Sabapara; Suresh Chugh; **Bharat Jethva;** Budhan Pukazhenth; David E. Widt; Terri L. Roth (1994) A note on reproduction research. **Asiatic Lion** Population Habitat Viability Analysis (PHVA) report, Vadodara, 1993.

6. Sandeep B. Munjpara, **B. Jethva**, C.N. Pandey: 2011: Distribution of the Indian Bustard Ardeotis nigriceps (Gruiformes: Otididae) in Gujarat State, India . Journal of Threatened Taxa. 01/2011; 3:2090–2094.

7. Sheetal Punjani, **Bharat Jethva**, Preeti Shrivastava: 2011: Morphophysiology of Radiation Induced Lenticular Opacity. International Journal of Scientific & Engineering Research, Volume 2, Issue 12, December-2011, ISSN 2229-5518.

8. Sheetal Punjani, **Bharat Jethva**, Preeti Shrivastava: 2012. Effects of fructose on Radiation induced lenticular opacity. International Journal of Scientific & Engineering Research, Volume 3, Issue 11, November-2012 ISSN 2229-5518.

Other Contributions:

1. Newsletter for Asian Waterbird Census December 2008. Published by Wetlands International Malaysia office.

2. Childress, B., Nagy, S. and Hughes, B. (Compilers). 2007. International Single Species Action Plan for the Conservation of the **Lesser Flamingo (*Phoenicopterus minor*)**. AEWA Technical Series No. --. Bonn, Germany.

3. Contribution to Chapter on Dugong of Asia, in a Book on Dugong (*Dugong dugon*) published by Elen Hinse. James Cook University of Australia.

Trainings obtained:

1. Training Programme on '**Mainstreaming Biodiversity in Energy Sector'** held in Wildlife Institute of India, Dehradun, Uttarakhand on 3-5 August 2015.

2. One week Regional Training Programme on **Wetland Management and Conservation** held between 2-6th May 2008 at GEER Foundation, Gandhinagar, Gujarat.

3. UNESCO Regional training program on **Satellite Image Processing** for Natural Resources Management (21-31 January 2002), conducted by Centre for Geo-Sciences and Engineering, Anna University, Chennai.

4. **Animal Welfare** Training Course 1995. Conducted by Animal Welfare Board of India, Ministry of Environment and Forests held at Sakkarbaug Zoo, Junagadh Gujarat.

Selected presentations/Abstracts in conferences:

1. Jethva Bharatkumar, A. G. Untawale, Jayantibhai Chauhan, Shigeyuki Baba. "Mangrove plantations by local community in Sabarmati Estuary, Gulf of Khambhat, Gujarat". Silver Jubilee Mangrove Conference on July 26-27 2017.

2. Jethva Bharat, A. G. Untawale, Shigeyuki Baba. "Mangrove Plantation in Sabarmati Estuary, Gulf of Cambey in Gujarat". International Conference on Sustainable Mangrove Ecosystems: Managing A Vital Resource For Achieving The SDGS and the Paris Agreement. 18-21 April 2017, Bali, Indonesia.

3. Conservation Potential of Green Sea Turtle (*Chelonia mydas*) in Gujarat. National workshop on Marine biodiversity and community held at GEER Foundation with the support of MoEF, Government of India at Ahmedabad.

4. Jethva B. 2005, Vulture Conservation initiatives in Gujarat, Abstract and Oral Presentation in the conference of Society for Conservation Biology Asia Chapter held in Kathmandu, Nepal, November-2005.

5. Jethva B. 2005, Crane Conservation and community in Gujarat, Abstract and Oral Presentation in the conference of Society for Conservation Biology Asia Chapter held in Kathmandu, Nepal November-2005.

6. Jethva B and Jhala Y.V 2003, Foraging ecology, economics, and conservation of Indian wolves. Abstract for an oral presentation in International Wolf congress to be held at Banff, Alberta Canada on September-25–28, 2003.

7. Jhala Y.V., Jethva B, and Chauhan K, 2001. The Role of Predation by Wolves (*Canis lupus pallipes*) and Jackals (*Canis aureus*) on Blackbuck (*Antelope cervicapra*) in Velavadar National Park, India. Presentation in International Canid Conference held in Oxford University U.K.

8. Jethva B and Jhala Y.V 2000, "Food habits, Consumption and predation by wolves in the Bhal, India, Abstract in an international symposium "Beyond

2000: Realities of Global Wolf Restoration held at Duluth, Minnesota, USA, Feb-2000.

9. Jethva B. and Jhala Y.V. 2000. “Ecological Impact Assessment of Lignite Mining in Kutch India”. Oral presentation given in an international symposium: Carnivore-2000, held in November-2000 at Denver, Colorado. USA.

National Accreditation Board for Education and Training

QCI/NABET/ENV/ACO/21/1974 Sep. 20, 2021

To
Bhagwati Enviro Care Pvt. Ltd.
28, 29, 30, Parmeshwar Estate II,
Opp. HDFC Bank & AMCO Bank,
Phase I, GIDC Estate, Vatva,
Ahmedabad – 382445, Gujarat

Sub.: Extension of Validity of Accreditation till December 19, 2021– regarding
Ref.: Certificate no. NABET/EIA/1921/RA0156

Dear Sir/Madam,

This has reference to the accreditation of your organization under QCI-NABET EIA Scheme, the validity of **Bhagwati Enviro Care Pvt. Ltd.** is hereby extended till December 19, 2021 or completion of assessment process, whichever is earlier.

The above extension is subject to the submitted documents/required information with respect to your application and timely submission and closure of NC/Obs during the process of assessment.

You are requested not to use this letter after expiry of the above stated date.

With best regards.

(A K Jha)
Sr. Director, NABET

Annexure IV: Enclosed as separate report

Comprehensive Hydrogeological assessment studies and designing of rain water harvesting program by Hydro-Geosurvey Consultants Private Limited, Jodhpur (HCPL).

Hydrogeology Assessment Studies

For

Proposed Greenfield Chemical Complex

Near Village, Bada, District Kutch

Gujarat

GHCL Limited,

GHCL House,

Opp. Punjabi Samaj Seva Hall, Navrangpura

Ahmedabad

Consultant:

Hydro-Geosurvey Consultants Pvt. Ltd. (HCPL)

Jodhpur.

1.0 INTRODUCTION

M/s GHCL LIMITED (GHCL) proposes to set up a green field **Chemical Complex** over an area of 546 hectares with production capacity ultimately up to 5,50,000 MTPA light Soda Ash, 2,50,000 MTPA dense Soda Ash, 66,000 MTPA Sodium Bicarbonate & 60 MW of Captive cogeneration power plant near village Bada, taluka Mandvi district Kutch, Gujarat. In the second phase Soda Ash plant capacity will be expanded up to 11,00,000 MTPA, Bicarbonate 1,26,000 MPTA & Captive co generation power plant up to 120 MW. In addition, company has planned to move in for salt based derivatives also. Water requirement will be met from desalination plant to be set up in the plant area for meeting process water and cooling water directly from once through cooling system.

Hydro-Geosurvey Consultants Private Limited, Jodhpur (**HCPL**) has been retained by **GHCL** to conduct the hydrological and hydrogeological studies of the core zone (plant area) and its buffer zone (10 km radius), the study area and to be part of the EIA report to be submitted to MoEF&CC for getting Environmental Clearance for the plant redistricting.

HCPL carried out the comprehensive hydrogeological assessment of the core and buffer zones and determined the present status of ground water development. HCPL conducted the assessment studies by collecting hydrogeological data of key wells by visiting them in the field, monitoring its hydrological data, estimating the long term ground water recharge, present ground water withdrawal and status of ground water development. The pre-monsoon and post monsoon hydrological data from 30 key wells were collected for the year 2018. The fluctuation of water levels in the surrounding area of the plant as recorded through monitoring wells was interpreted in relation to ground water recharge. As the buffer zone lies in taluka Mandvi which has been declared as an Over-exploited block**,** ground water recharge program has been proposed by recharging all the harnessable rainwater.

The present report embodies the findings of comprehensive hydrogeological assessment studies of core and buffer zones of **Soda Ash project** and extends proposals for ground water recharge of the buffer zone which will also help in restricting sea water ingress.

However, no ground water exploitation has been proposed from the plant area and ground water flow is towards the sea.

2.0 HYDROLOGY

2.1 Physiography of study area (Buffer Zone)

The buffer zone forms the southern part of the district Kutch and lies near Arabian Sea. Regionally, the area forms a vast featureless plain having a gentle slope towards the sea with a thick strip of sandy low land along the coast. Major area of buffer zone forms a flat plain with minor undulations and has 1.60 to 2.30 m/km slope towards south west. The elevation within the buffer area varies from 0 m above msl in south west to 55 m above msl in the north eastern part of the buffer zone as shown in the digitized elevation map **(Figure-1).** The major drainage flow direction is towards south-west towards Arabian sea. The major river that drains the study area is Vengadi river.

The drainage exhibits a sub-parallel drainage pattern in most of the area with dendritic pattern in few areas in northern part of the study area. But, segments of seasonal rivers are observed to be controlled by structural lineaments. Aval, Babool, thorny bushes, grass etc. are prevailing vegetation in the region.

2.2 Vengadi river basin

Vengadi river, a seasonal river drains the central part of the buffer zone. This river originates outside the buffer zone near village Makda and flows in dendritic pattern across the sloping areas of villages Makda, Poladia, Nagrecha, Undoh Moti, Padampur, Bayat, Bada and finds their way in to Arabian sea. A few seasonal nallas dissect the study area and drain to the Arabian sea whatever little precipitation is received in this semi-arid region. All the rivers and streams are seasonal and flow only in direct response to rainfall and remain dry for rest of the year hence the surface run off from the area is only during monsoon. The general drainage pattern of the area is a dendritic and sub-parallel.

2.3 Physiography of Chemical Complex (Core Zone)

The Soda Ash Project site is located about 50 m to 300 m east of Vengadi river and about 700 m north from Arabian sea. The major morphological features include undulating and flat land. The area is gently sloping towards southwest. Part of the area is under rain –fed cultivation whereas remaining areas is practically barren. There is no regular drainage pattern in this area. Rainwater follows as per the surface topography. The availability of soil cover is all over the area. The natural vegetation was practically lacking. In the core area, the natural flora is represented only by occasional cactus or small bushes of wild nature over the waste land.

2.4 Drainage pattern in Chemical Complex (Core Zone)

The drainage pattern of the plant area is shown in **Figure -2** where one stream of first order originates just outside the plant area near village Janakpur and passes through northern corner of the plant area. The catchment area of this stream originating outside the plant area is small and this stream carries limited surface runoff during the rains.

Figure-2. Drainage pattern before starting construction of plant

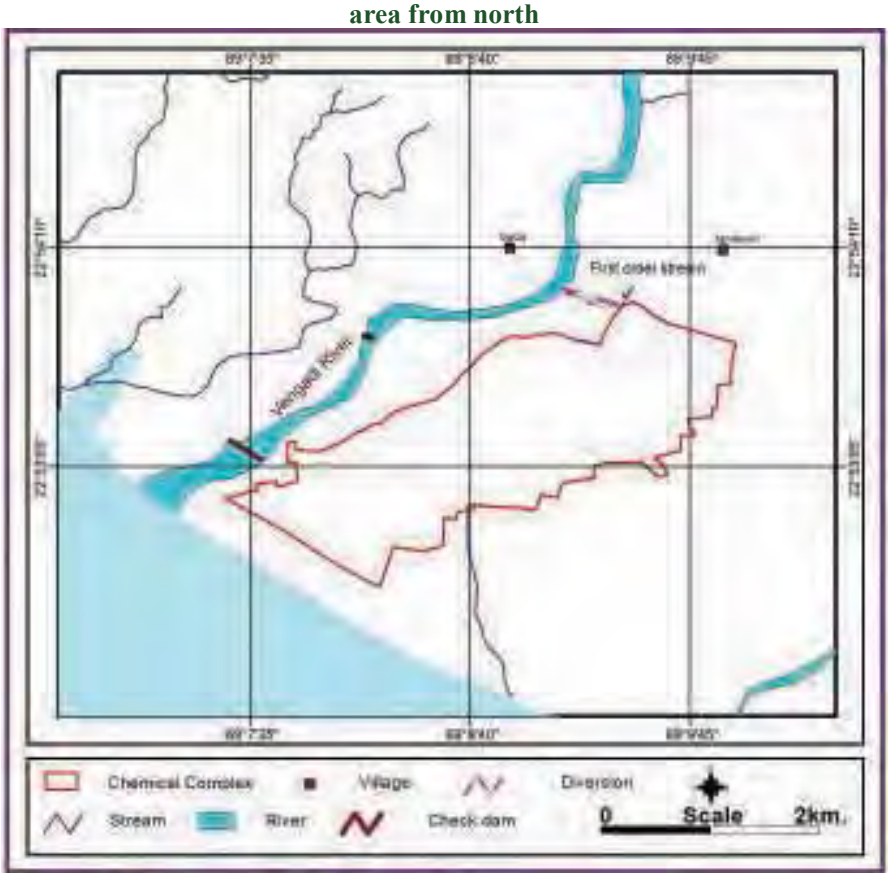


2.5 Impact of plant (Chemical Complex) on the surface water regime

During the plant operational activity, the surface runoff of the stream originating outside the plant area will be collected in a proposed drain, constructed just outside the plant area and proposed drain will join Vengadi river, **(Figure-3)**. Whatever surface runoff gets generated due to rainfall in the catchment area of the 1st order stream outside the plant area will be collected in the proposed drain and released in the nearby Vengadi river outside the plant area **(Figure-3)**. It is therefore apparent that there is not likely to be any adverse impact of plant on the surface water regime.

For channelizing the monsoon run off from the area adjacent to plant it is required to construct a peripheral drain along the plant boundary so that the flooding is avoided and run off find its way to the natural slope towards Arabian Sea.

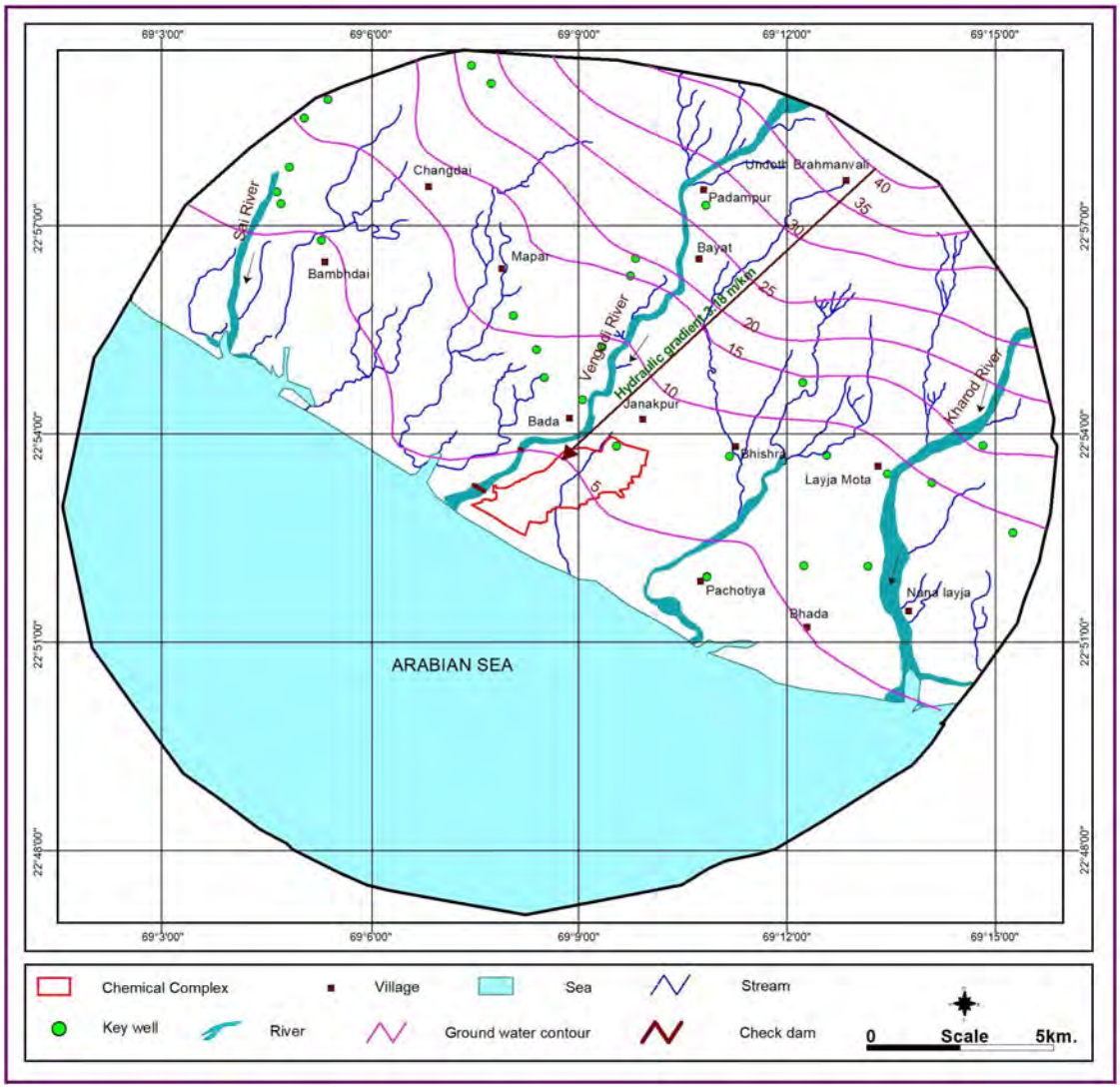
Figure-3. Drainage after construction of plant by diverting the stream entering in the plant area from north



3.3 Movement of ground water

As indicated, ground water movement is controlled mainly by the hydraulic conductivity of aquifer. A review of the topography and drainage pattern reveals that the general slope of the area is towards south west, and ranges from 1.8-3.2 m/km. The ground water also follows the topography and surface water flow direction and ground water movement is towards south west direction. The hydraulic gradient has been observed as 3.18 m/km as calculated from the monitoring of wells of the area **(Figure-8).**

Figure-8. Ground water contour map during post-monsoon period,2018



3.4 Nature of hydraulic conductivity

The principal aquifer of the buffer area is mainly alluvium which has low to moderate hydraulic conductivity which is mainly developed due to interstitial openings. Although, there are number of irrigation wells mostly bore wells driven by submersible pumps in the area, pump tests to find out hydraulic conductivity had not been conducted. However, a pump test carried out in nearby area on a bore well tapping alluvium has indicated hydraulic conductivity (K) of 10 m /day which can be classified as moderate.

3.5 Yield of wells

There are number of bore wells and open dug wells in the buffer zone tapping alluvium for irrigation and drinking purpose in villages. Open wells are generally 10-20 m deep and are operated mostly by electrically driven centrifugal pumps or by diesel engines and do not sustain pumping and go dry after few hours of pumping. Average yield of open wells with pump tapping alluvium as 100 m^3/day. Bore wells tapping alluvium yield 20-25 m^3/hr.

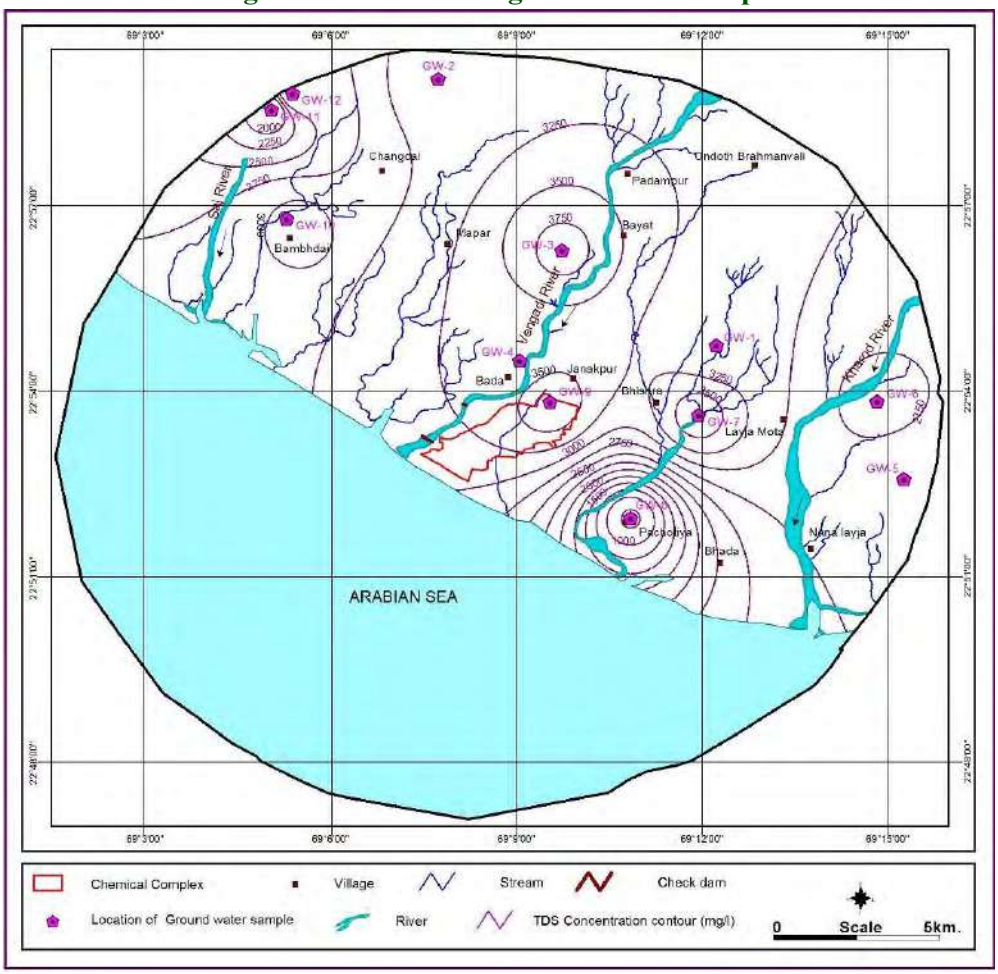
3.6 Quality of ground water

Quality of ground water is generally saline near the coastal area while it potable in upland area. There is wide variation in ground water quality laterally and vertically. Shallow ground water is potable but at depth it becomes saline. With a view to determine the quality of ground water in the buffer zone, 12 ground water samples were collected from bore wells and open wells. The coordinates of the sampling points are shown in **Table-7** while its location is shown in **Figure-9.** All the samples which were collected from bore wells near the rivers and ponds have shown lesser salinity than those which are away show the higher salinity. The Isocon map (showing the distribution of total dissolved salts in the buffer zone) has been prepared and is shown **as Figure-10.**

Table-7. Coordinates of the locations and sources from where the ground water samples were collected

S. No.	Sample	Latitude	Longitude	Source
1.	GW-1	22°54′40.5″	69°12′12.1″	Borewell
2.	GW-2	22°58′56.9″	69°07′44.6″	Borewell
3.	GW-3	22°56′11.8″	69°09′43.6″	Borewell
4.	GW-4	22°54′25.7″	69°09′02.9″	Borewell
5.	GW-5	22°52′31.4″	69°15′12.2″	Borewell
6.	GW-6	22°53′46.4″	69°14′46.6″	Borewell
7.	GW-7	22°53′33.1″	69°11′54.7″	Borewell
8.	GW-8	22°51′53.8″	69°10′49.6″	Dugwell
9.	GW-9	22°53′45.8″	69°09′32.0″	Borewell
10.	GW-10	22°56′42.5″	69°05′18.9″	Borewell
11.	GW-11	22°58′27.4″	69°05′04.5″	Borewell
12.	GW-12	22°58′43.2″	69°05′24.9″	Borewell

Figure-9. Locations of ground water sample



5.0 GROUND WATER DISCHARGE

5.1 Ground water discharge in core zone (Plant area)

At present, there is no dugwell / borewell in the plant area being operated for industrial and drinking purpose. It is also proposed that no ground water abstraction will be done for the plant and its entire water requirement will be met by desalination plant getting sea water from Arabian Sea for meeting process water and cooling water requirement's, total ground water discharge from core zone will be nil.

5.2 Ground water discharge in buffer zone (10-km radius area)

The ground water discharge takes place mainly by evapo-transpiration and by withdrawal from open dug /bore wells operated mainly for irrigation. There are 120 open wells along with 977 bore wells for irrigation tapping alluvium, mostly in the northern part of the buffer zone. Average yield of open wells with pump tapping alluvium has been taken as 100 m^3/day, while bore wells are yielding 160 m^3/day. Taking these values, the discharge is estimated as under.

120×100×120 = 1.44 mcm (Open wells with pumps tapping alluvium)

No.of wells × average yield/day × Rabi irrigation = Withdrawal

977×160×120 = 18.76 mcm (Borewells tapping alluvium)

No. of wells × average yield/day × Rabi irrigation = Withdrawal

In addition, the drinking and livestock water requirement of around 18 villages having a local population of about 32,500 is met by open dug wells is around 0.89 mcm considering 75/litre/capita/day consumption, i.e. therefore amounts to **21.09 mcm.**

6.0 PRESENT STATUS OF GROUND WATER DEVELOPMENT

The present study reveals that against the total ground water recharge of **20.93 mcm**, including recharge from return flow of irrigation water, the ground water discharge is **21.09 mcm** indicating the status of ground water development of buffer zone as **100.76%.** The

buffer zone therefore appears in **over-exploited category**. However, against the ground water recharge of **0.316 mcm**, the ground water abstraction from the plant area is **nil** indicating the status of ground water development of core zone as **0.0%**. So, plant area (core zone) lies in **safe category**. So, there will be no depletion in the static ground water reserves of the plant area but there may be long term declining trend of water level in block as it has been found as over-exploited. However, **GHCL** proposes to take up a rainwater harvesting program as part of it's CSR activities by deepening the existing village ponds to store surplus surface runoff from its catchment area and to recharge the groundwater basin which will dilute the salinity and raise the water level thereby also resisting the sea water ingress.

The Central Ground Water Board in association with state ground water organization carry out estimation of dynamic ground water reserves of every taluka/mandal of the state by monitoring the water levels in key wells during pre and post monsoon periods every year along with estimation of ground water draft. The report is published once in two years and last report has been released in June, 2017 for the dynamic ground water reserves as on 31.03.2013. This report places all the talukas/ mandals in different categories like safe, semi-critical, critical and over-exploited depending on the status of ground water development and long term water level trend.

This report has indicated the status of ground water development of Mandvi block is **over-exploited** while for whole Kutch district indicating the status of ground water development is 83% with no declining trend of water levels either in pre or post monsoon period. The present study has indicated the buffer zone as **over-exploited** like the Mandvi which lie in **over-exploited category**.

7.0 NEED FOR RAIN WATER HARVESTING FOR BUFFER ZONE OF SODA ASH PLANT AREA

As the status of ground water development of buffer zone as well as of Mandvi taluka has been found (>100%) and declared as over-exploited by CGWB, GHCL realizing its national obligation, proposes to utilize the surface runoff of the buffer zone of the Soda Ash plant by deepening the existing village ponds which will function as percolation tanks. The

ground water recharge by utilizing the roof top rainwater of the plant buildings and paved roads cannot be taken up as the depth to ground water table is within 5 m bgl and ground water is saline. The CGWA has also mentioned that artificial ground water recharge should not be taken in those area where water table is within 5 m bgl as it will otherwise create water logging leading to soil salinization and alkalinization. Accordingly, artificial ground water in the plant area is not proposed. The GHCL proposes to take up rain water harvesting by harnessing the roof top rain water from different buildings and proposes to collect it in water tank and use it for general plant purposes so that less ground water is pumped during monsoon period. Moreover, ground water being saline in the plant area, it is not going to be tapped for the plant and will be obtained by desalination of sea water. The details of existing village ponds, its catchment yield, present water storage capacity and recharge potential are discussed as under.

7.1 Basic requirement for artificial ground water recharge project

There are two basic requirements for taking up any artificial ground water recharge project and these are:

a) Availability of non-committed surplus monsoon runoff and

b) Identification of suitable hydrogeological environment and sites for creating sub-surface tank through cost effective artificial recharge techniques.

While considering these two aspects in special reference to plant area, it is observed that there is a definite availability of surplus monsoon water from the roof top of different buildings located within the plant area. The roof tops have sufficient area producing adequate quantity of water which could be harvested and utilized by the plant for general purposes like gardening, washing etc.

Another important aspect is to evaluate the storage potential of sub-surface reservoir having maximum unsaturated zone and maximum specific yield during the period when water is available for recharge. Artificial ground water recharge cannot be undertaken where water level is around 3 to 4 metres below the land surface during the post-monsoon period.

Unfortunately, the water table in the plant area is very shallow and less than 5 metres during pre-monsoon period below the land surface indicating that there is no unsaturated zone below the depth of 5 metres which could be recharged. If recharged, there will be water logging leading to soil salinization and soil alkalinization As such, only option available is to harvest the roof top rain water from different buildings and store it in cemented water tanks to be used for general purpose of the plant.

7.2 Proposed rainwater harvesting program

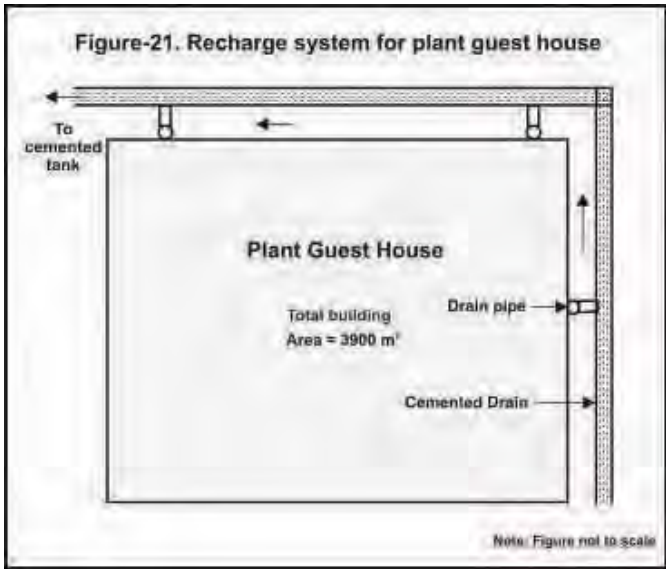
The cemented drains have been proposed in front and back or sides of plant buildings for harvesting the rainwater having area of more than 500 m^2. The cemented drains are proposed for the following building/sheds and are discussed as under:

Table-9. Tentative area of building/sheds for Roof top Rain Water Collection

S. No.	Building Name	Area (m^2)	Nos.	Total Area (m^2)
1.	Finished product go down	12000	2	24000
2.	Store / Inventory warehouse & workshop	7500	2	15000
3.	TG / Utility building	3250	1	3250
4.	PMCC / Sub-station building	875	4	3500
5.	RO Unit shed	2000	2	4000
6.	Canteen	1600	1	1600
7.	Engineering office	2000	1	2000
8.	Fire building & health centre	2000	1	2000
9.	Administrative building	1000	1	1000
10.	Laboratory	800	1	800
11.	Plant guest house	3900	1	3900

7.2.1 Finished product go down

Two number of finished product go down having total roof top area of 24,000 m^2 each (12,000+12,000) are proposed. All the roof top rain water will be collected through drain pipes and brought to cemented drain which has been constructed around the building as shown in **Figure-11.** The cemented drains carry roof top rain water to the proposed



7.3 Total rainwater harvested

All the 11 building/sheds have been proposed cemented drains constructed in the plant, will provide **21195 m^3** of roof top rain water which will be collected and stored in the proposed cemented tank in the plant. The details of roof top rain water collected from each building/sheds is shown the **Table-10.**

Table-10. Total rainwater harvested

S. No.	Building Name	Area (sq.mtr)	Nos.	Total Area (sq.mtr)	Runoff co-efficient	Availability of roof top rain water (m^3)	Peak availability of water (m^3)
1.	Finished product go down	12000	2	24000	0.80	8333	480
2.	Store / Inventory warehouse & workshop	7500	2	15000	0.80	5208	300
3.	TG / Utility building	3250	1	3250	0.80	1128	65
4.	PMCC / Sub-station building	875	4	3500	0.80	1215	70
5.	RO Unit shed	2000	2	4000	0.80	1389	80
6.	Canteen	1600	1	1600	0.80	555	32
7.	Engineering office	2000	1	2000	0.80	694	40
8.	Fire building & health centre	2000	1	2000	0.80	694	40
9.	Administrative building	1000	1	1000	0.80	347	20
10.	Laboratory	800	1	800	0.80	278	16
11.	Plant guest house	3900	1	3900	0.80	1354	78
Total				**61050**		**21195**	**1221**

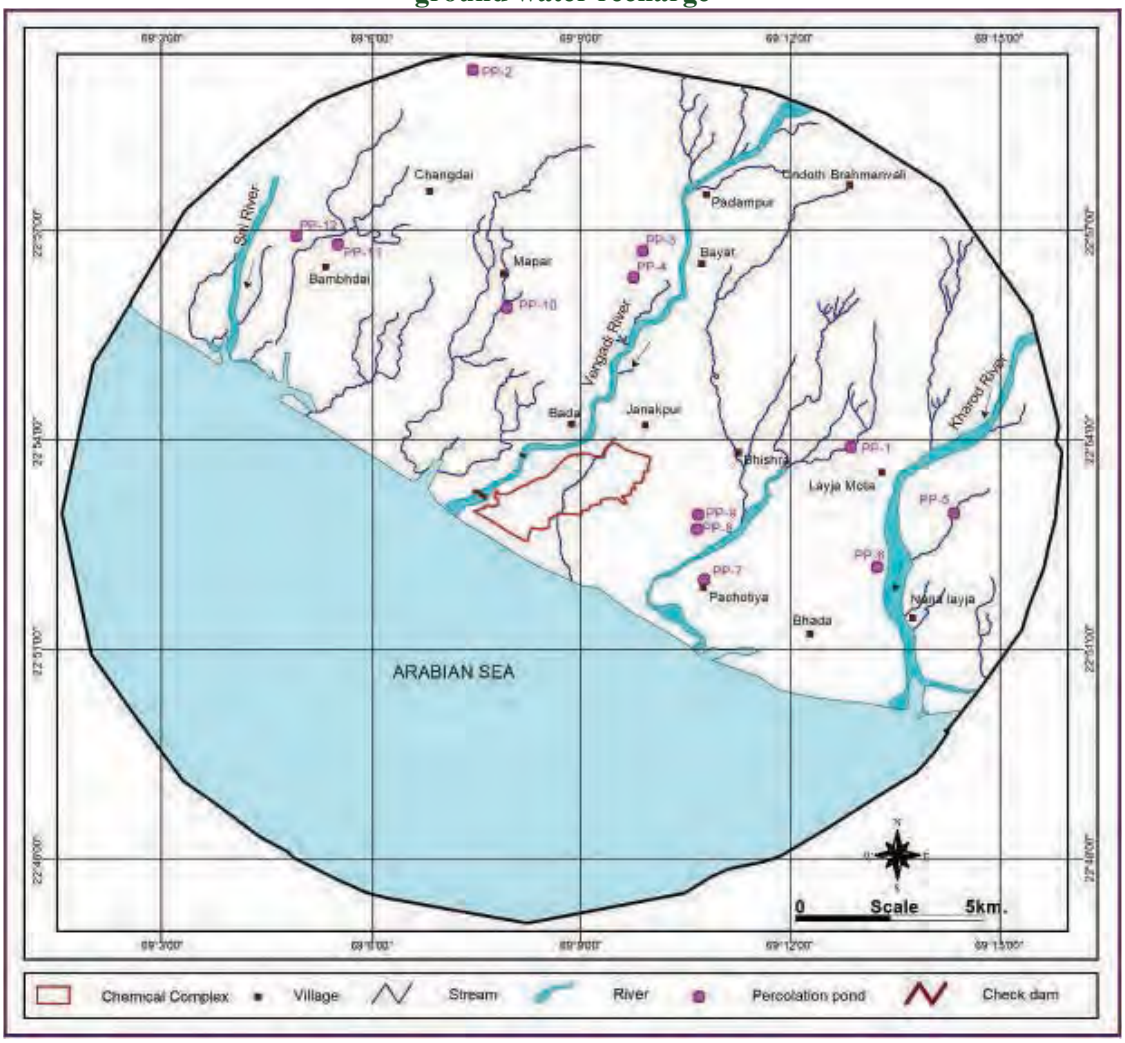
7.5 Surface runoff utilization

After reviewing the area around the plant and nearby villages, twelve percolation tanks **(Figure-23)** are proposed to be deepened to accommodate major part of the surface runoff available. The percolation tanks are mainly for ground water recharge and will not be used for any water withdrawal except the normal evaporation. So the entire accumulated water will have no other escape other than to percolate and join the ground water storage. It is proposed that piezometers (100 mm dia shallow boreholes, 30 m only meant for measuring the water levels) may be constructed around the percolation tanks and also within the plant area which will be regularly monitored to see the rise of water levels due to ground water recharge and to quantify the amount of recharged water.

Table-11. Coordinates of locations of proposed percolation pond

S. No.	Proposed percolation pond	Village	Latitude	Longitude
1.	PP-1	Layja Mota	22°53′50.6″	69°12′49.9″
2	PP-2	Dedhia	22°59′12.5″	69°07′27.8″
3.	PP-3	Bayat	22°56′38.1″	69°09′52.6″
4.	PP-4	Bayat	22°56′15.7″	69°09′44.9″
5.	PP-5	Layja Mota	22°52′54.2″	69°14′18.0″
6.	PP-6	Nana Layja	22°52′08.0″	69°13′12.5″
7.	PP-7	Pachotia	22°51′57.7″	69°10′45.1″
8.	PP-8	Pachotia	22°52′40.0″	69°10′44.5″
9.	PP-9	Pachotia	22°52′40.8″	69°10′38.6″
10.	PP-10	Mapar	22°54′49.8″	69°07′57.2″
11.	PP-11	Bambhdai	22°56′44.0″	69°05′32.9″
12.	PP-12	Bambhdai	22°56′50.9″	69°04′57.3″

Figure-23. Map showing location of proposed percolation ponds to be deepened for ground water recharge



7.5.1 Proposed percolation tank (PP-1) near village Layja Mota

An existing tank near village Layja Mota (N 22°53'50.6", E 69°12'49.9") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-1).** At present, the tank has storage capacity of 7,500 m^3 with water column of 0.5 metre in 150 m x 100 m. The catchment area of the tank has been determined as 39 hectares which will provide 42,857 m^3 of water taking 25% as runoff coefficient after desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 1.5 metres.

The additional storage capacity of this tank of 150 m x 100 m, if deepened up to average depth of 1.5 metres will be 22,500 m^3.

150 x 100 x 1.5 = 22,500 m^3 (Additional storage)

As the tank, will have the total water storage capacity of 30,000 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 11,250 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-1) near village Layja Mota to 11,250 m^3. There is an unsaturated zone, about 3 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-1. Proposed percolation tank (PP-1) near village Layja Mota



7.5.2 Proposed percolation tank (PP-2) near village Dedhia

An existing tank near village Dedhia (N 22°59'12.5", E 69°07'27.8") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-2).** At present, the tank has storage capacity of 2,500 m^3 with water column of 0.25 metre in 100 m

x 100 m. The catchment area of the tank has been determined as 23 hectares which will provide 25,000 m^3 of water taking 25% as runoff coefficient after compaction of soil of catchment area and desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 1.5 metres. The additional storage capacity of this tank of 100 m x 100 m, if deepened up to average depth of 1.5 metres will be 15,000 m^3.

$$100 \times 100 \times 1.5 = 15{,}000\ m^3 \text{ (Additional storage)}$$

As the tank, will have the total water storage capacity of 17,500 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 7,500 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-2) near village Dedhia to 7,500 m^3. There is an unsaturated zone, about 3 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-2. Proposed percolation tank (PP-2) near village Dedhia



7.5.3 Proposed percolation tank (PP-3) near village Bayat

An existing tank near village Bayat (N 22°56'38.1", E 69°09'52.6") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-10).** At present, the tank has storage capacity of 11,250 m^3 with water column of 0.50 metre in 150 m x 150 m. The catchment area of the tank has been determined as 59 hectares which will provide 64,286 m^3 of water taking 25% as runoff coefficient after compaction of soil of catchment area and desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 1.5 metres. The additional storage capacity of this tank of 150 m x 150 m, if deepened up to average depth of 1.5 metres will be 33,750 m^3.

$$150 \times 150 \times 1.5 = 33,750\ m^3 \text{ (Additional storage)}$$

As the tank, will have the total water storage capacity of 45,000 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 16,875 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-3) near village Bayat to 16,875 m^3**.** There is an unsaturated zone, about 5 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-3. Proposed percolation tank (PP-3) near village Bayat



7.5.4 Proposed percolation tank (PP-4) near village Bayat

An existing tank near village Bayat (N 22°56'15.7", E 69°09'44.9") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-4).** At present, the tank has storage capacity of 3,000 m^3 with water column of 0.25 metre in 150 m x 80 m. The catchment area of the tank has been determined as 28 hectares which will provide 30,000 m^3 of water taking 25% as runoff coefficient after compaction of soil of catchment area and desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 1.5 metres. The additional storage capacity of this tank of 150 m x 80 m, if deepened up to average depth of 1.5 metres will be 18,000 m^3.

150 x 80 x 1.5 = 18,000 m^3 (Additional storage)

As the tank, will have the total water storage capacity of 21,000 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 9,000 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-4) near village Bayat to 9,000 m^3. There is an unsaturated zone, about 5 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-4. Proposed percolation tank (PP-4) near village Bayat



7.5.5 Proposed percolation tank (PP-5) near village Layija Mota

An existing tank near village Laija Mota (N 22°52'54.2", E 69°14'18.0") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-5).** At present, the tank has storage capacity of 3,000 m^3 with water column of 0.50 metre in 100 m x 60 m. The catchment area of the tank has been determined as 16 hectares which will provide 17,143 m^3 of water taking 25% as runoff coefficient after compaction of soil of catchment area and desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 1.5 metres. The additional storage capacity of this tank of 100 m x 60 m, if deepened up to average depth of 1.5 metres will be 9,000 m^3.

$$100 \times 60 \times 1.5 = 9{,}000\ m^3 \text{ (Additional storage)}$$

As the tank, will have the total water storage capacity of 12,000 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 4,500 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-5) near village Layja Mota to 4,500 m^3. There is an unsaturated zone, about 4 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-5. Proposed percolation tank (PP-5) near village Layja Mota



7.5.6 Proposed percolation tank (PP-6) near village Nana Layija

An existing tank near village Nana Laija (N 22°52'08.0", E 69°13'12.5") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-6).** At present, the tank has storage capacity of 6,000 m^3 with water column of 0.50 metre in 120 m x 100 m. The catchment area of the tank has been determined as 32 hectares which will provide 34,286 m^3 of water taking 25% as runoff coefficient after compaction of soil of catchment area and desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 1.5 metres. The additional storage capacity of this tank of 120 m x 100 m, if deepened up to average depth of 1.5 metres will be 18,000 m^3.

$$120 \times 100 \times 1.5 = 18{,}000\ m^3 \text{ (Additional storage)}$$

As the tank, will have the total water storage capacity of 24,000 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 9,000 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-6) near village Nana Layja to 9,000 m^3. There is an unsaturated zone, about 4 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-6 Proposed percolation tank (PP-6) near village Nana Layja



7.5.7 Proposed percolation tank (PP-7) near village Pachotia

An existing tank near village Pachotia (N 22°51'57.7", E 69°10'45.1") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-7).** At present, the tank has storage capacity of 7,500 m^3 with water column of 0.25 metre in 200 m x 150 m. The catchment area of the tank has been determined as 69 hectares which will provide 75,000 m^3 of water taking 25% as runoff coefficient after compaction of soil of catchment area and desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 1.5 metres. The additional storage capacity of this tank of 200 m x 150 m, if deepened up to average depth of 1.5 metres will be 45,000 m^3.

$$200 \times 150 \times 1.5 = 45{,}000\ m^3 \text{ (Additional storage)}$$

As the tank, will have the total water storage capacity of 52,500 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 22,500 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-7) near village Pachotia to 22,500 m^3. There is an unsaturated zone, about 2 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-7. Proposed percolation tank (PP-7) near village Pachotia



7.5.8 Proposed percolation tank (PP-8) near village Pachotia

An existing tank near village Pachotia (N 22°52'40.0", E 69°10'44.5") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-8).** At present, the tank has storage capacity of 1,000 m^3 with water column of 0.25 metre in 80 m x 50 m. The catchment area of the tank has been determined as 12 hectares which will provide 12,857 m^3 of water taking 25% as runoff coefficient after compaction of soil of catchment area and desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 2.0 metres. The additional storage capacity of this tank of 80 m x 50 m, if deepened up to average depth of 2.0 metres will be 8,000 m^3.

$$80 \times 50 \times 2.0 = 8{,}000\ m^3 \text{ (Additional storage)}$$

As the tank, will have the total water storage capacity of 9,000 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 4,000 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-8) near village Pachotia to 4,000 m^3. There is an unsaturated zone, about 2 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-8. Proposed percolation tank (PP-8) near village Pachotia



7.5.9 Proposed percolation tank (PP-9) near village Pachotia

An existing tank near village Pachotia (N 22°52'40.8", E 69°10'38.6") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-9).** At present, the tank has storage capacity of 1,750 m^3 with water column of 0.25 metre in 100 m x 70 m. The catchment area of the tank has been determined as 21 hectares which will provide 22,500 m^3 of water taking 25% as runoff coefficient after compaction of soil of catchment area and desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 2.0 metres. The additional storage capacity of this tank of 100 m x 70 m, if deepened up to average depth of 2.0 metres will be 14,000 m^3.

$$100 \times 70 \times 2.0 = 14{,}000\ m^3 \text{ (Additional storage)}$$

As the tank, will have the total water storage capacity of 15,750 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 7,000 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-9) near village Pachotia to 7,000 m^3. There is an unsaturated zone, about 2 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-9. Proposed percolation tank (PP-9) near village Pachotia



7.5.10 Proposed percolation tank (PP-10) near village Mapar

An existing tank near village Mapar (N 22°52'49.8", E 69°07'57.2") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-10).** At present, the tank has storage capacity of 10,000 m^3 with water column of 0.5 metre in 200 m x 100 m. The catchment area of the tank has been determined as 53 hectares which will provide 57,143 m^3 of water taking 25% as runoff coefficient after compaction of soil of catchment area and desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 1.5 metres. The additional storage capacity of this tank of 200 m x 100 m, if deepened up to average depth of 1.5 metres will be 30,000 m^3.

$$200 \times 100 \times 1.5 = 30{,}000\ m^3 \text{ (Additional storage)}$$

As the tank, will have the total water storage capacity of 40,000 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 15,000 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-10) near village Mapar to 15,000 m^3. There is an unsaturated zone, about 3 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-10. Proposed percolation tank (PP-10) near village Mapar



7.5.11 Proposed percolation tank (PP-11) near village Bambhdai

An existing tank near village Bambhdai (N 22°56'44.0", E 69°05'32.9") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-11).** At present, the tank has storage capacity of 5,625 m^3 with water column of 0.25 metre in 150 m x 150 m. The catchment area of the tank has been determined as 52 hectares which will provide 56,250 m^3 of water taking 25% as runoff coefficient after compaction of soil of catchment area and desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 1.5 metres. The additional storage capacity of this tank of 150 m x 150 m, if deepened up to average depth of 1.5 metres will be 33,750 m^3.

$$150 \times 150 \times 1.5 = 33,750\ m^3 \text{ (Additional storage)}$$

As the tank, will have the total water storage capacity of 39,375 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 16,875 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-11) near village Bambhdai to 16,875 m^3. There is an unsaturated zone, about 3 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-11. Proposed percolation tank (PP-11) near village Bambhdai



7.5.12 Proposed percolation tank (PP-12) near village Bambhdai

An existing tank near village Bambhdai (N 22°56'50.9", E 69°04'57.3") is proposed for recharging the ground water basin and will function as percolation tank **(Photoplate-12).** At present, the tank has storage capacity of 2,000 m^3 with water column of 0.50 metre in 80 m x 50 m. The catchment area of the tank has been determined as 11 hectares which will provide 11,429 m^3 of water taking 25% as runoff coefficient after compaction of soil of catchment area and desilting of streams. The storage capacity of the existing tank can be increased by deepening the tank by 1.5 metres. The additional storage capacity of this tank of 80 m x 50 m, if deepened up to average depth of 1.5 metres will be 6,000 m^3.

$$80 \times 50 \times 1.5 = 6{,}000\ m^3 \text{ (Additional storage)}$$

As the tank, will have the total water storage capacity of 8,000 m^3 which will be received in whole year, it is expected that almost 50% of the additional storage will be recharged as the tank bottom has a alluvial zone followed by weathered sandstone. The balance quantity of additional water of 3,000 m^3 will be lost as evaporation. The ground water recharge from additional storage of proposed percolation tank (PP-12) near village Bambhdai to 3,000 m^3. There is an unsaturated zone, about 3 metres thick during post -monsoon period which would get recharged from this tank.

Photoplate-12. Proposed percolation tank (PP-12) near village Bambhdai



7.6 Total existing and additional rainwater recharge by twelve proposed percolation ponds

With deepening of 12 existing village ponds up to proposed depth, the ground water basin will get recharged by 1,26,500 m^3/year during the average rainfall year. This will not only improve the quality of ground water but will also raise the water table thereby restricting the ingress of sea water, although there is no possibility of it as the ground water flow is towards the sea.

S. N.	Pond	Village	Area	Existing depth	Existing storage	Existing recharge	Proposed additional depth	Proposed additional storage	Proposed additional recharge
			(Ha)	(m)	(m^3)	(m^3)	(m)	(m^3)	(m^3)
			A	B	C=A*B	D= 50% of C	E	F=A*E	G=50% of F
1.	**PP-1**	Layja Mota	1.50	0.50	7500	**3750**	1.50	22500	**11250**
2.	**PP-2**	Dedhia	1.00	0.25	2500	**1250**	1.50	15000	**7500**
3.	**PP-3**	Bayat	2.25	0.50	11250	**5625**	1.50	33750	**16875**
4.	**PP-4**	Bayat	1.20	0.25	3000	**1500**	1.50	18000	**9000**
5.	**PP-5**	Layja Mota	0.60	0.50	3000	**1500**	1.50	9000	**4500**
6.	**PP-6**	Nana Layja	1.20	0.50	6000	**3000**	1.50	18000	**9000**
7.	**PP-7**	Pachotia	3.00	0.25	7500	**3750**	1.50	45000	**22500**
8.	**PP-8**	Pachotia	0.40	0.25	1000	**500**	2.0	8000	**4000**
9.	**PP-9**	Pachotia	0.70	0.25	1750	**875**	2.0	14000	**7000**
10.	**PP-10**	Mapar	2.00	0.50	10000	**5000**	1.50	30000	**15000**
11.	**PP-11**	Bambhdai	2.25	0.25	5625	**2813**	1.50	33750	**16875**
12.	**PP-12**	Bambhdai	0.40	0.50	2000	**1000**	1.50	6000	**3000**
			Total Existing recharge			**30,563 m^3**	**Total additional recharge**		**1,26,500 m^3**

8.0 CONCLUSIONS

The comprehensive hydrological and hydrogeological studies conducted for the plant area and its buffer zone, have revealed that there are adequate surface and ground water resources which are being utilized for irrigation and drinking purposes in the buffer zone. There is a intensive ground water development in the inland areas of buffer zone for irrigation by open dug wells and bore wells. The quality of ground water is potable and

suitable for drinking and irrigation purposes particularly in the inland area of buffer zone .It has been observed that the status of ground water development of buffer zone as well as of Mandvi taluka has been found (>100%) and declared as over-exploited by CGWB, GHCL realizing its national obligation, proposes to utilize the surface runoff of the buffer zone of the Soda Ash plant by deepening the 12 existing village ponds which will function as percolation tanks and would recharge the ground water basin by 0.126 Mm^3/year. The ground water recharge by utilizing the roof top rainwater of the plant buildings and paved roads cannot be taken up as the depth to ground water table is within 5 m bgl and ground water is saline. Accordingly, it is proposed that roof top rain water of 11 plant buildings having total roof top area of 61050 m^2 may be harvesting by cemented drains releasing 21,195 m^3/year and collected in cemented water tank of 1250 m^3 capacity and utilized for the plant for general purposes.

By conducting the drainage studies of the area, it is observed that there is a one stream of 1^{st} order entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, may be diverted to nearby passing Vengadi river in the west has two check dams, one for salinity ingress check and on upstream side for storing fresh water. It is proposed that this pond may be deepened by 2 metres so as to store entire annual surface runoff for ground water recharge and for plant use. With the proposed deepening, there will not be any possibility of any overflow in the plant. While the other two rivers will continue to flow as these are not being affected by the setting up of the plant. So, the present hydrological setting of the area will remain unaffected.

However, being coastal area, there may be possibility of sea water ingress but it is not expected as there is no proposal of any ground water abstraction from the plant area and its entire water requirement will be met by desalination of sea water. The ground water flow of the main land is still towards the sea thereby keeping the fresh water / sea water interface away from the plant and near the high tide area. Moreover ground water recharge in inland area of the buffer zone will always keep the ground water at higher elevation and ground water movement will be towards the sea with no possibility of sea water ingress.

It is therefore concluded that with setting up of the plant, which will be meeting its water requirement by desalination and would not affect the surface water resources, there are no chances of any adverse impact on the ground water regime of the area.

for Hydro-Geosurvey Consultants Pvt. Ltd.,



(Dr. V.B. Khilnani)
Managing Director

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ANNEXURE R/7

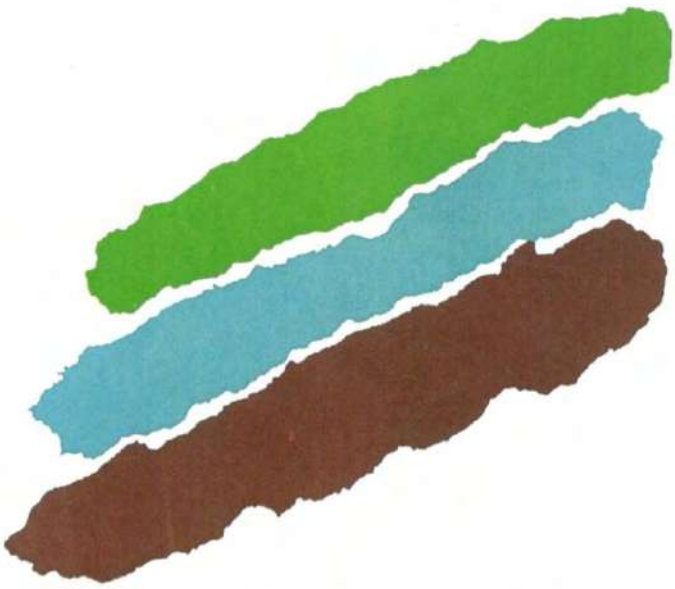
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Addendum

Marine EIA/EMP for Seawater Intake and Effluent Disposal for Greenfield Chemical Complex off Bada coast, Arabian Sea

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March 2022

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8.6 Dune Conservation Plan

The physical and biotic factors essentially correspond to the size and shape of the dune forms in any coastal region. The physical characteristics are speed of wind, directions, waves, grain size of sand, etc., whereas the biotic factors are plant succession and grazing pressure. Nevertheless, the coastal dunes are mainly formed by aeolian deposits by onshore wind and supply of hydrodynamically sorted fine-grained sand transport from the beaches. Near the seaward margins, aeolian deposits are intermixed with wave deposited beach sands, but wind action becomes the dominant force as the distance from the shore increases. Sand dunes also provide sand storage and supply for adjacent beaches. They also protect inland areas from storm surges, cyclones, floodwater, wind, and wave action that damage infrastructure. Sand dunes support an array of organisms by providing nesting habitats for coastal bird species, including migratory birds. Sand dunes are also habitats for coastal plants. Without vegetation, wind and waves regularly change the form and location of dunes. The coastal dune habitats are an ecological niche between terrestrial and marine realms and form important nature conservation sites. They are dynamic, complex, and sensitive ecosystems with singular functioning and high environmental/ecological value. Coastal sand dunes serve multiple socioeconomic and environmental functions that often conflict, such as recreation, biodiversity conservation, development, sand mining, freshwater catchment, and coastal protection. The sand dunes are subject to massive erosion by wind and get shifted inland by high monsoon winds and tides when coastal storms strike the coast. Thus, by arresting the storm surges, at least partially, the dunes act as barriers to the impact of the sea on land, thereby reducing the damage to landward developments. This vegetation is closely related to the prevailing sediment dynamics and geomorphological processes and continuously interacts with the associated fauna.

Coastal sand dunes provide an array of essential benefits supported by coastal geomorphic processes and location-specific ecosystems. In addition, coastal sand dunes provide attractive landscapes for recreation and tourism activities. Also, in highly energetic conditions, dunes can act as a moveable last line of defense, an emergency sediment supply against which the waves expend their energy, dragging sediment into the near-shore and enhancing further wave dissipation. Under less energetic conditions, shorter, steeper waves wash onto the more permeable, less saturated beach face forcing sediment back onshore. Consequently, the beach accretes and steepens, becoming more reflective, pushing wave energy back out to sea. A transfer of this sediment back into the dune system occurs when onshore winds combine with the effects of solar drying of the exposed beach face when onshore, an effect enhanced by the occurrence of more extensive tidal excursion.

Mainly due to significant direct and indirect anthropogenic pressure suffered by coastal areas in general and coastal dunes in particular, many of these ecosystems

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and the species they host are currently under threat worldwide, and conservation efforts are required in many countries. The general issues which often draw attention towards the sand dune management in the coastal regions are;

1. Dune vulnerability and degradation
2. Dune encroachment, constructions, and trampling
3. Dumping of solid waste and impacts of new development

The coastal region of the Arabian Sea house numerous sandy beaches backed by dunes, cliffs, promontories, and drowned estuaries. The coastal stretch of Gujarat state along the Arabian sea has the longest coastline exhibiting shore-based tourism, defense installations, salt works, port-led development, industrial establishments, etc. In recent years, the coast has become vulnerable to cyclones, floods, Tsunami, etc. The coast of Kutch has witnessed some severe cyclones in the last few decades. The severe one in 1998 Tropical Cyclone 03A and the recent one in 2021 Extremely Severe Cyclonic Storm Tauktae.

Sand dune forms along the western part of Kutch (from Jakhau to Rawalpir), covering the beach and village Bada, where the proposed project Greenfield Chemical Complex has been planned. The shore region comprises natural supra coastal dunes with a luxuriant Prosopis juliflora shrub. There are clumps of grasses on the shoreward and seaward sides of the dunes. No creepers and other hygrophytes are generally found on the supralittoral zone's upper side. seagrasses were found to be absent from the surveyed area. For the significant role of dunes in maintaining ecological balance and providing protection during natural calamities, it is essential to conserve these dunes in their original morphology.

8.6.1 Site-specific description and conservation plan of sand dune

The proposed Greenfield Chemical Complex development comprises activities related to the construction and establishment of process plants and other facilities along with seawater intake and effluent disposal system.

As the Soda ash manufacturing process requires a large quantity of water for process cooling worldwide, most of the Soda ash plants are established along the coastal areas. The process plants of the proposed project will be set up on the landward side away from the HTL (High Tide Line).

A continuous patch of sand dunes exists along the coast of the proposed development. Natural passage for laying seawater intake and effluent disposal pipeline path is not available. These sand dunes are outside the proposed plant boundary. Sand dunes are located between the Arabian Sea's waterfront and the landward side, where the chemical complex will be established.

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Keeping in view the high ecological and geomorphological importance of sand dunes, these areas have been classified under ecologically sensitive zone as CRZ-I A by the Ministry of Environment Forest & Climate Change (MoEF&CC) through CRZ Notification 2011 and 2019.

Although the coastal sand dune of Bada coast is more than 8000 years old, the sand dune formation is recycling of sand as erosion takes place by wave action and accretion takes place with sand being settled at the top of the sand dune with wind action, as can be seen in Figure 1.



Figure 1. Photographs showing accretion of sand over a dune by wind action around Bada coast.

The marine segment through which proposed Greenfield Chemical Complex–seawater intake and effluent disposal pipelines (through underground tunnels in sand dune stretch) would be laid is a specific segment of the Arabian Sea coast off Bada, consisting of a sandy pocket beach with an underlying rocky substratum. The coastal stretch along the project boundary is stable as understood from the LRR (Linear Regression Rate) data of satellite imagery from 2008-2018 studied by CSIR-NIO. Also, no visible erosion accretion was observed during the field survey. The dunes and adjacent coast were stable and doesn't warrant any restoration work. The sand dunes along the Bada coast were also observed physically during the monitoring program of the marine EIA study and through a morphological analysis by CSIR-NIO, Goa.

To achieve a sustainable and uninterrupted water supply for meeting the plant process and utility requirement, it is required to select a reliable source of water supply in the vicinity of the project. In the project area, the only water body present is the Arabian Sea, from which the required water quantity can be withdrawn on a sustainable basis. GHCL has planned seawater intake by laying pipelines from an appropriate intake point in the Arabian sea to the Plant area on the landward side. Similarly, effluent disposal pipelines must also be laid from the Plant area to the outfall or discharge point in the Arabian Sea. The pipelines will be laid through underground tunnels in the sand dune stretch. Since all pipelines of intake and

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outfall will be buried in the intertidal as well subtidal region, there will not be any alteration of wave action, hence, no effect on dune formations.

To maintain sand dune undisturbed, the following conservation methods are suggested:

- GHCL to honor the environmental regulations i.e., sand dunes cannot be altered or flattened.
- The first and foremost thing for conservation of sand dunes, there should be a selection of pipeline/tunnel laying methodology and understanding the morphology of sand dunes.
- Throughout the approx. 6.8 km dune, no natural passage is available to lay the pipelines without disturbing sand dunes. The seawater intake and effluent disposal pipelines are to be laid underground through sand dunes by tunneling as recommended in the EIA report, thus avoiding the disturbance to existing sand dunes. Underground Tunneling is one of the established construction practices for pipeline laying through such terrains.
- As per the morphological study report, coastal sand dunes present at the Bada coast are well stabilized and are more than 8000 years old. The corridor selection for tunneling needs to occupy a minimum footprint for the entire stretch, i.e., land to the subtidal area. Wherever it passes through sand dunes, it must be laid through the most stable dune section, considering the dune height and width. Hence, no damage would happen to sand dunes. It is strictly suggested that the dune stretch should not be disturbed at any cost during the pre-and post-project activities.
- Tunneling with the best available technique like micro tunneling in consultation with geotechnical and tunneling experts. The suggested LFPs (landfall points) can be further assessed and finalized based on ground conditions to conserve the sand dunes.
- Depth to the bedrock, tunneling distance, slope, etc., should be considered in detail.
- With tunneling procedure to lay the intake and outfall pipes, it is expected that all the engineering work will take place underground of the sand dunes; hence, no disturbance of the sand dune will take place. However, the contractor should be instructed not to create any obstacles to the wave and wind on the seaside during the laying of the pipelines.
- The fabrication yard, storage of construction material are to be constructed in the premises of the proposed industry, and no structure should be raised on sand dune area.
- Since sand dunes cover the entire area of approx. 6.8 km. Hence, the only construction material and equipment route is through the passage available along the seasonal River Vengadi, to prevent the disturbance of sand dunes.

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- While geomorphological characteristics and sand supply determine the role of dunes in wave attenuation and coastal defense, the presence of vegetation is more critical for dunes than any other sandy habitat simply because vegetation aids the accumulation of sediment. The construction should prohibit the removal and destruction of plants, trees, and other types of vegetation and animal species from the dune system. Hence, an effort is to be taken for the plantation of native species. But at the same time, over-expansion of the plantation can be avoided by more indigenous species through scientific research on the plantation to enhance the diversity.
- GHCL should contribute towards efforts in improving the area's biodiversity potential by supporting Forest Department initiatives.
- GHCL shall educate the workforce regarding the importance of sand dunes and measures required during pipeline laying jobs to protect sand dunes.
- GHCL shall provide adequate sanitation facilities for the workforce to prevent any misuse of the sand dune and adjoining intertidal area. No part of vegetation above sand dunes shall be uprooted for firewood etc.
- The aesthetic quality of surroundings to be restored on completion of the construction phase.
- Construction debris not to be heaped on sand dune area and it should be stored within plant boundary and based on characteristics can be utilized for backfilling. Topsoil shall be used for backfilling of trenches.
- No part of waste or any construction debris should be thrown in the sand dune and intertidal area.
- Though no sea turtles were observed during the EIA survey, GHCL shall contribute towards Sea Turtle Conservation efforts through Forest Dept.
- GHCL should develop a mechanism to collect debris such as plastics from the sand dune and beach region along the project area for conserving the sand dune.
- GHCL shall keep the above points in planning while laying pipelines through sand dunes. Apart from the above, GHCL shall comply with conditions given by the CRZ authority and the conditions mentioned in Forest diversion approval.

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PUBLIC HEARING PROCEEDING

As per the provision of Notification No. S.O.1533 (E) dated 14/09/2006 and its subsequent amendment thereof, Ministry of Environment, Forest & Climate Change, Government of India, New Delhi, Public Hearing has been conducted for M/s. GHCL Limited for Proposed the Soda Ash Plant (1) Light Soda Ash Plant – 11,00,000 TPA, (2) Dense Soda Ash Plant @ 5,00,000 TPA, (3) Sodium Bicarbonate @ 2,00,000 TPA with solid fuel based Captive Cogeneration Power Plant @ 120 MW capacity at Village: Bada, Taluka: Mandvi, District: Kutch, covered under Project category "A" as mentioned in their request application.

The Public Hearing was scheduled to be held on 06/04/2022 at 11:00 Hrs, Venue: Project Site, Survey No. 432, Village: Bada, Taluka: Mandvi, Dist. Kutch. Public hearing was time being postponed due to unavoidable circumstances and now the Public hearing is scheduled to be held on 17/10/2022 at 11:00 Hrs, Venue: Project Site, Survey No. 432, Village: Bada, Taluka: Mandvi, Dist. Kutch.

A copy of the Draft Environment Impact Assessment report and Executive Summary of Draft Environment Impact Assessment report both in English and Gujarati were sent to the following authorities or offices to make available the draft EIA report for inspection to the public during normal office hours, till the Public Hearing is over.

1. The District Collector Office, Bhuj, Dist. Kutch
2. District Development Office, Bhuj, Dist.: Kutch
3. District Industry Centre, Bhuj, Dist.: Kutch
4. The Taluka Development Office, Ta. Mandvi, Dist. Kutch
5. Regional Officer, Integrated Regional Office, Ministry of Environment, Forests and Climate Change (MoEF & CC), Room No. 407, Aranya Bhavan, Near CH-3 Circle, Sector – 10A, Gandhinagar, Gujarat – 382010.
6. Regional Office, Gujarat Pollution Control Board (Kutch-West), Katira Complex – 1, Near Mangalam Char Rasta, Sanskarnagar, Bhuj, Kutch – 370001.

Also, Executive Summary in Gujarati language was send to Talaticum Mantri of 12 villages for widespread publicity of Public Hearing. Other concerned person having plausible stake in environmental aspects were requested to send their responses in writing to the concern regulatory authorities.

Announcement of Public Hearing was also made through loudspeaker and banners on auto rickshaws and the rickshaw was also rotated in the villages of the study area before the Public Hearing on dated 15/10/2022 & 16/10/2022.

The advertisement was published in earlier Gujarati Newspapers **"Divya Bhaskar"** on dated 03/03/2022 and in English Newspaper **"The Times of India"** on dated 04/03/2022. Re advertisement was published on Gujarati Newspapers **"Divya Bhaskar"** on dated 30/09/2022 and in English Newspaper **"The Times of India"** on dated 01/10/2022.

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Shri. Chetan Misan (G.A.S), Sub Divisional Magistrate and Deputy Collector, Mundra, Kutch supervised and presided over the entire Public Hearing process.

A statement showing list of participants present during the Public Hearing is enclosed as **Annexure A.**

A statement showing salient points highlighting issues raised by the participants and responded by the representative of the applicant during the Public Hearing in English language is enclosed as **Annexure B** and in Gujarati language is enclosed as **Annexure B1.**

Statement showing responses and comments received in written, with respect to aforesaid public notice before and during the Public Hearing are enclosed as **Annexure C (C-Q-1 to C-Q-1154)** and replies given by project proponent with respect to these response and comments received in writing are enclosed as **Annexure D (D-A-1 to D-A-1154).**

Annexure E (E1 to E4) contains the advertisement published in Gujarati Newspapers **"Divya Bhaskar"** and in English Newspaper **"The Times of India"**. It also contains acknowledgement copies of EIA Report and Executive Summary submitted to authorities and Executive Summary submitted to village panchayat offices and photographs of announcement on microphone in the affected villages falling within 10 km radius of the proposed project area.

Place:
Project site,
Survey No. 432,
Village: Bada,
Taluka: Mandvi,
District: Kutch

Date: 17.10.2022

T. C. Barmeda
Regional Officer
GPCB Kutch (West) as
Representative of the Member
Secretary, GPCB

Chetan Misan (G.A.S)
Sub Divisional Magistrate &
Deputy Collector,
Mundra-Kutch

Encl.:

1. Annexure A, B, B1, C, D & E as above.
2. Video DVD containing videography of Public Hearing.
3. CD containing PDF file of Minutes of Meeting (MOM) of the PH proceeding and Annexures.

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ANNEXURE-A

A Statement showing participants present during the public hearing.

As per the Ministry of Environment and Forests & Climate Change, Government of India, New Delhi vide its notification no. S.O.1533 (E) dated 14th September, 2006 as amended; Public hearing is fixed for **M/s GHCL Limited for 11,00,000 TPA Light Soda Ash, 5,00,000 TPA Dense Soda Ash, 2,00,000 TPA Sodium Bicarbonate, 120 Captive Co-generation Power Plant, at Village. Bada, Ta. Mandvi, Dist. Kutch,** project category **'A'** was scheduled to be held on **06/04/2022 at 11:00 Hrs, Venue: GHCL Project Site, Survey No. 432, Village: Bada, Taluka: Mandvi, Dist. Kutch.** Public hearing is time being **postponed** due to unavoidable circumstances and now the Public Hearing is scheduled to be held on **17/10/2022 at 11.00 hrs, Venue: GHCL Project Site, Survey No. 432, Village: Bada, Taluka: Mandvi, Dist. Kutch.**

The List showing name of participants present along with signature during the public hearing are as under:

ભારત સરકારના વન, પર્યાવરણ મંત્રાલય અને જળવાયુ પરીવર્તન મંત્રાલય, નવી દિલ્હીના જાહેરનામા ક્રમાંક એસ.ઓ.1533 (ઇ) તા:14/9/2006 તેમજ વખતોવખત થયેલ સુધારાના અનુસંધાને **મેસર્સ જીએચસીએલ લીમીટેડ, ગામ. બાડા, તા. માંડવી, જી. કચ્છ દ્વારા ૧૧,૦૦,૦૦૦ ટીપીએ લાઇટ સોડા એશ, ૫,૦૦,૦૦૦ ટીપીએ ડેન્સ સોડા એશ, ૨,૦૦,૦૦૦ ટીપીએ સોડીયમ બાયકાર્બોનેટ, ૧૨૦ મેગાવોટ કેપ્ટીવ કો-જનરેશન પાવર પ્લાન્ટ વગેરે માટેની** પરીયોજના પ્રોજેકટ કેટેગરી **"એ"** અન્વયે લોકસુનાવણી **તા. ૦૬/૦૪/૨૦૨૨ ના રોજ ૧૧:૦૦ કલાકે, સ્થળ: જીએચસીએલ પ્રોજેક્ટ સાઇટ, સર્વે નં. ૪૩૨, ગામ. બાડા, તા. માંડવી, જી. કચ્છ** ખાતે આયોજીત કરવામાં આવેલ હતી. પરંતુ, અનિવાર્ય સંજોગોને કારણે આ લોકસુનાવણીનો કાર્યક્રમ મુલત્વી રાખવામાં આવેલ. હવે આ પરિયોજના પ્રોજેક્ટ માટેની લોકસુનાવણી કાર્યક્રમ **તા. ૧૭/૧૦/૨૦૨૨ ના રોજ ૧૧:૦૦ કલાકે, સ્થળ: જીએચસીએલ પ્રોજેક્ટ સાઇટ, સર્વે નં. ૪૩૨, ગામ. બાડા, તા. માંડવી, જી. કચ્છ**ખાતે રાખવામાં આવેલ છે. લોક સુનાવણી દરમ્યાન હાજર રહેલા લોકોના નામ તથા સહીની યાદી નીચે મુજબ છે.

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1	Abdi Harun Abdi	
2	ગોકળી [illegible]	AKG
3	[illegible]	
4	[illegible]	
5	[illegible]	[illegible]
6	[illegible]	P.R. Gadhavi
7	[illegible]	
8	[illegible]	
9	[illegible]	
10	Hari Gadhavi	
11	[illegible]	
12	[illegible]	
13	[illegible]	
14	[illegible]	
15	[illegible]	Hasi

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16	મહેશ્વરી મોહન. Vમાંગરોળિયા	
17	મહેશ્વરી કનૈયા શાંતિ પરમોરિયા	
18	ગોસ્વામી દશરથ ગોપા ઉમેદ	
19	ગોસ્વામી કનૈયા ગાવલ ઉમેદ	
20	ગોસ્વામી પરશા મીંગા	
21	ગોસ્વામી રામ મીંસરા	
22	ગોસ્વામી કિશના કરશન મીંસરા	કિશના કરશન
23	ગોસ્વામી ગદા ગોપાલ પરમોરિયા	
24	ઠક્કર કરામણ ભાડા	કરામણ
25	કોસ્તી મોહન લાલા ભાડા	
26	કોસ્તી ગોમાભાઈ ભાડા	ગોમાભાઈ
27	ગોસ્વામી ઉમેશ પ્રવાલ મહાનાયક	
28	ગોસ્વામી ગગા મીનેશ પરમોરિયા	
29	ગોસ્વામી મહેશ મનોજ પરમોરિયા	
30	ગોસ્વામી નિમાભાઈ ભાઈ રાવળ	

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46	સુથાર કિશ [illegible]	
47	કેનીયા રામજી [illegible]	
48	આનંદ ગોરધન	
49	આનંદ ગોરધન	
50	ગોરધન નીલેશ ભાઈ	
51	ગોરધન હરજી ભાઈ	
52	ગોરધન વીરજી [illegible]	
53	નારાણ વિશ્ર ગોરધન	
54	ભરત લોજરાજ ગોરધન	
55	મુકેશ ગોરધન	
56	જીવરાજ ગોરધન	

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57	કોલી મંગા	ગોધરા
58	દીનશાધર ગોવિંદધર	નાયમા મોરા
59	ઇશ્વરધર ગોવિંદધર	નાયમા મોરા
60	ગઢવી મિલેશા મિલેશ	નાયમા મોરા
61	ગઢવી અશોક જાદવ	પાંચોરીયા
62	ગઢવી પોકારી રામજી	મોરા નાયમા
63	ગઢવી મોહન ગોવિંદ	મોરા નાયમા
64	ગઢવી મિલેશ માડુ	મોરી ઉનડોડ
65	ગઢવી નાયમોળા	મોરી ઉનડોડ
66	ગઢવી કિલેશ મોહન	મોરા નાયમા
67	ગઢવી નવિન અરજણ	પાંચોરીયા
68	ગઢવી ગોપાલ અમરા	પાંચોરીયા
69	ગઢવી ગોવિંદ રાજ	પાંચોરીયા
70	ગઢવી નાયમ હરી	પાંચોરીયા
71	ગઢવી જશરાજ ગોવિંદ	પાંચોરીયા

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72	ગઢવી [illegible] (રાંધણીયા)	
73	ગઢવી [illegible] (રાંધણીયા)	
74	ગઢવી [illegible]	
75	ગઢવી [illegible]	
76	ગઢવી [illegible]	
77	ગઢવી [illegible]	
78	ગઢવી [illegible]	
79	ગઢવી [illegible]	
80	[illegible]	
81	ગઢવી [illegible]	
82	ગઢવી [illegible]	
83	ગઢવી [illegible]	
84	[illegible]	
85	[illegible]	
86	ગઢવી [illegible]	

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87.	ગઢવી વાલજી ગોવિંદ	
88.	ગઢવી ગોવિંદ વાલા	
89.	ગઢવી દેવાંધ પચુ	
90.	ગઢવી ગોવાભાઈ કાનાભાઈ	
101	ગઢવી ભુવાન ખેરાજ	
102.	ગઢવી દેવાત કાનાભાઈ	Bhuvad
103	કોમળજીત જી	
104	ઝડપે જીતુભા ભવાનજી	જીતુભા ઝાડેજા
105	ઝાડેજા જીતુભા ભોગાજી	જીતુભા ઝાડેજા

Gujarat Pollution Control Board

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Sr.No અનુ.નં	Name & Address નામ અને સરનામું	SignatureOR Thumb Impression સહી અથવા અંગુઠાનું નિશાન
106	[illegible]	[illegible]

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Annexure - B

A Statement showing issue raised by the participants and responded by the representative of the applicant during the Public Hearing.

As per the Ministry of Environment ,Forests and Climate Change of india , New Delhi vide it's Notification No : S.O.1533(E), dated September 14, 2006 and subsequent amendments covered under Category " A " of **Notification M/s. GHCL Limited, Village : Bada, Taluka : Mandvi, District : Kutch, Gujarat** by 11,00,000 (TPA Capacity Light Soda Ash Plant), 5,00,000 TPA Capacity Dense Soda Ash, 2,00,000 TPA Capacity Solid Fuel Based Captives with Sodium Bicarbonate - Generation Power Plant Environment public hearing regarding the project for 120 MW capacity . On 06/04/2022 at 11:00 hrs at Sthalam Project Site , GHCL Limited , Survey no . 432 was held at Village: Bada, Taluka: Mandvi, District : Kutch, Gujarat. But due to unavoidable circumstances, the program of this public hearing was postponed. Now, the public hearing program for this project is dated. On 17/10/2022 at 11:00 hrs , place Project Site , GHCL Limitted , Survey no . 432, Village : Bada, Taluka : Mandvi, District: Kutch, Gujarat .

Shri. Chetan Misan (GAS) , Sub Divisional Magistrate and Deputy Collector , Mundra - Kutch Supervised and presided over the entire public Hearing proceedings.

Shri T. C. Barmeda, Regional Officer, GPCB, Kutch (West) and the representative of Member Secretary, Gujarat Pollution Control Board welcomed all present at the Environmental Public Hearing. They EIA Various provisions under the notification and the process of public hearing are given in brief. He informed about the action taken by the Gujarat Pollution Control Board regarding the wide publicity of the public hearing and two daily news papers prior to its announcement "Times of India" in English was published on : 04/03/2022. And "Divya Bhaskar" In Gujarati was published on 03/03/2022. Two daily news papers re-advertisement of public hearings; Published in "Times of India" in English on dated 01/10/2022 and in "Divya Bhaskar" in Gujarati on: 30/09/2022. In most cases On 15.10.2022 and 16.10.2022, extensive public awareness has been done about public hearing through vehicle through loud speakers in various villages in the study area. He also said that EIA. As per the notification provision, only local affected people can make oral submissions in this public hearing while other persons having reasonable interest can make their submissions in writing , which will be included in the agenda.

Then, with the permission of the Sub Divisional Magistrate, they asked the representative of the industry to make a presentation on their proposed project in the local Gujarati language .

Then information about the company by industry, project location, project details, layout plan, useful requirements for the project, weather information of the area, satellite tracking activity, baseline data, environmental impacts and its mitigation measures, environmental management cost, project benefits, conclusion etc. in Gujarati language . Presentation was given .

After completion of the presentation by the industry, the Regional Officer, Kutch (West), Gujarat Pollution Control Board, with the approval of the Sub Divisional Magistrate, opened the forum for submissions / objections / suggestions of the local affected people .

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Objections / suggestions / opinions raised by the people present during the environmental public hearing and the responses given by the project representative are as follows :

Sr. No.	Name and address of the person raising the issue	Issues presented	Reply given by the representative of the company
1.	Hariom Aboti Village : Mota Laija	• They asked that they want to know from the company that what is heavy chemical? And what are the regulations to prevent pollution? What is it that company will explain us.	• As you have requested to explain what this heavy chemical is. Heavy chemicals means chemicals that are normally made in bulk are called heavy chemicals. A heavy chemical is not necessarily toxic or non-toxic. But any chemical that is produced in bulk is called heavy chemical.
• Regional Officer said , " Keep calm. Proponent gives answers. Proponent will give answers to your raised questions. Please listen calmly. "			
2.	Shamat Kesav Gadhavi Village : Pachotia	• They ask the company that in the 10 villages around them which are affected , what facilities will the company do for the villages and what will they do for the cows. It is a question for my supporters with public support . In which I am sure that GHCL will fulfill their request and further support the company.	• We have made verbal representations at several places and also given written undertakings that the GHCL foundation of GHCL is engaged in CSR activities, and this activity is reflected in doing various things, the main representation being whether the fodder will be arranged or not. So we have made a commitment that fodder will be arranged as per requirement. Apart from this, work will be done in education and arrangement of animal doctor for animals, work will be done for in in medical field and for skill development.
		• Sir, Now we can ask other questions?	•
• Stated by the chairman , you can ask the questions you want to ask, you can make written submissions, you can make any objections you have, this forum is for that. And we will listen to all your objection suggestions and submissions and also give positive answers to them, but we request you all to submit your questions one by one.			

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3.	Rajeshbhai Dhola Village : Padampur	• They ask the company that give us written answers whether they will employ the youth and sisters who are here or hire them from outside . So that we get the information.	• What we are talking in this public hearing today will be recorded in writing and this written note will be informed in writing to all. The employment you have talked about. Generally we try to provide employment locally as per the qualification and requirement in neighboring villages . Also, if I talk about Sutrapada itself, more than 80 percent local people are employed in Sutrapada.
• Told by the regional officer that tell your name before the next presentation.			
4.	Haribhai Ratanbhai Gadvi Village : Pachotia	• What they have done so far under CSR for scholarships in schools or for health can you inform. • Very goog sir, I want to know that what kind of pollution does the company cause and what equipment do you have for it?	• You are right , we have arranged medical van here even before the company started here for health. In the future we will try to upgrade the medical facilities here and make the existing schools more effective for providing education to the children. We have a CSR activity going on in every anganwadi etc. in the village and in future we are also planning to build an english medium school. • If you have talked about pollution, advanced arrangements will be made for both environment, sound and water pollution .
5.	Vijay Gadhavi	• Officer sirs, you have come to listen to company men only, and don't give us the mic. Is this the gathering for fodder for your cows? We protest. • No, you tell us whether this is a pollution meeting or a cow fodder meeting. • Here a man fell unconscious and had an attack and you are praising company. Thank you for being an officer thank you.	•

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• Chairman said that, now the mic is with you, whatever your presentation is on camera. You have the mic now, introduce your questions, ask your questions. You can submit any questions you have.			
6.		• How cruel of you sir, even if an ambulance arrives for three men, your hearing cannot be stopped for a moment.	•
7.	Jat Fakina the consignee Village : Bada	• What will GHCL do for Maldhari? Which can be answered.	• When it comes to the maldhari of Bada village, generally what the maldharis need is one for them to have a fodder system and the other for them to have the facility of a veterinary doctor that we will arrange.
8.		• Sir, listen to the proper issue, we don't want doctors, we are concerned about pollution.	•
9.	Prakash Ranmal Gadhavi Village : Laija	• In case, company comes or plant comes then, how many people will you provide employment opportunities if the company comes and if you provide employment then we support you publicly.	• As we have told you earlier we have employed 80 to 85% local people in Sutrapada plant, we will try to follow the same here as per the requirement as per qualification.
10.	Suthar Nirav Village : Mota Laija	• We appreciate your ambulance running under CSR for treatment and we support you openly for the fodder you provided for the livestock. • But at the same time we want to ask questions for the priority of the people here , that you will keep the first priority of the local people who are educated class people who are educated students and if you keep them, how much you will keep them. The laborer who will work here will also be a native of 10 villages here or will you invite them from outside. Another major issue is what you will do here for the preservation of the environment and for the improvement of the environment. In order to preserve the environment, we want to improve the environment here so much that this place becomes	• We have answered your employment issue before. In what you are talking about environment, we are going to do many things for the environment. Along with this, if we talk about environmental dust, today the norms of GPCB are very strict, we will see that we will maintain even more strict norms, use advanced equipment and in this equipment it will be such that whatever impact we have is more or less be restricted in the plant it self. Because a dense green belt will be created all around, there will be no major impact of noise and water or dust pollution. We are sure that the impact will be less than the norms of the environment.

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		worth visiting. If you accept our request, we welcome you with open heart.	
11.		• Hello , there is a misrepresentation here that marine life will not die, skin diseases will occur due to soda ash and then the company will open a hospital. First people will be poisoned by inhalation, then the company will open a hospital. This company makes false representations. Opponents are not allowed to enter. • Go back GHCL Go back GHCL Go back GHCL ,	• Now it has presented skin and respiratory diseases , today I am showing you that we have been running the plant there for the last 35 years and no such major problem has been observed. Apart from this, today there are four soda ash plants in Saurashtra namely Tata Chemical , Nirma, RSPL and Dhragandhra Chemicals. Looking at all these plants, no impact has been observed anywhere, so this seems to be a misleading thing, no such major impact has been observed. • Another thing was said that there will be pollution in the water and loss of life. The treated effluent we release is non-toxic and inorganic. And it has no impact on water. And it has been studied independently whose papers are available. Studies show that no fish or marine animals are harmed. Moreover, there is growth of sea weed and fish growth is more so there is no impact on it.
12.	Bharat Karshan Gadhavi Village :	• How hygienic and clean will the plant that will come up in Bada village be compared to the Sutrapada plant . • Thank you and we welcome you. • Second question We have more and more farmers and what facilities and protection will this GHCL company provide for the farmers?	• Sutrapada plant is 35 years old today, the technology we are going for today is very advanced and for the pollution control it. I can say today that this plant will have better control than any plant in India today. And by all means the advanced plant will come and provide good conditions and there will be no impact on the surrounding villages. • What we talked about today and our CSR presentation also

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			showed that agriculture and animal husbandry are our main themes. And in farming we do different things like organic farming, we work in zero budget farming. Also, GHCL provides support for the government's schemes like for drip irrigation and sprinklers , if we make it effective by giving subsidies, efforts will be made to produce more green production and good production by using less water.
13.	Vijay Karshan Gadhavi Village : Pachotia	• It is asked whether you can neutralize this public hearing or are you doing it at the behest of a person sitting in a corner under pressure from someone.	
14.		• If the EIA report prepared by the company is to be viewed legally by the public, the EIA has prepared the report without considering the nature of the matter here. First of all our demand is before you and honorable officials that this EIA report is wrong which is known to the public, our technical team and we have done this study and we put this before you this EIA report is wrong. While our area is shown as a dry desert, you should know from the road that our is our area actually a dry desert when you come to our area? And you guys have shown our area a dry desert in EIA. As the EIA report is completely wrong, It is our demand that it should be amended first and only after the amendment, this public hearing should be held. I end my speech.	• Today you made a submission that the EIA report is wrong, now the EIA report that we have prepared, it has been prepared by a very reputed agency of India. This is a government agency and their report is generally accepted for all projects. Apart from this, if there is any kind of suggestion in this EIA report, it will be noted, and if any correction is suitable or someone suggests it in the final EIA report, then we will try to implement it, we will review it for sure. So if you have any suggestion for EIA please show.
• During the entire public hearing, there was a continuous noise by the people , so that the Regional Officer As stated by make presentations one after another so that the voice of all can reach all.			
15.	Maheshwari Dhanji Valoo	• As our supporters have given you a statement, if you are able to fullfill,	• As you have talked about the chimney, then it will be fully

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	Village : Mota Laija	I welcome this company. • Second, sir , disclose the height of the chimney in this company to the public.	calculated for the height of this chimney and the minimum height of the chimney will be 130 meters.
16.	Bhawanjibhai shouted Village : Former Taluka Panchayat	• I support and welcome the company. • Here are our youth who are coming from the villages in your criteria area who are ready to study for skill development but if their economic condition is poor, what can you do for them. • I want to know what you will do for the farmers here in our area related to agriculture.	• We at GHCL do various such things and if there are any such thing in future we will try to help them as part of CSR . Apart from that, we will arrange education here too, but some suitable students will be selected for higher education. • As we mentioned earlier we will do many things for farmers out of which agro livelihood is one of our core skill areas where we will do things like zero budget farming, organic farming, drip irrigation and sprinklers .
17.	Viram Gadhavi Bada	• We want confirmation in writing that the company is committed to our cows for 365 days or not. Committed or not.	
18		• Make sure that there is a center of vipassana meditation nearby. All over is in the world. Vipassana center is near.	•
• During the hearing, there was continuous uproar from the people. It was presented simultaneously by different persons .			
19.	Valji Jashraj Charan	• EIA notification, this public hearing is held only in 24 days time, 45 days time is not given to us. to close this public hearing. Stop this public hearing and give us 45 days. • Sir, stop the proceedings, we don't need a hearing , Corona guidelines have been violated. • No, no, public hearing do not close, continue continuously. Just keep going • We don't understand why this public hearing is going on despite all this outrage. Tell us what is the reason for this public hearing, do	•

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		you not understand such public outrage hearing. • Outside men are coming and speaking. • Sir, which law and order which we took and order breached you to put in these minutes first you show which order we took and order breached. We will die but not go away. • Hon'ble Chairman Sir you make the public seat like this and give the company VIP treatment, is this right. • I want to make a presentation through electronic medium , then if I am provided with electronic medium and the LED should be turned on, this should be played, through electronic medium I want to ask questions.	
• Stated by the Regional Officer that you are frequently requested to present any issues you may have. If you don't have any technical presentation, please let us know so that further action can be taken. • Told by the Regional Officer, make the representation you want to make simultaneously so that the proponent can respond. • Told by the regional officer that this public hearing is only to hear your objections and representations, present your objections. It is our repeated request. This forum is neutral only to listen to your objections and take them to the right place. So give your submissions. • Chairman said that we are here to hear your objections and submissions but you are taking law and order in your hands you are getting into quarrel with the authority we are taking all your objections in writing and verbal don't take law in your hands . It is my humble request to all of you that whatever objections you may have, please let us know in writing and verbally on camera. Please I again inform you don't take law and order into your hands. Feel free to put your objections and representations and suggestions before us. We are ready to take on camera and in writing. But maintain the law and orders and maintain discipline. • Stated by Chairman Shri , whatever your oral presentation is, you should say it on camera. First you calmly tell us your objections and suggestions. • Regional Officer said that any objections you may have will be audio and video recorded and forwarded. • Stated by Chairman that make your submission.		
20.	Village : Janakpur	• Says I support this company and welcome the company. We support publically. • At the same time, we ask that you will do the work that the company	•

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		has to do in the interest of the public, and put it before us.	
21.	Vipassana Center		• Pollution or sound or any other effect does not affect the center of Vipassana. • All measures have been taken by us for pollution control. Dust pollution will be so low that it will generally have no impact due to green belt and minimum dust generation. For sound , any equipment having noise problem will be enclosed , the equipment will be inside the building and also because of the green belt , the impact of sound will be limited to the boundary of the plant. And the sound will stay within the board's norms so it has no major unappreciated impact. For which the plant assures that there will be no impact and for that one of our reputed agencies has done the entire study and the study shows that there will be no unappreciated impact.
• Told by the regional officer that once again a humble appeal to all of you that whatever issues, objections, representations you have, please make them so that we can minutise them and send them for further action. • Told by the regional officer that, sit down, do it quietly, if you all speak together, you can't be heard, please all speak simultaneously.			
22.		• We support this public hearing and welcome the company.	•
23.	Khushalbhai Gadhvi Village : Pachotia	• He said that around 300 laborers have come with them, so how will the GHCL company take those people into confidence that they will be given a chance first. Why will they be given priority to work.	• As mentioned above for employment, we will give priority to local people based on merit and need .
24.	Dr. Devendra Gauswami Village : Janakpur	• He said that in the presentation made by this company, you have not indicated whether they use ammonia in Sutrapada or store the ammonia tank there or not. And tell	• Your three - four questions are. I am answering three - four questions that ammonia is recycled in the process, ammonia is used, it is recycled and used,

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		here whether you will use it or not and how dangerous ammonia is. If his dust comes here, I am a doctor with 21 years of experience. Asthma cases have increased by 100 to 1000 percent here since the earthquake. You bring a company here and develop it, but you don't tell anyone that we will do this and we will do that. If you store ammonia here, what will you do about it, if there is a leak, what will happen to the people who are there?	ammonia consumption will be reduced from the existing plant, its advanced technology will be used, so ammonia consumption will be reduced. • Another question is whether ammonia will be stored yes it is clearly written that ammonia is in its ammonia bullet will be stored but the amount of storage will be very less and it will be well within environmental norms. For this ammonia what you talked about that if leakage will happen, then normally ammonia will not remain in the atmosphere. But in case of a catastrophic ammonia leakage, adequate provision is made for it to be controlled inside the plant boundary, a special scrubber is installed inside the plant boundary. As soon as ammonia level increases the spray of water showers like rain and ammonia is scrubbed and ammonia is eliminated in the same area, because ammonia is soluble in water. So in such a case, it would have rarely happened in the entire history, one case out of thousands would have happened anywhere and it can be controlled comfortably.
25.		• We have not seen this public hearing happening in this way anywhere in the country. and you are stoping people here, and not allowing public to come forward. You are doing forced public hearing like this, sir, you are working against the law, you are working against the people. And even though there is so much opposition from the village where this plant is to come, you forcefully hold a public hearing, you are doing it	•

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		forcefully this shows here. • No, I will speak, you have been speaking so long, if I forcefully come to the courtyard of your house , you will let me come. By buying the land of Bada village by your money do you have the right to put the plant. Public hearings do not take place in this way. • Note that a person cannot support or oppose from outside.	
• Stated by Chairman that Madam, state the reasons for your opposition on record we record here. You speak with reason. If you want to argue, we welcome and accept it, but suggest and present your objections to us. • Stated by the chairman that outsiders should give in writing. Any objection, suggestion, representation reason of your people give us oral written. We will consider your objections, suggestions and representations verbatim. At present public hearing is only for your objections and submissions. You don't have to protest. But if the reasons are genuine , you give us oral and written, we are ready to take. • D.Y.SP. By saying that "Brother, step back a little bit, everyone has to make a presentation. You step back a little bit. Please step back a few let's step back everyone. Everyone will get full opportunity of presentation, no one will be left behind.			
26.		• Please consider that no one from outside can support or oppose. • Ignoring the arrivals from any villages outside the affected village . You have full support from nearby villages.	
• GHCL go back, GHCL go back , • Sir give us the mic, • D.Y.SP. But if there is some arrangement here, I can give you the mic, is for you • GHCL hey hey, GHCL hey hey, • D.Y.SP. as stated that madam, go back a bit. • Chairman Give the mic to whoever wants to present and give everyone a chance to present. • Chairman said that everyone should give their objections and representations verbally and in writing and all objections and representations will be noted.			
27		• It is with great sadness that I have to say that you are a GPCB officer who is witnessing so much protest in the atmosphere inside the dome, the breathing for the colleagues is difficult even if an ambulance comes and takes them away, the shameless government is sitting silently, sir. I have studied EIA and	•

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		have come to put my points and I have also brought my points in writing sir. You are bound to listen to my points first you should preserve human values. These three sides of the dome are kept closed, which you cannot keep as per Corona guidelines. Three sites of dome are closed here and my colleagues are my colleagues are gasping for breath, in this case how will the public raise or hear this. How shameless you are now, you don't realize how many of our people are taken away by ambulance, what you will hear from us in the future. My request to the sirs of GHCL company is that you are not listening to human values now, if you do not appreciate human values now then what will you listen to us in future. I have come with all your reports, I have studied your marine report and your terrestrial report as well. And also we are not a people who have come to chant slogans, we are educated people, seekers of Vipassana. • Barmeda sir, I kindly request you that there is so much opposition and how you can allow this hearing to continue. What you are hearing by crossing human values is very sad sir. If you want to hold a hearing, keep it for three days.	
• Chairman said that, you may make your presentation, • Any representation issues you may have as stated by the Regional Officer, forward them to us. The hearing is for you to make your representations. Give us any issues or make representations.			
28		• I have a question to the honorable GPCB officials that a petition has been filed in the Gujarat High Court which directly means that the people are right and the people have the right to speak. And if the Gujarat High Court is listening, then	•

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		why this vulnerable government is not listening to us and our request is that we have 5 GB of data, if this data is shown on this screen, then we will believe you that you are capable of asserting our right. • Honorable officer of GPCB and Collector that sir we have the data evidence to be put on the screen. If the people see the supporters and also see the opponents, that means they will understand what is the real situation of the company and stop fooling the people and oppressing the people.	
• Told by the regional officer that, whatever issues you have, give us, we will send it along with the minutes and it will be decided. You can give us any data you have, so that we can forward your submission to the next committee to take a decision .			
29	Koli Mohan Viraji Atmaram Village : Bada	• What will you do for our Koli society ? If you do the work, our village has public support for the company.	• As a representative of the society of your village Bada, we have already informed that the coming of this plant or its effluent will not cause any problem in the fish catch and will not cause any damage , opportunities will be given to the youth as per merit.
30.		• Sir, listen to my presentation, this land where the plant is located belongs to Bada village. If the land of Bada village is gone, you are obliged to provide fodder for the cows of Bada village for 365 days.	• We have already given all our confirmations, we will provide fodder for cows as and when required.
31.	Govindgar Desai Goosai Village : Bayad	• He said that it is our request that some arrangement be made for education and animal husbandry and if the arrangement is made, we publicly support you and thank in behalf of 150 peoples.	• The requirement of Bayad village which you have shown, I have already said that in our activities, education and skill development will be done to make the youth of this place eligible to earn. Besides, we will modernize the existing schools and new schools as per the requirement. We will establish in the future.
32.		• Sir, it is my humble statement that more than 90 percent of those who speak in any opposition do not fall	• The work of seeing all this is being done by the reginal officer of GPCB and chairman sir.

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		within this buffer zone. So they have the right to give in written representation. • We believe that they has the right to give in writing but they have no right to speak in the public hearing sir. • Sir, we have many supporters behind us. But only the video is visible so far so you don't reach the eyes of the supporters. Actually 1000 of people and persons have come in support of this GHCL company. So my absolute request to you sir is that all the persons who oppose this only want to fight with government, to cancel this hearing and it is our humble request to you sir that you will be placed for 5 pm till the hearing is over. stay till Then. We ourselves want that any question or any solution can be made only from discussion. So, if we do not sit and discuss this, then there will be no solution to the question, so my humble request to the opposition party also is to maintain order and sit well and if you quarrel in this way, the health of the people will be 100 percent seriously affected.	

- If you have any complaints and submissions or objections or suggestions related to the hearing, please let us know informed by Chairman.
- Told by the regional officer that, you are again requested to the everyone that you can sit at your place and present any suggestions, representations, objections you may have. Which will be included in this agenda and forwarded. This forum is only for hearing your objections suggestions suggestions. No decision is to be taken from this forum. Therefore, we assure you that any of your submissions will be minutise with audio and video recording and sent for further action, so kindly request again to make any submissions to the everyone.
- D.Y.S.P. It has been stated by that, Chairman Sir please instruct that both the parties should present one by one.
- Please maintain discipline as told by Chairman. This thing is going out of order now. You have the right to object. But maintain discipline in it. If you have any objections , suggestions or representations, say them one by one inside the mic, then we will minitise them and send your suggestions word to word to the decision making committee. We have not come here to decide on the forum.

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33 .		• Listen sir, you said that we will give fodder to the cows as per requirement. Exactly, Jain society gives fodder as per need. You say that we will give fodder as per requirement, if you are transferred somewhere tomorrow morning, who should we catch? So we don't want, don't want and don't want this company. • GO back , GO back GHCL GO back.	• As you have said I will be transferred or when I am transferred, when we speak in this public hearing, the entire recording of the commitment is done, not as individual person, this is the commitment of the organization.
• D.Y.S.P. As stated by, Chairman Sir, there is no hearing of any kind in this manner. Until then, the hearing will be held only after peace is maintained, tell everyone in order.			
34		• I am not from this zone. I am a citizen of India, a citizen of Gujarat, a citizen of Kutch and have full rights, I have rights.	•
• As stated by Chairman that, whatever your objections are suggested, make any submissions you make in writing or orally. Whatever objections or suggestions you have, speak one by one, all your objections and suggestions will be heard. • D.Y.S.P. As stated by, all are allowed to speak but sit down all. • Speak one by one, present any objections one by one as stated by Chairman. All your objections will be heard. • I request you all to raise any representations or objections and maintain some discipline, said the regional officer . This doesn't seem like your behavior right now. • As stated by Chairman D.Y.S.P. Sir whoever is throwing all the shoes at the moment is kindly instructed to sit quietly. • D.Y.S.P. By saying, everyone please sit down. Now the police will do the work of the police. It is not considered reasonable, so please maintain discipline. • As stated by Chairman that, this is not discipline. I tell you again. Do not protest in this way, democratic protest should not be in this way, present your objection suggestions within your protest, we will listen to it. But what you are doing now is not protest. • D.Y.S.P. As stated that, all of you sit down. Sit down for a while. The question arises.			
35 .	Vijay Gadhavi	• One minute brother, one minute brother. First of all, I request you to sit down quietly, brother. We have to stay in this area and you. So you will not give any reaction. So we are capable but if you don't react then ok, Brother calm down, Mind my words have no power in this company. The court is big, the public hearing is not the last thing, the public can be sold, I can be sold, the officers can be sold but	•

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		the courts are not to be sold. We have so much opposition, so much matter. Dear chairman and Regional officer, We consider you biased. You are forcfully advancing the public hearing. Right now the petition is going on in the high court, I challenge you for being baised take you to the court in this matter. But the brothers who are sitting with us today. I request them to leave peacefully. So get out comfortably without making any noise. • Let's go brother let's go • GHCL hey, GHCL hey, GHCL hey, GHCL hey, GHCL hey, GHCL hey, GHCL hey, GHCL hey,	
• According to the Regional Officer, anyone who has any objections or representations regarding the project can do whatever objection if left. You can make any objection or suggestion regarding this project. Your submission is acceptable in both written and oral form. Which will be included in the minutes and sent for further action.			
36	Shamat Singh Sodha Bada	• I am the Trustee of the International Dhyana Center in Bada and listen to all people, all those who are in favor and against please listen. • Earlier also when officers of GHCL company came to meet the trustee . Even then we have made our submission. This is a very ancient science of India, the meditation of Vipassana Dhyana that no one has except India has and the attraction of all the world towards India. Vipassana meditation method has its attraction. So thousands and millions of people from all over the world come here to meditate. comes to do penance. For the past 32 years, this center has taught thousands and thousands of people the method of meditation and has given peace and happiness to their personal lives. Even before this meditation center, it is described in	• As for the vipassana center that we were introduced to, I have to say, first listen to me, the vipassana center is really a very good meditation center. And we respect it, we will also try to take advantage of them in future. Another thing is that the Bhopal example you gave is a bit misleading because in Bhopal methyl isocyanide was used and not ammonia and this ammonia dissolves in water and our consumption is very low, besides our storage of hazardous. is much less than limit , so no such question will arise. And its chances are very less. And if this happens, remedies have been taken for it, apart from this, talking about ammonia in those remedies, for this ammonia NEERI has done a very good study and studied it in detail. And

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		the scriptures that in the middle of this Bada village, many sages have practiced penance on this earth and that is why it is called Tapobhumi. Bada is a tapobhimi. So this is our history as a witness that our religious books spiritual or whatever sages are a witness that when any meditator's attention is disturbed, when someone disturbs it, the disturber and that meditations violator is condemned. To which our scriptures are witnesses. • Now secondly, sir has accepted that ammonia is to be used in this company and its storage is also to be done. So, within our India, an ammonia gas leakage incident has happened in Bhopal. All the news reporter of which are sitting here as witnesses. In which thousands and millions of people died of suffocation. My only suggestion is to save your money and energy and take this company far away from this center of attention. I am not saying that it should not be established here, the sea of Kutch is so big, from Abdasa to Nalia, you should take this company wherever there is less human population or many times far from human population, and especially from Vipassana meditation center. Otherwise, in my opinion, the company that is distracting in this center will be condemned, then it is up to you to decide what to do. If you want to save time and energy, this Bhanate (whom we call Sadhu with me, that Sages also has the same promises that explain to this company if the attention of these sages is disturbed then the company will be condemned. Sadhu, have already said that this	it is also believed that this quantity is very less and on this account there is no possibility of going beyond our plant boundary. But still all corrective actions will be taken for it. There is an automatic ammonia detection system and whenever this system detects any ammonia, immediately there is a protective water shower and scrubber that neutralizes it there and then.

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		company will not stay here, maybe if you set up here, there are also incidents that you will have to leave in the future. I have been doing meditation for 22 years and I express my inner feelings that I put before you then your wish.	
• Chairman said that, thank you very much, we have presented this very calmly and have recorded your presentation on camera and we will consider your presentation in two minutes. That's why this is a public hearing, whatever your objections, suggestions, there is no decision authority here. We have only come to listen to you, we take minute to minute word to word on camera whatever presentation you make, we will send it to the above decision authority in the same way as we have made such presentation. We assure you that.			
37.		• Sir, my environmental issue is that the report of the EIA report prepared by GHCL is also on point number 3 of the working summary of point number 1.2 analysis of five options in point number 16 of the project site. Analysis of the five options for which the company is to be established. According to the options analysis report, the company has selected Bada as the site after identifying five different alternative sites. So our view was that Modhwa village which is very close to the port was a more suitable option for this project because Modhwa village already has industrial units and is not a sensitive area in terms of environment and port logistics and other facilities are also nearby. Compared to this option, the coastal environment near Bada is highly sensitive. Also this area is currently free of any kind of sea or air pollution and there are reserved forests around Bada, Gorad Bird Sanctuary is just 25 km from Bada village. It is only here in the whole Asian continent that there are so many ecologically sensitive areas, but what is the purpose of choosing Bada among the five alternative	• This is a very important question of yours. When we thought of setting up the plant, as shown in the above, five sites were selected, the initial environmental impact assessment was done for all the selected sites and studying all these impact, where there is minimum environmental impact, and where it can be easily dissolve in water. And according to the various reasons given by MoEF (17 to 18 points) the best site Bada was identified and accordingly this site was selected. • Now if we talk about it, you people have shown that the forest is 25 km away from here, so the forest does not come in our impact area . • First listen to me, I have listened to you, now you listen to me, I am answering you. Another thing is that there are flamingos around Modhwa and there are also reserved forests, so about this plant is not suitable here, but any questions you may have. So I am showing the presentation of Mr. Krupadan who is an expert of NEERI . • Can I talk to NEERI sir for a

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		sites? • We say that Modhwa site is the best site when there is no pollution of any kind in Bada, no pollution of sea, no pollution of air, no pollution of any kind. The entire coastline from Mundra to Modhwa has been industrialized and fishing and polluted by every sector and every industry. Now only the coast from Mandvi to Jakhou is left only from Mandvi to Jakhou and the area of the environment is left and the area between Mandvi and Jakhou is the area of Bada and the area in between Introduce this company and how will it solve the pollution Well, why have you selected this area in between for pollution? • Well, why have you selected this area in between for pollution? • and another question that we have given NEERI organization to make all these EIAs, NEERI organization has studied all these sand dunes from forest department or from which department and with whose permission or have they gone away after doing illegal studies? • (turned off my mic) • Sir forest is not 25 km away from here, the forest is only 2 km away from here. Mandvi's Bada Rakhal Mandvi's Sea, Mandvi's Reserved Forest is a forest just 2 km from where we are standing. More photos of flamingos in the middle of Bada If my mobile is connected to it, show photos of flamingos with GPS of Bada . Flamingos also live here. I want my mobile to be connected. In my written application, photos including GPS have also been given. I will show you the photos of flamingos coming to the creek area with GPS . My	minute) • Karipadan Saheb (NEERI): No we have done in the report. You may have used a mobile but we captured everything from remote sensing data, we selected five sites from remote sending as per government regulation. And among them we have selected the best site. And it is not that I went alone and brought this data, we had a team of 20 scientists to collect all this data. This study has been done by going everywhere and examining everything , not only for the forest but we have taken into account water quality, turtles and all other parameters. • As sir said, I have repeated what I have said which five sites have been selected and which have been discussed. Its Environmental Impact Assessment has been done. Another is thing is that Modhva land is marshy land. Which is suitable for salt work but not for this project.

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		mobile should be connected. • Sir I have a question for those who don't want the company to raise their hands. These men do not want company. These are anti-company men. They want environment. They want animal husbandry. They don't want company .	
• D.Y.S.P. Tell them that these people do not understand Hindi and English, so there is no use in speaking in English.			
38		• Sir I have a question though everyone has the right to protest and support. But thousands of our public are sitting. I prove it here. Those who need company should raise both hands. Those who need company should raise both hands. You can also see this support. You can decide by looking at this support. All my brothers are there so there is no problem. And can see the men of support of the company. So we welcome and accept the company.	•
• Chairman said that, I request you to listen to me first, this forum is not a forum for taking decisions, so we should not discuss the matter of who is in support and who is against. This is my request to you who have objections or submissions, please put them before us. • It is my humble request to Sir that this is not a place for show of power. It is humble appeal. • As stated by the Chairman that, this forum is not a forum for taking decisions. Who is supporting and opposing is not to be discussed. This is only a forum for your presentation and public hearing, this is a forum to listen to any submission or objection or suggestion you have. This is a request.			
39	Charan Valji Jasraj	• Hon'ble sir, it is a humble request that this Govt GPCB recording is to be live on screen. Later, GPCB has given 17 notices to Gujarat Heavy Chemical Limited in Sutrapada by Gujarat High Court and these notices have not been shown to those people, to the society, ignoring the notices that this company is going to come up with	• Your question about disturbing sand dune is completely correct that sand dune cannot be disturbed. and for that we have studied the details of sand dune we also want the sanddunes. So the sand dune will not be disturbed at all. The first thing is that your point is correct, how will we lay the pipeline, for that

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		another plant here. What are the facts in those notices should be presented to the people so that people get more awareness. Then our question is that the places for 54 turtles within India have been selected. Hon'ble Chairman. There are three places in Kutch most of all which is the coastal area which we understand from Mundra to Narayan Sarovar the turtles which comes here to place the species of turtle within the whole world. People come here, their pollution comes here, the question here is the turtles who come here, but what the company will do for these turtles. • EIA Issue No. 56 Sea Water Consumption The company's sea water consumption report has clearly stated that the project site near Bada village is continuously covered with sand dune , sand dune along the entire coastline towards the sea coast. Located south of the sand - dunes. CRZ Environmentally Sensitive CRZ also declared these sand dunes as sensitive area on the CRZ notification , which you know and we also know. So no one is allowed in any region to disturb such sensitive area. sand dues protect from, tsunamis, and sea storms. And keeping that In mind, CRZ has made such rules. As per survey report of GHCL there is no natural way to get sea water. And to do this , the average width of the beach sand dunes near Bada is less than 1 km from the beach, which is very less compared to other villages. And any mistake will prove fatal to the sand dune . The responsibility of the company will	we will do underground micro-tunneling, and this underground will also go down about 15 to 17 meters from the ground and 15 to 17 meters below the base of sand dune. Micro tunneling will be done. And for this micro tunneling is also studied by NIO. And in the details of this study, the Intake and outfall point has been determined and will be done accordingly. We will not disturb the sand dune of any kind. We will not cut any trees. So the work of this pipeline will be done without any impact on the environment. Another thing is that we talked about turtles, what you have said that this work will be done underground tunneling and pipeline will be laid, there may be disturbance for two seasons during construction. After this, the coast will become as it is. So suppose the turtles are coming, but the report of ZSI and the representative of the guide with us have also studied, that if the tide comes in the sea of Bada village, there will be no space between sand and water. Being a rocky area, it is not suitable for turtles. And when people surveyed, no major observations were made, no nests were found, no dead things were seen. A guide representative is with us for that. A representative of NEERI is present This is the reason in my opinion. However, we do more things whether the turtles come or not, the first thing is that after two seasons it will be the same. If the turtles are coming, they can come. But

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		be whatever happens. Pipe line..... • Sir, my only question is that if you make a plan for the breeding of turtles, the turtles will not believe you or me and the turtles will not come to lay their eggs. It is a natural process, a natural creature, a natural animal. In EIA Summary Page No. 16 Point No. 4.5 Ecology and Biodiversity you have stated that the 2 km marine area south of the project boundary is not suitable for breeding and nesting of turtles. You have given wrong information.. Peace.. Peace.. Peace.. • According to the report of Sundarraj Potential Nesting Beach in Kutch, the 11.5 km sandy beach from Nana Laija to Bada is the number one potential nesting beach and the beach from Bada to Bambhadai in the southern direction is the third potential nesting beach. The company's EIA notification has indicated that the company's site falls on the third potential nesting beach. But the company's proposed location is east of Bada and is on the No. 1 potential nesting beach. A map of the area mentioned in Sundarraj's report is enclosed with the application. If you want to see sir kindly please connect my mobile so that I can show you the report of Wesley Sundarraj which shows the 11 km stretch of sea from Khata to Bada as potential No. 1 beach for turtle nesting beach. Please connect my mobile. Please connect my mobile. • So, sir you show the same report in your EIA. • Sir, my mobile should be connected so that I can show you the report of Sundarraj with proof. My mobile	we have taken the help of the guide to make a conservation plan for the turtles and sanddune and those people have made a detailed plan for the conservation for the breeding of the turtles and we are going to work on it. • Now what you are talking about that the report made by Sundarraj in 2002 is a very old report and there is no clear data, no long term data available. • ZSI's report we have taken reference of Sundarraj's report. And in addition we have done the detailed study again with the guide and also given them inspection in these details we will include in the EIA report and any corrective action will be taken. • You can certainly give anything that's there but I'm telling you again when we do the pipeline work and these two reports show what's not here. But you can send it to GPCB. • The first thing that has been said is that only two seasons are enough and then the sea will be absolutely normal. • This I will request the representative, Guide today to shed more light on this. • Guide: The first report of Wesley Sundarraj to be shown is the report of 2001-2002. There are still a couple of reports. The report that ZSI has made has not been mentioned, we guys have been working since June. • This brother says it is correct, since this report is from 2002, no study has been done on it. A study has been conducted by ZSI in 2019 .

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		should be connected , my mobile should be connected. My request to the technical team, Chairman, reginal Officer of GPCB Board, My request to these people that my mobile is connected then only the further hearing process should proceed. Sir, my humble request to the GPCB board is to present my objections. • So sir, if you can show this company on this screen, why can't you show our work ? In which law is it written? • Since so many times sir you are saying, how will this be on record if the public sees it all? If you can show the company on the screen, then you have told us so many times that keep calm, take your case, we are presenting our case, then my mobile should be connected to present this case. • Whatever legal question you have, whatever team of lawyers, whatever lawyers have come to us , highlight this thing and say, GHCL has the right to speak , the right to show the script, so we are local opponents here, so can not show us the screen? not right. • All the proofs I have obtained through RTI on birds and animals from here. Above this I request that my mobile be connected. • We have submitted electronically, sir, I have noted it, but I want to show it along with proof. • Sir, this officer says that we will send it to above, if it will be ssen and recorded than otherwise how will you say the same. • Sir show now I want to show proof public and GHCL . My mobile should be connected. I will show you schedule 1 animals, reptiles, marine	• Project Proponent : What you say is not reported. Give your name and village name. • The Katda does not come to our affected village. no 22 villages are not. Any representation you want to make can be made in writing. • Let's listen to his presentation first. Let's listen to his presentation in full first. • 22 villages are not in 10 km area.

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		plants, flamingos, all things, my mobile should be connected. Show you including its GPS number. • No sir, no sir, I am an environmentalist, an environment lover. So like NEERI organization I am an environment lover. • Sir, what goes into connecting our mobile, our mobile should be connected. • This is not Kerala or Bihar, this is Gujarat, this is Kutch , this is Kutch. You talk in Gujarati. • These people should be given the mic only after my presentation is over. I have a representation. Chairman, I want my mobile to be connected . • Everyone sit down comfortably. All those who are against us also sit down and those who are supportive brothers also sit down. Everyone sit and listen, I will sit and present properly. What birds do we have? What animals do we have? What kind of culture do we have, I suggest everyone sit down. • Hello sir my name is Charan Valji Jashraj, I am from village: Kathda, taluka: Mandvi, Kutch. The first thing you need to know is that as per the law no advertisement of your GHCL company GPCB board has been done in our village. Our Sarpanch has come with me, but we have not been informed. We have come after listening to the voice of all the public in our way, as per the notification, if you have to inform, you will also take it on record that our village has not been informed in any way. • As shown in your EIA report, 22 villages are shown in buffer zone in your EIA report. shown in your EIA report.	

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		• Our village name is as 22 villages are shown in your EIA report. Sir, I want my mobile to be connected to this screen, so I can tell you the answer to my questions from the area. • The points have been presented sir, I want to show the map of Sundarraj. • Here I want to show schedule 1 animals and birds. I want to show her photos, is it okay? If you show these people a presentation on the screen, then what will we do? • Sir my only submission is that my mobile should be connected, you have right to submit or not. Sir, my question is that I have the right to make a full presentation or not? Answer me Chairman sir. And GPCB Officer answer me my question whether it is my right or not. • So cancel this public hearing, what's the point of such incomplete work? If our mobile is not connected, the public hearing is violating the law. Please connect my mobile. • So cancel this public hearing, what's the point of such incomplete work? If our mobile is not connected, the public hearing is violating the law. Please connect my mobile. • If given an opportunity, I would like to present through electronic means. • Let me connect my mobile. Even if my misrepresentation after connecting my mobile, all my points are dismissed. • I also say publicly , if my points are wrong , if any of my points are not environmental oriented, then you can dismiss my points. • Sir, if my mobile is connected, GPCB board or GHCL has not made this arrangement, then how can we	

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		make this presentation. • In written/oral it means GPCB board met with GHCL. If the GPCB board allows GHCL to present on this screen, why not give us a presentation. Else postpone this public hearing or technically connect our mobile to present our issues. • Chairman sir, if GPCB is not competent in such technical matters and the company is not competent in technical matters, then you have no right to hold public hearing , you are not letting the people speak. If you can allow the company to perform this then the first is the citizens of India and the people of India. You have come to listen and we have come with evidence. And we are also able to challenge you. • Hon'ble Sir, In Law and Order there is a perfect right to present through electronic medium. Our demand is that our representation is done through electronic medium,What work does GHCL offer if not us? • So if you are a GPCB officiar or a government officiar, then you need to be aware of the fact that people like us will want to present through electronic means. • Not soft copy sir , electronic medium. • If not possible, cancel the hearing. • I can't show soft copy to people, I can't show it to media. • My mobile should be connected. • If it is not possible, the hearing should be cancelled . • SDM sir.....SDM sir.... , I am asking you if these people do not have the instruments to listen to what you are saying, we have no right to speak. • No, not a pen drive , I have my	

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		mobile. • If you don't have system, your system is very weak , it is proven. So let us complete the arrangement for you , help us to connect with the mobile we have. • Honorable Chairman, you are responsible. Points to be noted You are responsible for people's submissions. • Your media as well as these people, this hearing is completely wrong. The public hearing is completely misplaced and wrong to prove this. All the public are informed by us that there are insufficient instruments in this hearing. What is the use of hearing to make our submissions? So it is the hearing of one party, not our hearing, you have to listen to the same party? I want to show Schedule 1. • Connect our mobile with this then we will present. • Postpone the public hearing if you can't connect the mobile	

- Your oral presentation is on camera, the camera is running right in front of you, said by Chairman . So whatever you want...
- Chairmen said that show from there, if you can show from there, then you show from there.
- Regional Officer says that you can present yourself.
- Regional Officer says that it is noted and you can provide proof you can provide proof to GPCB.
- Any submissions you may have will be sent along with the paper and will be collected, as stated by the Regional Officer . And that thing will be declared.
- Told by the regional officer, , hear, hear
- D.Y.S.P. As stated that, both parties should be side by side. Move to this side, all the opposition move to this side, brother, move to one side. Put them aside, Sir, adjourn the hearing until these people sit aside.
- D.Y.S.P. As stated that sit down peacefully, it will be start only after sitting.
- If you give the name of your presentation, it will be recorded and from which village you belong, it will be recorded.
- D.Y.S.P. Let's sit down bro. Hello brother hello keep calm.
- The regional officer said that , everyone will be given a chance to speak maintain silence .
- D.Y.S.P. told that, " Brother, sit quietly, otherwise everyone will be removed from here." Brother, turn on this electric fan, turn on the table fan .
- You can present your issues as stated by the Regional Officer .
- As told by the regional officer that, give us the map and give us a hard copy. You can submit too.

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- As told by the regional officer that, you are presenting yourself.
- Told by the regional officer that, there is a possibility that mobile can be connected. Valji Bhai there is no possibility of that but let us ask.
- D.Y.S.P. told that , turn on the fan Sir turn on the fan here.
- Women: Patel Sir – Patel Sir
- You are being given complete opportunity and are being heard said by the Regional Officer .
- Told by the regional officer , you are not being stopped in any presentation. You can present yourself completely. Your submission has also been received in writing. Can also be done verbally.
- D.Y.S.P. As stated that, the fan will take a while to turn on , all your wires have been cut, the grates have been opened, and are kept closed to prevent any accidents.
- As told by the Regional Officer that, continue with your submissions. You can make the submission in writing or orally.
- Told by the Regional Officer that, we are not going to judge your issues right or wrong , we are forwarding your submission along with the accompanying videography.
- As stated by the Regional Officer that, you can present . We are listening to your presentations and it is also being recorded , there is no question of interrupting or interrupting anyone. You can submit.
- According to the regional officer, his presentation was in soft copy. If you have it, let us upload it
- Told by the regional officer that, if your submission is in soft copy , then give it and attach it.
- Told by the regional officer that, it is not possible, asked in your presence.
- As told by the regional officer , you can make whatever representation you want.
- Stated by the regional officer that, but it is not likely. Those who are technical people do not have convenience.
- Chairman said that if you have a pen drive or something like that, let us turn it on .
- As stated by the chairman , if you do not have a pen drive and the mobile is not connected, then you should present from there.
- Police: Whatever is written and can be spoken.
- As stated by the Regional Officer that, we will take whatever written submissions they have.
- Told by the Regional Officer that, whatever your submissions, if these are your submissions, you should give them in writing.
- Told by the regional officer , then these are your submissions Mike in your hands, you give them in writing. If we don't take it, tell me, now you shouted, please don't make representations. Whatever your presentation , photographs, give us.
- Stated by the Regional Officer that, any other issue , if any other person wants to make a representation, he can do it.
- Sir, you don't even give a mic, where can we get the screen to show you?

40	Meet Prakash Gadhavi Village :	• Honorable Chairman, we request, we request on behalf of the protesting villages. Honorable Chairman you allow our presentation. We can give our presentation. It is our right, we are residents of this country and sir we do not shout. People who are considered educated are arguing	•

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		against you. This is a conversation not a shouting person. • Sir, it is the demand of the people that we make this presentation.	
• You make your oral presentation as directed by the Regional Officer . The camera is on , recording. Written and oral submissions are to be taken within the hearing. Whatever you want to present , whatever your issues are, we are ready to take every issue word to word. We also hear you verbalize. On camera, on camera recording. We are also ready to take the representation on record.			
41	Charan Valji Jashraj	• I want to show you the map of Sundar Raj. I want to show the animals of schedule 1 here, we want to show the birds of schedule 1 here, I want to show the sand dunes here. So how do I show ? How to show the public and the media. • Our issues are the same, connect my mobile then I will present my issues. • So you accept the fact that there are not enough facilities in this hearing, give us the reason in writing and cancel the hearing due to this, you bring all the equipment and then hold the hearing. • If the facility is not for us then what is the work for the presentation of GHCL. • Hon'ble sir note within that minute that the company has not kept this arrangement and neither has GPCB. • We the people are sitting till you say. If you say ten days then adjourn the hearing till we are sitting for ten days.	•
• Told by the Regional Officer that, you can present the points that you have , even though the proponent has replied on that point . • Told by regional officer that, but mobile connect is not possible which I asked in your presence. • We have to accept any submissions, written and oral , as stated by the Regional Officer . There is no talk of electric media but we can not do it because here is no facility for it. You can put your issues in front of the people. • Stated by the Regional Officer GPCB that, your points will also be recorded whatever you are presenting now will also be included in the minutes. Anyone who wants to make another submission			

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can do so. • Told by the regional officer of GPCB that, your issues are being noted. Recording is continues and will invariably included in word-to-word.			
42	Meet Prakash Gadhavi Village :	• GPCB take our issue on record. Sir take our issue on record. You Don't let us connect from mobile or else cancel public hearing. we are sitting Adjourn the hearing.	•
• Chairman said that we are going to record your oral presentation, and it is on camera only.			
43		• Give it to us in writing or cancel the hearing. Indian government is not that weak. Our Indian government is strong, if a mobile, pollution officer can't connect, people suspect that they are favoring the company. • Honorable Magistrate Sir, Honorable Magistrate Sir please pay attention. Please note that Hon'ble Magistrate sir is our officer. The company is plotting. Let us speak. • Honorable Magistrate sir, listen these officers do not allow us to speak , the voice of the people is muffled. While I was speaking, they were speaking in between. My Indian government is not that weak, wait will connect us. Play the hearing only if our wild animals appear on the screen, otherwise stop. • Dear SDM sir, if the company's screen can be turned on here, why not ours?	•
• There is noise. • As told by the regional officer that, we are listening to your submissions. What is given in writing is also taken by us and still you can make any representations you want to make. The recording of whatever you are saying is going on continuously, so there is no question of stopping anyone. Mobile connectivity is not possible here and cannot be done as there is no technical expert and you have to accept both written and verbal representations which we are willing to accept without fail. So whoever wants to present can do it here and later also. • Was stated by the chairman that your oral presentation is done on camera, recording is being done, written and oral presentation only written and oral presentation is to be taken in the hearing. Whatever you want to present, whatever your issues, we are ready to take all the issues word to			

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word in writing and oral also.			
44		• Honorable Chairman Sir, I have one thing to say, the surrounding villages which are affected have also given it in writing to their people's representative given their support and we all support here that we all are in support all these villages that fall in the buffer zone. Now the people who come from outside who speak do not work. Take it in writing from him. And now talking about technical, if I want to do that, take the support form him and take it in writing. Then, sir, we have given all the support forms, we are the people's representative, it is there support forms, so now you consider our support forms.	•
• Told by the regional officer that, now do you have some other presentation regarding the project. • Again (appeal to keep calm)			
45	Yashish Shah Village : Mandvi	• I am a marine biologist. I am not in support of the company or I am not in opposition but I have a question that we also have life, we are also human beings. About 70% of the oxygen that the sea gives us contains microorganisms. It is called phytoplankton. What proof does your company have that the diversity of phytoplankton will not decrease because 70% of the oxygen is going to the opposition party and the support party as much as it is going to get from the sea , and how much phytoplankton diversity will decrease after this company comes. A decrease in phytoplankton diversity will affect the food chain. In the next 10 to 20 years , which the UN and UNESCO are currently coming forward to support the environment, will this company be	• In this, when the treated effluent goes into the sea, it will be done with proper treatment and proper design. And a lot of independent studies have been done and one R.N. Jadeja 's research paper at MS University looked and survey and found out that the effluent released in sea has increased the growth of phytoplankton Its growth increases the generation of fishing. And fish catch also increases. And its records are also available with the Gujarat Fisheries Department.

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		able to come forward and reduce pollution.	
46	Name : Meet Prakash Gadhvi	• Dear Sir, Before coming to the company, we have several questions. Before the company comes, the CSR activity that has to be done did the company do it, and what funding has been done within it. And the first question arises that sir, his own foundation which is working here from Sutrapada . They does not know about ground zero here. They does not know about our water places, he has no knowledge of our water and the work of CSR has been done by his own organization rather than there were many organizations like VRTI And what has been done for skill till now let us know. • We don't have to hear all that , now listen to my question, listen to my question , listen to my question, first listen to my question. GPCB Officer Listen to my question first. • (Seat down, Seat down, all public Seat down)	• What you are talking about CSR is not a compulsion with law but our CSR foundation which is working which shows our attitude. If you look at our company vision, it says maximizing stakeholder value responsibly. Maximizing stakeholder value and one of their stakeholders is the social society. Now when it comes to working on this, we have worked on education, and worked on animal husbandry, and a little bit on agriculture . • with this, NEERI has also done a socio - economic study.
47	Charan Valji Jasraj	• We don't want to listen is, now listen to my question, listen to my question, first listen to by question Sir, in EIA executive summary page no. 10, EIA report page no. 10 has shown that there is no sensitive or schedule-1 animal or bird in the proposed project area, which is wrong as we have definite information. Where I have roamed the whole area. I am a bird and animal lover of this area and the forest area of Bada and nearby village Bhishra, Pachotia is home to schedule-1 animals like Herotra, Caracal, bird Jarak, Henaj and Chinkra, Gorkhia (Gorkhodio) etc.	

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		Schedule-1 species lives. All the evidence is there. All the evidence of this matter is there. So I have evidence of Panchnama etc. to prevent the poaching of Chingkara in Chagdai area of Chagdai area of forest department some years ago. So I want to show proof how will you give me a chance to show proof. You can't connect my mobile how can I give you proof.. • My first thing is also to be recorded. The beach of Bada village is shown as potential turtle beach number 1, then this record is taken and secondly, there are many animals and birds of schedule - 1 in this area. Schedule - 1 species like peacocks in surrounding areas number in thousands, all these Schedule-1 birds are nowhere studied in EIA and it is clearly shown in EIA that there are no animals of Schedule-1. Video of Peacocks I want to show you, through my mobile medium, how many peacocks here in Pachotia village called Asrayvala pir, at least five hundred peacocks are roaming around the place of pir , more than five hundred in the center of Vipassana. So it is clear that the animal of schedule - 1 is the national bird peacock, so this organization has not counted the peacocks anywhere, nor has it appeared to the people. • Sir, if my mobile is connected, I will say. • So sir this thing should also be recorded that my mobile is not connected. • Hon'ble Govt., my request to the Central Pollution Board is also to take this on record that the issue of our people and the proof given	

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		by them, our mobiles are not connected. be taken up on record. • My sir answer one point at a time. If the birds of Schedule-1 are given then informat to people. • My question to these people is that I am a local here. Who are the locals who came with you? Where you did not see the animals and birds of Schedule-1 at the place. The organization coming from outside should study in their own way, the local residents of the place, the names of the birds and animals of schedule-1. • Which local people did those organizations take with them? • The organization took along the local people of Bada, Pachotia, Bhinsra, surrounding areas and five schedule 1 and endangered species of animals and birds will not come out on their own as expected by the organization. It is a natural life and let it come out in its own way, tell them that I am a local of here, so I am saying that so many birds are animals or I am giving proof of it, then these people have not seen it there too, if they have not seen it during i they study then deny. And my matter be taken on record so many animals and birds are in the area CPCB Board, Central Pollution Board consider this matter as main issue. • Answer now, Continue answering our questions. • Our presentation is completely environmental and not a single issue is without reason.	

- Told by the Regional Officer that, your issues will be noted in writing and action will be taken. Whatever you say will be recorded.
- Told by the regional officer that, one a minute speak all your point you have. Whatever your issues are, tell them all and it will be done. Whatever your points are incomplete, tell them whatever

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points are left complete them.

- As stated by the regional officer that, the mobile cannot be connected. we talked.
- According to the regional officer, whatever we discuss with you is on record. Nothing happens without a record. Continue your presentation.
- The regional officer said that whatever the issue is , the recording is still going on and if it is taken up on the record, continue your presentation.
- Told by the regional officer that, we will include your issues in the proceedings.
- Stated by the regional officer , the institution for the study is of national level and is reputed.
- The Regional Officer said that, however, we will take your submission on record. And the committee will give the answer to the people.
- Continue with your issues, continue with whatever issues you have , said the Regional Officer .
- People : sir please keep our mic on don't turn it off we request.
- As told by the regional officer , their presentations one after the other are fine, continue, don't interrupt, don't talk in between. Please let them speak, everyone will get a chance. Continue your submissions no issue .
- D.Y.S.P. As stated by that, now presentation can be done only when you sit properly. It can't happen until then. Sir, in this way presentation can be made.
- Told by the regional officer that, the proponent should reply if your points are completed. Speak, speak together, speak your points.
- Told by the regional officer that, if you speak all your points, then they will answer all together. Gadhavi bhai continue all your points.
- There is noise.
- Was told by the chairman that , after you all sit quietly, let us listen to the presentation, sit in a disciplined manner, let us maintain discipline. You make your presentation now.
- Sit down brother, everyone sit down for a while. Listen to all the topics.
- Listen to that, sit down for a while, then come, sit behind everyone. We don't want to back down at all. Let us sit down, drink water and sit down. All wise up and sit down. We have many questions and they have nothing.

48	Dhvani Shah Village : Bada	• The police can't show us your gun and stand up on us and oppress us. Please ask them to sit in his place.	•

- As told by the Chairman that, then you also sit in one place and present peacefully.
- Told by the regional officer that, present in turn, we are listen carefully and recording your presentations on camera. You make your presentations, we are here to listen you.

49	Dhvani Shah Village : Bada	• Sir, I am the daughter of Bada village Dhwani Shah, I am here to present by issue to you today. So this presentation should be done in Kutchi because we all are Kutchi and you have come to Kutch but for your convenience we are speaking in Gujarati and our issues which we will present now are expected from you as you are	• I am N. N. Radiya, President & CEO of GHCL Plant. • Our EIA representative is Mr. Karipadan and NIO representative is Mr. Pradhan. • NABET Accreditation Certificate is in their possession and will be uploaded. • Dr. Karipadan : NO, Without NABET accreditation no any

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		chairperson today, Chairman will respect this and give us a fair decision. Me and three other people filed a petition in the High Court, the judge has heard the petition but no order has been given, but even though the order has not been given, this public hearing is going on. Therefore, I present my submission under protest. If you wish, I will go further. • You keep saying that you are takeing on-camera recording, you will write these points and read them at the end of this hearing with all the names and speak a summary of the points raised and the answers given or not? • If you do not summarize all the points today, you are not meeting the EIA notification requirement. • EIA notification that when the submissions of all done let it be one day, two days, five days or 10 days, at the end of the collector sir who is a chairperson, the officers of the GPCB in the chairmanship must give a summary and all should listen . And the same summary and same minutes are required to be approved by you on the same day. If this video recording is under your and the company 's and GPCB's control, it will be tampered with, whatever happens is not in our control. • As Rule you needs to summarize this, tell us if you will do or not. Whenever this public hearing ends, we want to be assured that the 10 points presented by Dhwani, 10 points presented by Gadhavi Bhai and his company's reply will be read or not? • The issues we have presented or	organization can do the EIA . NEERI is ..... Hey brother will say in Gujarati latter. • He can show if you listen, if you listen. It is not necessary to show everything, if you listen you can show it with date and it is necessary to give proof. And the proof will be shown in a minute. We are doing this public hearing . • Dr. Karipadan : Madam, it's authorized , NEERI and NIO are national institute. • Karipadan : I don't know Gujarati that's why.

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		covered since morning. The issues that our people or other people have spoken have been recorded or not ? • Apart from who is sitting on the dais, who is present here from the project proponent to answer our questions. • Who is the representative man? • And the representative of your EIA consultant is the representative of your two EIAs. • Who is the representative of NIO sir, please show us the NABET accreditation certificate here and give us a copy of it sir. • No, on screen, on screen is in your hands right now. You don't give us screen access when we ask. Access to that screen do whatever you have, this public hearing cannot proceed unless you show us the NABET accreditation because he is not an authorized person and if you put him there, you may also be involved in illegal activities. It is not an official party in any way. • Now sir • One minute, keep calm, one minute. • If you have seen sir, two EIAs are presented on your website namely Terrestrial EIA and Marine EIA. We have seen it and the encloses with it has also been presented. We have seen it and after seeing it, I am raising this question. • Any query we have on EIA notification. We want to get the answer from your company representative. When this organization.. • If it is NABET accredited then why are you afraid, show us here then we will move on to the next point.	

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		If not, this public hearing cannot be held on the basis of illegal EIA. • Sir you are not the chairman excuse me sir you are not the chairman you are not the chairman you will not tell us whether the minutes will be recorded or not, your duty is to show us the accreditation certificate and only after that why are you afraid if you have done the authorized EIA. • Excuse me sir if you are showing it on screen and don't try to talk in English. We know English but we are Kachchi we are Gujarati . We will talk in Gujarati. Please talk to us in Gujarati. • Then sent somebody who knows. is there.... • Sir you don't .... you don't.. sir today is the platform sir. • Give me five minutes to prove that this platform is correct for this, and why I should prove it. • You who are sitting on the seat, it is in your hands that if you allow this thing to proceed illegally, you will be misusing the power of yours. This is our initial presentation, I would like to tell you that this is a public hearing based on the EIA and we have objections based on the draft EIA. And we are here to report that exactly this is the report. Illegal is our stand. This public hearing is illegal. But today it is available on the website of GPCB . One of which is Marine EIA done by NIO . Nowhere in the Marine EIA report is the record of accreditation of NIO shown in the EIA report. Also NIO is not recognized as an accredited organization on NABET site. On the basis of such illegal and false EIA, you are telling us	

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		that if we present our issue here within the illegal public hearing, we cannot ask for the accreditation certificate we have. • Sir that is not sufficient . The certificate is not attached to the EIA report. • If you are allowing this Public Hearing you are allowing an illegal activity to proceed. • Sir I am saying on the basis of the rights given under the EIA Notification. Sir if there is accreditation for NIO any company has accreditation then sir let me speak let me present. Any agency that conducts EIA has accreditation from NABET also maintains it on its website. Now is the ara of technology. Open its website and show us that it has done EIA report during 2018-2019, and it has accreditation. So show us we will present next. But he is an illegal person and this is an illegal report, so we will not allow any public hearing on the illegal report. That would be our violation. And you are above on this seat you as a Justice. You shall not make public hearing on this illegal report a. • Please give us a hard copy of it and we need 5-10-15 minutes of time to read it completely and make further presentations. • Sir, you are not the chairman, you are not the chairman, the chairman is here. Sir you are present in the public hearing which is currently chaired by a chairperson. • Sitting here, if you have accreditation, why are you afraid ? • No sir screen is you have. We demanded that you don't even	

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		give us to connect our mobile phones, so why have you built this big palace-like tent here and you have done this fencing of 5-6 feet, you have kept people away, you have kept the company close to you, if the company is close They have all the systems and all the facilities. So, no further representations will be made in this public hearing unless this certificate is shown to us. There are 6 screens, laptops, internet, mobiles. We don't know. This hearing will not proceed without seeing this certificate and Sir, the fact that these people are not providing it means that they do not have it. We will submit further only if there is and illegal you will not force us to submit further. And this is our right we can ask for a certificate. It is illegal if you take it from us. • notification clearly states that any objection from the public should be satisfactory response to project proponent , It is what a EIA notification states.	

- As told by the regional officer that, yes, definitely present your objection, we are taking that on camera record.
- Told by the regional officer that, one thing is important that we will be listening to the recording of what you are presenting and we will also write it down in detail. And all this will be uploaded online before sending to the Ministry. So there is nothing private about it.
- As told by the Regional Officer that, the recording is still going on, Madam
- Stated by the regional officer that, there is no editing of a single thing from the video recording. And it remains as it is and will be sent to them as it is.
- As told by the regional officer that, now you can come and present your points.
- As stated by the Regional Officer that, all the issues are recorded and the recording is in progress.
- Stated by the Regional Officer that, the representative of the project proponent is present.
- Stated by the Regional Officer that, a humble request to note that any EIA report can only be done by institutes having NABET accreditation.
- As stated by the Regional Officer that, which you may request. Please continue with your points. Please continue with your points.
- As told by the regional officer that, we have noted your issues.
- Chairman stated that, madam this public hearing is for objecting and for your representation and

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not here to present evidence against you now. For submission of your objection.

- Stated by Chairman that, you are going outside the subject. You are going off-topic. You can ask for whatever proof you want but this is not the platform for that. You have every right to ask for your proof. But currenlty this is not the platform .
- Was told by the Chairman that, Yes , sure, sure your on camera is recording.
- Was stated by Chairman that, but you can ask, you are taken on record. What you are saying is true it is recorded on camera. They will have to answer you.
- Told by the regional officer that, we will minitise any submission you have and the committee will also respond to it. Present any other points you may have. Please, your points are written, you present your points. Your submission has been taken on record. Madam speak.
- There is noise
- Stated by the Regional Officer that, we take note of the documents to be sought in pursuance of your submission and will be produced along with the minutes.
- Stated by Chairman that, no one is going to take away your right. We take your word in minutes. Taking video word to word . We take a record of it.

50		• Hello, hello, I request the collector sir to write down the number of villages that fall in the buffer zone. Show the number of villages falling in the buffer zone. You don't even turn on the mic for our presentation. Sir, the questions of the local people should also be heard, others will also have their turn. Any of our villages fall in the buffer zone. Local people should be heard. • Collector sir that as many villages as come in the buffer zone, show us legally. We have been sitting for the past one hour to present our presentation. Mic not turning on. We want to knownl who will get benefit , which villages will get benefit.	
51	Dhvani Shah Village : Bada	• Can not take further questions unless my questions are answered .	•
52		• Honorable Officer, I have a request, this madam is speaking, I don't think she belongs here, but please take his questions in writing.	•
53	Dhvani Shah Village : Bada	• O uncle!!!! You cannot say or ask whether we are from here or not.	•

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		You cannot say whether we are from here or not.	
54		• These questions are for support. The pollution board is designated to come from anywhere. It is made in the constitution , Gujarat Pollution Board will do its work itself, it is their job. You can ask for the document you want from there. Don't waste our time. Company is our talk....our support	•
55	Dhvani Shah Village : Bada	• So you can go .	
56		• I have a special request sir if you come with such questions then you are wasting our time. We have our support for the company. We want company.	
57		• I am a resident of Bada , let local people speak outsiders will not be taken on record So I have a request. • Sir please let us also point 0ur questions. • Chairperson it is my request please answer to 2000 supporter people also.	
• D.Y.S.P. It has been told by that , sir, one minute, sir, I have already told you to come to this side, come to this side. Please come here do understand. Please, no public hearing can be held like this, whatever your issues are, your leaders are all speaking. Anyone who wants to oppose does so, just all come to the side. • Sir, please continue let us present also. • D.Y.S.P. said that, let's all come to the side. • Reply to support men Collector sir, I have a request here. • D.Y.S.P. , as stated that Come to the side			
		• Today, representatives of all the 12 villages are present here. We have confirmed in writing and all leaders are present. And please all the leaders are present and welcome to the company.	•
58	Dhvani Shah Village : Bada	• The people who have come here to save the Bada village, our sea and the environment of the surrounding village, please sit on	•

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		the chair or sit on the ground.	
		• Brother, please go back and sit quietly in the air, no worries , it is okay to give trouble, we have such a capable team that we will not let this hearing stop for five days. All right, bro, sit back and don't disturb at all. Drink water, have fun, have fun, eat tea and water. Asking one by one we still have 500 men such technical. • And to challenge what belongs to madam Bada is a personal objection. I say to the police officers, do not tolerate such challenges, tell them there	•
59	Dhvani Shah Village: Bada	• I request that no one else's presentation is taken till then we will continue after it is shown on the screen sir. This public hearing will proceed after my questions are answered. • Sir, will you put this on the record, I cannot ask questions here, you are mis using your chairmanship. • I am reading this I have this EIA notification. EIA Notification Appendix 4 Para 6.4 clearly states that person present at the venue shall be granted opportunity to seek information or clarification on the project from the applicant. Sir I am using my right to ask for a simple accreditation document from you if you are covering the proponent then you are using your position in a biased manner. • Sir, if there is accreditation on this website, you have a system that you are not allowing us to use. Ask the project proponent to show us. He does not have any of them, so he is afraid. And if not, then you conduct this public hearing on the wrong EIA. You are misusing your post. • It is not its accreditation.	• Today all the soda ash in Hindustan its marine EIA done by NIO and whenever we get their consent it is also written in that this is done only on the basis of NIO 's report. All these things NIO is a government agency this marine is done according to EIA and every soda ash plant today we have 5 soda ash plants all of there EIA are done by NIO . • If not, then MOEF will take objection. And they will inform us • Request the Chairman. Sir, let me show that here we are conducting a public hearing, whose observations are being noted. This is not a forum for decision. I am talking to Chairman. Objection suggestion.

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		• What you said is not proof of accreditation. Let me give you an example of your own EIA report. I want an opportunity to use an example of your own EIA report. Your own Territorial EIA is done by CSIR NEERI organization and its certificate is attached with NABET Accreditation EIA report why not NIO . Because he has not, but if he has it, show it here. • Here public hearing cannot be held on non-documents. It is illegal, I request Chairman to use your power right side unbiasedly and cancel this public hearing impartially. Public hearing cannot be held on wrong EIA report. If the report of NIO is accredited then it has a certificate then I am telling you in plain language that the company has NABET accreditation and I am certified for the project and there is a website with its own EIA report attached to the report. That this report is authorized as I am NABET Accredited. NIO has not done any such thing so there is no ground for this public hearing on the basis of false report this public hearing cannot be held. It is up to you to decide what I should do. You have the authority we will wait for 2 hours 4 hours 4 days this certificate should be presented. So will go ahead. • We need clarification, we need proof. • Use your own post to approve the application. • This is not a misguide I am forwarding the EIA application given to me. • Why don't you give me any direction or give me a certificate, if you give then the issue will be over. Here you show that it is under the section that this thing looks to me these people come from 1000-1200 km away these people are from outside we need certificate without it this EIA cannot be done it is not possible for you to take a biased	We note and record your every presentation and you are repeating one thing and if this public hearing is done on wrong EIA then MOEF will not approve it I am not doubting on any government agency or Chairman.

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		decision you should approve their submission If you do, you are misusing your post. • The concerns of the local people should be addressed. • You know public hearing is the only place in the EIA process that comes to the project proponent and we don't know what decision is made above. It misleads you that we have done EIA report. But the EIA notification is clearly written that this is not a NABET accreditation organization so it cannot do the EIA report, then how do you conduct this public hearing using the power of your Chairman on the illegal EIA report. • Because EIA Notification clearly state you have to give the notice in the local language in local news paper date is circulate. But we did not get this notice on time, we got information from the board of our village. • Sir approval is next. You just tell us that you have come to address our concern by ticking the checklist of Public Hearing. If this public hearing is done today, they way to get EC will be clear .	
60	Valji Charan	Sir our mobile is not able to connect. This notification certificate is not able to be issued. You answer any question from him. Please support public also Yes, no, don't listen to the answer. Sir please answer our objection. We have raised our question you answer. If you are not able to connect the mobile show us certificate the cancel the public hearing. So stop the public hearing. Stop the public hearing if you have a problem.	•
61	Lakshman	Listen, honorable magistrate , people are having a doubt. Pollution officer Barmeda sir is not favoring the company? You are a competent authority. You are our officer. Pollution officer sir reply, provincial officer reply.	•

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		• According to the regional officer of GPCB that, let me tell you one thing in pursuance of your submission that as many submissions as you want will be answered with proof by the company. But continue your presentation. This is not a forum for questions. This is not a question forum and no one is being covered here. We have also taken a record for the certificate issue. And so we will inform you. • Clarification has also been given said by GPCB Regional Officer . • According to the regional officer of GPCB, this is not an approval authority. Do not misguide people. This is not an approval authority. We are not an authority to approve the company we are only here to hear your objections and suggestions. • As stated by the regional officer of GPCB that is why we are asking you to take make issue in writing. • I request Chairman that in the public hearing that we are conducting today, any objections made in the note, clarification has been given to you. There is no approval authority. Don't misguide these people. This is not a discussion forum. • Stated by Chairman that means we are taking your objections verbally and in writing on letter . The project proponent is responding to your questions. No one is opposes anyone here. • Stated by the chairman that, here no one is supporting anyone, no one is opposing anyone, we have heard your submissions for the last 2 hours. every single presentation is taken on record. Minute to minute word to word and will be sent to the decision making authority .	
62	Dhvani Shah Village: Bada	• Sir, the basis of public hearing is to fearlessly present to the people any of their submissions.	
63.	Nathunji Samraj Village: Bambhdai	• I am sarpanch of Bambhdai village and I support GHCL company. I give my questions in writing. Anyone who has questions should put them in writing. Please answer me where and what type of product you are going to produce. GHCL WELCOME GHCL WELCOME	•
64		• Sir you have every right to ask your question. We also want to ask a question, sir, in the public hearing, we are coming to Banfer zone of 10 villages. We have our turn to ask questions.	•
65.	Dhvani Shah Village: Bada	• I have seen this is illegal. Your power is not being used. Sir we have seen the answer. Sir EIA notification Indian constitution gives us right. If you go ahead with it, if you misuse it, you will violate our rights, we have seen the answer. We are certified. This report is false. If you authorize this, then you will do illegal activity . So you give direction to authority. You will go ahead, sir, you saw me making a presentation, please	•

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		don't talk between them. Sir my right is violated. Keep calm and order to saw the certificate. • Violation of public hearing Sir.	
66.		• We should also get a chance. We have come for the hearing and also take our questions. Speak in Gujarati.	•
67.	Dhvani Shah Village: Bada	• You don't use illegal sir, public hearing is violated, tell him to speak after my presentation is over.	•
• It was stated by the chairman that you speak your point . If you have objection, we will answer you. We are not the decision making authority. This public hearing is for your objection. This is legal rather than illegal • Stated by Regional officer that, submit your next the issues. If you want to make any clarification about the certificate, do it. weather its available in website.			
68.		• Chairman Sir check his Aadhaar card whether he has the right to speak or not. Give us a chance to speak. Listen to the local people, we have also raised this in the public hearing. Our questions are also heard. Hear the expectations of local people. This company comes and it has a very good effect on the economic life and people's life, people get daily bread. • This madam has been speaking for the last 2 hours. Now give us a chance.	•
69	Vijay Gadhavi	• If such a challenge is thrown in public that weather she has the right to speak in the public or not, then there will be cases of quarrel. For what are you seating as chairman ? A daughter says the certificate is authorized or not. So this report of yours is wrong sir why are you running. No sound.	•
• The regional officer responds that the TOR is issued from the ministry on the primary application of the project . And then study is done from concern agency .			
70 .	Dhvani Shah Village: Bada	• Sir, talking about TOR, there is no hesitation in giving TOR. In 2021, Marine EIA is ready before receiving TOR. From which authority has it happened? No you justify. Do not justify the illegal report. I have the right. Sir I have proved your document before you that you	• Sir today we have done public hearing. You have also noticed that Barmeda Sir or chairperson the no one is competent to take a decision. Right or wrong, those people will submit to the agency. I don't

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		application requirement. You don't justify. You order the report to be displayed. • Sir, they have no right to answer from your side , You are bounded by Indian constitution, you are public servant, we have come to see the supporting evidence. • EIA notification is correct. If the EIA report is wrong then what is the basis of public hearing. • This is our right, don't take it from us. Sir you are a public servant. You are a public servant, I believe there will be pressure on you to finish this public hearing in any way, but my right cannot be violated. This public hearing could not be completed. We will sit here with you for a week. I have right. Don't stop us from using it. You are on a judicial position to decide whether its right or wrong in the fever of public. Sir, we are allowing the process, we have not come to oppose the party, we have come to save the environment. If NIO has this certificate, there is no concern, no study and consulting has been done here, then on what account is the public hearing going on? • Sir, the EIA process is misleading. • Legally our mike should not be closed	think this is the stage to decide now. And we should note their objection. Because today marine EIA of soda ash plant is done by NIO. It is a reputed agency of the government . • Sir, when we asked the requirement for TOR to do this, we told MOEF in writing that the next study will be done by NEERI and NIO. And they are expert for that . • Sir EIA and we have given the justification of both the things. Let it be recorded that when the TOR was done, we clearly told the MOEF that we will do this through this agency and the TOR was given to us on the base.
71	Dhvani Shah Village: Bada	• Another thing Sir TOR has been received by people in 2021. On the basis of EIA notification, they should go to TOR which automatically generate standardize TOR for all studies in 2021 and use 3 years old base line data and any wrong EIA submission is made on this old data by wrong agency. Wants to cheat EIA's scoping when you submitted Form-1, Form 1 did not show them our temples, our lake, none. It is also illegal.	•

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72		• Sir give us a chance to speak welcome GHCL welcome GHCL is not working please read our questions give us a chance to speak	•
73	Dhvani Shah Village: Bada	• Sir why are you take decision of moving forward without Without getting answers to our questions, this public hearing will not proceed, please do not use your power in illegal way. • EIA notification clearly states the project proponent is supposed to give adequate answers or clarifications to the questions raised by the public this is our rights. Give it now sir.	•
• Chairman The objections you have raised now for that only the public hearings is arranged. You present the point before us, there is no legal in this matter, it is legal, that is why you have presented your objection. The process of public hearing cannot be stopped. It is not necessary to give all the evidence in the public hearing, so you cannot ask for evidence. • Stated by Regional officer, you cannot stop on 1 issue and stop public hearing.			
74	Dhvani Shah Village: Bada	• We don't want a copy of the certificate, keep calm, even if you don't have a copy, you are not so competent. Even after bringing 4G internet Modi sir, you are not competent. We believe on record only say whether NIO has NABET accreditation or not yes or no then only we will proceed on record this should be on recorded on proceeding.	•
75		• English can't work sir, we can't do it, we can't do it, our question is, if there is an employment opportunity for them, how much time will you give ?	•
76	Vijay Gadhavi Village : Laija	• You have come to listen This public hearing and to listen to us and you are telling us that we are getting sticky to the matters rather your ears to technical issues rather than supporting the company. What is your right? To tell us to the people to step forward .	•
77		• 30 days before advertisement and notice in Gram Panchayat of each village is not done. The date of advertisement in print is also 26th	•

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		September and if public hearing is to be held on 17th October then 1 month is not given and even as many as 20 villages According to the list of EIA, all the villages have not been informed about that ineffect even in the Gram Panchayat. The number of people who are present here today is because they have come from their own awareness, but it is the duty of the government and the company to inform the Gram Panchayat of every village. Here it is not done here you can check and ask and take this record whether you have any record or proof or not that you informed in each panchayat or not. When this project is going to be done in Gujarati with so many technicalities, when all the people in the village do not understand, you have not given the EIA report properly in Gujarati. Anyone who does not understand what the project really is for the people of the village, should also be recorded, properly informed and not the rule that we have decided, it is the rule of the government, which was not followed even before 30 days.	
78	Dhvani Shah Village: Bada	Please let me know whether certificate is available or not. The second question has been raised that if it has been reported 15 days before each village panchayat 21-22, in which days the receipt will be received ? Give sir date wise. Shall we calculate ? You say date wise. Sir, there is a notice from the pollution department. Sir you are the chairman we don't want any reply from the company.	• 12 villages have been informed, Gujarati executive summary of EIA has been given. Date wise will be given.
79		• Sir, I will be introduced. Sir, I have 1-2 questions ? Give us a chance we also want to speak we are supporter. We have the right. Please don't speak in English speak in gujarati.	•

- Chairman said that do not discuss internally. Everyone will get a chance at the same time. We are not here to see supporting evidence. It is your right to object in a public hearing because you are

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		presenting it. Whether the notification is correct or incorrect will not be decided here . If you say it is wrong, then we have a committee sitting and we will inform them. • According to Regional Officer of GPCB, Bayad 03/10, Mapar 03/10, Padampur 03/10, Changdai 03/10, Bambhadai 03/10, Bada 3/10, Bhinsra 03/10, Mota Laija 04/10, Janakpar 04/10, Panchotia 04/10, Bhada 04/10, Nana Laija 04/10. • The provincial official replied, I am not justifying anyone. I did not give the date. According to us, does not have or does not have any information at this time. There is a certificate. • As told by the regional officer that it is a matter of 15 days, if you asked me a question, I answered. Due to notification dated 09/05/2022, the first public hearing can be held again if postponed within 45 days, for which public newspaper advertisement should be given within 15 days. 12 stakeholders Talati Minister has been given a letter along with executive summary. • The regional officer said that, which is located in 12 villages.	
80	Laxman Gadhavi	• Dear chairperson kindly listen we have not came to hear the company we have came to hear you. Company is directing us in wrong way. First question • How many languages are valid in this public hearing? Your answer is not received and Our request to police that other mics are being turned on. How did you informed 21 villages in buffer zone. We have not come to listen to the company officials, we have come to listen to you.	
81	Dhvani Shah Village: Bada	• There are 21 villages in your study report, you said that notice has been given to 12 villages, not giving notice to 21 villages is a violation, it is a violation of procedure. Public hearings are illegal. Provide date wise proof , notice has reached 12 villages. Sir, you have given notice in all the 12 villages regarding the public hearing . It should be given in 21 villages. First violation of GPCB. You have informed the villages in a biased manner. EIA notification and my you get the authority and You are also violating that. Sir, this is a public hearing on the 17th, even if it can be done after this day, even if you have given it at 3 o'clock, you can also give it at 6 o'clock. So we will not count 3rd date. How many days are there from 4 October to 16 October ? Your requirement of 15 days has not been completed. This is illegal. This public	

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		hearing is illegal. What is the distribution of Divya Bhaskar in the village? EIA notification clearly states you have to give notice in local language and local newspaper that is largely circulated. We have not received the notice of Divya Bhaskar.	
• According to the regional officer of GPCB that, let me tell you one thing in pursuance of your submission that as many submissions as you want will be answered with proof by the company . But continue your presentation. This is not a forum for questions. This is not a question forum and no one is being covered here. We have also taken the record for the certificate issue. And so we will inform you. • Clarification has also been given to them as stated by the Regional Officer of GPCB . • According to the regional officer of GPCB that, this is not an approval authority. Do not misguide people. This is not an approval authority. We are not an authority to approve the company we are only here to hear your objections and suggestions. • As stated by the regional officer of GPCB, that is why we are asking you to give this issue in writing. • I request Chairman that any objections raised in the public hearing we are conducting today is not a discussion forum. • As stated by the Chairman that we are taking your objections in written and oral form and in written form on letter.			
82		• The company should answer me that where and what type of product you are going to produce	•
83	Dhvani Shah Village : Bada	• Sir, I want to make a presentation, please inform them not to talk in between . Sir my right is violated. • Public hearing is violated sir.	•
84		• We should also get a chance.	•
85	Dhvani Shah Village : Bada	• Sir public hearing is being violated tell him to speak after my presentation is over	•
• It was said by the Chairman that you speak your point .			
86		• This madam has been speaking for the last 2 hours. Now give us a chance.	•
87	Dhvani Shah Village : Bada	• I have the right. Sir I have proved your document before you that you application requirement.	•
88		• Sir give us a chance we also want to speak we are supportive. We have the right.	•
• Chairman said that do not discuss internally. Everyone will get a chance at the same time.			
89		• Sir, we are sitting silently for 2 hours and listening to madam.	•

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• As told by Chairman that, madam, whatever your issue is, speak it quickly. Talk about your points together.			
90		• Sir we have come here to ask a question sir we have got a chance to ask a question. They have not informed us the time..	•
• As told by the Chairman that, madam, speak as fast as you can. Because we...			
91	Dhvani Shah Village : Bada	• Sir you are a public servant. Sir, you can't give me direction to speak fast. You came for the public. • You have come to listen to us. Do this to prevent the public. Give answer. • You cannot bias my right to speak .	•
92		• Sir, you Hear to us they wants to stop the hearing. We maldharis also have questions so please answer to us..	•
• Stated by Chairman, we are not biased, you are here to present your objections. From the last hour, we are giving you complete opportunity to express your objections in writing and orally.			
93	Dhvani Shah Village : Bada	• You have violated the EIA. You are a public servant. You are doing illegal activity .	•
94		• You are trying to stop the public hearing.	•
95	Dhvani Shah Village : Bada	• These are trying to provoke our people.	•
96		• We come from Bada village. Have come for public hearing. Give us a chance. Ask their Aadhaar card.	•
97	Dhvani Shah Village : Bada	• I have a right to a public hearing. • You are abusing your presidency. • Don't make it illegal.	•
• As stated by the Chairman that, you and I cannot decide whether this activity is legal or illegal. It will be decided by the central level committee which seats in Delhi. We are hear to note your objections and suggestions. • Said by Chairman that, Madam this is a hearing committee , not a decision making committee. • I am the chairperson of the environmental hearing as told by the Chairman. There is no chairman to decide anything. So I will not give any opinion.			
98		• Sir, listen to me, why can't this daughter speak what is the meaning of speak fast (fatfat) ?	•
• As stated by the Chairman "Fatfat" means to present your points one by one.			
99	Vijay Gadhavi	• We are here for five days to speak.	•
• Chairman said that you present the objection here. (speaks to all)			

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100		• We are not leaving here until we get our answers.	•
• As stated by the Chairman that, that's why we are asking you to present your issue one by one.			
101		• You have to take every point we have, you have to listen to us. you have to listen to the people of Bada village.	•
• There is noise. • It was stated by the Chairman that bro speak turn by turn.			
102		• How can you tell us that our questions are not appropriate.	•
• There is noise. • Chairmen said that speak on by one whatever your presentation is.			
103	Dhvani Shah Village : Bada	• I speak sir	•
104	Laxman Kanji Karani	• Sir we are making representations of the people to a Magistrate competent authority. People are paramount. Listen to the voice of the people listen to our voice Magistrate Sir. This is recorded by the media of entire Gujarat. People are being injustice.	•
105		• Now we should get a chance to present ourselves.	•
106	Meet Gadhvi	• If chairmen is not able to answer us then you can leave the stage. • We're not going to leave until we get our answer. Your duty to answer and it is our right.	•
107		• This hearing will not be cancelled.	•
• As told by GPCB regional officer that, keep some peace you all are talking at the same time, both of your points are not being heard. • There is noise.			
108	Meet Gadhavi	• Sir, it is right with us if you don't have time then you can go.	•
109		• Chairman listen to all the questions and answer them.	•
110	Dhvani Shah Village : Bada	• If you want to hear our talk, tell the police to go outside the tent, you conduct public hearing like this, sir. Police are walking around us with guns	•
111		• Sir we have come here to ask company some questions	•

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112	Dhvani Shah Village : Bada	• Sir this is our presentation sir	•
• Chairman sir said that, in view of your submission which has reached us. Well done you pose as a democrat. Your presentation appears here right from back everyone is throwing cardboards throwing shoes this is also not democratic way. Cardboards are coming here, shoes are coming, this is not a democratic representation. • As told by the Regional Officer of GPCB that, you all can make your presentation with keeping the request and with limit of Chairman.			
113		• Chairman, You have been trying to listen to one party's presentation for an hour. Honorable Chairman, maintain your dignity and do not go astray.	•
• Was stated by the Chairman that, you present here at the front and the card board come from behind. This is not a democratic presentation.			
114		• These people are protesting like this.	•
• According to the regional officer of GPCB that, first of all, everyone should sit on their seats and present. • As stated by DYSP that, turn off the mic. All sit in their own place.			
115		• The representative of the people is present here, here we present, sir, this is a public hearing, every citizen has the right to raise questions, so please maintain the dignity of chairmen. From hear someone throw a cardboard. The opposition party also has the right to speak, but listen to what we have to say.	•
• As told by the Regional Officer of GPCB that, if you have any representation in writing, give it in writing, give it verbally, all the rest take their place and make their presentation.			
116		• If public hearing is to be done in writing, public hearing does not take place in this way. Public hearing means that we come here and make an oral presentation, so you should not give it in writing at the end of each issue. Because this is a platform for oral presentations and you are specking a democratic since morning. You should understand that. The position you are sitting on, 25 feet away from the people standing. That's not exactly a democratic way either. You have allowed the company to protect the company inside and allowed to do all the projections and tied the people here	•

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		and made them stand behind the baton of the police. This is not your democratic way.	
• Said by the Chairman , Madam it is a democratic that's why you had the mic in your hand and you are speaking now.			
117		• So you will not teach us the democratic way.	•
• Said by Chairman that madam what you are presenting is .....but what you are doing is not democratic. • Chairman said that we are quietly listening and taking it on record all your presentations .			
118	Dhvani Shah Village : Bada	• Thank you very much, public servant, for coming to listen to us. Salutations to you that you listen to us but we expect you to listen in a just and unbiased manner and sir one minute I request you to tell and all those who speak in support of the company not to provoke our villagers and we will listen to them calmly. Do not try to provoke us by arguing among us. After our presentations are over, we will sit quietly and listen to them.	•
• It was told by the chairman that, madam, please present your presentation. Internally we ...			
119		• Two mics are move together, , turn off the other mic .	•
• Stated by the Chairman Do not make a presentation together make one by one presentation			
120		• Whoever makes the presentation, continue. Another thing, I have requested the people living in Bada village (.....) if they know the meaning of democratic, then we who are standing here are standing wrongly.	•
• Stated by the Chairman , Madam, talk about the issue, talk about your objections and objections.			
121	Dhvani Shah Village : Bada	• I was talking about the issue for you, now about the issue, we listened to the representative who is here in GPCB, he told me that it is mentioned in 12 villages 20 to 21 villages come in the buffer of 10 km, it is presented in the EIA report. I called the first violation of public hearing and EIA notification. The second violation is the violation of campaigning in the villages within the limit of 15 days, although you have	•

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		come here to conduct the public hearing and this GPCB officer has repeatedly taken the company's side and wants to prevent me from speaking. Finish speaking fluently We want to help the company. I have a question for you are you doing it to put a tick mark, I have shown you the procedural losses against you, you are the chairman, you have the power to allow this public hearing to be held or not. I show you why this public hearing is illegal. Now will you allow this illegal public hearing to go ahead or not. Give us an answer on the record, from which side you will exercise your right as the chairman, for whom you will exercise your right, whether this illegal public hearing will be closed or not, answer yes or no if you do not. If not, it will be taken on record that this public hearing has been fixed by mis using your chairmanship.	
• Chairman said that, GPCB is also a member of this committee and he will answer your technical and EIA notification issues. So you listen...			
122		• Let me tell you one thing, notice of public hearing, while technically you are not there employer, you are a public servant, your salary is paid from my tax money. Issue number one. • Issue No. 2 This is the procedure of public hearing under a notification that it has been violated no one is above it neither I nor you. This right gives you the notification as the chairman. From which side you are going to use the right today, you give us clear, if we expect public hearing from you, or not, tell us clear, let us know, I have a notification and under which you are increasing, the procedure is lost transparent public hearing. So these losses have been counted, sir I have given us a clarification that twelve villages have been given. 3 and 4 are given during the date. I told you that the notification came at 6:30 pm on the 3rd, so the 3rd	•

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		should not be considered. Considering that the public hearing is on 17th, we have received a notification of 13 days. So the EIA notification which you have held this public hearing using the official is a violation then what do we give us that even after giving this violation notice we are your chairman as a public hearing responsibility will you allow this public hearing to be held today or is it an illegal public hearing. If so...	
• stated by the chairman that, you don't speak for one side, let them also decide.			
123		• Speak we listen too. • Now you have heard 2 sides, we have also kept the evidence that this notification is a violation, so what is your decision.	
• According to the Regional Officer of GPCB that, the record of information given to Talati from our Board is available here at present which I have announced. The information that was to be given to the Talati at the end of the announcement has been sent to them in time as per the provision of the notification. So there is no violation of the provision of notification and this operation is going on according to notification only.			
124	Dhvani Shah Village : Bada	• Requirement 15 days you have new notification.	•
• As stated by the Regional Officer of GPCB that, an advertisement has to be given in it			
125		• listen no sir	•
• As stated by the Regional Officer of GPCB , however your concern will be raised.			
126	Dhvani Shah Village : Bada	• I will clearly tell you that in the notification Appendix – 4, which is the EIA notification, in Appendix – 4 para number -3, D-3, A-3, B-3, C-3, O, 3-A, 3-B ,3-C, 3-D, 3.2, 3.3, 3.4, this procedure is done according to the four provisions. There is only one amendment in the 9th May notification which is 3.4 , the number 3 is small amendment, that amendment is applicable and it is clearly written in the notification that Grampanchayat, Impact Notification also states that this It is written in the EIA notification that a public hearing has been held but you are not following the notification. At present we are not	•

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		raising queries but it is clearly stated in the notification that there is a Gram Panchayat along with the public offices should be known within 30 days. You say according to the new notification that 15 days if there is an amendment in 3.3.a then the other provisions in Appendix – 4 are applicable to them, it is necessary to inform us within 15 days before. Divya Bhaskar does not come to our village and even if it does come, it comes on the next day. We came to know from the Gram Panchayat office on the evening of 3rd.	
127		• Sir Gram Panchyat has received notice. I am not protesting against Gram Pachyat	•
• Both speak together....			
128		• Sir how did the second mic turn on.	•
129		• All the people have the right to protest, that Gram Panchayat can also do , then they are also member of the Gram Panchayat.	•
130		• Sir, how helpless are you , other people are answering.	•
• As per GPCB Regional Officer that, your queries are as given in 2 Notifications.			
131		• Sir, there is an amendment in 3.3.A, those who feel it is necessary in public interest can give it 15 days before, although we do not know how it came, the Gram Panchayats have taken it since the people know, in which the provision of 15 days has not been undertaken, Sir, Chairman. There are 2 parties against you, this public hearing is illegal according to us, we have given you legal provisions, you have the right to cancel this public hearing. You again give 30 days notice we will come back. We will present our issues again We have not been given actual opportunity of public hearing It is proved against you with proof that you are the chairman of public hearing You have right and it is your duty which Public hearing continues	•

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		on the cause...	
• According to the regional officer of GPCB that, when the approval of the advertisement comes from office, the advertisement is given in the news paper and the letter is given to all the Talati and for which we recommend that it is not sent by post but to all . So some days have passed for that.			
132		• Thank you so much for giving us so much importance and reaching out to us sir. I am telling you that if the procedure is going to take time then you would not have held the public hearing on 17th you would have kept it on 20th....	•
133		• Honorable Chairman we have asked our questions and we have got a satisfactory answer from the company. We the villagers have raised our questions in the public hearing we have asked our questions we have got the answer from the company we are satisfied with the satisfactory answer.	•
134		• You can see the public outcry.	•
• According to GPCB Regional Officer that, we are listening to your submission.			
135		• There is no public protest, we don't need anything, we have thousands of people with us, no one can suppress our voice.	•
• You present your objections as stated by Chairman. • As told by the regional officer of GPCB that, you should make a presentation point wise, you should not make a presentation internally.			
136	Dhvani Shah Village : Bada	• You didn't inform people sir why did you let the second mic on.	•
• GPCB Regional Officer said that, We are hearing your submission			
137		• We've asked all our questions and we've got our answers.	•
138	Dhvani Shah Village : Bada	• Sir you approve the illegal public hearing	•
• According to the Regional Officer of GPCB that, whatever action is taken is announced as per the timely notification approved by the Talati.			
139	Dhvani Shah Village : Bada	• Chairman Sir, today you are the chairman of the public hearing as per Appendix -4 of EIA.....	•
140		• Kanjibhai, the president of Maheshwari Samaj, Mota layja, will ask the question. He is present here and we support him.	•
141	Dhvani Shah Village : Bada	• Sir turn off the mic until one man presents another person can't speak turn	•

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		them off the mic they are trying to provoke our people sir answer us our questions.	
142		• We want development, we are supportiing the company, you listen to us also, we want development	•
143	Dhvani Shah Village : Bada	• Sir second mic needs to be closed you have procedural law we have strong evidence against you. you are the chairman of public hearing if the procedure of public hearing is wrong then EIA notification gives you right to cancel it and reschedule it we Come on, but today you answer me that instead of 21 villages, the advertisement has been given in 12 villages, if you have taken it into consideration, then you are proceed with the public hearing by doing this illegally. You are making this public hearing legal. Take it on record that after showing proof also your decision is in the favour of company only. After that we will move forward. Tell us in whose favour will you decide.	•
• According to the regional officer of GPCB that, now both of these are announced and in Divya Bhaskar on September 30 and in Times of India on October 1, so they are in time.			
144	Dhvani Shah Village : Bada	• Sir, people here don't read Times of India. Divya Bhaskar does not come to our village. Sir, it is Notified to infrom Gram Panchayat. • As per provision of notification in Gram Panchayat within 15 days. • You have heard their answer, now you give your decision.	•
• According to the regional officer of GPCB, as per the notification provision... • Chairman said that, Madam, if you listen to the answer, then we will give it, simply by asking a question and protesting.. you also listen to his answer. • Listen to your answer as stated by Chairman. • To the Regional Officer of GPCB that, as per EIA notification, advertisement has been given in newspaper and we have given time limit which is suitable for provision of notification.			
145		• This madam is passing the time. Give us time to speak.	•
146	Dhvani Shah Village : Bada	• Turn off this second mic.	•
• Was stated by Chairman that in the front page of Divya Bhaskar it is mentioned.			

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147		• All these are attempts to stop public hearing	•
148	Dhvani Shah Village : Bada	• Its clearly state that news is widely circular in the village, divyabhaskar does not come in their affected area .	•
• There is noise			
149		• Here in every village Divya Bhaskar comes to every village	•
150		• Turn off the mic of this people	•
151		• These people want to stop the public hearing and are diverting from the issue.	•
152	Vijay Gadhavi	• Sir we are on the point Chairman and Pollution Officer we have raised environmental issues, impact issues. People who are supporting the company is it an public hearing for supporters or environmental public hearing please tell me my question is....	•
153		• And the press that you are talking about has not given the notification to each gram panchayat which has to be given within its rule and all the places are holding public hearings in such ways all over Gujarat which deliberately do not let people know and therefore people do not come. There are such public hearings, you read these dates yourself and you one of them	•
• According to the Regional Officer of GPCB that, proper advertisements are made and sent out from time to time in every place, which is accessible to the public and the public are given full exposure opportunities.			
154		• Also the dates which you read now prove that we were not given notices within 15 days and you also know....	•
• According to the Regional Officer of GPCB that, the same date has been given for public hearing which is convenient according to time.			
155		• Sir, we have been listening to madam's objections for an hour, we do not care about any of the questions. Baby turtle live or die give our baby the right to live. Baby turtle is taken care by the pollution control board and arrange it in its own way or it will manage in its own way we are working hard to save our children	•

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• There is noise			
• As stated by the regional officer of GPCB that, there is no internal discussion			
• Was stated by the chairman that there is no need for internal discussion, whatever your submission is, about the notification is also on the record and we are not going to leave a single submission.			
156	Vijay Gadhavi	• Sir, that brother has made a good presentation. Whether the baby turtle lives or dies, it is up to the government. Environment, we have come for this at the environment public hearing take him on record.	•
157		• We are asking for us if company comes then employment will be provided and turtles will be saved and cared by the environment department sir listen to us.	•
158		• Tortoise is a schedule 1 animal, whether the turtle is died or alive, the company does not care about the environment...	•
• Is stated by the Chairman that your submission that tortoise is in Schedule 1 animal. We have also taken on record that turtle is a schedule-1 animal.			
159		• The brother said that it does not matter if the turtle lives or dies, it means that the Gujarat Environment Board is not competent, if not, then legal action should be taken.	•
160		• We have only one issue, we support the company, if the company arrives it will increase the employment and we are working for that otherwise the turtle which are surviving is cared and conserved by Environment Board protects, there are other departments and they are performing they duty. what we ask to get us employment.	•
• Stated by the Chairman that, we have to protect turtles which come in schedule 1. Listen to my answer Tortoise comes in schedule 1 it is our responsibility to protect and preserve it.			
• There is noise			
161	Vijay Gadhavi	• No, Sir take steps against it how can you say 'Turtle Die or Live' which is schedule- 1 animal. I will file a FIR, you write, we will die for the turtle, why this brother is against you, you are listening to these sentences.	•
• It is the duty of all of us to protect and preserve the turtles as stated by the Chairman.			

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162	Dhvani Shah Village : Bada	• Sir, the presentation of the issue is misleading, which is a violation of the Wild Life Protection Act, action should be taken, but our question is.....	
163		• We welcome the company, we trust the environment department, the environment department will make the company comply with every rule.	•
• Was stated by the Chairman that, Madam, please make your next presentation, you are being taken minute by minute, your questions have been answered, you may proceed now.			
164		• You come from environment department you know everything which animal comes in schedule 1 and which animal comes in schedule 2	•
165	Vijay Gadhavi	• Please note our points that we have raised.	•
166		• Environment should be considered and environment should be preserved	
167		• The company is aware of everything and will maintain everything	•
• There is noise • As told by the regional officer of GPCB that, if you all speak turn by turn, your voice will be heard by us.			
168		• We are not getting turn to speak.	•
169		• We trust environment department sir.	•
170		• If the question of life and death of turtles is being raised from now, where will the turtles go after the company comes, where will our national birds go ?	•
171		• We have full confidence in the company sir the company will follow all the environmental norms and set up the plant we have full confidence in the company and we have full confidence in the Gujarat pollution department of India.	•
• As stated by GPCB Regional Officer that, it seems like you are debating within yourself when you are present simultaneously nothing is being heard here, this is not a political debate, just speak turn by turn.			
172		• None of your rules are followed.	•
• There is noise			
173		• We have trust in our pollution department and we have requested the	•

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		chairman and to the sitting officer, we have trust in pollution control board, so the permission should be given to the company .	
• According to the regional officer of GPCB that, please maintain peace because			
174	Dhvani Shah Village : Bada	• Sir, tell them not to provoke us by speaking in between and turn off the mic	•
175		• The company we are here for our employment questions and to ask our anganwadi questions so we wish that we get to ask questions. The brothers from the Maldhari community who have come childrens from school have also came.	• We have a question, we have a request that today when we are sitting for the public hearing, there is a violation of the public hearing on time, there is a violation of the procedure, as many questions are asked, how can the public hearing be stopped, when this is going on record. Another thing that is the topic is being diverted another thing is that this public hearing is of GHCL. This public hearing is not for an individual person. There is no point in arguing on those points. I feel that public hearing is being hijacked.
• There is noise • As told by GPCB regional officer , Peace please present quietly, your voice is not reaching us.			
176		• We have presented our question and we have received the answer from the company and we are satisfied with that answer. For hearing our question and public hearing, we have presented our questions from villages of the buffer zone. Thank you very much for making this public hearing a success. We are grateful for that.	•

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• GPCB regional officer said, if you want to make a presentation, just do it, don't shout,I request please don't debate internally.			
177		• Chairman, you have made this public hearing successful and we have asked the questions of the villagers to the company, we are satisfied with the fact that the company has answered the questions and we support for the company.	•
178		• Sir, in your presence, it does not matter whether the animal of the schedule 1 lives or dies.	•
• A GPCB regional officer said , " We have discussed it for a minute, let's look at the next issues."			

179		• Company people say that public hearings have been hijacked and you need to see who is doing it.	•
• As told by the Regional Officer of GPCB that, you are kindly requested not to talk to each other.			
180		• If they don't know what to say, whether the turtle lives or dies, what do the supporters of GHCL mean, they don't know what they are talking about.	•
• According to the regional officer of GPCB, the chairman is sitting please maintain peace			
181		• We the villagers have gathered here and we are satisfied that the company has answered the questions of the people	•
• Has been stated by the chairman that, but listen everyone, when it comes to animals of schedule 1, if any kind of animal of schedule 1 is harmed, there is a provision in it and its detention, if there is any harm to the animal, there is a provision for action according to the provision. If there is a loss to an animal of Schedule 1, be it a particular party or a company or anyone, there is a provision within the law for that loss, be it a particular party or a company or anyone, action will be taken as per the provision.			
182		Dear Sir, Mic is off	•
As stated by Chairman Mr. Mine also gets turned off automatically. We are not turning off.			
183		• Sir, today we have presented our questions and objections here. We are satisfied with the answers given by the company for the 12 villages which fall in the buffer zone.	•

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• There is noise • As told by the Regional Officer of GPCB that, turn by turn to speak.			
184		• Let us speak sir, we are also villagers, we are also here for public hearing, we who come in 12 villages buffer zone we want to ask our questions and are asking questions.	•
185		• Supporters of GHCL say whether the turtles live or die means that the company of GHCL speaks the same.	•
186		• From the fact that we have received satisfactory answers to all the questions we have asked...	•
• Chairman states that he not from the side of GHCL neither he is from any side , ..			
187	Dhvani Shah Village : Bada	• When will I get the right of public hearing first of all tell me? Sir how can I get the right of public hearing sir.	•
• As stated by the chairman that, you have free right.			
188	Dhvani Shah Village : Bada	• Turn off the mic on that side.	•
189		• Sir, Thank you very much for making today's public hearing a success. We have got a satisfactory answer to the questions we have asked. We welcome the company from our side. Thank you very much to the chairman. Today we got answers to our questions and this public hearing went well.	•
190	Dhvani Shah Village : Bada	• Sir, do I have the right to this public hearing or not?	•
• Chairman said that , madam, how many hours have you been speaking.			
191		• You can't even stop, the public hearing is still going on, so how can he say thank you.	•
• There is noise			
192		• Sir, the right to turn off the mic or suppress the voice in public belongs to the chairman and not to the people.	•
193	Dhvani Shah Village : Bada	• Violates my right to public hearing, violates law and order.	•
• As told by the regional officer of GPCB that, you continue your point.			

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194	Dhvani Shah Village : Bada	• Sir, please make peace from the support party. They have come to provoke our people.	•
• According to the Regional Officer of GPCB , first of all take your place.			
195	Dhvani Shah Village : Bada	• Sir, first of all, under protest, I am making my presentation, then record it, I will make the next presentation, until you give me an answer, the presentation will be suspended, please give me my answer and I will not waste the time of Chairman, and I can present, but they are diverting the topic by speaking in between. The point is that without giving the notice in the affected 21 villages on the base of notice. Sir, they are speaking in between. This is illegal.	
196		• Sir we have full confidence in Gujarat Pollution Control Board and the company will follow everything and set up the plant. It is our hope that this project will come up here and follow all the rules and the company will follow every pollution rules. It is the hope of our villagers that the company will set up its project.	•
• Chairman said that you present turnwise and all of us are here to hear. you all present in turnwise.			
197		• You will take this application on record immediately Project proponent says public hearing has been hijacked how this happened in your chairmanship sir.	•
198		• Madam, has only one presentation to make. Give me 2 minutes sir	•
• As told by the regional officer of GPCB that, turn off the second mic from the other side.			
199		• Since 2 hours, madam is talking, give us also the chance of speaking. Give us also.	•
200		• I will speak for 4 hours	•
• There is noise			
201		• Madam has been talking for 2 hours, give us a chance, give me a chance, sir. why don't you give me two	•

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		minutes, sir? I request madam to listen quietly for two minutes.	
• Was stated by the Chairman that , DYSP Sir, it is a humble request to you that you make everyone sit down and then take further action.			
202		• Madam please listen to me for 2 minutes.	•
• Said by Chairman that, Madam first sit in your place.			
203	Dhvani Shah Village : Bada	• Please respect me. Please sit down on your place. We have been provoked by wearing T-shirts of other companies. Until we complete our presentation, turn off their mic. Then we will listen to them too. To the supporters of company let me speak first. Sir all of us have seated as we stand the police stand up and immediately show us the baton and they don't show them we see the discrimination. We don't mind. It is your right how you use it is up to you the other thing It is my humble request that the mic should not be turned on until my presentation is over. Thirdly, the people of the company, when we are presenting, the company man comes and says that we are hijacking the public hearing, it is not within their right so record it, There is a violation of our right, Sir, I request that this violation be taken on record in your chairmanship. The third is a supporter of the second party trying to deflect my point. My issue is a simple question, we are looking at you, we have brought proof before you that this public hearing is illegal, but you want to go ahead with this public hearing or not, let us continue with the next presentation.	•
• Was told by the chairman that , madam, number of questions you have are answered, I am the chairman. So I on behalf of the Chairman states that your questions are answered whatever your technical matters or the point of your notification...			
204	Dhvani Shah Village : Bada	• So you are saying that this public hearing will be moving forward as it is right	•

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• Stated by Chairman that, you may continue with your objections and submissions			
205	Dhvani Shah Village : Bada	• I do the same sir who is this not in uniform sir you are the chairman who is this sir? sir who is this? you are the chairman who is this?	•
• As stated by the Chairman that, Mamlatdar.....			
206	Dhvani Shah Village : Bada	• Sir, who is this, why are they taking my mic, why are they coming near me, what right do they have, I am speaking.	•
• As stated by Chairman that, you continue with your objections.			
207	Dhvani Shah Village : Bada	• I am speaking, why did they come to take the mic from me?	•
• Chairman said that , you continue with your presentation.			
208	Dhvani Shah Village : Bada	• I continue, tell them to sit down and don't interrupt	•
• According to GPCB Regional Officer that, everyone sit quietly and continue your presentation.			
209	Dhvani Shah Village : Bada	• Please keep calm for a minute all sirs you said this public hearing will continue. Even after bringing the procedure laws in the public hearing process you say	•
• Chairman said that we are taking all the illegality on record and we will convey your matter to the decision making authority.			
210	Dhvani Shah Village : Bada	• You are the one, You are the one, The right of the collector.....	•
• Stated by Chairman that, Illegality from here..... • Brother, do what you say within the legal limits, take special care that what you say is going on in an orderly manner.			
211	Dhvani Shah Village : Bada	• I request you all that the daughter of your village, the daughter of Mandvi, the daughter of Kutch, I am speaking on your behalf. If you throw something in between, our side will be weakened and those people will win. Please do not throw anything and sir You will not do so much of standing and sitting, it is too much oppression and other things please tell policemen not to come in between. Your face is not even visible. Tell the policemen to stay on the side. We don't mind if	•

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		there is any problem inside, you can order them, you have the right to oppress me from time to time and my mic should not be taken, please give them direction.	
• Chairman said that, Madam, we have been listening to you for the last hour and we are still listening now. The mic is in your hands and we have given you the opportunity to make a full presentation. The mic is also in your hands. Madam Baton is shown to people who try to take the legal system into their own hands			
212	Dhvani Shah Village : Bada	• This is a public hearing	•
• Has been stated by the chairman that After all, this is a public hearing, then why are you throwing cardboards here.			
213	Dhvani Shah Village : Bada	• I have requested them not to throw anything against you anymore but stop provoking us.	•
• Said by the Chairman that, Madam, again instruct your people in the back, they gather back in five minutes and the cardboard are thrown. You have seen and it is happening in front of your eyes, first you make your people sit, we are sitting to listen to your objections, but if there is a method, you speak here and later on, it is not the right method.			
214	Dhvani Shah Village : Bada	• Will you Maintain my dignity by not throwing cardboard anymore, or not and if it comes from the supporting party then sir it is not our responsibility	•
• Was stated by the Chairman that, yes, now you continue your presentation.			
215	Dhvani Shah Village : Bada	• Sir please tell the police don't come in between this madam is standing on top of me I am being oppressed the right of public hearing is being violated here. she is standing here very welcome it is for our protection don't stand on top of me I am disturbed, Please sir please please.	•
• Stated by DYSP that, she is stand where one stands and no one has any form of obstacle for that.			
• Was stated by Chairman that, DYSP sir, I would like to request you to give some space to his submission			
216	Dhvani Shah Village : Bada	• Among the public with a gun.	•
• Said by the Chairman that, Madam, now you have got your answer.			
217	Dhvani Shah Village : Bada	• Sir, my request is that you tell them to go a bit aside.	•
• Give some side as stated by the Chairman.			

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218	Dhvani Shah Village : Bada	• And sir, secondly, my first point was that the illegality I have brought before you, you have used your right to decide that this public hearing will continue right.	•
• Stated by Chairman, we have taken the issue of your illegality on record.			
219	Dhvani Shah Village : Bada	• You have decided that this public hearing will continue.	•
• As stated by Chairman that, your questions have also been answered from GPCB and replied with date.			
220	Dhvani Shah Village : Bada	• You let your decision be heard.	•
• Stated by the Chairman that, is I am asking you to make your second presentation now, this will be on the record.			
221	Dhvani Shah Village : Bada	• Next yes or no answer was asked whether NIO has certificate or no answer yes or no then I will proceed further.	•
• According to the Regional Officer of GPCB that, Madam, this issue has been discussed, it is not present with them now and I have told him that he has expressed it to the project proponent, so we will take note of the issue and the reply will have to be given to the Ministry. You should continue with your issue.			
222	Dhvani Shah Village : Bada	• Why does it come forward that we have hijacked a public hearing that is just a yes or no? I'll move on to my next point.	•
GPCB regional officer told that, madam don't do repetition on every issue means clear cut that your issue is going on same issue for last one hour.			
223	Dhvani Shah Village : Bada	• Chairman sir. I don't get answer say yes or no I will go to next point.	•
• Was told by the chairman that , you have now come to know from the company that they do not have the certificate that you are asking for at this stage and they have given you a detailed reply. You present yourself.			
224	Dhvani Shah Village : Bada	• Even if it is not now, even if you have not shown it on the screen now, we have left it, just come here and go on record whether it is NABET accreditation or not, whether it says yes or no .	• First hear one thing that complete EIA is done by NEERI listen to me we have Marine EIA Completed .....listen to me.. • NEERI has done a complete EIA study and NIO has been declared a technical expert agency and its database has been studied. Complete

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			EIA report has been given by NEERI and confirmed by MOEF.
• Has been stated by the chairman that, after listening to his answer, listen to his full answer.			
225	Dhvani Shah Village : Bada	• Sir, I will speak now?	•
• Said by Chairman that yes.			
226	Dhvani Shah Village : Bada	• Sir, if your marine EIA which can be run on screen sir.	• Sir the study has been done which complete responsiblity of NEERI as per EIA. For everything we need to talk over here instead of hearing it is discussion.
• As told by the regional officer of GPCB that, we have to know what the issue is....			
227	Dhvani Shah Village : Bada	• Sir, these rights have been given by the company, they have come to put the company on our land , we have heard them, now listen to us..	•
• Was told by the chairman that, madam, I have given the mic only because nothing is going to happen until your objection is justified as right or wrong, because there is a public hearing for your objections.			
228	Dhvani Shah Village : Bada	• Sir, what are you saying, in other words, let me say I have come to fulfill the formality of which is the tick mark in completion of public hearing for the company, in any case, you make your presentation and go from here, then whatever you want to do. Do it and let this public hearing end, you say.	•
• Chairman said that , Madam, we are taking the report of your presentation			
229	Dhvani Shah Village : Bada	• I am not defending it, I am just interpreting and want to confirm to you in front of me.	•
• Chairman said that, your understanding is correct, I have come to listen to your objections and am listening now.			
230		• • Listen open my objection, you see its Marine EIA report, which is authorized by GPCB officer, and On that report of Marine EIA it is clearly written that NIO has done and company wants to say it is done by NEERI which is totally false. NIO has said that there is no	•

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		effect here as NIO has stated that outfall and intake points will not have any impact which is totally false as they don't have such authority. We want to know and they clearly answer us that they don't have accreditation right we will proceed is that right?	
• According to the Regional Officer of GPCB that, this point has been clarified to him			
231		• This is written or taken on record ?	•
• Told by Regional Officer of GPCB that, ok go ahead			
232		• May this be taken on record....	•
• According to the regional officer of GPCB that, whatever we say here will be on record.			
233	Dhvani Shah Village : Bada	• As you said Let there be a public hearing, what you told, if it is illegal, then we will let it happen.	•
• Chairman said that it is not illegal, he is answering our questions, whether it is legal or illegal, you or I should not take a decision sitting here, the Ministry of environment , ministry for different things is there , everything will be reported and, everything has been reported and then it will be decided. What is yet to be decided			
234	Dhvani Shah Village : Bada	• If you console the at least that this sir who is the representative of the company tells you that the NIO does not have accreditation, if you put it on record, I will proceed further.	•
• on record as stated by the chairman.			
235	Dhvani Shah Village : Bada	• Gram Panchayat affected by public hearing is not informed to Gram Panchayat. Gram Panchayat is public authority within constitutional amendment is bigger than newspaper and you can't do it even 15 days before you are running this illegal public hearing for the company. My submission is under Protest I submit.....	•
• Stated by the Chairman that, we have certainly taken this submission into consideration			
236	Dhvani Shah Village : Bada	• In your EIA report who has done a study on ecology impacts in the EIA report, he has not been given his accreditation certificate sir...	•
237		• Honorable sir today we have full	•

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		confidence in the company village residents who have come from the buffer zone we have asked our question our maldhari brothers who have come here today, students have come today farmers from 12 villages also want to ask questions. Sir we are seating since 1 to 2 hours. Every one has the right to ask question. Sir we the people of 12 buffer zone should also be listened and heared please give us the chance to speak.	
• There is noise • Was stated by the Chairman that , do not do the presentation simultaneously, present turn by turn.			
238	Dhvani Shah Village : Bada	• Sir you are take law and order in hands turn off the mic.	•
239		• Today we have been sitting for 2 hours, sir, the farmer brothers have come from the village, the maldahari brother, the students have come, everyone has the right to ask questions, so we also have a humble request to give us time to ask questions, we have all been waiting for one and a half hours, sir. Chairman Sir, let us also be heard from the villagers who have come from the buffer zone. We have come from the buffer zone of 12 villages. Let the villagers be heard. Farmers, students have come. Hear us from 12 villages.	•
• There is noise. • As told by GPCB regional officer that, do not debate inside, make presentations turn by turn, after the presentation is over, after your presentation is over, everyone should sit at the back, so the public hearing can be proceeded.			
240	Dhvani Shah Village : Bada	• Sir you are violating Law Order.	•
• GPCB regional officer told that , madam continue your presentation			
241		• The issue of environment is straying somewhere else Sir we have come here for the public hearing of the environment, only those who are going	•

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		somewhere else..	
• The regional officer of GPCB told that , present turn by turn brother, keep the mic off, till his presentation is over.			
242		• We have been sitting for 2 hours sir	•
• There is noise			
243	Dhvani Shah Village : Bada	• Respect us sir.	•
244		• We farmers and students have come here to get a chance to present the question sir this is a public hearing this is democratic and chairman sir we have full faith in the Gujarat Pollution Department we have the right to ask questions we are farmers, brothers and sisters there are questions of unemployment.	•
245	Dhvani Shah Village : Bada	• Sir, I said everyone to sit down and to respect you.	•
• Was stated by the chairman that now madam you have made a presentation.			
246	Dhvani Shah Village : Bada	• Everyone calmed down in front of you, respect you, you respect us, turn on the other mic and listen to them too.	•
247		• Dear sir, we have got satisfactory answers to our questions which we have asked many of our brothers we have got satisfactory answers from the company we are satisfied and we have full confidence in the pollution control board, we hope from the company.	•
• " Turn off the mic and listen to them" the regional officer of GPCB said.			
248		• The company will also set up the plant keeping everyone in mind and we hope from the company that each company has its own....	•
• As told by GPCB Regional Officer that , finish your presentation and let them continue.			
249	Dhvani Shah Village : Bada	• calm down please calm down, sir please give me a chance to finish my presentation.	•
• It was stated by the Chairman that, madam, you speak			
250	Dhvani Shah Village : Bada	• Thank you sir sir give me a minute	•

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251	Aditya	• Sir the company said that no recreation center, tourist area comes within 15 km radius but meditation center comes within 0.6 km and the company stated that none comes is wrongly mentioned in the appendix form 1 Bhimnath Temple is also located nearby and Ashar Mata Temple is also located. Vipassana Center is located within a radius of 15 km. Vipassana Center is an international center for the last 32 years and people from outside also come and this company keeps a distance of half a kilometer, then what the company will give guarantee that noise pollution will not occur and peace will not be disturbed.	•
252		• We don't need guarantee, a breach has occur. Even the company does not see that there are so many religious places and vipassana centers within half a km that the government itself has decided how many radius it should be within a radius of 15 km. Gujarat Pollution Board does not see what? The answer is how can this be approved? How can public hearing be done? What is the answer to this the basic complaince is not being done? Bhimnath Mahadev temple is near it is not the matter of 15 km and vipassana kendra this is not a small area we are talking about a area spread over of 35 acres.	• In the report it is clearly mentioned about the Vipassana center. Secondly in Vipassana center when we talk to the people of Vipassana center they say this is not a religion temple this is a meditation center here all kinds of people come and do meditation and this is also clearly mentioned in the report.
• According to the Regional Officer of GPCB that, listen to the answer given by them, the Vipassana Center is clearly mentioned in his report.			
253		• It is a meditation center.	•
• Chairman said that first let him answer then you ask questions you people can also sit and discuss we have not stopped you from setting at your places and discuss.			
254		• Here we have so many people standing and asking questions. So he should limit himself to such an extent that he stands up and at least comes forward and gives an answer. One	• It is clearly written on the paper 3.7.3 of NEERI that Vipassana Center & Shiva Temple are there. All those details are given.

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		thing and another that Vipassana center is not a religious center and you remove it from it and that is a meditation center within a radius of half a kilometer. If you do that, you have removed that it is not a religious place. It is a meditation center. And this is all. The government has made a rule to keep a bar of 15 km radius. People have not made this set rule. So if this rule is made by the government then it applies to every company and every individual who wants to put up a project in this country, then it also applies to GHCL. And if it does not fulfill all the compliance, then it has no right to reach to the public hearing.	
• Chairman said that now you have another presentation to make.			
255	Dhvani Shah Village : Bada	• Yes, I have very long 10 pages please keep calm. I am tired now, my throat also hurts but I have to make a presentation. I will but you please keep calm. Sir I would request the representative that, Stand up and answer us, we will enjoy watching them. A bit like we are talking to someone. And we will also be encouraged to advance our point sir. Another thing which temple and center of vipassana are not indicated, it is necessary to indicate it while submitting form-1. On this bases the TOR is issued. If they have not presented it in Form-1 itself, then the ToR has been taken from the Ministry by giving wrong information under wrong information. If this is on record, the submission from us will be considered illegal, and the many are still pending. ok sir next point,	•
• As stated by the Chairman that yes yes speak...			
256	Dhvani Shah Village : Bada	• Their TOR as I said tells me the exact date of issue.	•
• Said by the Chairman that, Madam, please state your point of objection			

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257	Dhvani Shah Village : Bada	• Sir, the date of issuance of TOR let us know, let them answer. I say next.	• TOR issue date: 10/08/2021
• Stated by Chairman that, but state your point of objection.			
258	Dhvani Shah Village : Bada	• This is the problem.	•
• As stated by Chairman that, but you should object. Madam, you spend 45-45 minutes, half and half an hour behind your one presentation.			
259	Dhvani Shah Village : Bada	• See I am not having fun, I also have a job, my home and my family. I don't have any fun. To hold and sit here for an hour.	• TOR issue date: 10/08/2021
260	Dhvani Shah Village : Bada	• That's why you support the company so that we move forward without their reply.	•
• As stated by the Chairman that, you people can also sit and discuss. We did not refuse you.			
261	Dhvani Shah Village : Bada	• When TOR is issued?, let them answer. Tell us the answer.	• TOR Issue 10/08/2021
262	Dhvani Shah Village : Bada	• Sir please come there, please sir with folded hands please sir please there. And again I don't know the date. Please.	• 10/08/2021
263	Dhvani Shah Village : Bada	• 10/08/2021. One minute, one minute.	• I want to say something I request you people to sit comfortably and talk .
264	Dhvani Shah Village : Bada	• Sir, when your base line data collection for terrestrial has been done? Baseline Data Collection for EIA Studies.	• Today all these details are available on the website. Present your objections.
265	Dhvani Shah Village : Bada	• Sir you answer me.	•
• According to the Regional Officer of GPCB that, listen to the information which is already disclosed in the advertisement and also available on the net. So please present the rest of the issues which are technical.			
266	Dhvani Shah Village : Bada	• Sir EIA notification said that I should get the reply. You are violating it. I should get an answer. EIA notification says that I will get the answer.	•
• According to GPCB Regional Officer, your questions which are available on net.			
267	Dhvani Shah Village : Bada	• People can't read. What is the problem in speaking?	•
According to the regional officer of GPCB that, these questions are just like a debate. Better than that put your technical points..			
268	Dhvani Shah	• Sir we are not in debate form. Sir it is	•

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	Village : Bada	the same. Are you on behalf of the company or on behalf of the people? EIA for...	
• According to the regional officer of GPCB that, we are not on behalf of anyone, we want to listen to the public.			
269	Dhvani Shah Village : Bada	• The EIA notification gives me an assurance that I will get an answer to my query from the consultant. Please don't shut me up. Ask consultant to answer me.	•
• No I am not silencing you ma'am as told by the regional officer of GPCB.			
270	Dhvani Shah Village : Bada	No you do the same. Ask them to answer me. I have asked a simple question.	Chairmen, we have presented his question in the record. Answered is given in the minutes of meetings.
271	Dhvani Shah Village : Bada	• Sir...	•
It was stated by the Chairman that your every presentation will be taken in minutes...			
272	Dhvani Shah Village : Bada	• Sir, I am open EIA notification and rights granted to me under EIA notification are you willing to violate my right than you can bar him from answering my question. He is supposed to answer my question every question.	•
It was stated by the Chairman, Madam, there is no question answer session at this time. If this is not related to your objection, you will automatically get your answer.			
273	Dhvani Shah Village : Bada	• Sir..	•
• Said by Chairman that Please don't make question answer session now just suggest your objections just give us your objections suggestion.			
274	Dhvani Shah Village : Bada	• Can I read the EIA notification ?	•
• It was stated by Chairman Yes, you read but you present your objection.			
275	Dhvani Shah Village : Bada	• I will read But you don't take the side of the company.	•
As stated by the Chairman that, we have not gathered here for question and answer. we have gathered here to hear for your objection.			
276	Dhvani Shah Village : Bada	• You are on record saying that you are ordering the provision of EIA notification not to disturb me.	•
• Chairman said that if you have any objections, you can make a presentation regarding the project.			

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277	Dhvani Shah Village : Bada	• Sir I have asked him a question.	•
• According to the regional officer of GPCB that, the information is available on the net regarding questions.			
278	Dhvani Shah Village : Bada	• Sir...	•
• According to the regional officer of GPCB that, no information is private. It is on public domain.			
279	Dhvani Shah Village : Bada	• Why do you favor them? Are you bias? Are you bias?	•
• As stated by the Regional Officer of GPCB that, no.			
280	Dhvani Shah Village : Bada	• EIA notification tell me that I will get an answer.	•
• As told by the Regional Officer of GPCB that, you can submit your next submission.			
281	Dhvani Shah Village : Bada	• Are you being biased on record. you said him to answer. I will tell my point. I may speak in English.	•
• As told by the Regional Officer of GPCB that, the proponent will respond to whatever representation you have. they have to give without fail they are forced to give. • As told by the Regional Officer of GPCB that, on which day you			
282	Dhvani Shah. Village : Bada	I will present my point and he will answer me. I will state my point. My question to them is when is the baseline data collection of terrestrial EIA done. Environmentally suggestion has been given that mitigation will be done. when the baseline data for the mitigation has been taken. I want a date. I will present my point.	•
• Is the data available ? as stated by the Regional Officer of GPCB?			
283		•	• If it is available, it will have to be taken. And this is still a draft EIA.
284	Dhvani Shah Village : Bada	• They have no availability. you tell me	•
285		•	• This is still a draft EIA.
• According to the Regional Officer of GPCB that, we request that do you have ..			
286		•	• This is still a draft EIA and its mitigation plan will come in the final EIA.

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			If you have any question, please let us know and we will answer it.
287	Dhvani Shah Village : Bada	• Sir, he has no answer	•
• According to the Regional Officer of GPCB that you received your answer.			
288	Dhvani Shah Village : Bada	They don't have the answer, but you say it's just their EIA report watch finals online. It does not say that baseline data has been collected? Who are the representatives of NEERI? So NEERI has prepared the report, then who are the representatives of NEERI? I want an answer. If you don't know the base line data, do you guys do EIA consultation?	•
• Chairman said that, Madam, therefore, we have taken your objections and their replies on record.			
289	Dhvani Shah Village : Bada	• Sir I am reading the related clause of public consultation of notification of EIA Ok. Give me 5 minutes go ahead it doesn't matter if you don't ask them to answer just give me 5 minutes I Want to read.	•
chairman told that, brother, you have given 5 minutes to the madam, then let her make presentation, keep calm. please.			
• As told by GPCB regional officer that, ma'am give your other points.....			
290	Dhvani Shah Village : Bada	• Sir I have asked for time from you, I am saying you will give me time give me an opportunity. my points will be presented, I read.	•
The regional officer of GPCB says that, yes, until then, if anyone want to present they can.			
291	Dhvani Shah Village : Bada	• I want to read then it takes 5 minutes to get the provision then why can't you wait?	•
292	Valji Jashraj Charan	Sir, The number of National Bird Peacock in Bada village is more than 500. Peacock is a Schedule I bird, although peacock is a schedule 1 bird, it is not mentioned in their EIA report, The number of peacocks in the surrounding 10 km buffer area is more than 1500. Here in where the largest	•

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		peacock nest, Bada Vipsyana center is only half a km away, only 150 to 200 peacocks are seen wandering in Vipsyana center even today. Also in Pachotia area in Peer Wala area is our supporter Brother's village, they will tell the truth but may not back down. More than 500 peacocks are also found in the shelter extension of Pachotia village. You don't connect my mobile phone, otherwise I will show the video to tell our supporting brothers whether it is Pachotia area or not. So the number of peacocks is 500 in this area. More than 100 flocks come to graze which I have seen with my eyes. I have also sent you my selfie with GPS. If this project comes, these people have not shown a single number of peacocks in the EIA report. All these numbers of peacocks are not so much public but also GHCL supporters can see, the number of peacocks is 1000. Due to coming of GHCL company, our peacocks will have to be shifted. We are of the opinion that innocent and dumb animals will be sacrificed. So why not a single peacock appeared in its EIA report.	
• It is stated by the Chairman that , that we have also taken this presentation in the minutes. We are going to take the each presentation on record. Whater discussion has been made on peacock, it will be taken on record.			
293	Valji Jashraj Charan	• Number of 500 to 1000 peacocks should be recorded.	•
• It is stated by the Chairman that sure sure,			
294	Valji Jashraj Charan	• There are 600 to 500 peacocks in the center of Bada Vipsyana only. Sea area, in Aashrey vada pir area, this side has nesting places of peacocks in half a km area. the national bird is a schedule 1 bird, So, if you can see, ask these people that during your study, not a single peacock was seen, when or how	• Details of the peacock have been given and a conservation plan for it has also been suggested • Talking about peacocks, you don't have to decide whether I should do this sitting or standing One

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		many peacocks were recorded. Ask sir to stand up and answer calmly, show the number of peacock studied in our area, otherwise if you connect my mobile then will show the number of peacocks living in your area with proof. Vipsyana Kendra, Bhimnath Temple peacock's eating video I show on mobile but you are affected for this thing. I accept it, you disagree.	minute, the details of peacocks has been shown and conservation plan has also given.
295	Laxman Kanji Karani	Provincial officer, company officers are lying, now don't support them, cancel the hearing.	•
• It is told by the Chairman, that your submission has been taken on record. The submission of Peacock's matter has been taken on record.			
296	Charan Valji	• So what do we mean by taking on record what you have taken on record and these people sir are hearings, then they don't have an answer to any of our things....	•
• It is informed by Chairman that this hearing is for taking on record only.			
297		• Sir we have presented our questions we have found my answer satisfactory, so we are satisfied, we have presented our questions in written and oral form here in our buffer zone. We have received satisfactory answers to our queries from the company and so we support the company.	•
• The regional officer of GPCB says that there is another representation?			
298		• Dear Chairman sir, Thank you very much for holding today's hearing .	•
• There is noise • It is known by the chairman that , make a presentation calmly sir, then speak what you want to make a presentation. • It is known by the Chairman that Madam , you should make your presentation.			
299		• Do not repeat one presentation.	•
• It is informed by the Chairman, to make your presentation			
300		• Thousands of people we are satisfied with this company and now we are leaving Welcome GHCL.	•

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• It is stated by the Chairman that we should stop the internal discussion • The regional officer of GPCB says that , stop internal discussion and sit quietly. • It is stated by Chairman that , make your presentation inside.....			
301		• Listen as I give my presentation on environment. People with this support have no environmental question and they want to complete the hearing, let them go their way, let us ask environmental questions.	•
• Regional officer of GPCB states that please sit in your seat before presenting the questions calmly. • There is noise			
302		• Welcome GHCL, Welcome GHCL	•
• There is noise • It is announced by the Chairman that, please take your seat.			
303	Dhvani Shah Village : Bada	• Sir, we calmed our people, other people came and provoked.	•
• It is stated by the chairman that , it is our humble request to all that do not take law and order in hand, maintain peace. It is a humble request to the police officer to maintain peace and obey the rules and make them sit down.			
304	Dhvani Shah Village : Bada	• Sir, our people often sit but if you give them opportunities to provoke, then I will not be able to do anything.	•
• It is stated by the Chairman that , Madam, please make your presentation			
305	Dhvani Shah Village : Bada	• No representative of NEERI is present here to answer our questions. Right sir that may be taken on record.	•
• It is stated by the chairman sure sure we take record.			
306	Dhvani Shah Village : Bada	• Violation of EIA notification. EIA notification clearly gives the rights to me seek clarification and ask the question. they don't have an answer when was the base line data done? do they know what is the base line data? A draft EIA is made under this EIA notification. On the basis of the draft EIA, this public hearing is held. The people and the base line data who conduct the field visits to prepare the draft EIA are called the base line data.	•
• Provincial Officer of GPCB said that Madam please proceed with your presentation which is the explanation of the applicable officers. Please continue.			

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307	Dhvani Shah Village : Bada	• I say you do not stop.	•
• Regional Officer of GPCB said that , I am not stopping you, go with your issues.			
308	Dhvani Shah Village : Bada	I am coninueing, please you don't talk in between. This draft EIA report is made on the basis of the base line which you have facilitated that this public hearing is done is the EIA report which is draft....	•
• It is stated by the chairman that first madam you maintain peace we should follow discipline here.			
309		• Sir you have come to other people's side in support of the company also tell them that please respect us, I told all my people. Why does the second mic turn on? He wants to provoke.	•
• It is stated by the chairman that , I am giving a general instruction, madam. It is a general instruction, I have not used the word supporter or opponent. This is my general instruction. Clearly has been said, I have appealed to everyone to maintain peace. Do not use the same words. I have clear cut said appealed everyone to maintain peace, in everyone all has come.			
310	Dhvani Shah Village : Bada	• You facilitate the second mic to continue	•
311	Vijay Gadhvi	No no no you all are biased and the ladies are presenting, the daughter from village is presenting to save the environment, a deputy collector tries to suppress her.	•
• It is stated by the chairman that I am here to listen to her and appeal to others to maintain discipline to listen her.			
312	Vijay Gadhvi	• We still have thousands of questions that you have to answer	•
313	Dhvani Shah Village : Bada	• You give us an assurance that another mic will not be switched on so that people will not be disturbed and everyone will sit quietly and listen. Will you sit or not? Sir everyone will listen. Sir, base line data can not be older than three years from the date of this public hearing happens. They don't know their baseline.	•
• It is stated by the chairman that sure sure speak speak....			
314	Dhvani Shah Village : Bada	• What I give, take it on record that the consultant is not present and those who are present do not even know when the base lines were taken and I tell you that the TOR according to them	•

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• It is stated by the chairman that yes yes yes tell.....			
315	Dhvani Shah Village : Bada	What I want to say is that the TOR provided based on baseline in August 2021, their base line was done in 2018-2019, if there is any authorization letter from them, from ESE or environment ministry, that using old data, such false EIA is made and false public. hearing can process, present here and if not present my point be taken on record.	•
• It is stated by the chairman that yes yes yes.....			
316	Dhvani Shah Village : Bada	This public hearing is being conducted completely in violation of EIA and EC procedure. They have not done any kind of base line data in these villages. They have not seen the turtle, sea, vipassana center, temple of these villages. People have not met, to such an extent sir, you are the district magistrate and our father. Sir, in your presence, those who have the right, who have the duty to do so, we the people, the Pagadia fishermen who have been doing Pagadia fishing for years since the time of British, there is no EIA of them, in your presence we do not get even that protection, we have come withour study record. They come with false EIA and come to present which is illegal according to us. We have presented it to you, you said let the process go ahead I am making my second point.	•
• It is stated by the Chairman that, Madam, let me make it clear to you that the public hearing is neither legal nor illegal. All the objections you have raised now are illegal, this is a public hearing to record the matter.			
317	Dhvani Shah Village : Bada	• Pagadia is not mentioned at all. If you are new in our district, then for your information let me tell you that Pagadia fisherman has been doing sea fishing for years. The high & low tide will release 3 degrees of warm water in the sea if there is no EIA of those people,	•

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		then those people have not been studied at all. The villages have not come, the EIA is totally wrong whose public hearing is being facilitated now	
• It is stated by the Chairman yes			
318	Dhvani Shah Village : Bada	Apart from that, this is a forest area, inside the forest area there are spices, animals, plant spices, whatever we want to say, my request to increase of volume of my mic , People sitting behind are not able to hear. Secondly, if five degrees warmer water is to be released into the sea, the impact it will have on our people is not on record, the process of public hearing is fraudulent, illegal. Secondly, in the forest area, Valji Charanbhai has repeatedly said that we have protected species, it is nesting, it is clearly in the EIA report that this species is also done in the EIA report in the forest area, the permission taken from the forest presented to us.	•
• Regional officer of GPCB said that if your presentation is over, then continue..			
319	Valji Jashraj Charan	• Madam has asked question, now answer it.	•
320		Can I get information yes or no, please give us direction that permission is taken or EIA permission is taken then show me letter, give me letter number, will get details.	•
Regional Officer of GPCB said that any such information is present, Mr.Proponent? madam, ask your question until you get the answer, parallelly you continue.			
321		• I get the answer, I further, no sir I get the answer, I will present, answer me. I will present next yes or no? And the number and date of the letter, do not even bother to bring the letter and present it.	•
322		Sir, we do not want any proof, if permission has been taken, yes or no, this public hearing has been attended so many, sir, we know how the public hearing is	•

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		done. Our question their answer in public hearing, no other things.	
• GPCB Regional Officer said that please maintain some peace.			
323	Laxman Kanji Kariya	• Regional officer sir If there is no reply, cancel this illegal public hearing.	•
324	Dhvani Shah Village : Bada	• can i read the EIA report ?	•
• GPCB regional Officer said that yes sure.			
325	Dhvani Shah Village : Bada	• In EIA 6.4 it is clearly granted and for unity information verification project that you or I cannot take over the notification of it .	•
• It is stated by the Chairman, that I am not overruled.			
326			• Today, when the forest is being studied, the study experts to go for the forest have done it with their permission or not.
327		• SDM sir, my humble request, why VIP treatment to these people as well as our company men. He has been seated in a chair and a fan, we have been given only a chair.	•
• It is stated by the Chairman that, you have also been given and chair given, you are standing of your own free will, everyone sit down, you have been given a chair, sit down, you have been given a chair, everyone sit down.			
328		• And why does the company have the courage to sit like this? Place them here and if the company doesn't have the certificate, cancel it now.	•
• It is stated by the chairman that whether there is a certificate or not , we take it on record, this public hearing is not a question answer session, if your question is not answered, then we take it on record.			
329		The record will not work, even in this modern ,time, everything is available on the net, these people have all the equipment, the net, all this is being recorded, the net is working, search now from the net, otherwise cancel it. We don't want anything except one thing. If this company, this GHCL, considers us as fool, considers us as villagers, then we will not let it happen and these people are given	•

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		VIP treatment and we are tied up in this barricade. Media and international media to request to take a note of this. If thay don't have the answer, cancel it now and catch it running. If sir now you want to do them a favour, then say it open, we are joining GHCL and we are with GHCL.	
• It is stated by Chairman that we have only come to listen to the objections , this is environmental hearing and we are not giving any response from the company, we are only within the scope of our work and we are not making a decision at this time. Whatever your questions are, It is technical, there is no obligation to answer it, it is being recorded minute by minute and wherever it is possible to send the video, which is an objection, we will send it impartially.			
330		Sir, please direct the company to ask for the certificate from the head office and cancel the hearing if it is not presented. we don't want anything except that thing, If it is illegal then how we can give one question from last 2-3 hours...	
• What information is available with you ? as stated by Regional Officer of GPCB.			
331			• I am referring to the entire report of the forest department which has been submitted by the forest department. The question of forest department NEERI 's report, whether permission to go to forest or not is a question of forest department, it has nothing to do with public hearing.
332		• Our question is that if his certificate is not shown, cancel this hearing, issue a fresh notice and give a fresh order and conduct a fresh hearing.	•
• It is stated by the Chairman, that the hearing is not legal or illegal, the public hearing for the objection you are raising now, without a public hearing it is not possible to say what you are saying now.			
333		• No positive response from you.	•
• It is stated by the Chairman that, but we are			
334		• Ask them for the certificate from NEERI from head office.	•

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• It is stated by the chairman that, in the public hearing, we are sitting to take your objections, who are you to say that don't take objections, it won't work.			
335		• No public hearing on false EIA report. We do not want any report except one thing. Show us correction of report, correction in report	•
• It is stated by Chairman that this is your suggestion and we take the suggestion. We take your objection and suggestion .			
336		• This process is not legal. Now send them to Mandvi, From Mandvi will get access to net, fetch from there and come back. Can't attach the mobile, what acceptance do we have with you? We have nothing to do with the company we want to talk to you. • Show date and certificate.	• NEERI has certificate and renewed in 2022. • Renewed on 5 September 2022.
337		• Sir we want the certificate of this report prepared in 2018-2019. The second thing is that the certificate is on record in 2022, before that it is not specifically this is to be taken on record. And another thing is that again this is a member uncle with me and the police came to take it away from him. Please, the next thing is that the EIA report consultant is here for the public hearing so that our questions can be answered peacefully and satisfactorily. The consultant is not present. It is illegal and they does not have the answer to our questions. Therefore, this public hearing under your chairmanship is illegal. This is a presentation to take note of what is happening.	•
338		Sir, there are no many documents, there is nothing to present to us, yet why continue this hearing? And yet you don't want to cancel. Why are so many people protesting that there is no certificate giving you base because the EIA report is completely wrong, there is no certificate. Even if the EIA report proves that the same is wrong, still why the public hearing continues.	•
• It is stated by the chairman that, the public hearing is for your objection, I have no decision to give			

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here, there is no point in keeping the public hearing on or off, the objection you will give now or after that week is today that are same.			
339		• This hearing will be for the public and if you cannot answer, you should cancel.	•
• It is stated by Chairman that, we will take your objections and your answers on record, we will not decide whether the report is wrong or right.			
340		• Ask all these experts sitting here, ask them.	•
• The Chairman said that all these reports will go to the Central Committee and it will be decided there			
341		Sir, I request you, make those stand up who made this and we question, if they don't have it then this hearing has no meaning.	•
• It is stated by the Chairman, that this is not a forum for questioning, this is not a session, this is for your objections. This is not to get a satisfactory answer after questioning, now objections have to be taken			
342		• And if the one who has something wrong in his stomach stands with his face down, all these people are sitting without record, they have no record.	•
• It is stated by Chairman that we are taking objection from him.			
343		• You ask a question ,	•
• It is informed by the Chairman that this is not to be answered from him, the Central Committee will ask for your objections from him. We give direction for your objection, submit your objection, we are neutral.			
344		• Are you from Public or GHCL?	•
• It is stated by the Chairman, that we are neutral and have taken your objections as they will have to answer your objections to the Central Committee.			
345		• So why is the company not responding, why are you responding? Why is the officer not answering?	•
• It is stated by the Chairman that since I am the Chairman I am the Chairman of the Environmental Hearing I can answer.			
346	Dhvani Shah Village : Bada	Sir first of all you often say, let me speak for a minute. You repeatedly say that the presentation of this public hearing is only for our hearing, which is a violation of my right as directed in para 6.4 of this EIA notification. And you violate it right. if you're not allowed us to get answers and give directions then give us answers.	•
• It is stated by the Chairman that here legal or illegal			
347	Dhvani Shah	• Here again I read, the person present	•

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	Village : Bada	at the venue shall be granted opportunity to seek clarification of the project from the applicant you can not take over our opportunity back , We have the opportunity to ask questions , seek information and clarification.	
• Regional officer of GPCB said that, madam you are asking your questions. This is followed by presentations that go further.			
348	Dhvani Shah Village : Bada	• Sir it goes on record that you say that repeatedly.	•
349	Valji Jashraj Charan	• Sir, the previos hearing was canceled in just 15 minutes , then you have every right to cancel the hearing as well. Even if we protest so much, why not call you to cancel the hearing? We canceled the previos one in just 15 minutes.	•
• According to the regional officer of GPCB, this committee has no authority to evaluate the EIA report.			
350	Keshav Gadhavi	• Sir, this is a favor. Inspite of so much outrage from our people, we request you to the officer sir, inspite of so much outrage, why do you people support the company. Why are you asking us so many questions?	•
• Regional officer of GPCB said that this committee does not support anyone. This committee is only for listening to the public.			
351	Keshav Gadhavi	• No one believes in the power of the public. What question do you want to ask? And secondly sir you have no answer to any of our questions. The company does not respond. And you come in front of us and you sir give up and cancel it. Request to cancel this public hearing. sir Despite the public outcry you don't understand why. Remember this, you have babies, we have babies too. There are also children in this public. Remember not a single person, money does not work. I am the son of a Charan. I am the son of a Charan. Remember to cancel this.	•
352	Meet Gadhavi	• Hon'ble Officer, We have been seeing since morning that inspite of very vehement opposition this	•

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• It is stated by Chairman that, but we have recorded all your objections. We give in writing. You are discussing the matter that this committee has no powers for that. That power does not belong to the committee.			
353	Meet Gadhavi	• You have the power to further hearing canceled in view of public protest, we demand again cancel this, cancel this.	•
• It is stated by the Chairman that we are not from the Power Committee , that you are demanding. • Regional officer of GPCB said Whatever your submissions will be forwarded. Whatever the representation is.			
354	Dhvani Shah Village : Bada	• If your committee does not have these powers, then you do not have the power to violate the provisions of the EIA notification. • 6.4 Clearly states that, I have rights to Seek Information and Clarification from the Project Proponent. Let me fulfill my right. You do whatever you want to do. • Sir, this EIA notification has not been made online by me, but you yourself said that you should search this draft EIA from the internet. So I also fetched this EIA notification from net. I need information and clarification. • Sir...	•
355	Meet Gadhavi	• Hon'ble officer sir, let us also be heard personally. What are you talking about inside? In the ongoing hearing, you listen to the company's officer personally, listen to us also personally, you can't talk to any employee of the company personally on the stage in your own way. What does it mean to talk personally?	•
• It is stated by the Chairman that, they called to answer your question. • Listen to what the chairman has been told, said by the regional officer of GPCB.			
356	Meet Gadhavi	• Sir, what did you do personally? Declare, and cancel and why above?	•
• As told by the regional officer of GPCB that, I am talking about the same .			
357	Meet Gadhavi	• Sir, what did you do personally? Declare, and cancel and why above?	•
• I am talking about the same as told by GPCB regional Officer.			
358	Meet Gadhavi	• If you don't allow anyone to come on stage, then why do you allow employees of the company to come?	•
359		• Sir, you don't let us pass through this barricade.	•

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360		• Sir, how can you allow a company man to come on the stage like this, you are biased, you are biased, sir, how did you tell us that sir, if you cannot cross the barricade, then how can the company employ ?	•
• As told by the regional officer of GPCB that, please listen my talk. • There is noise			
361		• Sir how can he talk to you personally?	•
• According to GPCB regional Officer that nothing is personl.			
362		• You should do it on Mic sir.	•
• It is stated by the chairman that if you want to know the answer, listen to the answer, you should not only ask questions, but also know the answer. • According to GPCB regional Officer that, the answer to your questions is that the information available with the party is given and the rest will be given along with the minutes.			
363		• Sir, how can the rights of the company go up on the stage like this, sir	•
• As told by the regional officer of GPCB that, you can continue with the next presentation, we can do any presentation if you have to.			
364		• Honorable Chairman, I want to come and make a presentation on your desk. Please allow me. If you allow the company, I am your public. You have come to listen to us. Open this barricade. This barricade should be opened. If you listen to the compny what is your relation with them?	•
• Stated by GPCB Regional Officer that, put forward your points			
365		• Sir, this is the issue, why did you talk personally, sir	•
366		• Chairman sir, is this public hearing or company hearing you are listening to the official of the company. Chairman why did you listen in personal this is not your collusion.	•
• According to GPCB regional Officer that, I called the proponent of the project or his representative, I wanted an answer from them, what information is available with them and I have disclosed the same answer to you, no information is private.			
367		• Sir, let our Gadhavi sir come there privately. Our V.K.Gadhavi was allowed to come there in private. If you let the employees of the company come, then you don't let us come? And this barricade should be opened.	•
• Continue your next submission as told by GPCB regional officer.			

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368		• Sir, first clarify your attitude towards the company, why the company can climb over your dais?	•
• It is stated by the chairman that he was called to get information from the company and to answer your questions.He was called here to give you the information available to him at the moment.			
369		• He climbed up, you have been giving such instructions here and there for so many times, he came to you in this way and spoke in this way, what did you do to stop him or come down and tell me what you want to say in the mic.	
• It is stated by Chairman that, that is why he was kept down.			
370		• How can they have so much courage? How can they have so much courage? You know that there are only two persons on this stage, one Pollution Department Officer and Provisanal Officer. Apart from these two persons, no third person has any right to come and he climed and he talks and you listen but you can't tell him directly that you go down there.	•
• It is stated by the Chairman, that you make your presentation and make any presentation related to the subject.			
371		• Sir, I request you that this public hearing is not legal, we are asking so many questions, but you are one sided, this public hearing should be canceled, the public is tired of hearing one thing, the public is not in control of itself, hearing your question repeatedly, you do not speak in favor of it.	•
• It is stated by Chairman that we take your objection on record. You say notification is wrong this report is wrong then we take it on record.			
372		• Honorable Chairman, Why the company's employee came on the stage, you are in doubt or the company is in doubt, please clarify your attitude.	•
• It is stated by the chairman, that the company has been called to know what is on hand.			
373		• Sir if you want to speak on hand, you can also announce from the mic, do what you have on hand. Is it reasonable to come up on the stage and make a secret complaint with Provincial Officer, sir?	•
• It is stated by the chairman that because all of you were, 10 people talking together did not make			

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any sound, so we have told them to give whatever they have with them right now.			
374		• Sir, this thing doesn't work	•
• According to the regional officer of GPCB, that if we have to make any presentation regarding the issue then make the presentation further			
375		• If this is not the issue, then what is this sir, this is the issue of these people, how can any our man come to you, sir	•
• As told by the regional officer of GPCB, if we have to present the issue then do it.			
376		• If you are letting company employees in, keep our people inside and open this barricade.	•
• As told by the regional officer of GPCB, if we have to present the issue then do it.			
377		• Sir, our submission is that again we are told that you are giving a personal suggestion to the company, we are getting suspicious.	•
• According to the regional officer of GPCB, If we have to make any presentation,then do it			
378		• You are 100% with the company. As a defender of democracy, I will appeal to the media to show this to the officer who went to meet this personnel, because you are our voice, because these bullies have been opposing democracy since morning.	•
379	Vijay Gadhavi	• That voice will not sit, if you go and clarify everything privately, your voice is also heard in the recording, which we have no right to be an officer. company officer should answer here. The officials are speaking in favor of the company which is pressed by the company We will present in the High Court.	•
• It is stated by the Chairman, that if you want to make a representation, do so. This is not a representation, this is an allegation, this is not a representation, this is an allegation.			
380	Vijay Gadhavi	• This is the presentation sir	•
• It is stated by the chairman that , this is not a representation, it is an accusation, you also do not know what they did say to him coming over here, you will not make a one-sided accusation, no, no, you are not within the limits of the law and you will not take the law into your hands. Accusing an officer You accuse an officer			
381	Vijay Gadhavi	• We say what we saw.	•
• It is stated by the Chairman, that, that is why I would like to you make your presentation.			
382	Vijay Gadhavi	• No one has taken law and order into their hands. You yourself have said what	•

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		has come in this video. This is not a story.	
It is informed by Chairman, that is why this public hearing is organized to listen your presentation. Whether it is legal or illegal after the public hearing we will take your objections then the company will reply to the Central Government Committee.			
383	Vijay Gadhavi	• Sir, the one thing in each of you which is opposing the company, it is criticized and the company which is favoring	•
• It is stated by the Chairman that you do , you certainly protest, you are not denied.			
384	Vijay Gadhavi	• If we raise slogans, we have no right in the public, in the...	•
• It is stated by Chairman, that you protest. We are not denying it to you. We have no objection to your objection, but you give us your objection in the form of objection, written and verbal, we are sitting to take it.			
385		• These ladies do oral..	•
• It is stated by the Chairman that, But if you talk about it.			
386	Vijay Gadhavi	• But there is a procedure, sir, we are not blind either. We saw how open you were to him when he came to you. What came to say that we doubted?	•
• It is stated by the chairman that, but that is to give you clarity.			
387	Vijay Gadhavi	• We came to you and said that I will go up, there is no this much even for the Prime Minister, I have goneput something like Pakistan where you have put this barricade but that is...	•
• As told by the regional Officer of GPCB, Mr. Vijay Bhai, what personal presentation do you have to make?			
388	Vijay Gadhavi	• It is to make a personal presentation to sir.	•
• As told by the regional officer of GPCB, that. you can come here, I will take the permission of sir, one person should come.			
389	Dhvani Shah Village : Bada	• Sir Vijay Bhai and our other brothers and sisters presented, Saheb this democracy is being demonstrated. You are on the stage, the representative of GHCL Company is closest to you, and people 30 feet away from you. This is how democracies performing. Invite us there. Would you do it if someone came and spoke? You won't, but this company will, because this company set it up, they gave you statements, and we know for sure that you're speaking from their side.	•

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390	Laxman Kanji Karani Village: Pachotia	Provisional officer sir my humble appeal, I am Laxman Kanji Karani, village Pachotia, this is the person you were talking to is our chairman the leader of this fight, he is the honored officer of His Excellency the President of India. V. K. Gadhavi has been awarded by a medal by the supreme majesty of India for his devotion to duty. For that, the people of Kutch of Mandvi taluka are also ready to give this head. Respect our officers.	•
• It is stated by the Chairman that , we have to proceed politely and co-operatively, we have no personal			
391	Laxman Kanji Karani	• The provincial officer, majesty is the head of the respected constitution he has honored him and you don't believe it.	•
• It is stated by Chairman Shri , We believe all and all are given respect.			
392	Valji Charan	• Sir cancel this public hearing by cooperating with all of us. if you really want to cooperate with us, then really you like people who came to kill innocent lives, people came to save innocent lives, then you cooperate with us accept our demand and go fair public. last hearing was cancelled, in the same way, even if you cancel this public hearing late, my demand is the same, cancel it.	•
• It is stated by the chairman that, my cooperation is with you.			
393		• Gadhavi Sir we really appreciate your cooperation. He has cooperated. Your full cooperation will be when you give us a letter of cancellation of public hearing, we will consider that you have cooperated. Otherwise, we believe that you have come to the wrong hearing by taking a decision in favor of the company.	•
• It is stated by Chairman that , my cooperation to you...			
394		• Sir, remember one thing here dumb animals are grazing cows, buffaloes, as well as sheep, goats. Take their prayers, you remember, you will not be favored, I say as charan.	•
• GPCB Regional Officer that, this committee has no such authority to take decision on report. No such authority committee has. Whether you have suggestions or objections, we have to minuteize all this			

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and send it to Delhi and the decision has to be taken from the Ministry.			
395		• Started from 11 am from morning, arrived at 5 pm. You can see from the last hour how many people are protesting in such a big mandap, even after that, it is wrong to conduct the hearing by force for so many hours. And you have the authority that if there is so much public outcry and so much opposition, there is no need to conduct any public hearings that I know you you are not authorized to give such permission for company. We all are educated. I know you are not here to give clearance but you have the right to take decision regarding public hearing, but you should understand that.	•
• It is stated by the Chairman, that the public hearing has already been canceled once and it is the second time.			
396		• 2 times, will happen 5-10 times.	•
• It is stated by Chairman that , we take your objections			
397		• It is your duty to see and understand that if a project of 3.5 thousand crores is going to be done in the village where the area is to be built over 1300 acres of land, the entire area is to be destroyed, if such a project comes, people will protest.	•
• It is stated by the Chairman that , that's why we have held a public hearing, madam my authority is to hear you and I am hearing you.			
398		• Your authority is to listen to me and to listen to the people. Your authority is also to take decisions regarding the public hearing and last time the public hearing was canceled only because those who came instead of you saw that the public hearing could not be held amid so much public outrage. That's all this time..	•
• It is stated by the Chairman that , there was no presentation then, now you have made all the presentation, minuted it, everything has been recorded and we have taken it in writing. Now if you have any presentation, speak up.			
399		• So that this time one minute one minute.....	•
400		• Sir, you also wrote the note about the public revolt that was happening at that time in such a way that the public	•

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		hearing was postponed due to unavoidable reasons, not that the public hearing was postponed due to public outrage. Even now there is more outrage than what you are seeing since morning but still not taking a decision .. showing insensitivity.	
• As stated by GPCB Regional Officer, that your outrage, your grievance will be minute along with any representation and forwarded for further action. If there is no other representation regarding the project then with the permission of the authorized chairman.....			
401		• Honorable Chairman, I want to ask you a question that the hearing that was held was due to exigent circumstances which was such an exigent circumstance due to that was canceled the answer should be presented to us here.	•
• According to the Regional officer of GPCB, that last time the reply to the approval was sent in the minutes and it is written in it that the issue is yours, the issue is written only because of unavoidable circumstances.			
402	Mitrajit Gadhavi	• In the RTI I read, Sir in the above mentioned matter to know that a public hearing was scheduled for this company on 06/04/2022, in which the hearing was cancelled due to strong opposition from the local people Sir I am Mitrajit Vijay Kumar Gadhavi.....	•
• According to GPCB regional Officer, that it is unavoidable circumstances and public outrage is a part of unavoidable circumstances.			
403		• Sir there is a difference between vehement opposition and compelling circumstances. Sir, there is a lot of difference	•
404		• When any person is doing public protest, writes public protest in the word sir.	•
• According to the regional officer of GPCB, Well now someone has to present about the project...			
405	Mitrajit Gadhavi	• Request to you sir, responsible, why contradiction sir, in your speech and in RTI to you I am Mitrajit Vijayakumar Gadhavi. • So what is the part of ? • What do you mean by giving different in report and paper ? You yourself are not clear , your government system is not clear. • No no sir here is our presentation, our	•

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		presentation. • No no sir here is our presentation , our presentation • Otherwise, we the people will sit in your office on the fast movement and....	
• According to GPCB Regional Officer, all your submissions have been heard. • Chairman said that now all your submissions have been heard. • This is not part of the public hearing. Discuss the present.			
406		• So after hearing so many presentations, you don't have an answer.	
407	Meet Gadhavi	• What do you mean by giving different in report and paper ? You yourself are not clear , your government system is not clear.	•
• According to the regional officer of GPCB, that if there is no any further presentation about the project, then with the permission of the honorable chairman, we declare today's public hearing complete.			
408	Meet Gadhavi	• No no sir here is our presentation, our presentation	•
• Stated by the Regional Officer of GPCB, speak presentation.			
409	Meet Gadhavi	• Do not take any decision until our presentation is over.	•
• Speak your presentation as told by the Regional Officer of GPCB.			
410		• Otherwise, these people, we will sit in your office on the fast movement.	•
• It was stated by the chairman that if there is a presentation, speak, but if it is a presentation, then you speak			
411	Dhvani Shah Village : Bada	• This is all presentation.	•
As stated by Chairman No, this is not a representation.			
412	Dhvani Shah Village : Bada	• This is all presentation.	•
• As stated by the Chairman, Madam, there is a hearing regarding this presentation. Present regarding them madam.			
413	Valji Jashraj Charan	• But these are all submissions, sir, even though we made all these submissions, what did we get the answer ?	•
• It was stated by the Chairman, but we did take it on record			
414	Valji Jashraj Charan	• But not a single answer was received.	•
• It was stated by the Chairman. that even if we have taken the record, we have taken the record. present your presentation (we are taking on record) • Chairman said that we take everything on record, we also take on record as many questions as you asked and you did not get the answer.			

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415	Vijay Karshan Gadhavi	• Sir I am Vijay Karshan Gadhavi. I am presenting to you, which company to you which village Bada, No water body is mentioned in form no. 1, answer what is it? In that, oh sit down, calm down, sit down quitely, sit down please, we have to ask a question, we don't want to riot, sit down camly,	• Hello, Feasibility Report is clearly mentioned and that is part of Form No.1.
416	Laxman Kanji Karani:	• Now let us stop the slogans for a while and let us speak freely, listen to them, answer them, but in the boundaries of our Bada, in the boundaries of Pachotia, as many Dharma places, as many lakes as there are, let us answer them all. • No, tell me where is it ? • No, now there is a public hearing, so we are going to ask questions • No, tell me where is it? • Mentioned? Show us where it's done. • Mentioned in Feasibility Report in Form No. 1, submitted to Govt. • Sir, we are asking the question, it has already been given.	• Now we have to see. • No, no, we have shown you the water body that was your question and it is mentioned in it . • It is mentioned in Pre-feasibility report and submitted to Govt.
• If the information is available in your report, then provide. said by the Regional Officer of GPCB • Chairman said, that's why on-record is running, if there is a record with them, it gives information or not, we take it in the minutes.			
417		• • Absolutely. We don't have any GPCB but I want a clear answer on this. Show the map, we have to show something here, why you sir! What do we want from them sir? What do we ask of you? • We are asking these questions after studying this, they are saying it is with them, then everything is with them, then sir, , we expect from you that the company shows us all this.	• These details are given by EIA. Land use map. These details are given in the EIA land use map. • today..
• Submit the information you have, as told by the Regional Officer of GPCB.			
418		• Mentioned in Form 1, tell us! • Sir show us the map. • Sir have you read your own EIA report, on form, feasibility report? If you haven't read it, send it to someone who has read it, we need an answer. who	• Map 4.3 is given in ecology report, we have it now. • Currently we do not have the details online

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		gives You answer something else No Sir (Do You Know) Importance of Form 1. Form 1 is the basic documentation of TOR. • Form No. 1 is the basic documentation of TOR The issue, there are rivers, there are lakes, any kind of mention is not covered in Form No. 1 and Feasibility Report because you have given completely wrong information in the TOR and the documents taken.	mentioned in five places. • in Section 4.3 of the Ecological Report .map is given. • We have answered you. and details are given.
Chairman stated that, it is your representation that he has taken any permission. There is no evidence with them, they did not follow the proper guidelines, we are recording it, this is your presentation.			
419	Vijaybhai Gadhavi	• They Can't answer, this is also an answer.	
• Chairman stated that , yes , we also take the presentation on record.			
420	Dhvani Shah Village : Bada	• Is Sir NEERI's representative who made this report or not? • yes or not and he does know the local language or not? • If he doesn't know, sir, those who know, they don't know anything, those who know, ask him to tell us. But please sir give your introduction first. • Hindi, we can speak Hindi. You Said I am • You prepaid this report? • Have you prepaid this report? • Please keep an answer of the question? • Does Not mentioned any water body Is Our Question? Why does it not mention? Please tell them and ask the Gujarati. you don't know Gujarati. unfortunately we also know Gujarati as you see, • Read and translate	• Here is Dr. R. J. Kripadam. • They don't know how. • Dr. R. J. Kripadam: Hello, I am Dr. R. J. Kripadam • Dr. R. J. Kripadam: Name is in a single language! • Dr. R. J. Kripadam: My name is R. J. Karipadam, I am a scientist in NEERI, so my designation is scientist. • Dr. R. J. Kripadam: I am not alone we are 25 people. • Dr. R. J. Kripadam: Ya • Dr. R. J. Kripadam: Ya please • Form No. 1 is

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			given in Point No. 4 • It is written that that he says
• Chairman said that, Madam, Madam, this hearing should not be conducted in this manner.			
421	Dhvani Shah Village : Bada	• You don't know.	•
• Chairman said that the hearing is conducted in this way, you make a presentation, he gives your answer if he has, and if he doesn't, he will refuse.			
422	Vijaybhai Gadhavi	• Sir this is a very serious thing because we need you for environment... • Siir I.....	•
• Chairman stated that , we take your objections.			
423	Vijaybhai Gadhvi:	• You take object but what to do with only objection ?	•
•. Chairman stated that we will present the objection above!			
424	Vijaybhai Gadhvi:	• No no we here..... • Hey my sir I have to stay here my boy to lick the dust.	•
• Chairman informed that, we will make your presentation above. Yes, but that's why your objections, that's why...			
425	Vijaybhai Gadhavi:	• My boy has to drink salty water. My boys will get cancer.	•
• Chairman Sridwara said that , sir, that is why I have called you for your objection.			
426	Vijaybhai Gadhavi	• No no means you have to... • No, we don't decide in this.	•
• Chairman said that, you will decide here, it will not happen, there is no authority here, not you or me...			
427	Vijaybhai Gadhavi:	• No, No authority we know, you can't do it here but we have to understand, what is this situation of ours?	•
• Chairman said that, if not, the above head will cancel the plant and not allow it .			
428	Vijaybhai Gadhavi:	• No, we saw that!	•
• Chairman said that people are giving as much as they have .			
429	Dhvani Shah Village : Bada:	• Sir, I request you again, this public hearing is not for taking our suggestions, it is for us to get clarification and information, so please do not use the same phrase again and again. • Not giving, it reads.	•
• Chairman said that They are giving			
430	Dhvani Shah Village : Bada:	• It reads and translates. Sir, do it in Kutchi in local language, if not in Kutchi, do it in Gujarti? Not asked to say in kutchi.	•

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• GPCB regional officer said that we will minute it that they don't have an answer, let the decision be taken by the competent committee. Because you can't stop like this, so keep going. I am telling you the same thing madam, if they don't have an answer then we take it on record.			
431	Dhvani Shah Village : Bada	• They must have an answer !	•
432	Vijaybhai Gadhavi	• No sir, they are not saying that, if they are saying it to us.....	•
• As told by the Regional Officer of GPCB that, Let me ask proponent to give information what they have.			
433	Vijaybhai Gadhavi:	• Not mentioned in the same.	• No No This is an answer considering what has been said. Given its details and map number, now what is its description we have to see from the report.
434	Dhvani Shah Village : Bada:	• You say answer here, explain us. • you explain	• This is that.
435	Vijaybhai Gadhavi	• Brother, keep calm, we are looking for an answer, we are looking for an answer, keep calm. • Sir we have written applications , objections, do any arrangement to take them.	•
• As stated by the Regional Officer of GPCB, that give this side. • Chairman said that whatever objection there is, your government official should go and take as many written representations as they have.			
436	Vijaybhai Gadvi	• Arrange the table here, then there will be no inconvineance.	•
• Chairman stated that , yes yes yes.....			
437	Dhvani Shah Village : Bada	• Sir, please take the table to the side and take the receipt copy of any submission between us, disturbances happen here, put them outside for our submission.	•
• Chairman said that whoever you want to give a written statement, you should give all the written statement to our officers. Speak into the mic. We were about to take written submissions from all.			
438		• At 5 o'clock this evening, we, the GPCB, have to sit here and take written submissions from all. This is because we have raised the issue, if not, In designed	•

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		things, was it possible?	
• Chairman said that we were about to take the written submission of all.			
439		• If any GPCB gives physical submission along with this barricade, we are not going to talk about giving submission to us mentally, then why are we called?	•
• Chairman said that we are taking madam. • All your written submissions will be minuted as stated by the Regional Officer of GPCB.			
440		• Sir, you will not do the same wrong thing 50 times.	•
• Chairman said that, there is nothing wrong.			
441		• It will not help that, there is not the same answer for everything.	•
• Chairman informed that your objection application will be minuted.			
442		• The answer to the argument is no that we are sitting to listen, what is the issue here, GPCB has to come and take written submissions from all, so much barricade has been built, GPCB is sitting 50 feet away, how will they take the objection petitions of public hearing.	•
443	Dhvani Shah Village : Bada	• Sir please set the table to take the receipt copy. Sit us out here, so that we can be comfortable.	•
• As stated by the Regional Officer of GPCB, the arrangements are being done.			
444	Dhvani Shah Village : Bada	• We are not criminal here. We are citizens, you have put us in jail. We bear your oppression since morning. Don't think that you hear us and we hear you. Your suppressed public hearing proceedings We submit to you in peaceful manner. We also ask questions, show you illegality, though it is increaseing. Please I have 6.4 Is the Right to Clarification and Information. Kindly do not hinder, let them answer us, if there is information then the detail is said first, if not then why not. Don't tell us you go online and do it because that's not what it's here for.	•
445	Ritesh Vijaybhai Thakkar	• My name is Ritesh Thakkar. Worked as Assistant Manager at Gujarta Heavy Chemical Limited, Sutrapada from July 2019 to July 2021. I am thankful that those people who have given me	• The very nice presentation that was presented today was also a very nice

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		employment, but the public here, the people who have come here, have to see my eyes and listen to me. For that I have been given a mic, the people presented it, lime stone and salt in the raw material, these two things came up on the display. I present what I saw there. Those people are using lignite there, that's right. Using ammonia gas and in my two years of experience ammonia has leaked many times. Inhaled. The dusting in the plant there has been highlighted many times, those people were taken by the management while I was performing my duties as a safety officer. So there I put those representations. Those people also worked there, but the dust-collector of that place said in the morning that we will arrange dust-collectors here to prevent dusting of soda. But sir, it would be good if those good dust-collectors are arranged in that Sutrapada first, because even today there is so much dusting in that plant, the smoke of their kiln is the dust of their kiln. The smoke of their power plant chimneys is dusting in the surrounding villages. You will find their carbon print in the surrounding fields, that's right. Second, there are two sides of the coin, if a country is to develop, industrialization is necessary, right. government is supporting it, it is also necessary. Do not cause any damage to the environment. If those people are bringing their new industrial equipment as support, then it is necessary to present them on display and it is their duty and the government's duty to satisfy the public. We will only produce so much, we will do it from among these, it is not necessary. How do you think all this dusting is harming the environment, that's right. The loss that was occurring there, the effluent water which is the waste water, which was released into the sea, I have checked with my finger, the	presentation for Vipassana Center. One thing is that the report gives us all the details of Lignite & Ammonia. His second question was good. We also showed in our presentation that we are running this plant for 35 years and the environmental norms were different 35 years ago, when this plant was commissioned and the environmental norms for the old plant are still different, then these environmental norms The equipment of the plant is running accordingly. Now the second thing is that all these equipments of Limestone and any other equipment as we have talked about before are going to be installed very advanced, in which this type of problem will not occurs because, we have faced, seen, it was difficult to control.

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		degree of water was really higher than what is being said now. I had a burning sensation in my finger. There is no temperature measurement calculation so I can't say. This thing should be presented to them systematically. If our madam is asking for the certificate, it should be presented to her. And then you give these people the satisfaction which they are not getting now. So what if the people calm down and satisfy the people, then you go ahead. All want development. There are many companies located in Kutch, be it Welspun, Mann Company, Surya, there are many companies, which I don't want to mention. Kutch has developed because of it, that's right. Industrialization will increase the country's GDP. We will cooperate with you in the country which is the goal of Modi sir, 5 trillion economy. We will make a self-reliant India. But on the other hand, you adjust the equipment, outlet that we are using in your current plant and operate it well, then you think of something here, that's right. You will say that I will use this equipment well here, OK, when you drive the conveyor belt there, the siren will run , so it will not disturb the people nearby? Can meditation centers run? The meditation center which is running since 1991, sir is correct. Which has given millions of people a better way of life. The practice of rising is being taught continuously here, right. Can it be taught here? What we need to think about is sir, we have heard the question from the people and have answered them that we will run the company with advanced equipment that will not make noise. Just don't show it. Actually, where is the equipment that will make a sound that it will not make a sound in one and half kilometers, the center is located in one and a half kilometers, it is equal to your	For complete design change, and all new equipment suppose lime kiln like all densification plant. All types of soda dusting equipment will be of new design, densification plants will not have any chimneys in the plant. But we have to say that all these equipments will be changed because of what we have shown them. Their design will be modified. As of today, if we talk about dust, the environmental norms, which were 150 grams, have been reduced to 30 mg, so today it is made very strict, so it becomes necessary to make the equipment etc. and after that these norms are maintained. As is well done, Norms may be lower than what is shown.

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		boundary. So how will Sadhana be done in it? Such seekers of the future that today's young generation are taking good rites, panchshil being taught there, do not steal, not to be drunk, not to speak falsely. Today I have been doing sadhana for 22 years, so there is no intoxication sir, I have been standing without any intoxication since morning, how I am standing on is due to this sadhana. If this sadhana is not done on your future generation, then we develop as much at your expense, no matter how much materiality is changed, but we do not know how to make good use of it. If knowledge comes, we can use it well and if that center is suppressed by such a center sir, then we really should not bring such companies. It is my suggestion to the management of the company that they should be taken away from this area, where it is so rich in environment, where there is such a beautiful beach. I pause my speech, say Bharat Mata Ki Jai.	
446	Dhvani Shah Village : Bada:	• Sir, I thank you. you praised about your plant, but I want to give some praise, sir, tell me whether I am telling the truth or not? Site visit of GPCB to your plant on October 15 was done on the basis of complaint yes or no? • Complaints, people's complaints • Right • say from the front. • Joint site visit was done on 31st October. • You have been issued number of time showcauses, closures have also been made. • Sir our comments are not against GPCB. • Ok sir thank you, our allegation is not on GPCB, our just one submission. We don't convince people that you are not doing any kind of environmental compliance on your existing plant and you want to do the same here, so we have since, I started speaking and my	• GPCB • Listen GPCB is very sensitive organization. And if there is any kind of small issue, if there is a complaint, then the people of GPCB will visit, and do verification on the part of the complaint and write. • The number of times you need to talk. • Listen to me, you • Listen to me Number of times this type of visit has been done

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		fellow members are speaking, since you are an illegalist within this process. While Pagadia has been recognized as important by the British Gazetteer for so many years, this report states that there is no fishing in the area. Such a company would come to us and hypothetically submit and operate an Environmental Control Device. We cannot have any expectation, hope, trust, confidence, because they have not taken any kind of environmentally sensitive steps in the existing plant. Their same effluent which is hot water, lime stone mixed with ammonia mixed effluent, which is released into the sea, all our members here have done site visits there themselves. Based on that, a complaint has been made, on the basis of which GPCB has been taken action. Unfortunately, call it ours unfortunately, we could not bring the copy of Site Visit, but will definitely bring it and our whole village will study it. And your efforts to mis guide us today, which is an existing plant without any kind of violation, we will show it by black and white water and milk separator, it would be better if you don't mislead us. Secondly, even today there are huge piles of lime stone, slurry, any by-product or acid, whatever is on the shore. Even today. On that, the site complaint was done and visited was made. You have taken some action, GPCB does their job, we have no doubt about it. GPCB belongs to us, and works for our good. So you are not trying to create an image that we are against GPCB or doubting on GPCB. They are our parents. Our environment remains clean through them. Because they implements the same, and what does it implement? How much does it do? This is not a hearing on the GPCB. Since all these years you have been issued show cause notice etc. These people who are	and.... • See all plants today, no plants closed any time today. But all these plants get small derivation, so the show cause notice of GPCB always comes. And that shows we can doubt on GPCB today. But GPCB norms are so strict, now people are asking online. When the derivation takes place, they know immediately. And those people visit and with or without complet means in this plant... • When this plant is running, minor derivation often occurs, GPCB comes, take complaint it and listens to its presentation. Take direct action of how true it is. It often happens that there are small accidental problems in the plant, then it is given for it, and GPCB says, by when you will attend to this, a complete plan is given and it is

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		here have personally visited your plant and also seen the videos, so we also know clearly what is going on there and what our situation is going to be. . When british also include our pagadiya? But you do not include then What you can can do for us. None and we don't expect too. But our expectation is that the President sees the illegality from the beginning, yet we still expect, that he will be heard us. And take the necessary steps for us. Second thing, not only Pagadia, here on Gauchar land, on government land, people who are alive and awake, who are grazers who are goods holders, who are migrant goods holders, that place is not even mentioned. But unfortunately for you sir, which is the company, few educated people came out. In the villages, they came to know that the company did not go to the people living in the Chanian area and mentioned them. Sir, all those under you, in your presence, under your protection, who live by trusting you, this company does not mention. Sir you go above this suppression. How is it sir, we hope you will take note of this and take necessary action.	given.
• Chairman said that surely, madam, whatever presentation we have, we will send it word to word, word to word, there will be no change in it.			
447	Charan Keshav GadhAvi	• We have a request, Charan Keshav Gadhavi I am speaking Khodiyar Mano devotee, Sir I am charan. Remember these cows, buffaloes whether the are giving false bribes or fodder or they are not giving fodder, they will give it for two or three months now. Even if those people give fodder for two or three months, if you ask them about our sheep and goats, who will answer the question, who will give the sheep or to the goats or who will give the sheep or to the goats? Ask them the answer? And still answer?	•

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• Will you give, speak ? as stated by Chairman.			
448	Vijaybhai Gadhavi	• Chairman Sir, I have a question about GHCL Greenfield Chemicals complex Project village bada, no water body is mentioned in Form No. 1. Give the clarification about it. Sir please give.	• In the ecological report 4.4.2 the water body is located. our observation and literature review suggests there are no major wetlands present with in study area i.e. 10 km buffer area of the project site however, there are total 6 seasonal drainages that run north to south in the study area, these drainages have small check dam are built on them which do not accumulate over flowing run of water for the short period. A part form being important hydrological features in the semi -arid area, this check dam is also an important habitat for many bird species and water source for wild life in the rhythm of one such seasonal drain is known as Vangdi River which flows from north to south. Adjustment to project site in Western Site of Proposed Project Site (Map 4.3). There is one checkdam on this river adjacent to project site boundary of the project site. However, all such drainages are seasonal in nature and flow only during rainy days. This drainage produces water from the main land to the Arabian Sea on the Kutch coast. Apart from drainage and

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			dam, there are number of pond location in study area. This pond mostly have smaller catchment area and are located near village, wasteland, forest, or in the agriculture area to hold rain water for domestic use such as drinking for human small minor seasonal pond is located at 250 meters. in South-East direction from the proposed project boundary. A Village Pond is located at Bada Village in North-East direction. These ponds may not be important hydrological features but they provide a crucial source of drinking water for wildlife in the region .
449	Vijayakumar Gadhavi	• Sir, Bada river passes near us, you has shown it seasonal, when did you survey it or was it seasonal? • But sir, if there is no water in drought, why can you say seasonal, if today, sir, listen, it has stopped raining for 2 months, there is water in the river. 6 months ago Please accept this report as misquoted. • What is ? how ? • But sir our river is not seasonal. There is a dam on it, and it remains full of water, it is hidden.	• This river is classified as seasonal and we have been side by side from the river bed for number of times. • No it is not but it is classified as a seasonal river. • Classification The classification of rivers of this type as seasonal rever is shown. • It is clearly written that it has a dam and that it has a dam and it has water all rituals are utility.

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450	Dhvani Shah Village : Bada	• Sir, only one thing, from where did you read such a long paragraph from this report. • Our question is Related to Form 1. Our question was related to Form 1. Form 1 and EIA report are different, don't mislead us and secondly you say that there is seasonal river and you tell us about standard but standard says that there is seasonal river then what is seasonal river is seasonal river according to you. Coming in that season you have to do a study which you don't even show your desire to do, you just do a three month four month study and say it has no ecological importance then you misguide us also you misguide the authority and you unfortunately mistakenly said that It will not matter if we leave it but are an educated people sir. • But what you are reading sir ? • But why not? We will wait for it? We Want Form 1. • No sir, the correction is wrong in the EIA report, come again, the EIA report is wrong, come again, that is our suggestion, the EIA report is wrong, you go back, come to us again with the EIA report, we will give a suggestion that you have not studied in the season, in monsoon. If this is not active, then tell us.	• Ecological Report 4.4.2. • All this is given in point number 2 dash 3 in form 1. • I don't have form 1 right now. • Listen to me your suggestions are recorded any corrections will be done in EIA. This is a draft report and will be included in the final EIA report.
451	Vijayakumar Gadhavi	• Chairman sir, we want to save environment we said something, you saw everything saw such questions, we say the report is wrong. He himself admitted that	

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		form number 1 in our report is this, that all these are not mentioned. our river is not seasonal. I mean we're not going to get butter out from the water. we do because these people made that report all wrong. I'll ask up to this time till tomorrow. Explain all that in the report. We don't want explanations. If you don't have an explanation, then say no to it, we won't insist that we want it.	
452	Dhvani Shah Village : Bada	• Sir second time you were showing me notification issue date 9th May 2022 there is another notification dated 14th February 2022 in which it is clearly written that you cannot set up your plant within 500 meters area of any wet river have you seen that. And if you want to see, your proposed project site is totally illegal because this river goes to the bank and what you say is first Vegadi river plus there is another seasonal river as well which is passing through your project site. Convently in EIA report in form 1 has said about it, that you will divert but it will not have any environmental impact but how do you know how many animals live in the seasonal river? when there is water during rains and how many grasses grow? How many trees are grown? how much ground water is recharged? how much the surrounding water bodies get nutritious? you have not done any kind of study about it and you have done wrong seeding. Project's 14th February 2022 Valentine's Day, Environment Ministry has shown its love for the rivers, and has ordered to protect the rivers, that you cannot set up your company here. That's our suggestion, what do you	

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		do now? When you go to MoEF, what will you do on the basis of our suggestion to remove this project from here? Answer us.	
453	Vijayakumar Gadhavi	• Please we always respect each other till this morning we said a lot, now let's talk to the company in such a way that the relationship becomes normal.	
• It is said by the Chairman that whatever your presentation is, state it			
454	Vijayakumar Gadhavi	• Sir, we need this answer, this is the water body in form 1, we need this answer, sir, we have our life on it, sir, we live on it, our whole base is on it, when GHCL comes, then all of us....	• In Form No. 2 is written, area Which is Important or Sensitive for Ecological research Water Fall on of Water Body ECO person Zone in By For of Mountainous Forest.
455	Vijayakumar Gadhavi	• Sir this is not clearance • Sir, the answer we are getting is not satisfactory, the question asked is not satisfactory, it is not in their project report, their project report is wrong, it is requested that no hearing be held.	• It states that Coastal Land Zone Land Sand dunes Schedule 1 an over side along being area been 0.8 km South-East River to vengdi River 0.5 km North-West for the Two Sea Site run near to the plant unless forest out Site project boundary.
• It is stated by the Chairman that whatever your submission is			
456	Dhvani Shah Village : Bada	• • Sir whatever have read is in English....	
• It is stated by the Chairman that yes yes yes...			
457	Dhvani Shah Village : Bada	• What he has read in English, how can people know it in Gujarati, did not translate it into vernacular language....	• Let us give it in the report or we will make the minutes and the reply will be given in Gujarati
458		• Sir, it is a request that inspite of so much public outcry, why so many times.....	•
459	Vijay kumar	• Sir, why is it with you that we will	• We did not say that we

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	Gadhavi	give, he will give or you will give	will give.
• It is stated by the Chairman that we will send your submission above.			
460	Vijay kumar Gadhvi	• no no no.....	•
• It is stated by the Chairperson that we will have to respond, we will put your presentation up			
461	Dhvani Shah Village : Bada	• Sir 6.4 Public Hearing Proceedings Please, Sir here too they know that people don't know English. Public hearing should be held in vernacular language. However, it reads in English. Unfortunate people here knows english. He read them in English, but he did not mention that the sewers will be built and the seasonal river is coming here. Tell them this is written without mentioning that he will build a drain and discharge their water into the Vegdi river. And they were saying about Sand dune, the question of sand dune will come later, that time you say them. even if Vegdi river is a seasonal river, according to them, its study is in the season in which it is active, it has water, in which life force lives on it, on which When people are alive,. The answer has not been given to us yet. They had any such permission to skip that season and study another random season even before getting TOR, that is illegality. Before receiving the TOR, they did the report and study as per their convenience. This is the baseline data that is three years old, when the public hearing is held today, it has no legal validity. Let's go ahead.	•
• It is stated by Chairman, that madam I am telling you again, that there is no forum to decide legality and illegality. We will put above your objections which you presented in this forum, which are illegal. Don't get confused yet we are not sitting down to decide. We are not sitting here to decide.			
462	Dhvani Shah Village : Bada	• • We are not confused at all.	•

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• It is stated by the Chairman that we only you.....			
463	Dhvani Shah Village : Bada	• We also told you under the public hearing proceedings, you have the right, the procedure to cancel is the only clause. And we are so clear but you don't understand that we are confused sir....	•
• It is stated by the Chairman that we...			
464	Dhvani Shah Village : Bada	• We are so clear, we want answer we told you we have the right. You don't think we are confused.	•
• It is stated by the Chairman that sure....			
465	Dhvani Shah Village : Bada	• Yes sir, even though they have no right, they filed an appeal on the illegal EIA report. You have executed your order to conduct this public hearing. We do not support you to conduct this public hearing. No problem, we will make further submissions.	•
466	Vijay Gadhavi	• Chairman sir, it is stated that government land is to be taken in this project. So we are local residents here, our animals will graze, we will have many jobs, so what government land will this company take? Tell us a little.	• Here is the question of revenue, It is seen by revenue department. • This is government land and come in center and will be complete when the project is completed.
• Provide the information as stated by the Regional Officer of GPCB.			
467	Vijay Gadhavi	• No we have government land there, we have roads. • Stand up and answer. • One minute sir let me say one thing, sir We are not doing false stubbornness. • I don't understand English, so you explain me in Gujarati. • Sir, Govt. I am asking the same thing, Sir, that if I want to take government land in this, after I apply..... • What is it done sir?	• In the feasibility report... • This item is given in feasibility report . • These details are given in feasibility report. • We have applied already.

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		• No no, the report that you have given or given to the government belongs to the public and stage is your personal, not that you have any personal dealings with the government.	• Details are given in prefability. Survey number wise details are given in prefability report. • I was going to ask the same sir, all these details are revenue's issue. Environment is not an issue. So, there is issue for revenue, even though it is said...
468		• Village land is called village land.	• Although the details of this revenue are given in the report, another thing is that there is no Gauchar land In it.
469		• Village land is called village land, that means the government also has the rules for it, it is not like that, only the company and the government are talking. The people of the village are asking whether the government land of the village is given or not and they have to give an answer as to what has been given. And even if you say that there is no other Gauchar land, prove that it is not Gauchar. This village has cattle population. If you showed that in your EIA, you should say that. How much cattle population is there in this village and according to the rule set by the government how many cattle per acre are there in the gauchar and how is this calculated and if you are going to take this gauchar what will you do to those animals how will they live?	• Every question you ask about is for the collector office and government office etc. All the details of which are the government lands of which we ....
470	Vijay Gadhavi	• Siri , sir this... • • •	• Calculation is that ? When the government will give this government land, it will be given according to the law. • We will reply in minutes. We don't have the details.

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		• • Chairman Sir, we are asking so that this land has not been taken away from us as it has been shown in its assessment report. So if they have a report, where are the survey numbers's map? So if we find out, don't wake up tomorrow and accept as this will go to the company only • We want it now • • • No, no, sir, you have to come with full preparation. Chairman sir it is required. Chairman sir, all the answers are given like this, there is no such guarantee, so what are these people. What we are and what are this people we want to know.	• It is not needed that everything be provided in deep.There is no need to read every detailed answer right now.
471	Dhvani Shah Village : Bada	• Sir, Government land if not declared Gaucher land, but used as Gaucher is an important part for ecology and people. You say, you have done a survey. You have created an EIA report. We say, you created it sitting on the computer. If you have made an EIA here again, you have deliberately hidden it that during the rains and winters when grass is available, our cows come here to graze all our cattle. In this report you oppress us. you know english You can create a report by money. But you oppress us, you have not mentioned about us in it, you have not acknowledged the existence of us as per the Constitution of India. You Can Not Deny Our Right Our existence. We live here, the Constitution acknowledges us. Gives us the right, that whatever	• For your information this has been recorded.

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		profession we can pack, if you exclude us in your report, you exclude us under the provisions of the Constitution of India. For a time for study and other procedure	
• The regional officer of GPCB said that now you have another submission.			
472	Valji Jashraj Charan	• Sure, sir there are many representations about our environment.	•
• It is said by the chairman that you work one presentation after another.			
473	Valji Jashraj Charan	• You listen	•
• It is said by the chairman that yes yes say..... • It is stated by the Chairman that madam in the constitution, according to Article 226 and Article 232 in the Hon'ble High Court and the Supreme Court, there is a provision that if a person's constitutional right is lost, they can approch the High Court and the Supreme Court. There is no one stopping you either, you all have ready gone, when their judgment comes, the judgment of the Hon'ble High Court and the Hon'ble Supreme Court will bind you all.			
474	Dhvani Shah Village : Bada	• Sir we are presenting to you. You tell us of the Supreme Court or the High Court..	•
• Chairman stated that because you showed us the Constitution that's why I have replied to you it .			
475	Dhvani Shah Village : Bada	• No, I am showing the structure because they want to include us in the study.	•
• It is told by the chairman that so madam, we are taking your minutes in the report.			
476	Dhvani Shah Village : Bada	• Then you...	•
• It is stated by the Chairman that this thing is not in the report.			
477	Dhvani Shah Village : Bada	• Why did you show me the constitution. you can't say that you want to go to the Supreme Court .	•
• It is said by the Chairman that it will not be decided sitting here, Madam.			
478	Dhvani Shah Village : Bada	• So where did I ask you to decide.	•
• It is said by the Chairman that we have less authority. I am only asking your objection. No authority to give.			
479	Dhvani Shah Village : Bada	• I am not saying anything. Nothing tells you to make a decision. I make my submission.	•
• It is said by the chairman that we are nobody to take the decision.			
480	Dhvani Shah Village : Bada	• So why you put me in High Court and Supreme Court.	•
• It is stated by the Chairman that we are not here to take a decision			

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481	Dhvani Shah Village : Bada	• Where did I say, that decide as S.D.M like this..	•
• It is informed by the Chairman that we will report the same study which you reported in minutes to minutes.			
482	Dhvani Shah Village : Bada	• Then you ask me to go to Supreme Court and High Court. This is my submission, please take it on record and settle it.	•
• It is said by the chairman that you speak to the point madam.			
483	Dhvani Shah Village : Bada	• No sir, sir this was my problem.	•
• It is told by the chairman that we have taken your objection into consideration.			
484	Dhvani Shah Village : Bada	• Then why are you asking to go to Supreme Court and High Court.	•
• It is said by the Chairman that we are just talking that we all are not competent officials.			
485	Dhvani Shah Village : Bada	• Where am I asking you to make a decision? You took the decision that was within your competence. I am not asking you to take a decision in this matter.	•
• It is said by the Chairman that you present your objections.			
486	Dhvani Shah Village : Bada	• Should have been written neutrally. It whould have been finished.	•
• It is stated by the chairman that if it is illegal, that will also be decided.			
487	Dhvani Shah Village : Bada	• Yes, it will be seen. Let me speak now. You are sitting to counter me.	•
• It is said by the chairman that say yes			
488	Dhvani Shah Village : Bada	• Why are you countering me from the company side.	•
• It is stated by the Chairman that I have given a neutral reply from the company side.			
489	Dhvani Shah Village : Bada	• So why are you asking me to go to Supreme Court and High Court?	•
• It is told by the Chairman that you told me to take a decision here, so I said.			
490	Dhvani Shah Village : Bada	• Who threw? Who threw? Don't throw anything. Don't throw anything.	•
• It is stated by the Chairperson that you may continue your objections, Madam.			
491	Dhvani Shah Village : Bada	• Sir, my objection was that you advised me that there is no need to go to High Court and Supreme Court. Do not take any action. Delete it from the record even though the record is on.	•
• It is said by the Regional Officer that whatever objection you have, present it. That is why we are standing here. We listen one after another. Minutes to minutes are happening.			

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492	Vijay Gadhavi	• As per Office Memorandum dated 14/02/2022 of Environment Department of Government of India any industrial project should be at least 500 meters away from the river but the boundary of this project is on the banks of river Vengli which is violated in the above office memorandum so this company is giving false information and did process to takes permission so that this.....	•
• It is stated by the Chairman that yes yes yes.....			
493	Vijay Gadhavi	• How far is this river, answer the question? As per office memorandum dated 14/02/2022 how far is the river from the project this my question can be written from anywhere and answered from the company.	•
• It is informed by the Regional Officer of GPCB that your question has been written down here in writing where you have submitted in writing.			
494	Vijay Gadhavi	• Ok sir, thank you sir, brother discipline means strong discipline.	•
• It is said by GPCB Regional Officer that any information is given for. Vengli river			
495		•	• In this, the plant area and company's land is roughly half a kilometer away from the river.
496	Vijay Gadhavi	• Sir gave that answer sir. • Sir, we say that the company is close to what it is today as per office memorandum dated 14/02/2022 or not? It says Mention this, which Indicates, I want to note this. I want to go to the Supreme Court tomorrow. • Sir have written the answer to this?.	• The company has a joint land but its plant is roughly half a kilometer. • I have given the answer, that is my answer.
• It is told by the GPCB regional officer that yes, I wrote it down and he told that it is about half a kilometer away.....			
497	Vijay Gadhavi	• So it shouldn't be	•
• The Regional Officer of GPCB is told that yes exactly , that is the answer			
498	Vijay Gadhavi	• No, he did not show it to me because, I have to go to the	•

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		Supreme Court on one-one minute. I write your answer on your minutes, sir, I will not ask wrong questions to bother you. There are questions about going to Supreme tribunal or High Court. We don't have annoying questions.	
• GPCB regional officer says no no sure all your queries are welcome here			
499	Vijay Gadhavi	• Say sir...	•
500		• Where are the minutes being written here because usually on this side of the GPCB notes and above it.	•
• It is stated by the Chairman that the minutes are being written here also and what is on camera is also done in the minutes.			
501		• Not on camera Not on camera Where are the minutes written?	•
• It is told by the chairman that madam, it is an oral presentation, it has to be taken on camera, if you give it in writing, we will write it in writing and if you give it orally, that is on camera recorded.			
502		• That's a different thing, that's a different thing • It is a submission from you where are the written minutes. How will you read the written minutes.	•
• It is stated by the Regional Officer of GPCB that everything is recorded.			
503		• After all this is over, we talked in the morning that after the public hearing is over, you have to read it, then, where is it being written in those minutes, who is writing it, there is not a single paper visible on the desk of GPCB.	•
• According to the Regional Officer of GPCB, the minutes are fined and uploaded online.			
504		• It has to be put on the net	•
• It is stated by the Regional Officer of GPCB, that there is nothing to keep private in this video..			
505		• Must be posted on the net at the end of each public hearing and it should be read after the end of public hearing.	•
• It is stated by the Regional Officer of GPCB that it is not possible to write such a submission on record, therefore only recording is done.			
506		• Yes, but its points can be written...	•
• The regional officer of GPCB has informed that the issues are written, all the records are recorded, we will make the record by listening to it.			

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507	Dhvani Shah Village : Bada	• Sir, what time did you come, it was 6 o'clock, we took a little break from 11 o'clock to 6 o'clock, and we can get some introduction of people sitting here on two sides.	•
• GPCB regional officer says ma'am continue with your questions. • It is said by the Chairman that Madam present your objections. • Please continue your questions continue your presentation by Regional Officer of GPCB.			
508		• No no this...	•
• It is stated by the Regional Officer of GPCB that if you have any objections we write madam minutes.			
509	Dhvani Shah Village : Bada	• Both sides have an introduction sir.	•
• It is stated by the Chairman that all those introductions do not come in such hearings.			
510	Dhvani Shah Village : Bada	• You have given him permission, so they are sitting on this side, so what authority does he have? We want to understand why, when you said that GPCB should take the submission, then Mamlatdar Sir came to us to take it, when this submission should be taken by GPCB, but why is he asking, we want to understand who is still sitting with him. We want to recognize them.	•
• It is said by the chairman that ma'am you should talk about your objection, you are separating the question from the topic now....			
511	Dhvani Shah Village : Bada	• Sir, here from the public...	•
• It is said by the Chairman No no, Madam, talk about the objection, talk about the objection.			
512	Vijay Gadhavi	• Sister, Chairman Sir, Sister's question is not unreasonable, be it our officer, journalist, company officer, I will present this video of the whole day in the Supreme and anywhere, even in the head office, the MLA's son should sit on the table and monitor you from there. How reasonable it felt to sit from From what authority was he sitting . Is it a monarchy that the son will sit after the father, with what reason did you allow him to sit, we can ask you...?	•

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• It's getting noisy			
513		• This is our Radia Sir and other person were sitting next to each other as I speak, on the right side at the top end are you trying to influence us. 20-25 people can do the entire monitoring, they have built such a big boundary for us, have done this, fencing, and allowing to seat someone's son, how much is your consistency? Sir, there is a question mark on it.	•
• It is said by the Chairman that you, you discuss your objections and do not discuss anything else.			
514	Vijay Gadhavi	• It matters, it matters, it matters, it matters you are influenced.	•
• Your objection is recorded said by the Chairperson.			
515	Vijay Gadhavi	• Record my objection. The GPCB and our chairmanship held this public hearing since I arrived in the morning. In that public hearing, the public was kept out of the bush with a strict police presence, a barricade was placed in the middle, and the MLA's son and the company officer kept a chair next to him. Sitting, gossiping continuously. Answer it or not, but you are biased, we see.	•
• It is told by the Chairman that if your presentation is project related then do it.			
516	Vijay Gadhavi	• Sir it was related to this project. People's hearing needs to be very free, very open hearted, no one can suppress, no one can bind, it is called public hearing. But it doesn't matter, it doesn't matter. Going forward, I am asking my question, the EIA report has not mentioned the details of Pagadia fisherman and the marine report has been misrepresented. So the information has been deliberately hidden. This is the process of taking permission based on wrong information, so sir, does this impact the soil or not....	• This was already shown but still in the case where the effluent is discharged. It has no impact. On the contrary, there is more growth of fish. In other words, the Pagadia you mentioned are fishing in the coastal area. While this pipeline will be one to one and a half kilometers deep in the sea and roughy ten to ten and half meters deep, where Pagadia will not be

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		• No sir, I am saying whether Pagadia fisherman is there or not? Where they will do the fishing is not to be seen by the the company, it should be mentioned that there are Pagadia fishermen in this area. If you are referring to the same animal, referring to a turtle, you are bringing a small object of your company's and appreciating, such a large class socially and ecological are to be harmed. And when the environment is going to be affected, you didn't mention those people or did you? Tell us that. And if not, then you have written the EIA report wrongly.	fishing. • In this report, one, fishing is discussed, namely Pagadia fishermen.....
517		• Show us where this is done in the report Provide information on where this is mention in the Environment Report.	•
518		• Show page number	•
519		• Give page number and show in projector if you have arrangement.	•
520		• And what do you think, a pipeline will be laid at such a depth one and a half kilometers away, then the fishes in such a big sea decide whether we should live on this side of the one and a half kilometer in the sea or on that side which means the fishes...	• Pagadiya fishermen are fishing on shores normally.
521		• That is how the fish come to the shore?	• But when the treated effluent is discharged from this pipe, its effect does not occur within 200 meters.
522		• Answer the question whether fishing is there or not. We ask one question and you answer the other question. Is the area around Bada and Mandvi talukas fishing or not?	• Page no. 52 It is written.
523	Vijay Gadhavi.	• Chairman Sir, you have nothing to do in this matter. Mr. Chairman, we say that the fisherman is such a	• His opinion was being taken and written. Exactly as written there is no

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		huge number class, who will have direct effects, it should have been in this report. Many projects have been closed due to fishermen, many challenging. So how many fishers is it mentioned anywhere. tell me	commercial fishing in this area.
524	Dhvani Shah Village : Bada	• Sir again please.	• It is mentioned in this that there is no commercial fishing in this area, hence the quantity is off...
525	Vijay Gadhavi	• Where it is mentioned state how many fishermen there are and where it is mentioned. • No, sir, there is fishing, there are fishermen here. In our report, it is written that there are no fishermen in Bada.	• It is not written how many fishermen are there but it is mention that it not present. • It is not even written that there is no fishing in Bada.
526	Dhvani Shah Village : Bada	• Sir you have written, there is a fisherman in Bada. But you have clearly written that no fish is found dead which is clearly written in the report. • Second Declaration of Commercial Fishing Sir, Paghadias do not fish only for their food. Fishing is done here, it is sold to commercial. What data have you requested from the Fisheries Department? Please give us the details of the letter when you received it from the Fisheries Department? And what data has been taken.	• Page no. ... • It is also mentioned in details of fishing on page 101 in the EIA marine report.
527	Vijay Gadhavi	• Sir, means he has mentioned that fishing does not happen in Bada ? Have they done , sir, if you have done it later... • No no show what is there ? • Sir, let us show you how many fishermen we have. I want all this in writing. I don't want to bother	• There is no commercial fishing but the details of the fishing that takes place are given on page no. 111 of EIA. • I don't know why all these reports, what we are talking about is available.

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		you.	And the details can be seen.
• It's getting noisy. • It is told by the regional officer of GPCB that if the fishing record is still OK then give it. Give whatever is available.			
528	Vijay Gadhavi.	• no no.....	•
• What records are available with the company ? as stated by the Regional Officer of GPCB.			
529	Vijay Gadhavi	• If you have not mentioned it then don't show to us we don't mind if you did don't mention it. We don't want to have it. • Where is it in Bada? • Show me where it is mentioned, I don't see you in the report. • Where is the show? show Show page number. • Show the number, sir will have the report, sir will see. • Where are you sir? See page number 111 above, show it, show it sir. Show us that. Show above screen, sir see what answers are given, you see page no. 111.	• Details of 193 Fishermen are given 193.. • In the Bada area, in the adjacent area of Bada. • is written. • When? sir see page no. 111 have shown you.
• It is stated by GPCB Regional Officer that what he says is on record.			
530	Valji Jashraj Charan	• He does not say no sir, it is not about your favour, but he says it is an extravagant answer sir, what can a chairman like you say, see above 111.	• Whose details are available. It has been given. It has been given in Page no. 193.
531	Vijay Gadhavi	• Chairman sir, see by yourself, is 111 written up, and don't show us. And let the Chairman say that it is 111. If mentioned as such, we approve.	•
• According to the Regional Officer of GPCB, they have been given the information including the page, then we have put it on record as 111.			
532	Vijay Gadhavi	• Look, sir, this is the truth. Sir, you have come to sit for this today, paying so many thousands of rupees at the expense of the police and company, sir. • What is this?	•
• It is said by the Regional Officer of GPCB that send with someone			
533	Vijay Gadhavi	• What is this ? Sister, what is this, sister report is not another study,	•

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		we want to read your impact report. So I have a lot of things in Google. • • Yes Yes OK What is written in this.	
• It is stated by GPCB Regional Officer that the figure written as 193. 193 fishermen in Bada area.			
534	Vijay Gadhavi	• Yes sir, I want to ask them how many fishermen have been given the kit by these people as a social Welfare, the company gives money and gives all this. • Not how many fishermen, but how many fishermen it has given. The company has been saying this for 6 months, • Then why do you say that we will give. • So sir, if this company has sold that kit, then if you give us the figures, we will pair it if we know. • So write that it is not started.	• Our plant has not arrived yet, when it arrives all the details will be given. Small things may be given by a company but still.... • No, some people must have got. Until the plant is commissioned, we will not run any regular CSR. • We don't do regular CSR and we have started quite a few.....
• It is stated by GPCB Regional Officer that yes we are writing the issue.			
535	Vijay Gadhavi.	• The beaches of Bada village and Mandvi taluka have very fine sand dunes due to which green turtles from Indonesia, Australia and Lezte two turtles lay their eggs on these beaches.comes up on this shore , so if the project comes up on this shore, intake channel will be made and water of lime stone and salt will be pour into the polluted water on this shore due to which the turtles will die and stop coming. No information about endangered species falling under Schedule I. None of this information is mentioned in the EIA report in this project form 1. Indicated ask such a rare world species turtle comes here for safety to lay eggs, we are its pier.	• All this problems is studied and will be done and a conservation plan for turtles has been given. The second thing is that nothing should be thrown on the shore, which will discharge within a one and half kilometer and 10 meters depth of the sea. 200 to 500 meters will be discharged and this has no significant impact as shown earlier. Answered. May be the shore gets disturb the shoreline for two seasons while construction continues .
536		• Sir, due to environmental development, these turtles, from	•

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		Kathda to Kari Bada and Bambhadai and on the sea coast from 2019 to 2022, about 7 green-sea turtles have died due to industrial pollution. Here I want to show the information through on record proof RTI. How do I show you my information by sending it to you or showing it via video?	
• It is stated by the Chairman that give your information written and oral presentation give written and presentation			
537		• So sir, my information be taken on record.	•
• It is said by the chairman that yes we will take the pollution.			
538		• During 2019 to 2022 of Green-Sea-Turtles due to industrial pollution, 7 Green-Sea-Turtles on record were registered by the Forest Department and these turtles are stranded here in dead condition, and also injured turtles are stranded here. • Second question, Sir, EIA report page no. 9 No. 9 of these people. It has been shown that, the time period of site observation for the study of reptiles is between pre-monsoon and post-monsoon season, and no turtles have been observed for site observation, these people say so, those people have shown that. Sea Turtle Green-Sea-Turtle and Olive Reed species come out at night only to lay female eggs and that too at night, and I know maybe you don't know, because of this laying of egg at night data from public are often says, eaten by foxes. The information is reported by the local fishermen to the forest	• The thing is, turtles come at night and lay their eggs, they are also found during the day. Another thing is that, we are not saying, these do not come in the shore, but the area that is in the area of our plant boundary, the rocky area from here, the slope, is not suitable for turtles to lay their eggs. Such is the opinion of the experts, but despite what I said earlier, we are recruiting a special guide to make a conservation plan for these turtles. And after studying all the seasons, they have given us a conservation plan. Which we have to submit in the EC letter, and according to what defect or observation, presentation, that will be given as conservation plan.

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		department. whose eggs have also been taken for rearing, the details of whose eggs have been taken for rearing, whose eggs have been obtained through RTI and this I have enclosed with my application. If you also GPCB Board, you Provincial Officer shri Also, I am Charan Valji Jashraj, I have placed a hard copy of my application along with proof to you before your office. You may have also found from outside in the post. So most of the eggs were found in Mandvi Forest. Large numbers have been found in Mandvi, indicating that sea turtles frequently come in the area. Forest department successfully released 6905 hatchlings from 8545 eggs Drop back into the sea, while these people are saying, not a single turtle hatches here. In this regard, I have given you the information with the signature of the Forest Department through RTI. It should be taken on record even now. Answer sir. When you don't find a single turtle, tell us the day forms your EIA report study, or you ask someone local or the fisherman, if here the turtle has come out to lay eggs? or is the green sea turtle a female turtle came out? Answer me that.	
539	Valji Jashraj Charan	• Sir, I have a question sir, based on the answer given, the question is about the plant boundary of the people, the plant boundary of the people	• This sister was also shown that 2 to 5 degree water will go in 5 degree difference. And if the water is cooled first the

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		is in the barren lands of this side from the Bada forest area, those people are showing that they will plant in the barren lands. It is not the people's plant at the seaside. So the water released from their tunnel will go directly to the sea or not. Yes or no. • This water may or may not be ammoniated plus heated. • Whether or not our question is about ammonia is it or not? • Give this answer whether it is ammonia or not, sir, you tell them, the answer to our question is simply, we question answer according to your opinion. Now my question is if there is any environmental unfairness not about environment then you can stop us. Now I have a question, tell sir to answer whether there is ammoniated water plus hot water or not. • You sir don't ask questions. • I ask you.	content of that water will not be more than 5 degrees maximum, • It has norms for ammonia, the impact of ammonia in soda ash plant is very negligible. • Listen to me first I answer • What is the definition of ammonia? • I am replying you and you are stopping me. I say so.
• GPCB regional officer is told that you have heard the answer.			
540	Valji Jashraj Charan	• Sir one minute one minute sir stop it, you can't stop us. • It is our right. You don't question us. • Aren't you diverting the point yes or no ? yes or no?	• The water that is released... • Have to know to understand this ammonia , this ammonia.... • This ammonia will be released into the sea at a very low level of its limit so there is no impact in sea.
• It is stated by the Chairman that you have been answered.			
541	Valji Jashraj Charan	• We want the answer in yes or no..	•
542	Vijay Gadhavi	• Sir, Chairman Sir,	•
• It is stated by the Chairman that , yes yes yes			

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543	Vijay Gadhavi	• My question is if I ask about turtles, who is the expert in the group here? Give us that answer. Sir, is giving every answer, we need an expert's answer.	•
• There is noise.			
544	Valji Jashraj Charan	• The geological person who answers us who studies these turtles studies.	•
545	Valji Jashraj Charan	• Sir, first give us an introduction and what are your qualifications? Do any of them have degrees? Where do you work? In which organization do you work? Then reply to us. • We will not do it, Sir we will not do it at all, this is Gujarat, not Bihar. Sir we all don't know Hindi.	• Answer given by Dr. Gupta: You will accept the answer in hindi.
• It is said by the chairman , but what to do if the expert you call is not a Gujarati?			
546	Valji Jashraj Charan	• So sir, then sir, arrange for him to speak Gujarati. Bring a translator. Let's hear our answer in Gujarati. Today we are sitting in Gujarat. not in Bihar or Kerala.	• I will translate for him.
• It is stated by the Regional Officer of GPCB that you have received his technical reply.			
547	Vijay Gadhavi.	• Sir, Sir This Sir ... • Chaimen sir, Hindi words will work. Sir, introduce yourself. • Sure • No No Sir recorded. was written. yes then... • Who was not recorded.	• You just speak in English. • My self Dr. Gupta. I am working with Guide. • I read the report of Sundarraj from 2001 to 2002 and ZSI report done at 2019, where it was written that no record found.. • Even then that study .... • There was no direct certificate record of turtle.

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		• Meaning, sir, today you have the report without the study, you can know that...	It is recorded in the study. Okay, now you've heard it, you've heard it all. But it was a seasonal study. That was not the study of the year. That's why we have started studying from June, Which will be a whole year long study.
• It is stated by the Regional Officer of GPCB that , note his reply			
548	Vijay Gadhavi	• I sir..... • No sir, chairman sir, I am saying that the entire report is made from the study with great effort. Wind directions, humidity, all of that. If there is no such information about an endangered species like turtle, then the report is wrong, is it believed or not?	• These studies as they are saying today, is studied. The guide study that is being done today is a study for making a conservation plan. This study is being done on what ZSI has advised. • Main study is ours. • No No, it is studied. Which has done this report in 2019.
549	Valji Jashraj Charan	• Not clear. no no i...	• Get more details about the conservation plan.
550	Vijay Gadhavi	• Sir, can I ask a direct question?	•
• It is stated by the Regional Officer of GPCB that , you can do.			
551	Vijay Gadhavi	• I can do it sir, I did physical study and it was green sea turtle..... • No no sir, everything is ok, the report is generated, check it sir • Chairman Sir .... • No no sir...	• Answer given by Dr. Gupta: Just started Just started We started from June guide • That Was Conservation Planning. • Previous report made by ZSI in May 2019,
• According to the Regional Officer of GPCB , we are taking both the issues on record.			
552	Vijay Gadhavi	• Look sir...	• The previos report was created by ZSI and made by making a physical visit.
• It is stated by the Chairman that , the report of the turtle is from 2019 and now we are taking both his question and your answer on record.			
553	Vijay Gadhavi	• My question is, my question	•

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		is, to be clear, there are green sea turtles in this area. This is not mentioned.	
• It is stated by the Chairman that , OK OK.			
554	Vijay Gadhavi	• There are many rare species which are not mentioned.	•
• It is said by the Chairman that , OK OK.			
555	Vijay Gadhavi	• On asking his expert, he says that I have studied so and so and have not done a physical report.	•
• It is stated by the Chairman that , Yes.			
556	Vijay Gadhavi	• The public hearing was held before the public hearing today, but now those people study. What a reliable thing it is. This is my question.	•
• It is stated by the Chairman that , OK OK.			
557	Valji Jashraj Charan	• Answer and take this on record that the study of these people	•
• It is stated by the Chairman that we are taking everything on record .			
558	Valji Jashraj Charan	• As per EIA notification, this EIA has given that dated 2018. Those people have said that they have done this study in 2018, now this brother is clearly saying that, we have not gone to any place and this EIA page no. Let me also tell you that these people should clearly say what is written on this page. Nor did we see any sea turtles. So how is it written? Those people have written the same without checking the place. While we are local here, we are on the sea 24 hours, our brothers are fishing on the sea. If any turtle comes out injured, any turtle comes out to lay eggs, then we immediately know that the turtle has hatched in this side.	• I am again giving an answer that in 2019 ZSI has done a study and it has done physical verification and this study has been done. Now that the guide have been given because ZSI asked us to prepare a conservation plan, we recruited guide And said that we will study ourselves than give you the conservation plan according they are studying. study done by ZSI in 2019 is in the EIA report.

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559	Vijay Gadhavi.	• Where are the experts here? Sir, ask that is done physically here? Turtles came to our area to see. Even though what he says... • where here where _ • No tell us... • We want experts, we don't listen to this sir, replies round and round. Sir, we ask the expert to stand in front of us and give us an answer. You are not bound to answer yes or no.	• ZSI is physically done. • Bada's shore, in the surrounding area... • No, it happened in 2019, those people are doing it now.
560	Valji Jashraj Charan	• It is clearly written on page no. 9 of the EIA report that, in page no. 9 of the EIA, it has been shown that the period of site inspection for the study of reptiles is the period shown by these people in the inspection 2018. Before rainy season and after rainy season, these people came to observe, they did not see sea turtles. When now the people, the organization, the official who surveyed the turtle is not here, then what is the meaning of public hearing?	•
561	Valji Jashraj Charan	• Let me say this today. Even today we will say, cancel it, someone...	•
• According to the Regional Officer of GPCB , we take all your turtle matter sent to us,it is Include in minutes.			
562	Valji Jashraj Charan	• Sir , this thing is new which these people have studied no one is present to answer us to answer the question	•
• It is also stated by the regional officer of GPCB that we take it.			
563	Valji Jashraj Charan	• These people admit, the Green sea Turtle is a Schedule 1 reptile, an amphibian, and	•

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		for its study, no one has come from the company, nor is there a conservation plan to do so, from where the EIA has been done. We are giving you this proof, whether the brother is here or has not visited, which should be taken on record should be taken on record.	
• It is said by the regional officer of GPCB that OK OK.			
564	Vijay Gadhavi	• Sir, the company has not answered my question, the government land is being taken in this project, so please give me its map and survey number. If you have ever asked a question, I think they will searching. answer now. • These people will be searching so they will respond.	• We will submit .
• The Regional Officer of GPCB has informed that whatever representation you have, forward it			
565	Vijay Gadhavi	• We do, sir, no answer, sir.	•
• It is said by the regional officer of GPCB, Hello, there is a record of government land, give a clear answer. Whatever it is, give a clear answer.			
566		•	• The record is available and will be submitted.
567	Vijay Gadhavi	• Who shall the public tell? Answer that • Sir, we have lost the village land, then our gauchar land has gone, the government land has gone, if we have to report, then we did not ask, who are you yourself that you will use the government land. So we say which land to use?	• This report will come in minutes.
• It is stated by GPCB Regional Officer that after OK.... • It is said by the Chairman that your government land matter has been taken which we will take the answer in minutes if not then we will take it accordingly in minutes.....			
568	Valji Jashraj Charan	• Now another question, Sir, page no. 15 of the EIA report, point no. 4.5 Ecology and	• The details of Lizard are given in page number 3.8

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		Biodiversity, written in the report, the claim made in the report of reptiles as there is no presence of any rare and highly protected reptiles in the proposed project area or buffer zone. Absolutely wrong. Lalira Lake in the southern direction of the village is the land right in the middle of the proposed project area, and within 2 km around the lake there are many species of Sandha, Lizard, Swanlazard, including Swanlazard and Swan lizards. Schedule 2 is a protected reptile, as evidenced by photos taken on camera by GPS, the Sandha that often come to caves, burrowing underground. I have also included in my application by taking photos through GPS, also in mobile. But I don't have mobile connection so can't show you. I tell you all these animals coming in 500 to 600 Swanlazard is schedule 2 have their colonies above in Lake Lalira. This company lives right in the middle. Nowhere have these people mentioned anything in the EIA report. And the adjacent protected forest and buffer zone are home of many species of reptiles and amphibians, and are also proof. And due to technical problem, I could not show my proof. However, I have sent this proof in my application. So where is the number of 500 sandhas in 2 km around the protected area and Lalira lake which is not mentioned in	

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		the EIA report, or even answered me? • • What did you say sir, I did not hear the answer. Speak again sir? • • Details are given. You don't have the details of who lives here, how many colonies there are, while we have those details. Let us take this matter on record. These people have only given details.	• The details of Lizard are given in page number 3.8.
• It is said by the Chairman that OK OK			
569	Valji Jashraj Charan	• Similarly, 90 km from Ami Bada place, wherever there is Sandha species, there are Lizard species in the whole Bada area . These people know that these people have simply mentioned it, but they have not given the place where it is because 200 to 500 The Sandha of the joints are in the middle of the company, in the center of the company, which is the animal of schedule 2, near the protected guard.	•
570	Vijay Gadhavi	• Sir, I have a question related this. Can I ask is there anyone who khow about Sandha anyone is there.Sir.... • But sir, if there are many seas like Salim Mamad, I can give the answer name, but I want to know the answer, who is the expert of sandha, in what temperature can sandha live, how much heat can it tolerate, how much noise can it tolerate, how much dust can it tolerate? Are you an expert in Sandha? is there anyone.	• It is Mr. Jethwa who is not present and Mr. Jethwa is an accredited expert.
• It is said by the chairman that no, not now, that is not an expert, he say...			
571	Vijay Gadhavi	• taken on record.	•

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• It is stated by the Chairman that OK.			
572	Vijay Gadhavi	• No sir, it should not be, no it should be an alternative arrangement. We have entered the fray to save life, and we will not be fooled by the answer. What study have these people done for all this, if it is not a study then sir has read it.	•
573		• If the expert is not present, then the one who has done it is the expert, then his name and his accredition of the prepare who and his accreditation certificate or not.	• Dr. Bharat Jethwa has done it and is NABAT accredited and as an expert....
• It is told by the Chairman that the details are sufficient to answer your presentation, we will take the rest on record, you should make your presentation.			
574		• Honorable sir and have been asking for the certificate form the last four hours, till now they are responsible, there is lack of net and equipment, they can go mandvi and come so many times, they don't have the certificate, the entire EIA report is false, so we cancel this hearing.	•
• It is stated by the Chairman that the certificate...			
575		• No, sir, certificate, we are standing, these lenders are sitting, we are standing, these lenders are sitting, call for their certificate, otherwise cancel the hearing.	•
• It is told by the chairman that the certificate is given to you			
576		• No sir	•
• It is stated by the Chairman that the certificate you say that this data survey is illegal and your submission is taken on record will not be decided here.			
577		• sir	•
• It is said by the Chairman that what is right and wrong will not be decided between you			
578		• Sir, who records the minutes, what is to be written, write down the book and where it is written and show who writes	•

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		it.	
• According to GPCB regional officer, audio and video recording of all these is going on.			
579		• We have a lot of doubts, audio video can have a lot of noise, humans can delete it, it can have noise, it won't work because it is written....	•
• It is stated by the regional officer of GPCB that, these records will also be placed in the public domain, so the thing can never be wrong and GPCB is not.			
580		• There is no revenue system in it, at what time each minute has started and at what time it has ended, how many GB is and all these records have to be given to you in writing here.	•
• It is said by the GPCB regional officer that there is no problem to see it, when it is completed.			
581		• And until the certificate comes, this public hearing is illegal with them....	•
• It is told by the chairman that we are not the decision authority but neither you nor I can take this project as legal or illegal.			
582		• You can take a decision	•
• It is stated by the Chairman that we can only take records.			
583		• You have taken the company on a soft corner.	•
• It is stated by the Chairman that I am not doing anything in the beyond of procedure.			
584		• So the procedure.....	•
• It is stated by the Chairman that no one can decide whether the project is legal or illegal			
585		• Why not direct them?	•
• It is said by the chairman that if you write that the certificate is not given, then write your presentation.			
586		• He is not an expert	•
• It is stated by the Chairman that we take everything on record.			
587		• We have to hear everything	•
• It is stated by the Chairman that we take everything on record.			
588		• But we have doubts in the record.	•
• It is stated by the Chairman that we have taken it on record that the thing which has not been presented to him has been presented and how much he has made a demand but not shown how much.			
589		• So far not even 30% satisfaction answer has been given, 70% are lying.	•
• It is stated by the Chairman that we are taking your request on record.			

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590		• So then	•
• We also take it on record that he has not replied it is stated by the chairman.			
591		• Come up with a new EIA	•
• It is said by the Chairman that no, it will not be brought by the new one, it is only for our objection.			
592		• So pospond it , cancel it...	•
• It is stated by the Chairman that this hearing is not to decide whether the report is true or false, whether the report is legal or illegal.			
593		• This is all wrong as you can see.	•
• It is stated by the Chairman that that is why I am saying that we do not have that authority.			
594		• You are a public servant, you are our...	•
• It is stated by the Chairperson that I am a public servant and will present and present your objections. • According to the regional officer of GPCB, the wording that we have will be put in the MOM and a technical committee will emulate it, no processing decision will be taken and this committee will not have the power to take a decision, it will go ahead and decide. There is no question of hiding anything, there is no chance of missing.			
595		• Now the company currently operating in Sutrapada discharges the water into the pipeline or is left from above.	• Today the death level in Sutrapada is much closer because the sea depths are different so total one pipeline is 275 meters and the other pipeline is 150 meters.
596		• Live has shown you in the pen drive, where you left off.	• All this is put in the context of as per the reference of NIO
• It is told by the chairman that where is it being done in Sutrapada, where is it not being done, you should give your presentation here, now don't discuss the other location of the other project.			
597		• On paper...	•
• It is said by the chairman that you give, you give you make a presentation, if you have any objections you speak... • Presented by the Regional Officer of GPCB about the project for which discussion is going on. Make presentation for that.			
598		• This is a matter of making us stupid.	•
• It is told by the Chairman that you submit in writing where we refuse..			
599		• In this pen drive...	•
• It is stated by the Chairman that you have refused to submit a written submission...			
600		• You said that time that, If you have a pen drive then insert it.	•
• It is said by the Chairman that you present your objections			

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601		• How many are wrong will be known now.	•
• It is said by the Chairman that you present your objections			
602		• Turn on this 2 minutes now and show us what practices on all these papers are holding back the people of this poor village.	•
603	Vijay Gadhavi	• Sir, the one who spoke about Sutrapada, that chairman sir, should not talk to the boy in the fire for him and burn him a few times. If it is burnt, it is said that it is burnt. It is said that where there is burn, where there is bad, there is bad.	•
• It is said by the chairman that if your oral talk is over, there was a question in Sutrapada.			
604	Vijay Gadhavi	• We do it sir because if we get a project.....	•
• It is stated by the Chairman that yes, but I am telling you the same thing, that you give oral and written presentation, we take it on record that this is the case in Sutrapada. If we go into details in that matter, this public hearing will increase. If you object, we are sitting down to listen to it.			
605	Vijay Gadhavi	• Sir, we also say the same that sir....	•
• It is stated by the Chairman that, because the days will be less for the answer of such a question. Give your presentation. This is not for our committee to decide now.			
606	Vijay Gadhavi	• Sir...	•
• It is stated by the Chairman that we will send your submission above			
607	Vijay Gadhavi	• Our representation is that, our representations are skewed. Your sir, who is sitting, is filling us with lies.	•
• It is said by the chairman that it is ok.			
608	Vijay Gadhavi	• Which of our here....	•
• It is told by the chairman that yes, just talk about two things here			
609	Valji Jashraj Charan	• 2 minutes sir we are giving pen drive.	•
• It is stated by the Chairman that, we have discussed with Sir (Vijay) that you said that the information was wrong, we have taken it on record.			
610	Dhvani Shah Village : Bada	• This is your refusal to receive our electronic submissions.	•
• It is stated by the Chairman that electronic submissions are not accepted.			
611	Dhvani Shah	• So play it	•

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	Village : Bada		
• It is stated by the chairman that he did not refuse.			
612	Dhvani Shah Village : Bada	• Insert the pen drive and play it, then the video will be on record and there will be peace.	•
• It is stated by the Chairman that the video is on record only...			
613	Dhvani Shah Village : Bada	• Turn on the video	•
• It is told by the chairman that it belongs to another plant, that is, Madam...			
614	Dhvani Shah Village : Bada	Sir...	•
• It is stated by the chairman that it is not of existing plant but of another plant.			
615	Dhvani Shah Village : Bada	• Sir, we have a submission. Whether it's an existing plant or an old plant, we want to show them that we know that what starts today is the first (stand a minute) today when the public hearing started. The most opportunity came to speak to us exactly. What he said in 3-4 lines while speaking, in the submission, that the project proponent that the project will not cause any damage to the environment is on record.	•
• It is stated by the Chairman that yes , it is.			
616	Dhvani Shah Village : Bada	• So why are you refusing to play something when we show us something?	•
• It is said by the Chairman that you are showing another plant			
617	Dhvani Shah Village : Bada	• Sir, not from other plant	•
• It is stated by the Chairman that Sir...			
618	Dhvani Shah Village : Bada	• The company is the same..	•
• It is stated by the chairman that no, even his.....			
619	Dhvani Shah Village : Bada	• No sir	•
• It is stated by the Chairman that, there are..			
620	Dhvani Shah Village : Bada	• Sir we submitted it, from the beginning sir we submitted it from the beginning, could you	•

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		give the example of Sutrapada, you didn't stop us, how good is Sutrapada plant, then allow us to say how bad is their plant, ?	
• It is said by the Chairman that you have given written report that how many questions you have, you have given all the report in written form.			
621	Dhvani Shah Village : Bada	• Sir in all matters you can say no or give in writing. You connect our mobile.....	•
• It is stated by the Chairperson that the video recording has been sent.			
622	Dhvani Shah Village : Bada	• No sir	•
• It is stated by the Chairman that Jaitley Process Ne			
623	Dhvani Shah Village : Bada	• Sir 6.4 again	•
• It is stated by the Chairman that 6.4 is OK all are your submissions.			
624	Dhvani Shah Village : Bada	• no sir	•
• It is stated by the Chairman that Don't let you...			
625	Dhvani Shah Village : Bada	• You denied us access to the computer or photo mobile evidence cannot deny in the every think it is our right to the work.	•
• It is said by the chairman that we are in the meeting itself, we have been in the meeting since 11 o'clock			
626	Dhvani Shah Village : Bada	• Why are you denying me that I want this video recording?	•
• It is stated by the Chairman that it is another plant.			
627	Dhvani Shah Village : Bada	• So why allow them?	•
• It is stated by the chairman that you can do it in writing or orally.			
628	Dhvani Shah Village : Bada	• Why did you allow the company to talk about Sutrapada here....	•
• It is stated by the Chairperson that because you are asking questions here			
629	Dhvani Shah Village : Bada	• You are biased	•
• It is said by the Chairman that, no objection, ok madam, ok madam, you continue your presentation.			
630	Dhvani Shah Village : Bada	• You want to talk to the company about Sutrapada and why are you refusing us.	•
• It is said by the Chairman that if you have any other representation then speak.			

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631	Dhvani Shah Village : Bada	• No sir, we have our presentation in video evidence. It makes me...	•
• It is said by the chairman that madam has given your evidence.			
632	Dhvani Shah Village : Bada	• You have the authority You are our My-Father. We believe	•
• It is stated by the Chairman that I am not the father of anyone.			
633	Dhvani Shah Village : Bada	• But you are a magistrate	•
• It is stated by the Chairman that I am no one's my-father is the word...			
634	Dhvani Shah Village : Bada	• You are a magistrate, a collector, the position makes you my father. Individuals do not make you, positions make you. Your respect and coming to handle our submission. It becomes your duty to have an audio and let it play. First you showed the mobile evidence, then we brought the pen drive, now let us turn on the pen drive. Whoever's submission was Sutrapada's submission, but you used your position to deny it, but now let us continue.	•
• It is told by the chairman that we have something ..			
635	Dhvani Shah Village : Bada	• No sir let us see.	•
• It is stated by the Chairman that we will not delete any verbal or written details.			
636	Dhvani Shah Village : Bada	• Sir, Allow Them Use And Machinery....	• We have not shown any presentation about Sutrapada here, we are just talking about it.
637		• Wrong , wrong , wrong	• We record the rest
638	Dhvani Shah Village : Bada	• You are wrong, sir, you are wrong, sir, you have spoken a lie. You now...	•
• It is said by the GPCB Regional Officer that we are taking your word on record, only Sutrapada saw any problem.			
639		• If there is no sin in today's date, show the one who can fight taking leadership. A pen drive does not have the power to show. They do not have the	•

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		strength to show a pen drive. Speak in them, this is the voice of the general public. You have the strength, say to turn on this pen drive.	
640		• Hon'ble Chairman GPCB has given him as many as 17 notices so it proves that something is wrong. We all have brought the same report in the pen drive, then give it to him, then he said, bring the pen drive. So you 2 hours ago.....	•
• It is stated by the Chairman that the matter not belonged here.			
641		• This matter belongs here.	•
• It is stated by the Chairman that the matter not belonged here.			
642		• If sir will put a factory here, then those people are not going to be there. If only soda is to be made, then it comes, there is no biscuit factory to be set up here. Only soda factory is to be set up. Destruction there....	•
• It is said by the Chairman that you should make a written and oral representation that there are no questions and that there were so many questions when you were in Sutrapada, so we take them in evidence.			
643		• So much soft corner to wards company and your bureaucracy is a question mark. To the public, you...	•
• It is stated by the Chairman that we , we , we			
644		• we	•
• It is stated by the Chairman that we are going to take our minutes on record			
645		• Then we just need this 2 minute pen drive and if it is true, the company people are sitting here, if it is true then they can show a 2 minute video clip, the challenge is from this Bada village. I challenge. I say open. Sir, it is not 1 meter away from the beach. The discharge point of	•

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		which is not 1 meter away, but these people are 275 meters / 150 meters inside. such a lie....	
• It is stated by the Regional Officer of GPCB that your submission is that they diacharge at beach.			
646		• Yes, see	•
• It is stated by the regional officer of GPCB that yes we take note of the issue.			
647		• Yes, take note	•
• The Regional Officer of GPCB is informed that we are taking note of the presentation given word to word.			
648		• Sir, if you take note, show this record and take it.	•
• GPCB regional officer says that everything you say is recorded.			
649		• If yes show , from here to here	•
• It is stated by the regional officer of GPCB that another plant cannot be run here.			
650		• How many people can go to Sutrapada and see the heinous business of this monstrous company. Those who were taken by these people, sir, know what they have shown, sir, an empty anganwadi, their good hall, their good office. Was anyone taken to the discharge point? Our village has been taken 2-4 times against their eyes, so ask, sir, ask, you have the right to ask. It is a right to ask (one minute), right sir.....	•
• It is stated by the Chairman that therefore we have taken on record that Sutrapada is different from the facts			
651		• Ask him and let us answer. Ask him and how many people he takes.	•
• According to the regional officer of GPCB, we are conducting a public hearing of this place, so we have taken all the records on record.			
652		• But then the side effect of soda came to know about GHCL. When did these men know? You come here to our place or I will send the laptop to you. So you look at your	•

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		table.	
• It is said by the Chairman that your speech has been recorded, please do not repeat the same thing over and over again			
653		• This record has to be taken in video.	•
• It is stated by the Chairman that the recording will be sent			
654		• You look at this laptop.	•
• It is stated by the Chairman that it does not come in this procedure of public hearing.			
655	Valji Jashraj Charan	• We request you if you see us in laptop then what is the problem to see if you don't need to.	•
• It is said by the Chairman that ok show me...			
656	Valji Jashraj Charan	• We have the right	•
• It is stated by the Chairman that until then, make your other objections and submissions till this goes on..			
657	Valji Jashraj Charan	• When you let this end, we stand with peace.	•
658	Dhvani Shah Village : Bada	• Sir public hearing you put on the screen it will take only 2 minutes	•
• It is told by the regional officer of GPCB that the sister does not come in the procedure, only your written and oral presentation comes in the procedure and on camera.....			
659		• No problem sir let us show in our laptop.	•
• It is stated by the Regional Officer of GPCB that you have shown it.			
660		• Please record this video.	•
• According to the regional officer of GPCB, the recording is still ongoing.			
661		• The media should also covrage about this a little and after watching it, we request you to ask your soul what is the need ?	•
• It is said by the Chairman that I am saying that only because the no has been decision is to be taken.			
662		• We hope you will submit your personal filling.	•
• It is said by the Chairman that I am not going to take any decision from here, I am going to send your presentation above.			
663		• No no sir for our records...	•
• It is told by the chairman that if I was to take a decision, when would it have been done			
664		• Sir I have a humble request to you because, this is what appears to be water and its discharge. See this is the	•

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		discharge point and this is the old discharge point. This discharge point is old through the canal, through the open canal then this entire slurry pile is 60 feet high and 1 kilometer long.	
• It is told by the chairman that brother you show your process.			
665		• See where this is being thrown. See how far the discharge point is, not even 10 feet, sir, not even 10 feet. This entire canal pours this waste into the sea for 24 hours 365 days. Where did this slurry go and the discharge point here, Radia sir, if you say 150 feet then show me? Where is your 150 feet?	•
• It is said by the chairman that ok you have shown the video, you have shown the recording, there is a presentation.			
666		• It should be noted that the answer is wrong.	•
• It is stated by the Chairman that OK.			
667		• The answer is wrong	•
• It is stated by the Chairman that OK.			
668		• A similar situation will happen here or not?	•
• It is stated by the Chairman that OK.			
669	Valji Jashraj Charan	• The EIA report shows that the current SO_2 and NO_X levels in this area are very high. The figures shown in the report do not seem to be correct because there is no major activity in the area that emits gases in this area . But if it is indicated high, then this gives the information that the pollution from its emissions is less.	•
670	Dhvani Shah Village : Bada	• Sir , the chairs are lifted from the back	•
• It is stated by the Chairman that there is enough behind			

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671	Valji Jashraj Charan	• Sir, the public hearing is not over yet, let our facility be maintained, tell the company to maintain our facility. Public hearing is still going on otherwise....	•
• It is stated by the chairman that you can see the back.			
672		• Only then the question will arise, not until then, first you make arrangements.	•
• It is told by the chairman that you should go and see that there is a backlog			
673	Valji Jashraj Charan	• Sir, my question was that SO_2 and NO_x levels like noise pollution from vehicles sound are shown here more than in big city like Ahmedabad.	•
• It is stated by the Chairman that OK			
674	Valji Jashraj Charan	• There is not a single company around here, not only in the area of 30 kilometers, but according to us, the noise level should be very low. Ask them how much the noise levels have been shown. Sir, the display and sound are being released from behind. The public hearing is not over. Please inform them...	•
675		• Sir, display and sound are released from behind, public hearing hearing is not over. Please inform them...	•
• It is stated by the chairman that we are not hearing from the back LED...			
676	Valji Jashraj Charan	• No, sir, want to see the people sitting behind.	•
• It is told by the Chairman that you do not make any other submissions, present your objections.			
677	Valji Jashraj Charan	• Our presentation is correct. you have seen and heard us now after some time you will turn off this sound.	•
• It is stated by the chairman no no			
678	Valji Jashraj Charan	• Until we speak, you must listen, listen, and listen.	•
• It is said by the Chairman that we are listening but you raise the objection and do not do			

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anything else like LED takes out don't say like that.			
679	Valji Jashraj Charan	• Answer by the experts that these levels of SO_2 and NO_X are shown in this EIA, we are asked by the experts to answer how high these levels are and in what proportion these levels are in dB where this situation exists.	•
• It is said by the chairman that are we experts here ?			
680	Valji Jashraj Charan	• Every question is answered by Radia Sahib which is not suitable for us.	• Mr. Jethwa is the expert who has given this information • Dr. Karipadam: I have studied.
• It is stated by the Chairman that if you listen to him, then...			
681	Vijay Gadhavi	• Yes, we know he speaks in Hindi, we will understand everything • What is the degree of this sir ? Where did you study? An indirect answer to everything will not work.	•
• It is stated by the GPCB regional officer that introduction is given.			
682	Vijay Gadhavi	• Speak in Hindi.. • What do you know about sound? You have done chemistry. What do you know about pollution? • You are speaking. • Ji sir I will ask a few questions. When did you come to Bada? • When did you join this firm sir? Our counter question is when did this sir come to the village to study us? (don't make noise brother) • Did you come here? • Where were you visit? Where	• R. J. Karipadam: My Name Is R J. Karipadam. I am Scientist in NEERI so my qualification is PhD in Chemistry.. • R. J. Karipadam: I..... • R. J. Karipadam: I did 20 years ago. I have been working at this EIA for 22 years. • R. J. Karipadam: In that Bada ? • R. J. Karipadam: We did this study in February 2020.

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		was this machine installed?	• R. J. Karipadam: Yes, I came
		• If you have come, tell me where this machine was installed. Data taken?	• R. J. Karipadam: I have put this noise meter in 10 location.... in the report.
		• Was taken from Bada village?	• R. J. Karipadam: Yes, I did.
		• Where was the machine installed in Bada village? See, if you put it at a bus station, it will be different and if you put it in another area, it will also be different. Randomly you show me what D study is.	• R. J. Karipadam: It has a plan study.
		• I know you came to tell me are you coming? How much you stay and how did you study in 24 hours every night?	• R. J. Karipadam: Sir, in our record it is written that Whole Day and Night is available in public domain please go available in public domain so don't tell us that we didn't. It is not so.
		• Tell us how long it took you to do the research you did in Bada?	• R. J. Karipadam: No I did not research. Monitoring has been done.
		• How long has the monitoring been done? Did it sit here or did it sit there?.	• R. J. Karipadam: Where to sit?
		• Sit in the Bada or in the laboratory?	• R. J. Karipadam: Here the machine has to be installed and viewed on site.
		• Where did you come to Bada?	• R. J. Karipadam: After coming in February 2021, it has been done after COVID, complete monitoring was done in the month of February. Monitoring was also done as per CPCB guidelines.
		• Let's assume you came.	

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			Four people came in this. You should go to Bada Village, and then ask After doing that. • R. J. Karipadam: Our work is government, we cannot lie on this account.
• It is said by the Chairman that now do your presentation. Because the object is going beyond the subject.			
683	Vijay Gadhavi	• No sir.	•
• It is said by the Chairman that give any objection you have.			
684	Vijay Gadhavi	• Sir this question is still pending. I have this left. Government land is pending. Now tell me if this is a record.	•
• If the records are available as stated by the Regional Officer of the GPCB, give a clear answer , whichever is the case.			
685		•	• Sir, this annexure is given. All the information about which land is government is given in it.
686	Vijay Gadhavi	• Want it now, we don't ask anything else , no sir, don't give details. If they give any kind of round answer, we should not have the real satisfaction of public hearing.	•
• The regional officer of GPCB is told that there is another one where we can prepare the answer pending our walk ahead.			
687	Vijay Gadhavi	• Sir yes, I would like to ask one thing sir, what are the negative aspects of such a beautiful company coming to us, what is the harm that can be caused by it, can any expert show us.	•
• It is stated by the Regional Officer of GPCB that any other submission of yours apart from this...			
688	Vijay Gadhavi	• Sir, I told myself to show what are the Hazards in this .	•
• It is stated by the regional officer of GPCB that all this is given in the report and no one can explain it by doing a complete study here. This question is big.			
689	Vijay Gadhavi	• Sir, my question is, so many 4000-4000, 3000-3000 people cannot read the report, what	• R. J. Karipadam: Any industry comes with its negative points. I am

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		happens if there is a leakage, what happens if there is a fire, what happens if something else happens, what happens if a boiler bursts. What are the risks to us then we let the company come ?	clearly saying that it does have negative points similarly every industry has.
690	Vijay Gadhavi	• Take note of what this gentleman is saying.	•
• The GPCB regional officer said that the record is still ongoing.			
691		•	• R. J. Karipadam: I am still talking, what is in this?, what is the emission?. There are gases like Nitrogen Dioxide, Sulfur Dioxide, Ammonia Ask Ammonia Also There. If the gas is volatile, it will burn quickly. We have suggested for that. You have to use high stack bullet. In even of break c we have also proposed in the mechanism that is scrubbing the management plan of how to do it has been given. It is not that those instruments came.
• Listen calmly, says GPCB Regional Officer.			
692	Vijay Gadhavi	• Sir, sir now talk about ammonia. • The problem is you have a problem answering. We listen in Hindi, your Hindi is also not good. Can't even speak Hindi.	• R. J. Karipadam: No sir, hear my answer, what is the problem? • R. J. Karipadam: A management plan has also been given in this, it has also been shown that this gas, nitrogen dioxide, sulfur dioxide and ammonia and water, you have also shown that this is also very high, the temperature is also very high. How to manage this has also been shown. We

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			have shown this example open channel, the temperature drops. We have set a temperature limit of 5 degrees before water goes into the ocean. As noise you have explained it perfectly. There is also noise, the status for equipment used for noise is called for using new equipment and we are strictly recommending used and these emissions come with sound enclosures. So we have also shown it in an impact report. So look at the negatives once.
		• What we want to know is, if you have a case, happened in Sutrapada, what should we do with Bada people? • Sir, this answers no. Now sir, show me which accident from terrible to terrible to more dangerous can happen from this company.	• R. J. Karipadam: So you have many legal options. We will verify it with the Pollution Board GPCB. Is That Which Are Negotiated.
		• A gas will be manufactured or brought from the company, this is ammonia. • Accha will bring from outside. • • What should we do for anaprotection if it leaks. What happened in transport is dangerous, in transport, in transportation ...	• R. J. Karipadam: There is nothing like that, the only chance of getting one is ammonia storage, so we have also shown about that, if ammonia storage leaks, how far it can go. In that we can say damage disappears. If it breaks, it goes 200 meters. 300 meters goes. Accordingly, we have shown in mitigation for that. So to reduce distance, it is not like that how much is scientifically studied.
		• No sir, • We are in earthquake zone – 5, what has the special	• R. J. Karipadam: They Will bring this. It will not happen here in this company.. • R. J. Karipadam: Then will

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		company done for anything can happen to us here? • This should be noted.	store in bullet here. • R. J. Karipadam: Now we are suggesting for transportation that Ammonia gas can not come in petrol type. There are specifications for that too, AC condition also comes. The transporter will also be transported in AC condition, so don't think that ammonia leaks. • R. J. Karipadam: You can give an example that ammonia is leacked from bullets. • R. J. Karipadam: Sir, we have made bullets for that, if there is an earthquake, we will experience that.
• It is stated by the Chairman that this has been noted. If you have any other suggestions please let me know. The talk is being done from one side just to drag on.			
693	Vijay Gadhavi	• Not answering me.	•
• It is stated by the Chairman that you have submitted your written submission, it has been received. Noticed and what are your objections regarding the details of government land with you.			
694		•	• 251, 400, 459, 453, 272, 282, 311, 271, 270, 406, 277, 252, 470 which is government land
695	Vijay Gadhavi	• These are private lands and not government lands. • Sir sir • Sir mentioned 419 in government land, how false this is.	• No this is government land • 271, 548, 719, 407, 408, 521, and 245
• The Regional Officer of GPCB has informed that we will check their records.			
696	Vijay Gadhavi	• No	•
• It is said by the Regional Officer of GPCB that what is there will be taken on record.			
697	Vijay Gadhavi	• No wrong answers.	•
• It is stated by the regional officer of GPCB that it is not included in the report			
698	Vijay Gadhavi	• No no	•
• It is said by the regional officer of GPCB that there is no question of lying.			
699	Vijay Gadhavi	• It says that 419 is our	• These are all new survey

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		government land, it has been purchased which is private land . • Sir, we think of making this fool. It makes us. We are public and none of that. Sir, we also tell you that don't take the public for granted that you have done anything. Why do you answer 419 has been sold. Why did you answer to make us stupid?	numbers. • What is mentioned is given in our report.
• It is stated by the Chairman that there is an on-hand report with him now.			
700	Vijay Gadhavi	• It will be the same with them.	•
• It is said by the Chairman that what is your questionof government land, say it.			
701	Vijay Gadhavi	• Which land is govt. Say that the number of private land has been given sir .	•
• It is said by the chairman that where is the private land and where is the government land is your matter.			
702	Vijay Gadhavi	• I have always had the same question since 2 hours, since 2 hours, why do you want to take government land.	• And we cannot give that description now.
• It is stated by the Chairman that you have that reference?, not, ok.			
703			• We don't have details other than this.
704		• SDM sir, all these answers given by GHCL, are all nonsense answers. Not a single answer is serious. So the whole report is wrong, no clarification yet.	•
• It is stated by the Chairman that we have taken it on record.			
705		This hearing is hereby Canceled.	•
• It is stated by the Chairman that all matters have been taken on record, may you make your second presentation.			
706		• This presentation will continue until we get clarification.	•
• It is stated by the Chairman that you said on the one hand that such reports are wrong, we have now taken the record, so have the matter....			
707		• Do not put so much pressure on the people of the village.	•
• It is stated by the chairman that no no....			
708		• Do not put so much pressure on	•

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		the people of the village.	
• It is stated by the Chairman that you...			
709		• The company is corporate, we have the right to vote, we have the rights to ask, we are the parents, and these people give me whatever answer they want and get away with it.	•
• It is said by the Chairman that your questions will not be allowed.			
710		• You're a...	•
• It is stated by the Chairman that your questions will not be released, will not be released.			
711		• This question was about 5 hours ago about the certificate, and there is no service available here, Mandvi can come in one and a half hour and show it.	•
• It is also on record that it is stated by the Chairman that the certificate has not been shown. Taken on recored.			
712		• So if the report is wrong then why the hearing.	•
• It is stated by the Chairman that if the report is wrong then the committee will decide it and the Central.....			
713		• Yes, Hearing done on the false report ?	•
• It is said by the Chairman that if you say we were deciding, then what will the committee do ?			
714		• So gave you rights.	•
• It is told by the chairman that if you or we were to decide that the study was not to be done here, then what would the central committee do.			
715		• Canceled the previous one.	•
• It is said by the Chairman that we cannot decide sitting here, no one will report. • The regional officer of GPCB is told that if the issue is to be presented, do so. • It is stated by the Chairman that the possibility of being right or wrong will not be verified.			
716		• That the previous public hearing was canceled due to public opposition. That is true. Due to people's opposition... • No no no.... • First I want the answer to the certificate, give it, no, your whole report is wrong , there is no public hearing on it.	• Once again I want to repeat that according to Govt • If there is any mistake, he can correct it. Again I want to follow the Public Govt.
• It is stated by the Chairman that the report is wrong will not be decided here, I tell you again no no no , one sided will not be decided. (You have to be neutral.)			

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717		• SDM sir , tomorrow we...	•
• We will not decide on the basis of discussion, right and wrong. We will only take your objections word by word. Right or wrong is not to be decided here.			
718		• Such a lying company sir said 150 meters and leaves at 10 meters and these people are telling such lies. Still fun to watch though.	•
• It is stated by the Chairman that we have not taken that thing on record.			
719		• No no how are they all sitting.	•
• It is said by the chairman that it is fine. • It is informed by GPCB Regional Officer that your submission has been accepted.			
720		• There is no technical head in front of him, no human being to give reply.	•
• It is stated by the Chairman that OK. • Let the Regional Officer of GPCB present your issue.			
721		• How unfair is this people. What an injustice against this people.	•
• It is stated by the Chairman that OK.			
722		• What is the degree of N.N Radia sir, answer all questions is of wild animal .	• I am BE Mechanical. I have been working in the soda ash for 35 years, since 40 years. I also worked in Tata and now worked in GHCL.
• It is said by the chairman that if you have objections, speak up, if you have objections, speak up. We are not here to discuss any education, qualification and experience. If you have any objections in the matter of the company, present it in the matter of GHCL. We will not discuss anyone's education, qualification or degree or experience here.			
723		• Show the certificate.	•
• It is stated by the Chairman that he does not have the certificate on hand at present. Having said that, we took it in writing.			
724		• The entire EIA report is wrong	•
• It is stated by the Chairman that OK. • It is said by the GPCB Regional Officer that no further submission is yet to be made. • It is said by the Chairman that now you are saying that the EIA report is wrong then now you have to have a discussion.			
725		• Cancel today's hearing.	•
• It is stated by the Chairman that in today's hearing you have to make another submission that you are saying that all the reports of GHCL are false. Or should we take on record that all records are false.			
726		• Whether the report is true or false is another matter. The first thing is that the government has given a	•

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		list of these types of assessment. Which agency should be approved by the government. Be it a government certified company or an agency, they can make this type of report. We do not know if the agency that has made them work does not have an accreditation certificate.	
• The regional officer of GPCB is informed that madam, it has been discussed. • It is stated by the Chairman that the matter has come on record. • It is stated by the regional officer of GPCB that the matter has come on record. Present any remaining issues you may have. • It is stated by the chairman that the discussion of the certificate is already done.			
727		• When did you say that we didn't do it or whether the report is true or false, true or false is a matter of later, the government has made a rule about who can do it and who can't do it. Not read, it's about black and white.	•
• It is stated by the Chairman that we have taken your objection and we...			
728		• Secondly, the agency named Biodiversity's Guide is the one who named him, Bharat Bhai Jethwa, who has the accreditation certificate.	• Bharat Jethwa has an accreditation certificate.
729		• If not, all these certificates should be in EIA report. You GPCB site, no you are such a big company. You will get the certificate generated by paying money. What are we sure of? All this should be ready before the public hearing is scheduled. You open the website of GPCB, as many as are in the public hearing schedule, open and see all of them, there are certificates in all of them.	•
• It is told by the chairman that ok ok we have recorded it.			
730		• No no how does it work, how do you approve, this conduct type public hearing ...	•
• It is stated by the Chairman that we are not checking any data for the public hearing, madam, we are not checking the data here. There is a public hearing for all these objections.			

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731		• You should do	•
• It is stated by the Chairman that madam we are not technical experts nor do we give opinions by checking data.			
732		• This rule is made in the government not our house.	•
• It is said by the Chairman that we are saying that we take your objection			
733		• I have an answer for everything.	•
• It is stated by the chairman that, I am not holding the hearing of forest data for SDM's technical data, environment data, ecological data. A hearing is simply a process, in which we call people and take their objections and present them to the committee. We have been doing the process since morning.			
734	Valji Jashraj Charan	• We have not yet received any response to our objections if all the queries have been made to the environment.	•
• It is stated by the Chairman that we have to take your objections, we will take your objections in writing and verbally and send them.			
735	Valji Jashraj Charan	• Mr. Radia Sir, answers everything. Actually, according to the government rules, the experts of the institute who have studied the environment, animals and birds have to come and answer.	•
• It is stated by the Chairman that the answer to the item ...			
736	Valji Jashraj Charan	• There is no degree that answers this question.	•
• It is stated by the Chairman that, I have heard the answer to one of the things, which you have asked the question, but the answer has not been given or the expert is not present at the moment, or the information which they do not, have on record at the moment. You have not been informed that so many people are not present.			
737	Valji Jashraj Charan	• Sir, the levels of SO_2 and NO_x have been shown in a city as big as Ahmedabad, while the so-called air pollution and the levels of air pollution have been shown, they do not have the answer. Those are the levels that people have shown, and how much they should be in the current situation.	•
• It is stated by the Chairman that OK.			
738	Valji Jashraj Charan	• Answer me expert.. • He just came and kept talking in English and got no response. • Sir, when you heard the answer,	• We now have information about Karipadam Sir... • It has been done with an expert and

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		you made me translate it to Gujarati, which was answered in English. • Can you tell me the decibel volume of the sound or why so much decibel volume came .	has been answered. • One need not repeat an answer.
• It is stated by the Chairman that we have not gathered here to discuss even decibels. There are no experts here.			
739	Valji Jashraj Charan	• Sir, in the EIA report of those people, you accept the EIA report, even if you keep something, you don't keep anything else, you accept its EIA report, right, those people made it.	•
• The regional officer of the GPCB said that the objection you have is that the decibels are too visible here, and the committee will have to respond to it.			
740	Valji Jashraj Charan	• The decibel volume of a city as big as Ahemdabad, Bombay is shown here, when there is so much volume, is there a Vipassana center here?	•
• It is stated by the Regional Officer of GPCB that the agency for the study is a government agency and not a private party. The officer from NEERI who has done the study is not private party or private consultant.			
741	Valji Jashraj Charan	• Yes, this official from the NEERI has created the wrong decibel volume.	•
• The Regional Officer of GPCB states that yes he has noted your objection.			
742	Valji Jashraj Charan	• Let it be taken on record that this is shown to be false.	•
• The regional officer of GPCB is told that OK , the objection has been taken, what is the next issue ?			
743	Valji Jashraj Charan	• The EIA report states that the project will use ammonia gas (NH_3) in large quantities. Ammonia, Ammonia gas Is highly flammable and harmful to the environment and health.	•
• The GPCB regional officer said that the matter has just been discussed. Just finished discussing ammonia.			
744	Valji Jashraj Charan	• Ok ok, it is postponed, sir, due to this project, the amount of polluting gases like sulfur dioxide SO_2 and nitrogen oxide (NO_2) will increase in the air of Bada area.	•

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• It is stated by the chairman that yes yes we.			
745	Valji Jashraj Charan	• So the health and the surrounding forest will have an adverse effect on the side on which the forests are located. SO_2 is the main cause of acid rain as you will know and experts will also know its effects have not been properly assessed in the EIA report. For the project, the captive power plant will emit NO_x gas, which will increase the amount of ozone gas in the environment. Ozone gas causes diseases like asthma to people and reduces agricultural production which these people have not observed.	•
• It is informed by GPCB Regional Officer that your issues will be noted and forwarded for necessary study.			
746	Valji Jashraj Charan	• So sir, let us be answered what these people have assessed?	•
• It is stated by the Regional Officer of GPCB that the assessment is given in the study report. • It is stated by the Chairman that the assessment.....			
747	Valji Jashraj Charan	• So sir, if you give all the answers, then what will these people answer?	•
• GPCB regional officer tells me I am not responding.			
748	Valji Jashraj Charan	• Our proper...	•
• I am told by GPCB Regional Officer that, I am not ready and unable to give any answer on their behalf.			
749	Valji Jashraj Charan	• No, you have given, that the study will be done, what will we do if you do all the study ?	•
• It is stated by the Regional Officer of GPCB that the study...			
750	Valji Jashraj Charan	• Sir, you are studying everything from morning everything we have done in the evening, evening has come, we have to study all this...	•
• It is stated by the regional officer of GPCB that please state your next points			
751	Valji Jashraj Charan	• If we tell all the following points, this will give the answer. You will send above. Above will give permission. And we have come	•

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		here today to make an argument because we do not approve of the breach here.	
• of GPCB , there is an evaluation committee and the committee will decide. The same cannot happen because one person can not takes the decision.			
752	Charan Valji	• Your committee is not supporting us now, what will the above committee support us. I say in general media. Any committee that raises the right questions for this matter from our people, or our right questions are for the environment and pollution of the environment will also be false. How many such companies have been given clearance by GPCB in this way.	•
• To GPCB Regional Officer said that, clearance is never given by GPCB .			
753	Charan Valji	• All matters are coordinated and finalized by the GPCB. Sir, we have a problem now and even if you don't speak, don't force me to accuse.	•
• According to the Regional Officer of GPCB, but GPCB does not speak anything for that.			
754	Charan Valji	• So sir, let us get the answers to our questions from you sir. If sir cannot answer then answer yes or no. • Are you an expert in those gases then answer if you are an expert. • boiler made of iron does not contain gases. • SO_x cause acid rain or not? Yes or no ?, yes or no ?. • The question is not that it will not come, my question is whether it will be only yes or not.	• Yes, you have been presented that for SO_x and NO_x by us equipment and listen to me. • Today I am an expert on boilers, today I am an expert on boilers. • A limit has been given on how much gas can be generated from the boiler and how much SO_x and NO_x come. And for that I have said before and show again that De-Sulphurization process accordingly

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			for SO_x. and what will be the emissions. Its equipment will be taken as it is within the norms of pollution. • If So_2 exceeds its norm then it can be possible, but we don't have this question.
• Stated by Chairman Yes, acid rain does not occur till SO_2 is up to the prescribed limit, we measure SO_2 everywhere.			
755	Charan Valji	• You do not speak sir, sir you are a supporter of GHCL, sir you are a supporter of GHCL .	•
• Stated by Chairman, I am not a supporter of GHCL. I am just replying to you that I am also educated as much as SO_2 is the prescribed limit.			
756	Charan Valji	• We have been pleading with you since morning, in so many numbers, yet you do not understand. Not so sir, you are educated, then as a young man as a young man, and as SDM....	•
• Stated by Chairman, you ask wrong questions, and it answers you, but you are not convinced by its answers. Not really convinced by his answers.			
757	Charan Valji	• In time you as SDM, I am your question, your answer that Radia Sir.	•
• Was stated by Chairman that, he replied to you that the prescribed limit ...			
758	Charan Valji	• So sir, you answer our questions in that answer, our questions are taken on record. Why are you answering our question?	•
• But we take it on record, but that reply, you also don't want to hear it later, as stated by the Chairman.			
759	Charan Valji	• We don't trust this hearing at all, even though we have been running since morning, the date of the hearing, which is called the date, is clearly a hearing in favor of this company. Hindi speaking speak in hindi, speak in English, we run everything we run everything, we run we asked for certificate not from you, we asked	•

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		for mobile not from you. We prove everything and we come to show even if we are not ready to listen to anything, so we request that at least do not speak in favor and let the gentlemen speak .	
760		• Dear sir, if this plant comes, you are not going to be present, it is good that you have knowledge to be present, you must have knowledge. But if those who will be present do not know then what is our future? There is no problem with you. What is our future? who comes has no knowledge.	•
• Was told by the Chairman, that is why he has replied to you, I am telling you that.			
761	Charan Valji	• You don't answer, no, they give the wrong answer. Those people....	•
• We also take it on record that he gave a wrong answer as stated by the Chairman.			
762	Charan Valji	• My answer to you is sir, it is taken on record SO_2 causes acid rain then the environment is damaged and agriculture can be damaged due to this, then because of these people company there is a possibility of acid rain there which is on record taken.	•
• Was stated by Chairman that, I say the same, your question and its answer are taken on both these records ok .			
763	Charan Valji	• The transportation of coal will increase not only the project site but also in the surrounding villages, the pollution of air particles $PM_{2.5}$ means 2.5 micrometers to small particles PM_{10} means 10 micrometers which is bad for health. Which is understated in the EIA report. From coal burning is such as mercury like trace metals and leaches into water and air. These metals are harmful even in very small amounts which is not	•

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		evaluated or mentioned in the EIA report. If mercury metal If mentioned, show us with the page number that mercury is mentioned as per this page number.	
• Was told by the Chairman that, ok ok where is mercury used in this brother if it is in your plant then answer it if not then give answer no.			
764		•	• There is no use of mercury, they say that there is some mercury in the production due to burning of coal, then once you see it, it will show, once tell the page number of mercury.
765		• Tell me sir how much mercury metal will be produced there is no estimate in EIA.	• EX -7 which is a point in the EIA report is shown in
766		• Sir what those people say should be taken on record.	•
• It was stated by the Chairman ok			
767	Charan Valji	• As per our understanding in. Your EIA report has not mentioned any mercury that is produced due to coal. It is also recorded.	•
• was stated by the Chairman that, EX - What did you say, where are you referring to Mercury?			
768		•	• Sir it is mentioned in EX 7 that we will take it on record.
769	Charan Valji	• According to the EIA report taken on record, it is written that there are no mangroves in Bada and its surrounding area, this is completely wrong. There are mangroves in Bada area. It doesn't matter, I'll give you photos of Mangrove in my mobile, crick here.	•
• Was stated by the chairman that, let us ask him for a minute, brother, whether you have mentioned any mangroves in this.			
770	Charan Walji	• That people is clearly mentioned the there are no mangroves.	•

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• As stated by the chairman that, we should ask him			
771	Valji Jashraj Charan	• I am standing in the mangrove forest with GPS number and this mangrove forest is not mentioned anywhere and in the ECO-Sensitive zone as per the notification of CRZ which is classified as very sensitive .	
• According to the regional officer of GPCB that, its I think Gadhavi sir has been discussed for duse for one time ...			
772		•	• Mangroves are mentioned in Base 8 Page No. ...
773	Charan Valji	• It is clear sir that the mangroves are not mentioned but the forests of mangroves.	•
• Stated by Chairman that, No, but he says no, but he has mentioned Mangroves.			
774		•	• Mentioned in Ex-base 8.
775	Charan Valji	• Sir, may it be taken on record that according to us is clearly written in the EIA that any mangroves are not in Bada.	•
• Stated by the regional officer that, Sir, a note here...			
• Stated by Chairman that , ok			
776	Charan Valji	• And these people say that, if flamingos come around Bada or in Modhva. The place of Modhva is not chosen because of flamingos. I show them the mobile phone, then I show the photo of the flamingo standing in the Bada Creek area with my proof, I am standing, the whole flock of flamingos is standing behind, I show the GPS photo of that too. If you want to upload my mobile platform, I will send it there too and prove this thing to you. These 50 to 60 plots are taken on 90 acre records. Bada which is the western side of the company, there are 50 flamingos like these	

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		flamingos which come here from Sahib Arabia as migratory birds every year in the creek of Bada. Apart from that, these flamingos roam this area very freely, this photo of which has GPS numbers. Show my mobile if you want.	
• It was stated by the Chairman that, yes ok ok yes ... .. no no we take the record.			
777	Charan Valji	• Ok ok ok	•
• is stated by the regional officer of GPCB that, in suiting, we take it on record.			
778	Charan Valji	• Ok ok ok	•
• The Regional Officer of GPCB that, Sir, we take in the shooting, take in the record also.			
779	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• First, I declare my feelings, after that my question should be recorded. I am the leader of the people. The people are constantly saying that your officers have conspired against the people and are becoming a party of the company. Please answer. Answer.	•
• Chairman said that if it was so, then we would not have taken anything on your record, now it is going on in a mix up manner so everything is taken on camera record.			
780	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• Ok sir, more than 300 questions have been asked, none of them have been answered. So my question comes later, I take it on record	•
• officer of GPCB , ok			
781	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• My question starts that, Hon'ble Provincial Officer shri, Company tell us or Pollution Officer Barmeda sir tell us, how many km away from human settlements should be the industries of such polluting toxic chemical heavy companies? Only the pollution department will answer it. Note Company, Pollution Department should respond. • Such heavy chemicals sir, listen	•

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		to me, I am a citizen, of Gujarat, I will talk with my finger down. I ask the question, pollution department such a toxic chemical company listen to me, don't interrupt me, I am a free people. Don't interrupt me, I will move further Bermuda sir, don't interrupt me, until my question is finished, according to the constitutional right, can any official of Gujarat government stop me or not? Provincial Officer give the answer.	
• Stated by the Regional Officer of GPCB that, speak up.			
• It was stated by the Chairman , Sir, ask your question.			
782	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• My question is not finished, until sir point finger at me and honorable officer sir, why are you interrupt me in the middle, can you interrupt me or not...?	•
• Stated by the Chairman that, No , do not ask, you should present your questions.			
783	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• No no sir my next question comes later whether an officer speaking for the public can stop the call or not Hon'ble provincial officer.	•
• Stated by the Chairman Mr. , that means that he will answer after you ask your question			
784	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• No, sir, sir, he has interrupt us, he has stopped us, he speaks in the middle of the mic, can he do it or not? That is to be answered sir...	•
• Stated by the chairman that, Now, because he wants to answer your questions...			
785	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• No no sir...	•
• As stated by the Chairman that, there are no absolute things, so you do not ask me. why he interrupt me. This answer cant given by me.			
786	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada	• No No Sir I have been stopped. No No Sir I am expected before your Magistrate.	•

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	, Pachotia		
• Told by Chairman that, But that 's why I can't answer, why he stopped you, but I can assure you that he will answer after you, ask your question.			
787	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• I want to know from a provincial official how it can be stopped.	•
• Stated by the Chairman, I am telling you that it is not an absolute thing, it is relative. I don't know why they stopped you,			
788	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• No sir...	•
• As stated by Chairman that, you can ask him later			
789	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• No, it is our officer, the magistrate officer, you are the pollution officer and the people have a big doubt towards him, may be he can stop me or not?	•
• Stated by the chairman, that is why you may have felt that you have been stopped in the middle.			
790	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• So sorry will say that ?	•
• Chairman said that, then make a presentation and then he will answer			
791	Laxman Karshan Bhai Gadhavi, Village: Farmer of Bada , Pachotia	• No my question remains.	•
• As stated by the Chairman that, you ask questions.			
792	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• I have been restrained in your presence.	•
• Stated by the Chairman that, I said again that it is not an absolute thing, but a relative thing, why did they stop you? We cannot answer that someone is speaking from your side			
793	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• Thank you sir this also can't give me clear answer, now I draw my question again.	•
• As stated by the Chairman yes, speack up..			

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794	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• Such heavy chemicals companies which are polluting, the pollution department has heard this, such heavy chemicals emit toxic fumes, emit noise, kill turtles, kill cows, how many km should such industries be away from human habitations? Let my question be recorded first. Awaiting reply, only we provincial officer question whether or not is not his business, only pollution department, GHCL will not speak, thank you, GHCL will not speak in this. Let's wait for the answer, provincial officer sir, you are listening, I have already asked the question 4 times, and if you will give a roundabout answer as a conspiracy, then let's not accept.	•
• According to the regional officer of GPCB that, the siting criteria for any industry is fixed as per red category distance should be minimum 500 meters.			
795	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• The second time this answer is recorded. As long as this company seems to be the Primaises from the human settlement, these questions are my second. It seems for this company, talking about all the given companies, talking about the rule, now this Gujarat Heavy Chemical Company should be in Bada from how far? Awaiting reply from pollution department..	•
• To the regional officer of GPCB, it should be according to the criteria of the city, so if it is more, it will work.			
796	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• Powering the Pollution Department, Officer Mr. everyday is sitting in your office. Sir, one answer has not been received in the whole day, how far should this company far from Bada village? How far should be from the Pachotia village? How far	•

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		should the Bhada village be from the village? How far should janakpur be from the village? How far should be from the Mapar village? How far should it be from Bambhadai village? How far should it be from Godhra village? Do you have the answer?	
• Regional officer of GPCB said that, no			
797	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• Provisonal officer...	•
• Ok ok we take on record. as stated by Chairman.			
798	Laxman Karshan Bhai Gadhavi , Village: Farmer of Bada , Pachotia	• Reiterating my question, still this officer is betraying the people. My direct allegation is that the pollution department, if the officer is close to retirement, that is, does he know how far the Bada company will be or should be? Even if the official magistrate does not get the answer, then what will happen to our people. What will happen to our people? Expecting a answer.	•
• The regional officer of GPCB said that, I will speak for 2 minutes. I again made the same presentation and said that there should be a minimum distance of 500 meters .			
799	Laxman Karshan Bhai Gadhavi , Village: Bada , Pachotia's farmer	• Tell , Regional Officer officer, how much far company should be from Bada and this company is.	•
• According to the regional officer of GPCB, this unit is of red category so minimum should be more than 500 meters.			
800	Laxman Karshan Bhai Gadhavi , Village: Bada , Pachotia's farmer	• Wait, wait, so the regional officer, if we say this answer in Kutchi language "Hane aado avro hale to sacho che nato" I am translating into Gujarati and his answer changed for the second time in my question within two minutes. I will ask again. Bada GHCL's plant, No answer in vague manner. I am asking you Straight	•

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		forward question. I need answer from it. How far should this plant be and how far is it? I will continue asking the question until I get a clear answer Sorry Regional Officer.	
• According to the regional officer of GPCB, the answer to my questions has come again.			
801	Laxman Karshan Bhai Gadhavi , Village: Bada , Pachotia's farmer	• GHCL company plant in Bada	•
• According to the Regional Officer of GPCB, GHCL Company is a red category unit and the minimum distance is more than 500 meters.			
802	Laxman Karshan Bhai Gadhavi , Village: Bada , Pachotia's farmer	• No No Specify more clearly , please specify.	•
• According to the regional officer of GPCB, more than 500 m.			
803	Laxman Karshan Bhai Gadhavi , Village: Bada , Pachotia's farmer	• That means 1000 km , 2000 km, one and a half kilometers sir. I am asking to regional Officer. Just look at me, Regional Officer	•
• According to the Regional Officer of GPCB , your question.....			
804	Laxman Karshan Bhai Gadhavi , Village: Bada , Pachotia's farmer	• No I am asking to Regional officer. Let me ask question to Regional Officer	•
• As stated by the chairman that, I am saying that it states that it should have minimum criteria and there is no maximum criteria, minimum 500 meters.			
805	Laxman Karshan Bhai Gadhavi , Village: Bada , Pachotia's farmer	• Sir, this should be recorded, media should also take it on record.	•
• Told by the chairman, he has replied answer.			
806	Laxman Karshan Bhai Gadhavi , Village: Bada , Pachotia's farmer	• Officer, my regional officer as per my information these heavy chemicals plants should be more than 3 km away from human settlements .	•
• It was stated by the Chairman that, yes ok.			
807	Laxman Karshan Bhai Gadhavi ,	Whether you are agreeing to this, the Regional Officer will respond.	•

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	Village: Bada , Pachotia's farmer		
•It is a technical matter as stated by Chairman. This is technical matter. Whether it is 3 Km or 500 m, I cant give answer, If you are saying it is 3 Km, then it shall be taken in record.			
808	Laxman Karshan Bhai Gadhavi , Village: Bada ,	•Sir, I have one more question, Sir, I have the right to ask questions Regional Officer shri?	•
•So what are you doing now? You are asking questions only Said by provisional officer.			
809	Laxman Karshan Bhai Gadhavi , Village: Bada ,	•Yes my second one is coming	•
•Stated by Chairman that, then...			
810	Laxman Karshan Bhai Gadhavi , Village: Bada ,	•They will make soda ash slurry, bring lime, coal, and salt. Now in India there is a no such facility that it can come by plane. The first question for this is how many trucks will come daily? Under that, my second question is how many trucks for raw material, trucks for labor will pass through the border of Bada? The question for the road remains, give an answer and these 25 to 30 people are sitting. •There are totally useless technical people, is this a big deal? I think sir, these people don't really need, that's why Radia ji is answering, then we, you, this and we are 2-4 people and we would have answered the question now answer that, how many trucks will coming? My question is.	•At present we have given the information about the material, that much tons we will bring, the trucks will be brought according to this, now big capacity trucks are used and no. of trucks will be reduced and this will covered with tarpaulin and there will be parking area and waiting area will be within plant boundary and all trucks will wait in it.
811	Laxman Karshan Bhai Gadhavi , Village: Bada	•Regional officer, My question was that how many trucks will come, their answer was how trucks will be parked sir you are unstable magistrate sir, limit is	•

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		crossed I am requesting.	
• Stated by the Chairman that, I am also saying same thing this question stating that how many trucks shall come and still plant is not yet commissioned and you are asking how many trucks will come, I am not taking this question as a problem how many trucks will come , this is matter when plant gets commissioned, It will depend on how much raw material and finished product shall come, Now all these calculations can not be done now at this place.			
812	Charan Valji	• Sir, my question to these people is wrt EIA whether Indian monitar lizard, which is a species of reptile. whether these people have studied it or not?	•
• According to the regional officer of GPCB, the report of study of Lizard and Sandha has been discussed.			
813	Valji Jashraj Charan	• This is different sir this is different Sandho and Indian Monitor Lizard . if you don't know if there is any expert here ask him about animal otherwise I will take the name of the animal in Kachchi.	• This has been studied and its details are mentioned in the ecology report.
814	Valji Jashraj Charan	• Exactly now the details are given in ecology. Can you tell me you have experts what is this called in local language.	• I don't know. This is studied by expert and they do this type of studies and expert does it..
815	Charan Valji	• Take this on on record, then call the experts sir.	•
• Stated by Chairman that, no, you give your objections. If In this way, experts will be called, then when this, this things are primary level, if there is any problem please provide.			
816	Charan Valji	• So sir no problem Indian conological lizard species is a reptile in schedule 1. Sir don't know anything about that thing	•
• Stated by the Chairman, Ok ok yes			
817	Charan Valji	• To be taken on record. Now the point is that in view of the EIA and various languages, due to the project area migrants population will increase, and because of this the surrounding forest area, which is protected, is a forest subject, poaching of wild	•

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		animals in this area and wild life. The threat is the same because EIA ANNEXURE 3 ecology study and page number 43 of wild life conservation plan in which point number 5.3.1 Indian monitor lizard hunting will happen as this happens for meat and oil It is known that there is a threat of poaching due to the influx of migrants and the local population in the project core area and buffer area Many have awareness and they ready to protect the wildlife They also provided water and food for animals and birds, but with the influx of migrant population, as seen in other areas, hunting activity has increased, so this is a schedule 1 animal, which are large in no. Now you say that the Indian monitar lizard is called Chandan go in Gujarati, it is a schedule 1 animal. And it is found in many places in Bada. Even today, it is found in plat area	
• It was stated by Chairman that, ok			
818	Charan Valji	• It is absolutely a question of the environment that if this company comes then it is having an impact on this animal. Take a record.	•
• Regional Officer says, Ok this is question pertaining to Indian monitoring lizard and there is risk Ok.;			
819	Charan Valji	• It may also be taken on record that an Indian monitar lizard is present in the bada.	•
• It was stated by the Chairman yes sure.			
820	Valji Jashraj Charan	• It is also a Schedule 1 animal and not shown in EIA	•
• stated by Chairman, Ok ok			
821			• It is shown in EIA and conversation plan is also

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			mentioned.
822	Dhvani Shah	• Sir Valji Bhai's next question was how many trucks will come? In that you replied that you cannot guess. Sir do you know what is EIA? There is an EIA report to show the estimated number of trucks coming from the road and the amount of production, how much raw material will be required for construction, its cumulative impact and the ecological impact. Why are you misguiding us that we don't need to do that now. Traffic studies is an essential part.	•
• Was stated by the Chairman that within the Environment Impact Assessment, the number of trucks has been asked to be shown?			
823	Dhvani Shah Village : Bada	• Yes traffic study.	•
• As stated by Chairman, then you show me			
824	Dhvani Shah Village : Bada	• Summary traffic study is essential part of EIA notification..	•
• Was told by the chairman, yes, but he gave his answer now..			
825	Dhvani Shah Village : Bada	• You may ask them sir you may ask them, the TOR they have got, it is not written in it to do traffi cstudy, ask them they have all the documents. • OK sir, you said that you are going to use the road, Are you going to make a new road? • Do you know While doing EIA report if public road is used, it should be written clearly. Secondly what is the local impact when public road use is done. What have you done about it? Let us know in the EIA. We know you haven't done any traffic study. As soon as the truck comes, you now know that it is an EIA part. And what is required in EIA, please don't miss guide us. If you	• From whom the details have been obtained, the average truck will come around 500 to 600. Still, if the big trucks come, the number will decrease. • As of today, there is no scheme to build a new road, after talking to the government, efforts will be made to do so, for now, public roads will be used.

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		don't have the authority to speak or make a decision, then you don't have the authority to speak on their behalf. Let me speak.	
• Said by the Chairman that, if you have any objections, Madam, then say your objections, we are recording your problems and whatever they are not answering that also we care recording but topic can not be changed.			
826	Dhvani Shah	• No sir I know sir we have objections. we need to get answered but on their behalf answer can not be given , you are misusing your authority, Anwer us. but why did you answer us to abuse your diss on his behalf.	•
• No, I do not miss guide as stated by Chairman.			
827	Dhvani Shah Village : Bada	• What you did. Record has been made now.	•
• As stated by the Chairman, what to object to and what not to object also comes under my responsibility as the Chairman. Don't act like that, or I won't speak. Madam you speak, then I will also speak...			
828	Dhvani Shah	• Sir, don't favor them by speaking.	• Madam Listen
• Chairman said that, listen mam I am not favoring anyone, I felt that they are unable to speak everything has been taken in minutes, the company is unable			
829	Dhvani Shah	• They should study perfectly. You just came here to check. We have not been able to respond on behalf of him.	•
• Was stated by the chairman that, I am not answering you, I am telling you the subject that discussion isgoing outside the subject that is being discussed.			
830	Dhvani Shah	• This environment study .... • No sir, you said that the construction will take place when the company knows how much raw material will come, then what is the EIA made for? • Traffic study you have done while standing on a road, you are not aware of any details village roads have been used let me explain that the public road we use is heavy truck transportation well aware sir that heavy truck transport can not happen from	• Please listen madam, in EIA that details are given in 4.1.4.3 in EIA that traffic study has also been done. • We have given the details of what has been done

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		villages road and they are failed in do though they have not included anything regarding accident.	
• It was stated by Chairman that ,ok			
831	Dhvani Shah Village : Bada	• Our life is at risk ....atleast can not say that they don't have to do that traffic studies.	•
• Stated by Chairman that , ok			
832	Dhvani Shah Village : Bada	• They have to do you not answer on their behalf.	•
• Stated by Chairman that , ok			
833	Valji charan	• Sir, please tell us we want to ask Radia sir that for withdrawal of sea water , tunnel will be put up and fresh water will be withdrawn through tunnel, to pressurize this water whether any machine will be installed or water will come on its own Gravity means sir I did not understand air pressure... • Ok sir, listen, take it on record, the water is pure water due to air pressure, this company is only 200 m from Bada village, the end of the company is 200 meters from here, the village starts. OK, now Do you know Kutch falls under which seismic zone ? • Now sir, take it in record that earthquake seismic zone 5 i.e. high sensitivity area. Now sir, what is liquefaction? Ask your experts what liquefaction is called. • If the land issubsiding down, the structure of the land is weak, it is called liquefaction in the language of earthquakes. Now Kutch has been classified as seismic zone 5 and the land of Kutch has also been declared as liquefaction land, which is available in records. our land of	• Will come from gravity • It will come through level difference from air pressure. • seismic zone 5 and any design will be done considering seismic zone 5. • Land will not subside as it is coming through tunnelong. • Intake you talked about is that we are taking water because we can get turbidity or clean water and the air pressure is atmospheric, that is, the water will come here with the same pressure as it is now.

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		Kutch Due to high heat, there is more liquefaction. If these people build a tunnel, the structure of the earth is weak because of the tunnel. If there is an earthquake, there is also liquefaction. The ground will break and if the tunnel breaks, how will we stop the water coming from the sea because it is air. If the pressure is high, it can damage Bada village only 200 meters away or not ? Sir answer me • If the ground breaks due to liquefaction or if your tunnel breaks, the water will come to Bada village or not?	
• It was stated by Chairman, that ok			
834	Charan Valji	• Sir, I am explaining the whole issue to you, a tunnel is to be laid and that tunnel is coming in the relevant zone of Kutch area during the earthquake, there is soil liquefaction and if there is a chance of the tunnel breaking, we think it is due to the environment and you also from GPCB. If you are an officer, it will also be relevant to you and the people who understand the environment will also be relevant. If this tunnel breaks due to the environment, to what extent the sea water can damage Bada village and it's a big risk which should be taken on the GPCB record.	• Due to the pressure, the water does not enter the sea. If this is broken, the water will not enter. Water will not go to or anywhere else.
• Ok ok, stated by Chairman.			
835	Valji Jashraj Charan	• That, sir, is a 15-20 meter tunnel.	•
• We are taking your complaint on record ok ok ok as told by the chairman.			
836	Valji Jashraj Charan	• Sir, let it be taken on record that earthquake prone zone-5 and liquefaction is also in land.....	•

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• Ok ok yes yes stated by Chairman.			
837	Charan Valji	• As mentioned on page no. 12 of EIA, that means the dhuwa is only 1 km away from badas dunes. and then sea comes. Sir, the width of these dunes is up to 1.5 meters, Digging sand dune will impact natural greenbelt wherein prosporis julifera is naturally grown. Green belt will be destroyed on sand dune due to 15 m tunnelling on sand dunewhich will lead to destruction by entry of cyclone water in bada.	• As you mentioned about sand use, sand dune is necessary for all. It is also necessary for us, because it is our protection. A geotechnical study has been done for sand dune, according to the geotechnical study, the sand dune is properly designed and about 15 meters below microtunneling will be done. There will be no disturbance to sand dune . Pipeline will gi through plant area to sea and there will be no requirement of cutting of trees and disturbance . This is justified.
838	Valji Jashraj Charan	• Sand dunes matter should be taken on record.	•
• Said by Chairman ,Say yes			
839	Valji Jashraj Charan	• A sand dune bed is naturally hilly so it is not a flat surface but a sloping surface. Also, on the fine sand s prosporis julifera plants are growing. If these people want to measure 15 meters of San Duce, then how can they measure it if there are at the top and bottom? How they did they measure? • The EIA report shows that impact is less to birds. During October –	•

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		February month thousand of migratory birds like common crane stays. So, due to this project, these migratory birds will be disturbed many times. Apart from this the the Pink-billed Surkhab, the Lesser Flamingo .I have shown you the photo. comes here. I request that they should say whether there will be impact on birds. while common cranes feed on cultivated groundnuts and crab Migratory birds travel thousands of km from Saudi Arabia. it should be taken on record.	
• Ok ok, stated by Chairman Shri			
840	Valji Jashraj Charan	• No bird will come near toxic chemical Sir EIA ANNEXURE 3 In Page No. 34, Table No. 4.7, a bird called Black Soldier Kite was seen in the buffer area. ButI have seen this bird in the core area of the project in the border of Bhinsara village of Bada with my own eyes. I have a studies these birds, animals and schedule 1 birds. Apart from this Mars harriers which we call sitros in our language, which is also a schedule 1 bird. Which is seen in the core area of the project. Apart from these birds mentioned above, animals like schedule 1 chinkara, wild cats, Jarak coming in schedule 3 schedule 3 jarak have been observed in the main area proposed for the project. which should be taken on record.	•
• According to the Regional Officer of GPCB, well.			
841	Valji Jashraj Charan	• Wildlife is not covered in the EIA report. which declares the report false. Many bird species will be affected by the project. If project	•

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		is permitted than this is not benficial to Wildlife.	
• Ok ok stated by Chairman.			
842		• Yes sir, I am present since 11 o'clock. Being a citizen of India too, many provisions have been made in the constitution. The citizens of this village are all running a kind of mass movement without food or drink, without thirst, how are we running, arguing for one side. Most of those who were favoring and then also you are conducting public hearing	•
• According to the Regional Officer of GPCB, there is no submission left.			
843	Valji Jashraj Charan	• My points are still pending to raise I am opposing this in environment front.	•
• According to the regional officer of GPCB, we have noted that issue, we have noted that issue.			
844	Valji Jashraj Charan	• Now next point , in EIA page no 14 it is shown that high conservation significance species stays far away from the project area, so I would like to ask sir, how far your project area is from Bada and Pachotia forest area?	•
• Presently you have any record, of all these matters as stated by Chairman.			
845	Valji Jashraj Charan	• Sir, it is very common matter. So they need to know how far the project area is from the forest. How far is it from reseve forests? • We have to take the matter on record, sir has said not only the animals rescued by me in the reserve area, the rakhal of Bada, on which 4-5 officers are posted by the governor, the rakhal of Pachotia, There are so many people appointed the reserve forest area only declared declared as a protected forest area.	• Reserve forest is not here. the forest area is near to our plant Pachotia area is about 4-5 KM away.

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• The regional officer of GPCB is informed that, your issue noted very well.			
• It was stated by Chairman that, ok ok.			
846	Valji Jashraj Charan	• Sir's point should also be noted that those people deny that there is no reserve forest area. • So now I have the same issue or another question. Protected Forest, according to us is only 100 meters from this project. The southern end of this project is on the beach side. It is only 100 meters away from the whole forest. There is no human population there. Bada as well as Mapar and Pachotia sim area have many conservation significance species as mentioned above these are Chinkara, Jarak, Hagetra, Jackal, Khawkhadro, Porcupine etc. As proof of this, I can show you the group of porcupine on mobile if you don't mind and ot should be taken on record.	• unclassified forest area.
• We take on record that stated by Chairman.			
847	Valji Jashraj Charan	• Porcupine is a schedule 2 animal.	•
• Took it on record that you said reserve forest , he said unclassified forest.			
848	Valji Jashraj Charan	• I have included their footmark in application and so I am telling you. Schedule 1 animals and birds living in this reserve forest, innocent wild animals will die, to what extent they will be able to survive, that is a question for the GPCB so what is shown in your EIA report? Answer my questions. • Conservation plan is the next thing. Before establishment, the company has to evaluate the environment impact report EIA report i.e. environment impact report. You, hey, you have done the assessment, you have shown	• Deviation of the EIA report has been brought to your notice, accordingly, whatever correction or conservation is to be planned, whatever is suggested will be planned. • So you say whatever is shown in this report, then what is your

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		the reserve forest animals, if I these is not reserve forest, then how these animals have come in the EIA report? • So the question is, there is a reserve forest here. didn't you know that here in the Reserve Forest there are animals of Schedule 1 of the category staying in this forest? Please take this on record that only one official from GHCL is answering that is Radia sir. Who has no degree above zoology, biology. He is not knowing about environment then my question should be taken on record. We have studied and survey by ourself conservation species living in the protected forest and we have evidence and information has been obtained through RTI . Please take in this record. GHCL has not mentioned anything about environment or birds coming in schedule 1 the or these people are not aware.	question?
• It was stated by Chairman that ,ok			
849	Vijay Gadhavi	• Sir, I have a question. In this project, a power plant of 120 mw is to be built, in which once through cooling system will be utilised. As these would impact marine organisms , Forest & environment department has banned this technology in 2015, This technology will impact marine life and project has mentioned wrong details and is trying to obtain permission. For this reason cancel this public hearing and Sir, Reply.. • Sir I want to ask you one more question in Bada and surrounding areas 800 families earn their	• All type of power plant has this once through cooling system and this is standard procedure and tehre is no significant impact in environment . We have studied 10 villages and details are mentioned in EIA.

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		livelihood from forest produce. but in the EIA report the social and environmental studies of forest dependent families have not been done so the process of taking permission has been done on the basis of wrong information and there are 800 families. please tell me how much and what it is • No sir, why do you answer like this? public hearing should not be organised and youa are saying this and that. We are saying these are the numbers.	
• Was stated by Chairman that, Yes, if you say that we should take it on record that there are so many and they are not mentioned in the EIA report.			
850	Vijay Bhai Gadhavi	• Yes, add 800 families to this, how many have these people shown, ask them whether they answer yes or no, why not. If it says not shown.	•
• It was stated by the chairman that, yes, how many are there ?			
851	Vijay Bhai Gadhavi	• I say 800 families.	•
• Chairman said that 800 families say ok			
852		•	• We have shown livelihood details.
• The Regional Officer of GPCB that the study report includes this?, Proponent sir.			
853		•	• in socio Economic Studies
854	Vijay Bhai Gadhavi	• Where sir? how many families are mentioned in which page no. Show this to Sir, If he says yes then I have no issues.	•
• There is noise			
855		•	• How may overall families are dependent in 10 villages pertaing to forest ....
856	Vijay Gadhavi	• Sir , where has it been shown that our objection is that we want to fight on the report and you say	• Details are mentioned in Page no. 3.1.20 but

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		that it is not or not, For this reason we are coming to numbers. • We want to talk about this as you will grab our land you told that it is not mentioned then I don't have any problem So I don't mind if the environment of this on the forest.....	exactly figures showing dependency on forest are not mentioned, It is shown in but what I am talking about is the total population of the village and the details are there, it does not have the details of exactly how many families are working on the forest.
• According to the Regional Officer of GPCB, he was given a clear answer that it was made general and not specific.			
857	Vijay Gadhavi	• We also said that they are not saying that how many families live in each village.	•
• stated by the Regional Officer of GPCB , it is correct			
858	Vijay Gadhavi	• But 800 families from here are forest dependent, why this has not been shown	•
• According to the Regional Officer of GPCB , we are taking note of it.			
• It was stated by Chairman that , ok ok			
859	Vijay Gadhavi	• Please ensure this is in record that forest dependent families are not mentioned.	• We have not shown the details of how many villages and how many families live on the forest.
• It was stated by Chairman that , ok ok			
860	Vijay Gadhavi	• There is madadpir temple in the project area and report does not mention anything or temple or mosque or cremation center . This should be mentioned and tell us where it is mentioned, There is a temple of Madad pir Dada in the area of this project, which is not mentioned in this	•

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		report, where there should be mention of temples or mosques or crematories.	
• There is noise			
861	Vijay Gadhavi	• We are asking relevant question	•
• Was stated by the chairman that, do one thing is not the answer with people, it is ok, you can give us in writing any questions you have, we will take them on record.			
862	Vijay Gadhavi	Sir	•
• stated by the Chairman , there is no end to this discussion if we discuss it one by one			
863	Vijay Gadhavi	• Even if there is no end...	•
• Chairman said that the question, we will give all your questions in writing, we are going to take the minutes at the end.			
864	Vijay Gadhavi	• Chairman sir, this is our last chance to make such representations. How much wrong is your report?	•
• Chairman said that , your words are true, we are not denying what you said.			
865	Vijay Gadhavi	• Whether this Madadpir is mentioned in the report ?	•
• There is noise			
866		•	• Temple details are mentioned in 3.4.2 table
867	Vijay Gadhavi	• You show us • Whether details are available or not, where we are going to represent	• Details are mentioned in the report , but as desired by you details needs verification .
• There is noise			
868			• Shiva temple is mentioned.
869	Vijay Gadhavi	• Not Shiv Temple, What about Madadpir dada temple?	• This does not come in our project area
• There is noise			
870		•	• It does not come in our project area
• As stated by Chairman Shri , do you have information in hand ? If not, then said no.			

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871		•	• No sir it does not come in my project area.
872	Vijay Gadhavi	• it comes	• We have provided available details
• Stated by Chairman that, we have recorded both the questions that you ask from here are answered.			
873	Vijay Gadhavi	• Provincial Officer Sir, my question is the temple of Madadpir Dada is located in this project area, Right.	•
• It was stated by Chairman that , ok			
874	Vijay Gadhavi	• I am saying that it is there, I have not mentioned it, whether the company accepts it or not, you write and submit	•
• Stated by the chairman, we are writing the company's reply that this temple is not located in their project area.			
875	Vijay Gadhavi	• Sir, we will prove it how we can prove it? it will come..	•
• told by the Chairman that, how can I prove it now?			
876	Vijay Gadhavi	• This is not mentioned.	•
• Was said by the chairman that, then it will be biased. Why should I say yes then it will be biased			
877	Vijay Gadhavi	• We are saying, we are not saying to write anythingwe are saying that the temple exists	•
• Told by the chairman that, we will write your presentation in the same way.			
878	Vijay Gadhavi	• Write like that	•
• Chairman said that, we will write your submission in that manaer, as has written that reserve forest is unclassified for them.			
879	Vijay Gadhavi	• This is not the answer we are saying that Pirdada's temple is located.	•
• Stated by the chairman that, we will write in the same way.			
880	Vijay Gadhavi	• Write that company is that there is no temple of Maladpir dada in our area.	•
• It was told by the chairman that, yes, the same thing was said to him.			
881	Vijay Gadhavi	• No, I didn't say that	•
• Stated by Chairman that , said that it does not come in our affected area.			

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882	Vijay Gadhavi	• Madad pir dada temple is not affected or whatever it is just say that his is not mentioned in project report	•
• Was told by the chairman that, same thing was said by him.			
883	Vijay Gadhavi	• Did I did not say • Not seen, sir, it will be seen tomorrow.	• Shiva temple details are provided, Pir dada temple details are not seen.
• As told by GPCB Regional Officer, tell us whether it is mentioned in your study report.			
884	Vijay Gadhavi	• If we get up tomorrow and add them, • Public have worked hard.	• There is no detail of the temple.
• Has been stated by the chairman that. the temple which is not mentioned in the report will be noted.			
885			• We will check pir dada temple.
• It was stated by Chairman that, ok.			
886	Vijay Gadhavi	• What, what, sir, Why you will check this in area. • Write that down that Maradpir dadas temple is not mentioned.	• I said that this is not in our report From my point of view temple doen not come in our area.
• As stated by Chairman that, yes same thing he said.			
887			• We have to confirm whether it is inside or outside our area that needs to be confirmed
888	Vijay Gadhavi	• Report is made in such a way that temple disappears • What is reports reliability	• That temple does not come in our area.
• stated by the Regional Officer of GPCB , let us write.			
889	Vijay Gadhavi	• Next, we have said that there is is temple and this company is saying that there is no temple The company has made an incomplete report even the temple has not been considered.	•

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		On this report public hearing should not happen should not be heard. • My second question is your area has two Vachhara Dada temple and there is mention about approach road toward vacchradada Mandir.	
• There is noise			
890		•	• Temple details are mentioned in 3.4.2.2 and further to this details are not available present
891	Vijay Gadhavi	• Why it is not present • This is not the way	• Your questions will be answered in the minutes of the meeting.
• Chairman said that, but you are given a reference			
892	Vijay Gadhavi	• Sir, why does he give reference. We are not free in public hearing . We want answer.	•
• Told by Chairman that, then you do one thing, give your questions, objections, we will answer accordingly. If you answer now, not all things are present.			
893	Vijay Gadhavi	• Cancel Cancel	•
• There is noise			
• Stated by the Chairman, Say your objections.			
894	Vijay Gadhavi	• Sir, these temples are not mentioned, the report itself is wrong.	•
• Stated by Chairman that, it is ok we will take up the record			
895	Vijay Gadhavi	• This report is wrong, why are we discussing this wrong report, you ask this the company, why did you come without a report, people are asking questions. • Sir, I am asking the third question,This is false report as this does not mention temple. Company is not replying and we are strongly opposing this.This	•

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		project has panjhoda pir durgah . What shall we do for the approach road to Panjodha pir durgah which comes on our way. This is the approach road towards durgah . Panjrapir is not mentioned . There are so many hindu holy places.	
• There is noise			
• Stated by Chairman , there are as many objections as you.			
896	Vijay Gadhavi	• Sir you ask him why are you telling me.	•
• As stated by Chairman that, I am not against you, I am speaking your objections			
• There is noise			
• Chairman said that, I am asking your pbjections and asking them to reply.			
897	Vijay Gadhavi	• Sir, he is sitting cross-legged and we are standing without eating or drinking, sir, tell him that the they have come to establish a company .they have not come to please us. He is sitting in fan and we are standing as we are supporting our region we are fighting for my region.	•
• There is noise			
898		•	• In the study area which I have shown four temples have been shown, Photograph is also mentioned . We have to know the exact details.
899	Vijay Gadhavi	• No, we don't see the details, We will drag everyone in highcourt • Next Next	• Details are given in the report.
• It was stated by the Chairman yes yes			
900	Vijay Gadhavi	• Dargah of Kantala Pir is located in this project area. Where is this dargah shown?	•

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• There is noise			
901		•	• Sir, the names of these temples are not given but the details aboutMasjid and Shiva Temple are mentioned.
• There is noise			
• It was stated by Chairman that, ok			
902	Vijay Gadhavi	• Sir, such a senior officer is sitting, we are fighting for our region, He is sitting and answering very comfortably.	•
• There is noise			
• Chairman said that, I have also told you that we have taken your objections if you have more than you can represent orally or in written mode.			
903	Vijay Gadhavi	• They have to give answer as this is not our first public hearing	•
• Has been stated by the chairman that, they gives as many answers as many they have however answer are not with them, We are recording them.			
904	Vijay Gadhavi	• Sir we are discussing on false assessment report.	•
• Stated by the Chairman, I am saying that it will be decided based on your objection whether it is right or wrong, right now we are not discussing whether it is right or wrong.			
905	Vijay Gadhavi	• Now my question is the same as previous one, answer my previous question and answer me. • How can I know whether this is answer to my previous question. • Sir, Chairman Sir, how they can say that it is given in the previous answer. Now let me say previous question, answer the previous question. • Well, sir, it may be noted that this report is done without study.	• What questions are you talking about? • Your question was about the dargah and I have given the details of the location of the temple and the mosque in it, the mosque and the temples are there but the specific dargah you are talking about is in our area or not is not given in this report.

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• It is said by Chairman ok that, ok, then your Mandir Masjid has been discussed. He has told all the records with him.			
906	Vijay Gadhavi	• No, no, I want to ask what has been studied in the report ? why are you putting us in such a false report? Sir, you have brought us to a wrong public hearing and this is not the way, I have attended many public hearings and the officer should answer in this way, We are from public and he is not our father.	•
• Is said by the Chairman that, ok ok, that is why, we are taking your objections, that is, your objections, the objections of the incomplete report.			
907		• Now we are coming openly, you are so biased You are not favouring us by taking our objections . We will fight for this.	
• Is stated by Chairman that, We have taken your complete objections . Please submit your objections			
908	Vijay Gadhavi	• No No sir you are continuously favouring company • Till you give us temple details coming in study area , we will not go further .	
• Is stated by Chairman, Submit your objection If any....			
909	Vijay Gadhavi	• No No sir why it is not mentioned. • We say that if they do not care What studies they have conducted for birds porcupine. We want to prove this.	
• Is stated by Chairman, ok ok took your point on record.			
910	Vijay Gadhavi	• Sir, you are so cold-hearted, I did not expect so much from an officer.	
• Has been stated by the chairman that, we are not sitting to decide it now, if you are saying that record is wrong then we are taking it on record. I cant say now whether you are right or company is right. I am neutral right now.			
911	Vijay Gadhavi	• No, you are saying company is right	

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• It is informed by the chairman that , no, I have not told this is true, your objections has been taken.....			
912	Vijay Gadhavi	• No no no no you didn't take it we say on the record.	
• The Chairman said that, we have taken this on record			
913	Vijay Gadhavi	• No sir you two are loyal to the company.	
• It is informed by the Chairman that , no, no, if even one such comment is made, then it will be announced from my side that this process is over. Speak up if you have any objections. Otherwise it will be declared from my side that this process is complete. No, no, if you have any objection, speak up, don't say anything else.			
914	Vijay Gadhavi	• I am presenting my objection.	
• It is informed by the chairman that, raise your objections you say if we do not take your objections.			
915	Vijay Gadhavi	• We are saying our objection	
• It is informed by the chairman that, if the record is not taken, then you say.			
916	Vijay Gadhavi	• My objection is that there is a temple of Ashapura Mataji in this project area. Show me that it is mentioned. Now I don't have to go ahead and show it in the paper if you have objection then we also have objection	• In 3.4.2.2 it is written that Shiva Temple, Ashapura Mata Temple and Masjid are situated. Three things are mentioned.
• It is announced by the Chairman that, then next, next, next....			
917	Vijay Gadhavi	• Sir, GHCL Company Heavy Chemical did not mention any water body detail in Form 1 .	
• The provincial officer of GPCB said that, these points have been dicussed earlier. • Is stated by the chairman that the Issue related to details has been taken on record.			

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918	Vijay Gadhavi	• Listen to me or you will speak on behalf of company	
• Is said by the chairman that, speak up			
919	Vijay Gadhavi	• You don't want to hear us.	
• It is said by the chairman that , speak up			
920	Vijay Gadhavi	• Kali talavadi is in the area .Why is there no mention of Kali Talavadi in it?	
• Stated by the Chairman that, you are saying that Kalithalavadi is not mentioned ok.			
921	Vijay Gadhavi	• If his project lay over Kalithalavadi, then where is Kalithalavadi?	
• Stated by the Chairman that , OK. Ok , if you have information provide them or ...			
922	Vijay Gadhavi	• We are not here to beg . We need information why there is no Kalitaravadi • Sir this is the answer, you asking us to stop • Get it checked • We need this information.. Now, if you threaten us to complete the public hearing, then we don't mind. We have many other rights as well. We will sit in your office with 5000 people. you should not say this We are cancelling this. This person is sitting and giving answer. as he is our father and you are favouring him. They are doing enchroaching our land. They are destroying our environment and bullying us.	• The details of the water body are given in the hydrogeology report. • The information is given in the hydrological report but it has to be checked whether this Kalithalawadi is mentioned in it or not . • That information is not available now.
923	Dhvani Shah Village : Bada	• Sir, I have a question before vijay bhai speak further .Valjibhai asked about traffic study and no . of incoming trucks whether it is answered or not, Please clarify. Whether their replies have been	

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		recorded , Please clarfy	
• The provincial officer of GPCB said that every discussion that takes place here			
924	Dhvani Shah Village : Bada	• No sir you said if the record is not taken up then the record is taken up or not. Your words sir.	
• Stated by the Chairman that, your questions and their answers have been taken on record.			
925	Dhvani Shah Village : Bada	• You said that this record will not be taken up so I am asking specifically.	
• Regional officer of GPCB said that he has given a clear answer.			
926	Dhvani Shah Village : Bada	• No sir you said record will not be taken up. So whether the record will be taken or not sir is your words.	
• Stated by the Chairman that. your questions and their answers have been taken on record.			
927	Dhvani Shah Village : Bada	• You said not to take this on record so I am asking specifically.	
• Regional officerof GPCB said that he has given a clear answer. • stated by the Chairman that, both your questions and their answers have been recorded.			
928	Dhvani Shah Village : Bada	• Sir exactly you have written and also your speech should be taken on record and further to this I have one more submission. TOR received by them dated 10/08/2021 it clearly states in 6.9 that traffic study is mandatory and I am reading whateveris mentioned in TOR . Traffic study of area, types of vehicle, frequency of vehicles for transportation of material, additional traffic due to proposed project. Parking arrangements should be provided if they use the village road, then sir you know that heavy road transportation	

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		takes place and the village road cannot handle it. Tomorrow there will be potholes, tomorrow the road will be broken. We are the people with motorcycle.. During riding motorcycle ,it may happen that we may fall and it may lead to death Sir, this should be taken on record. We should given all such estimation in the EIA report.	
• Is said by the Chairman that OK OK.			
929	Dhvani Shah Village : Bada	• What ever you said that they need not to do should be also be taken on record. This TOR submission should also be taken on record. If this is not taken on record then public hearings proceeding will be considered incomplete. Whatever you said.	
• Stated by the Chairman that your questions.....			
930	Dhvani Shah Village : Bada	• They don't need to do what you said. What you say it should be recorded.	
• Stated by the chairman that ,I did not say that, I did not say that, I did not say that.			
931	Dhvani Shah Village : Bada	• You said	
• Is said by the chairman that I did not say that. What I say is not recorded.			
932	Dhvani Shah Village : Bada	• Sir, you have clearly said these words, I am repeating , it may be jumbled, but you have clearly said that the company cannot say everything now, When company starts then they may know that how much exact material is required for construction ,	
• Is told by the chairman that you asked for the exact number, I told no for exact number			
933	Dhvani Shah Village : Bada	• How can you refuse, you don't have the right , TOR says that company has To..	

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• Said by the Chairman that, Madam, Madam, I have told you about the exact number.. Do you have any thing left to say regarding environment ? It is not compulsory to provide exact number now			
934	Dhvani Shah Village : Bada	• EIA report is 100% hypothetical because....	
• Stated by the Chairman that, he gave his answer later.			
935	Dhvani Shah Village : Bada	• No sir one minute let me finish.	
• Said by the Chairman that, you speak after.			
936	Dhvani Shah Village : Bada	• Yes, I am speaking, you listen	
• It is told by the chairman that you do not talk about something else.			
937	Dhvani Shah Village : Bada	• You can't tell me like this.	
• Said by the Chairman that you should speak your issue.			
938	Dhvani Shah Village : Bada	• The record I want to bring up. I will say that. You have to take it. You don't tell me to say this or say that.	
• Said by the Chairman that you speak.			
939	Dhvani Shah Village : Bada	• Sir please I have right to say whatever I want to say.	
• Is told by the chairman that yes, you say			
940	Dhvani Shah Village : Bada	• If it is illegal sir then you can arrest me. It is your administration. But you can't pressurize me like this, it is my right.	
• Is told by the chairman that, I am not denying you, I am asking you to speak. But be specific whatever to the point. You don't discuss something else..			
941	Dhvani Shah Village : Bada	• Something else is not discussed. Not something else. You know the point. You know the point.	

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• Is told by the chairman that, speak as many objections as you have with company. Madam, don't talk now, Please be relevant , tell me what is your problem with the company.			
942	Dhvani Shah Village : Bada	• You don't have the authority to say what is relevant and What is irrelevant .	
• Is stated by the chairman that, I am the chairman of this committee. I am the chairman and I am speaking as a chairman. Present whatever concerns you have please speak. I am the chairing this public hearing. As the chairman, I am telling you that we are ready to take whatever objection you have against GHCL company wrt ienvironment. Discuss your objections.			
943	Dhvani Shah Village : Bada	• Sir, It is related to company, it is only related to company. I say the same. Sir you have violated your right as you spoke on behalf of GHCL	
• Stated by the Chairman that, I have not spoken on behalf of GHCL .			
944	Dhvani Shah Village : Bada	• You have violated your rights.	
• Is stated by the chairman that, as chairman, I have right to say whether this matter is required to discuss or not feel that this matter is required to be discussed at the present level or not.			
945	Dhvani Shah Village : Bada	• You have no rights to speak, the company will speak.	
• Is said by the chairman that, now you have to do the discussion on the issue or the general debate. • The Regional officer of GPCB said that, sister, please represent your points whatever is left to be done. • Stated by the chairman that, you want to discuss in general or relevant points. • Stated by the Chairman that, you want to discuss points in general or relevant points are to be discussed.			
946	Dhvani Shah Village : Bada	• Discussions are relevant	
• Said by the Chairman that, after I am asking for the last time then I will close this public hearing.			
947	Dhvani Shah Village : Bada	• sir sir sir	
• Is said by the chairman that whatever objection you have in the company , discuss it.			

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948	Dhvani Shah Village : Bada	• I am doing the same you are stopping me....	
• Is said by the chairman that , now speak now speak now speak.			
949	Dhvani Shah Village : Bada	• You can't threaten me repeatedly and threaten my friends repeatedly.	
• Is said by the chairman that, speak now speak now.			
950	Dhvani Shah Village : Bada	• Closing public hearings is not in your jurisdiction.	
• Said by the Chairman that, it is within my jurisdiction.			
951	Dhvani Shah Village : Bada	• No sir, Every last person the youngest person can present here.	
• Said by the Chairman that, make whatever presentation you have to make. You present. You present your points			
952	Dhvani Shah Village : Bada	EIA report, they already know as they are running a plant, how much material is used for constructing a chimney. They know only how much exactly revenue is generated,they will not know the exact figure , What is this EIA for ?	
• Stated by the Chairman that, OK OK.			
953	Dhvani Shah Village : Bada	• EIA report is hypothetical Project should know that how many trucks will come and how much impact will occur. They have or not have exact figure, This is their forte. Commitie has the decision power. You can not decide.	
• Said by the Chairman , OK OK OK			
954	Dhvani Shah Village : Bada	• Don't threaten us again to end the hearing.	

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• Is said by the chairman that, whether you have any other concern. • Regional officer of GPCB said that, please raise your concern.			
955	Valji Jashraj Charan	• I have concerns related to environment.	
• Is told by the chairman that, your objections have come and represent your all objections together.			
956	Valji Jashraj Charan	• Sir, We have concerns related to environment.	
• Regional officer of GPCB said that , Submit your concern togetehr			
957	Valji Jashraj Charan	• We are submitting cocerns together only. We have attended othe public hearings. You are guiding us in a way.	
• Is said by the chairman that, we are not saying no to you			
958	Valji Jashraj Charan	• This GPCB official, this GPCB official is favouring and guiding the company in wrong manner We have not seen this in any public hearing.	
• Regional officer of GPCB said that there was no biasness. You are asked to make a presentation.			
959	Valji Jashraj Charan	• GPCB Board, GPCB Board is speaking in favor of the company which is not right at all. And our objection is particular, my objection is totally about the environment, not a single issue without the environment.	
• The provincial officer of GPCB said , yes continue.			
960	Valji Jashraj Charan	• Honorable SDM sir, I also request that this matter be taken on record that our objections and we have attended two or three public hearings before, so we know that our question and the company's...	
• Stated by the Chairman that, all your objections will be taken on record.			

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		• Take it on record but a competent authority should reply. A single person single person is answering this since 11 am and also giving an extravagant answer. That we don't know, look at me, look at me. Not a single answer is clear. Still I have question. If you discharge effluent in sea, what will be the temperature of ammonia gas and waters temperature. Answer me that question.	• We have already given this answer. listen to me
		• The question is related to environment only.	
961	Valji Jashraj Charan	• Sir, ask your experts if there is some or more impact on marine life health.	• We have given this answer that the effluent temperature will not be more than 5 degrees and the level of ammonia gas will be much less than the prescribed level. That would be much lesser than negativity
		• Sir it is shown in your EIA itself that the beach of Bada creates a healthy and healthy environment for life and marine life as shown in its EIA report answer yes or no?	• Expert says that ...
		• Sir we have proof of this thing, Our team has gone to Sutrapada. We have a video of the fish lying on the beach at their plant, the dead microorganisms due to the effluent plant of these people. So sir government sir due to instruction we can not show this thing on screen. It is not ok GPCB & that we cannot prove this thing, many fishes are lying dead in Sutrapada plant.	• And no effect on organism and marine as it will be released within prescribed norms asd as it will be less there will no impact.
• Regional officer of GPCB said that your issues are on record.			

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962	Valji Jashraj Charan	• This issue is about the same thing, the main point will come now that, sir, our effluent plant will not affect the marine environment, but the way they are operating in Sutrapada, the plant is currently running, it will also affect the marine environment. doing. We met fishermen and local people there. And the residents and labor have become absolutely miserable,. So here we have mainly fishermen from Modhwa, Kathda, Mota Laija, Bada, Bambhadai and these villages with a population of more than 10,000. There is no mention in the EIA wrt Koli people of Khata village who do fishing, the Pagadia fishermen who have license . One thing, another thing is that if so much effluent from the plant is released into the sea, then in the upstream direction from Kandla Port to Kandla Port, Tuna Port, then Mundra Port, then Bhadreshwar Power Plant, Mundra Power Plant, then Tragadi. In Kari Kari Mandvi taluka, Tata Power Plant and the sea coast up to Tragadi village have been completely damaged. This area is filled up with all pollutants, due to which the fishermen of Mundra taluka and mandvi taluka have become completely unemployed. Where in today's date not a single fish is found alive, or it does not come into the polluted side. At present, the main area of the Athamani side starts from Bada, where the fishes are collected. Fisherman brothers are gathered here Raise your hands. Every brother raise your hand. These fishermen brothers are dependent on this	

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		and only bada shore is left for any development Ammonia emission can be dangerous and this should be taken on record.	
• Is stated by the chairman that, ok ok			
963	Valji Jashraj Charan	• Secondly, wrt Pagadiya , it has been mentioned in the report that that land is marshy and this land can not be marshy as I can show that in mobile, dolphin is seen and I have myself captured video, Dolphin is found in clean water and that should be taken on record.These people are installing effluent plant and tunnel which they are proposing , fishes in bunch are coming.. It is also mention in the effluent disposal area there are dunes and so many organisms are present. Badas shore don't have marshy land and it does not have stones or marshy . Fishing does not happen in land.	• Marshy related matter was discussed wrt Modhva. This is rocky area and sandstones are available. You have some misunderstanding in this case.
• Is stated by the chairman that, ok ok.			
964		• Bada is best area for fishing activity,they are going to release hot water as per EIA, These people have told rock area istead of marshy area. There are two types of study done in EIA, if they want to discharge hot water then it becomes marshy land and if they want to discharge hot water then it will be become rocky area.I want to show dolphin fish along Bada coast. Clean and clear water suits dolphin. This area rotects many animals and birds. This company will destroy everything. This is total crime , This will kill 1000 peacock. There are 500 habitat where chandangho lives . This will lead to death of schedule 1 ,2 if this industrial development	•

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		will happen. We request to GPCB & CPCB that whichever you carry out such companys public hearing, they should not be goven any clearance. This is matter of 5000-7000 animals. This will be gift to humanity .World is facing so many issues such as global warming , sea level rise . If permissions will be given to this type of industry then it will impact innocent life. This is dangerous to human habitation. man-made industries harming innocent living beings will one day pose a threat to mankind.	
• Is stated by the chairman that, ok ok			
965	Keshav Gadhavi Village : mota layja	• I am making a request, you are young, sorry, you are educated , You must have taken oath and you are in good position.I will forgive, Mother cow will not forgive . You are totally biased.	•
• It is said by the chairman that, ok ok now you don't have any problem. So you...			
966	Valji Jashraj Charan	• I have objections.	
• It is said by the chairman that, you don't drop the mike, speak if you have any objection, I am not sitting here to give clearance. I am the poet again, I am not sitting here to give clearance, just to listen to your objections. Whatever objection you have, I will send it above. There is no decision to be made on this matter from my side.			
967	Laxman Kanji Kariya	• Sir, let me ask a question	
• is said by the chairman that, ask.			
968	Laxman Kanji Karani	• My name should be taken on record, I went to urinal when Vijay sir was asking question , Whatever you discussed about Masjid , temple , I am asking ypu through regional officer 2500 year old durgah is present , name is Jarivala dada. I am 54 year old and trustee . Government has contributed grant for this 2500 old mosque. I have all proof. Gujarat government ahs planted trees in 5 acre land . This report ahs this	• In our area I have talked before that Madad Pir Dada, Vachra Dada and Pagoda Dada are part of our study and this does not come in our area.

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		durgah , This radia sir will not know. Even regional officer does not know. Radia sir has replied to 250-300 wrong answer We have listened to wrong answer. Jari vara dada has 2500 old culture. • Sir , Please record this	
• Is said by the chairman tha , yes, it is being recorded, we will answer your question.			
969	Laxman Kanji Karani	• It has no information sir. And this is called public hearing? Sir, if it is to be given in writing, please send it to Mundra and Barmeda sir, if the public hearing is held in this manner. If this is unconstitutional, my one question is this public hearing should be cancelled.	•
• Stated by the Chairman that, he answers as many questions as you have and as many as he does not answer the questions, we take them on record in this way. We take all your concerns and suggestions on record.			
970	Laxman Kanji Karani	• When I am asking a question to Provisionol officer. Please this is my humble request that we have not come to listen to Radia sir. • Sir, once I have said that about 25 to 30 people are sitting, they should be asked to go as they don't have any answers . how much people will tolerate?	•
• Is said by the chairman that, okay, your presentation is like this, yes, we are recording it			
971		• No No Sir, Record that, We have listened to 250-300 wrong anwers	
• Stated by the Chairman that all the questions asked since morning are recorded.			
972		• The answer is wrong sir, respect the people, we pay thetax and your salary is paid .Respect people and do not divert people in wrong	

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		direction.	
• Has been stated by the chairman that, out of respect for you, this has been kept and verbalized.			
973	Laxman Kanji Kariya	• Therefore, this public hearing is proved to be inconstitutional. There is no answer to this, this Digital India is done by our Gujarat government, sir, you can not let us show dolphin fish inspite of big screen.	
• Has been stated by the chairman that, here is your objection, we have not come to see dolphins or to see digital India. Speak your issue.			
974	Laxman Kanji Kariya	• My question sir, this screen which is visible is called screen in English, we say curtain, who has put it, company. Respected Govt or Honorable Govt of Gujarat or Pollution Department answer me who put this screens? Can give the answered to the public, you people are not giving an answer , these people are taking time to answer . This means there is a conspiracy going on. .	
• According to the Regional Officer of GPCB, the arrangements made in the public hearing have been made by the project proponent.			
975	Laxman Kanji Kariya	• To put it bluntly, the company has installed screens, and why is it not working ?	
• As stated by the Regional Officer of GPCB, dscreen was on during presentation and there is nothing to display s it is closed.			
976	Laxman Kanji Kariya	• No, no, we had mobiles, we had EIA reports.	
• As told by GPCB Regional Officer, discuss whatever objections you have. • Been stated by the Chairman that, present your objections. • As told by GPCB regional officer, this issue is going on since morning, if there is another issue, tell me. • Has been stated by the Chairman, that the next objection is someone speak .			
977	Laxman Kanji Kariya	• You lead the people on the wrong path .	
• Has been stated by the chairman that , no, there is no wrong way . You are diverting in wrong subject.			

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978	Laxman Kanji Kariya	• We are the people .	
• Has been said by the Chairman that, if you are a citizen, give us whatever objections you have.			
979	Laxman Kanji Kariya	• Sir, if you have come to listen to us, then in writing, not our bada, not 22 villages.	
• Has been stated by the chairman that, we give justice to each and every one of you. We take care of your issues. And we are listening since morning, you still present the issues you ccan submit in writing and verbally, but you are not to the point.			
980	Laxman Kanji Kariya	• Sir, we are to the point. We have not diverted from the point, so sir, why this army of 25 people has been kept for us. So let us discuss this. If these people are present then they have to answer. What are these 25 people sitting for? If this is the only question we want to hear, then these 25 people are from government agencies or private so are there officials in them? This is my question? Sir, you have a question? If any government official is sitting, then which agency is government, please answer this, Radiya Sir, these are all private agencies, then none of the agencies have spoken their name .	
• It has been stated by the Regional Officer of GPCB that, if you have any issue please speck...			
981	Laxman Kanji Kariya	• This is an issue, whether they are government officials or private officials. If they are government i, there should be registration . Every agency should tell their registeration no. and thus should be recorded.I am contractor and have 3 agency , We communicate through numbers only.	
• The GPCB regional officer said that, the record is still ongoing			
982	Laxman Kanji Kariya	• Whether you are government agency , tell us yes or no. ?	• NIRI and NIA are government agencies .

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983	Laxman Kanji Kariya	• Whether it is by the Government of India or Gujarat Government or not, at the place of hearing, can you provide the record of them who are sitting. Please record whatever radia sir said that they are all government agencies.	• NEERI and NIO are government organisation.
• Stated by the Chairman that, what is your objection honestly. Say that, you will not stop the procedure. No, no, raise objections regarding your project. Raise objections related to plant.			
984	Laxam Kanji Kariya	• Provincial Officer ...	
• Has been told by the chairman that you should not discuss in this way , Please say your point.			
985	Laxman Kanji Kariya	• We have an intangible right	
• Has been stated by the Chairman, that you should submit a valid objection. Present your objections first. • Regional officer of GPCB said that, the two Central Government Officer are presents, he said that.			
986	Laxman Kanji Kariya	• So give us a list .	
• State your objection, as stated by the Regional Officer of GPCB.			
987	Laxman Kanji Kariya	• Ok thank you. I have filed an application in the environment department. Secretary, Govt of India, I have applied with Delhi Govt. I have the answer to this. Now you don't see any papers. I will not come to give papers. And wrong agency has given wrong report .	
• According to the Regional Officer of GPCB, Ok.			
988	Laxman Kanji Kariya	• To this the Secretary has given an answer that a investigation Committee has been appointed and the investigation is going on. And this type of order comes then public hearing can not be organised and this is unconstitutional.	
• GPCB Regional Officer informed that we have no such record.			
989	Laxman Kanji Kariya	• The provincial officer may record this. Pollution Officer, West Kutch Hon'ble Badmera, has been ordered him to investigate by	

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		Delhi Pollution Department, copy of which is present. Will take a look. Provincial officer look now.	
• It has been stated by the Chairman that , Ok			
990	Laxman Kanji Kariya	• Will see.	
• Show me , as told by Regional Officer of GPCB.			
991	Laxman Kanji Kariya	• DYSP let one of our person come inside so that I can forward this letter.	
• Is stated by Chairman that, I have taken your details on record			
992	Laxman Kanji Kariya	• Now you refuse, Pollution Officer refuses. No one knows that and if you are a magistrate, can you make a decision ?	
993	Laxman Kanji Kariya	• I am coming, Instruct to police officer	
• Has been stated by the chairman that, you give us, we will take it from the record. I have nothing to decide here. I will put your matter on letter record. I assure you to if you give your written representation , we ll keep it in record.			
994	Laxman Kanji Kariya	• You are an officer. You are involved in conspiracy.	
• Is stated by the Chairman that, so you give your presentation we take it on record.			
995	Valji Jashraj Charan	• Where do I come from sir, show this record .	
• Is stated by Chairman that, do n't sho , you speak, I am taking it on record.			
996	Valji Jashraj Charan	• I am telling the reader. • Government of Gujarat Forest and Environment Department, Gandhinagar, Ashok Chauhan, Junior Technical Officer, Deputy Secretary. Letter No. ENV-10-2021-43. To, Chairman District Level CRZ Committee, Collector Office, Kutch – Bhuj. The Regional Officer and Member Secretary. District Level CRZ Committee,	

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		Gujarat Pollution Control Board, Katira Commercial Complex 1, Mangalam Char Rasta Kutch Bhuj. Office of Tushar Badmera Saheb Shri. Subject – presentation of damage to environment and agriculture. By proposed project of Gujarat Heavy Chemical Limited in Bada Madhya of Mandvi Taluka. (GHCL) Repressentation is received from Applicant Valji Charan resident of Kathada village , Mandvi taluka , Copy is attached This is with respect to wrong environment impact assessment report prepared for obtaining environmental clearance. Please submit suitable actions atken and revert back . Yours sincerely- Ashok Chauhan , cc Gujaart pollution board, cc- Valji Charan. I have not got answer to my applicatyion till now.Your public hearing is inappropriate . I have all proof.	
• According to the regional officer of GPCB, the letter of yours, Valji Bhai, which is a copy given by the board, says that the plant should be inspected wrt pollution, but this plant has not yet come.			
997	Valji Jashraj Charan	• So, sir, no one has replied to me in the mail since you have sent me your letter. Now that is not what you will give me. The public hearing is over, I am speaking the proof of how these rules are being violated. Another response to my application, Reference Compliance Report. Received from Charan Valji Jashraj – 19/07/22 Please find include complaint received from valjijashrajcharan	

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		again M/s. Gujarat Heavu Chemical Limited, Regarding EIA report proposed – cancellation of PH of the above project of GPCB. URL: required verified to talk necessary actions regarding intermission complaint with this department with regards copy to charanvaljijashraj. Now the order of the third inquiry is the Collector and the District Magistrate, Kacheri Bhuj . To, Regional Officer, Gujarat Pollution Control Board Bhuj Kutch means Badmera sir, Badmera sir, you, Provincial officer, Mundra, Kuchch, you two officers have received my application, in response to which there is an order for investigation, no investigation has been done yet Subject – Gujarat Heavy Chemical Limited coming up in Bada at of Mandvi Taluka. (GHCL) presentation of damage to environment and agriculture . Reference – Junior Technical Officer and ex-officio Deputy Secretary, Forest and Environment Department, Ganginagar. Letter No. – ENV – 10- 2021-43 /Tcell, dated – 22 .07. 22 The above subject, to state that the applicant Mr. Charan Valji Jashraj, resident – Kathda, Mandvi's undated application reference letter is represented here. A copy of the application is enclosed herewith. It is requested to examine the submissions made in the application and send a reply to the applicant. BH Jala , Chitnis to the Collector	

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		Kutch Bhuj. Dated 22.07. 2022 So the orders you received at least 2 months ago have not been checked, There is no such checking yet. This should be taken on record.	
• According to the Regional Officer of GPCB, Ok.			
998	Valji Jashraj Charan	• Sir , the inquiry order of the same has been written on Collector and District Magistrate neooffice by Bhuj Kutch Collector. Regional Officer, Pollution Control Board Bhuj Kutch – 21.09.2022 This application has been forwarded. The application of the subject environment is the matter of the investigation procedure. Reference – Charan Valji Jashraj, Resident , Mandvi Kutch Neerji In the above matter to state that the applicant Mr. Valji Jashraj Charan Res. Kathda , Our office is presented with reference to Mandvi. Which is enclosed with the copy of the application which initiates the application, is requested to investigate and take action as per the rules and reply to the applicant Shri . BH Jala , Chitnis to the Collector Kutch Bhuj . And on the second from the District Magistrate of Kutch Bhuj, a copy is sent. Shri Charan Valji Jashraj We have sent an inquiry 3-4 months ago we have written to you... two officials are sitting. Officer, I have received the inquiry order of your officer which tells you that EIA report should be checked and still report is not verified . This public hearing is going to end but still I have not received reply. All these three	

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		letter should be taken on record You accept this that the application received 3 months back has not been investigated. Sir, may it be taken on record. Then this application ...	
• It has been stated by the regional officer of GPCB that the record will be taken up.			
999	Valji Jashraj Charan	• My applications came to me from 3 places, there are replies and from the application I made which is the investigation agency, investigation is done but the government does not investigate for 3-3 months and direct PH is done in favor of the company. What does GPCB board mean? It is to give clearance to industries and this is not joke . So we request you to check our application. Give us the right answers. We request that any private organisation shouls check a government agency report We have succeeded in proving that the EIA report is wrong and yet we are again saying for the 10th time that the EIA report of these people is totally wrong. Check them.	
• On record, that it has been stated by Chairman.			
1000	Valji Jashraj Charan	• Investigate EIA report , Provide a satisgactory reply, then only these people should be given environment related clearance. They are not giving clear reply related to companys environment clearance	
1001		• Sir, I have a question regarding the management of solid and hazardous waste. That the effluent from the captive power plant RO and DM plant is to be deposited in the landfill where it has been treated and disposal, if you have	• The first thing is that the effluent will not be put in the landfill , an MoU has been done with the cement plant, we have done an MoU with Sanghi Cement

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		done so in your EIA report, the BOD / COD will be negligible only, I would like to know from you that What is the limit when this type of effluent is to be put in a landfill site, how much BOD and COD should it contain and if you have written that there is a negligible amount.what does it mean?	and will give it at that time . If you talk about the effluent plant will be mixed with effluent and as our effluent is alkaline , HCL will be used as & when required and this will act as a treatment.
1002		• Sir, this is also my question that if your EIA report says that your BOD / COD is negligible, then what is the permissible limit if this type of hazardous waste is to be dumped in the landfill site area. And you have said here that this is negligible, so we assume that you will do the treatment as said and suppose that even after doing proper treatment, if it is to be put in the landfill, then how much will be its BOD and COD .	• But I talked about fly ash.
1003		• This is not about fly ash. The EIA report says that your RO and DM plant where your effluent is going to be released and you are going to dump it to a landfill site. It has been said that the amount of BOD and COD will be negligible amount. So what is the standard procedure of that. It has been assumed that if you do the treatment, you will do the treatment 101 %. What will be the BOD and COD after treatment ? • How much BOD is there ? • You have 30 years of experience .	• Normally which is BOD and COD . So this BOD / COD will be within its permissible limits . And only then we will use in land fill site . • At the moment we have not specified anything. Will know when we start. • We do not get any such requirement .
• This is a non-smoking area as stated by Chairman Shri. You go out, you are standing stand in public and smoking. Take out this person who is smoking cigarette. The police are requested to get him out as. public hearings, is still going on. This is harmful for nearby person. Now give your representation.			
1004		• You are running this plant since 30 years. You should know. If you treat the effluent from the power	• I have already talked about using RO and DM plant effluent

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		plant and RO and DM plant and put it in the landfill site, how much will be its BOD / COD .	which is normal effluent and this will be used for effluents correction. These effluent are normally acidic.This is not needed to dispose in landfill
• The regional officer of GPCB has told that Radia sir if you have the details, otherwise you should Say no specifically.			
1005		• No but your EIA report says that • I am saying that after reading the EIA report .	• No, if the need arises, it will be done according to their limit. • We understand your point.
• The regional officer of GPCB told that she is whether yoy have BOD/COD data. ?			
1006			• We do not have BOD / COD actual data in present.
1007	Vijay Gadhavi	• Sir, I request that you have correctly mentioned that he is standing and smoking here, You can see these small smoke but If it comes near by Chimney what will happen. You can see ciggrete smoke but you can see chimneys smoke . We are standing without food . These many people have come . What is reason behind this public hearing? There is one request that company is saying we will provide fodder, they will provide for give for four days. Radia sir I have question whetehr you will give rabbit, deer , porcupine back. Please answer. Please leave Bada and go towards desert area as whole desert is free.	
• Regional officer of GPCB said that. OK OK we have heard all your submissions, if people have objections, if anyone has any questions...			

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1008	Laxman Kanji Kariya	• My question remains sir, look honorable provincial officer, I am Laxman Bhai Kanji Bhai Gadhavi, I have not said anything like that, why are you torturing me.	
• Chairman stated that this is general talk, Please present your objections.			
1009	Laxman Kanji Kariya	• Police don't torture.	
• Has been stated by the chairman that, you are involved in politics, you should talk about the issue.			
1010	Laxman Kanji Kariya	• Dear Provincial Officer, the issue is that there are Gogal trees in our forest area, the company does not cut these trees, family of 264 from the area of this land, let me continue my question these families, collect Gogal from these Gogal trees and 264 families earn their livelihood, then what is the arrangement for those families ? He is currently earn their livelihood whether he should commit sucide.. • The company has said that we will plant Gogal trees, how many trees will grow till then, how will the life of 264 families live, the government or the company has a plan, the answer is expected .	• We have no work to do in the forest area. If these trees are there, there is no point in taking away their livelihood .It will be same and there will be no any impect on Gogal.
1011		• The provincial officer and the pollution department will be responsible for any Gogal tree that is uprooted , My second question .	
• Chairman said that, we have taken your questions and company's answers on record.			
1012	Laxman Kanji Kariya	• Honorable officer, We have not come to listen from the company, we have not come to say anything about the company, we have come for the honorable officer.	
• Has been told by Chairman that, but you have to come here, the head of the plant gives the answer.			
1013	Laxman Kanji Kariya	• They are giving wrong answers.	

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• Has been stated by the Chairman, that we are taking it on record, and we are taking their answer in record.			
• Has been stated by the chairman that, he wants to say that they are still stuck in one matter..			
1014	Laxman Kanji Kariya	• I am thinking of other question. What will happen to 3 check dams built by Gujarat government? If it is made from government money, then the company will eat it. Radiya ji give the answer. Sir he come to answer this.	• Now it depends on the government that it will suggest an alternative.
1015	Laxman Kanji Kariya	• We don't understand English, I'm sorry.	• They will give us their plans which place we need to shift. So we will remove it and make another place. That is because the of EIA experts were saying that when plant will come the water has to be diverted, where will the rain water go when the plant comes, that will be done and necessary steps will be taken, but as of today there is no plan for it.
1016	Laxman Kanji Kariya	• Sir, I used to say that everything is above all.	
• Has been stated by Chairman that, all this has been taken on record.			
1017	Laxman Kanji Kariya	• Yes, 3 dams are there but we still know, I doubt it. Hence... question further	
1018		• How many acres of lands application is submitted to government.	• An application of around 100 ha has been given.
1019	Lakshman	• Sir, tell in Gujarati with explanation. I don't know. These illiterate people do not know.	• Around 250 acres
1020	Lakshman	• A proposal of 250 acres has been put. 5000 animals including near	

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		by cow, buffalo , goat are grazing. What will our buffalo , cow will do. These 5000 no, where it will go ? Did tyou do any study . Againwe are going to listen wrong anwer to this question. They only want to install plant. • give answer	
• The reply given by the Sub Divisional Magistrate That is your represention.			
1021	Lakshman	• Not you, I want answer from them.	
• We have come to listen to your objections even if we do not have the answer we have come here to listen your obejcetions as stated by the Sub Divisional Magistrate.			
1022	Lakshman	• No no sir	
• The Sub-Divisional Magistrate will reject if there is no reply to us given by the court officer. We have taken your objection.			
1023	Lakshman	• So sir, when the DLR report was made, the first public hearing was 6 months ago, till then these documents were not prepared.	
• The reply given by the Sub Divisional Magistrate The information which they have they have given them. Those informations which did not have with them are taken in the letter.			
1024	Lakshman	• This should be recorded. 5000 cattle from 5-7 villages are being fed. The officials of the GHCL company do not tell the truth to the people through the provincial officials. Sir, please be side of Public.	
• The answer given by the Sub Divisional Magistrate Officer, We belong to the people, the hearing is going on since 11 o'clock in the morning.			
1025	Lakshman		
• Answer given by Sub Divisional Magistrate Officer, I am not sitting to give clearance now.			
1026	Lakshman	• So sir, they do not have answer in this public hearing.	
• The answer given by the Sub Divisional Magistrate your objection are there. You have been objecting since morning.			
1027	Lakshman	• Sir cancel this, if they don't have answer.	
• The answer given by the Sub Divisional Magistrate is no. Send us your objections			
1028	Lakshman	• Sir, tell me what they have done in this study.	

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• The reply given by the Sub-Divisional Magistrate, they have to reply to the Committee They have to answer. The answer will be given to the committee.			
1029	Lakshman	• Sir, you explained in one word. This is a committee's responsibility. What are these people for? Why have people been called? So you would have send it directly.	• People of Bada village have presented. Our fodder land is going and that's why....
• Reply by Sub Divisional Magistrate Your objections.....			
1030	Lakshman	• Show the names of the people in this village.	• That is why we have given guarantee of 12 months of fodder for Bada village.
1031	Lakshman	• One minute. This company is going to stay for 12 months? 35 years in Sutrapada, this is 12 months.	• All 12 month. Fodder will be arranged as per requirement.
1032	Lakshman	• Have you Study yes or not. How many in 5000?	• We have not studied no. of cattle.
1033	Lakshman	• Take it on record, these people have not studied at all.	
1034		• This is platform where villagers can represent.Villager can do RTI to statuatary body and get their answers Radiya sir is saying-12 month. who will answer me.	
• The answer given by the Sub Divisional Magistrate is that he has answered the questions asked. Taken in minutes.			
1035	Lakshman	• Provincial officer you are senior to us one second, Let me take a breathe.	
• Inhale or discuss, the answer given by the Sub Divisional Magistrate Strat Officer.			
1036		• Hon'ble officer has arranged fodder within CSR. Fodder has been given for 15 days to Buffer zone. When there was a great need, the villagers demanded fodder. we have a written photo. They were not capable to provide fodder. 250 acres of land for this fodder is not a small matter. This is taken a big area. Shows the	• Fodder has been provided to villagers. We have provided details about fodder. We have given this in writing to villagers.

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		planning of the future. Our livestock is usafe. Let us plan ahead. Where EIA report is not included and CSR activities are to be done there . So did not. Why should we do? Give answer	
1037		• Please provide figure, how many villages you gave fodder in CSR fund.	• I don't have exact figures a present
1038		• I need past data related to CSR fund and their activity	• Approx. 35-40 lakhs have been spent.
1039		• In which village? How many livestock are there in the village?	• have provided 12 village impact area
• Answer given by the Sub Divisional Magistrate Officer, Do not divert discussion. Say your issue.			
1040		• You drink milk, I drink milk. This is same mother cow .	
• The reply given by the Sub Divisional Magistrate Officer that, this public hearing is not for discussion, We are taking your written representation too,We are not discussing on whether you want to bring this plant or not, This is not deciding authority. This is not platform for argument			
1041	Vijay Gadhavi	• I am vijay gadhvi these people are going to install power project. In order to operate it, they should tell how they will operate and from where they will bring fuel .	• Today we are talking about solid fired boiler . Whererin we are going to utilise lignite. We are in consultation with TCE (Tata consulting enginner). We are wishing to utilise biomass in future as an other alternative . We are also checking on their commercial viability. We are going to utilise coal lignite and we ll transport it through truck.
1042	Vijay Gadhavi	• Approximately how many trucks will be ?	• About 70-100 trucks for fuel.
1043	Vijay Gadhavi	• All this is strictly observed. • the coal,lignite handling today is not a violation of the government's coal handling guidelines?.	• It will be done according to its guideline.
1044	Dhvani Shah Village : Bada	• Public roads cannot be used as per the coal handling guideline.	• All these plants use public roads.

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			Alternatives will be considered when instructions are given to us.
1045	Dhvani Shah Village : Bada	• one minute	
• Provincial Officer of GPCB - First listen to sir whatever other objection are. Put it in. Question – Answer should not be done.			
1046	Dhvani Shah Village : Bada	• 6.4 Sir	
• Sub divisional magistrate stated that this type of questioning and ansering is not Ok			
1047	Dhvani Shah Village : Bada	• 6.4 sir you cannot violate my right.	
• 6.4 Sub Divisional Magistrate asked to give in writing.			
1048	Dhvani Shah Village : Bada	• You can not violate our right. • No sir.	
• Answer given by the Sub Divisional Magistrate Officer that, Now I will close the hearing after 5 minutes.			
1049	Dhvani Shah Village : Bada	• No sir EIA notification says you are not above it.	
• Sub divisional magistrate said that you will not decide, I ll decide			
1050	Dhvani Shah Village : Bada	• There is no timeline detailing until the issue ends. You will stop black mailing. You are saying about all power plant. Adani has a plant. It is based on advanced technology. You use using once through cooling. That is old technology why would you use that? • You have given examples of all plants. You said the best technology. But why don't you do it?	• The best technology will be done. this is commercially viable.
1051	Dhvani Shah Village : Bada	• Whether now it is commercial viable or not ?	• We will use the latest technology. We will do it on basis of commercial availability.
1052	Dhvani Shah Village : Bada	• OPG power plant was once through cooling system, it had to change the technology. After studying the available option, why not include it was including in EIA?	•

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		Secondary sir, if you use best available technology and do not pollute. For that, intake and outfall channels are required. You need it because you want to discharge polluting material.	
• GPCB - You enter into the discussion with whatever they have replied.			
1053	Dhvani Shah Village : Bada	• I am seeking clarification. 6.4 you cannot stop me. Please answer.	• As we said once through cooling system we have back pressure turbine and huge sea water requirement. And we will also be using the cooling tower as per the requirement and it is not a question. Otherwise once through cooling system will be used in soda ash. so we have taken as an option.
1054	Dhvani Shah Village : Bada	• ZLD is the best available technology. Why don't you need that.	
• Provincial Officer of GPCB - Your suggestion is good. You send it. This is the subject related to environment. I am telling you. • The Chairman Stated that you cannot make any oral submission. Because you are coming back again 4th times. You all are coming one after another. Give us your written submission. submit your issue related to environment in writing.			
1055	Vijay Ghadhavi	• You are an officer.	
• The Chairman Stated that give us in writing			
1056	Vijay Ghadhavi	• Give you in writing	
• Provincial Officer of GPCB - Vijay gadhavi, If you have any other submissions, let me know.			
1057	Vijay Ghadhavi	• Sir, we don't give it in writing • You are an officer.	
• The reply given by the Sub Divisional Magistrate Officer that,It will be recorded in this record. This is public hearing. So get this in writing			
1058	Valji Jashraj Charan	• We are a citizen we have not come to do investigation.....	
• The answer given by the Sub Divisional Magistrate Officer this is public hearing. You give it in writing.			

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1059	Valji Jashraj Charan	• you can't leave anyone. We will come to GPCB again. You can not leave the place even if the hearing lasts for 4 days.	• GPCB Regionall Officer and Chairman.
• It was stated by the chairmam, That if you have any written submission. give it to us Give your points. • The Regional officer of GPCB said that if you do not give in writing then this public hearing is over.			
1060	Vijay Gadhavi	• My own 9-10 questions are remaining to ask. My question remains. My question remains. But there is no question. 10 question are of mine to ask.	
• As stated by Chairman Shri, you should give it in writing. I have been listening to your public hearing since morning. You are repeating same point one after another. 3 to 4 persons are only coming during public hearing. Only one objection comes then they go out and comes back. Give your representation in writing.			
1061	Vijay Gadhavi	• You become a supporter of the company.	
• It was told by the chairman that, we have been listening to you since morning, we have given you the mic. Everything you say has been recorded. We gave you mic frequently and you have spoke for many time. Your speech has been recorded, no one has taken mic away from you, you have been speaking since 11 o'clock.			
1062	Vijay Gadhavi	• Mic was taken away from me.	
Reply by Sub Divisional Magistrate Officer . You give it in writing. You give your oral submission in writing . No No Give it in writing.			
1063	Vijay Gadhavi	• I have to make an oral presentation.	• Chairman only one thing to say. This should be noted that Dhwani Shah and Valji Charan are far from the affected area. So there oral submission should not be considered.
1064	Vijay Gadhavi	• Now I present..	
• Chairman said that you should submit a written submission. Submit your written submission, present your objection within the legal jurisdiction.			
1065	Vijay Gadhavi	• Radia sir, is giving wrong answers to all the questions. Radia Sir has given wrong answers to 200 questions. Then he is saying that	

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		this sister is not from this area. Valji doesn't belong here, your are doing forcefully. Why are you doing that? The whole public hearing is in favor of the company and they are putting allegations on us.	
1066		• We people are not from here, then from where is the company?	
• It was stated by the Chairman, give any representation you have in writing. We conclude this hearing.			

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Regional officer, Kutch (West), Gujarat Pollution Control Board told the public that written submissions have been received from a total of 1154 persons including 1031 persons with reasonable interest before the public hearing and 123 persons during the public hearing will be included in the agenda.

Regional Officer, Kutch (West), Gujarat Pollution Control Board was present in the presence of any other people's views / suggestions / representations regarding the proposed project , but no other views were presented .

- Environmental Public Hearing was finally declared closed by the Regional Officer Kutch (West), Gujarat Pollution Control Board with the approval of the Sub Divisional Magistrate Shri.

Place :
Project Site , Survey no. 432 , Village: Bada , Taluk: Mandvi , District: Kutch, Gujarat ,

Date : 17 / 10 / 2022

T. C Barmeda

T. C. Barmeda
Regional Officer,
GPCB, Kutch (West) as
Representative of the
Member Secretary, GPCB

Chetan Misan (GAS) ,
Sub Divisional Magistrate and
Deputy Collector , Mundra
(Kutch)

2nd PH photographs










GHCL LTD – Public hearing Action Plan

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
1	CSR – Fodder	4	Steps to be taken for cattle Care about Maldhari community Security regarding fodder supply for livestock.	Fodder will be provided as well as provision for veterinary doctor will be carried out by GHCL foundation under CSR activity.	• Activities for fodder supply will be carried out under CSR and CER activities for strengthening the bond between the project authorities and the local population. (refer Ch-8 and Table 10.4 in Ch-10). Fodder field will be developed on the Government/allocate land to nearby villages. • Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR activities for communities. • During year 2020-2021, GHCL foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation, Animal husbandry, health care, SHG, Infrastructure development etc. • We have already provided veterinary doctor for nearby affected villages.	• As per MoEF&CC Office Memorandum F.NO. 22-67/2017-IA III, MoEF&CC, New Delhi, dated on 1st May 2018 GHCL Ltd has earmarked 0.5 % of capital investment (appro. Rs. 18.04 crore), towards the Corporate Environment Responsibility in 5 years • GHCL Ltd will spend approx. **4.35 crore*** towards Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages as per requirement under CER activities (* value may defer as per actual requirement)	5 years	GHCL Limited
2	Employment	5	For employment of local villagers Number of employment opportunities to be generated Priority must be given to nearby 10 villages Regarding priority to nearby villages	Information on employment opportunities has given by Project Proponent that there are different types of employment opportunities in the two phase of the projects i.e. construction	• The proposed project has a potential for employment of skilled, semiskilled and unskilled employees during construction phase as well as	• GHCL Ltd will spend approx. 2.25 crore towards Promoting activities for skill building to improve	During construction and Operation phase	GHCL Limited

GHCL LTD – Public hearing Action Plan

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			for labor work Regarding employment for local communities.	phase and operational phase of the project. GHCL will strive to provide these employment opportunities to the local people, for which work will be done for their skill development and employment opportunities will be provided to the local people. As per requirement, training will be given to local people in coordination with HR department. Priority will be given for employment of local people. In nearby villages a group of women can be formed so that they can work in Gruhudhyogs (Home- based business). M/s. GHCL shall provide employment to women as per their skills and qualification.	operational phase. The plant will create direct employment in phased manner for about 1200 (operational phase) skilled as well as semi-skilled staff and indirectly large number of unskilled manpower will be engaged for the project. For Employment, local people will get first priority as per suitability and requirement. People will also get employed by the contractors for various project related activities.(Refer Ch-8 of EIA report) • GHCL foundation will carry out skill development Programme for local youth to improve their employment opportunities, women empowerment under CSR and CER activities.	employment opportunities and women empowerment in nearby villages under CER activities.		
3	CSR - Health	1	Regarding health facilities under CSR activities	Will provide mobile health van facility and upgradation of existing healthcare infrastructure	• Industry will provide Mobile Health Care, Health Camps, and Specialized Check Up Camps in nearby villages. Necessary support and help will be extended for advanced diagnosis and treatment wherever identified, Free medical health checkup under CSR and CER activities.(Refer Ch-8 of EIA report). We have already initiated mobile health van facility for nearby affected villages of project site.	• GHCL Ltd will spend approx.. 1.12 crore towards Infrastructure development Such as primary healthcare units and the fulfilment of the basic amenities in PHCs including mobile medical van and Provide Bala-Rasayana to Malnutrition Children in Aanganwadi and PHC of nearby Villages under CER activities.	5 years	GHCL Limited
4	CSR - Education	3	Regarding scholarship under CSR activity Regarding skill development of youth and improvement of economic	Will build school in future as per requirement and will also upgrade the existing school infrastructure and will carry out	• Unit will be directed at two levels viz. school and skill building to improve employment opportunities. At	• GHCL Foundation will spend approx.. 1.47 crore	5 years	GHCL Limited

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			conditions To provide educational facilities	skill development activities	school level we intend to promote quality of education and learnability, develop infrastructure of Government schools, provide vocational training as per the requirement under CSR and CER activities. • GHCL foundation will support local government and NGO to make that program more effective. • GHCL foundation will carry out skill development Programme for local youth to improve their employment opportunities, women empowerment under CSR and CER activities. • During year 2020-2021, GHCL Foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation, Animal husbandry, health care, SHG, Infrastructure development etc.	towards Infrastructure development for quality of education, which will ultimately upgrade schools in nearby villages under CER activities.		
5	Air Pollutants (SOx, NOx, Dust)	6	Height of chimney to be installed Levels of Sox and NOx Regarding acid rain cause by Sox Emission of PM during transportation and Emission of heavy metal such as	For minimizing Air Pollution, requisite height of the stacks will be provided as per the NAAQS norms. Besides this, Modern technology equipment's like Dust collector, Electrostatic Precipitator, Scrubber will be	• The best available technology-based pollution prevention and control shall used to meet the regulatory standards and these pollution control systems will be commissioned before	• **Air pollution** • Capital cost would include air pollution control devices like ESPs, Scrubbers, Dust extraction and suppression systems,	During operation phase	GHCL Limited

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			mercury. Regarding once through cooling for 120 MW. Regarding linkage of fuel and how they are going to use it	installed. As a result, the pollution level will be within standard limits. GHCL will continue to support development of green belt in the surrounding villages through various agencies including GHCL Foundation (AF). GHCL shall endorses AF tree plantation movement of planting trees in entire Mandvi Taluka and 50,000 trees that mentioned, GHCL shall surely nurture those plants for five years.	commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the operational units, so that failure of the control system shall shut down the respective operational unit. • High efficiency ESPs shall be provided in the flue gas path of the CFBC boilers for control of particulate matter. • Finely ground limestone will be added to the boiler combustion zone • together with coal/lignite to arrest the SO2 formed during combustion. • Lime stone dozing system to the furnace to be designed to achieve higher than 90% capture of SO2. Monitoring system(CEMS) of air pollutants SO2, NOx, NH3, PM10 and PM2.5 will be implemented. • So, the expected pollutants will be well within standard norms. • The air quality monitoring will be carried out on regular basis by approved agencies by CPCB/GSPCB. (refer Ch-6 and Ch-10 of EIA report) • GHCL will implement greenbelt /plantation program to ameliorate the pollutants and improve the aesthetics and ambient air quality. (refer Ch-10 of EIA report) • There is negligible cooling water requirement for power generation. There is no any alternative effective system is available for soda ash plant.	Stacks, Dry Fog system, Wind screen etc- 89.28 crore • recurring cost would include operation and maintenance of pollution control devices- 1.50 crore • **Environmental monitoring Programme** capital cost include OCEMS, online weather station etc- 3.4 crore • Recurring cost – 0.95 crore • **Greenbelt** • Capital Cost- 20 Crore • Recurring Cost- 0.5 crore		

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					• There is no readily available infrastructure for transportation of fuel i.e. rail or water way. So, we have to transport through road. Traffic study are shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. In future, any alternative option available will explore. • GHCL Foundation will also promoting plantation activities in nearby villages under CSR and CER activities			
6	Water pollutants (BOD,COD,Ammonia, Mercury, Sea Weed, Mangroves)	7	Regarding water related question by Koli society Regarding decrease in number of phytoplanktons and disruption of food chain Regarding temperature and presence of ammonia in waste water Regarding presence of mangroves Regarding setup of tunnel for intake of sea water, seismic zone in which company falls, liquification of land due to heat Regarding discharge of effluents into sea containing ammonia and high temperature and death of fishes at Sutrapada plant Regarding quality of effluent in terms of BOD and COD	Effluent will be highly alkaline so it will be mixed with HCL and then it will be disposed off in sea. Design of structure will done according to seismic zone V. In soda ash industry impact of ammonia is very low.	• Industry will provide adequate effluent management and monitoring system for disposal of treated water • Proper seawater intake and treated effluent disposal (ensure maximum dilution) shall be done as per recommendation Marine EIA report. • The water monitoring results of (surface and groundwater and marine) should be carefully evaluated to identify significant changes, if any, adverse change from the baseline accordingly, corrective measures will be taken to ensure the sustenance of water quality. However, there is no ground water pollution is envisage in such soda ash plant, • The ammonia concentration in treated waste water well	• **Water Pollution** • Capital cost would include cost of ETP, STP etc- 14 crore • recurring cost would include operation and maintenance of pollution control devices- 0.12 • **Environmental monitoring Programme** capital cost include online pH, NH3-N, Temp meter etc- 3.4 crore • Recurring cost including Fresh water & wastewater sample analysis charges and Marine area environment monitoring – 0.95 crore	During operation phase	GHCL Limited

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					within the limit specified by CPCB for soda ash industry. • There is no such fish kill cases due to treated effluent in existing plant. There are independent studies available which indicates there is no significant adverse impact on marine environment but there will be positive impact on environment. • During studies, there is no such mangroves identified in sea water intake and outfall line area. • Design of pipeline/tunnel will be done according to seismic zone V. In case of catastrophic failure/ liquification on land, there are no chances of flooding as water transport through gravity.			
7	Marine Life	1	Effect on marine life due to proposed project	No adverse impact on fish or marine animals and sea weed observed.	• Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. The effluent release scheme can then be adequately modified to ascertain necessary dilution, if required. The efficiency of the diffuser must be checked periodically and if necessary, it should be cleaned to revert back to the dilution ascertained through initial tracer studies. • There are independent studies available which indicates there is no significant adverse	• A provision of Rs. 1 crore to be earmarked for the biodiversity management plan to be implemented in the project area during construction phase and operation phase. • For periodic monitoring of the marine area environment during project • construction phase, a provision of Rs. 0.5 crore to earmarked. • For operation phase, Rs. 0.3 crore per year to be kept provision for • the monitoring.	During construction and Operation phase	GHCL Limited

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					impact on environment but there will be positive impact on environment. • Design of pipeline/tunnel will be done according to seismic zone V. In case of catastrophic failure/ liquification on land, there are no chances of flooding as water transport through gravity.			
8	Health & Hygiene(Ammonia Leakge)	2	Skin diseases due to Soda Ash Regarding the leakage of ammonia.	GHCL will take care of any such issues related to Health of local peoples and workers. All the necessary measures for handling of chemicals will be implemented to reduce its impact on health of peoples. This information is also provided in the EIA report. All the pockets will have leak detection and repair system technology. Moreover, periodical maintenance will also be carried out. GHCL will ensure that there will be no leakage and therefore, there will not be occupational health issues for workers or villagers working in the plant. Moreover, GHCL will also provide PPE kits to workers for their safety.	• Ammonia tanks should have latest instrumentation provision for pressure indication, temperature indication and level indication. The provision of instrumentation should be within 100 percent redundancy. Continues recording of major parameters pertaining to the storages shall be maintained in the control room. • Unit will provide all the safety measure for ammonia storage as well as also prepare onsite and offsite emergency plan and all the APCM with respective units to mitigate the air pollution. The best available technology-based pollution prevention and control shall used to meet the regulatory standards and these pollution control systems will be	• Capital cost would include cost of OHS center, PPEs, fire & safety instruments, automation system for ammonia storage – 3.4 crore • Recurring cost would include maintenance charges and training, audit & health check-up etc.- 0.35 crore	During operation phase	GHCL Limited

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					commissioned before commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the operational units, so that failure of the control system shall shut down the respective operational unit. • There is no significant impact observed in the existing soda ash plants in Gujarat.. • There are rare possibilities of ammonia leakage observed in soda ash plant however, recommendation of Disaster management plan and risk assessment will be followed.			
9	CSR - Farmers	3	Facilities to be provided to nearby farmers How hygenic the plant will be? How hygenic will be bada plant and what facility will be provided to the farmer.	GHCL Foundation is already providing subsidy for drip irrigation and GHCL will also consider to support this scheme further out of the CSR funds proposed for this project. To help agriculture, GHCL will help farmers as part of our CSR activity in consultation with villagers. The details and type of developmental work will be decided in consultation with villagers. GHCL foundation has been working for farmers through its different schemes like ground water recharge, water harvesting, zero chemical farming, drip irrigation etc.	• Industry will Promote environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of high-quality seeds/manure, efficient irrigation solutions, etc. under CSR and CER activities	• GHCL Ltd will spend approx.. 3.00 crore towards Promoting environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of high-quality seeds/manure, efficient irrigation solutions, etc under CER activities.	5 years	GHCL Limited
10	EIA Report & PH	14	EIA report is not correct	The terrestrial EIA report is	• It is requested to note that as			GHCL Limited

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
	advertisement		Regarding the alternative of site modhwa village. Regarding the NIO accreditation to prepare marine EIA report Regarding ToR granted and Study carried out prior of ToR granted. Regarding the advertisement of the PH Regarding NABET accreditation of consultant organization Regarding Marine EIA Regarding NEERI who has prepared EIA report Regarding the correction in EIA report Regarding the monitoring data collection Regarding accreditation certificate of additional studies for ecology.	prepared by CSIR NEERI and Marine EIA report is prepared by NIO, Mumbai	per OM number J-17011/8/92-IA-III dated 8th August, 2019, there are 7 institutes/agencies authorized for preparation of CZMPS in consonance with the provision of CRZ notification, 2019 vide GSR 37(e) dated 18/01/2019. IRS anna university Chennai has prepared the CRZ map for GHCL LTD. CSIR -NIO is Expert hired to carryout the Marine EIA study. • EIA report has been prepared by CSIR-NEERI, which is reputed governmental body and QCI NABET accredited consultant. • An extensive study on the ecology and Biodiversity in the study area was conducted by the QCI NABET approved functional area expert.			
11	Vipassana	3	Project site is near Vipassana meditation center The meditation center will be disturbed due to industry. Ammonia used in the industry. Related to presence of Vipassana center and other religious places in 15km radius of project site	--	• Environmental Management Plan envisages the plans for the proper implementation of mitigation measures to reduce the adverse impacts. • The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment. • The monitoring of all valued environmental components will be monitored as per the norms prescribed by GPCB/CPCB and the time to-time guidelines issued for soda	• Cost of Environment-management plant including various installations for Air Pollution, Water Pollution, Noise Control, Greenbelt Development, Occupational Health and Safety and other related activities.-205.07 crore • Recurring cost include maintaining and monitoring of all components- 6.98 crore. • **Greenbelt** • Capital Cost- 20 Crore	--	GHCL Limited

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					ash manufacturing industry. • It is reported in CSIR NEERI report that there are no significant impact expected on man-made sensitive installations and habitations. On basis of study of present environment condition near project area and impact prediction and control measures proposed by GHCL Ltd. The proposed project will not have any significant negative impact on environment. Company operations are limited to the plant boundary and no negative impacts on Vipassana Centre are anticipated. The company will have robust peripheral Green Belt in order to attenuate noise and air emission due to plant operations.	• Recurring Cost- 0.5 crore		
12	CSR - Animal Husbandry	3	Regarding arrangements for Animal husbandry to nearby villages Regarding distribution of kits to fisherman under CSR activity Regarding number of cattle present in the area	GHCL Foundation will support nearby community by providing education and livelihood support to make them self – reliant.	• Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR activities. • Unit will also promote development Initiatives for Fishing Communities such as Creation of infrastructure like ice plants, cold storages as well as provide operational inputs such as fishing boats, nets and engines • We have already provided veterinary doctor for nearby affected villages.	• GHCL Ltd will spend approx.. 4.35 crore towards Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages under CER activities	5 years	GHCL Limited

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13	Site Selection	2	Regarding the alternative of site modhwa village. Regarding showing presence of marshy land near coastline	--	During the site selection, the alternative sites considered for setting-up of the proposed chemical complex project are given below: : Site 1 – Village Pingleswar, Taluka – Abdasa, Dist. Kutch Site 2 – Village Suthri, Taluka – Abdasa, Dist. Kutch Site 3 – Village Bambhdai, Taluka – Mandvi, Dist. Kutch Site 4 – Village Bada, Taluka – Mandvi, Dist. Kutch Site 5 – Village Modhva, Taluka Mandvi, Dist. Kutch The site at village bada is considered favorable based on the environmental and logistic advantages over other four sites. Justification of Site selection are given in Chapter-5 of EIA report.	--	--	GHCL Limited
14	Sand Dunes	2	Concern of presence of sand dunes at bada coast Regarding digging of sand dunes for preparation of tunnels for water intake	--	• There is no disturbance to existing sand dunes. • Tunnelling work (much below ground level) for laying pipeline through sand dunes will be done by adopting proven construction methodology like micro tunnelling. The detailed Studies on sand dune mapping and morphological changes near the project site was carried by National Institute of Oceanography (NIO), Goa. This report can be referred from CSIR NIO Marine EIA. • GHCL Ltd is committed for conservation plan for sea turtles and sand dunes as suggested by various studies.	--	--	GHCL Limited

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
15	Turtle	3	Regarding presence of turtles on the coastline of bada Regarding information on endangered species not mentioned in EIA report Regarding hatching and presence of sea turtles	--	• Study on Status Survey and Conservation Plan for Sea Turtles along Mandvi Taluka, Bhuj, Gujarat by **Zoological Survey of India**, **Kolkata (April,2019)** is attached with EIA report. • ZSI study report mention that they did not any encounter any sea turtle and fresh/old nests or crawl marks of turtles on the beach. Since many of the factor for selection of a suitable nesting site are not conducive. • As per additional Ecological and Biodiversity study, suggests that the coast near the proposed project site may not be suitable for sea turtle nesting due to narrow supra tidal region, steep slope, dense vegetation and presence of predators such as dogs and jackals. Though, observations suggest that there may be no or negligible probability of sea turtle nesting. • GUIDE is also engaged for study of turtle survey and preparing conservation plan. Premiliary observation are found to be similar. GHCL Ltd is committed for conservation plan for sea turtles and sand dunes as suggested.	• Contribution to Forest department for Sea Turtle Conservation Activities- 0.20 crore	10 years	GHCL Ltd
16	Schedule 1 species (Peacock, Googal. Turtle,	4	Regarding presence of greater numbers of peacocks nearby and not	--	• Details of schedule -1 species and conservation plan is	• the proposed budget	10 years	GHCL Ltd

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
	Sandha and indian Monitor Lizard)		stated in report Presence of reptiles and amphibians not reported Related to study of presence of Indian Monitor Lizard in study area Regarding presence of gugal trees,		already incorporated in EIA report. • GHCL shall make financial allocations for taking up wildlife mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • GHCL Ltd have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle, Chinkara and Gugal - Schedule –I species and Critically Endangered species) to CWLW department of Gujarat.	allocation for conservation of Schedule 1 species for 10 years is 1.25 crore		
17	Conservation Plan	2	Regarding conservation plan for Schedule 1 species Concern regarding green sea turtles and conservation plan for them	--	• GHCL shall make financial allocations for taking up wildlife • mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • The unit have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle, Chinkara and Gugal - Schedule –I species and Critically Endangered species) to CWLW	• the proposed budget allocation for conservation of Schedule 1 species for 10 years is 1.25 crore	10 Years	GHCL Limited

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					department of Gujarat.			
18	Form 1(Water Bodies, Temples, Schedule 1 Species)	5	Regarding presence of waterbody not shown in form-1 Regarding religious places and lakes not mentioned in PFR report. Waterbody not mentioned in form-1 Data given in form-1 and EIA are different Waterbody not mentioned in form-1	--	• Environmental settings are given in Chapter-1 and Chapter-5 of EIA report. Approximate distance of water bodies, temples etc are given in EIA report. • Through drainage studies of the area, it was observed that there is one stream of 1st order entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, will be diverted to nearby passing Vengadi River in the west. • There are also pond inside the premises. It is proposed that pond i.e. inside the premises will be used to store entire annual surface runoff plant use. If permitted by concern authority.	• -Cost of drainage network of surface runoff, rainwater collection pond and rain water harvesting system – 53 crores (included in EMP)	--	GHCL LTD
19	Govt. Land	3	Regarding type of land to be procured by the industry Regarding status of government land to be procured Providing data for proving gauchar land	--	• There is no gauchar land within proposed project site. M/s GHCL has applied to Industries Commissioner and District Collector for allotment of aforesaid land. Industries Commissioner has granted In Principle approval for Bonafied Industrial Purpose. District Collector has initiated actions for allotment of Govt. waste land.	--	--	GHCL LTD
20	Fishing	8	Regarding details of Pagadia fisherman not mentioned and Marine EIA is misinterpreted	--	• Proper seawater intake and treated effluent disposal (ensure maximum • dilution) shall be done as per	• A provision of Rs. 1 crore to be earmarked for the biodiversity management plan to be	During construction and	GHCL LTD

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Regarding disturbance to fishes due to presence of pipeline Regarding status of fishing near bada and Mandvi Related to number of fisherman not incorporated in study -- Related to presence of dead fishes not reported in study, fishing carried out for commercial purpose Regarding presence of fisherman in study area		Marine EIA report prepared by NIO • Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. • Details of Fishery and fishermen including their family and population are given in Chapter-3 of marine EIA report. • Other than construction phase, there will be no any impact on pagadiya fisher men. As shore line will remain undisturbed. • It is mentioned in marine EIA report that no large-scale commercial fishing operation prevail in the study area except for minor shore based and Gill net operations. • There are independent studies available which indicates there is no significant adverse impact on environment but there will be positive impact on environment. • Unit will also promote development Initiatives for Fishing Communities including pagadiya under CER and CSR activities	implemented in the project area during construction phase and operation phase. • For periodic monitoring of the marine area environment during project • construction phase, a provision of Rs. 0.5 crore to earmarked. • For operation phase, Rs. 0.3 crore per year to be kept provision for • the monitoring. • GHCL Ltd will spend approx.. 0.75 crore towards Development Initiatives for Fishing Communities including pagadiya under CER activities	Operation phase	
21	Water Body (check dams)	2	Related to presence of seasonal river which passes near bada village and presence of dam over it	--	• Through drainage studies of the area, it was observed that there is one stream of 1st order	• Cost of drainage network of surface runoff, rainwater collection	During construction and	GHCL LTD

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S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Related to distance of river from project site		entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, may be diverted to nearby passing Vengadi River in the west, which has two check dams, one for salinity ingress check and on upstream side for storing fresh water. This will not cause any adverse impact on the downstream. For channelizing the monsoon run off from the area adjacent to plant it is required to construct peripheral drain along plant boundary so that flooding is avoided and run off find its way to the natural slope towards Arabian Sea. So, the present hydrological setting of the area will remain unaffected. So, the present hydrological setting of the area will remain unaffected. • The additional water enter into the vengadi river through drainage will not impact on check dam. As any additional water above the river and check dam shall overflow to the Arabian sea.	pond and rain water harvesting system – 53 crores (included in EMP)	Operation phase	
22	Traffic (RMH, Heavy Trucks, Road Usage)	4	Regarding number of trucks passing due to project for raw material Related to traffic study not mentioned in ToR, impact not carried out Concern regarding public roads Regarding number of trucks passing	--	• Traffic study are shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. • We will use existing road network as no other transportation i.e. rail/water ways are available. We have carried out calculation on	--		GHCL Limited

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					Traffic study (Level of Service) and added on Form Part-C.			
23	CSR General	1	Regarding past data of CSR	GHCL has proposed CSR budget in the EIA report which will be utilized based on need identification and village development meetings. CSR will be implemented with CSR implementing agencies including GHCL Foundation is working in following area. 1. Agro-livelihood and animal husbandry, 2. Education and skill development, 3. Health, water, and sanitation.	• GHCL's commitment towards the development of weaker sections of society has been a continuous initiative for more than two decades. Through its "GHCL Foundation Trust", GHCL has upgraded its CSR activities to cover a larger section of the society to provide support to the downtrodden, needy and marginalized citizens and also to create a social infrastructure for their sustenance. GHCL Foundation serves as the Corporate Social Responsibility arm of GHCL Limited and represents our commitment to the holistic development of our surrounding community. During year 2020-2021 GHCL has spent INR 9.03 Crores towards CSR activities. During year 2021-2022 GHCL has spent INR 10.62 Crores towards CSR activities • CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation, Animal husbandry, health care, SHG,	--	--	GHCL LTD

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					Infrastructure development etc.			
24	Pollution and Environment General	4	Regarding pollution to be caused by industry -- Regarding to dusting due to kiln and power plant, temperature of water Related to disposal of effluent water	Unit will follow all the rules and regulation with their subsequent amendments as directed by concerned authorities	• Environmental Management Plan envisages the plans for the proper implementation of mitigation measures to reduce the adverse impacts. • The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment. • The monitoring of all valued environmental components will be • monitored as per the norms prescribed by GPCB/CPCB and the time to time guidelines issued for soda ash manufacturing industry.	• Cost of Environment management plant including various installations for Air Pollution, Water Pollution, Noise Control, Greenbelt Development, Occupational Health and Safety and other related activities.-205.07 crore • Recurring cost include maintaining and monitoring of all components- 6.98 crore	--	GHCL Limited
25	Forest area	2	Related to distance of project site from forest area Details regarding families dependent on forest	There is no classified forest area.	• There is no forest land within the boundary of proposed project site. However, some part of the unclassed forest area located south of the project site outside boundary. Sea water intake and outfall pipeline will pass through underground micro tunnel in specific corridor to cross forest area. The permission from the Forest Department is under process. • There will be no major impact on families dependent on forest. As the pipeline will be laid under ground through latest technology. • M/s GHCL has also applied to MoEF&CC for Forest Diversion	--	--	GHCL LTD

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					of 0.9689 Ha. of un-class forest land vide' proposal no. FP/GJ/Others/147527/2021. • GHCL Ltd will support afforestation programme in consultation with local forest department.			
26	Supporting for Industrial Development to GHCL LTD	--	For Employment For Infrastructure development in nearby village Social upliftment towards nearby villages Health facilities Women empowerment Skill development Education Fodder supply support Plantation in nearby villages	GHCL LTD team thanked for welcoming the industries	--	--	--	--
	Total	94						

GHCL Limited

10.01.2023

Dr. Pradeepkumar
Sugumar ,Scientist 'B',

IA-II (Industry-III) and
IPCC & NATCOM,Vayu
Wing, 2nd Floor, V-233
(Cabin),

Ministry of Environment, Forest &
Climate Change,Government of
India,

Indira Paryavaran
Bhavan,Jorbagh Road,

New Delhi-110003.

Subject: Response of GHCL Limited to the Complaint Letters dated 30.10.2022 and 01.11.2022 of Mr. Bharat Gangji and Ms. Dhwani Shah against the proposed Soda Ash Plant of GHCL at Bada Village, Mandvi, Gujarat.

Dear Sir,

This is in reference to your email dated 23.12.2022 stating that Mr. Bharat Gangji and Ms. Dhwani Shah (hereinafter referred as the 'Complainants'), have submitted Complaint Letters dated 30.10.2022 and 01.11.2022 to your good office objecting to the grant of Environment Clearance to the proposedSoda Ash Plant of GHCL Limited (hereinafter referred as the 'Undersigned') at Bada Village, Taluka Mandvi, Distt Kutch, Gujarat. The Undersigned was also directed by you to submit their representation/clarification regarding the issues raised in the Complaint Letters.

Accordingly, the Undersigned seeks to submit a comprehensive response on behalf of the Greenfield Chemical complex GHCL Limited to the queries/issues raised by the Complainants vide their letters dated 30.10.2022

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and 01.11.2022 addressed to your good office, clarifying that the Undersigned has ensured strict compliance with the Environment Impact Assessment Notification, 2006 , among other environment laws.

I. Background of the Project

The present project for establishment of a Soda Ash Plant at Bada Village, Taluka Mandvi in the Kutch District of Gujarat is being undertaken in pursuance of the Memorandum of Understanding signed with the Government of Gujarat during the Vibrant Gujarat Summit of 2017 for setting up a Greenfield Chemical Complex in the District of Kutch, Gujarat for increasing production of soda ash to meet the demand in the domestic and international markets. The Project envisages to establish a greenfield chemical complex to produce Light Soda Ash of 11,00,000 TPA capacity, 5,00,000 TPA of dense soda ash and 2,00,000 TPA Sodium Bicarbonate near Bada village, Mandvi Taluka in the Kutch District of Gujarat over an area of 1350 acres (about 546 ha) .

The Undersigned undertook alternative site assessment studies by CSIR-NEERI In line with provisions of EIA Notification2006 and subsequent amendments, GHCL Ltd. had applied for Terms of Reference (TOR) for the project on 28th July , 2021 and after making reply to EDS generated by MOEFCC, TOR had been granted by MOEFCC on 10th August, 2021

Accordingly, the Undersigned initiated the compliance with each condition of the Standard as well as the Specific Terms of Reference listed in the letter dated 10.08.2021. The cover letter submitted to MOEFCC and Essential Details Sought dated: 06th Aug, 2021 for seeking grant of proposed Terms of Reference mentioned about the engagement of consultants and additional studies.

The Undersigned had engaged Council for Scientific & Industrial Research – National Environmental Engineering Research Institute (CSIR-NEERI), a NABET-QCI accredited institution for undertaking the Environment Impact Assessment of its Project. Additionally, CSIR – National Institute of Oceanography was engaged for conducting a Marine Impact Assessment. The Undersigned also engaged domain experts such as Dr. Bharat Jethwa for conducting Ecological and Wildlife Conservation Study and Hydro-Geo Survey Consultants for conducting the hydrological assessment studies to

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supplement the findings in the EIA Report ofCSIR-NEERI, and also engaged domain experts such as the Zoological Survey of India for undertaking detailed study of the presence of turtle habitats and nesting at the Project site .

The comprehensive EIA Report along with the Studies conducted by domain experts was placedbefore the public during the public hearing on 17.10.2022 . The Public Hearing for the project of the Undersigned took place for eleven hours, where the concerns raised herein in the Complaint Letters, were duly addressed by the Undersigned and the Consultants. The Undersigned received 1154 written submissions from the public and has responded to each andevery submission.

Subsequently, the Minutes of the Public Hearing along with the written submissions of the public, the response of the Undersigned and the CD of the proceedings were submitted to your good office. However, the Complainant has now raised similar issues again by writing a representation dated 30.12.2022 and 1.11.2022 to your good office. The Undersigned at the outset submits that the Complainant has raised issues that have been duly addressed by the Consultants well as the Undersigned during the public hearing. Further, the Complainant has supressed certain developments such as the Judgment of the High Court of Gujarat upholding the validity of the public hearing conducted by the Undersigned, which the Undersigned will be addressing in its subsequent response to the issues raised by the Complainant in his Complaint Letters.

The Undersigned has identified the common issues highlighted in the Complaint Letters dated 30.12.2022 and 01.11.2022 and accordingly submitting a comprehensive response to each issue along with supporting documents.

II. Comprehensive Response of GHCL Ltd. to the Complaint Letters dated 30.10.2022 and 01.11.2022.

Issue I

The Complainant alleges that the Public Hearing was organised in violation of the EIA Notification

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Response of Undersigned:

The Complainant in his letters has wrongly alleged violation of the Environment Impact Assessment Notification, 2006 by the Undersigned. Subsequent to the grant of the Terms of Reference by the Ministry of Environment, Forest & Climate Change on 10.08.2021 and preparation of the EIA Report, Marine Assessment Study and Wildlife and Biodiversity Studies, the Undersigned wrote to the Gujarat Pollution Control Board (GPCB) for finalisation of the date and time of the Public Hearing. The Gujarat Pollution Control Board in consultation with the District Administration had finalised the venue and the date for the Public Hearing of the Project as 06.04.2022. However, due to the large number of letters, representations , including threats of creating public disturbance if the public hearing is organised, the hearing was postponed by the District Authorities due to unavoidable circumstances during public hearing as mentioned in Minutes of Meeting. Minutes of Public Hearing dated 06.04.2022 is enclosed herewith as **Annexure I.**

Thereafter, on 26.09.2022, the Member Secretary of the Gujarat Pollution Control Board issued the Public Notice for re-scheduling of the Public Hearing on 17.10.2022 for the Project of the Undersigned at 11am at the Project Site, Survey No. 432, Village Bada, Mandvi Taluka, District Kutch. The Notice of the public hearing was also published in Divya Bhaskar on 30.09.2022 and the Times of India on 01.10.2022 to ensure compliance with Appendix IV of the EIA Notification, 2006 which requires the Project Proponent to issue advertisement of the Public Hearing fifteen days prior to the date of the scheduled Hearing.

Subsequently, the Undersigned has submitted copy of the Draft Environment Impact Assessment Report in English and Gujarati along with the Executive Summary of the Project to the Offices of the -

a) District Collector Office, Bhuj District, Kutch

b) District Development Office, Bhuj, Distinct Kutch

c) District Industry Centre, Bhuj, District Kutch

d) Taluka Development Office, Mandvi, District Kutch

e) Regional Officer, Integrated Regional Office, Ministry of Environment,

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Forest & ClimateChange

f) Regional Office, Gujarat Pollution Control Board.

The Executive Summary of the Project was also shared with the Mantri of the twelve villages and announcement of public hearing was made through loudspeakers and banners on auto rickshaws on 15.10.2022 and 16.10.2022 by GPCB, in compliance with the requirements under the EIA Notification, 2006.

The Public Hearing was conducted on 17.10.2022, which was presided over by the Sub Divisional Magistrate and Deputy Collector, Mundra along with the Mr. T.C. Barmada Regional Officer, Gujarat Pollution Control Board who was also present along with the Undersigned, the EIA consultant , representatives from CSIR - NEERI and CSIR - NIO. Due to the large number of threats received prior to the conduct of the public hearing and having experience of earlier Public Hearing, the District Administration deemed it fit to ensure appropriate presence of a certain number of police officials for preventing any untoward incidents. A Copy of the threats received prior to the Public Hearing for cancellation of the said hearing is annexed herein as **Annexure II.**

The District Administration had ensured enough arrangements to combat any untoward incidents that may occur in view of the large number of threats received for cancellation of the said hearing. The role of the Undersigned was limited to discussion regarding the proposed project and answering the queries raised by the public.

The public hearing was continued for over eleven hours, giving sufficient time to the public to raise their queries, seek clarifications or submit grievances against the project. The Sub- Divisional Magistrate had also clarified that the public can seek further clarification through written representations or submissions from the Undersigned. The written submissions made bythe public prior to and during the public hearing are also available on the website of the Gujarat Pollution Control Board clearly establishing that all the submissions were duly considered and included in the Minutes of the Public Hearing.

That the said Public Hearing was also challenged before the Hon'ble High Court of Gujarat in Writ Petition (PIL) No. 85/2022 titled ' Bharat Gangji

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Gala and Others v. Gujarat Pollution Control Board and Others', wherein Mr. Bharat Gangi and Ms. Dhwani Shah, the present Complainants herein alongwith two other person raised the same grievance in October, 2022. The Hon'ble High Court vide its Order dated 18.10.2022 had dismissed the said Writ Petition, imposing a cost of Rs. 50,000 on the Complainants Mr. Bharat Gangji, Ms.Dhwani Shah and two others for misusing the process of law to stall the public hearing and suppressing the Amendments made to the Environment Impact Assessment Notification, 2006 with respect to the time period of giving prior notice of Public Hearing.

Hon'ble Gujarat High Court in its said order categorically made certain observations against the Petitioner No. 4 i.e. Ms Dhwani Shah, a complainant herein.

Despite the said observations of the Hon'ble High Court of Gujarat, the Complainant has approached your good office, by suppressing the said Order of the Gujarat High Court which categorically held that the public hearing on 17.10.2022 was conducted in accordance with the EIA Notification, 2006. A Copy of the Order dated 18.10.2022 is marked and annexed herein as **Annexure III.**

The undersigned has received numerous positive responses from general public as well the Sarpanchs, apprising the setting up of the Project by the Undersigned and highlighted therein numerous advantages to the area by such Project specially improvement in employment, economic and industrial activities which will certainly uplift the social & economic level of the residents of so many villages. The undersigned has received at least 390 no. of such letters from concern stakeholders, copies of which are annexed herein as **Annexure IV.**

Issue II

The Complainant alleges that the Environment Impact Assessment Report, the Terrestrial Impact Assessment Report and the Marine Impact Assessment Report has failed to identify the presence of scheduled species near the proposed site of the project, especially presence of Turtles and Dolphins on the Bada Coast.

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Response of the Undersigned:

The Standard TOR granted by MoEF&CC to the Undersigned on 10.08.2021 required the Undersigned to submit a detailed description of the flora and fauna existing in the Study Area and preparation of Wildlife Conservation Plan only if there is presence of any Schedule I species in the Study Area. Environment Impact Assessment Report by CSIR NEERI and the Ecological and Wildlife Conservation Plan prepared by Dr. Bharat Jethwa clearly states that there is no Protected Area (National Park, Wildlife Sanctuary) within ten kms of the Project site of the Undersigned. The Complainant has also misrepresented the distance of the Ghorad Bird Sanctuary from the Project of the Undersigned as 25 km when in fact it is 50 km away as per the EIA Report and the Wildlife Conservation Study and will not impact the Great Indian Bustard.

The Wildlife Conservation Study/Plan has listed the thirteen species (twelve species of animalsand one species of plant) that are Schedule I species as per the Wildlife Protection Act, 1972. Out of the twelve species , the green sea turtle is classified as Endangered and the Olive Ridley sea turtle is classified as vulnerable. Further, the Ecological and Wildlife Conservation Study also records that the coast near the project site of the Undersigned may not be suitable for sea turtle nesting due to narrow supra tidal region, steep slope, dense vegetation and presence of predators such as jackal. ZSI report also mentions We did not encounter any sea turtle and fresh/old nests or crawl marks of turtles on the beach.

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Table-6.1: Schedule-I fauna and Critically Endangered plant species reported from the study area.

No.	Taxa	Name of Species		IWPA Status	IUCN Status
		Common Name	Scientific Name		
1	Reptile	Flap shell Turtle	*Lissemus punctatea*	Sch-I	LC
2	Reptile	Green Seaturtle	*Chelonia mydas*	Sch-I	EN
3	Reptile	Indian monitor lizard	*Varanus bengalensis*	Sch-I	LC
4	Reptile	Olive Ridley Seaturtle	*Lepidochelys olivacea*	Sch-I	VU
5	Bird	Black shoulder kite	*Elanus caeruleus*	Sch-I	LC
6	Bird	Eurasian Spoonbill	*Platalea leucorodia*	Sch-I	LC
7	Bird	Indian Peafowl	*Pavo cristatus*	Sch-I	LC
8	Bird	Marsh Harrier	*Circus aeruginosus*	Sch-I	LC
9	Bird	Oriental Honey Buzzard	*Pernis ptilorhyncus*	Sch-I	LC
10	Bird	Shikra	*Accipiter badius*	Sch-I	LC
11	Bird	Short-toed Snake Eagle	*Circaetus gallicus*	Sch-I	LC
12	Mammal	Chinkara	*Gazella bennettii*	Sch-I	LC
13	Plant	Gugal	*Commiphora wightii*	--	CR

Further, specifically for sea turtles, the Undersigned had engaged the Zoological Survey of India to carry out a detailed assessment of the presence of sea turtles at the project site and the impact of the Project. The Study also relies upon the observations of Wesley Sundderaj and CS Bhaskar to record that there is Sporadic nesting takes place throughout the year along Gujarat coast. During the Study period, not a single turtle nesting, at the site of the proposed Project of the Undersigned, was recorded by the Zoological Survey of India.

The Zoological Survey Report in Section 5.1 at Page No. 10 clarifies that - "*the beach between Layja Nana – Mandvi Palace reported high threatened value and gained nesting site rank 1.0 and therefore it secured top conservation rank and given high conservation priority (Sunderrajet al 2013). The findings of Sunderraj et a. 2013 is mentioned and it is also mentioned "due to data deficiency and discrepancy, Sunderraj et al (2013) could not ascertain on species specific nesting for Kachchh coast.*

Moreover both the site Bambhdai to Bada and Bada to Layja Nana have been reported as Medium Site for conservation priority. (Evaluation of Sea Turtle, Gujarat Ecology Commission Govt. of Gujarat)."

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The Undersigned has engaged another expert for conducting study of sea turtles nesting in furtherance of the suggestion in the Ecological and Wildlife Conservation Plan and take appropriate ecological measures, as recommended.

Further, with respect to sighting of Dolphins, the EIA Report clarifies that the same have been sighted offshore and not in the vicinity of the proposed project of the Undersigned. However, the Undersigned has prepared a comprehensive Conservation Plan for Schedule I species , including the mitigation measures that will be adopted by the Undersigned to reduce the impact of the project on the wildlife recorded in the said area.

It is pertinent to highlight that Proof No-1 in complaint letter dated 01.11.2022 does not provide proof of the presence of Caracal, Hyena etc. as it does not mention the names of the species northe location in the said letter. Further, the allegations of presence of Ratel (Ghorkhodiyu) have not been substantiated by any credible proof in the Complaint letters

Proof No. 7 annexed in complaint letter dated 01.11.2022 stating the presence of porcupines is a geographical location outside the project boundary of the Undersigned. The location mentionedin the photograph lies two km beyond the South-East boundary of the Project of the Undersigned.

None of the said species mentioned in the Complaint Letters were found during the assessment of wildlife in the study period and area in the Ecological and Wildlife Conservation Plan. Even the representation does not provide proofs of species that are not mentioned in the Wildlife Conservation Plan. However, it must be added that the Undersigned Project proponent would undertake every possible measure to mitigate any impact on wildlife. In fact, the Undersigned has decided that it will be allocating Rs. 125 lakhs for implementation of mitigation and conservation measures for conservation of wildlife residing in the vicinity of the project site. Thus, the concerns of the Complainant are duly addressed in the Environment Impact Assessment Report and the Studies undertaken by the Zoological Survey of India and the Ecological and Wildlife Conservation Plan by Dr. Bharat Jethwa. It is pertinent to note that the Undersigned had written to the Principal Chief Conservator of Forest (PCCF) & Chief Wildlife Warden, Gujarat on 09.11.2022 , seeking their approval for the Conservation Plan prepared for

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Schedule I species by Dr. Bharat Jethwa. The PCCF has duly accorded his acknowledgement for the same on 19.11.2022.

Table-6.3: Proposed financial allocation for mitigation and conservation measures.

S. No	Activity	Implemen -ting Agency	Duration Years	Rate/Year (Lakh)	Total Amount (Lakh)
A	**Implementation Activities**				
1	Carryout Tree plantation in the villages, schools roadsides etc. areas in study area.	GHCL	10 years	5.0	50.0
2	Carryout plantation of *Commiphora wightii* in RF areas and maintenance (to be paid by GHCL)	KWFD	5 yeas	2.0	10.0
3	Contribution to Forest department for Sea Turtle Conservation Activities (to be paid by GHCL)	KWFD	10 years	2.0	20.0
				Subtotal	80.0
B	**Monitoring & Compliances Activities**				
6	Ecological & Biodiversity monitoring by third party once every 5 years for 10 years after commencement of project	GHCL	At every 5 year for 10 years	7.5	15.0
7	Monitoring and administrative activity (to be paid by GHCL) by Kutch West Forest Division	KWFD	First year		10.0
8	Documentation and preparation of Annual compliance report. 10 years	GHCL	Annual	2.0	20.0
				Subtotal	45
			Total (A=B) Amount in Lakh		125.0

Issue III

The Complainant in his letter dated 01.11.2022 has alleged submission of misleading information on the baseline data, presence of sand dunes, distance of the Project from the Arabian Sea by the Undersigned with respect to its Application and Form I

Response of the Undersigned:

a) Baseline data

The Complainant has wrongly suggested that the baseline data submitted is more than three years old . At the time of submission of the data in November 2021 to the Gujarat Pollution Control Board for conducting public hearing, the collection period was valid. However, due to unavoidable circumstances & numerous threats received from the public for cancellation of public hearing, the Public Hearing initially scheduled for 06.04.2022 was postponed and subsequently conducted on 17.10.2022. This does not render the baseline data as

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invalid,as it was submitted within the timelines prescribed. The Public Hearing was conducted within validity of TOR which is in compliance to MOEFCC O.M dtd. 8th June 2022.

b) According to some maps provided in the EIA report, there are sand dunes present along the Southern boundary of the plant. Any development in this close proximity of the sand dunes will hamper them.

The CRZ Map prepared by IRS Anna University shows presence of sand dunes as CRZ IA outside the boundary of the project site of the Undersigned. The Undersigned will be maintaining the regulated distances mentioned as per the CRZ map to ensure minimum impact on the sand dunes located outside the project boundary. Further, the Undersigned has carried out a detailed assessment of the Project on the sand dunes in the EIA Report and the Marine Impact Assessment Report. To ensure preservation of sand dunes as per the Marine Impact Assessment Report, pipelines will be established through tunnelling to ensure avoidance of any disturbance to sand dunes

Accordingly, the Undersigned will involve geotechnical and tunnelling experts for establishing pipelines. Further, the treated effluent release from the Plant of the Undersigned will ensure strict adherence to the standards specified by CPCB for soda ash industry thus the release of effluent will not impact the sand dunes in the vicinity of the project. There is no activity proposed on top of the sand dunes.

c) As per the .kml file downloaded by us from the Ministry's website as on the date of drafting this letter, the boundary of the project is less than 300 meters away from the sea.

The distance is varying as the project boundary is irregular in shape. However details is submitted as per final EIA submission. Please note that the regulated CRZ distance will be maintained.

d) The project boundary runs along Vengadi Nadi along the western side. There is no distance maintained from the river.

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In Form I, the Undersigned has mentioned that the Vengadi Nadi is at a distance of 0.5 km North West and further to the seaside it runs near to the plant boundary. The Hydrological Assessment Studies also mention that the Project site is located 50m to 300m East of the Vengadi river. This explains that towards the sea side, the distance narrows down and it runs parallel to the project boundary. It is pertinent to note that the Undersigned will not release even treated wastewater in the Vengadi River. Along the boundary of the project , an effective Green belt will be developed. Green Belt area willbe 33% of the total project area. Further, the regulated distance as per CRZ map from River Vengadi will be maintained.

e) **Presence of streams within the plant area has not been addressed.**

The Complainant has alleged that the Undersigned will be undertaking diversion of seasonal streams which could impact the water availability in a semi-arid region such as Kutch. The Hydrological Assessment Studies clarifies that there is one stream that is originating from outside the plant area but would pass through the northern corner of theplant. The said stream carries limited surface runoff water during rainfall. During and post the construction of the project of the Undersigned, if the surface runoff is generatedin the said stream, it is proposed that the water will be collected in a drain outside the plant area and released in the Vengadi River. Therefore, there will be no impact on the seasonal streams that are generated outside the plant area of the Undersigned.

f) **The Complainant states that the presence of alternative site of Modhwa village has not been taken into consideration for establishment of the Project since the Port is closer to Modhwa Village compared to Bada Village.**

The Undersigned had undertaken examination of five alternatives/alternate sites during 2017-2018. Modhwa village was not considered appropriate due to the area being a nesting ground for flamingos in winter. Further, near Modhwa two Mega power plants are operating and their seawater intake channels and outfall points

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were in close proximity. The village of Bada was selected as the impact on ecology, biodiversity and wildlife was least compared to the rest of the sites available forthe establishment of the soda ash plant.

g) **Pollution from the project will impact the Bada Coast**

CSIR -NIO have undertaken impact assessment studies of the proposed project of the Undersigned through field observations, drogue study and simulation modelling exercise.The results of the study show that there will not be any significant impact due to treated effluent release as adequate dispersion is available in the discharge point and the released effluent achieves ambient conditions within 300 m distance. During operation phase of the proposed plant the standards for discharge of effluent and emissions specified by CPCB will be complied with and also taken in to design considerations.

Issue IV

The Complainant has alleged that the Environment Impact Assessment Report, Marine Impact Assessment Report, Zoological Survey of India and Hydrological Assessment Studies have not been carried out by Accredited Consultants.

Response of the Undersigned:

The Complainant in his Letter dated 30.10.2022 has questioned the accreditation of the following Consultants for conducting the Environment Impact Assessment and the accompanying Studiesannexed in the Assessment Report –

a) **CSIR – National Institute of Oceanography (NIO) does not have a NABET Accreditation for undertaking the Marine Environment Impact Assessment.**

CSIR-National Institute of Oceanography ('NIO') has conducted the Marine EIA for assessing the impacts of the project on marine ecology. It is pertinent to mention that the Minutes of the 73rd Accreditation Committee Meeting of

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NABET and QCI dated 20.03.2012 record that NABET will identify specialised functional areas, such as marine ecology, which are relevant for specific EIAs and would notify it on the QCI website within 6 months. Thereafter, NABET conveyed the same to NIO vide letter dated 21.05.2012. In the interim, it was stated that NIO may allow its scientists to take up the marine component of EIAs in association with an accredited EIA consultant organisation. Thus, the said latest communication dated 21.05.2012 permitted NIO to take up marine assessments even though it has not yet formally been accredited by NABET, as a functional area expert. In furtherance of the same, the task has been carried outby NIO under the aegis of CSIR-NEERI, which is an accredited government agency, without compromising on the quality or any parameter of the EIA. A Copy of the letter dated 21.05.2012 of NABET permitting NIO to undertake marine impact assessment is marked herein as **Annexure V.**

b) CSIR NEERI has undertaken terrestrial impacts of the Project. As per the NABET Accreditation, NEERI does not have any accreditation for assessing the impacts of a Soda Ash Plant

The draft EIA reports have been prepared by the Council of Scientific and Industrial Research - National Environment Engineering (CSIR-NEERI) Institute, Nagpur and CSIR National Institute of Oceanography (CSIR-NIO), Mumbai, both of which are of national repute . Their names were mentioned in the Technical Guidance Manual of Soda Ash Industry prepared for MoEF&CC.

CSIR-NEERI, Nagpur was requested to conduct a terrestrial EIA/EMP on 20.11.2017 for the proposed GHCL soda ash Plant in the Taluka Mandvi of the Kutch District of Gujarat. There was no NABET accredited consultant for the soda ash sector at the time the Undersigned had contacted CSIR-NEERI for undertaking the environment assessment. CSIR-NEERI was accredited for chlor alkali and there was no accreditation for soda ash as of August 2017. It is pertinent to note that soda ash accounts for 50-60% of the chlor alkali industry. Specific accreditation for soda ash was introduced by NABET later in July 2019.

A similar dispute related to accreditation has been adjudicated by the Hon'ble

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NGT in the case of Akhil Bhartiya Jeev Raksha v. Union of India & Others (2018 SCC OnLine NGT 2030), wherein the challenge to the absence of accreditation of the EIA consultant for nuclear sectors was rejected by the Hon'ble Tribunal. Since at the time of the engagement of the Consultant, there were no parameters/requirements on the website of NABET for nuclear sectors, the said EIA Report was held to be valid.

Similarly, in the present case, in the absence of specific accreditation for soda ash, no objections can be raised against the accreditation of CSIR-NEERI for conducting environment impact assessment for the Project of the Undersigned. This is apart from the fact that CSIR – NEERI is a highly acclaimed government institution for such studies and often relied upon by the Hon'ble Supreme Court on numerous cases for technical opinions.Union Ministry of Environment, Forest and Climate Change took secondary source of data from institutes like NIO and NEERI for preparation of its Technical EIA Guidance Manual for the Soda Ash Industry, based on their experience of conducting EIA

It is pertinent to mention, that the current Project Proponent seems to be targeted by the Complainant as many soda ash industries have been granted environmental clearance and whose EIA studies have done by institutions which are not specifically accredited for soda ash. Without prejudice these include, Tata Chemicals, Nirma, RSPL among others but the Complainant seems to be targeting only the Undersigned.

It is clear that CSIR-NEERI has, over the years, conducted EIA studies for the Soda Ash Industry which have been accepted by the concerned authorities before successfully granting an Environmental Clearance. In keeping with CSIR-NEERI's recognised expertise, they were engaged to carry out the EIA study for GHCL's proposed project. Such appointment was duly communicated with MoEFCC on 23rd Nov 2017 and also while securing the TOR approval for the instant project when theTOR application was submitted on 28th July, 2021. The cover letter of the Application clearly specified that GHCL had appointed CSIR-NEERI and CSIR-NIO for carrying out terrestrial andmarine environment impact assessment, respectively.

c) Objection to Hydro-Geosurvey Consultants Pvt. Ltd. for conducting the Comprehensive Hydrological Assessment Studies and designing of rain water harvesting program

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The Hydrogeological assessment studies were mentioned under additional Study in EIA report prepared by CSIR-NEERI and the complete report is submitted as Annexure IV of the said EIAreport.

Hydro-Geosurvey Consultants Pvt. Ltd. has been accredited for conducting Groundwater studies.The SCS Enviro Services Pvt. Ltd. is another laboratory which is NABL accredited and which further prepared the Groundwater report. The Certificate of Accreditation has been clearly reflected in the EIA Report, as submitted.

The said Consultants were engaged given their specialisation in groundwater assessment to ensure that the establishment of the Project of the Undersigned near Bada Village will not adversely impact the availability of water at the site or in the vicinity of the Project, especially on groundwater. It is surprising that the Complainant has raised objections to the hydrological assessment studies, which have been carried out by the Undersigned as an additional measure, apart from the assessment that had been undertaken by CSIR-NEERI in their Impact AssessmentReport, to capture all possible impact of the project of the Undersigned on the ecology of the area.

d) Mr. Bharat Jethwa does not have accreditation for preparing EIA Report for projects under Item 4(e) of the Schedule of the Environment Impact Assessment Notification, 2006;

Dr. Bharat Jethwa, is an accredited category A - Functional Area Expert for Ecology & Biodiversity with Bhagwati Enviro Limited since 2013 and was engaged as a functional expert to carry out an additional study for the ecology and the wildlife prevalent at the site of the proposed project of the Undersigned . The Study by Dr. Bharat Jethwa was meant to supplement the Environment Impact Assessment Report prepared by CSIR- NEERI, which also includes portions on the impact of the project on wildlife and ecology of the area.

Bhagawati Enviro Limited is an accredited organisation and the latest NABET Certificate extending its accreditation till 19.12.2021 is marked and annexed herein as **Annexure VI.** Thus, the Complainant has wrongly suggested that Dr. Bharat Jethwa has carried out the preparation of EIA Report without valid accreditation . It is pertinent to note that the Undersigned

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had written to the Principal Chief Conservator of Forest (PCCF) & Chief Wildlife Warden, Gujarat on 09.11.2022 , seeking their approval for the Conservation Plan prepared for Schedule I species by Dr. Bharat Jethwa. The PCCF has duly accorded his acknowledgment for the same on 19.11.2022. A Copy of the Letter dated 09.11.2022 with the stamp of the PCCF is marked and annexed hereinas **Annexure VII.**

e) **Zoological Survey of India has undertaken Study on Status Survey and Conservation Plan for Sea Turtles along Mandvi Taluka of Bhuj, Gujarat . NABET accreditation of ZSI has not been submitted.**

The Zoological Survey of India (ZSI) is a nationally reputed Organisation under the aegis of the MoEF&CC, Government of India. They had been engaged by the Undersigned in 2018 to carry out a Status Survey and Conservation Plan for Sea Turtles to adjudge the ecological significanceof the area for the proposed project of soda ash plant. It may also be noted that the above Study through ZSI has been mentioned as an additional study in the TOR submission to MoEF&CC vide application dated 28th July 2021.

The Undersigned could have engaged the services of only CSIR-NEERI for completing the Impact Assessment of its Project. However, specialised organisation and functional experts of national and international repute were engaged to ensure that all possible impacts of the project on the ecology, biodiversity and wildlife of the area can be captured before proceeding with the establishment of the Project. However, the Complainant has been questioning the veracity of all the Studies undertaken to supplement the Impact Assessment undertaken by CSIR-NEERI without any substantial basis by raising frivolous grounds of lack of accreditation. It is pertinentto note that there is no restriction on submission of additional studies apart from Impact Assessment Report prepared by accredited organisations, especially if the Studies have been prepared by organisations considered to be functional and domain experts at the National and international level. It is pertinent to add that there have been no comment on the merit of the reports which clearly hints that the Complaints's motive has got nothing to do with the substantial question of environment.

Issue V:

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The Complainant in its Complaint letter dated 01.11.2022 has challenged the findings in the EIA Report on numerous grounds to state that it fails to provide authentic information.

Response of the Undersigned:

a) **Presence of Lalira Lake in the middle of the Proposed Project Site**

The lake mentioned 'Lalira' is positioned outside the project boundary and does not fall within the project site. However it is recommended in Hydrogeological assessment report that GHCL proposes to take up a rainwater harvesting program as part of its CSR activities by deepening the existing village ponds to store surplus surface runoff.

b) **The Report shows misleading concentration levels of SO2 and NOx in the area**

The National Ambient Air Quality Standards (2009) states that ambient concentration of SO2 and NOx shall be below 80 µg/m3. The concentration of SO2 and NOX reported in the EIA report are well below the said standard. Even at the operation stage of the Project, there would be only a marginal increase in ground level concentration up to 25 µg/m3 which is far below than the 80 ug/m3, as prescribed in the standard. Recommended Stack height of 130 m for efficient dispersion of stack emissions will be maintained by the Undersigned.

The Undersigned has also submitted an Environment Management Plan where a budget of approximately Rupees Two Hundred Crores has been earmarked for adopting and implementingmeasures to ensure strict compliance with the standards of SO2 and NOx among other emissions standards during the establishment and operational stage of the Plant.

c) **Use of Ammonia in the production process - potential leak of Ammonia during transportation may severely impact the environment. Further, the effluent discharged would also contain high concentration of Ammonia. The local population in the village would be impacted due to the presence of such harmful chemicals .**

Ammonia consumption in the process is as per the stoichiometric chemical reaction and as a high value chemical, it cannot be used more than required

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quantities. It will be stored in specially designed tanks where sensors for rapid detection will be provided as per normal industrial practices to address ammonia leaks. Also, fire hydrants will be provided as special precautions.

Ammonia will be stored in line with the requirements of the Hazardous Waste Management Rules, 2016. Water curtain and spray system shall also be provided by the Undersigned. An Automatic Ammonia Detection System will also be installed.

Further, only treated effluent will be discharged at the recommended effluent discharge locationas mentioned in the EIA report. The results of the study show that there will not be any significant impact due to treated effluent release as adequate dispersion is available in the discharge point and the released effluent achieves ambient conditions within 300 m distance. The RTI information procured by the Complainant about Modhwa and Tragdi and Bhadreshwar has no relation with this project activity. It is also pertinent to note that the concentration of ammonia

in the proposed effluent is much less than the effluent discharge standard set by CPCB, i.e., 50 mg/L.

As per the risk assessment studies carried out as part of EIA, the level of risk is found to be acceptable as per the international standards. The F/N curves for storage tanks are also within acceptable region. The Disaster Management Plan is also detailed to mitigate and minimize the risk. The Undersigned shall also implement Health Safety & Environment (HSE) awareness/information programs for the nearby communities in collaboration with the local administration.

d) There will be an increase in the level of PM 10 and PM 2.5 due to coal transportation

Coal will be transported by using tarpaulin covers to prevent particulate emission. Further, the emissions from the proposed captive cogeneration power plant will be kept within the standards specified by CPCB with the selection of applicable air pollution control measures.

e) Presence of Mangroves not recorded in the EIA Report.

There is no project activity proposed in the indicated area as mangroves in the photograph (proofno 5). They shall be maintained as such and utilised only in

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accordance with law.

f) **There will be increase in poaching activity due to increased presence of migrantLaborers**

Although this is a socially and legally an unacceptable allegation or presumption, the Undersigned will be undertaking specific awareness programs among the labourers both from within or other states and a proper security system shall be implemented to avoid any such events.

g) **Kachchh district experiences frequent earthquakes. It is a Seismic Zone 5 area (highprobability of earthquake).**

The Undersigned will be designing the structures as per IS code for Earthquake Resistant structures.

h) **The EIA report underplays the impact on migratory and local birds in the area.**

Apart from the EIA Report, a detailed Ecological and Wildlife Conservation Study has also been included as one of the Annexures in the EIA Report, which records in detail the studies undertaken for recording the local and migratory birds in the area. The Wildlife Conservation Study also does not record any significant impact on the bird species of the area.

It is pertinent to note that there is a Soda Ash project operating since a long time in Porbandar and it is located near the 'Porbandar Bird Sanctuary' and Chhaya Rann Wetland. Thousands ofmigratory birds and Flamingos feed and roost in these wetlands without any disturbance and impacts.

The annual festival known as the "Pink Festival" is organized in Porbandar by a local NGO tocelebrate the onset of the breeding season of flamingos in this area. This area is located near theboundary of an operational Soda Ash project in Porbandar. However, the operation of the soda ash plant has not impacted the birds or their habitat.

i) **The EIA report shows the coastal area as Stoney when it comes to impact on local fishermen but shows the area as soft-muddy-land when it comes to release of effluent from the proposed factory -**

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This has been done with malafide intention as effluents do more harm in stony areas compared to soft-muddy area

The impact of effluent release has been done for the entire study area and the Study has considered the bathymetry for Flow simulation model. The seabed shows very irregular features and gives an impression of the presence of hard strata. The effluent will be discharged to the sub tidal area which has uneven bottom topography associated with rocky zones as resulted from bathymetry study. The sediment texture in the mentioned inter tidal area is sandy (98%). The sub tidal sediment has largely varied grain size or texture and mostly dominated with silt content. Details of sediment texture for sub tidal and inter tidal area are provided in EIA report. However, the treated effluent discharged locations achieves adequate dispersion and dilution.

j) **Project mentions that the factory will require a significant amount of fresh-water which will be obtained from ground-water. As mitigation efforts, the report asks for rain-water harvesting. However, Kachchh is a drought prone area and even when it rains the total amount of rain-fall is small. Hence, rainwater harvesting will not provide enough water to compensate for uptake by the factory**

The project will not use any ground water for its fresh water requirement. It is proposed to use seawater RO system for project requirement. There is no water withdrawal from the mentioned lake 'lalira' and groundwater. The said lake is outside the project boundary as mentioned in pointno. 7 above.

GHCL proposes to take up rainwater harvesting as part of its CSR activities by deepening existing village ponds to store surplus runoff from its catchment area and to recharge the groundwater basin which will dilute salinity and raise the water level thereby also resisting sea water ingress.

k) **The buffer zone shown in the EIA report includes 1840 hectares of reserve forest which hosts numerous wild-life, a large number of them include endangered species. The project will increase noise pollution because of the use of machinery, population and traffic in the area. This will result in either migration or destruction of wildlife in the reserved forest in nearby villages.**

There is no project activity planned over reserve forest area. Forest area in the

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10 km study area is only 4.15 % (1779 Ha.). Further, noise studies by using FHWA model reported that 70 db(A) and 66 dB(A) noise levels were found at 10 m and 20 m from the noise generating sources. Thus, any adverse impact outside the plant premises is not envisaged. A robust peripheral Green belt has also been proposed to attenuate noise levels, among other mitigation measures as delineated in the Environment Impact Assessment Report.

l) **The ecology study in the report is done without consulting local environmental or wildlife experts**

The Complainant had wrongly alleged that local environmental and wildlife experts have not been consulted. During the Ecology and Wildlife Conservation study, a series of consultations were made with both technical and non-technical stakeholders to get better picture on the project area/core area and buffer zone habitats. In order to know more about the seasonal presence of several faunal species and their movement, study team informally consulted and discussed with local naturalists and local people, from the villages, herders and farmers who inhabit close to the proposed project area.

m) **Region around Bada and in the buffer zone contains a very pristine and clean environment. Such an area has a large potential to be developed as a tourist destination and should not be allowed pollution.**

The Undersigned will ensure that the local ecology and biodiversity in Bada Village is not adversely impact by the Project of the Undersigned. It is for this reason that the Undersigned has earmarked a sum of Rs. 200 crores for implementing environmental mitigation measures along with Rs. 125 lakhs specifically for implementing wildlife conservation plan.

n) **Company has only acquired 600 acres out of 1300 acres of land for the proposed project. Until the company acquires sufficient land, environmental hearing should not be done.**

The Undersigned is in the process of acquiring/buying the land in accordance with law and at the moment the Industries Commissioner has granted in-principle approval for allotment of the remaining area of the land required for the project of the Undersigned. It is pertinent to note that the procedure for Environment Impact Assessment is under a separate legislation and the procedure of acquiring/buying of land is under a different legislation. Further,

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Undersigned has applied for diversion of 0.9689 ha of unclassed forest land and the same is pending appraisal before the requisite competent authority.

o) **The factory will release a large amount of greenhouse-gas. World-wide greenhouse gasses are causing global warming and climate change. Kachchh is one of those vulnerable regions of the globe that will have a large negative impact of global warming.**

It is submitted that the best available technology considering economic feasibility will be adopted for the project to mitigate Green House gases and reduce temperatures. It is reiterated that a sum of Rs. 200 crores has been earmarked for implementing the Environment Management Plan. Further, the Undersigned will ensure strict compliance with the emission standards and periodic reporting of the same to the Gujarat Pollution Control Board, as required by law.

p) **EIA Annexure Part 3 mentions the area is having arid and barren lands and groundwater is too saline to do agriculture. This is not factually correct information. Bada village has several irrigated horticulture farms and huge harvest of fresh-dates, mangoes, guava, pomegranate, sapodilla, java plum is taken every year. Under such circumstances, cost-benefit analysis will not favour setting up a factory in the eco- sensitive zone.**

The complainant is mixing information under different segments of the EIA Report . The EIA Report has comprehensively recorded the presence of horticulture farms around the project site of the Undersigned. However, the presence of Horticulture farms does not categorise the area as an Eco-Sensitive Zone. To facilitate agricultural activities, the Undersigned has committed three crores for promotion of environment friendly farming activities and development of nature basedsolutions for enhancing productivity of farmers. It also covers capacity building measures on farming techniques, provision of high-quality seeds/manure, efficient irrigation solutions, among other activities.

In view of the above mentioned responses, it may be concluded that the Undersigned has ensured strict compliance with the Environment Impact Assessment Notification, 2006 and has gone a step further by engaging nationally reputed organisations for conducting detailed studies on ecological,

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hydrological and wildlife significance of the area. The Complainant in his ComplaintLetters has failed to highlight any violation of the EIA Notification, 2006 and has in fact supressed the Judgment of the Gujarat High Court condemning the action of the Complainant to initiate litigation on frivolous grounds without conducting due diligence. The same may be disregarded and this project of national importance be allowed to be executed within the framework of law and especially environmental law.

Yours Faithfully.

For GHCL Limited



Chief Operating Officer

GHCL Ltd.

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-TRUE COPY-

GHCL Limited

Date: 05/01/2023

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Director and Member Secretary (Industry III),
Ministry of Environment, Forest & Climate Change,
3rd Floor, Vayu Wing, Indira Paryavaran Bhavan,
Jor Bagh Road, Ali Ganj,
New Delhi- 110003.

Subject: Submission of EDS reply for obtaining Environmental Clearance for proposed Greenfield project of M/s. GHCL Limited
Ref.: EDS sought by MoEF & CC dated on 07/12/2022 (attached as Annexure – 1)
Proposal no.: IA/GJ/IND3/408164/2022

Respected Sir,
It is requested to note that point wise reply of EDS sought by MoEF&CC dated on 07/12/2022 is given as follows:

Sr. no.	EDS sought by MoEF&CC	EDS reply
1.	Please submit all the requisite documents as per CRZ Notification, 2011 and the recommendations of SCZMA.	It is requested to note that CRZ application is under scrutinization at GCZMA. We have submitted replies of the additional information sought by GCZMA in the Technical Committee presentation dated 17-01-2022 and reply of the same has been submitted to GCZMA on 29th November, 2022 along with Final EIA report. Reference of the same is attached here as **Annexure-2** for your ready reference. We will furnish GCZMA recommendations once the same is obtained.
2	Please submit the Stage-I FC for the forest land.	Online application for Forest clearance was made on 21-09-2021 under Forest (Conservation) act, 1980 to MOEFCC for diversion of 0.9689 ha Unclassified Forest land for laying seawater intake and outfall pipeline vide proposal no. FP/GJ/Others/147527/2021. The online status of the aforesaid application is "Proposal is pending at DFO due to EDS raised by State Government". Once the Stage I forest Clearance is obtained, we will submit the same. The online status be referred as **Annexure-3**. Query received from DFO seeking geotagged drawing requirement through DILR study. Proof of the same is attached as **Annexure-4.** It is under process.
3	Please upload Copy of duly signed Proceedings of Public Hearing in English in the relevant section.	We have noted your suggestion, However Proceeding size greater than 5 MB is not accepted by online portal. So, we have submitted 93 parts of proceeding into the portal. In addition to that, we have attached here Google drive link to see the sequential public hearing proceeding for your ready reference. It is attached as **Annexure-5.** Signed copy of proceeding is attached as **Annexure-6.**
4	Under Part-A, please revise Whether QCI/NABET Accredited EIA Consultant engaged?	During online proposal submission CSIR NEERI name was not appearing in drop down list so NO was selected. The proposed project "Greenfield Chemical Complex" was envisaged and conceptualized during Vibrant Gujarat Summit 2017, Govt. of Gujarat. During MOU GHCL Ltd. has committed to set up Greenfield Soda Ash facility in District Kutch, Gujarat. At the time of planning of execution of project, there was no NABET accredited Consultant for soda ash sector available. List of ACO is attached as **Annexure-7** for your reference. M/s. GHCL limited has appointed institutes of National repute like CSIR NEERI, Nagpur based on their past experience of EIA for similar nature of Greenfield Soda Ash project at Gujarat coast. The proof of the work order is attached as **Annexure-8.**

<table>
<tr><td></td><td></td><td>M/s. GHCL Limited has informed to MoEF&CC regarding the appointment of EIA consultants (CSIR NEERI) Vide Letter no. GHCL/AHD/ENV/MOEF/VND/17-18/07 dated 23-11-2017. The same is attached as Annexure-9.

It is also requested to note that all the EIA study of Soda ash industry was earlier carried out by only Chlor Alkali Approved consultant and Environmental Clearance was granted by MoEF&CC. The list of Projects is given below for reference.

<table>
<tr><th>Name of Company</th><th>Chlor Alkali accredited consultant engaged</th><th>EC granted by MoEF&CC - Date</th></tr>
<tr><td>RSPL</td><td>NEERI</td><td>12th Nov-2015</td></tr>
<tr><td>TATA chemical</td><td>J. M. EnviroNet Pvt Ltd</td><td>5th July-2019</td></tr>
<tr><td>Nirma Limited</td><td>San Envirotech Pvt Limited & Kadam Environmental Consultant</td><td>6th Aug-2021</td></tr>
</table>
After that CSIR-NEERI and GHCL Limited has also started site alternatives for the proposed Greenfield chemical complex, we have examined 5 site alternatives for proposed Greenfield chemical complex and this activity has taken significant time to finalize the proposed site and after that we have started collection of Baseline monitoring. We intended to commission plant activities at earliest but due to COVID 19 the project activities got seriously impacted and delay has been affected.

GHCL Ltd. had made an online proposal during July 2021 to MOEFCC for obtaining TOR proposal for the aforesaid project, in Covering letter of the proposal mentioned status about appointment of CSIR NEERI (Annexure-10). At the time of submission of TOR proposal, the baseline data was near completion. Hon'ble MOEFCC has raised EDS for TOR proposal. During reply of EDS we have again indicated the name of hired EIA consultant (CSIR NEERI). TOR was granted for the project on August 2021 after reply of EDS.

Based on previous preceding, we request you to consider our case and proceed for Environmental Clearance.</td></tr>
<tr><td>`5</td><td>Please upload all the QCI-NABET accreditation certificates of the Consultant for sector 4 (e) for the entire period of engagement for this EIA & EMP.</td><td>It is requested to note that CSIR NEERI consultant has been engaged during entire course of time for preparation of EIA/EMP report for category 4(e).
Looking into condition NEERI was the only organisation to carry out the study in 2017 as they were accredited for Chlor Alkali, so we have appointed them as they have carried out studies previously for similar Soda Ash plant.

List of agencies engaged is mentioned below:
<table>
<tr><th>Scope of work</th><th>Agencies</th><th>Accreditation/ Institution/ Professional expertise</th></tr>
<tr><td>EIA/EMP Study</td><td>CSIR-NEERI</td><td>Attached as Annexure-A</td></tr>
<tr><td>Marine EIA</td><td>CSIR-NIO Mumbai</td><td>Attached as Annexure-B</td></tr>
<tr><td>CRZ Mapping</td><td>IRS, Chennai</td><td>Attached as Annexure-C</td></tr>
</table></td></tr>
<tr><td>6</td><td>Please upload the NABL accreditation certificates of the laboratory for the entire study period.</td><td>Accreditation is attached as Annexure-11.</td></tr>
<tr><td>7</td><td>Please also crosscheck and ensure that all the</td><td>Undertaking is attached as Annexure-12.</td></tr>
</table>

GHCL Limited

	information and documents in the CAF & Proposal are filled/uploaded and are factually correct.	

If any confusion, feel free to contact us.

Thanking You.
Yours faithfully,
For GHCL ltd.

[N N Radia - Chief Operating officer]

Enclosure:
Annexure-1 EDS
Annexure-2 Submission proof of GCZMA requirements
Annexure-3 Online status of the proposal of Forest Clearance as on date
Annexure-4 Query Generated by DFO regarding DILR study.
Annexure-5 Google link for Public Hearing minutes
Annexure-6 Signed copy of Proceeding
Annexure-7 List of Accredited consultant organisation
Annexure-8 Work order given to CSIR NEERI
Annexure-9 Letter by GHCL Limited to MoEF&CC regarding appointment of CSIR NEERI as EIA consultant
Annexure-10 Covering letter of proposal stating CSIR NEERI as EIA consultant for the project
Annexure-11 NABL Accreditation certificate
Annexure-12 Undertaking by GHCL stating data are factually correct.

Annexure-A NABET accreditation certificate of CSIR NEERI
Annexure-B Letter from NABET to NIO
Annexure-C Notification of accredited CRZ mapping agencies

GHCL Limited

Date: 29/11/2022

To,
Director(Environment) & Member Secretory,
Gujarat Coastal Zone Management Authority (GCZMA)
Forest & Environment Department,
Gandhinagar, Gujarat

Subject: Reply of Additional details required for CRZ Clearance for Greenfield Chemical Complex Seawater Intake and Effluent disposal facilities at Village- Bada, ta- Mandavi
Ref.: Email from GCZMA dated on 01/02/2022 (Annexure-1)

Respected Sir,

	Suggestion	Answer
1.	Submit final EIA report.	It is requested to note that Final Environment Impact Assessment Report with Public hearing minutes and Action plan has been submitted to Ministry of Environment, Forest and Climate Change. Acknowledgment Slip, Final EIA Report and Report of Part-C which is generated after Final EIA submission is attached as **Annexure-2.**
2.	Submit Public Hearing details.	It is requested to note that the public hearing was completed on 17-10-2022 at 11.00 Hrs. Venue: Project Site, Survey no . 432, Village: Bada, Taluka: Mandvi, District: Kutch, Gujarat. Public hearing minutes is attached as **Annexure-3** and the same have been forwarded to MOEFCC.
3.	Forest land involve in the proposed project, submit status of Forest Clearance.	It is requested to note that there is no forest land within the boundary of proposed project site. However, some part of the unclassed forest area located south of the project site outside boundary. Sea water intake and outfall pipeline will pass through underground micro tunnel in specific corridor to cross forest area. M/s GHCL has applied to MoEF & CC for Forest Diversion of 0.9689 Ha. of un-class forest land vide' proposal no. FP/GJ/Others/147527/2021. The Current status of Forest Clearance application is pending at State level. Proof of status and Forest clearance application is attached as **Annexure-4.**
4.	Submit Olive Ridley Turtle conservation plan approved from Forest Department.	GHCL Ltd have submitted Conservation Plan for Olive Ridley Turtle to CWLW department of Gujarat. Conservation plan prepared by Zoological Survey of India and Dr Bharat Jethava – QCI NABET approved expert as well as Submission proof are attached as

M.V. 6/12/2022

Forests & Environment Dept.
Govt. of Gujarat Sachivalaya
New Sachivalaya, Gandhinagar

GHCL Limited

		Annexure-5.
5.	Submit sand dunes conservation plan	Conservation plan of Sand Dunes is prepared by CSIR- National Institute of Oceanography, Mumbai which is attached as **Annexure-6.**
6.	Based on submission of above details team of official will visit the site.	Noted.

We kindly request you to consider the same and do the needful for CRZ Clearance to our above stated project proposal

Thanking You.
Yours truly,

For, **M/s. GHCL Ltd**

Enclosure:

Annexure-1 Email dated 01/02/2022
Annexure-2 Part-C, Final EIA Report and Acknowledgement Slip of Final EIA submission
Annexure-3 Public Hearing Minutes
Annexure-4 Forest Clearnce application and its status
Annexure-5 Conservation plan of Olive Ridley Turtle and its submission proof
Annexure-6 Conservation plan of Sand dunes

ANNEXURE R/11
[Colly]

GHCL Limited

Date: 08/09/2023

To,
Director and Member Secretary (Industry III),
Ministry of Environment, Forest & Climate Change,
3rd Floor, Vayu Wing, Indira Paryavaran Bhavan,
Jor Bagh Road, Ali Ganj,
New Delhi- 110003.

Subject: Submission of EDS reply for obtaining Environmental Clearance for proposed Greenfield project of M/s. GHCL Limited
Ref.: EDS sought by MoEF & CC dated on 19/01/2023
Proposal no.: IA/GJ/IND3/408164/2022

Respected Sir,
It is requested to note that Point wise reply of EDS sought by MoEF & CC dated on 19/01/2023 is given as follows:

Sr. no.	EDS sought by MoEF & CC	EDS reply
1.	Please submit all the requisite documents as per CRZ Notification, 2011 and the recommendations of SCZMA.	Detailed discussion and deliberation was made on 04.08.2023 to SCZMA and it was decided by SCZMA in Minutes of 67th meeting of GCZMA (Gujarat Coastal Zone Management Authority) to recommend to Ministry of Environment, Forest and Climate change to grant CRZ clearance for proposed project for establishment of sea water intake and outfall facility for proposed Greenfield chemical complex at village Bada, Taluka Mandvi, Dist Kutch, Gujarat. 67th Minutes of Meeting of GCZMA is attached as Annexure-1
2	Please submit the Stage-I FC for the forest land, as and when received.	Stage-I Forest Clearance was obtained on date: 18/07/2023 which is attached as Annexure - 2.
3	Please submit a clarification from QCI - NABET regarding the starting date of accreditation of consultants for sector 4 (e) i.e. soda ash industry.	Clarification letter from QCI - NABET regarding the starting date of accreditation of consultants for sector 4 (e) i.e. soda ash industry is attached as Annexure - 3.
4	Please confirm if any consultant accredited for sector 4 (e) has been engaged for the project. If so, the details thereof	The proposed project "Greenfield Chemical Complex was envisaged and conceptualized during Vibrant Gujarat Summit 2017, Govt. of Gujarat. During MOU GHCL Ltd. has committed to set up Greenfield Soda Ash facility in District Kutch, Gujarat.At the time of planning of execution of project, there was no NABET accredited Consultant for soda ash sector available. M/s GHCL limited has appointed institutes of National repute like CSIR NEERI Nagpur based on their past experience of EIA for similar nature of Greenfield Soda. Ash project at Gujarat coast. M/s. GHCL Limited has informed to MoEF&CC regarding the appointment of EIA consultants (CSIR

GHCL Limited

		NEERI) Vide Letter no. GHCL/AHD/ENV/MOEF/VND/17-18/07 dated 23-11-2017. It is also requested to note that all the EIA study of Soda ash industry was earlier carried out by only Chlor Alkali Approved consultant and Environmental Clearance was granted by MoEF&CC. After that CSIR-NEERI and GHCL Limited has also started site alternatives for the proposed Greenfield chemical complex, we have examined 5 site alternatives for proposed Greenfield chemical complex and this activity has taken significant time to finalize the proposed site and after that we have started collection of Baseline monitoring. We intended to commission plant activities at earliest but due to COVID 19 the project activities got seriously impacted and delay has been affected.GHCL Ltd. had made an online proposal during July 2021 to MOEFCC for obtaining TOR proposal for the aforesaid project, in Covering letter of the proposal mentioned status about appointment of CSIR NEERI. At the time of submission of TOR proposal, the baseline data was near completion. Hon'ble MOEFCC has raised EDS for TOR proposal. During reply of EDS we have again indicated the name of hired EIA consultant (CSIR NEERI). TOR was granted for the project on August 2021 after reply of EDS Even though we have engaged with M/s. T.R.Associates for additional baseline studies which is accredited for sector 4 (e) . Based on previous proceeding, we request you to consider our case and proceed for Environmental Clearance

If any confusion, feel free to contact us.

Thanking You.
Yours faithfully,
For GHCL ltd.

[N N Radia - Chief Operating officer]

Enclosure;

Annexure-1 67th Minutes of Meeting of GCZMA
Annexure-2 Stage-I Forest Clearance was obtained on date: 18/07/2023
Annexure-3 Clarification letter from QCI - NABET regarding the starting date of accreditation of consultants for sector 4 (e) i.e. soda ash industry

GHCL Limited

Date: 27/12/2023

To,
Director and Member Secretary (Industry III),
Ministry of Environment, Forest & Climate Change,
3rd Floor, Vayu Wing, Indira Paryavaran Bhavan,
Jor Bagh Road, Ali Ganj,
New Delhi- 110003.

Subject: Submission of EDS reply for obtaining Environmental Clearance for proposed Greenfield project of M/s. GHCL Limited
Ref.: EDS sought by MoEF & CC dated on 03/11/2023 (attached as Annexure – 1)
Proposal no.: IA/GJ/IND3/408164/2022

Respected Sir,
It is requested to note that point wise reply of EDS sought by MoEF&CC dated on 03/11/2023 is given as follows:

Sr. no.	EDS sought by MoEF&CC	EDS reply
1.	Proper recommendation letter from GCZMA.	It is requested to note that the unit has received the Final Recommendation letter from GCZMA vide File no. ENV/10/2021/184/T-cell dated 26-12-2023. The Recommendation letter is attached as **Annexure-2** for your ready reference.
2	Detailed CRZ report prepared by IRS, Anna University.	Detailed CRZ report prepared by IRS, Anna University is attached as **Annexure-3** for your ready reference. The CRZ Index Map and CRZ Map with 1:25,000 scale for the 7 km buffer from the proposed project site is attached as **Annexure-4.**
3	NOC from SPCB w.r.t discharge of treated effluents.	The unit has obtained CTE after TOR vide file no. GPCB/ (PCB ID- 84051)/ CTE- 48987 dated 09th September, 2021 from Gujarat Pollution Control Board (GPCB) and the same is attached as **Annexure-5** for your ready reference. All necessary information, including details about the discharge of treated effluents, has been submitted and is provided in **Annexure-6** for your reference.

Kindly consider the same.

Thanking You.
Yours faithfully,
For GHCL ltd.

for Singh

[N N Radia - Chief Operating officer]

Enclosure:
Annexure-1 EDS
Annexure-2 Recommendation letter from GCZMA
Annexure-3 Detailed CRZ Report Prepared by IRS, Anna University
Annexure-4 CRZ Maps
Annexure-5 CTE after TOR
Annexure-6 Application of CTE

-TRUE COPY-

GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(IA DIVISION-INDUSTRY-3 SECTOR)
*****

Dated:8.1.2024

MINUTES OF THE 72nd EXPERT APPRAISAL COMMITTEE (INDUSTRY-3 SECTOR) MEETING HELD ON 2nd JANUARY, 2024

Venue: Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003 through Video Conferencing (VC)

Time: 10:30 AM onwards

(i) Opening Remarks by the Chairman

Prof. (Dr.) A.B. Pandit, Chairman welcomed the Committee members and opened the EAC meeting for further deliberations.

(ii) Details of Agenda items by the Member Secretary

The Member Secretary then apprised the Committee about the details of Agenda items to be discussed during this Expert Appraisal Committee (EAC) meeting.

Agenda Items as per Parivesh 2.0 Portal

Agenda No. 72.1

Proposed expansion for manufacturing of Synthetic Organic Chemicals and Resins and Formaldehyde with production capacity from 833.33 MTPM to 16000 MTPM located at block no. 634/7/1 & 637, Lamdapura Road, Manjusar, Taluka: Savli, District: Vadodara, Gujarat by M/s. Rajsha Chemicals Pvt. Ltd. Consideration of Environmental Clearance

[Proposal No. IA/GJ/IND3/447188/2023, File No. J-11011/607/2009-IA-II(I)]

1. The proposal is for Environmental Clearance to the Proposed expansion for manufacturing of Synthetic Organic Chemicals and Resins and Formaldehyde with production capacity from 833.33 MTPM to 16000 MTPM located at block no. 634/7/1 & 637, Lamdapura Road, Manjusar, Taluka: Savli, Dist.: Vadodara, Gujarat by M/s. Rajsha Chemicals Pvt. Ltd.

Paithan, District Aurangabad, Maharashtra by M/s Satellite Pharmaceuticals Pvt. Ltd. - Consideration of Environmental Clearance

[Proposal No. IA/MH/IND3/419096/2023; File No. IA-J-11011/505/2021-IA-II(I)]

PP did not attend the meeting. Accordingly, the proposal was **deferred.**

Agenda No.72. 9

Proposed project to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity, 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka - Mandvi, District - Kutch in the Gujarat state by "Greenfield Chemical Complex" of GHCL Ltd- Consideration of Environmental Clearance

[Proposal no: IA/GJ/IND3/408164/2022, File No. IA-J-11011/293/2021-IA-II(I)]

1. The proposal is for Environmental Clearance to the Proposed project to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity, 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka - Mandvi, District - Kutch in the Gujarat state by "Greenfield Chemical Complex" of GHCL Ltd

2. The project/activity is covered under Category 'A' of Item 4 (e) soda ash industry of Schedule of Environment Impact Assessment (EIA) Notification, 2006 (as amended) and requires appraisal at Central Level by the Expert Appraisal Committee (EAC) as the project is located outside the notified industrial area.

3. The ToR was issued by the Ministry, vide letter no. IA-J-11011/293/2021-IA-II(I) dated 10th August, 2021. The PP applied for the Environment Clearance in the Common Application Form and submitted the EIA/EMP Report and other documents. The PP in the CAF reported that it is a **Fresh EC case.** The proposal is placed in 72nd EAC Meeting held on 2nd January, 2024 where project was wherein the PP and an accredited Consultant, CSIR NEERI [NABET accreditation till **NABET Accreditation Number: NABET/EIA/2124/RA 0227, Valid till July 01, 2024**], made a detailed presentation on the salient features of the project and informed the following:

4. The PP reported that the Total land area is **5463200 m^2; no** additional land will be used for **proposed project** and no R& R is involved in the Project. The details of various products are as follows:

Sr. No.	Name of the Product	Production Capacity (MT/Month)	CAS Number	End use
1	Light Soda Ash	11,00,000 TPA	497-19-8	Manufacturing of glass, usage in chemical industry, paper and detergent manufacturing, and food industry
2	Dense Soda Ash	5,00,000 TPA	497-19-8	
3	Sodium bicarbonate	2,00,000 TPA	144-55-8	
Captive Co-generation Power plant Steam (CFBC boilers)			120 MW	
Emergency DG Set			5 MVA	
Note- The production capacities are planned in phased manner and for Phase 1 production capacity for LSA: 5,50,000 TPA, Dense Soda Ash: 2,50,000 TPA, SBC: 1,00,000 TPA and 60 MW for Captive Co-generation Power plant.				

5. The PP reported that there is no violation case as per the Notification No. S.O.804(E) dated 14.03.2017 and no direction is issued under E(P) Act/Air Act/Water Act.

6. The PP reported that There is no National Parks, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. **Marine National Park and Sanctuary, Jamnagar are located at 75 km aerial distance in South direction and Narayan Sarovar Sanctuary is located at more than 100 km aerial distance in North-West directions**. Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Gugal Schedule-I species were found in the study area for which conservation plan has been preapred and submitted to PCCF and Chief wildlife warden dated 9.11.2023.

7. The PP reported that the diversion of 0.9689 ha unclass forest for laying part of sea water intake and effluent disposal pipeline and passage for related construction equipment movement in Kachchh has been obtained vide ketter dated 18. 7.2023.

8. The PP reported the Unit has received the Final recommendation letter from GZMA vide file no ENV/ 10/ 2021/184/ T- cell dated 26.12.2023. CRZ details are as:

Activities	Zone
Construction of process plant and utilities etc.	Outside CRZ area
Effluent collection	Outside CRZ area
Seawater Intake system i.e. sump and pump house	CRZ III
Intake Pipeline	CRZ IA, CRZ IB and CRZ IV
Outfall Pipeline	CRZ IA, CRZ IB and CRZ IV

Laying of Seawater Intake and effluent disposal underground pipeline through tunnel from unclassified Forest area, Sand dune area, intertidal area outside project boundary.

9. The PP reported that **Ambient air** quality monitoring was carried out at **10 locations** during **December 2019 – February 2020**. The baseline data indicates the ranges of concentrations as: PM_{10} (**19 µg/m^3 to 53 µg/m^3**), $PM_{2.5}$ (**8 µg/ m3 to 17 µg/ m3**), SO_2 (**1 µg/m^3 to 14 µg/m^3**), NOx (**5 µg/m^3 to 16 µg/m^3**), Ammonia (**6 µg/m^3 to 19 µg/m^3**), Ozone (**2 µg/m^3 to 8 µg/m^3**), Carbon Monoxide (**0.09 mg/m^3 to 0.21 mg/m^3**), Hydrocarbons [Methane hydrocarbons (**0.23 µg/m^3 to 1.27 µg/m^3**) and Non-Methane hydrocarbons (**0.11 µg/m^3 to 0.19 µg/m^3**)], Lead (Pb) (**0.05 µg/m^3 to 0.27 µg/m^3**), Arsenic (As) (**0.02 ng/m^3 to 0.11 ng/m^3**), Nickel (Ni) (**0.11 ng/m^3 to 0.18 ng/m^3**), Benzo(α)pyrene(B[a]P) (**ND to 0.03 ng/m^3**) and Benzene (**ND to 0.16 µg/m^3**). AAQ modeling study for point source emissions indicates that the maximum incremental GLCs after the proposed project would be **3.05** µg/m^3 in case of Lignite, Coal and Petcoke with respect to PM_{10}, **10.98** µg/m^3 in case of Lignite, **2.55** µg/m^3 in case of Coal and **13.26** µg/m^3 in case of Petcoke with respect to SO_2 and **11.37** µg/m^3 in case of lignite, **7.3** µg/m^3 in case of coal and **5.62** µg/m^3 in case of Petcoke with respect to NO_x. The resultant concentrations are within the National Ambient Air Quality Standards (NAAQS).

10. The PP reported that the Total water requirement for project will be 15,20,060 m^3/day in case of Dry Lime process or 13,63,878 m^3/day in case of Wet Lime process which will be met from Sea water. Total Effluent of 15,88,570 m^3/day (Domestic - 160 m^3/day + Industrial – 15,88,410 m^3/day) in case of Dry Lime process or 14,48,818 m^3/day (Domestic - 160 m^3/day + Industrial – 14,48,658 m^3/day) in case of Wet Lime process. The Process effluent generated i.e. from distiller waste, brine purification reject, RO/DM rejects will be disposed off along with once through return cooling water/fresh seawater into Arabian Sea as per recommendation of NIO. The characteristics of the discharge water are within the norms prescribed by CPCB.

11. The PP reported that the Power requirement for proposed project will be 120 MW and will be met from Captive Co-generation Power plant. D. G. Set (5 MVA X 1) [Fuel: HSD (60 KL)] shall be provided and used only in case of power failure. Stack (30 meter) and Retrofit shall provide as per CPCB norms to the DG sets. Industry will provide six Steam Boiler (150 TPH) for captive power plant, six lime kilns and D G sets

12. Details of process emissions generation and its management:

SR.NO.	Stack attached to	Capacity	Height of the stack (m)	Fuel & its Consumption	Expected Pollutant	APC System	GPCB Limit
1	CPP with flue gas desulphurization CFBC Boiler (6 Nos.)	150 TPH	130 m	Imported Coal/Lignite/ Pet coke (Imported Coal: 13,14,000 TPA, Lignite :19,71,000 TPA, Pet coke: 9,12,500 TPA)	SPM SO_2 NO_2 Hg	Individual ESP with each Boiler	PM ≤ 30 mg/Nm^3 SO_2 ≤ 100 mg/Nm^3 NO_2 ≤ 100 mg/Nm^3 Hg ≤ 0.03 mg/Nm^3
2	D G Set (2/3 Nos.)	5 MVA	30 m	HSD (60 KL)	HC CO PM NO_x	Retrofitting	NOx 710 ppmv NMHC 100 mg/Nm3 PM 75 mg/Nm3 CO 150 mg/Nm3

3	Lime Kiln 1		68 m	Coke or Briquette or Anthracite (Coke - 1,30,000 TPA, Briquette- 1,55,000 TPA, Anthracite - 1,10,000 TPA)	SPM SO_2 NO_2	Scrubber and Dust Collector system	SPM ≤ 150 mg/Nm^3 SO_2 ≤ 100 ppm NO_2 ≤ 50 ppm
4	Lime Kiln 2		68 m			Scrubber and Dust Collector system	
5	Lime Kiln 3		68 m			Scrubber and Dust Collector system	
6	Lime Kiln 4		68 m			Scrubber and Dust Collector system	
7	Lime Kiln 5		68 m			Scrubber and Dust Collector system	
8	Lime Kiln 6		68 m			Scrubber and Dust Collector system	

SR.NO.	**Stack attached to**	**Height of the stack (m)**	**Expected Pollutant**	**APC System**
1	Ammonia Recovery system	42 m	Ammonia	Water scrubber
2	Lime grinding system / Slaker	65 / 20 m	PM / Water vapor	Bag filter / Adequate stack height
3	Calciner unit	37 m	PM	Scrubber, Bag filter
4	Densification	43 m	PM	Scrubber

5	Sodium Bi-Carbonate Unit	30 m	PM	Bag filter
6	Lime Kiln	Closed system	PM	Scrubber and Wet ESP

13. **Details of Solid Waste/ Hazardous Waste Generation and Its Management**:

Sr. No.	Type of Waste	Mode of Disposal
1	ETP Sludge from treatment of effluent generated from captive power plant & RO/DM Plant	The effluent from power plant, RO/DM plant will require only neutralization & it will have negligible BOD/COD. Sludge will be disposed off in nearby landfill site.
2	Used Oil / Used Cotton	It will be sold to MoEF&CC/CPCB registered recyclers only. Approx. 12 KL
3	Discarded Drums	It will be sold to approve traders. Approx. 5 MT/yr
	Discarded Bags	It will be sent back to supplier for reuse.
4	Spent Ion exchange resin	To be sold to authorized recyclers or will be incinerated at MoEF&CC/CPCB approved TSDF for which plant will obtain membership. Approx. 3000 l/yr
5	Lead acid Batteries	It will be sold to authorized agency through auction.
6	Ash (Fly ash & Bottom Ash) from Boiler	The Boiler ash will be used for cement Manufacturing/ Brick Manufacturing. Approx. 750 TPD
7	Limestone rejects	It can be used in Boiler for desulphurization and as a sweetener in cement industry, road making, pavement etc. 5% of lime stone consumption.
8	Settled sludge	Since settled sludge, non-hazardous in nature, it is proposed to be disposed off in Nearby landfill site.

14. The Budget earmarked towards the Environmental Management Plan (EMP) is ₹ **205.07 crore** (capital) and the Recurring Cost (operation and maintenance) will be about ₹ **6.98 Crore** per Annum. Industry proposes to allocate ₹ **18.04 Crore** towards CER.

15. The PP reported that Public Hearing for the Proposed project has been conducted by the State Pollution Control Board at the project site on **17.10.2022**. The main issues raised during the public hearing are related to the air pollutants, water pollutants, schedule 1 conservation plan, fishing, traffic etc.

16. The PP proposed to set up an Environment Management Cell (EMC) by engaging Environment officals for the functioning of EMC.

17. The PP submitted the Disaster and Onsite and Offsite Emergency Plans in the EIA report.

18. The estimated total project cost is **Rs 3550 Crores**. Total Employment will be **1200** persons as direct.

19. Intake pipeline and outfall pipeline fall in CRZ 1A, 1B and IV area as per demarcation. It was reported that construction of process plant and utilities fall outside the CRZ area. SCZMA recommendation has been obtained for Laying of Seawater Intake and effluent disposal underground pipeline through tunnel from unclassified Forest area, Sand dune area, intertidal area outside project boundary.
20.

21. The Public Hearing earlier was scheduled to be held on 16-04-2022 at 11:00 Hrs, Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch, Public hearing was then time being postponed due to unavoidable circumstances. After that public hearing was completed on **17-10-2022 at 11.00 Hrs.** Venue: Project Site, Survey no . 432, Village: Bada, Taluka: Mandvi, District: Kutch, Gujarat. Which was presided over by Shri Chetan Mishan(GAS), Sub Divisonal Magistrate & Deputy Collector, Mundra- Kutch. Public hearing Details as given below:

S.No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
1	CSR–Fodder	4	Steps to be taken for cattle Care about Maldhari community Security regarding fodder supply for livestock.	Fodder will be provided as well as provision for veterinary doctor will be carried out by GHCL foundation under CSR activity.	• Activities for fodder supply will be carried out under CSR and CER activities for strengthening the bond between the project authorities and the local population. (refer Ch-8 and Table 10.4 in Ch-10). Fodder field will be developed on the Government/allocate land to nearby villages. • Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR activities for communities. • During year 2020-2021, GHCL foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation, Animal husbandry, health care, SHG,	• As per MoEF&CC Office Memorandum F.NO. 22-67/2017-IA III, MoEF&CC, New Delhi, dated on 1st May 2018 GHCL Ltd has earmarked 0.5 % of capital investment (appro. Rs. 18.04 crore), towards the Corporate Environment Responsibility in 5 years • GHCL Ltd will spend approx. **4.35 crore*** towards Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages as per requirement under CER activities (* value may defer as per actual requirement)	5 years	GHCL Limited
2	Employment	5	For employment of local villagers Number of employment opportunities to be Priority must be given to nearby 10 villages Regarding priority to nearby villages	Information on employment opportunities has given by Project Proponent that there are different types of employment opportunities in the two phase of the projects i.e. construction	• The proposed project has a potential for employment of skilled, semiskilled and unskilled employees during construction phase as well as	• GHCL Ltd will spend approx. 2.25 crore towards Promoting activities for skill building to improve	During construction and Operation phase	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			for labor work Regarding employment for local communities.	phase and operational phase of the project. GHCL will strive to provide these employment opportunities to the local people, for which work will be done for their skill development and employment opportunities will be provided to the local people. As per requirement, training will be given to local people in coordination with HR department. Priority will be given for employment of local people. In nearby villages a group of women can be formed so that they can work in Gruhudhyogs (Home-based business) M/s	operational phase. The plant will create direct employment in phased manner for about 1200 (operational phase) skilled as well as semi-skilled staff and indirectly large number of unskilled manpower will be engaged for the project. For Employment, local people will get first priority as per suitability and requirement. People will also get employed by the contractors for various project related activities.(Refer Ch-8	employment opportunities and women empowerment in nearby villages under CER activities.		
3	CSR - Health	1	Regarding health facilities under CSR activities	Will provide mobile health van facility and upgradation of existing healthcare infrastructure	• Industry will provide Mobile Health Care, Health Camps, and Specialized Check Up Camps in nearby villages. Necessary support and help will be extended for advanced diagnosis and treatment wherever identified, Free medical health checkup under CSR and CER	• GHCL Ltd will spend approx.. 1.12 crore towards Infrastructure development Such as primary healthcare units and the fulfilment of the basic amenities in PHCs including mobile	5 years	GHCL Limited
4	CSR - Education	3	Regarding scholarship Regarding skill development of	Will build school in future as per requirement and will also upgrade the existing school	• Unit will be directed at two levels viz. school and skill building to		5 years	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			conditions To provide educational facilities	skill development activities	school level we intend to promote quality of education and learnability, develop infrastructure of Government schools, provide vocational training as per the requirement under CSR and CER activities. • GHCL foundation will support local government and NGO to make that program more effective. • GHCL foundation will carry out skill development Programme for local youth to improve their employment opportunities, women empowerment under CSR and CER activities. • During year 2020-2021, GHCL Foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation, Animal husbandry, health care, SHG, Infrastructure development etc.	towards Infrastructure development for quality of education, which will ultimately upgrade schools in nearby villages under CER activities.		
5	Air Pollutants (SOx, NOx, Dust)	6	Height of chimney to be installed Levels of Sox and NOx Regarding acid rain cause by Sox Emission of PM during transportation and	For minimizing Air Pollution, requisite height of the stacks will be provided as per the NAAQS norms. Besides this, Modern technology	• The best available technology-based pollution prevention and control shall used to meet the regulatory standards and these pollution control systems will be commissioned before	• Air pollution • Capital cost would include air pollution	During operation phase	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			mercury. Regarding once through cooling for 120 MW. Regarding linkage of fuel and how they are going to use it	installed. As a result, the pollution level will be within standard limits. GHCL will continue to support development of green belt in the surrounding villages through various agencies including GHCL Foundation (AF). GHCL shall endorses AF tree plantation movement of planting trees in entire Mandvi Taluka and 50,000 trees that mentioned, GHCL shall surely nurture those plants for five years.	commencement of operation of the project. Wherever possible, the control systems shall be interlinked wit h the operational units, so that failure of the control system shall shut down the respective operational unit. • High efficiency ESPs shall be provided in the flue gas path of the CFBC boilers for control of particulate matter. • Finely ground limestone will be added to the boiler combustion zone • together with coal/lignite to arrest the SO2 formed during combustion. • Lime stone dozing system to the furnace to be designed to achieve higher than 90% capture of SO2. Monitoring system(CEMS) of air pollutants SO2, NOx, NH3, PM10 and PM2.5 will be implemented. • So, the expected pollutants will be well within standard norms. • The air quality	Stacks, Dry Fog system, Wind screen etc- 89.28 crore • recurring cost would include operation and maintenance of pollution control devices- 1.50 crore • **Environmental monitoring Programme** capital cost include OCEMS, online weather station etc- 3.4 crore • Recurring cost – 0.95 crore • Greenbelt • Capital Cost- 20 Crore • Recurring Cost- 0.5 crore		

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					• There is no readily available infrastructure for transportation of fuel i.e. rail or water way. So, we have to transport through road. Traffic study are shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. In future, any alternative option available will explore.			
6	Water pollutants (BOD,COD,Ammonia, Mercury, Sea Weed, Mangroves)	7	Regarding water related question by Koli society Regarding decrease in number of phytoplanktons and disruption of food Regarding temperature and presence of ammonia Regarding presence of mangroves Regarding setup of tunnel for intake of sea water, seismic zone in which company falls, liquification of land Regarding discharge of effluents into sea containing ammonia and high temperature and Regarding quality of effluent in terms of BOD and COD	Effluent will be highly alkaline so it will be mixed with HCL and then it will be disposed off in sea. Design of structure will done according to seismic zone V. In soda ash industry impact of ammonia is very low.	• Industry will provide adequate effluent management and monitoring system for disposal of treated water • Proper seawater intake and treated effluent disposal (ensure maximum dilution) shall be done as per recommendation Marine EIA report. • The water monitoring results of (surface and groundwater and marine) should be carefully evaluated to identify significant changes, if any, adverse change from the baseline accordingly, corrective measures will be taken to ensure the sustenance of water quality. However, there	• Capital cost would	During operation phase	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in BH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					within the limit specified by CPCB for soda ash industry. ● There is no such fish kill cases due to treated effluent in existing plant. There are independent studies available which indicates there is no significant adverse impact on marine environment but there will be positive impact on environment. ● During studies, there is no such mangroves identified in sea			
7	Marine Life	1	Effect on marine life due to proposed project	No adverse impact on fish or marine animals and sea weed observed.	● Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. The effluent release scheme can then be adequately modified to ascertain necessary dilution, if required. The efficiency of the diffuser must be checked periodically and if necessary, it	● A provision of Rs. 1 crore to be earmarked for the biodiversity management plan to be implemented in the project area during construction phase and operation phase. ● For periodic monitoring of the marine area environment during project ● construction phase, a	During construction and Operation phase	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					impact on environment but there will be positive impact on environment. • Design of pipeline/tunnel will be done according to seismic zone V. In case of catastrophic failure/ liquification on land, there are no chances of flooding as water transport through gravity.			
8	Health & Hygiene(Ammonia Leakge)	2	Skin diseases due to Soda Ash Regarding the leakage of ammonia.	GHCL will take care of any such issues related to Health of local peoples and workers. All the necessary measures for handling of chemicals will be implemented to reduce its impact on health of peoples. This information is also provided in the EIA report. All the pockets will have leak detection and repair system technology. Moreover, periodical maintenance will also be carried out. GHCL will ensure that there will be no leakage and therefore, there will not be occupational health issues for workers or villagers working in the plant. Moreover, GHCL	• Ammonia tanks should have latest instrumentation provision for pressure indication, temperature indication and level indication. The provision of instrumentation should be within 100 percent redundancy. Continues recording of major parameters pertaining to the storages shall be maintained in the control room. • Unit will provide all the safety measure for ammonia storage	• Capital cost would include cost of OHS center, PPEs, fire & safety instruments, automation system for ammonia storage – 3.4 crore • Recurring cost would include maintenance charges and training, audit & health check-up etc.- 0.35	During operation phase	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					commissioned before commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the operational units, so that failure of the control system shall shut down the respective operational unit. ● There is no significant impact observed in the			
9	CSR - Farmers	3	Facilities to be provided How hygenic the plant will How hygenic will be bada plant and what facility will be provided to the farmer.	GHCL Foundation is already providing subsidy for drip irrigation and GHCL will also consider to support this scheme further out of the CSR funds proposed for this project. To help agriculture, GHCL will help farmers as part of our CSR activity in consultation with villagers. The details and type of developmental work will be decided in consultation with villagers. GHCL foundation has been working for farmers through its different schemes like ground water recharge, water harvesting	● Industry will Promote environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of high-quality seeds/manure, efficient irrigation solutions, etc. under CSR and CER activities	● GHCL Ltd will spend approx.. 3.00 crore towards Promoting environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity	5 years	GHCL Limited
10	EIA Report & PH	14	EIA report is not correct	The terrestrial EIA report	● It is requested to note that as			GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
	advertisement		Regarding the alternative of site modhwa village. Regarding the NIO accreditation to prepare marine EIA report Regarding ToR granted and Study carried out prior of ToR granted. Regarding the advertisement of the PH Regarding NABET accreditation of consultant organization Regarding Marine EIA Regarding NEERI who has prepared EIA report Regarding the correction in EIA report Regarding the monitoring data collection Regarding accreditation certificate of additional studies for ecology.	prepared by CSIR NEERI and Marine EIA report is prepared by NIO, Mumbai	per OM number J-17011/8/92-IA-III dated 8th August, 2019, there are 7 institutes/agencies authorized for preparation of CZMPS in consonance with the provision of CRZ notification, 2019 vide GSR 37(e) dated 18/01/2019. IRS anna university Chennai has prepared the CRZ map for GHCL LTD. CSIR - NIO is Expert hired to carryout the Marine EIA study. ● EIA report has been prepared by CSIR-NEERI, which is reputed governmental body and QCI NABET accredited consultant.			
11	Vipassana	3	Project site is near Vipassana meditation center The meditation center will be disturbed due to industry. Ammonia used in the industry. Related to presence of Vipassana center and other religious places in 15km radius of project site	--	● Environmental Management Plan envisages the plans for the proper implementation of mitigation measures to reduce the adverse impacts. ● The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment.	● Cost of Environment management plant including various installations for Air	--	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					ash manufacturing industry. • It is reported in CSIR NEERI report that there are no significant impact expected on man-made sensitive installations and habitations. On basis of study of present environment condition near project area and impact prediction and control measures proposed by GHCL Ltd. The proposed project will not have any significant negative impact on environment. Company operations are limited to the plant boundary and no negative impacts on	• Recurring Cost- 0.5 crore		
12	CSR - Animal Husbandry	3	Regarding arrangements for Animal Regarding distribut Regarding number of cattle present in the area	GHCL Foundation will support nearby community by providing education and livelihood support to make them self – reliant.	• Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR activities. • Unit will also promote development Initiatives for Fishing Communities such as Creation of infrastructure like ice plants, cold storages as well as provide operational inputs such as fishing boats, nets and engines	• GHCL Ltd will spend approx.. 4.35 crore towards Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides	5 years	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
13	Site Selection	2	Regarding the alternative of site modhwa village. Regarding showing presence of marshy land near coastline	--	During the site selection, the alternative sites considered for setting-up of the proposed chemical complex project are given below: : Site 1 – Village Pingleswar, Taluka – Abdasa, Dist. Kutch Site 2 – Village Suthri, Taluka – Abdasa, Dist. Kutch Site 3 – Village Bambhdai, Taluka – Mandvi, Dist. Kutch Site 4 – Village Bada, Taluka – Mandvi, Dist. Kutch Site 5 – Village Modhva, Taluka Mandvi, Dist. Kutch The site at village bada is considered favorable based on the environmental and logistic advantages over other four sites. Justification	--	--	GHCL Limited
14	Sand Dunes	2	Concern of presence of sand dunes at bada coast Regarding digging of sand dunes for preparation of tunnels for water intake	--	• There is no disturbance to existing sand dunes. • Tunnelling work (much below ground level) for laying pipeline through sand dunes will be done by adopting proven construction methodology like micro tunnelling. The detailed Studies on sand dune mapping and morphological changes near the project site was carried by National Institute of	--	--	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
15	Turtle	3	Regarding presence of turtles on the coastline of bada Regarding information on endangered species not mentioned in EIA report Regarding hatching and presence of sea turtles	--	• Study on Status Survey and Conservation Plan for Sea Turtles along Mandvi Taluka, Bhuj, Gujarat by **Zoological Survey of India, Kolkata (April,2019)** is attached with EIA report. • ZSI study report mention that they did not any encounter any sea turtle and fresh/old nests or crawl marks of turtles on the beach. Since many of the factor for selection of a suitable nesting site are not conducive. • As per additional Ecological and Biodiversity study, suggests that the coast near the proposed project site may not be	• Contribution to Forest department for Sea Turtle Conservation Activities- 0.20 crore	10 years	GHCL Ltd
16	Schedule 1 species	4	Regarding presence of greater numbers of	--	• Details of schedule -1	• the proposed	10 years	GHCL Ltd

S. No.	Issue related to	Nos. Issues	Concern in PH	G HCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
	Sandha and indian Monitor Lizard)		stated in report Presence of reptiles and amphibians not reported Related to study of presence of Indian Monitor Lizard in study area Regarding presence of gugal trees,		already incorporated in EIA report. • GHCL shall make financial allocations for taking up wildlife mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • GHCL Ltd have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake	allocation for conservation of Schedule 1 species for 10 years is 1.25 crore		
17	Conservation Plan	2	Regarding conservation plan for Schedule 1 species Concern regarding green sea turtles and conservation plan for them	--	• GHCL shall make financial allocations for taking up wildlife • mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • The unit have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle,	• the proposed budget allocation for conservation of Schedule 1 species for 10 years is 1.25 crore	10 Years	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					department of			
18	Form 1(Water Bodies, Temples, Schedule 1 Species)	5	Regarding presence of waterbody not shown in form-1 Regarding religious places and lakes not mentioned in PFR Waterbody not mentioned in form-1 Data given in form-1 and EIA are different Waterbody not mentioned in form-1	--	• Environmental settings are given in Chapter-1 and Chapter-5 of EIA report. Approximate distance of water bodies, temples etc are given in EIA report. • Through drainage studies of the area, it was observed that there is one stream of 1st order entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, will be diverted to nearby passing Vengadi River in the	• -Cost of drainage network of surface runoff, rainwater collection pond and rain water harvesting system – 53 crores (included in EMP)	--	GHCL LTD
19	Govt. Land	3	Regarding type of land to be procured by the industry Regarding status of government land to be procured Providing data for proving gauchar land	--	• There is no gauchar land within proposed project site. M/s GHCL has applied to Industries Commissioner and District Collector for allotment of aforesaid land. Industries Commissioner has granted In Principle approval for Bonafied Industrial Purpose District	--	--	GHCL LTD
20	Fishing	8	Regarding details of Pagadia fisherman not mentioned and Marine EIA is misinterpreted	--	• Proper seawater intake and treated effluent disposal (ensure maximum	• A provision of Rs. 1 crore to be earmarked for the	During construction and	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Regarding disturbance to fishes due to presence of pipeline Regarding status of fishing near bada and Mandvi Related to number of fisherman not incorporated in study -- Related to presence of dead fishes not reported in study, fishing carried out for commercial purpose Regarding presence of fisherman in study area		Marine EIA report prepared by NIO • Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. • Details of Fishery and fishermen including their family and population are given in Chapter-3 of marine EIA report. • Other than construction phase, there will be no any impact on pagadiya fisher men. As shore line will remain undisturbed. • It is mentioned in marine EIA report that no large-scale commercial fishing operation prevail in the study area except for minor shore based and Gill net operations. • There are independent studies available which indicates there is no significant adverse impact on environment but there will be positive impact on environment.	implemented in the project area during construction phase and operation phase. • For periodic monitoring of the marine area environment during project • construction phase, a provision of Rs. 0.5 crore to earmarked. • For operation phase, Rs. 0.3 crore per year to be kept provision for • the monitoring. • GHCL Ltd will spend approx.. 0.75 crore towards Development Initiatives for Fishing Communities	Operation phase	
21	Water Body (check dams)	2	Related to presence of seasonal river which passes near bada village and presence of dam over it	--	• Through drainage studies of the area, it was observed that there is one stream of 1st order	• Cost of drainage network of surface	During construction and	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Related to distance of river from project site		entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, may be diverted to nearby passing Vengadi River in the west, which has two check dams, one for salinity ingress check and on upstream side for storing fresh water. This will not cause any adverse impact on the downstream. For channelizing the monsoon run off from the area adjacent to plant it is required to construct peripheral drain along plant boundary so that flooding is avoided and run off find its way to the natural slope towards Arabian Sea. So, the present hydrological setting of the area will remain unaffected. So, the present hydrological setting of the area will remain unaffected. • The additional water enter into the vengadi river through drainage will not impact on check dam. As	pond and rain water harvesting system – 53 crores (included in EMP)	Operation phase	
22	Traffic (RMH, Heavy Trucks, Road Usage)	4	Regarding number of trucks passing due to project for raw Related to traffic study not mentioned in ToR, impact not carried out Concern regarding public roads Regarding number of trucks passing	--	• Traffic study are shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. • We will use existing road network as no other transportation i.e. rail/water ways are	--		GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					Traffic study (Level of Service) and added on Form Part-C.			
23	CSR General	1	Regarding past data of CSR --	GHCL has proposed CSR budget in the EIA report which will be utilized based on need identification and village development meetings. CSR will be implemented with CSR implementing agencies including GHCL Foundation is working in following area. 1. Agro-livelihood and animal husbandry, 2. Education and skill development, 3. Health, water, and sanitation.	• GHCL's commitment towards the development of weaker sections of society has been a continuous initiative for more than two decades. Through its "GHCL Foundation Trust", GHCL has upgraded its CSR activities to cover a larger section of the society to provide support to the downtrodden, needy and marginalized citizens and also to create a social infrastructure for their sustenance. GHCL Foundation serves as the Corporate Social Responsibility arm of GHCL Limited and represents our commitment to the holistic development of our surrounding community. During year 2020-2021	--	--	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					Infrastructure development etc.			
			Regarding pollution to be caused by industry -- Regarding to dusting due to kiln and power plant,		• Environmental Management Plan envisages the plans for the proper implementation of mitigation measures to reduce the adverse	• Cost of Environment management plant including various installations for		GHCL Limited

24	Pollution and Environment General	4	Related to disposal of effluent water	Unit will follow all the rules and regulation with their subsequent amendments as directed by concerned authorities	impacts. • The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment	Air Pollution, Water Pollution, Noise Control, Greenbelt Development, Occupational Health and Safety and other related activities.- 205.07 crore	--	
25	Forest area	2	Related to distance of project site from forest area Details regarding families dependent on forest	There is no classified forest area.	• There is no forest land within the boundary of proposed project site. However, some part of the unclassed forest area located south of the project site outside boundary. Sea water intake and outfall pipeline will pass through underground micro tunnel in specific corridor to cross forest area. The permission from the Forest Department is	--	--	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					of 0.9689 Ha. of un-class forest			
26	Supporting for Industrial Development to GHCL LTD	--	For Employment For Infrastructure development in nearby village Social upliftment towards nearby villages Health facilities Women empower ment Skill	GHCL LTD team thanked for welcoming the industries	--	--	--	--
	Total	94						

22. **Deliberations by the EAC:**

After detailed deliberations, EAC desired the following additional information:

1) **Action plan for disposal of gypsum and fly ash generated from desulphursation plant.**
2) Action plan for management and disposal of $CaCl_2$ and $CaSO_4$.
3) Details of existing natural drains within the proposed project site as well as proposal for diversion if any. Details of measures to be taken to maintain the flow.
4) Status of land acquisition including government and pvt. land as well as permission for landuse change for industrial purpose.
5) It was observed that baseline study was conducted during December 2019 – February 2020, which is more than 3 years old. As per OM, PP shall conduct fresh 3 months study.
6) It was noted that EIA -EMP report is prepared by NEERI, which is not QCI /NABET accredited consultant for soda ash. PP informed that now T R Associate has been hired for the proposed project who is a QCI /NABET accredited consultant for soda ash. The Committee suggested that new consultant shall undertake site visit and verify/check the entire data as well as EIA -EMP report. They should give undertaking that they are satisfied with data and own the data provided in the EIA-EMP report. PP shall also submit authorization letter for new Consultant.
7) Revised water balance to be submitted. STP's treatment process shall include secondary treatment.
8) PP informed that widening of approach road to project site is being carried out. PP shall submit road wideining action plan. Traffic study to be conducted.
9) Air quality modeling for line source shall also be incorporate and cumulative impact of line and point source shall provided.
10) As per point source air quality modeling, incremental levels of SO2 and NOx have been estimated to be 10.98 $\mu g/m^3$ and 11.37 $\mu g/m^3$, which are in higher side. PP shall reduce the incremental values after taking suitable pollution control measures.
11) Villages are located 500-600 m away from the project site. PP shall elaborate various measures to be taken for the surrounding villages.
12) Details representations received by SPCB/MoEF&CC agains the project, if any. Action plan to address the issues raised in writted/represntations received by SPCB /MoEF&CC.
13) Details of issues raised by local fishermen if any. Action plan to address the said issues.
14) Copy of stage I forest Clearance and SCZMA recommendations.
15) Commitment for Disaster Management Plan in case of Tsunami, earthquake and cyclone to be prepared and submitted to the respective authority.

Accordingly, proposal was deferred for want of above additional information. Above all additional information shall be submitted online to the PARIVESH portal for further consideration by EAC.

Annexure-III

List of the Expert Appraisal Committee (Industry-3) members participated during Video Conferencing (VC) meeting

S. No.	Name of Member	Designation
1.	**Prof. (Dr.) A.B. Pandit**	Chairman
2.	**Dr. Suresh Panwar**	Member
3.	**Prof. (Dr.) Vijayanand S. Moholkar**	Member
4.	**Dr. (ER.) Dibakar Swain**	Member
5.	**Shri Dinabandhu Gouda**	Member
6.	**Dr. Kishore Malviya**	Member
7.	**Dr. P. Jagannadha Rao**	Member
8.	**Prof. (Dr.) Suneet Dwivedi**	Member
9.	**Dr. D. S. Pai**	Member
10.	**Shri Dinesh Runiwal,**	Member
11.	**A N Singh**	Member Secretary
MOEFCC		
1.	**Dr. Kanchan Puri**	Scientist-B
2.	**Dr. S. Pradeepkumar**	Scientist-B

***

MOM approved by



(Prof. Aniruddha B. Pandit)
Chairman
***

-TRUE COPY-

ANNEXURE R/13 [Colly]

GHCL Limited

To,
M/s. T. R. Associates,
A-401, S G Business Hub,
Near Gota Overbridge,
Sarkhej - Gandhinagar Highway,
Gota, Ahmedabad, Gujarat 380060

Date: 10.01.2024

Subject: Authorization for checking and validating EIA/EMP Report as instructed in the ADS by honourable EAC committee of MoEF&CC during appraisal for further Environmental Clearance

I, **N N Radia – Chief Operating Officer (COO) of** "Greenfield Chemical Complex" of GHCL Ltd., to be located at Village: Bada, Taluka: Mandvi, District: Kutch, Gujarat do hereby **authorize M/s. T. R. Associates**, NABET Accredited consultant for Soda Ash Industry, to undertake the checking and verification of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports for our proposed Soda Ash plant.

They are also authorized to make the necessary application on behalf of us for obtaining Environmental Clearance.

It is important to note that we had previously authorized NEERI to prepare the EIA/EMP report for our proposed project. However, considering the specific accreditation requirements for soda ash projects and as advised by EAC committee of MoEF&CC, we have chosen to engage M/s. T. R. Associates, who are QCI/NABET accredited consultants for Soda Ash to conduct the necessary checks and verifications.

EIA - EMP report is prepared by NEERI, which is not QCI /NABET accredited consultant for Soda Ash. M/s. GHCL Limited is authorizing T. R. Associates for the proposed project who is a QCI /NABET accredited consultant for Soda Ash and Thermal Power Plant. As per the Committee's suggestion, T. R. Associates shall undertake site visit and verify/check the entire data as well as EIA - EMP report prepared by NEERI. T. R. Associates should give undertaking that they are satisfied with data and own the data provided in the EIA-EMP report.

We trust that M/s. T. R. Associates will undertake these responsibilities diligently and in accordance with the relevant guidelines and standards. They are also authorized to correspond with the concerned authorities on behalf of us regarding the environmental clearance process.

We appreciate your cooperation and look forward to a successful and environmentally compliant execution of our proposed Soda Ash plant.
Thank you for your attention to this matter.

N N Radia
Chief Operating Officer (COO),
GHCL Ltd.

GHCL LIMITED

ADDENDANUM of EIA REPORT

FOR

"Greenfield Chemical Complex" of GHCL Ltd. (Light Soda Ash Plant of Capacity 3000 TPD, Dense Soda Ash 1500 TPD, Sodium Bicarbonate 600 TPD with Solid Fuel based Captive Co-generation Power Plant (120 MW capacity), Seawater Intake and Effluent Disposal System) Village Bada, Taluka Mandvi, District Kutch, Gujarat"

GHCL Limited,
GHCL House, Opp. Punjabi Samaj Seva Hall,
Navrangpura, Ahmedabad.

CATEGORY: 4 (e) and 1(d), 'A'

Baseline Monitoring Period [December 2022 to February 2023]
Baseline Study Carried By: T. R. Associates Laboratory
(NABL Certificate Number: TC-7896)

PREPARED BY:

T. R. ASSOCIATES
[NABET ACCREDITED EIA CONSULTANT]
A-401, S. G. Business Hub,
B/w sola Bhagwat & Gota Over Bridge,
Near Umiya Campus, S. G. Highway, Ahmedabad – 380060
E-MAIL: adm.trassociates@gmail.com
CONTACT NO.: 09825371099

NABET Accreditation No.: NABET/EIA/2326/RA 0293 valid up to April 8, 2026.

JANUARY, 2024

trassociates.in

A-401, S.G.Business Hub, Between Sola Bhagwat & Gota Over Bridge, Near Umiya Campus, S.G. Highway, Ahmedabad - 380060. Gujarat. | P : +91 98253 71099, +91 97241 49800 | E : adm.trassociates@gmail.com

OUR SERVICES : ENVIRONMENTAL CONSULTANT | ENVIRONMENTAL LABORATORY
EXPLOSIVE CONSULTANT | PROJECT CONSULTANT | CHARTERED ENGINEER

T. R. ASSOCIATES

UNDERTAKING

I, Mr. T. R. Patel, Proprietor of T. R. Associates, a QCI/NABET accredited consultant for Soda Ash Industry and Thermal Power Plant, here confirm that we have checked/verified the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) report for the "Greenfield Chemical Complex" of GHCL Ltd., at Bada, Kutch.

We have verified the EIA/EMP report, and prepared an addendum report describing our findings and observations. This report conveys our satisfaction with the data presented in the EIA/EMP report.

Furthermore, it is important to note that a fresh baseline study has been conducted by T. R. Associates Laboratory, a NABL accredited laboratory. This study was conducted during the winter season from December 2022 to February 2023. The results of this baseline study have been incorporated into the EIA Addendum report.

Date: 30.01.2024

Place: Ahmedabad

T. R. ASSOCIATES AHMEDABAD

Mr. T. R. Patel,

Proprietor,

T. R. Associates

PART A: DECLARATION BY ACO AND EXPERTS CONTRIBUTING TO THE ADDENDUM OF EIA REPORT

Declaration by experts contributing to the EIA study for proposed soda ash manufacturing plant at Village Bada, Taluka – Mandvi, District Kutch, Gujarat by **M/s. GHCL Limited.**

I, hereby certify that I was a part of the EIA team in the following capacity that developed the EIA report.

EIA sector number as per NABET	14 & 4	**Name of the sector**	Soda Ash Industry & Thermal power plants

EIA CO-ORDINATOR

Name:	**Mr. T. R. Patel**
Signature:	
Date:	30th January, 2024.
Period of Involvement:	**November, 2022 – January, 2024**
Contact information:	**M/s. T. R. Associates** A-401, S. G. Business Hub, B/w. Sola Bhagwat & Gota Over Bridge, Near Umiya Campus, S. G. Highway, Ahmedabad – 380060. Contact No.: 98253 71099 adm.trassociates@gmail.com

FUNCTIONAL AREA EXPERTS

Sr. No.	Function Area	Name of the FAEs	Involvement & Task	Signature
1	AP Air Pollution Monitoring, Prevention & Control	Mr. T. R. Patel	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Baseline monitoring visit; • Identification of impacts of the proposed project based on industrial activities and proposing mitigation measures; • Finalisation of EIA Addendum report.	30/1/24.
		Mrs. Hiral Shah	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Data Collection and identification of pollutants; • Baseline monitoring visit and noted filed observation; • Verification of ambient air quality results. • Preparation of EIA Addendum report.	Hiral Shah 30/1/24
2	AQ Meteorology, Air Quality Modeling & Prediction	Mr. T. R. Patel	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Verification of primary data received, for air quality modelling; • Finalization of EIA Addendum report; • Identification of impacts of the proposed project and suggesting mitigation measures.	30/1/24.
		Mrs. Hiral Shah	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Identify fuel characteristics, calculate proposed pollution load generation due to combustion of fuel; • Collection of primary and secondary meteorological data; • Air Quality Modeling for Point source and Line source; • Preparation of EIA Addendum report.	Hiral Shah 30/1/24

Sr. No.	Function Area	Name of the FAEs	Involvement & Task	Signature
			Period of Involvement:	
3	**WP** Water Pollution Monitoring, Prevention & Control	Mr. Malav Dalwadi	November, 2022 – January, 2024 **Tasks:** • Site visit; • Verification of analysis results; • Contributiuon in preparation of EIA Addendum; • Identification of impacts of the proposed project and suggestion for its mitigation measures.	30/1/24
		Mr. Darshit Dave	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Baseline monitoring visit and collected water samples & noted field observation and co-relate with baseline monitoriong results; • Perform ground truth verification of relevant ground water & surface water. • Onsite preservation of samples; • Onsite parameter measurement.	30/1/24
4	**SHW** Solid & Hazardous Waste Management	Mr. T. R. Patel	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Finalization of categorization of sources of non-hazardous & hazardous/solid waste from proposed project; • Finalization of quantification of hazardous waste generated from industrial activities; • Identification of impacts of the proposed project & suggestions for mitigation measures related to solid & hazardous waste management. • Finalization of action plan for fly ash & gypsum generation from desulphurisation plant.	30/1/24.

T. R. ASSOCIATES

Sr. No.	Function Area	Name of the FAEs	Involvement & Task	Signature
			Period of Involvement:	
	SHW (SW & HW)	Mrs. Hiral Shah	November, 2022 – January, 2024 **Tasks:** • Review of categorization of sources of non-hazardous & hazardous/solid waste from proposed project; • Verification of quantification of hazardous waste generated from industrial activities; • Preparetion of action plan for fly ash & gypsum generation from desulphurisation plant.	Hiral Shah 30-1-24.
5	**RH** Risk Assessment & Hazards Management	Mr. T. R. Patel	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Site visit; • Finalization of disaster management plan; • Verification of impacts of the proposed project and suggesting mtitgation measures; • Finalisation of RH report.	30/1/24.
		Mr. Darshit Dave	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Site visit with EIA coordinator, FAEs and relevant team members; • Analysis and Identification of impact of the proposed project from the manufacturing process and storage hazards. • Verification & review of RH report.	30/1/24
6	**SE** Socio-Economics	Mrs. Snehaben Patel	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Collection of secondary data; • Evaluation of socio economic status from primary data; • Assessment of the possible changes to socio-economic issues arising out of the project; • Identification of impacts of the proposed project on surrounding environment and suggesting mitigating measures; • Preparation of SE report.	Patel 30/1/24

Sr. No.	Function Area	Name of the FAEs	Involvement & Task	Signature
7	**SC** Soil Conservation	Dr. B. T. Patel	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Site and field visit for baseline monitoring; • Collection of soil samples; • Compilation of data; • Review & finalization of results for soil analysis; • Interpretation of results of soil analysis; • Identification of impacts of the proposed project on soil environment and suggestion of its mitigation measures.	30-01-2024
8	**N** Noise	Mr. Rajendra Gohil*	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Site and field visit for baseline monitoring; • Review & finalization of noise monitoring results; • Identification of impacts of the proposed project on surrounfing environment & suggestions for mitigation measures.	Rajendra Gohil 30/1/24
9	**HG** (Hydrology, Ground Water & Water Conservation) **&** **GEO** (Geology)	Mr. I. M. Patel	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Collection of secondary data; • Site visit; • Primary data collection; • Verification of secondary data during site visit; • ground water quality results; • Identification of impacts & mitigation measures; • Preparation of FAE report.	30/1/24.

Sr. No.	Function Area	Name of the FAEs	Involvement & Task	Signature
10	LU Land Use	Mr. Vishwas Patel	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Site visit; • Preparation and Finalization of landuse map of study area; • Preparation & finalization of landuse report.	30/1/24
11	EB Ecology and Biodiversity	Dr. Pankaj Joshi*	**Period of Involvement:** November, 2022 – January, 2024 **Tasks:** • Site visit; • Varification of primary data; • Identification and assessment of impacts of proposed activities of project on biological environment; • Preparation and finalization of EB report.	30/1/24

Note: * Empaneled Expert

Name of the EIA consultant organization: T. R. ASSOCIATES

NABET Certificate No.: NABET/EIA/2326/RA 0293 valid up to April 8, 2026.

CHAPTER - 1
INTRODUCTION

PURPOSE OF EIA ADDENDUM

The proposed project "Greenfield Chemical Complex" was envisaged and conceptualized during Vibrant Gujarat Summit 2017, Government of Gujarat. During MOU M/s. GHCL Ltd. has committed to set up Greenfield Soda Ash facility in District Kutch, Gujarat. At the time of planning of execution of project, there was no NABET accredited Consultant for soda ash sector available. M/s. GHCL limited had appointed institutes of National repute like CSIR NEERI Nagpur based on their past experience of EIA for similar nature of Greenfield Soda Ash project at Gujarat coast. M/s. GHCL Limited had informed to MoEF&CC regarding the appointment of EIA consultants (CSIR NEERI) Vide Letter no. GHCL/AHD/ENV/MOEF/VND/17-18/07 dated 23-11-2017. Earlier all the EIA study of Soda ash industry was carried out by only Chlor Alkali Approved consultant and Environmental Clearance was granted by MoEF&CC. After that CSIR-NEERI and M/s. GHCL Limited had started site alternatives for the proposed Greenfield chemical complex, they had examined 5 site alternatives for the proposed Greenfield chemical complex and this activity had taken significant time to finalize the proposed site and after that we had started collection of Baseline monitoring data. M/s. GHCL Limited intended to commission plant activities at earliest but due to COVID 19 the project activities got seriously impacted and delay had been affected. M/s. GHCL Limited had made an online proposal during July 2021 to MOEFCC for obtaining TOR proposal for the aforesaid project, in Covering letter of the proposal mentioned status about appointment of CSIR NEERI. At the time of submission of TOR proposal, the baseline data was near completion. Hon'ble MOEFCC had raised EDS for TOR proposal. During reply of EDS we had again indicated the name of hired EIA consultant (CSIR NEERI). After that TOR was granted for the project on 10-08- 2021 after reply of EDS vide letter No. IA-J-11011/293/2021-IA-II(I).

During the 72nd EAC meeting held on 02nd January, 2024 EAC committee considering the specific accreditation requirements for soda ash projects directed to engage the QCI/NABET accredited consultant for Soda Ash Industry that shall undertake site visit, conduct fresh 3-month Baseline Monitoring and verify/check the entire data as well as EIA - EMP report prepared by NEERI.

Therefore, M/s. GHCL Limited have chosen to engage T. R. Associates, who are QCI/NABET accredited consultants for Soda Ash Industry, to conduct the necessary checks and verifications.

SECTION 1.2: IDENTIFICATIOBN OF PROJECT AND PROJECT PROPONENETS

Details of Directors and their background

Sr. No.	Name of The Directors	Address	Designation
1	Shri Anurag Dalmia	9, Tees January Marg, New Delhi Pin -110011	Non- executive Chairman
2	Dr. Manoj Vaish	B-305, Paradise, Raheja Vihar, Powai, Mumbai – 400072	Independent Director

3	Smt. Vijaylaxmi Joshi	564, Shriniketan CGHS Plot No. 1, Sector-7, Dwarka, New Delhi – 110075	Independent Director
4	Justice (Retd.) Ravindra Singh	A – 216, Sector – 31, Noida – 201301 (U.P.)	Independent Director
5.	Shri Arun Kumar Jain	House No. B – 802, Prateek Stylhome, Sector-45, Noida – 201303 (U.P.)	Independent Director
6.	Dr. Lavanya Rastogi	74 Elandor Blossom, DR Tomball TX 77375, US	Independent Director
7.	Shri R. S. Jalan	330, Mandakani Enclave, Alakhnanda New Delhi 110019	Managing Director
8.	Shri Raman Chopra	C - 143, Sector – 44, Noida – 201301, U.P.	CFO & Executive Director (Finance)
9.	Shri Neelabh Dalmia	9, Tees January Marg, New Delhi Pin -110011	Executive Director (Growth & Diversification Projects)

Details of EIA Consultant including NABET accreditation:

The EIA consultant for the proposed project is T.R. Associates, which is approved NABET accredited consultant in Soda ash Industry, Category 4(e) with NABET Accreditation No NABET/EIA/2326/RA 0293 valid up to April 8, 2026. There are a group of experts from different organizations including CSIR-NIO involved in this project. The demarcation of coastal zone related to CRZ study was carried out by the Institute of Remote Sensing (IRS), Anna University, Chennai. The details about the T.R. Associates and NABET Accreditation are given in Chapter 12.

T. R. ASSOCIATES

SECTION 1.4: SCOPE OF THE STUDY- DETAILS OF REGULATORY SCOPING CARRIED OUT (TERMS OF REFERNCE)

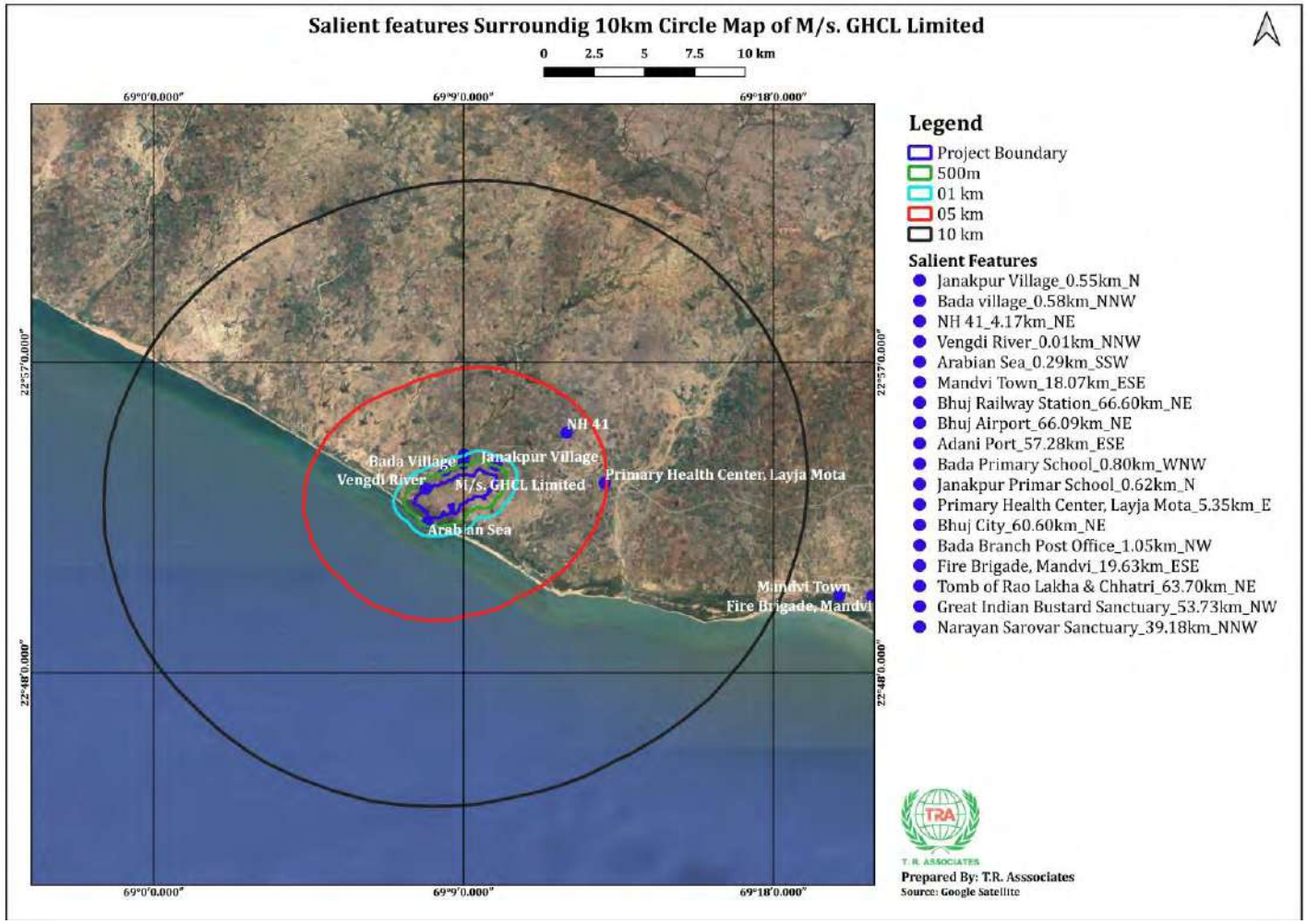


Table 1.1 Environmental Settings in the 10 km Study Area of the Proposed Project

Sr. No.	Important Features	Description
1.	Location	Village: Bada, Taluka: Mandvi, District: Kutch, Gujarat
2.	GPS Co-ordinates	22°53'12.29"N, 69° 8'47.63"E
3.	Temperature Range	19.6 - 33.6
4.	Mean Sea Level	34
5.	Annual Rain Fall	378.2
6.	Nearest Village	Janakpur Village at 0.55 km in North direction Bada village at 0.58 km in NNW direction
7.	Nearest Highway	NH 41 at 4.17 km in NE direction
8.	Nearest River/Water body	Vengdi River at 0.01 km in NNW direction Arabian Sea at 0.29 km in SSW direction
9.	Nearest Town	Mandvi at 18.07 km in ESE direction
10.	Nearest Railway Station	Bhuj Railway Station at 66.60km in NE direction
11.	Nearest Airport	Bhuj Airport at 66.09 km in NE direction
12.	Nearest Port	Adani Port at 57.28km in ESE direction
13.	Areas occupied by sensitive man-made land uses (hospitals, schools etc.)	Bada Primary School at 0.80 km in WNW direction Janakpur Primar School at 0.62 km in North direction
		Primary Health Center, Layja Mota at 5.35 km in East direction
14.	Nearest city	Bhuj city at 60.60 km in NE direction
15.	Nearest Post office	Bada Branch Post Office at 1.05 km in NW direction
16.	Nearest Fire station	Fire Brigade, Mandvi at 19.63 km in ESE direction
17.	Seismic Zone	V
Details of Environmental Sensitivity within 10 km study area		
18.	Nearest heritage place	Tomb of Rao Lakha & Chhatri at 63.70 km in NE direction
19.	Nearest Reserved Forest	Not within 10 km of Project Site
Details of Ecological Sensitive area within 10 km study area		
20.	National Parks / Sanctuary	Great Indian Bustard Sanctuary at 53.73 km in NW direction Narayan Sarovar Sanctuary at 39.18 km in NNW direction
21.	Eco-sensitive Area (ESAs)	Not within 10 km of Project Site
22.	Eco-sensitive Zone (ESZs)	Not within 10 km of Project Site

Regulatory Frame Work

The proposed project is of Soda Ash manufacturing unit; so, the regulatory framework related with the hazardous or toxic chemicals as well as regulatory provision of risk, emergency & safety management are applicable to the proposed project. The regulatory provision related to the hazardous chemical handling, manufacturing, storage & transportation are also applicable to the project. The project will have potential of pollution and also attracts the provisions of EIA notifications 2006 - SO 1533 (as amended). So, the proposed Greenfield Chemical Complex of M/s. GHCL Limited may be required to comply with many regulatory provisions.

The project proponent shall follow the regulatory frame work as listed below and additional applicable provision shall also be referred timely as cited as mandatory provision for proposed unit. In any case, proponent shall comply with the regulatory provision as directed through particular regulatory provision. The major regulatory provisions applicable to the proposed project are shown here:

Table: Regulatory Frame Work

SR. NO.	LEGAL INSTRUMENT (TYPE, REF., YEAR)	CONCERN AUTHORITY OR BODIES	APPLICABILITY
1	Air (Prevention and Control of Pollution) Act, 1981 and its subsequent amendments	CPCB and SPCB	Air emissions from the stacks attached to the Boiler, DG set, Lime Kiln, Ammonia Recovery system, Lime Grinding system/Slaker, Calciner Unit, Densification unit, Sodium Bi-Carbonate Unit of the Soda Ash Plant and Captive Power Plant. The project proponent will obtain CC& A after obtaining EC from concern authority.
2	Water (Prevention and Control of Pollution) Act, 1974 and its subsequent amendments	CPCB and SPCB	Wastewater generation from industrial activities and from domestic activities. The project proponent will obtain CC& A after obtaining EC from concern authority.
3	The Environment (Protection) Act, 1986 & Environmental (Protection) Rules, 1986 and their subsequent amendments	Ministry of Environment and Forests, & Climate Change (MoEF&CC), CPCB and SPCB.	Production of Soda Ash. The project proponent will obtain CC& A after obtaining EC from concern authority.
4	Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016	MoEF&CC, CPCB, SPCB, DGFT, Port Authority and Customs Authority	Generation of Solid & Hazardous Wastes from industrial activities. The industry will obtain membership for disposal or incineration of wastes.
5	Manufacture Storage and Import of Hazardous Chemicals Rules, 1989 amended 2000	MoEF&CC, Chief Controller of Imports and Exports, CPCB, SPCB, Chief Inspector of Factories, Chief Inspector of Dock Safety, Chief Inspector of Mines, AERB, Chief Controller of Explosives, District	Unit will take safety precautions for storage of hazardous chemicals identified under MSIHC Rules 1989. And the safety aspects are considered during Plant layout. It can be seen in Plant layout provided in Chapter 2.

SR. NO.	LEGAL INSTRUMENT (TYPE, REF., YEAR)	CONCERN AUTHORITY OR BODIES	APPLICABILITY
		Collector or District Emergency Authority, CEES under DRDO	
6	Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996	Ministry of Environment & Forests & Climate Change, Chief Controller of Imports and Exports, CPCB, SPCB/UTPCC, Chief Inspector of Factories, Chief Inspector of Dock Safety, Chief Inspector of Mines, AERB, Chief Controller of Explosives, District Collector or District Emergency Authority, CEES under DRDO.	Storage of hazardous chemicals within the project premises. Onsite-offsite emergency plan will be prepared.
7	EIA Notification, 2006 and its subsequent amendments	MoEF&CC, SPCB	Production of Soda Ash.
8	Public Liability Insurance Act, 1991 amended 1992 & Public Liability Insurance Rules, 1991 and its subsequent amendments	MoEF&CC, District Collector	The Manufacturing of Soda Ash will require approx. 1200 no. of employees.
9	The Factories Act, 1948	Ministry of Labor, DGFASLI and Directorate of Industrial Safety and Health/Factories Inspectorate	Industrial unit will apply to DISH (Director industrial Safety and Health), Gujarat after getting Environmental Clearance.
10	The Explosive Act ,1884	Ministry of Commerce and Industry (Department of Explosives)	Industrial unit will obtain the required licenses after getting Environmental Clearance for PESO department.
11	Noise Pollution (Regulation and Control) Rules, 2000 and its amendments	CPCB and SPCB	Noise may be generated due to industrial activities.
12	Fly Ash Notification, 1999 and its subsequent amendments	CPCB and SPCB	The Fly ash generated from the manufacturing of Soda Ash will be collected, storage, transported and sold to the nearby Cement/Brick Manufacturing Industry.
13	Bio-medical Waste Management Rules, 2016	CPCB and SPCB	The biomedical waste generated in the premises will be managed and disposed of as per Biomedical waste management rules and its subsequent amendments.
14	Battery Waste Management Rule, 2022	CPCB and SPCB	The Lead acid Batteries generated due to industrial activities will be Collected, stored and sold to authorized agency through auction.
16	E-Waste (Management) Rules, 2022	CPCB and SPCB	The E-waste generated due to industrial activities will be Collected, stored and

SR. NO.	LEGAL INSTRUMENT (TYPE, REF., YEAR)	CONCERN AUTHORITY OR BODIES	APPLICABILITY
			sold to authorized agency through auction.
17	Plastics Waste Management Rules, 2016 and their subsequent amendments	CPCB and SPCB	Collection, Storage and Disposal to CPCB/SPCB authorized recyclers under EPR of Plastic Waste Management
18	Construction and Demolition Waste Management Rules 2016	CPCB and SPCB	Collection, storage and utilize internally for area filling, road making etc.

T. R. Associates – NABET Accredited Consultant was appointed by Greenfield Chemical Complex of M/s. GHCL Limited to prepare the Addendum of Environmental Impact Assessment report for their proposed project.

TRA
T. R. ASSOCIATES

CHAPTER – 2
PROJECT DESCRIPTION

SECTION 2.3: PROJECT LOCATION

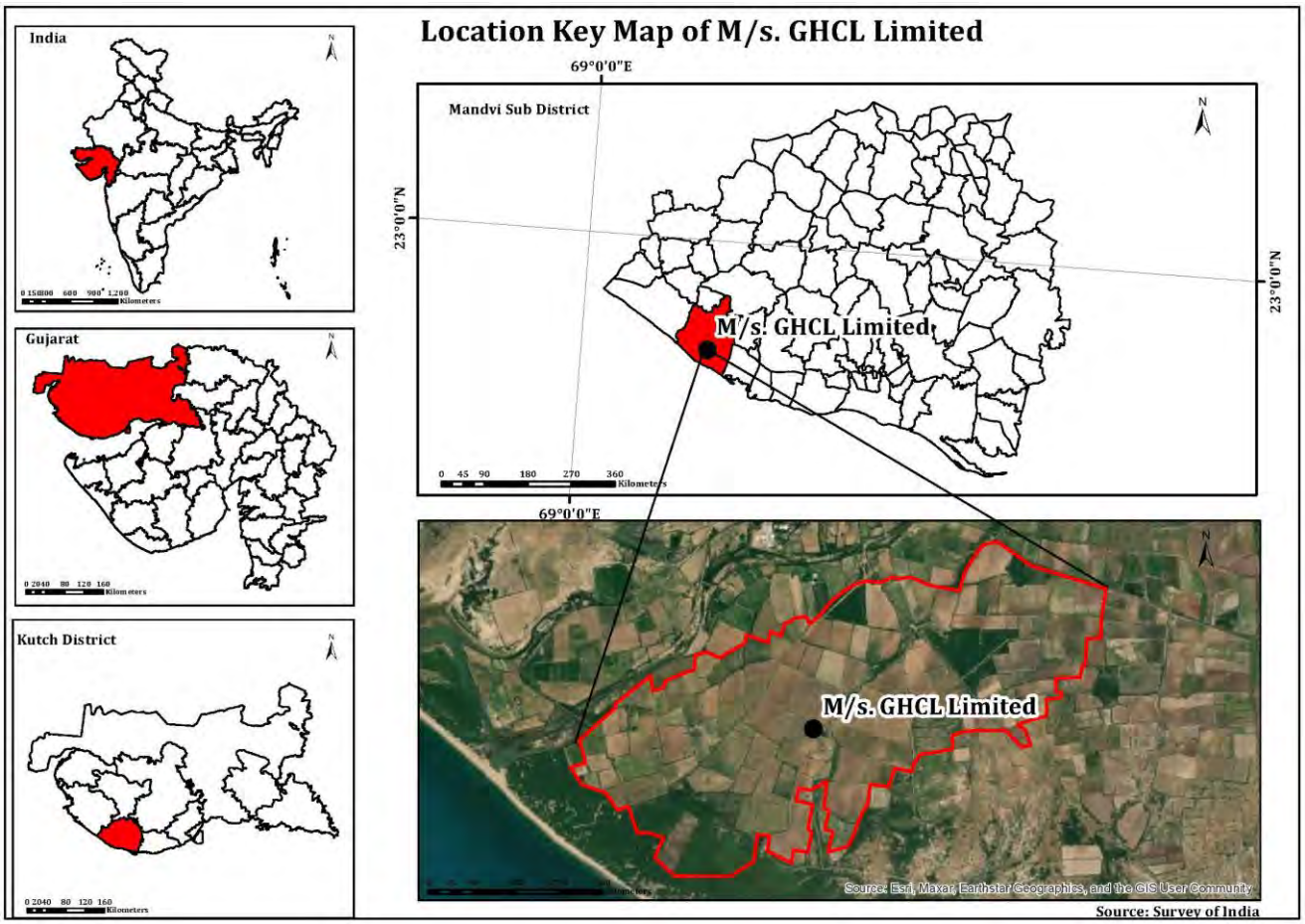


Figure 2.1 Project Location

T. R. ASSOCIATES

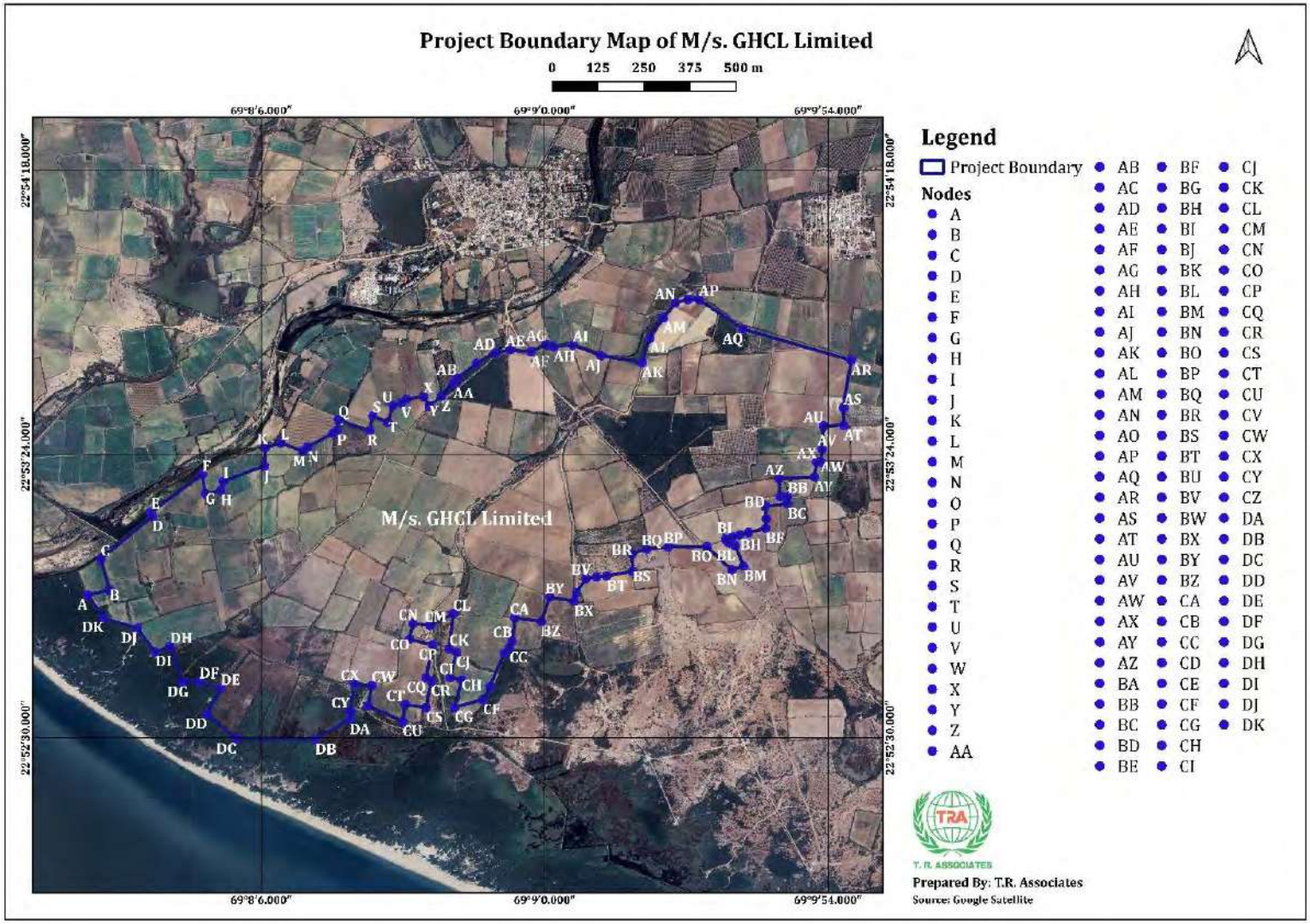


Figure 2.2 Google Image showing Project Location

SITE HISTORY

This project site is located at Village Bada, Taluka – Mandvi, District Kutch, Gujarat which proposes to set-up a Greenfield Chemical Complex to produce Light Soda Ash Plant of 11,00,000 TPA, Dense Soda Ash of 5,00,000 TPA and 2,00,000 TPA of Sodium Bicarbonate, 120 MW captive power plant, RO DM plant and seawater intake and effluent disposal system.

The below figure shows the site history of the project site.



Imagery Date: 08/11/2015 Imagery Date: 11/04/2023

Image source: Google Earth

Figure: Site History of Project Site

PROJECT COST

The estimated capital cost, including foreign exchange component, for the proposed Soda Ash Plant Phase 1: Capacity 5,50,000 TPA Light Soda Ash, and 2,50,000 TPA Dense Soda Ash, 1,00,000 TPA Sodium Bi-carbonate and CPP 60 MW is Rs **3563.08 crores.** The bifurcation of the project cost is given in below table:

Table: Project Cost of the Proposed Project

Sr. No.	Details	Total Cost in Crore
1	Land	130
2	Building	400
3	Plant & Machineries	2715
4	EMP	318.08
TOTAL		**3563.08**

T. R. ASSOCIATES

CHAPTER – 3
DESCRIPTION OF ENVIRONMENT

3.1 INTRODUCTION

Baseline monitoring is required to evaluate prevailing environment to workout direct and indirect impacts on various components of environment (viz. water, air, noise, soil, socio) due to upcoming project and their interrelationships as per EIA Notification 2006. Based on the identified impacts required and adequate mitigation measures will be proposed in the project.

The objective of establishing baseline conditions is "To compile authentic and relevant information on the environmental components in the study area, which are likely to undergo change due to the proposed project-related activities in both short as well as long term and have potential of causing environmental impacts." This necessitates ensuring focus on capturing the information which is relevant, appropriate, authentic and credible.

Baseline data requirement is also necessary to identify environmentally significant issues as well as to enumerate the critical environmental change that is likely to occur due to the project activity. Here an attempt has been made to collect the information about an existing environment on the below mentioned six major environmental attributes:

1. Air Environment
2. Water Environment
3. Noise Environment
4. Land & Soil Environment
5. Biological Environment
6. Socio – Economic Environment

For baseline data collection, an effective methodology is important and impact prediction is important to develop an efficient environment management plan. For this aspect, it is very important to understand the ground realities of the site and surrounding by the Functional Area Experts.

Accordingly, a team of Functional Area Experts had visited the project site to understand the surrounding environment and possible impacts from the activities of the proposed plant. The EIA coordinators in consultation with the respective Functional Area Experts had selected the sampling locations as per the TORs prescribed by the EAC, New Delhi.

3.1.1 BASELINE STUDY PERIOD

The baseline monitoring was undertaken during **December 2022 to February 2023 (01-12-2022 to 22-02-2023)** by the members of T. R. Associates along with in-house NABL accredited laboratory and external NABL accredited laboratory. The collected data were analyzed and interpreted. The same is represented below under various sections. The photo of visit of all Functional area Expert, Team Member & Functional Area Associates as well as EIA Co-Ordinator at project site is shown under various sections of this chapter:

3.1.2 BASELINE STUDY AREA

To carry out Environment Baseline Monitoring and to generate baseline environmental data, study area of 10 km radial distance from project site has been selected. Base line data of ambient air quality, water quality, soil quality, noise, ecology as well as socio economic status were collected for study area of 10 km.

3.1.3 BASELINE STUDY METHODOLOGY

For the generation of baseline data, guidelines proposed by MoEF&CC as well as generic TORs issued by Expert Appraisal Committee (EAC) of MoEF&CC has been taken into consideration. Relevant secondary data available for different environmental components were collected and analyzed. Baseline planning has been described in **Table 3.1** in brief. Pre-Baseline Network design of 10 km study area is briefly described in **Annexure-1**.

Table 3.1 Brief Baseline Monitoring Planning

Sr. No.	Environmental Attribute	Description of Baseline Monitoring Planning
1	Air	**Monitoring Frequency**: 24 hourly twice a week throughout the study period for some parameters and once a month throughout the study period for others **No. of Locations:** 10 locations in core and buffer zone of the project site **Parameters:** PM_{10}, $PM_{2.5}$, SO_2, NO_x (24 hourly, twice a week) VOC (hourly & Once during Monitoring Period) NH_3 (24 hourly, twice a week & Once during Monitoring Period) O_3 (hourly, twice a week & as per NAAQS) CO, As, Ni, Pb, Benzo alpha Pyrene, Benzene (once a month)
	Meteorology	**Monitoring Frequency**: On hourly basis for entire study period **Parameters:** Temperature, Relative humidity, Wind direction, Wind speed, Precipitation
2	Water	**Surface Water Monitoring** **Monitoring Frequency**: Once during Monitoring Period **Type of sampling**: Grab sampling **No. of Locations**: 8 locations in core and buffer zone of the project site **Parameters**: As per CPCB guidelines
		Ground Water Monitoring **Monitoring Frequency**: Once during Monitoring Period **Type of sampling**: Grab sampling **No. of Locations**: 11 locations in core and buffer zone of the project site **Parameters**: As per CPCB guidelines
3	Noise	**Noise Monitoring Frequency**: Day & Night Time monitoring; **No. of Locations**: 10 locations within core zone of study area **Traffic Monitoring Frequency:** **Monitoring Frequency:** Once in a season Morning (10 AM to 14 PM),

		Evening (16 PM to 20 PM) **No. of Locations:** 1 location
4	Ecology & Biodiversity Study	**Monitoring Frequency**: Once in a study period **Locations**: 10 km aerial distance from the project site **Methodology**: Visual encounters (Detail methodology is described into the ecology and biodiversity section)
5	Soil	**Monitoring Frequency**: Once in a season **No. of Locations**: 10 locations within core & buffer zone of study area **Methodology**: As per CPCB guidelines
6	Socio – Economic	**Monitoring Frequency**: Once in a season **No. of Locations**: 10 locations within core & buffer zone of study area **Methodology**: household survey, group discussion & individual discussion via questionaries
7	Land use Pattern	**Monitoring Frequency**: Once in a season **Location**: 10 km radius (Aerial distance) from the project site **Methodology**: Sentinel satellite image procured from NRSC, Hyderabad
8	Hydrology	**Monitoring Frequency**: Once in a season **Locations**: 10 km radius (Aerial distance) from the project site **Methodology**: Site survey through field visit

3.2 AIR ENVIRONMENT

Dispersion of different air pollutants released into the atmosphere have significant impacts on the surrounding air environment of an industrial project and forms an important role in impact assessment studies. The ambient air quality status with respect to the study area of 10 km radius from the plant site will form the base line information over which the predicted impacts due to the proposed plant can be super imposed to find out the impacts on air environment. The baseline status of the ambient air quality can be assessed thorough scientifically designed ambient air quality monitoring network. Baseline Network design of 10 km study area is briefly described in **Annexure – 1.** The design of monitoring network in the air quality surveillance program is to be based on the following considerations.

- Meteorological data with respect to wind speed, wind direction, relative humidity & temperature in general observation.
- Topography of the study area.
- Representation of regional background levels.
- Representation of plant site.
- Representation of cross-sectional distribution in the downward direction.
- Influence of the existing sources if any, are to be kept at minimum.
- Inclusion of major distinct villages to collect the baseline status.
- Villages having large population and near to the plant site.

Note: We have considered the locations that were previously monitored for data validation of the previously collected baseline data. The baseline environmental quality has been determined previously for winter season (December 2019 – February 2020) by following guidelines

prescribed in MoEF&CC, EIA notification 2006, standard ToR, TGM (Soda Ash Sector) and subsequent amendments

3.2.1 MICROMETEOROLOGICAL DATA

Micro-meteorological data within the project area during the survey period is an indispensable part of air pollution study. The meteorological data recorded during survey period is very useful for proper interpretation of the baseline information as well as serves as an input, to predictive models for air quality impacts.

To understand meteorological scenario primary and secondary data are collected. Primary data was collected for the proposed project site during the study period (**December 2022 to February 2023)**, while secondary data were collected from Indian Meteorological Department (IMD), Bhuj. This data is used in the interpretation of wind scenario. The data collected from both the sources are summarized as follows:

Table 3.2 Meteorological Data Collection Period

Meteorological data	**Primary data (December 2022 to February 2023) (01-12-2022 to 22-02-2023):** Parameters like Wind speed and its direction, Temperature, Humidity and Precipitation collected. **Secondary data (Last 30 Years):** Secondary data has been collected from the nearest IMD source (Bhuj) for Temperature, Humidity, Rainfall and Wind Speed.

3.2.1.1 METEOROLOGICAL DATA FROM SECONDARY SOURCES

Temperatures vary considerably from season to season. The summers are generally hot and winters are cool. The year can be divided into four seasons. The period from March to May is the hot season (summer) followed by southwest monsoon from June to September, October and November constitute the post-monsoon or retreating monsoon season. The cold season (winter) starts from December and ends in February.
The mean maximum temperature ranges between 32°C during January to 43.7°C during May and the mean minimum temperatures vary between 5.3°C during January and 24.6°C during June. The relative humidity varies between 29 % (February/March/April) and 84 % (August). The mean wind speed varies from 4.9 kmph (November) to 15.2 kmph (June). Long-term average annual rainfall recorded by IMD station at Bhuj is 323.3 mm. Climatological data of nearest IMD station which is Bhuj is given in the **Table 3.3.**

Table 3.3 Monthly Mean values of Meteorological Data (Secondary Data)

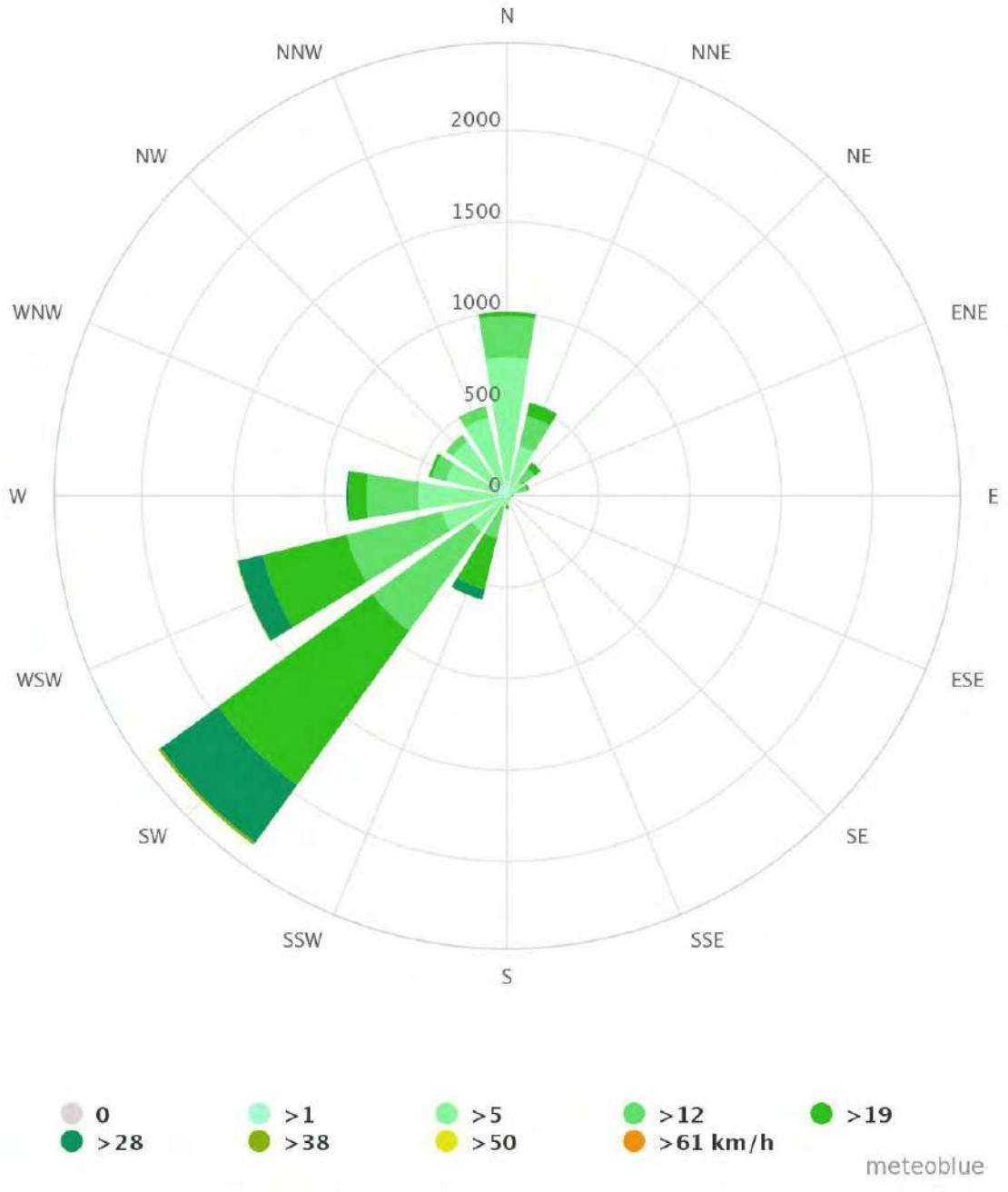
Month	Air Temperature(°C)		Humidity (%)		Mean Wind Speed (Kmph)	Rainfall (mm)
	Max.	Min.	Max.	Min.		
January	32	5.3	71	32	5.4	1.3
February	35.5	7.2	71	29	6.2	0.3
March	40	12.4	70	29	7.2	1.1
April	43	17.9	68	29	9.9	0.2

Month	Air Temperature(°C)		Humidity (%)		Mean Wind Speed (Kmph)	Rainfall (mm)
	Max.	Min.	Max.	Min.		
May	43.7	22.3	73	39	14	1.5
June	42	24.6	75	51	15.2	35.6
July	38.3	24	81	64	14.6	130.9
August	36.2	23.6	84	66	12.9	99.7
September	38.8	22	81	54	9.6	48.6
October	40	17.5	71	33	5.9	2.3
November	36.6	11.1	67	31	4.9	1.8
December	32.6	6.7	69	33	5.1	0.2
Annual Mean	**44.3**	**4.7**	**73**	**41**	**9.2**	**323.3**

Source: As per Climatological Table – IMD, Bhuj Station (1981-2010)

The wind rose diagram obtained from meteoblue organization for the entire year based on 30 years of hourly historical weather data for Mandvi location is presented in **Figure 3.1.**

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Source:https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/m%c4%81ndvi_india_1263824

Figure 3.1 Wind Rose Diagram of Entire Year (Secondary Source)

Interpretation: Spoke of pre-dominant wind indicates that wind blows from SW to NE direction

- 0.84 % of the time winds blow from SW to NE at >1-5 Km/hr
- 8.76 % of the time winds blow from SW to NE at >5-12 Km/hr
- 26.84 % of the time winds blow from SW to NE at >12-19 Km/hr
- 41.8 % of the time winds blow from SW to NE at >19-28 Km/hr
- 15.56 % of the time winds blow from SW to NE at >28-38 Km/hr

- 0.6 % of the time winds blow from SW to NE at >38-50 Km/hr

3.2.1.2 PRIMARY METEOROLOGICAL DATA (December 2022 TO February 2023)

Meteorology of the study zones plays an important role in the study of air pollution. Micrometeorological conditions regulate the dispersion and dilution of air pollutants in the atmosphere. The weather data has been collected for the period of December 2022 to February 2023 (01-12-2022 to 22-02-2023) and recorded hourly observations for the parameters like Maximum and minimum Temperatures (°C), Relative Humidity (%), Wind Speed (m/sec), Wind direction and Rainfall (mm).

Meteorological conditions of the site regulate the transport and diffusion of air-pollutants released into the atmosphere. Ambient temperature, wind speed, wind direction and atmospheric stability are called primary or basic meteorological parameters because the dispersion and diffusion of pollutants depend mainly on these parameters. Humidity, precipitation, pressure and visibility are secondary meteorological parameters as this control the dispersion of the pollutants indirectly by affecting primary parameters. The weather data are depicted in the form of wind roses. Primary meteorological data are shown below:

Table 3.3(A): Primary Meteorological Parameters

Sr. No.	Parameters	Minimum value	Maximum value	Mean Value
1.	Temperature (°C)	9	31	19.78
2.	Wind Speed (m/s)	0	3153	130.996
3.	Relative Humidity (%)	12	100	40.29
		Total rainfall (mm)	**No. of rainy days**	**Average annual rainfall (mm)**
4.	Rainfall	0	0	378.2
5.	Predominant Wind direction	NNE		

Source: NABL Accredited laboratory of M/s. T. R. Associates

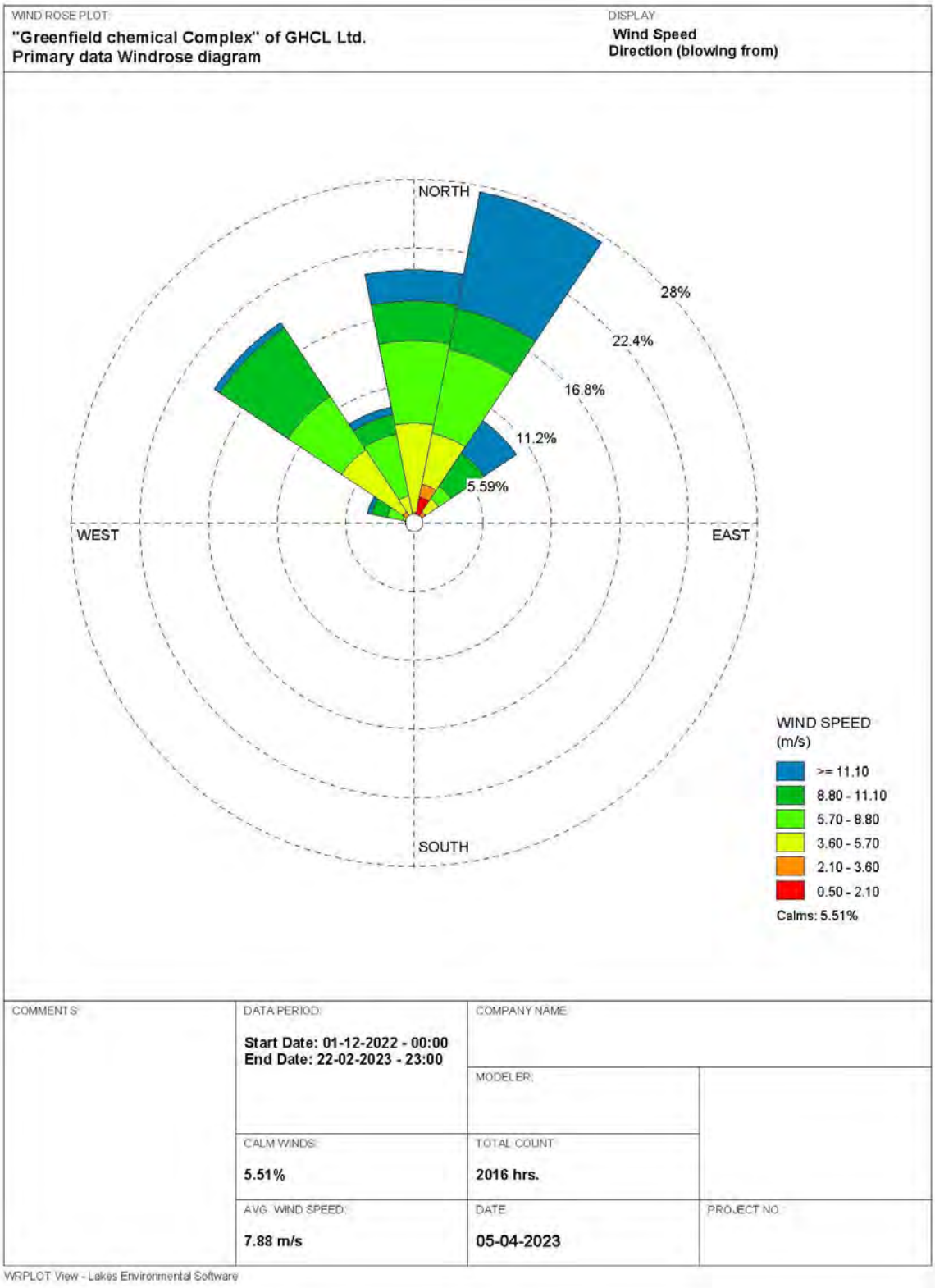


Figure 3.2 Primary wind rose diagram

Interpretation: Spoke of wind indicates that winds blow from NNE direction to SSW direction. From the primary meteorology data, it can be interpreted that average speed of the wind was 7.88 m/sec during the monitoring period and 5.51 % was observed to be in calm condition.

3.2.2 SELECTION OF AAQ STATIONS

As per the guidelines of CPCB, a network of ten ambient air-sampling locations have been selected for assessment of the existing status of air environment within the study zone of 10 km. The sampling locations were selected according to CPCB guidelines. The heights of the sampling locations were kept between 3 to 6 m in all the locations. After inspection of the area and observing the topographical features and review of the available meteorological data and local conditions the sampling sites were chosen which will be the representative of the local areas under study.

Note: We have considered the locations that were previously monitored for data validation of the previously collected baseline data.

3.2.2.1 EXISTING AAQ (PRE-PROJECT) STATUS

Ambient levels of pollutants such as PM_{10}, $PM_{2.5}$, SO_2, NO_x, NH_3, O_3, CO, VOC, and Heavy Metals (Pb, Ni, As) Benzo alpha Pyrene and Benzene are selected for the sampling. Ambient air monitoring locations is given in **Table 3.4**. The frequency of monitoring is given in **Table 3.5** and methodology of analysis in detail is given in **Table 3.6**. Photograph showing ambient air monitoring is shown in **Figure 3.4**. ambient air quality monitoring results are shown in **Table 3.7.**

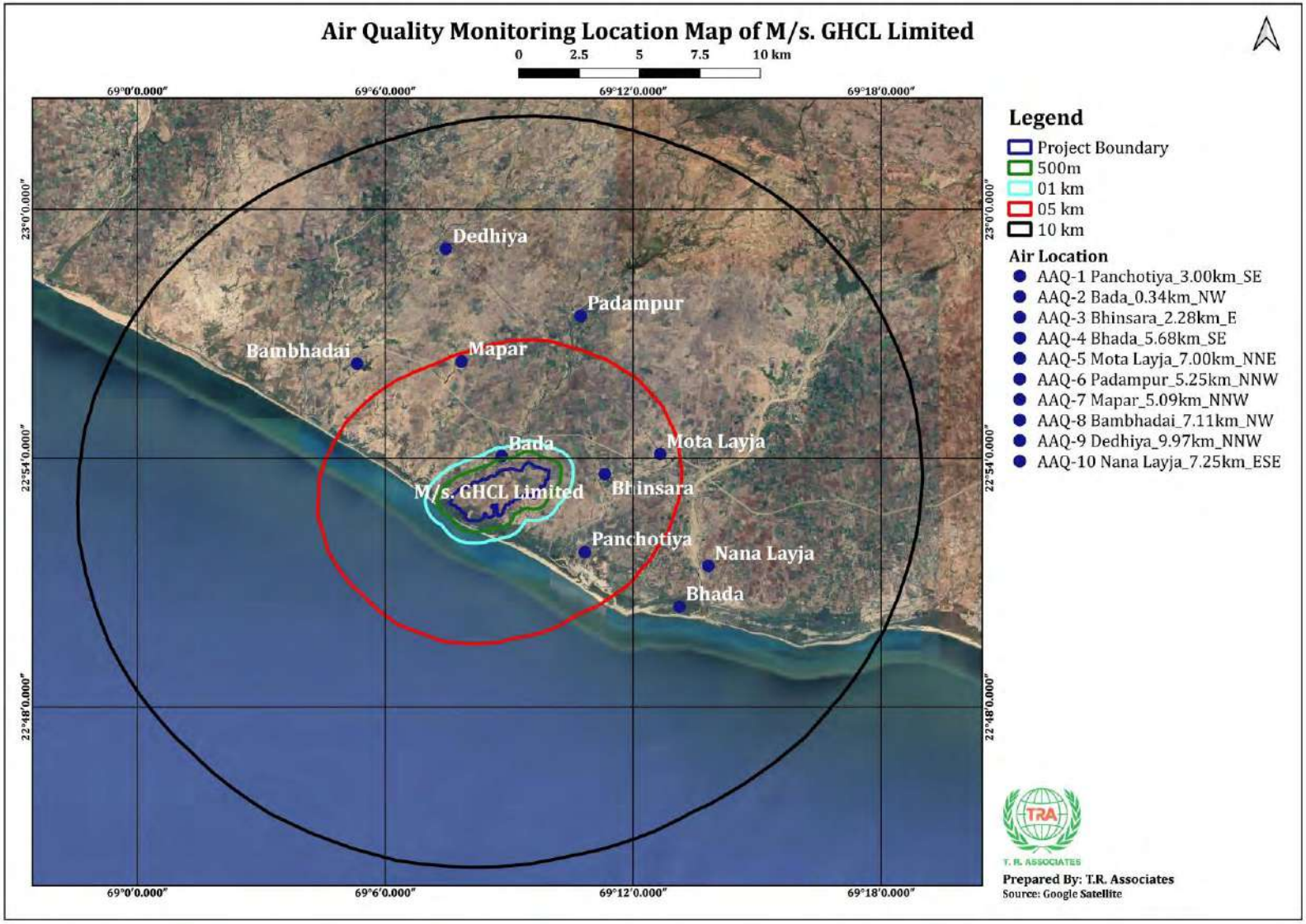


Figure 3.3 Map showing Ambient Air Quality locations

Table 3.4 Ambient Air Monitoring locations

Sr. No.	Village	Distance (km)	Direction	Located in	Latitude & Longitude	Taluka	District	Observation
1.	Panchotiya	3.00 km	SE	Downwind	22°51'49.9"N 69°10'46.9"E	Mandvi	Kutch	Temples and small houses were observed surrounding the location. No industries were found.
2.	Bada	0.34 km	NW	Upwind	22°53'38.7"N 69°08'12.8"E	Mandvi	Kutch	Residential area was found surrounding the monitoring location. No industries were found nearby.
3.	Bhinsara	2.28 km	E	Crosswind	22°53'41.8"N 69°11'18.5"E	Mandvi	Kutch	Temples and residencies were found near the location. Surrounding land was barren and no industries were observed.
4.	Bhada	5.68 km	SE	Downwind	22°51'09"N 69°12'14.4"E	Mandvi	Kutch	Dry agro waste was found near the monitoring location. Temples and wind wheels were observed nearby. Arabian Sea is close to the monitoring location. Gando Baval was observed near Arabian Sea.
5.	Mota Layja	7.00 km	NNE	Crosswind	22°53'23.04"N 69°13'14.50"E	Mandvi	Kutch	Main highway (NH41) was passing nearby the location, farm and barren land was observed.
6.	Padampur	5.25 km	NNW	Crosswind	22°57'28.7"N 69°10'47.3"E	Mandvi	Kutch	Surrounding area is residential and no industries were found nearby.
7.	Mapar	5.09 km	NNW	Crosswind	22°56'23.2"N 69°07'47"E	Mandvi	Kutch	Residential and agricultural areas were observed near the location. No industries were found.
8.	Bambhadai	7.11 km	NW	Upwind	22°56'23.5"N 69°05'23.7"E	Mandvi	Kutch	Wind wheels were found near the monitoring location. Surrounding land is agricultural land.
9.	Dedhiya	9.97 km	NNW	Crosswind	22°58'58.6"N 69°07'26.4"E	Mandvi	Kutch	No industries were observed near the monitoring location. Residential areas were found nearby.
10.	Nana layja	7.25 km	ESE	Crosswind	22°51'24.5"N 69°13'28.4"E	Mandvi	Kutch	Surrounding land was covered by baval. No industries were found nearby the location.

	
Location: Nana Layja Latitude: 22°51'23"N, Longitude: 69°13'50"E	**Location: Panchotiya** Latitude: 22°51'44"N, Longitude: 69°10'49"E
	
Location: Mapar Latitude: 22°56'20"N, Longitude: 69°7'51"E	**Location: Bada** Latitude: 22°54'3"N, Longitude: 69°8'49"E
	
Location: Bambhadai Latitude: 22°56'17"N, Longitude: 69°5'19"E	**Location: Mota Layja** Latitude: 22°54'6"N Longitude: 69°12'39"E
	
Location: Bhinsara Latitude: 22°53'37"N Longitude: 69°11'19"E	**Location: Padampur** Latitude: 22°57'26"N Longitude: 69°10'44"E



Location: Bhada
Latitude: 22°50'25"N, Longitude: 69°13'7"E



Location: Dedhiya
Latitude: 22°59'3"N, Longitude: 69°7'28"E



AWS Location: Bhinsara
Latitude: 22°53'37"N, Longitude: 69°11'19"E

Figure 3.4 Photograph showing Ambient Air Monitoring and AWS location

Table 3.5 Air - Parameters Analyzed and Sampling Duration

Attribute	Parameter	Frequency of Monitoring
AAQ	PM_{10}, $PM_{2.5}$, SO_2, NO_x, NH_3, O_3, VOC, CO, Benzene, Benzo alpha Pyrene and heavy metals (Pb, As, Ni, &) at 10 locations	24 hrs. Sampling for PM_{10}, $PM_{2.5}$, SO_2, NO_x, -24 hourly, Two days per week during the study period December 2022 to February 2023 **(01-12-2022 to 22-02-2023)** 24 hrs. Sampling for NH_3, Monitored for twice a week & once during the study period. Hourly sampling for O_3, Monitored for twice a week as per NAAQS during the study period
		VOC – hourly & Once in the study period December 2022 to February 2023 **(01-12-2022 to 22-02-2023)**
		CO, As, Ni, Pb, Benzo alpha Pyrene, Benzene (once a month)

Attribute	Parameter	Frequency of Monitoring
		The stated monitoring was carried out in accordance with the guidelines of Central Pollution Control Board (CPCB), Scientific Manual of GPCB and National Ambient Air Quality Standard (NAAQS) of CPCB.

Table 3.6 Ambient Air Quality - Methodology

	Pollutant			Method of analysis
Variables	Dust	PM_{10}	Particulate Matter 10	IS 5182 (Part 23)
		$PM_{2.5}$	Particulate Matter 2.5	IS 5182 (Part 24)
	Gases	SO_2	Sulfur dioxide	IS 5182 (Part 2)
		NO_2	Nitrous Oxides	IS 5182 (Part 6)
		O_3	Ozone	IS 5182 (Part 9)
		NH_3	Ammonia	IS 5182 (Part 25)
		VOC	Volatile Organic Carbon	TRA/STP/AA/07 (Based on manual instrument manufactures)
		CO	Carbon Monoxide	IRDH/SOP/AAQM/08:2015
	Heavy metal	Pb	Lead	IS:5182(Pan-22):2014
		As	Arsenic	IRDH/SOP/AAQM/06: 2013
		Ni	Nickel	IRDH/SOP/AAQM/07:2014
	other	C_6H_6	Benzene	IRDH/SOP/AAQW/11:2015
		BAP	Benzo alpha Pyrene	IRDH/SOP/AAQM/12:2015

Various statistical methods like standard deviation, geometric mean, minimum; maximum concentrations have been used and different percentiles have been computed from the data examined during sampling in all sampling stations.

Table 3.7 Ambient Air Monitoring Results (Baseline Period: (01-12-2022 to 22-02-2023))

Ambient Air Quality Locations												
Parameter	**Particular**	**Panchotiya**	**Bada**	**Bhinsara**	**Bhada**	**Mota Layja**	**Padampur**	**Mapar**	**Bambhadai**	**Dedhiya**	**Nana Layja**	**NAAQ Standard (24 hours)**
$PM_{2.5}$ ($\mu g/m^3$)	Min	44.77	35.34	36.60	46.08	21.65	31.24	30.38	43.27	26.22	39.12	60 $\mu g/m^3$
	Max.	50.64	42.50	43.37	51.31	27.82	38.55	36.84	47.92	32.55	47.62	
	Mean	47.45	39.06	39.90	49.00	24.63	34.52	33.66	45.33	29.46	42.67	
	98th Percentile	50.53	42.35	43.31	51.29	27.60	38.50	36.76	47.52	32.53	47.28	
PM_{10} ($\mu g/m^3$)	Min	75.54	69.44	62.78	78.40	53.64	58.72	60.11	65.16	50.31	71.28	100 $\mu g/m^3$
	Max.	81.53	76.56	68.99	83.48	59.73	68.74	65.94	72.99	58.68	81.98	
	Mean	78.83	72.80	65.82	80.68	56.12	63.45	63.25	69.15	54.73	75.48	
	98th Percentile	81.50	75.94	68.69	83.33	59.70	68.40	65.94	72.88	58.41	80.66	
SO_2 ($\mu g/m^3$)	Min	11.08	9.12	8.03	11.32	B.D.L(DL=5)	7.27	6.03	5.44	B.D.L(DL=5)	10.10	80 $\mu g/m^3$
	Max.	15.60	14.82	13.68	16.92	8.25	12.92	11.78	10.94	9.85	17.38	
	Mean	13.26	11.52	10.94	14.10	6.25	9.85	9.03	8.57	7.48	13.86	
	98th Percentile	15.48	14.21	13.62	16.78	8.19	12.84	11.70	10.84	9.77	17.26	
NO_x ($\mu g/m^3$)	Min	33.58	28.30	27.03	36.49	16.38	25.14	23.28	21.11	18.24	28.72	80 $\mu g/m^3$
	Max.	38.88	33.67	31.81	41.49	22.71	30.38	33.62	28.45	25.65	36.43	
	Mean	35.56	30.66	29.26	39.03	19.17	28.12	28.47	25.27	22.20	33.08	
	98th Percentile	38.81	33.63	31.77	41.46	22.38	30.37	33.13	28.40	25.61	36.37	
NH_3 ($\mu g/m^3$)	--	B.D.L (D.L-21)	B.D.L (D.L-21)	B.D.L (D.L-21)	B.D.L (D.L-21)	B.D.L (D.L-21)	B.D.L (D.L-21)	B.D.L (D.L-21)	B.D.L (D.L-21)	B.D.L (D.L-21)	B.D.L (D.L-21)	400 $\mu g/m^3$
O_3 ($\mu g/m^3$)	Min	B.D.L(DL=10)	B.D.L (DL=10)	B.D.L (DL=10)	11.19	10.59	B.D.L(DL=10)	B.D.L(DL=10)	B.D.L(DL=10)	B.D.L(DL=10)	B.D.L(DL=10)	180 $\mu g/m^3$
	Max.	14.09	B.D.L (DL=10)	12.47	17.67	19.62	13.14	12.83	11.89	12.08	11.08	
	Mean	11.87	B.D.L (DL=10)	10.22	14.34	13.18	B.D.L(DL=10)	B.D.L(DL=10)	B.D.L(DL=10)	B.D.L(DL=10)	B.D.L(DL=10)	
	98th Percentile	14.03	B.D.L (DL=10)	12.39	17.50	19.45	11.63	12.50	10.36	11.81	10.93	
Note :	CO : BDL, VOC : BDL, Lead : BDL, Arsenic : BDL, Nickel : BDL, Benzene : BDL & Benzo alpha Pyrene : BDL											

3.2.2.2 Baseline Data Interpretation of AAQ of Study Area

- PM_{10} concentration is observed within the study area in the range of 50.31 µg/m³ to 83.48 µg/m³. The maximum concentration is observed at Bhada with the result of 83.48 µg/m³. The maximum concentration 98th percentile is recorded at Bhada with the result of 83.33 µg/m³. It may be due to the fugitive emission from unpaved internal roads.
- $PM_{2.5}$ concentration is observed within the study area in the range of 21.65 µg/m³ to 51.31 µg/m³. The maximum concentration is observed at Bhada with the result 51.31 µg/m³. The maximum 98th percentile concentration is also recorded at Bhada with the result of 51.29 µg/m³. It may be due to the fugitive emission from unpaved internal roads.
- SO_2 concentration is observed within the study area from B.D.L(DL=5) to 17.38 µg/m³. The maximum concentration is observed at Nana Layja with the result 17.38 µg/m³. The maximum concentration 98th percentile is recorded at Nana Layja with the result of 17.26 µg/m³. Higher concentration can be due to the vehicular emission from nearby village road.
- NO_x concentration is observed within the study area in the range of 16.38 µg/m³ to 41.49 µg/m³. The maximum concentration is observed at Bhada with the result 41.49 µg/m³. The maximum concentration 98th percentile is recorded at Bhada with the result of 41.46 µg/m³. Higher concentration can be due to the transportation activities on village road.
- Ozone concentration is observed within the study area from B.D.L(DL=10) to 19.62 µg/m³. The maximum concentration is observed at Mota Layja with the result 19.62 µg/m³. The maximum concentration 98th percentile is recorded at Mota Layja with the result of 19.45 µg/m³. The possible reason for higher concentration can be vehicular movements on the NH-41, which is passing nearby the village.
- Ammonia, CO, VOC, Lead, Arsenic, Nickel, Benzene & Benzo Alpha Pyrene were observed B.D.L.
- All the above results are found well within the prescribed limits of National Ambient Air Quality standards for 24 hrs.

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3.2.3 AIR QUALITY INDEX

3.2.3.1 OBJECTIVE OF AIR QUALITY INDEX:

Air Quality index is an effective tool to know overall status of ambient air quality in baseline monitoring area and its impact on health of public. Air Quality Index (AQI) is one such tool for effective dissemination of air quality information to people. As per CPCB guideline, there are six AQI categories, namely Good, Satisfactory, Moderately polluted, Poor, Very Poor, and Severe. The overall objective of the project can be stated as under:

"To adopt/develop an Air Quality Index (AQI) based on national air quality standards, health impacts and monitoring programme which represent perceivable air quality for general public in easy to understand terms and assist in data interpretation and decision-making processes related to pollution mitigation measures."

The AQI values and corresponding ambient concentrations (health breakpoints) as well as associated likely health impacts for the identified eight pollutants are as follows:

AQI Category, Pollutants and Health Breakpoints								
AQI Category (Range)	PM_{10} 24-hr	$PM_{2.5}$ 24-hr	NO_2 24-hr	O_3 8-hr	CO 8-hr (mg/m^3)	SO_2 24-hr	NH_3 24-hr	Pb 24-hr
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200	0-0.5
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400	0.5 –1.0
Moderately polluted (101-200)	101-250	61-90	81-180	101-168	2.1- 10	81-380	401-800	1.1-2.0
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800	801-1200	2.1-3.0
Very poor (301-400)	351-430	121-250	281-400	209-748*	17-34	801-1600	1200-1800	3.1-3.5
Severe (401-500)	430 +	250+	400+	748+*	34+	1600+	1800+	3.5+

Source: Report on National Air Quality Index published by CPCB, New Delhi (2014-2015)

Table 3.8 Rating of Ambient Air Quality

AQI	Rating	Associated Health Impacts
0-50	Good	Minimal Impact
51-100	Satisfactory	May cause minor breathing discomfort to sensitive people.
101-200	Moderately polluted	May cause breathing discomfort to people with lung disease such as asthma, and discomfort to people with heart disease, children and older adults.
201-300	Poor	May cause breathing discomfort to people on prolonged exposure, and discomfort to people with heart disease
301-400	Very Poor	May cause respiratory illness to the people on prolonged exposure. Effect may be more pronounced in people with lung and heart diseases.
401-500	Severe	May cause respiratory impact even on healthy people, and serious health impacts on people with lung/heart disease. The health impacts may be experienced even during light physical activity.

Source: Report on National Air Quality Index published by CPCB, New Delhi

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. Associated likely health impacts for different AQI categories and pollutants have also been suggested, with primary inputs from the medical expert members of the group.

Based on analysis results of AAQ monitoring (Table 3.7) in baseline monitoring area, AQI calculated as under:

Calculation of AQI

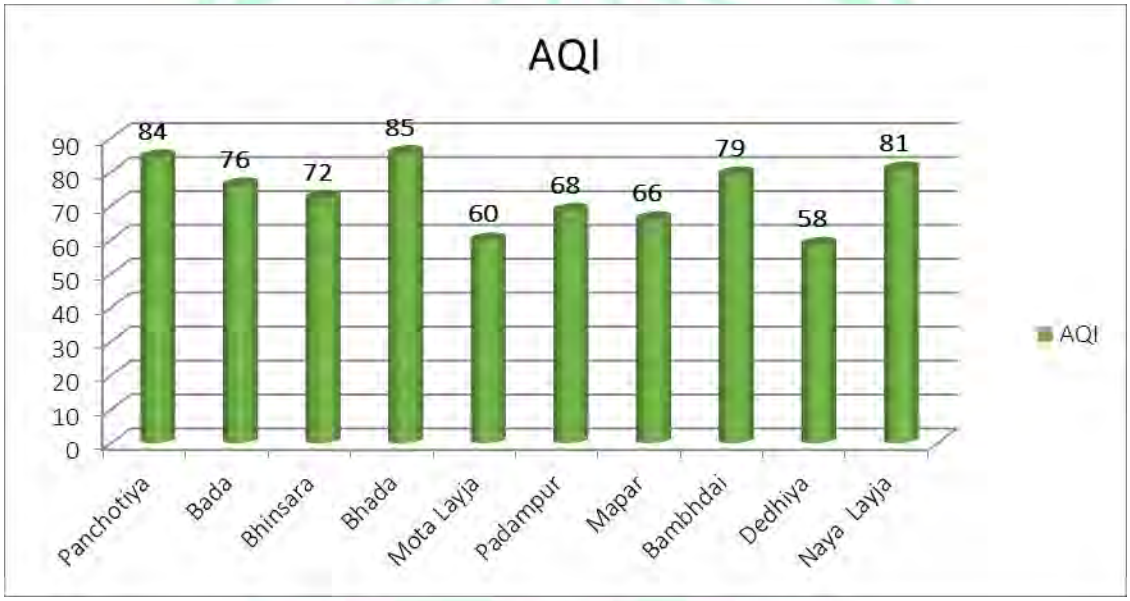
Date		Address	Panchotiya GHCL, Kutch		
Dec 2022 -Feb 2023					
Pollutants		**concentration in µg/m3 (except for CO)**	**Sub-Index**		**Air Quality Index**
				check	
PM10	24-hr avg	81.50	82	1	
PM2.5	24-hr avg	50.53	84	1	
SO2	24-hr avg	15.48	19	1	
NOx	24-hr avg	38.81	49	1	AQI = 84
*CO (mg/m3)	max 8-hr	0.00	0	0	
O3	max 8-hr	14.03	14	1	
NH3	24-hr avg	0.00	0	0	

* Concentrations of minimum three pollutants are required; one of them should be PM10 or PM2.5
* The check displays "1" when a non-zero value is entered

Good (0–50)	Minimal Impact	**Poor (201–300)**	Breathing discomfort to people on prolonged exposure
Satisfactory (51–100)	Minor breathing discomfort to sensitive pe	**Very Poor (301–400)**	Respiratory illness to the people on prolonged exposure
Moderate (101–200)	Breathing discomfort to the people with lu heart disease, children and older adults	**Severe (>401)**	Respiratory effects even on healthy people

Table 3.9 Baseline Status of Ambient Air Quality

Sr. No.	Location	AQI
1.	Panchotiya	84
2.	Bada	76
3.	Bhinsara	72
4.	Bhada	85
5.	Mota Layja	60
6.	Padampur	68
7.	Mapar	66
8.	Bambhadai	79
9.	Dedhiya	58
10.	Naya Layja	81



3.2.3.2 Interpretation of Air Quality Index

According to National Air Quality Index prescribed by CPCB, the result obtained is shown in table given above. AQI of baseline monitoring locations are ranges from 58 (Dedhiya) to 85 (Bhada). It seems that quality of ambient air is satisfactory. It may cause minor discomfort to sensitive people. So, it is advised to sensitive people to take necessary precautions.

3.3 NOISE ENVIRONMENT

Noise word come from the Latin word 'nauseas', is a loud outcry or commotion that is unpleasant, unexpected, or undesired with various frequencies over the audible range due to the regular activities of the mankind primarily noise pollution (or environmental noise) is displeasing human, animal or machine-created sound that disrupts the activity or balance of humans or animal life. The source of most outdoor noise worldwide is mainly evolved from industries, constructions and transportation systems, including motor vehicle noise, aircraft noise and rail noise, poor urban planning may give rise to noise pollution.

Industrial noise resulting to noise pollution has many reasons such as industries being close to human habitats which prevent the noise from decaying before it reaches human ear.

A determination is made of the micro scale impact by predicting anticipated noise levels for each alternative during both construction and operational phases. Predicted noise levels are compared with applicable standards or criteria in order to assess the impact.

The physical description of sound concerns its loudness as a function of frequency. Noise in general sound which comprises of many frequency components with different variations in loudness over the audible frequency range.

Various noise scales have been introduced to describe, a single number, the response of an average human to a complex sound made up of various frequencies at different loud levels, the response of the human ear to sound is dependent on the frequency of the sound and this has led to the concept of weighting scales. In the "A-weighting" scale, the sound pressure levels for the lower frequencies and higher frequencies are reduced by certain amounts before they are being combined together to give one single sound pressure level value. This value is designated as dB (A). The dB (A) is often used as it reflects more accurately the frequency response of the human ear. A perceived loud noise has a high dB or dB (A) value and a soft noise has a low one. The human ear has peak response around 2,500 to 3,000 Hz and has a relatively low response at low frequencies.

3.3.1 EXISTING NOISE LEVELS

Noise levels have been monitored at different points within the study zone and device manufactured by LUTRON SL 4033-SD was used for this purpose. Keeping in view of various local activities such as residential, commercial, silence and Industrial activities 10 noise level measurement locations were identified previously and the same sites were monitored again for baseline data validation, sites are depicted in the **Figure 3.5** & **Table 3.10**.

Table 3.10 Noise Monitoring Locations

Sr. No.	Village	Distance (km)	Direction	Latitude & Longitude	Taluka	District	Zone
1	Panchotiya	3.00 km	SE	22°51'49.04"N 69°10'45.96"E	Mandvi	Kutch	Residential
2	Bada	0.76 km	North	22°54'8.17"N 69° 8'51.85"E	Mandvi	Kutch	Residential
3	Bhinsara	2.19 km	East	22°53'42.94"N 69°11'15.47"E	Mandvi	Kutch	Residential
4	Bhada	5.70 km	SE	22°51'10.12"N 69°12'15.83"E	Mandvi	Kutch	Commercial
5	Mota Layja	5.60 km	ESE	22°53'29.19"N 69°13'14.47"E	Mandvi	Kutch	Commercial
6	Padampur	6.94 km	NNE	22°57'26.95"N 69°10'48.46"E	Mandvi	Kutch	Commercial
7	Mapar	5.05 km	NNW	22°56'18.08"N 69° 7'52.39"E	Mandvi	Kutch	Commercial
8	Bambhadai	7.24 km	NW	22°56'22.58"N 69° 5'27.55"E	Mandvi	Kutch	Silence
9	Dedhiya	9.97 km	NNW	22°59'0.37"N 69° 7'23.64"E	Mandvi	Kutch	Silence
10	Nana Layja	7.63 km	ESE	22°51'22.68"N 69°13'41.76"E	Mandvi	Kutch	Silence
Traffic Study							
Bada-Bhishra-Mota layja road		0.62 km	North	22°54'4.56"N, 69° 9'3.20"E	Mandvi	Kutch	
NH-41		5.27	East	22°53'32.88"N, 69°13'3.29"E	Mandvi	Kutch	



Location: Dedhiya
Latitude: 22°59'3"N, Longitude: 69°7'20"E



Location: Padampur
Latitude: 22°57'26"N Longitude: 69°10'45"E



Location: Mota Layja
Latitude: 22°53'32"N, Longitude: 69°13'4"E



Location: Bhambhadai
Latitude: 22°56'28"N, Longitude: 69°5'21"E



Location: Bhinshra
Latitude: 22°53'42"N Longitude: 69°11'15"E



Location: Bhada
Latitude: 22°51'9"N, Longitude: 69°12'15"E



Location: Mapar
Latitude: 22°56'15"N, Longitude: 69°7'54"E



Location: Bada
Latitude: 22°54'10"N, Longitude: 69°8'47"E



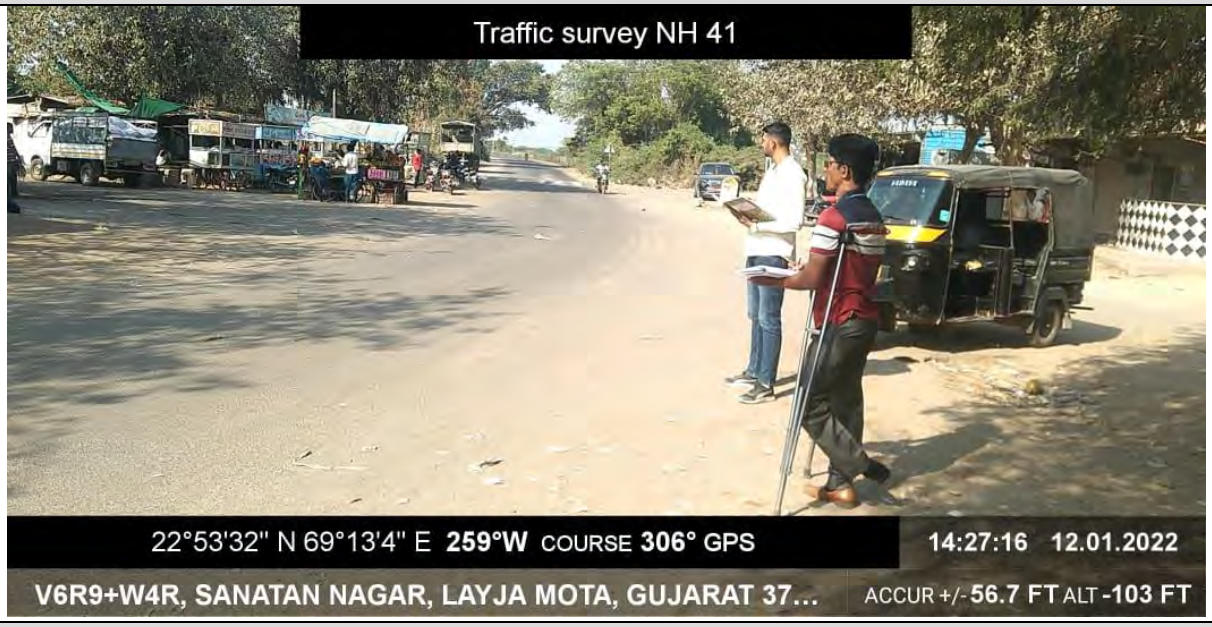
Location: Panchotiya
Latitude: 22°51'42"N, Longitude: 69°10'47"E



Location: Nana Layja
Latitude: 22°51'25"N, Longitude: 69°13'43"E



Traffic Survey Location: Bada-Bhishra-Mota layja road
Latitude: 22°54'1"N, Longitude: 69°9'10"E



Traffic Survey Location: NH 41
Latitude: 22°53'32"N, Longitude: 69°13'4"E

Figure: 3.5 Photograph showing Noise monitoring sample collection

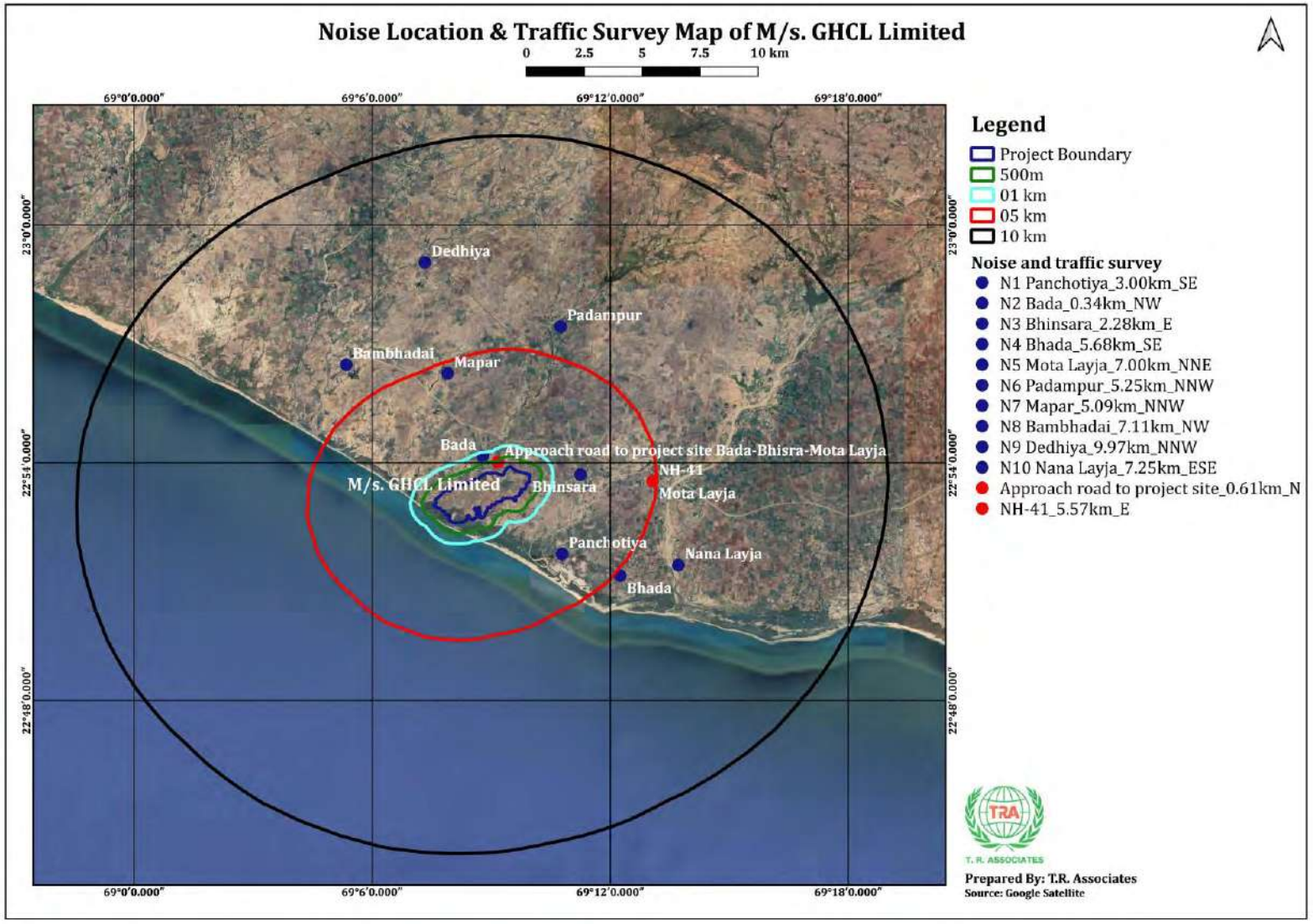


Figure 3.6 Map Showing Noise Sampling Locations

Source: Satellite image (Google Earth)

3.3.2 DATA ANALYSIS

The recorded sound levels are given in Table 3.11 and 3.12**.**

Table 3.11 Noise Level Monitoring Data (Day timings in Leq dB (A))

Day time Monitoring						
Location	Sampling Date	Category	Recorded level in dB(A)			Limits Leq (dB(A))
			Minimum	Maximum	Leq	
Panchotiya	01.12.22 to 02.12.22	Residential	44.9	53.5	50.3	55
Bada	02.1.22 to 03.12.22	Residential	40.7	47.6	44.9	55
Bhinshra	03.12.22 to 04.12.22	Residential	39.6	43.8	42.1	55
Bhada	04.12.22 to 05.12.22	Commercial	52.4	65.8	62.0	65
Mota Layja	05.12.22 to 06.12.22	Commercial	56.1	63.8	60.8	65
Padampur	06.12.22 to 07.12.22	Commercial	47.5	63.7	60.7	65
Mapar	07.12.22 to 08.12.22	Commercial	49.4	60.7	57.5	65
Bambhadai	08.12.22 to 09.12.22	Silence	35.8	47.7	44.0	50
Dedhiya	09.12.22 to 10.12.22	Silence	41.4	47.8	45.4	50
Nana Layja	10.12.22 to 11.12.22	Silence	33.4	46.6	42.7	50

Table 3.12 Hourly Noise data (Night timings in Leq dB (A))

Night time Monitoring						
Sampling Location	Sampling Date	Category	Recorded level in dB(A)			Limits Leq (dB(A))
			Minimum	Maximum	Leq	
Panchotiya	01.12.22 to 02.12.22	Residential	39.5	44.1	41.9	45
Bada	02.1.22 to 03.12.22	Residential	31.5	42.6	38.4	45
Bhinshra	03.12.22 to 04.12.22	Residential	33.3	41.1	37.4	45
Bhada	04.12.22 to 05.12.22	Commercial	49.2	57.4	52.9	55
Mota Layja	05.12.22 to 06.12.22	Commercial	39.8	46.8	44.4	55
Padampur	06.12.22 to 07.12.22	Commercial	46.2	52.3	48.2	55
Mapar	07.12.22 to 08.12.22	Commercial	45.2	52.6	50.2	55
Bambhadai	08.12.22 to 09.12.22	Silence	30.5	39.2	35.7	40
Dedhiya	09.12.22 to 10.12.22	Silence	32.9	37.2	35.0	40
Nana Layja	10.12.22 to 11.12.22	Silence	32.5	39.4	35.8	40

3.3.3 BASELINE DATA INTERPRETATION OF AMBIENT NOISE QUALITY (DAY AND NIGHT TIME)

Sound levels had been recorded according to IS: 9989:1991 (Reaffirmed 2001). The maximum noise level (Leq.) measured in the study area was 62.0 dB (A) in day time and 52.9 dB (A) in night time at Bhada, which is below the stipulated standards in day time as well as in night time.

Residential Zone: The noise levels (Leq) of the residential area within the impact zone varied from 42.1 – 50.3 dB (A) in the day time and 37.4 – 41.9 dB (A) in the night time.

Commercial Zone: The noise levels (Leq) of the commercial area within the impact zone varied from 57.5 – 62.0 dB (A) in the day time and 44.4 – 52.9 dB (A) in the night time.

Silence Zone: The noise levels (Leq) of the Silence area within the impact zone varied from 42.7 – 45.4 dB (A) in the day time and 35.0 – 35.8 dB (A) in the night time.

Out of all the 10 locations measured for noise levels, recorded noise levels are found to be within the standard limits.

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3.4 WATER ENVIRONMENT

Studies on Water Environment aspects of ecosystem is integral for Environmental Impact Assessment to identify sensitive issues and take appropriate action by maintaining balance of the organisms in an ecosystem in the early stages of development of the project. The objective of this report is to define the present environment in which the proposed plant will operate, to evaluate all possible events, to ensure that all negative impacts are minimized, and to demonstrate that proposed project has been appropriately announced to all interested parties so that their concerns can be considered.

Water quality studies have been carried out in the study area to understand the availability of water resources, possibility of water contamination and existing water quality.

3.4.1 WATER QUALITY

Water of high quality is essential to human life as well as for flora & fauna and water of acceptable quality is essential for drinking, agricultural, industrial, domestic and commercial uses; in addition, most recreation is water based; therefore, major activities having potential effects on surface water are certain to be of appreciable concern to the consumers.

3.4.1.1 SAMPLE COLLECTION AND ANALYSIS

The water resources in the study area may be classified into two major categories like Surface water and Ground water.

Water samples were collected at 19 different locations, out of which 8 samples were selected from surface water sources and 11 samples selected from ground water sources for physico-chemical and biological parameters. Parameters like pH, Odour, Temperature, TDS and DO were analyzed at the time of sampling. TDS & DO were also analyzed in laboratory. For other Parameter analysis the samples were preserved as per the recommended techniques for various Elemental determinations as per `IS: 3025 (part I) 1987'. Preservation chart for the different parameters is given in **Table 3.13**. These parameters were analyzed as per the procedures specified in 'Standard Methods for Examination of Water and Wastewater' Published by American Public Health Association (APHA) / IS 3025. Ground water & Surface water samples results were compared with IS: 10500 specifications.

Method of Water Sampling, Collection, Preservation

The following procedures were followed while sampling:

- Washing the bottles/cans with distilled water prior to the sampling.
- Before collection of water the bottles/cans are again washed 2-3 times with the same water.
- For surface water, bottles were lowered to a minimum depth of 30 cm below water surface.
- At each point different sets of water samples were collected so as cover all the parameters.
- Proper attention is taken in proper numbering at the site.
- Sterilized bottles were used for the samples that are to be analysed for bacteria.
- Civil supply water pipeline taps are sterilized before collection for bacteriological analysis
- Parameters like pH, Odour, Temperature and TDS were analysed in the field conditions and the results were reconfirmed after getting to the laboratory. DO is fixed in the field itself. Appropriate

preservatives are added, depending upon the elements to be analysed and marked accordingly (IS: 3025 (part I) 1987). Preservation chart for the different parameters is given in **Table 3.13.**

- All the water samples collected in the ice box, were immediately transported to the laboratory and freeze at < 4°C for analysis
- Field observations were noted in the field notebook
- As far as possible photographs were taken in almost all sampling points. Sampling & analysis of all the parameters are as per APHA, 22nd Edition & IS: 3025.



Sample preservation



Sample preservation

Figure 3.8 Photographic proof of sample preservation

Table 3.13 Preservation chart for different parameters

Sr. No.	Parameters
A. SAMPLE PRESERVATION: **ONSITE ANALYSIS**	
1.	Odor
2.	Temperature
3.	pH
B. SAMPLE PRESERVATION: **COOL, 4°C**	
1.	Acidity
2.	Alkalinity
3.	Bicarbonate
4.	Carbonate
5.	Chloride
6.	Chlorine Demand
7.	Chlorine Residual
8.	Chromium Hexavalent
9.	Chromium Total
10.	Color
11.	Conductivity
12.	Dissolved Oxygen
13.	Fluoride
14.	Nitrate-Nitrogen
15.	Nitrite-Nitrogen
16.	Phosphate (ortho)
17.	Settleable Solids
18.	Silica

19.	Solids (dissolved)
20.	Solids (fixed) each
21.	Solids (volatile) each
22.	Sulfate
23.	Sulfites
24.	Suspended Solids
25.	Total Solids
26.	Turbidity
C. SAMPLE PRESERVATION: **HNO_3, pH <2**	
1.	Aluminum
2.	Boron
3.	Calcium (Titrimetric)
4.	Copper
5.	Hardness (calcium)
6.	Hardness (total)
7.	Iron
8.	Magnesium
9.	Manganese
10.	Nickel
11.	Sodium
12.	Potassium
13.	Sodium Absorption Ratio (SAR)
D. SAMPLE PRESERVATION: **H_2SO_4 PH<2, COOL 4°C**	
1.	Ammonical Nitrogen
2.	Chemical Oxygen Demand (COD)
3.	Oil & Grease
4.	Phosphate (total)
E. SAMPLE PRESERVATION: **FIX ON SITE AND STORE IN DARK (2 ml $MnSO_4$ + 2 ml ALKALI AZIDE + 2 ml H_2SO_4)**	
1.	Dissolved Oxygen (Winkler)
2.	Biochemical Oxygen Demand (BOD)
F. SAMPLE PRESERVATION: **NaOH pH > 11**	
1.	Phenol
G. SAMPLE PRESERVATION: **ZINK ACETATE + NaOH pH > 9, COOL 4°C**	
1.	Sulfide

Table 3.14 Ground Water Monitoring Locations

Sr. No.	Location	Distance from project site (km)	Direction	Latitude & Longitude	Taluka	District	Site Observation
1.	Bhada	5.51	SE	22°51'14.6"N 69°12'8.7"E	Mandvi	Kutch	Water used for domestic purpose.
2.	Panchotiya	3.06	SE	22°51'50.4"N s69°10'49.9"E	Mandvi	Kutch	Open well was at the bank of pond. Water used for domestic purpose.
3.	Bada	0.78	NNW	22°54'2.8"N 69°08'33.5"E	Mandvi	Kutch	Water used for domestic purpose. Depth – 100 ft. Dia- 5 mts. Single phase motor.
4.	Bhinsara	2.45	East	22°53'22.1"N 69°11'22.5"E	Mandvi	Kutch	Waste debris, frogs observed in the well. Water level was at 20 ft. In the open well, water mixed with pond water due to monsoon activity.
5.	Mota Layja -1	5.59	East	22°53'39.6"N 69°13'14.2"E	Mandvi	Kutch	Pond water is directly penetrating into the open well. Well is surrounded by the pond.
6.	Mota Layja -2	4.16	NE	22°55'34"N 69°11'19.5"E	Mandvi	Kutch	Some debris along with frog, fishes and small insects observed in the well. Borewell constructed in open well.
7.	Bayath	5.31	NNE	22°56'28.2"N 69°10'47.4"E	Mandvi	Kutch	Water is used for the domestic purpose.
8.	Bambhadai	6.86	NW	22°56'11.2"N 69°05'27.6"E	Mandvi	Kutch	Water used for domestic purpose. Dug well near pond. Depth – 40 ft.
9.	Nana Layja	6.62	ESE	22°52'9.6"N 69°13'22.8"E	Mandvi	Kutch	Water used for domestic and agriculture purpose.
10.	Padampur	6.61	NNE	22°57'16.1"N 69°10'43.9"E	Mandvi	Kutch	Sample taken from open well. Water used for domestic and agriculture purpose.
11.	Dedhiya	8.12	NNW	22°58'11.1"N 69°08'25"E	Mandvi	Kutch	Water used for drinking and domestic purpose after treatment. Depth – 100 ft. Dia - 200 mm. Single phase motor. Phreatic water level – 70 ft.

	
Location: Nana Layja Latitude: 22°52'4"N, Longitude: 69°13'24"E	**Location: Bhada** Latitude: 22°51'14"N, Longitude: 69°12'8"E
	
Location: Panchotiya Latitude: 22°51'49"N, Longitude: 69°10'49"E	**Location: Bhinsara** Latitude: 22°53'46"N, Longitude: 69°11'22"E
	
Location: Bayath Latitude: 22°56'25"N Longitude: 69°10'46"E	**Location: Padampur** Latitude: 22°57'26"N, Longitude: 69°10'39"E
	
Location: Mota Layja-1 Latitude: 22°53'39"N, Longitude: 69°13'13"E	**Location: Mota Layja-2** Latitude: 22°55'34"N, Longitude: 69°11'19"E



Location: Dedhiya
Latitude: 22°58'58"N, Longitude: 69°7'40"E

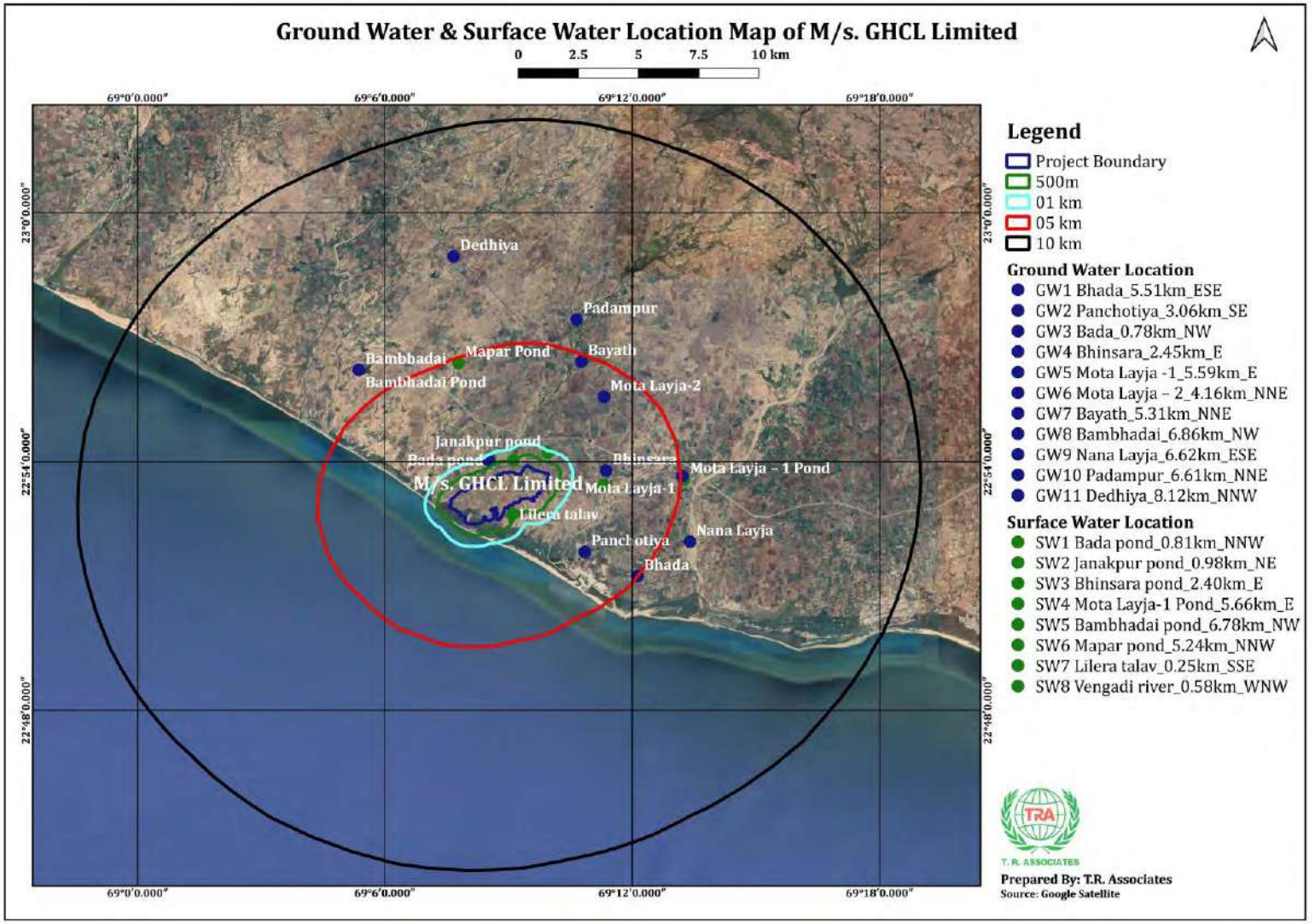


Location: Bada
Latitude: 22°54'3"N, Longitude: 69°8'33"E



Location: Bambhadai
Latitude: 22°56'13"N, Longitude: 69°5'22"E

Figure 3.7 Photograph showing Ground Water Sample Collection



Source: Satellite Image (Google Earth)

Figure 3.8 Map showing Ground Water and surface water Monitoring Locations

Table 3.15 Surface Water Monitoring Locations

Sr. No.	Location	Distance from project site (km)	Direction	Latitude & Longitude	Taluka	District	Observation
1.	Bada Pond	0.81	NNW	22°54'4"N 69°8'33.3"E	Mandvi	Kutch	Animal bathing observed. Washing activity also observed & water used for domestic purpose.
2.	Janakpur Pond	0.98	NE	22°54'13.8"N 69°09'57.3"E	Mandvi	Kutch	Religious debris observed. Water is used for Domestic purpose.
3.	Bhinsara Pond	2.40	E	22°53'24.6"N 69°11'20.9"E	Mandvi	Kutch	Slide turbidity observed in water due to suspended particles of soil. Biota and green vegetation observed.
4.	Mota Layja – 1 pond	5.66	E	22°53'34.8"N 69°13'15.4"E	Mandvi	Kutch	Waterbody was full of water. Biota observed around the pond. Religious waste observed.
5.	Bambhadai Pond	6.78	NW	22°56'12"N 70°28'28.42"E	Mandvi	Kutch	Use for domestic activity. Animal bathing and biota observed.
6.	Mapar Pond	5.24	NNW	22°56'23.2"N 69°07'47"E	Mandvi	Kutch	Biota observed. Animal bathing observed.
7.	Lilera Talav	0.25 km	SSE	22°52'44.00"N 69° 9'6.00"E	Mandvi	Kutch	Biota observed. Animal drinking and bathing observed.
8.	Vengadi River	0.58 km	WNW	22°54'2.00"N 69° 9'7.00"E	Mandvi	Kutch	Vengadi river is seasonal river and stagnant water observed. Biota observed all over area. Also, small fish observed.

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<table>
<tr><td> 
</td><td> 
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<tr><td>Location: Bhinsara Pond
Latitude: 22°53'26"N, Longitude: 69°11'18"E</td><td>Location: Mota Layja Pond
Latitude: 22°53'34"N, Longitude: 69°13'15"E</td></tr>
<tr><td> 
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</td></tr>
<tr><td>Location: Bhambhdai Pond
Latitude: 22°56'13"N, Longitude: 69°5'22"E</td><td>Location: Lilera Talav
Latitude: 22°52'44"N, Longitude: 69°9'6"E</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Location: Janakpur pond
Latitude: 22°54'13"N, Longitude: 69°9'57"E</td><td>Location: Bada Pond
Latitude: 22°54'4"N, Longitude: 69°8'33"E</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Location: Mapar Pond
Latitude: 22°56'23"N, Longitude: 69°7'47"E</td><td>Location: Vengadi River
Latitude: 22°54'2"N, Longitude: 69°9'7"E</td></tr>
</table>

Figure 3.9 Photograph showing Surface Water Sample Collection

Sr No	Parameters	Bhinsara Pond	Mota Layja-1 Pond	Bada Pond	Bambhadai Pond	Mapar Pond	Janakpur Pond	Vengadi river	Lilera Talav	Acceptable Limit	Permissible Limit
	m as Mo (mg/L)	0.01)	0.01)	0.01)	1)	.01)	.01)	0.01)	.01)		
46	**Selenium as Se (mg/L)**	BDL(DL= 0.005)	BDL(DL= 0.005)	BDL(DL= 0.005)	BDL(DL=0.0 05)	BDL(DL=0 .005)	BDL(DL=0 .005)	BDL(DL= 0.005)	BDL(DL=0 .005)	0.01	No relaxation
47	**Zinc as Zn (mg/L)**	BDL(DL= 0.02)	BDL(DL= 0.02)	BDL(DL= 0.02)	BDL(DL=0.0 2)	BDL(DL=0 .02)	BDL(DL=0 .02)	BDL(DL= 0.02)	BDL(DL=0 .02)	5	15

Note: BDL = Below Detection Limit, NS = Not Specifies, D.L. = Detection Limit, ND = Not Detected
Permissible Limit is applicable in the absence of Alternate source

3.4.1.4 BASELINE DATA INTERPRETATION OF SURFACE WATER ANALYSIS

- pH is found between 7.37 to 8.38 which is well within the acceptable limits.
- Chloride is found within the range of 41.5 mg/L to 589 mg/L. The concentration is found higher than the acceptable limit at Janakpur pond and Vengadi river, but found well within the permissible limit. The higher concentration is may be due to the use of surfactants for domestic washing activities such as cloth and utensil washing. Also, the higher concentration can be due to the saline soil of study area.
- Total Hardness is found within the range of 70 mg/L to 890 mg/L. The concentration is found higher than the acceptable limit at all locations except Bambhadai pond, Mapar pond and Lilera talav. Total hardness was found higher than the permissible limit at only Vengadi river. It may be due to the saline soil due to nearby coastal area.
- Magnesium is found within the range of 8.1 mg/L to 126.4 mg/L. The value found higher than the acceptable limit at Bada pond and Vengadi river and found higher than the permissible limit at only Vengadi river.
- Calcium is found within the range of 12 mg/L to 148.3 mg/L. The value found higher than the acceptable limit at Bhinsara Pond, Janakpur pond and Vengadi river, but found well within the permissible limit.
- TDS is found within the range of 176 mg/L to 2472 mg/L. TDS found higher than the acceptable limit at all locations except Bambhadai pond, Mapar pond and Lilera talav. The TDS is found higher than the permissible limit at Vengadi river. It may be due to the salty soil of the study area. The sampling location is nearby the coastal area. Also, domestic washing activities may contribute to the higher results of TDS.
- DO is found within the range of 4.9 mg/L to 5.6 mg/L, which is quite good for aquatic life.
- COD is found within the range of 8.1 mg/L to 44.4 mg/L, which may be due to the agriculture run off and storm water runoff.

- The concentration of iron found higher than the acceptable limit at Bhinsara pond and Bambhadai pond. It may be due to the iron content in the soils of the area.
- Other parameters like Arsenic as As, Zinc as Zn, Selenium as Se, Molybdenum as Mo, Mercury as Hg, Lead as Pb, Cobalt as Co and Cadmium as Cd at all the locations are found BQL.
- Total coliform was found at all locations. And it may be due to the cattle washing, presence of algae, and use of water for domestic activities, which may impact on health of persons who will use this water.
- Thus, surface water can be used for domestic and agricultural purpose after primary treatment as well as after disinfection.
- Water quality of all 8 locations is found below E as per CPCB guidelines

3.4.1.5 WATER QUALITY INDEX

Table 3.18 water quality classification based on WQI value

WQI Value	Water Quality
<50	Excellent
50-100	Good water
100-200	Poor water
200-300	Very poor water
>300	Water unsuitable for drinking

(Ramakrishnaiah *et al.*2009)

Table 3.19 Water Quality Index for Surface Water

Parameter	Standard	Bada Pond	Janakpur Pond	Bhinsara Pond	Mota Layja-1 Pond	Mapar Pond	Bambhadai Pond	Lilera Talav	Vengadi River
	S1	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**
pH	7	7.73	8.38	7.37	7.86	8.23	8.06	8.22	7.78
Chloride as Cl^-	250	191.3	281.9	166.1	167.8	41.5	50.3	55.9	589
Total Hardness as $CaCO_3$	200	290	366.7	300	263.6	70.0	100	88.9	890
Calcium as Ca^{++}	75	64.1	75.7	76.2	61.9	12	20	22.3	148.3
Magnesium as Mg^{++}	30	31.6	43.2	26.7	26.5	9.7	12.2	8.1	126.4
Nitrate as NO_3^-	45	1.98	2.79	3.31	3.90	1.72	2.18	3.51	1.44
Fluoride as F	1	0	0	0	0	0	0	0	0
Sulphate as SO_4^{-2}	200	64	125	66	49	10	48	52	166
TDS	500	860	1300	784	524	176	212	300	2472
Bicarbonate*	600	48	88	160	130	38	12	18	116

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Bada Pond	Janakpur Pond	Bhinsara Pond	Mota Layja-1 Pond	Mapar Pond	Bambhadai Pond	Lilera Talav	Vengadi River	Weight (wi)	Relative Weight (Wi)
q1	q2	q3	q4	q5	q6	q7	q8		
110.43	119.71	105.29	112.29	117.57	115.14	117.43	111.14	4	0.1
76.52	112.76	66.44	67.12	16.58	20.12	22.36	235.60	3	0.1
145.00	183.33	150.00	131.82	35.00	10.00	44.45	445.00	2	0.1
85.47	100.93	101.60	82.53	16.00	16.27	29.73	197.73	2	0.1
105.33	144.00	89.00	88.33	32.33	40.67	27.00	421.33	2	0.1
4.40	6.20	7.36	8.67	3.82	4.84	7.80	3.20	5	0.2
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4	0.1
32.00	62.50	33.00	24.50	5.00	24.00	26.00	83.00	4	0.1
172.00	260.00	156.80	104.80	35.20	42.40	60.00	494.40	4	0.1
8.00	14.67	26.67	21.67	6.33	2.00	3.00	19.33	3	0.1
								33	1.0

Bada Pond	Janakpur Pond	Bhinsara Pond	Mota Layja-1 Pond	Mapar Pond	Bambhadai Pond	Lilera Talav	Vengadi River
SI1	**SI2**	**SI3**	**SI4**	**SI5**	**SI6**	**SI7**	**SI8**
13.39	14.51	12.76	13.61	14.25	13.96	14.23	13.47
6.96	10.25	6.04	6.10	1.51	1.83	2.03	21.42
8.79	11.11	9.09	7.99	2.12	0.61	2.69	26.97
5.18	6.12	6.16	5.00	0.97	0.99	1.80	11.98
6.38	8.73	5.39	5.35	1.96	2.46	1.64	25.54
0.67	0.94	1.11	1.31	0.58	0.73	1.18	0.48
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.88	7.58	4.00	2.97	0.61	2.91	3.15	10.06
20.85	31.52	19.01	12.70	4.27	5.14	7.27	59.93
0.73	1.33	2.42	1.97	0.58	0.18	0.27	1.76
66.81	**92.08**	**65.99**	**57.01**	**26.84**	**28.81**	**34.28**	**171.61**
Good	**Good**	**Good**	**Good**	**Excellent**	**Excellent**	**Excellent**	**poor**

Interpretation for Surface water: Water quality index is found to be Excellent at Mapar Pond, Lilera pond and Bambhadai Pond, good at Bada Pond, Janakpur pond, Bhinsara pond, and Mota Layja-1 pond and observed poor at vengadi river. Poor quality water can be used after appropriate treatment.

3.5 SOIL ENVIRONMENT

Land study is important for Environmental Impact Assessment to identify sensitive issues and take appropriate action by maintaining 'ecological homeostasis' in the early stages of development of the project. The objective of this report is to define the present environment in which the proposed action is to occur, to evaluate all the possible eventualities, to ensure that all negative impacts are minimized and to demonstrate that the proposed project has been appropriately announce to all the interested parties so that their concerns can be considered.

For this purpose, baseline data (biotic and abiotic factors) have been studied around 10 km radius of the project. This data has been generated during **December 2022- February 2023.**

3.5.1 METHODOLOGY OF SOIL SAMPLING AND ANALYSIS

Soil

For soil quality analysis, 10 sampling sites were chosen to understand physio-chemical status of the soil. Photograph of soil sampling is shown in **Fig. 3.10** and the sampling sites are marked in **Fig. 3.11**. This will establish the baseline characteristics and will facilitate identifying the contamination if any due to the proposed project.

Collection of soil samples and analysis

The soil samples were collected with tube auger the rotary cuttings and bailers and also from split spoon samplers. Un-disturbed tube samples were collected using thin walled tubes. Soil samples were collected such that structure and moisture content of the soil do not get altered. In accordance with IS: 2720, split samples were carefully extracted from the samplers.

Adequate amount of composite soil samples was collected very precisely for analysis. The samples were packed in dependable, waterproof containers and marking specified accurately and distinctly. All the soil samples and core boxes were carefully transported to the testing laboratory. Soil sampling and analysis has been done as per the Indian Standard IS – 2720.

	
Location: Bhinsara Latitude: 22°53'36"N, Longitude: 69°12'26"E	**Location: Bayath** Latitude: 22°55'39"N, Longitude: 69°11'17"E

	
Location: Padampur Latitude: 22°57'51"N, Longitude: 69°10'17"E	**Location: Bambhadai** Latitude: 22°57'4"N, Longitude: 69°4'51"E
	
Location: Mapar Latitude: 22°55’40"N, Longitude: 69°8'4"E	**Location: Bada** Latitude: 22°53'35"N, Longitude: 69°7'52"E
	
Location: Mota Layja Latitude: 22°52’44"N, Longitude: 69°13'42"E	**Location: Bhada** Latitude: 22°51’17"N, Longitude: 69°11'54"E
	
Location: Panchotiya Latitude: 22°51’33"N, Longitude: 69°10'35"E	**Location: Janakpur** Latitude: 22°53’16"N, Longitude: 69°10'36"E

Figure 3.10 Photograph showing soil sample collection

Parameters analyzed for soil samples were pH, Electrical Conductivity, Moisture, Organic Matter, Organic Carbon, available Phosphorus, Sodium, Potassium, Cation Exchange Capacity, Water Holding Capacity and SAR, Total Nitrogen, Calcium, Magnesium, Nitrate, Bulk density & texture.

CHAPTER – 5
ANALYSIS OF ALTERNATIVES

SECTION 5.3: TECHNOLOGIES FOR ENVIRONMENT MANAGEMENT

SR. NO.	PARTICULAR	CONVENTIONAL TECHNOLOGIES	PROPOSED TECHNOLOGY ALTERNATIVES	JUSTIFICATION FOR SELECTION OF TECHNOLOGY
1.	Wastewater Management	Domestic wastewater: • **Option: 1** Domestic wastewater can be disposed to soak pit via septic tank or treated I STP with primary treatment • **Option: 2** Domestic wastewater can be treated in STP with Primary treatment followed by Secondary and Tertiary treatment.	**Domestic wastewater:** • Total domestic wastewater (160 m^3/day) will be generated which will treated in STP and reuse in gardening (150 m^3/day).	• The domestic wastewater treated with Primary treatment followed by Secondary and Tertiary treatment in STP effectively reduce the concentrations of pollutants, suspended solids, organic matter, and nutrients in the wastewater, meeting regulatory standards and environmental discharge requirements. • The sludge generated from STP will be reused as manure in gardening as organic fertilizer promoting sustainability and resource efficiency. • Additionally, treated wastewater will be reused in greenbelt development, thereby reducing the demand for fresh water resources. • So, **Option 2** is adequate and efficient for the unit for domestic effluent treatment.

SR. NO.	PARTICULAR	CONVENTIONAL TECHNOLOGIES	PROPOSED TECHNOLOGY ALTERNATIVES	JUSTIFICATION FOR SELECTION OF TECHNOLOGY
2.	Air Pollution Control	• **Option: 1** Multi cyclone Separator followed by ESP followed by Alkali scrubber can be provided as APCM for stack attached to Boiler of Captive Power Plant. • **Option: 2** Flue Gas Desulphurization System along with individual ESP with all 6 nos. of CFBC boiler as APCM for stack attached to CFBC boiler of Captive Power Plant.	• Unit will have Flue Gas Desulphurization System along with individual ESP with all 6 nos. of CFBC boiler as APCM with adequate stack height of 130 m. • The unit will Inject Sodium Bicarbonate for the control of SO_2 emission.	• The unit will install CPP with flue gas desulphurization CFBC Boiler along with 6 individual ESP with each Boiler. The unit will provide adequate stack height of 130 m. • The desulphurization system will have 97% efficiency and further the Injection of Sodium Bicarbonate will increase the efficiency to 99.70% controlling the SO_2 emission up to larger extent meeting the emission standards and will not pose any impact on the environment as well as nearby habitat and vegetation. • For the control of process gas emissions from Lime Kiln, Ammonia Recovery system, Lime grinding system / Slaker, Calciner unit, Densification and Sodium Bi-Carbonate Unit, the unit will provide efficient APCM such as Scrubber, Bag filter, Wet ESP, Dust collection system. • Proposed APCM are efficient to remove the Pollutants and required need meets the pollutants criteria given by authority. • So, **Option 2** is adequate and efficient for the unit for the control of air pollution.
3.	Solid/ Hazardous Waste Management	Solid & Hazardous Waste can be stored in separate storage area with pucca	Details of Hazardous Waste Management: ➢ **Settled Sludge from treatment of effluent**	• The proposed disposal management of the Solid/Hazardous waste generated from the Soda Ash and Captive power plant is

SR. NO.	PARTICULAR	CONVENTIONAL TECHNOLOGIES	PROPOSED TECHNOLOGY ALTERNATIVES	JUSTIFICATION FOR SELECTION OF TECHNOLOGY
		flooring, shed & leachate collection system The Solid & Hazardous wastes can be finally disposed of by following ways: 1) To TSDF site 2) To CHWIF site 3) Recover/Reuse of wastes within premises. 4) Treated in ETP. 5) Sold to registered recyclers	**generated from captive power plant & RO/DM Plant** Collection, storage and disposal at approved TSDF site ➢ **Used Oil** Collection, storage and used within premises as a lubricant / sold to registered recycler ➢ **Discarded Drums and Bags** Collection, storage & sold to authorized vendor ➢ **Spent Ion exchange resin** Collection, storage and disposal at approved TSDF site ➢ **Used Cotton** Collection, storage and disposal at approved CHWIF site ➢ **Lead acid Batteries** Collection, storage & sold to authorized agency through auction.	adequate for the unit to ensure that it will not have any adverse impact on the land/soil, marine life and nearby terrestrial habitat.

SR. NO.	PARTICULAR	CONVENTIONAL TECHNOLOGIES	PROPOSED TECHNOLOGY ALTERNATIVES	JUSTIFICATION FOR SELECTION OF TECHNOLOGY
			➢ **Ash (Fly ash & Bottom Ash) from Boiler** Collection, storage & sold to cement Manufacturing/ Brick Manufacturing ➢ **E-Waste** Collection, storage & sold to authorized agency through auction ➢ **Plastic Waste** Collection, Storage and Disposal to CPCB/SPCB authorized recyclers under EPR of Plastic Waste Management ➢ **Bio-medical Waste** Collection, storage and disposal at as per Bio-medical Waste Management Rules, 2016 ➢ **Construction and Demolition Waste** Collection, storage and utilize internally for area filling, road making etc. ➢ **STP sludge** Reused as Manure in Greenbelt Development ➢ **Kitchen Waste** Collected and composted in Composter and further used as manure for gardening in the	

SR. NO.	PARTICULAR	CONVENTIONAL TECHNOLOGIES	PROPOSED TECHNOLOGY ALTERNATIVES	JUSTIFICATION FOR SELECTION OF TECHNOLOGY
			premises ➢ **Limestone rejects** Collection and reused in Boiler for desulphurization and as a sweetener in cement industry, road making, pavement etc.	

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CHAPTER – 6
ENVIRONMENTAL MONITORING PROGRAM

6.1 PREAMBLE

Environmental monitoring can be defined as the sampling and analysis of different aspects of environment like air, water, soil, noise and biodiversity to analyse at regular intervals. Environmental monitoring is used in the preparation of environmental impact assessments, as well as in many circumstances in which human activities carry a risk of harmful effects on the natural environment. All monitoring strategies and programs have reasons and justifications which are often designed to establish the current status of an environment or to establish trends in environmental parameters. In all cases the results of monitoring will be reviewed and analysed statistically.

Environmental monitoring program is designed to understand how the environment changes over time. Therefore, regular monitoring program of the environmental parameters is essential to consider the changes in the environment. The objectives of environmental monitoring program are;

1. To verify the results of the impact assessment study in particular with regard to new development.
2. To follow the trend of parameters which have been identified as critical;
3. To check or assess the efficiency of the pollution control measures;
4. To ensure that new parameters, other than those identified in the impact assessment study, do not become critical through the commissioning of new installations;
5. To check assumption made with regards to the development and to detect deviations in order to initiate necessary measures; and
6. To establish a database for future Impact Assessment Studies for new projects.

6.2 ENVIRONMENTAL MONITORING PROGRAM & BUDGET FOR IMPLEMENTATION OF ENVIRONMENTAL MONITORING PLAN

The attributes, which merit regular monitoring, are air quality both at source and ambient atmosphere, water and wastewater quality, noise levels, ecological conservation, greenbelt development, socio-economic aspects, etc. The Post Project Monitoring program is given below in Table 6.1. NABL accredited /GPCB approved agency will carry out monitoring/sampling, analysis and charge/cost will be as specified by the GPCB. Annual budget allocated towards environmental monitoring with respect to the proposed project is approx. **Rs. 50,30,870 per Annum** as described in **Table - 6.1.**

Table 6.1 Environmental Monitoring Program & Budget Allocation

Sr. No.	Particulars	Monitoring Frequency	Parameters	Analysis & sampling Rate in Rs. per parameters	Methodologies	Total Budget in Rs. per year
Air Pollution Monitoring						
1.	Stack Monitoring of flue gas stack (8 Nos) and process gas stack (9 Nos)	Monthly	SPM, SO_2, NO_2, CO, HC or specified by GPCB in their consent	SPM – 1050 SO_2 – 1050 NO_2 – 1050 HC – 5300 NO_x – 1050 PM – 1050 CO – 1050 Sampling Charge: Stack Monitoring Flue Gas - 13100 Stack Monitoring Process Gas - 18400	PM: IS 11255(Part-1):1985 (RA 2014) SO_2: IS 11255(Part-2):1985 (RA 2014) NO_x: IS 11255(Part-7):2012 (RA 2017)	44,59,800/-
2.	**Ambient Air Quality Monitoring** • Near Coal Storage • Near Parking • Near Process Area • Upwind of CPP stack • Downwind of CPP stack-1 • Downwind of CPP stack-2	Every 3 Month or as per EC & CCA	SPM, SO_2, NO_2 specified by GPCB in their consent	SPM- 1050 SO_2 – 1050 NO_2 – 1050 & sampling charge = 10500	PM: IS 11255(Part-1):1985 (RA 2014) SO_2: IS 5182(Part-2):2001 (RA 2017) NO_x: IS 5182(Part-6):2006 (RA 2017)	3,70,800/-
3.	Work zone fugitive monitoring for VOC (2 locations)	Twice in a year	SPM	SPM-1050 & sampling charge = 10500	PM: IS 11255(Part-1):1985 (RA 2014)	46,200/-
Water Pollution Monitoring						

Sr. No.	Particulars	Monitoring Frequency	Parameters	Analysis & sampling Rate in Rs. per parameters	Methodologies	Total Budget in Rs. per year
4.	Monitoring of wastewater (ETP inlet and outlet)	Monthly	pH, Temperature, TSS, Ammonical Nitrogen, Oil & Grease	pH – 110 Temperature – 120 TSS – 180 Ammonical nitrogen - 350 Oil & Grease – 350 & sampling charge = 960	APHA-AWWA 22nd edition	49,440/-
5.	Monitoring of wastewater (STP inlet and outlet)	Monthly	pH, BOD, TSS	pH-110 BOD-1050 TSS-180 & sampling charge = 960		55,200/-
Noise Quality Monitoring						
6.	**Ambient noise monitoring** • Near DG set • Near Turbine in CPP • Near Boiler & ESP area • Near Limstone Grinding Section	Twice in a year	Noise level by Sound Level Meter	Sampling charge: First Monitoring - 7000 Each Subsequent Monitoring Within same premises - 10500	IS: 9989	35,000/-
Soil Quality Monitoring						
7.	Monitoring of soil (1 within the premises and 1 from vicinity)	Once in a year	EC, Nitrate, CEC, Phosphate, SAR, Organic Carbon	EC – 175 Nitrate-530 CEC-700 Phosphate-700 SAR-1140 Organic carbon-620	IS 2720 various parts and book by Department of Agriculture and Cooperation, Ministry of Agriculture	9830/-

Sr. No.	Particulars	Monitoring Frequency	Parameters	Analysis & sampling Rate in Rs. per parameters	Methodologies	Total Budget in Rs. per year
				& sampling charge = 1050		
8.	Monitoring of solid / hazardous waste generated (ETP waste)	Once in a year	Reactivity Corrosivity Total Organic Carbon	Reactivity – 960 Corrosivity – 960 Total Organic Carbon – 880 & sampling charge = 1800	--	4600/-
9.	Records of generation of Solid / Hazardous Wastes	Daily				
10	Record of storage, treatment, transportation and disposal of solid / hazardous wastes to recyclers/Re processors and TSDF	Daily				
	Total					**50,30,870/-**

Source: The Gujarat Government Gazette "Egazzete analysis charge 13/05/2022" by Gujarat Pollution Control Board

6.3 Infrastructural Requirements

The unit will provide effluent treatment plant for treatment of industrial effluent. The unit will install small laboratory for analysis of effluent for basic parameters like pH, COD, TDS regularly. In order to observe the efficacy of treatment system. In addition to this, regular monitoring will be carried out through NABL approved laboratory.

For the medical facilities, first aid boxes/kits, with basic medicines and requirements, will be provided at prominent places in the premises and also one MBBS doctor will be appointed for weekly visit in the plant. Moreover, unit will tie-up with nearby hospital for medical assistance in case of any emergency. Unit will maintain the medical records of all workers.

6.4 Documentation and Reporting

All the data and reports of monitoring of all parameters as stated in monitoring program will be properly maintained and timely reviewed by management for taking corrective or preventive actions. Monitoring reports will be regularly submitted to the concerned authorities as per their requirements.

6.5 Corporate Environment Policy

Project proponent is going to propose manufacturing plant of different types of resins and understand their responsibilities towards community as well environment alongwith doing business. They believe in sustainable development and therefore will provide adequate environmental control and management system in unit and will regularly and efficiently operate the same.

Unit will prepare environment policy duly approved by all partners prescribing standard operating procedures to bring into focus any deviation/violation of environmental or forest norms/conditions. The policy will be displayed at various prominent places in the premises and all the employees will be educated about the same.

For performing all the environmental management activities and operating environmental management systems efficiently, unit will establish Environmental Management Cell governed by partner as mentioned below.

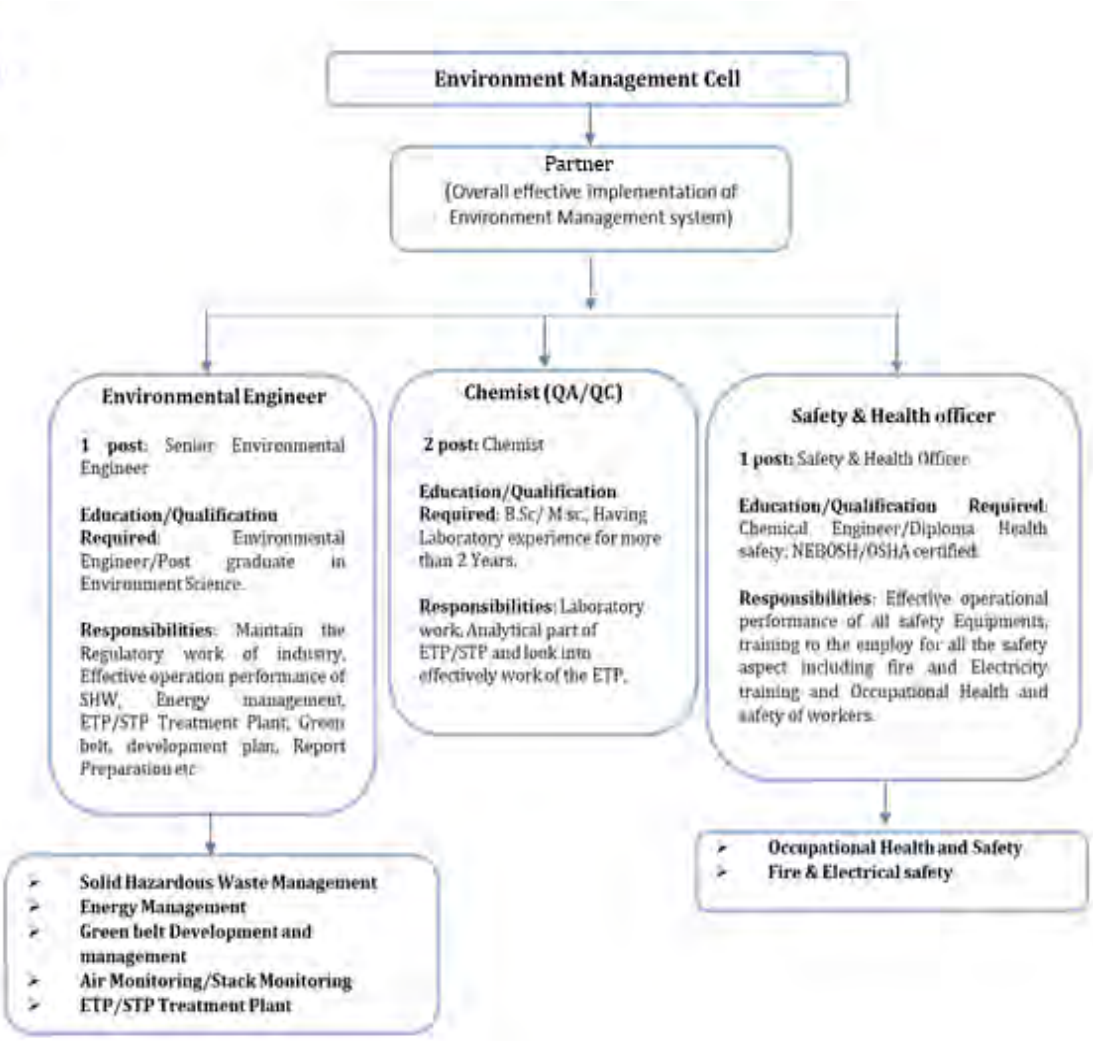


Figure 6.1: Environmental Management Cell

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CHAPTER - 7
ADDITIONAL STUDIES

A. Public Consultation

The proposed project **Greenfield Chemical Complex of M/s. GHCL Limited** is located at Village Bada, Taluka – Mandvi, District Kutch, Gujarat for manufacturing of Soda Ash. The proposed product fall under Category 4(e) as stated in Environment Impact Assessment Notification Published on 14th September, 2006.

Public Consultation refers to the process by which the concerns of locals likely to be affected or all the stakeholders who have tenable stake in the environmental impacts due to the project are established with a view to considering all the material concerns in the project design as appropriate.

Public Consultation:

1. Submission of Draft EIA report to the Concern authorities
2. Notice of Public hearing
3. Panel supervising the public hearing process
4. Videography
5. Proceedings
6. Process of public hearing should be complete in 45 days date of receipt of the request letter from the Applicant.

- The Public Hearing earlier was scheduled to be held on 16-04-2022 at 11:00 Hrs., Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch. Public hearing was then time being postponed due to unavoidable circumstances. After that public hearing was completed on **17-10-2022 at 11.00 Hrs.** Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch, Gujarat. Which was presided over by Shri Chetan Mishan (GAS), Sub Divisonal Magistrate & Deputy Collector, Mundra- Kutch.
- The public hearing was attended by 106 people. Requisite publicity through local newspapers/ media i.e. earlier an advertisement in English was published in **"The Times of India" Dated 04.03.2022** and in Gujarati in **"Divya Bhaskar" Dated 03.03.2022** and re advertisement in English was published in **"The Times of India" Dated 01.10.2022** and in Gujarati in **"Divya Bhaskar" Dated 30.09.2022.**
- Total 1154 written questions and 1066 verbal questions were asked by people in Public Hearing.
- The project proponent has given commitment to fulfil the environmental and social responsibility for development of community of nearby villages.
- The Public hearing Action Plan for written as well as verbal issues is attached below:

S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
1	CER – Fodder	4	Steps to be taken for cattle Care about Maldhari community Security regarding fodder supply for livestock. Provision for taking care of the health cattle.	Fodder will be provided as well as provision for veterinary doctor will be carried out by GHCL foundation under CSR activity.	• Activities for fodder supply will be carried out under CSR and CER activities for strengthening the bond between the project authorities and the local population. (refer Ch-8 and Table 10.4 in Ch-10). Fodder field will be developed on the Government/allocate land to nearby villages. • Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR activities for communities. • During year 2020-2021, GHCL foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation, Animal husbandry, health care, SHG, Infrastructure development etc. • We have already provided veterinary doctor for nearby affected villages.	• As per MoEF&CC Office Memorandum F.NO. 22-67/2017-IA III, MoEF&CC, New Delhi, dated on 1st May 2018 GHCL Ltd has earmarked 0.5 % of capital investment (approx. Rs. 18.04 crore), towards the Corporate Environment Responsibility in 5 years • GHCL Ltd will spend approx. **4.35 crore*** towards Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages as per requirement under **CER activities** (* value may defer as per actual requirement)	5 years	GHCL Limited
2	CER - Employment	5	For employment of local villagers Number of employment opportunities to be generated	Information on employment opportunities has given by Project Proponent that there are	• The proposed project has a potential for employment of skilled, semiskilled and	• GHCL Ltd will spend approx. **2.25 crore** towards Promoting	During construction and	GHCL Limited

			Priority must be given to nearby 10 villages Regarding priority to nearby villages	different types of employment opportunities in the two phase of the projects i.e. construction	unskilled employees during construction phase as well as	activities for skill building to improve	Operation phase	

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S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			for labor work Regarding employment for local communities.	phase and operational phase of the project. GHCL will strive to provide these employment opportunities to the local people, for which work will be done for their skill development and employment opportunities will be provided to the local people. As per requirement, training will be given to local people in coordination with HR department. Priority will be given for employment of local people. In nearby villages a group of women can be formed so that they can work in Gruhudhyogs (Home- based business). M/s. GHCL shall provide employment to women as per their skills and qualification.	operational phase. The plant will create direct employment in phased manner for about 1200 (operational phase) skilled as well as semi-skilled staff and indirectly large number of unskilled manpower will be engaged for the project. For Employment, local people will get first priority as per suitability and requirement. People will also get employed by the contractors for various project related activities. (Refer Ch-8 of EIA report) • GHCL foundation will carry out skill development Programme for local youth to improve their employment	employment opportunities and women empowerment in nearby villages under **CER activities.**		

3	CER - Health	1	Regarding health facilities under CSR activities	Will provide mobile health van facility and upgradation of existing healthcare infrastructure	opportunities, women empowerment under CSR and CER activities. • Industry will provide Mobile Health Care, Health Camps, and Specialized Check Up Camps in nearby villages. Necessary support and help will be extended for advanced diagnosis and treatment wherever identified, Free medical health checkup under CSR and CER activities.(Refer Ch-8 of EIA report). We have already initiated mobile health van facility for nearby affected villages of project site.	• GHCL Ltd will spend approx. **2.12 crore** towards Infrastructure development Such as primary healthcare units and the fulfilment of the basic amenities in PHCs including mobile medical van and Provide Bala-Rasayana to Malnutrition Children in Aanganwadi and PHC of nearby Villages under **CER activities.** • GHCL Foundation will spend approx. **2.47 crore**	5 years	GHCL Limited
4	CER - Education	3	Regarding scholarship under CSR activity Regarding skill development	Will build school in future as per requirement and will also upgrade the existing school infrastructure and will carry out	• Unit will be directed at two levels viz. school and skill building to improve employment opportunities. At		5 years	GHCL Limited

S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			conditions To provide educational facilities	skill development activities	school level we intend to promote quality of education and learnability, develop infrastructure of Government schools, provide vocational training as per the requirement under CSR and CER activities. • GHCL foundation will support local government and NGO to make that program more effective. • GHCL foundation will carry out skill development Programme for local youth to improve their employment opportunities, women empowerment under CSR and CER activities. • During year 2020-2021, GHCL Foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation, Animal husbandry, health care, SHG, Infrastructure development etc.	towards Infrastructure development for quality of education, which will ultimately upgrade schools in nearby villages under **CER activities.**		
5	Air Pollutants (SOx, NOx, Dust)	6	Height of chimney to be installed Levels of SOx and NOx	For minimizing Air Pollution, requisite height of the stacks will be provided as per the NAAQS	• The best available technology-based pollution prevention and control shall	• **Air pollution** • Capital cost would	During operation phase	GHCL Limited

			Regarding acid rain cause by SOx Emission of PM during transportation and Emission	norms. Besides this, Modern technology equipment's like Dust collector, Electrostatic Precipitator, Scrubber will be	used to meet the regulatory standards and these pollution control systems will be commissioned before	include air pollution control devices like ESPs, Scrubbers, Dust extraction and		

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S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			mercury. Regarding once through cooling for 120 MW.	installed. As a result, the pollution level will be within standard limits.	commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the	Stacks, Dry Fog system, Wind screen etc- 89.28 crore which is included in		

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			Regarding linkage of fuel and how they are going to use it	GHCL will continue to support development of green belt in the surrounding villages through various agencies including GHCL Foundation (AF). GHCL shall endorses AF tree plantation movement of planting trees in entire Mandvi Taluka and 50,000 trees that mentioned, GHCL shall surely nurture those plants for five years.	operational units, so that failure of the control system shall shut down the respective operational unit. • High efficiency ESPs shall be provided in the flue gas path of the CFBC boilers for control of particulate matter. • Finely ground limestone will be added to the boiler combustion zone • together with coal/lignite to arrest the SO2 formed during combustion. • Lime stone dozing system to the furnace to be designed to achieve higher than 90% capture of SO2. Monitoring system (CEMS) of air pollutants SO2, NOx, NH3, PM10 and PM2.5 will be implemented. • So, the expected pollutants will be well within standard norms. • The air quality monitoring will be carried out on regular basis by approved agencies by CPCB/GSPCB. (refer Ch-6 and Ch-10 of EIA report) • GHCL will implement greenbelt /plantation program to ameliorate the pollutants and improve the aesthetics and ambient air quality. (refer Ch-10 of EIA report) • There is negligible cooling water requirement for power generation. There is no any	**EMP cost** • Recurring cost would include operation and maintenance of pollution control devices- 1.50 crore which is included in **EMP cost** • **Environmental monitoring Programme** • Capital cost include OCEMS, online weather station etc- 3.4 crore which is included in **EMP cost** • Recurring cost – 1.30 crore which is included in **EMP cost** • **Greenbelt Development** • Capital Cost- 20 Crore • Recurring Cost- 0.5 crore The capital and recurring cost of greenbelt development is included in **EMP cost**		

S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					alternative effective system is available for soda ash plant. • There is no readily available infrastructure for transportation of fuel i.e. rail or water way. So, we have to transport through road. Traffic study is shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. In future, any alternative option available will explore. • GHCL Foundation will also promoting plantation activities in nearby villages under CSR and CER activities			
6	Water pollutants (BOD, COD, Ammonia, Mercury, Sea Weed, Mangroves)	7	Regarding water related question by Koli society Regarding decrease in number of phytoplanktons and disruption of food chain Regarding temperature and presence of ammonia in waste water Regarding presence of mangroves Regarding setup of tunnel for intake of sea water, seismic zone in which company falls, liquification of land due to heat	Effluent will be highly alkaline so it will be mixed with HCL and then it will be disposed off in sea. Design of structure will done according to seismic zone V. In soda ash industry impact of ammonia is very low.	• Industry will provide adequate effluent management and monitoring system for disposal of treated water • Proper seawater intake and treated effluent disposal (ensure maximum dilution) shall be done as per recommendation Marine EIA report. • The water monitoring results of (surface and groundwater and marine) should be carefully evaluated to identify significant changes, if any, adverse change from the baseline accordingly, corrective measures will be	• **Water Pollution** • Capital cost would include cost of ETP, STP etc- 14 crore which is included in **EMP cost** • Recurring cost would include operation and maintenance of pollution control devices- 0.12 crore which is included in **EMP cost**	During operation phase	GHCL Limited

			Regarding discharge of effluents into sea containing ammonia and high temperature and death of fishes at Sutrapada plant Regarding quality of effluent in terms of BOD and COD		taken to ensure the sustenance of water quality. However, there is no ground water pollution is envisaged in such soda ash plant, • The ammonia concentration in treated waste water well	• **Environmental monitoring Programme** • Capital cost include online pH, NH3-N, Temp meter etc- 3.4 crore which is included in **EMP cost**		

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S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					within the limit specified by CPCB for soda ash industry. • There is no such fish kill cases due to treated effluent in existing plant. There are independent studies available which indicates there is no significant adverse impact on marine environment but there will be positive impact on environment. • During studies, there is no such mangroves identified in sea water intake and outfall line area. • Design of pipeline/tunnel will be done according to seismic zone V. In case of catastrophic failure/ liquification on land, there are no chances of	• Recurring cost including Fresh water & wastewater sample analysis charges and Marine area environment monitoring – 1.30 crore which is included in **EMP cost**		

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7	Marine Life	1	Effect on marine life due to proposed project	No adverse impact on fish or marine animals and sea weed observed.	flooding as water transport through gravity. • Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. The effluent release scheme can then be adequately modified to ascertain necessary dilution, if required. The efficiency of the diffuser must be checked periodically and if necessary, it should be cleaned to revert back to the dilution ascertained through initial tracer studies.	• A provision of Rs. 1 crore to be earmarked for the biodiversity management plan to be implemented in the project area during construction phase and operation phase which is included in **EMP cost** • For periodic monitoring of the marine area environment during project Construction phase, a provision of Rs. 0.5 crore to earmarked. • For operation phase, Rs. 0.5 crore per year to be kept provision for the monitoring.	During construction and Operation phase	GHCL Limited

S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					• There are independent studies available which indicates there is no significant adverse impact on environment but there will be positive impact on environment. • Design of pipeline/tunnel will be done according to seismic zone V. In case of catastrophic failure/ liquification on land, there are no chances of flooding as water transport through gravity.	• The cost of periodic monitoring of marine area is included in **EMP cost**		
8	Health & Hygiene (Ammonia Leakage)	2	Skin diseases due to Soda Ash Regarding the leakage of ammonia.	GHCL will take care of any such issues related to Health of local peoples and workers. All the necessary measures for handling of chemicals will be implemented to reduce its impact on health of peoples. This information is also provided in the EIA report. All the pockets will have leak detection and repair system technology. Moreover, periodical maintenance will also be carried out. GHCL will ensure that there will be no leakage and therefore, there will not be occupational health issues for workers or villagers working in the plant. Moreover, GHCL will also provide PPE kits to workers for their safety.	• Ammonia tanks should have latest instrumentation provision for pressure indication, temperature indication and level indication. The provision of instrumentation should be within 100 percent redundancy. Continues recording of major parameters pertaining to the storages shall be maintained in the control room. • Unit will provide all the safety measure for ammonia storage as well as also prepare onsite and offsite emergency plan and all the APCM with respective units to mitigate the air pollution. The best available technology-based pollution prevention and control shall used to meet the regulatory	• Capital cost would include cost of OHS center, PPEs, fire & safety instruments, automation system for ammonia storage – 3.4 crore which is included in **EMP cost** • Recurring cost would include maintenance charges and training, audit & health check-up etc.- 0.35 crore which is included in **EMP cost**	During operation phase	GHCL Limited

S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					commissioned before commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the operational units, so that failure of the control system shall shut down the respective operational unit. • There is no significant impact observed in the existing soda ash plants in Gujarat. • There are rare possibilities of ammonia leakage observed in soda ash plant however, recommendation of Disaster management plan and risk assessment will be followed.			
9	CER - Farmers	3	Facilities to be provided to nearby farmers How hygenic the plant will be?	GHCL Foundation is already providing subsidy for drip irrigation and GHCL will also consider to support this scheme	• Industry will Promote environment friendly and nature-based solutions to enhance productivity of	• GHCL Ltd will spend approx. **3.00 crore** towards Promoting environment friendly and	5 years	GHCL Limited

			How hygenic will be bada plant and what facility will be provided to the farmer.	further out of the CSR funds proposed for this project. To help agriculture, GHCL will help farmers as part of our CSR activity in consultation with villagers. The details and type of developmental work will be decided in consultation with villagers. GHCL foundation has been working for farmers through its different schemes like ground water recharge, water harvesting, zero chemical farming, drip irrigation	farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of high-quality seeds/manure, efficient irrigation solutions, etc. under CSR and CER activities	nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of high-quality seeds/manure, efficient irrigation solutions, etc under **CER activities.**		
10	EIA Report & PH	14	EIA report is not correct	The terrestrial EIA report is	• It is requested to note that as			GHCL Limited

S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
	advertisement		Regarding the alternative of site Modhwa village. Regarding the NIO accreditation to prepare marine EIA report Regarding ToR granted and Study carried out prior of ToR granted. Regarding the advertisement of the PH Regarding NABET accreditation of consultant organization Regarding Marine EIA Regarding NEERI who has prepared EIA report Regarding the correction in EIA report Regarding the monitoring data collection Regarding accreditation certificate of additional studies for ecology. Regarding the studies mention in EIA report Regarding the study of ecology and Biodiversity in the study area Regarding the CRZ study	prepared by CSIR NEERI and Marine EIA report is prepared by NIO, Mumbai	per OM number J-17011/8/92-IA-III dated 8th August, 2019, there are 7 institutes/agencies authorized for preparation of CZMPS in consonance with the provision of CRZ notification, 2019 vide GSR 37(e) dated 18/01/2019. IRS anna university Chennai has prepared the CRZ map for GHCL LTD. CSIR -NIO is Expert hired to carry out the Marine EIA study. • EIA report has been prepared by CSIR-NEERI, which is reputed governmental body and QCI NABET accredited consultant. • An extensive study on the ecology and Biodiversity in the study area was conducted by the QCI NABET approved functional area expert.			
11	Vipassana	3	Project site is near Vipassana meditation centre	--	• Environmental Management Plan envisages the plans for the proper implementation of	• Cost of **Environment management plan (EMP)** including various	--	GHCL Limited

			The meditation centre will be disturbed due to industry. Ammonia used in the industry. Related to presence of Vipassana centre and other religious places in 15km radius of project site		mitigation measures to reduce the adverse impacts. • The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment. • The monitoring of all valued environmental components will be monitored as per the norms prescribed by GPCB/CPCB and the time to-	installations for Air Pollution, Water Pollution, Noise Control, Greenbelt Development, Occupational Health and Safety and other related activities- 318.08 crore • Recurring cost include maintaining and monitoring of all components- 7.53 crore.		

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S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					time guidelines issued for soda ash manufacturing industry. • It is reported in CSIR NEERI report that there are no significant impact expected on man-made sensitive installations and habitations. On basis of study of present environment condition near project area and impact prediction and control measures proposed by GHCL Ltd. The proposed project will not have any significant negative impact on environment. Company operations are limited to the plant boundary and no negative impacts on Vipassana Centre are anticipated. The company will have robust peripheral Green Belt in order to attenuate noise and air emission due to plant operations.	• **Greenbelt Development** • Capital Cost- 20 Crore • Recurring Cost- 0.5 crore The capital and recurring cost of greenbelt development is included in **EMP cost.**		
12	CER - Animal Husbandry	3	Regarding arrangements for Animal husbandry to nearby villages Regarding distribution of kits to fisherman under CSR activity	GHCL Foundation will support nearby community by providing education and livelihood support to make them self – reliant.	• Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR	• GHCL Ltd will spend approx. **4.35 crore** towards Animal husbandry promotion through providing support for breed	5 years	GHCL Limited

			Regarding number of cattle present in the area		activities. • Unit will also promote development Initiatives for Fishing Communities such as Creation of infrastructure like ice plants, cold storages as well as provide operational inputs such as fishing boats, nets and engines • We have already provided veterinary doctor for nearby affected villages.	improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages under **CER activities**		

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S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
13	Site Selection	2	Regarding the alternative of site Modhwa village Regarding showing presence of marshy land near coastline	--	During the site selection, the alternative sites considered for setting-up of the proposed chemical complex project are given below: : Site 1 – Village Pingleswar, Taluka – Abdasa, Dist. Kutch Site 2 – Village Suthri, Taluka – Abdasa, Dist. Kutch Site 3 – Village Bambhdai, Taluka – Mandvi, Dist. Kutch Site 4 – Village Bada, Taluka – Mandvi, Dist. Kutch Site 5 – Village Modhva, Taluka Mandvi, Dist. Kutch The site at village bada is considered favorable based on the environmental and logistic advantages over other four sites. Justification of Site selection are given in Chapter-5 of EIA report.	--	--	GHCL Limited
14	Sand Dunes	2	Concern of presence of sand dunes at Bada coast	--	• There is no disturbance to existing sand dunes.	--	--	GHCL Limited

			Regarding digging of sand dunes for preparation of tunnels for water intake		• Tunnelling work (much below ground level) for laying pipeline through sand dunes will be done by adopting proven construction methodology like micro tunnelling. The detailed Studies on sand dune mapping and morphological changes near the project site was carried by National Institute of Oceanography (NIO), Goa. This report can be referred from CSIR NIO Marine EIA.			

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S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					• GHCL Ltd is committed for conservation plan for sea turtles and sand dunes as suggested by various studies.			
15	Turtle	3	Regarding presence of turtles on the coastline of Bada Regarding information on endangered species not mentioned in EIA report	--	• Study on Status Survey and Conservation Plan for Sea Turtles along Mandvi Taluka, Bhuj, Gujarat by **Zoological Survey of India**, **Kolkata (April,2019)** is attached with	• Contribution to Forest department for Sea Turtle Conservation Activities- 0.20 crore which is included in **EMP cost**	10 years	GHCL Ltd

			Regarding hatching and presence of sea turtles		EIA report. • ZSI study report mention that they did not any encounter any sea turtle and fresh/old nests or crawl marks of turtles on the beach. Since many of the factor for selection of a suitable nesting site are not conducive. • As per additional Ecological and Biodiversity study, suggests that the coast near the proposed project site may not be suitable for sea turtle nesting due to narrow supra tidal region, steep slope, dense vegetation and presence of predators such as dogs and jackals. Though, observations suggest that there may be no or negligible probability of sea turtle nesting. • GUIDE is also engaged for study of turtle survey and preparing conservation plan. Premiliary observation are found to be similar. GHCL Ltd is committed for conservation plan for sea turtles and sand dunes as suggested.			
16	Schedule 1 species (Peacock, Googal. Turtle,	4	Regarding presence of greater numbers of peacocks nearby and	--	• Details of schedule -1 species and conservation plan is	• The proposed budget	10 years	GHCL Ltd

S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
	Sandha and indian Monitor Lizard)		stated in report Presence of reptiles and amphibians not reported Related to study of presence of Indian Monitor Lizard in study area Regarding presence of gugal trees,		already incorporated in EIA report. • GHCL shall make financial allocations for taking up wildlife mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • GHCL Ltd have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle, Chinkara and Gugal - Schedule –I species and Critically Endangered species) to CWLW department of Gujarat.	allocation for conservation of Schedule 1 species for 10 years is 1.36 crore which is included in **EMP cost**		
17	Conservation Plan	2	Regarding conservation plan for Schedule 1 species	--	• GHCL shall make financial allocations for taking up wildlife	• The proposed budget allocation for	10 Years	GHCL Limited

			Concern regarding green sea turtles and conservation plan for them		• mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • The unit have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle, Chinkara and Gugal - Schedule –I species and Critically Endangered species) to CWLW	conservation of Schedule 1 species for 10 years is 1.36 crore which is included in **EMP cost**		

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S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					department of Gujarat.			
18	Form 1(Water Bodies, Temples, Schedule 1 Species)	5	Regarding presence of waterbody not shown in form-1 Regarding religious places and lakes not mentioned in PFR report Waterbody not mentioned in form-1 Data given in form-1 and EIA are different Waterbody not mentioned in form-1	--	• Environmental settings are given in Chapter-1 and Chapter-5 of EIA report. Approximate distance of water bodies, temples etc are given in EIA report. • Through drainage studies of the area, it was observed that there is one stream of 1st order entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, will be diverted to nearby passing Vengadi River in the west. • There are also pond inside the premises. It is proposed that pond i.e. inside the premises will be used to store entire annual surface runoff plant use. If permitted by concern authority.	• Cost of drainage network of surface runoff, rainwater collection pond, EMS training and rain water harvesting system – 53 crores which is included in **EMP cost**	--	GHCL LTD
19	Govt. Land	3	Regarding type of land to be procured by the industry Regarding status of government land to be procured Providing data for proving gauchar land	--	• There is no gauchar land within proposed project site. M/s GHCL has applied to Industries Commissioner and District Collector for allotment of aforesaid land. Industries Commissioner has granted In Principle approval for Bonafied Industrial Purpose. District Collector has initiated actions for allotment of Govt. waste land.	--	--	GHCL LTD

20	CER - Fishing	8	Regarding details of Pagadia fisherman not mentioned and Marine EIA is misinterpreted	--	• Proper seawater intake and treated effluent disposal (ensure maximum dilution) shall be done as per	• A provision of Rs. 1 crore to be earmarked for the	During construction and	GHCL LTD

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S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Regarding disturbance to fishes due to presence of pipeline Regarding status of fishing near Bada and Mandvi Related to number of fishermen not incorporated in study Related to presence of dead fishes not reported in study, fishing carried out for commercial purpose Regarding presence of fisherman in study area Regarding the impact due to project activities on fishes Regarding chances of reduction in number of fishes		Marine EIA report prepared by NIO • Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. • Details of Fishery and fishermen including their family and population are given in Chapter-3 of marine EIA report. • Other than construction phase,	biodiversity management plan to be implemented in the project area during construction phase and operation phase which is included in **EMP cost** • For periodic monitoring of the marine area environment during project Construction phase, a provision of Rs. 0.5 crore to earmarked. • For operation phase, Rs. 0.5 crore per year to be kept provision for the monitoring.	Operation phase	

					there will be no any impact on Pagadiya fisher men. As shore line will remain undisturbed. • It is mentioned in marine EIA report that no large-scale commercial fishing operation prevail in the study area except for minor shore based and Gill net operations. • There are independent studies available which indicates there is no significant adverse impact on environment but there will be positive impact on environment. • Unit will also promote development Initiatives for Fishing Communities including Pagadiya under CER and CSR activities	• GHCL Ltd will spend approx. **1.0 crore** towards Development Initiatives for Fishing Communities including Pagadiya under **CER activities**		
21	Water Body (check dams)	2	Related to presence of seasonal river which passes near bada village and presence of dam over it	--	• Through drainage studies of the area, it was observed that there is one stream of 1st order entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, may be diverted to nearby passing Vengadi River in the west, which has two check dams, one for salinity ingress check and on upstream side for storing fresh water.	• Cost of drainage network of surface runoff, rainwater collection	During construction and	GHCL LTD

S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Related to distance of river from project site		This will not cause any adverse impact on the downstream. For channelizing the monsoon run off from the area adjacent to plant it is required to construct peripheral drain along plant boundary so that flooding is avoided and run off find its way to the natural slope towards Arabian Sea. So, the present hydrological setting of the area will remain unaffected. So, the present hydrological setting of the area will remain unaffected. • The additional water enter into the vengadi river through drainage will not impact on check dam. As any additional water above the river and check dam shall overflow to the Arabian sea.	Pond, EMS training and rain water harvesting system – 53 crores which is included in **EMP cost**	Operation phase	
22	Traffic (RMH, Heavy Trucks, Road Usage)	4	Regarding number of trucks passing due to project for raw material Related to traffic study not mentioned in ToR, impact not carried out Concern regarding public roads	--	• Traffic study are shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. • We will use existing road network as no other transportation i.e. rail/water	--		GHCL Limited

			Regarding number of trucks passing		ways are available. We have carried out calculation on			

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S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					Traffic study (Level of Service) and added on Form Part-C.			

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			Regarding past data of CSR		• GHCL's commitment towards the development of weaker sections of society has been a continuous initiative for more than two decades. Through its "GHCL Foundation Trust", GHCL has upgraded its CSR activities to cover a larger section of the society to provide support to the downtrodden, needy and marginalized citizens and also to create a social infrastructure for their sustenance. GHCL Foundation serves as the Corporate Social Responsibility arm of GHCL Limited and represents our commitment to the holistic development of our surrounding community. During year 2020-2021 GHCL has spent INR 9.03 Crores towards CSR activities. During year 2021-2022 GHCL has spent INR 10.62 Crores towards CSR activities			GHCL LTD
23	CER - General	1		GHCL has proposed CSR budget in the EIA report which will be utilized based on need identification and village development meetings. CSR will be implemented with CSR implementing agencies including GHCL Foundation is working in following area. 1. Agro-livelihood and animal husbandry, 2. Education and skill development, 3. Health, water, and sanitation.	• CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation,	--	--	

S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					Animal husbandry, health care, SHG Infrastructure development etc.			
24	Pollution and Environment General	4	Regarding pollution to be caused by industry Regarding solid waste management Regarding to dusting due to kiln and power plant, temperature of water Related to disposal of effluent water	Unit will follow all the rules and regulation with their subsequent amendments as directed by concerned authorities	• Environmental Management Plan envisages the plans for the proper implementation of mitigation measures to reduce the adverse impacts. • The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment. • The monitoring of all valued environmental components will be • Monitored as per the norms prescribed by GPCB/CPCB and the time to time guidelines issued for soda ash manufacturing industry.	• Cost of Environment management plant including various installations for Air Pollution, Water Pollution, Noise Control, Greenbelt Development, Occupational Health and Safety and other related activities. – 318.08 crore • Recurring cost include maintaining and monitoring of all components- 7.53 crore	--	GHCL Limited
			Related to distance of project site from forest area		• There is no forest land within the boundary of proposed			GHCL LTD

25	Forest area	2	Details regarding families dependent on forest	There is no classified forest area.	project site. However, some part of the unclassed forest area located south of the project site outside boundary. Sea water intake and outfall pipeline will pass through underground micro tunnel in specific corridor to cross forest area. The permission from the Forest Department is under process. • There will be no major impact on families dependent on forest. As the pipeline will be laid under ground through latest technology.	--	--	

S. No.	Issue related to	Verbal/ written nos. of issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					• M/s GHCL has also applied to MoEF&CC for Forest Diversion of 0.9689 Ha. of un-class forest land vide' proposal no. FP/GJ/Others/147527/2021. • GHCL Ltd will support afforestation programme in consultation with local forest department.			
26	Supporting for Industrial Development to GHCL LTD	--	For Employment For Infrastructure development in nearby village Social upliftment towards nearby villages Health facilities Women empowerment Skill development	GHCL LTD team thanked for welcoming the industries	--	--	--	--
Total		**94**						

SECTION 7.5.8.5 DISASTER MANAGEMENT PLAN

DISASTER MANAGEMENT PLAN FOR TSUNAMI

1. TSUNAMI

Tsunami is Japanese word for "harbor wave which is a huge ocean wave that can travel at speeds up to 965 km/hr can have heights of up to 30m, wavelengths of up to 200 km and long periods, usually between 10 and 60 minutes. Sometimes incorrectly called a tidal wave, a tsunami is usually caused by an underwater earthquake or volcanic eruption and often causes extreme destruction when it strikes land. It is a series of waves which travel outward on the ocean surface in all directions in a kind of rippleeffect.

- Tsunamis are extremely rare events in Gujarat. No instrumental records or damage records are available for tsunami impact in the region.
- GHCL project has natural protection of Sand Dunes, which will restrain the storm surge to enter the project site, if Tsunami occurs.
- GHCL has designed the plant structures to face the wind speed of 60 m/sec (216 km/hr).
- GHCL has designed the plant drainage system in such a way that if Tsunami occurs, it will drain the water properly in a short period of time.

PLANNING & PREPAREDNESS:

- **Constitute** Emergency **Response Team(s) comprising of**

1. **Site in charge**
2. **Fire team member**
3. **Safety in charge**
4. **Security in charge**

- Each member of the team shall have a designated alternate member.

- **Control centers equipped with:**
- Communication facilities with IMD and other concerned Government departments.
- Emergency vehicles/ Equipment.
- List of emergency contacts.
- Occupational Health Facilities.

ACTION DURING EFFECTIVE PERIOD

- Do not panic.
- Assemble at emergency assembly point.
- Stand near columns or duck under sturdy furniture.
- Communication with Unit Head for immediate/Planned shutdown of Unit, if required.

TSUNAMI DO'S & DON'S

Before:

- We will make familiar with the tsunami warning signals.

- We will make aware the people living along the coast should consider an earthquake or a sizable ground rumbling as a warning signal. A noticeable rapid rise or fall in coastal waters is also a sign that a tsunami is approaching.
- We shall make sure that all family members know how to respond to a tsunami. We shall make evacuation plans and pick an inland location that is elevated. ·
- We shall ensure that after an earthquake or other natural disaster, roads in and out of the vicinity may be blocked and accordingly will pick more than one evacuation route.
- We shall provide awareness program & teach family members how and when to turn off gas, electricity, and water.
- We will make awareness program and taught Children in advance about the evacuation plans.
- We will prepare emergency kit beforehand. The emergency kit will contain Flashlight and extra batteries, First aid kit with essential medicines etc.

During:

We will listen to a radio or television to get the latest emergency information, and will be ready to evacuate, if asked to do so.

- If you hear a tsunami warning, move at once to higher ground and stay there until local authorities say it is safe to return home.
- Move in an orderly, calm and safe manner to the evacuation site ·
- Stay away from the beach. Never go down to the beach to watch a tsunami come in. If you can see the wave you are too close to escape it.
- Return home only after authorities advise it is safe to do so.

After:

- We will be stay tuned to a battery-operated radio for the latest emergency information.
- Help injured or trapped persons.
- Stay out of damaged buildings.
- Return home only when authorities say it is safe.
- Enter your home with caution.
- Use a flashlight/torch when entering damaged buildings.
- Check for electrical shorts and live wires. Do not use appliances or lights until an electrician has checked the electrical system.
- Open windows and doors to help dry the building.
- Check food supplies and test drinking water.
- Fresh food that has come in contact with flood waters may be contaminated and should be thrown out.

DISASTER MANAGEMENT PLAN FOR CYCLONE

2. CYCLONE

For tackling any anticipated emergency situation preparedness is required to accomplish optimum readiness so that the response to such a situation is swift and effective. Therefore, a state of readiness is essential to combat successfully any anticipated emergency situations.

- A cyclone is a storm accompanied by high speed whistling and howling winds. It brings torrential rains.

- Cyclone arrival this warning is issued 12 hours before a cyclone is due to hit the land. The warning gives information about cyclone and will continue until the winds subside. In sea ports, danger signal is hoisted about the impending cyclone.
- One feature of cyclones is that they build slowly, but strike suddenly. It involves an atmospheric system characterized by the rapid inward circulation of air masses about a low-pressure center, usually accompanied by stormy and destructive weather.
- Cyclones circulate counter-clockwise in the northern hemisphere and clockwise in the southern hemisphere.
- The calm centre may move at speeds near 50 km an hour. Cyclones can be predicted through satellite tracking, hours or even days before their occurrence.

How does a cyclone affect us?

- A cyclone causes heavy floods.
- It uproots electricity supply and telecommunication lines. Power supply shuts down and telephones stop functioning.
- A cyclone tears away wall sidings and blows off roofs of buildings.
- The speeding winds cause loose metal and wooden sheets to fly turning them to potential killers. Broken glass pieces can cause serious injuries.
- Lightweight structures, buildings without proper anchorage to the foundations, settlements located in low lying coastal areas, roads, fences, electricity or telephone poles, hoardings, light-pitched roofs, are usually under grave risk during cyclones. Disruption of water supply and sanitation may lead to the outbreak of epidemics. Breakdown of communication links would hinder smooth management efforts.

What to do before and during a cyclone?

- Buildings are being checked before a cyclone season starts and carry out whatever repairs that are needed.
- Communication to subordinate and explain about cyclones and emergency contact numbers.
- Create storm awareness by discussing effects of a cyclonic storm with all members so that everyone knows what one can and should do in an emergency. This helps to remove fear and anxiety and prepares everyone to respond to emergencies quickly.
- Ensure no blockage of storm water drain in plant and colony.
- Ensure a team of rigor with hydra/JCB operator is available.
- Ensure Lift operation is stopped.
- Keeping valuables and documents in containers, which cannot be damaged by water?
- Keep torches and spare batteries. These must be kept in secure places and handy.
- Keep trees and shrubs trimmed.
- All doors, windows and openings should be secured.
- Continue to listen to warning bulletins and keep in touch with local officials. Keep radio sets in working condition. Battery powered radio sets are desirable.
- Evacuate people to places of safety when advised.
- Remain calm.

What one should not do during a Cyclone attack?

- During the storm do not venture out unless advised to evacuate.
- Avoid remaining on the top floor of dwellings. Stay close to the ground.
- Avoid taking shelters near old and damaged buildings or near trees.
- Do not touch power lines. One may get electrocuted.

What to do after the cyclone?

- Watch out for broken glass and other sharp items in debris.
- Listen to the advice of local officials and emergency workers.
- It is advisable to wait for the "all clear message".
- Stay away from flooded areas.
- Organizing clearing-up so that normalcy returns as soon as possible
- All tall structures have proper lightening arrester to earth the lighting stroke
- Welfare team takes care of enough availability of food, drinking water and medical assistance to tackle an emergency situation arisen due to natural calamities like cyclone.

DISASTER MANAGEMENT PLAN FOR EARTHQUAKE

3. EARTHQUAKE

- Communicate the facts about earthquake to all members
- Arrange the training for first aid and fire fighting
- Keep important documents at safer place.
- Identify special skills of neighbour (medical, technical) so that it can be utilized in emergency.

During Earthquake

- Do not panic
- If already inside, then Stay indoors! Get under a heavy desk or table and hang on to it.
- If fire breaks out, drop on the floor and crawl towards the exist
- If you are out doors during the quake, keep away from buildings, trees and electricity lines. Walk towards open places, in a calm and composed manner.
- If you are driving, quickly but carefully move your vehicle as far as safer place and stop. Do not stop on or under a bridge or overpass or under trees, light posts, power lines, or signs. Stay inside the car until shaking stops.

After the Earthquake

- Do not be afraid of the aftershocks
- Listen to radio-TV and other media for Government Announcement
- Examine walls, floors, doors, staircases and windows to make sure that the building is not in danger of collapsing.
- Carry out head count in all plant area.
- Check for injuries in affected area. Give first aid.
- Extinguish fire, if any
- Do not enter into the unsafe or risky buildings
- Do not keep telephone lines busy unnecessarily
- Switch off electric lines

CHAPTER – 8
PROJECT BENEFITS

CORPORATE ENVIRONMENT RESPONSIBILITY (CER)

The Industry will provide **18.04 Crore** towards Corporate Environment Responsibility. Socio-economic development activities will be planned based as per general necessity in villages. The investment will be made after discussions with local administration.

Action Plan for Corporate Environment Responsibility Development Activities

SR. NO.	TYPE OF ACTIVITIES	AMOUNT TO BE SPENT PER YEAR (RS. IN CRORES)			TOTAL AMOUNT TO BE SPENT (RS. IN CRORES)
		1st YEAR	2nd YEAR	3rd YEAR	
1.	**Fodder /Animal husbandry**	1.45	1.45	1.45	**4.35**
2.	**Employment/ Promoting activities**	0.75	0.75	0.75	**2.25**
3.	**Health** Infrastructure development Such as primary healthcare units and the fulfilment of the basic amenities in PHCs including mobile medical van and Provide Bala- Rasayana to Malnutrition Children in Aanganwadi and PHC of nearby Villages under CER activities.	0.72	0.70	0.70	**2.12**
4.	**Education** Infrastructure development for quality of education, which will ultimately upgrade schools in nearby villages	0.83	0.82	0.82	**2.47**
5.	**Farmers** Promoting environment friendly and nature-based solutions to enhance productivity of farming	1	1	1	**3.00**
6.	**Fishing** Development Initiatives for Fishing Communities	0.34	0.33	0.33	**1.00**
7.	**Renewable Energy**	0.95	0.95	0.95	**2.85**
Total					**18.04**

CORPORATE SOCIAL RESPONSIBILITY (CSR)

Activities under Corporate Social Responsibility

SR. NO.	PROGRAMMES AND ACTIVITIES	PROPOSED BUDGET FOR FY 23-24 (RS. LAKHS)
1	Agriculture and Animal Husbandry Livelihood	152.94
2	Health	22
3	Education and Vocational Training Institute	28
4	Women Empowerment	5.80
5	Water Resource Development Program	30
6	Rural Development Project & national Heritage	31.50
7	Establishment & Other	8.30
Total		**278.54**

- GHCL Foundation serves as the Corporate Social Responsibility arm of GHCL Limited.
- For its work towards CSR Excellence and Sustainability GHCL Ltd. awarded with prestigious Mahatma Award 2021.

GHCL would carry out number of community welfare activities in the following areas:

- Health and Family Welfare
- Environmental activities
- Sanitation, Water supply and Fodder for animals etc.
- Education

Since FY 20, GHCL is doing various undertakes various corporate social responsibility (CSR) initiatives.

T. R. ASSOCIATES

CHAPTER – 10
ENVIRONMENTAL MANAGEMENT PLAN

BUDGET ALLOCATION FOR ENVIRONMENT PROTECTION MEASURES

ASPECT OF ENVIRONMENTAL MANAGEMENT	CAPITAL		RECURRING	TOTAL CAPITAL COST	TOTAL	
				RS. IN CRORE	RECURRING COST	
					RS. (CRORE/ANNUM)	
	COMPONENTS	COSTING (RS. IN CORE)	COMPONENTS	COSTING		
Air Pollution	**Flue Gas Emissions** Individual ESP with 6 No. Boiler Scrubber and Dust Collector system with 6 No. Lime Kiln	12.03	Operation	1.5	**89.28**	**1.5**
	Process Gas Emissions Water Scrubber with Ammonia Recovery system (Including 2 no of stack)	2.70	Maintenance			
	Bag Filter- Lime Grinding System	1				
	Scrubber, Bag Filter - Calciner Unit	4.7				
	Scrubber- Densification	0.75				
	Bag filter- Sodium Bi-Carbonate Unit	1				
	DC bagging	1.5				
	DC_RMH	2.5				
	Bed Ash System (Fly ash management)	0.5				
	Dust Suppression system- Road	5.2				

	ESP- CFBC	30				
	68 m stack height -Lime Kilns	1				
	42 m stack height -Ammonia Recovery system					
	20 m stack height- Lime Grinding System/ Slacker					
	37 m stack height -Calciner Unit					
	30 m stack height -Sodium Bi-Carbonate Unit					
	43 m stack height - Densification					
	Dry Fog system	0.9				
	Wind Screen	0.5				
	130 m stack height -CFBC	25				
Water Pollution	ETP	1.50	Fresh water analysis	0.12	**14**	**0.12**
	STP	12.50	waste water analysis			
	Drainage network (marine area)	--	Operation			
AWH	Continues emission Monitoring System	2.4	Marine area environment monitoring during construction phase and operation phase. (Marine)	0.8	**3.4**	**1.30**
			Air (Stack, ambient)	0.48		
	online weather station	0.5	Water	0.010		
			Soil	0.00098		
	online pH, NH3-N, Temp meter	0.5	Solid waste	0.00046		
Noise	Acoustic Enclosures-TG	0.9	Monitoring of Noise	0.0035	**2.9**	**0.0035**
	Acoustic Enclosures-CO compressor	1.8				
	Acoustic Enclosures - DG set	0.2				

Hazardous/Solid waste management	Storage area		1			Transportation Cost	1	**1.05**	**1.10**
	Member Ship charges		0.05			Dumping			
						Used Oil Drum	0.034		
						E waste Management	0.009		
						Bio medical Waste Management	0.005		
Green Belt	4,50,000 No. of trees		20			Maintenance charges & Manpower salary	0.5	**20**	**0.5**
Fire safety cost	**SR. NO.**	**COMPONENTS**	**CAPACITY**	**QTY.* (NOS.)**	**COSTING**	**SR. NO.**	**COMPONENTS**	**COSTING**	**2.967**	**0.20**
	1	Jockey Pump	80 M^3/Hour	1	0.0282	1	Maintenance of Equipments and Periodic check-up	0.12		
	2	Electrical pump	410 M^3/Hour	1	0.1085	2	Safety officer	0.08		
		Diesel pump	410 M^3/Hour	1	0.18					
	3	Water storage tank (For Fire)	550M^3	2	0.15					
	4	Hose Pipe	63mm*15m	44	0.02326					
	5	Single Head Hydrant Post	63mm	127	0.06858					
	6	Automatic Sprinkler system (Alarm Valve)	--		0.05					
	7	CO_2 type Fire Extinguisher	4.5kg	16	0.0066064					
	8	ABC type Fire Extinguisher	6kg	463	0.159735					
	9	ABC type Fire Extinguisher	25kg	8	0.0093436					
	10	ABC type Fire Extinguisher	75kg	9	0.01728					
	11	Foam type Fire Extinguisher	9L	4	0.0045					
	12	Foam type Fire Extinguisher	50L	5	0.0075					

	13	Sand Bucket Stand	Nos.	30	0.00039			
	14	Foam	Liter	1000	0.008			
	15	Dry Chemical Powder	kg	1000	0.0137			
	16	Pump	Portable	1	0.013			
	17	fire proximate suit	PAA	3	0.008			
	18	Fire Hydrant line Installation cost	Meter	5556	1.2			
	19	foam trolley	3	33075	0.0099225			
	20	Fire Tender	8000L water	1	0.75			
	21	Automation for Handing of Chlorine and ammonia.	--	--	0.15			
Occupational health and safety	**SR. NO.**	**COMPONENTS**	**QTY.* (NOS.)**		**COSTING**	**COMPONENT**	**COSTING**	**0.44**	**0.15**
	1	Safety Audit	By yearly		0.03	Safety training/health awareness training to workers	375000		
	2	OHC and medical and health related periodical check ups	1544		0.03	Safety audit	375000		
	3	PPE kits (safety helmet, safety glasses, gloves, safety shoes, first aid kit, protective jacket,)	6928		0.27	OHC and medical and health related periodical check ups	375000		
	4	Antidots	12		0.00045	Mock drill	375000		
	5	SOP/Emergency preparedness plan	-		200000				
	6	Training cost	6		0.015				
	7	Safety boards	3600 sq ft		0.0886				
	8	Safety shower/ Eye	10		0.0064				

	Wash fountains					
Renewable Energy	Installation of Solar + Windmill	20 MW	--	--	**113**	**--**
Miscellaneous	Rain Water collection pond and rain water harvesting	8	Environment Management Cell	0.3	**53**	**2.66**
	Drainage Network for rain water	44.60	Sch-1 conservation plan	1.36		
	Environmental laboratory	0.25	Biodiversity management plan to be implemented in the project area during construction phase and operation phase. (Marine)	1		
	Environmental Management system, miscellaneous study, statutory application fees, audit, training cost etc.	0.15				
CER	**CER**	18			**18.04**	**--**
Total					**318.08**	**7.53**

Budgetary allocation towards Environmental Management

ASPECT OF ENVIRONMENTAL MANAGEMENT	COST IN CRORE [RS.]	RECURRING COST (CRORE /ANNUM) [RS.]	REMARKS
Air Pollution	89.28	1.50	Capital cost would include air pollution control devices like ESPs, Scrubbers, Dust extraction and suppression systems, Stacks, Dry Fog system, Wind screen and the recurring cost would include operation and maintenance of pollution control devices
Water Pollution	14	0.12	Capital cost would include cost of ETP, STP and recurring cost would include operation and maintenance of pollution control devices
Noise Pollution	2.9	0.0035	Capital cost would include providing adequate sound enclosures for TG, CO- compressor, DG Set
Hazardous / Solid Waste Management	1.05	1.10	Capital cost would include expense for providing storage area for hazardous waste and membership charges of TSDF/CHWIF Site and recurring cost would be for solid/ hazardous waste disposal charges and Sampling & analysis charges of solid waste.
Environmental monitoring Programme	3.4	1.30	Capital cost would include expense OCEMS, Online weather station, online pH, NH3-N, Temp meter and recurring cost would include monitoring and analysis of noise level., Sample analysis charges & ambient air & fugitive emission sampling & analysis charges etc., Fresh water & wastewater sample analysis charges etc. Soil: recurring cost would be for Soil Sample analysis., Marine area environment monitoring
Green Belt	20	0.5	Capital cost would include development of green belt within the project premises and recurring cost would include maintenance charges and manpower salary etc.
Renewable Energy	113	--	Capital cost would include Installation of Solar and Windmill
Fire safety & Occupational Health & Safety	3.4	0.35	Capital cost would include cost of OHS center, PPEs, fire & safety instruments and recurring cost would include maintenance charges and training, audit & health check-up etc.
Miscellaneous	53	2.66	Miscellaneous activity such as development of rain water harvesting system, Drainage Network for rain water, Environmental laboratory, Environmental Management system, miscellaneous study, statutory application fees, audit, training cost etc. and recurring cost would

			include biodiversity management plan, hiring of EMC and Conservation Plan for Schedule 1 species.
CER	18.04	--	Capital cost would include cost of CER activities such as promoting renewable energy, skill development Programme, Organic farming, water conservation (like village pond deepening), forestry etc. and develop infrastructure of schools, health facilities, Fishing activities, roads in nearby villages
Total (EMP + CER)	**318.08**	**7.53**	

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T. R. ASSOCIATES

CHAPTER - 11

SUMMARY AND CONCLUSIONS

11.3 DESCRIPTION OF THE ENVIRONMENT

The baseline environmental quality has been carried out during Winter Season between December 2022 to February 2023 in the study area of project site for various environment components mainly air, water, soil, noise, ecology and socio-economics**.**

11.3.1 AMBIENT AIR QUALITY

Location Village	**Results (98th Percentile)**					
	$PM_{2.5}$ µg/m³	**PM_{10} µg/m³**	**SO_2 µg/m³**	**NO_2 µg/m³**	**Ozone µg/m³**	**NH_3 µg/m³**
Panchotiya	50.53	81.50	15.48	38.81	14.03	B.D.L (D.L-21)
Bada	42.35	75.94	14.21	33.63	9.57	B.D.L (D.L-21)
Bhinsara	43.31	68.69	13.62	31.77	12.39	B.D.L (D.L-21)
Bhada	51.29	83.33	16.78	41.46	17.50	B.D.L (D.L-21)
Mota Layja	27.60	59.70	8.19	22.38	19.45	B.D.L (D.L-21)
Padampur	38.50	68.40	12.84	30.37	11.63	B.D.L (D.L-21)
Mapar	36.76	65.95	11.70	33.13	12.50	B.D.L (D.L-21)
Bambhadai	47.52	72.88	10.84	28.40	10.36	B.D.L (D.L-21)
Dedhiya	32.53	58.41	9.77	25.61	11.81	B.D.L (D.L-21)
Nana Layja	47.28	80.66	17.26	36.37	10.93	B.D.L (D.L-21)
Permissible limit **[NAAQ standards-2009]**	**60 µg/m³**	**100 µg/m³**	**80 µg/m³**	**80 µg/m³**	**400 µg/m³**	**180 µg/m³**
Note:	CO: BDL, VOC: BDL, Lead: BDL, Arsenic: BDL, Nickel: BDL, Benzene: BDL & Benzo alpha Pyrene: BDL					

- All the above results are found well within the prescribed limits of National Ambient Air Quality standards for 24 hrs.

11.3.2 NOISE

- Sound levels had been recorded according to IS: 9989:1991 (Reaffirmed 2001). The maximum noise level (Leq.) measured in the study area was 62.0 dB (A) in day time and 52.9 dB (A) in night time at Bhada, which is below the stipulated standards in day time as well as in night time.
- Residential Zone: The noise levels (Leq) of the residential area within the impact zone varied from 42.1 – 50.3 dB (A) in the day time and 37.4 – 41.9 dB (A) in the night time.
- Commercial Zone: The noise levels (Leq) of the commercial area within the impact zone varied from 57.5 – 62.0 dB (A) in the day time and 44.4 – 52.9 dB (A) in the night time.
- Silence Zone: The noise levels (Leq) of the Silence area within the impact zone varied from 42.7 – 45.4 dB (A) in the day time and 35.0 – 35.8 dB (A) in the night time.
- Out of all the 10 locations measured for noise levels, recorded noise levels are found to be within the standard limits.

11.3.3. WATER QUALITY

Water samples were collected at 19 different locations, out of which 8 samples were selected from surface water sources and 11 samples selected from ground water sources for physico-chemical and biological parameters. Parameters like pH, Odour, Temperature, TDS and DO were analyzed at the time of sampling. TDS & DO were also analyzed in laboratory. For other Parameter analysis the samples were preserved as per the recommended techniques for various Elemental determinations as per `IS: 3025 (part I) 1987'.

Baseline data affirm that overall quality of both surface & ground water is suitable for domestic activity including agricultural activity as per drinking water quality standards IS 10500. Surface water and ground water of all locations can be used for domestic and agricultural purpose after appropriate treatment.

The important findings are listed below:

BASELINE DATA INTERPRETATION OF SURFACE WATER ANALYSIS

- pH is found between 7.37 to 8.38 which is well within the acceptable limits.
- Chloride is found within the range of 41.5 mg/L to 589 mg/L. The concentration is found higher than the acceptable limit at Janakpur pond and Vengadi river, but found well within the permissible limit. The higher concentration is may be due to the use of surfactants for domestic washing activities such as cloth and utensil washing. Also, the higher concentration can be due to the saline soil of study area.
- Total Hardness is found within the range of 70 mg/L to 890 mg/L. The concentration is found higher than the acceptable limit at all locations except Bambhadai pond, Mapar pond and Lilera talav. Total hardness was found higher than the permissible limit at only Vengadi river. It may be due to the saline soil due to nearby coastal area.
- Magnesium is found within the range of 8.1 mg/L to 126.4 mg/L. The value found higher than the acceptable limit at Bada pond and Vengadi river and found higher than the permissible limit at only Vengadi river.
- Calcium is found within the range of 12 mg/L to 148.3 mg/L. The value found higher than the acceptable limit at Bhinsara Pond, Janakpur pond and Vengadi river, but found well within the permissible limit.
- TDS is found within the range of 176 mg/L to 2472 mg/L. TDS found higher than the acceptable limit at all locations except Bambhadai pond, Mapar pond and Lilera talav. The TDS is found higher than the permissible limit at Vengadi river. It may be due to the salty soil of the study area. The sampling location is nearby the coastal area. Also, domestic washing activities may contribute to the higher results of TDS.
- DO is found within the range of 4.9 mg/L to 5.6 mg/L, which is quite good for aquatic life.
- COD is found within the range of 8.1 mg/L to 44.4 mg/L, which may be due to the agriculture run off and storm water runoff
- The concentration of iron found higher than the acceptable limit at Bhinsara pond and Bambhadai pond. It may be due to the iron content in the soils of the area.
- Total coliform was found at all locations. And it may be due to the cattle washing, presence of algae, and use of water for domestic activities, which may impact on health of persons who will use this water.
- Thus, surface water can be used for domestic and agricultural purpose after primary treatment as well as after disinfection.

BASELINE DATA INTERPRETATION OF GROUND WATER ANALYSIS

- pH is found between 7.46 to 8.22 which is within the acceptable limit.
- Chloride is found within range of 65.4 to 1026.9 mg/L. The concentration of chloride found higher than acceptable limit at Nana Layja, Bhada, Bhinsara, Padampur, Mota Layja-2, Bada, and Dedhiya. At Bada the concentration is found higher than the permissible limit. This may be due to river system flowing through the area have subsequently been overlain by the aeolian deposits. The texture is sandy to sandy loam with silty clay loam in areas. The salt content is very high with the sodium chloride as the dominant salt.
- Total Hardness within the range of 77.8 mg/L to 1611.1 mg/L. Total Hardness is found above the acceptable limit at all the locations except Bambhadai and found above the permissible limit at Bhinsara, Padampur and Bada. It may be due to whole area is saline area and near to the coastline.
- Calcium is found within the range of 8.9 mg/L to 320.6 mg/L. It was observed within the acceptable limit at only Bhada, Panchotiya, Bayath, Mota Layja-1 & Bambhadai. It was observed above the permissible limit at Bhinsara and Bada. It may be due to salinity of the area.
- Magnesium ranges between 13.5 mg/L to 197.1 mg/L. It was observed above the acceptable limit at all locations except Bambhadai. The results were observed within permissible limits except Bhinsara, Padampur and Bada. This may be due to Present near the seawater and after sodium most commonly found cation in seawater.
- Sulphate ranges between 12 mg/L to 419 mg/L. It was observed within the acceptable limit at all locations except Padampur but well within the permissible limits. This may be due to ground water moves through soil and rock formation that contain sulphate Minerals.
- TDS is found within the range of 196 mg/L to 4440 mg/L. TDS is found higher than the acceptable limits at all locations except Bambhadai. It was observed higher than the permissible limit at Bhinsara, Padampur and Bada It may be due to present of Salt contain is very high and presence of sufficient amount of gypsum in soil.
- Iron content found higher than the acceptable limit at Nana Layja, Bhinsara, and Padampur, which may be due to geological formation of that region. Higher concentration of iron may lead to health concern.
- Ground water is suitable for domestic and agricultural purpose after primary treatment and disinfection.

11.3.5 SOIL QUALITY

Ten soil samples were taken from 10 locations considering the land use pattern in the study area. Soil samples were collected from agricultural land, barren land and forest land.

- pH varied from 7.45 to 9.00 indicating that soil of the study area was moderately alkaline to highly alkaline in nature.
- The soil of project area found to be safe with respect to electrical conductivity (EC).
- Analytical results revealed that organic carbon content of soils was found low. Organic carbon works as buffer to salinity and alkalinity. A low organic matter content in the soils maybe a possible explanation for alkaline soil. Also, the study area falls under the acid region where evapo-transpiration more than precipitation and as a result of which salts move up to the surface.

- Cation exchange capacity (CEC) values of all most all the soil is having lower fertility. However, soil near mota layja village had high CEC value indicating high soil fertility with more clay content.
- Fertility status of soils of project area shows that soils were low in N and available P_2O_5 and high in K_2O.
- Calcium and magnesium salts in soils were founded more than critical levels. (Ca > 25% of CEC and Mg > 4% CEC). Calcium and magnesium values ranged from 23-43% and 5-11% respectively. There is a considerable amount of limestone present in the soil of Kutch. This maybe a possible reason for higher Ca content in soils of the Study area.
- SAR values were mostly low except the soils of Bambhdai, Bhinsara and Padampur which have medium value.
- Sodium content of the Soil samples was ranged from 1.38 to 2.97 (mg/g).
- Soil of project area was varied. Soil textural classes show that soils were sandy, loamy sand and sandy loam. The water holding capacity of sandy soil, loamy sand and sandy loam were in the ranges of 21.24 to 29.79, 24.71 to 29.27 and 22.95 to 30.86 respectively. By and large, WHC could be considered as medium.
- A compact soil has a higher value, while less compact soil has value. The bulk density value ranged from 1.07 to 1.58 (g/m^3). Based on results, soils of study area are easy to field operations.

11.3.6 ECOLOGY

- One of the necessary preconditions for the conservation of a species is, understanding of various ecological parameters controlling their population status and its distribution pattern. One of the fore most management strategies for the conservation of biological diversity is in situ conservation. This option suggests that maintenance and protection of wild plants and animal species in the wilderness or natural conditions or habitats in nature preserves such as biosphere reserves, national parks and sanctuaries.
- Protected Areas play a key role in conserving natural ecosystem and they contribute substantially to biodiversity conservation provided they are managed effectively. They ensure the continued flow of ecosystem services and also provide significant economic benefits to the dependent communities. This option is maintained by strict enforcement strict law.
- However, in the recent past it has been realized that, the conservation of biological diversity is not possibly without involving the dependent community. As a result of it there are many community-based forest protection programmes like, Joint Forest Management (JFM), Eco-development, Buffer Zone Management etc. have been initiated. This initiative will also suggest to start in this landscape.
- This study reported a total of 154 plant species, 10 herpetofauna, 58 birds and 12 species of mammals from the core and buffer zone of GHCL- Bada, Mandvi-Kutch Locality. However, no scientific data on ecology of each rare, endangered, and threatened species are available for this landscape and hence, need to be conducted a separate study in details is very necessary before initiate any project activities on site.
- In addition, once completed this detail study, there are also need to be marked the macro and micro habitats for each species along with local villagers and respective forest ranges for long-term conservation of wildlife corridors and habitats of important species including- birds, mammals, reptiles, and plant species mentioned.
- Identified and through interviews, mangrove patches are recorded far off from the project site with severe anthropogenic pressures.

- All the necessary conservation plans for recorded and referred threatened and scheduled animals' species are submitted along with this report in details.
- A detailed status survey of threatened floral species needs to be done and the habitats supporting high floral diversity should be identified and notified as Mini Core Areas (MCA) of the Bada Landscape. Strict protection should be given to these Mini Core Areas to prevent wood cutting, grazing and collection of other natural resources. Under restoration programme degraded habitats should be restored with the threatened species and their associate species.
- Even though many GSFD nurseries exist in the district, they generally develop common and fast-growing trees species for fuel wood, timber, avenue plantation and certain extent some medicinal plants under social forestry programmes. No priority was given to shrub and herbaceous species under social forestry scheme. Moreover, out of 16 species have been identified as threatened species, except Commiphora wightii (small tree or shrub) rest all were herb, shrub, under shrub, climber and ground runner. Hence, development of nursery, especially for the threatened species mentioned should be part of social forestry mandate.
- Many species are unique in Kutch landscape are also recorded in and around the proposed project localities, and hence, need to be discussed and clarity on long-term conservation of existing population of these species are very important.
- The recent development in the tract of community involvement is People's Biodiversity Register (PBR) programme under the Biological Diversity Act (BDA), 2002. It is aimed to document people's knowledge and perception of the status, uses, history, ongoing changes and forces driving these in the biological diversity resources of their own localities. The concept and outcome of this initiation has been widely discussed (Gadgil et al. 2000). For all the surrounding and adjoining villages of proposed site, PBR process will be started with concerned technical support group and the Gujarat Biodiversity Board (GBB), Gandhinagar.
- For above PBR process, and with respective Biodiversity Management Committee/s (BMCs), all other recorded species and detailed documented species like- recently recorded Sea Turtle Nesting sites, Vulture nesting sites, Dolphin sightings etc. by Forest Range Offices, Naturalists and local resource personals need to be conserved and protected with participatory approaches.

11.3.6 SOCIO-ECONOMIC STATUS

Study area Observation

SR. NO.	STUDY VILLAGE	FIELD OBSERVATION	MAJOR ISSUES
1	Bada	Anganwadi and government primary schools, secondary schools, and higher secondary schools are available. Agriculture and labour are the two most common occupations. Sub-post office and Primary Health Centre are available. Major crops are Cotton, Groundnuts, and wheat.	Road, Drainage problem and Employment
2	Bhinsara	Anganwadi and Government primary school are present. Mobile van Healthcare facility, Post office and Community Hall available.	Drinking water, Healthcare facilities and employment

SR. NO.	STUDY VILLAGE	FIELD OBSERVATION	MAJOR ISSUES
3	Panchatiya	Anganwadi and primary school are available. Agriculture and labor are the main occupations in the village. Major sources of drinking water are well and tap water. Sub-post office and ration shop are available in the village. Cotton, Groundnut and till are major crops	Drainage problem, Road
4	Layja Mota	There are anganwadis and government primary schools and secondary schools. The Primary Health Centre, the Community Hall, and bus facilities are available for transportation. Tap water is a major source of drinking water.	Drinking Water & Employment
5	Layja Nana	Primary education is provided by Anganwadis and Government primary schools. The main occupations are daily labour and fishing. Three Community Halls and Sub-post office are available. Cotton, groundnuts, and wheat are the major crops	Education facilities, Health facilities and employment
6	Bhada	Anganwadi and government primary and secondary schools are available for education. Primary Health Centre facility, Community Hall, sub-post office and for transpotation bus facilities are available. Major drinking water source is tap water.	Drainage problem, toilet, PHC and employment
7	Bayath	Anganwadi and Government primary school and High School are present for education. Primary Health Centre facilility, Community Hall, sub-post office and for transpotation bus facilities are available. Major drinking water source is tap water.	Drinking water facilities and Employment
8	Mapar	Anganwadi and Government primary school are present for primary education. Major occupation are labour work and agriculture. Community Hall and Sub-post office are available. Major crops are Cotton, Ground nut, Wheat and Pearl Millet	Road facility and Health facility and Employment
9	Bambhadai	Anganwadi and Government primary school are present for primary education. Major occupation are labour work and fishing. Community Hall facility and Sub-post office available. Major crops are Cotton, Ground nut, Wheat	The available drinking water has high TDS, which is not suitable for consumption purpose. Road Facility is not proper- Kachha road, Drainage system not available, PHC not available, High rate of Un-employment

SR. NO.	STUDY VILLAGE	FIELD OBSERVATION	MAJOR ISSUES
10	Padamapar	Anganwadi, Government Primary School is available for primary education system. Most of the population is employed in agriculture and labour work. Major drinking water source is tap water, all types of road facilities available Pakka Drainage facility present, Community Hall available and also Bank available, ration shops present in the village Major cultivation is Cotton, Ground nuts.	Health and Drinking water facilities

SECTION 11.8 PROJECT BENEFITS

Action Plan for Corporate Environment Responsibility Development Activities

SR. NO.	TYPE OF ACTIVITIES	AMOUNT TO BE SPENT PER YEAR (RS. IN CRORES)			TOTAL AMOUNT TO BE SPENT (RS. IN CRORES
		1st YEAR	2nd YEAR	3rd YEAR	
1.	**Fodder /Animal husbandry**	1.45	1.45	1.45	**4.35**
2.	**Employment/ Promoting activities**	0.75	0.75	0.75	**2.25**
3.	**Health** Infrastructure development Such as primary healthcare units and the fulfilment of the basic amenities in PHCs including mobile medical van and Provide Bala- Rasayana to Malnutrition Children in Aanganwadi and PHC of nearby Villages under CER activities.	0.72	0.70	0.70	**2.12**
4.	**Education** Infrastructure development for quality of education, which will ultimately upgrade schools in nearby villages	0.83	0.82	0.82	**2.47**
5.	**Farmers** Promoting environment friendly and nature-based solutions to enhance productivity of farming	1	1	1	**3.00**
6.	**Fishing** Development Initiatives for Fishing Communities	0.34	0.33	0.33	**1.00**
7.	**Renewable Energy**	0.95	0.95	0.95	**2.85**
TOTAL					**18.04 Crore**

Activities under Corporate Social Responsibility

SR. NO.	PROGRAMMES AND ACTIVITIES	PROPOSED BUDGET FOR FY 23-24 (RS. LAKHS)
1	Agriculture and Animal Husbandry Livelihood	152.94
2	Health	22
3	Education and Vocational Training Institute	28
4	Women Empowerment	5.80
5	Water Resource Development Program	30
6	Rural Development Project & national Heritage	31.50
7	Establishment & Other	8.30
Total		**278.54 Lakhs**

SECTION 11.10 ENVIRONMENTAL MANAGEMENT PLAN

ASPECT OF ENVIRONMENTAL MANAGEMENT	COST IN CRORE [RS.]	RECURRING COST (CRORE /ANNUM) [RS.]	REMARKS
Air Pollution	89.28	1.50	Capital cost would include air pollution control devices like ESPs, Scrubbers, Dust extraction and suppression systems, Stacks, Dry Fog system, Wind screen and the recurring cost would include operation and maintenance of pollution control devices
Water Pollution	14	0.12	Capital cost would include cost of ETP, STP and recurring cost would include operation and maintenance of pollution control devices
Noise Pollution	2.9	0.0035	Capital cost would include providing adequate sound enclosures for TG, CO- compressor, DG Set
Hazardous / Solid Waste Management	1.05	1.10	Capital cost would include expense for providing storage area for hazardous waste and membership charges of TSDF/CHWIF Site and recurring cost would be for solid/ hazardous waste disposal charges and Sampling & analysis charges of solid waste.
Environmental monitoring Programme	3.4	1.30	Capital cost would include expense OCEMS, Online weather station, online pH, NH3-N, Temp meter and recurring cost would include monitoring and analysis of noise level., Sample analysis charges & ambient air & fugitive emission sampling & analysis charges etc., Fresh water & wastewater

			sample analysis charges etc. Soil: recurring cost would be for Soil Sample analysis., Marine area environment monitoring
Green Belt	20	0.5	Capital cost would include development of green belt within the project premises and recurring cost would include maintenance charges and manpower salary etc.
Renewable Energy	113	--	Capital cost would include Installation of Solar and Windmill
Fire safety & Occupational Health & Safety	3.4	0.35	Capital cost would include cost of OHS center, PPEs, fire & safety instruments and recurring cost would include maintenance charges and training, audit & health check-up etc.
Miscellaneous	53	2.66	Miscellaneous activity such as development of rain water harvesting system, Drainage Network for rain water, Environmental laboratory, Environmental Management system, miscellaneous study, statutory application fees, audit, training cost etc. and recurring cost would include biodiversity management plan, hiring of EMC and Conservation Plan for Schedule 1 species.
CER	18.04	--	Capital cost would include cost of CER activities such as promoting renewable energy, skill development Programme, Organic farming, water conservation (like village pond deepening), forestry etc. and develop infrastructure of schools, health facilities, Fishing activities, roads in nearby villages
Total (EMP + CER)	**318.08**	**7.53**	

M/s. Greenfield Chemical Complex of GHCL Ltd., Kutch

Project Site: Village Bada, Taluka Mandvi, District Kutch, Gujarat.

BASELINE NETWORK DESIGN

Geo Co-ordinates:

22°53'53.19" N,
69°09'26.63"E

Prepared by:	Checked by:	Approved by:
Hiral Shah	Malav Dalwadi	T. R. Patel

PROJECT PLANNING FOR BASELINE MONITORING

Plan order to conduct field studies in systematic manner, a check list has been prepared by T.R. Associates. This would help the concerned ECs and FAEs for effective planning of the study.

PRE VISIT CHECK LIST

Pre visit check list LU Monitoring

Sr. no	Description	Checklist
1	Prepare 10 km Radius TOPOMAP	Annexure - 1
2	Prepare 1,5,10 km radius Google map	Annexure - 2
3	Identified Level 1, level 2, level 3 Land use classification based on Google image and prepare desk report for site monitoring.	--

Pre visit check list for SE Monitoring

Sr. no	Description	Checklist
1	Prepare List of villages, total population, house hold, covered in the 10 km radius map provided by Land use expert based on latest Census, report	R-10 E
2	Prepare sociology status indicator of study area (i.e. Physical, Demographic, Health, Education, Agriculture, Trade commerce, Economic(income source), public utilities, Transportation/communication, other indicators)	
3	Check questionnaire incorporating project specific information	

Pre visit check list Ambient air quality Monitoring

Sr. no	Description	Checklist
1.	Collect secondary data on meteorology for the past 10 yrs.	
2.	Identified Valuable environmental component from the TOPOMAP and verified status on Google earth for finalization of the monitoring location. (i.e. Reserve forest, Eco sensitive zone, major water body etc.)	R-10 A
3.	Prepare or Down load wind-rose diagram of the district from Meteoblue website and plot it onto the study area.	
4.	Identify/locate the Down wind direction and village fall into predominant down wind direction (one in core zone 0 to 5 km and one buffer zone 5 to 10 km) and upwind direction (one location).	
5.	Segregate no of ambient air location according to 10 km land use area (I.e. Agriculture, Industrial, Domestic, and Vehicular or traffic location). (Approximate identified from the Google earth data)	

PROJECT PLANNING FOR BASELINE MONITORING

Pre visit check list Water Monitoring

Sr. no	Description	Checklist
1.	Identified Major Surface water location within 10 km study area from the Google earth.	R-10 B
2.	Prepare no of Ground water location according to land use of the 10 km study area. (i.e., Agriculture, Domestic, Industrial etc.)	
3.	If major river available select upstream and downstream of the river by checking drainage pattern on Google earth.	
4.	Identified major population available in the study area for domestic water quality check location selection.	
5.	Identified any GIDC within the study area for check water quality of industrial activities.	
6.	Identified Agriculture land within study area for check water quality used for agriculture (irrigation).	
7.	Identified the impact due to source emission on the nearest water body by identified pre dominant down wind direction map given by AP expert.	
8.	Identified observations on local surrounding areas of sampling locations	

Pre visit check list Noise Monitoring

Sr. no	Description	Checklist
1.	Identified No. of monitoring location according to CPCB Guideline (Commercial, residential, silence, Industrial)	R-10 D
2.	Identified core zone and buffer zone for selection of noise monitoring location.	
3.	Identified location for traffic study within study area using Google map provided by land use expert.	
4.	Identified local activities at the sampling location affecting noise environment	

Pre visit check list Soil Monitoring

Sr. no	Description	Checklist
1.	Identified No. of monitoring location based on satellite image of 10 km radius map provided by expert. (Agriculture land, non-cultivated land, Forest land, waste dump, ETP Site etc.)	R-10 C

PROJECT PLANNING FOR BASELINE MONITORING

Pre visit check list EB Monitoring

Sr. no	Description	Checklist
1.	Collected information of local flora & fauna of the study area from secondary sources including Forest department	
2.	Prepare 10 km radius topo map and identified type of habitat/ land use in 10 km radius map. (i.e. Forest / Natural vegetation, Type of forest (Tropical dry-deciduous, Tropical moist deciduous, Semi-ever green, Wet ever-green, etc.), Water bodies and Marshy land / Mangroves, Grazing land, Agricultural land, Human Settlements, Barren land, etc.	--
3.	Determine seasonal variation of the habitats and identified ecological characteristics of each habitat based on secondary information	
4.	Prepare wind rose diagram and overlay it on to the Google image to identify the predominant down wind direction and upwind direction and identify project surroundings	
5.	Identify the secondary source data (flora & fauna) and check Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD), Not Evaluated (NE) etc.	

- **After successfully completion of the above exercise (BASELINE NETWORK DESIGN) Project coordinator will finalize the sampling location and allotment the work to TRA laboratory through TRA/EIA/R05 document.**
- **After that project coordinator will prepare baseline planning document coordinating with project proponent. Project coordinator will inform to PP for basic arrangement i.e., number of car, local manpower, and accommodation facilities required for monitoring team. Take prior approval from the local villages identified in the baseline network design for air monitoring. Project coordinator also informs to project proponent to make prior discussion with local sarpanch and talati for their village need base assessment study. In addition to that also informed regarding basic requirements of all Monitoring team (i.e. breakfast, lunch etc.)**

DURING VISIT

- **After reach at the project site, first introduce our team to project proponent. Vice versa project proponent will introduce their team. Once completion of introduction, project coordinator will segregate the team according to pre-desk study document as per prefixed requirement of functional area (i.e., water sampling team, Air sampling, noise sampling, Soil sampling, Socio Economy study, etc.)**

PROJECT PLANNING FOR BASELINE MONITORING

- **Take photograph of the team and start work according to allotted functional area for Baseline data collection.**
- **All FAE will get informed by project coordinator to collect precise baseline data for better understanding regarding site surrounding. It is also informed to collect the photographic evidence for representing objects for specific functional area and observation must be put into respective FAE field log book.**
- **Once all the primary baseline data will be collected by respective functional area, FAA, FAE and Project coordinator will planning for return at destination with fulfilling all necessary requirement (i.e., ice, other sample preservatives etc.)**
- **Water sample will be stored into the laboratory refrigerator with proper identification.**

POST BASELINE VISIT

- **On the next day water sample from the laboratory will be sent to subcontracted laboratory (NABL Accredited) for biological parameter analysis.**
- **Project coordinator will collect evidence of the baseline data collection (i.e., photographs from FAE) and save into the respective company folder for further data interpretation procedure.**
- **Project coordinator will inform to FAE to provide quality checks of their primary data collection and also ask to provide their report within stipulated time frame given into Bar chart.**

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Certificate of Accreditation

T R Associates, Ahmedabad

A-401, S.G Business Hub, Between Sola Bhagwat and Gota overbridge, Near Urniya Campus, S.G. Highway, Ahmedabad, Gujarat-380060

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Thermal power plants	4	1 (d)	A
2	Metallurgical industries (ferrous and non-ferrous)	8	3 (a)	A
3	Cement Plants	9	3 (b)	A
4	Chlor-alkali industry	13	4 (d)	A
5	Soda ash Industry	14	4 (e)	A
6	Pesticides industry and pesticide specific intermediates	17	5 (b)	A
7	Synthetic organic chemicals industry	21	5 (f)	A
8	Building and construction projects	38	8 (a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated July 14, 2023, posted on the QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance with the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/23/2872 dated September 6, 2023. The accreditation needs to be renewed before the expiry date by T R Associates, Ahmedabad following the due process of assessment.

Sr. Director, NABET
Dated: September 6, 2023

Certificate No.
NABET/EIA/2326/RA 0293

Valid up to
April 8, 2026

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to the QCI-NABET website.

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T R Associates

A-401, S. G. Business Hub,
Between Sola Bhagwat and Gota Overbridge,
S.G. Highway, Ahmedabad, Gujarat- 380060

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, 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 including opencast /underground mining	1	1 (a) (i)	A
2.	Thermal power plants	4	1 (d)	A
3.	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
4.	Cement plants	9	3 (b)	B
5.	Chlor-alkali industry	13	4 (d)	A
6.	Soda ash Industry	14	4 (e)	A
7.	Pesticides industry and pesticide specific intermediates (excluding formulations)	17	5 (b)	A
8.	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	21	5 (f)	A
9.	Building and construction projects	38	8 (a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SA AC minutes dated September 29, 2021 and supplementary assessment minutes dated February 25 and June 3, 2022 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/22/2276 dated March 14, 2022. The accreditation needs to be renewed before the expiry date by T.R Associates, Ahmedabad following due process of assessment.

Sr. Director, NABET
Dated: June 23, 2022

Certificate No.
NABET/EIA/1922/SA 0153 (Rev.01)

Valid up to
April 08, 2023

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

T.R. ASSOCIATES LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

SURVEY NO. 272/3, ROYAL ENFIELD SHOWROOM LANE,S.G HIGHWAY, AHMEDABAD, GUJARAT, INDIA

in the field of

TESTING

Certificate Number: TC-7896

Issue Date: 25/11/2022 **Valid Until:** 24/11/2024

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : T.R. Associates

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

T.R. ASSOCIATES LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

SURVEY NO. 272/3, ROYAL ENFIELD SHOWROOM LANE,S.G HIGHWAY, AHMEDABAD, GUJARAT, INDIA

in the field of

TESTING

Certificate Number: TC-7896

Issue Date: 25/11/2020 **Valid Until:** 24/11/2022

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : T.R. Associates

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

GUJARAT LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

F-16,17 MADHAVPURA MARKET, SHAHIBAUG, AHMEDABAD, GUJARAT, INDIA

in the field of

TESTING

Certificate Number: TC-5961

Issue Date: 12/03/2022 **Valid Until:** 11/03/2024

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : Gujarat Laboratory

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

2843 1094

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

IND RESEARCH & DEVELOPMENT HOUSE PVT. LTD.

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

C-10, II FLOOR, SECTOR 06, NOIDA, UTTAR PRADESH, INDIA

in the field of

TESTING

Certificate Number: TC-5912

Issue Date: 30/06/2022 **Valid Until:** 29/06/2024

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : IND RESEARCH & DEVELOPMENT HOUSE PVT. LTD.

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

GO GREEN MECHANISMS PRIVATE LIMITED (TESTING LABORATORY)

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

DAYAL ESTATE, NATIONAL HIGHWAY NO.8, BAREJA,JETALPUR, AHMEDABAD, GUJARAT, INDIA

in the field of

TESTING

Certificate Number: TC-7073

Issue Date: 09/11/2022 **Valid Until:** 08/11/2024

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity: Go Green Mechanisms Pvt Ltd

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

trassociates.in

A-401, S.G.Business Hub, Between Sola Bhagwat & Gota Over Bridge, Near Umiya Campus, S.G. Highway, Ahmedabad - 380060. Gujarat. | P : +91 98253 71099, +91 97241 49800 | E : adm.trassociates@gmail.com

OUR SERVICES : ENVIRONMENTAL CONSULTANT | ENVIRONMENTAL LABORATORY
EXPLOSIVE CONSULTANT | PROJECT CONSULTANT | CHARTERED ENGINEER

T. R. ASSOCIATES

UNDERTAKING

I, Mr. T. R. Patel, Proprietor of T. R. Associates, a QCI/NABET accredited consultant for Soda Ash Industry and Thermal Power Plant, here confirm that we have checked/verified the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) report for the "Greenfield Chemical Complex" of GHCL Ltd., at Bada, Kutch.

We have verified the EIA/EMP report, and prepared an addendum report describing our findings and observations. This report conveys our satisfaction with the data presented in the EIA/EMP report.

Furthermore, it is important to note that a fresh baseline study has been conducted by T. R. Associates Laboratory, a NABL accredited laboratory. This study was conducted during the winter season from December 2022 to February 2023. The results of this baseline study have been incorporated into the EIA Addendum report.

Date: 30.01.2024

Place: Ahmedabad

Mr. T. R. Patel,

Proprietor,

T. R. Associates

-TRUE COPY-

ANNEXURE R/14

GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(IA DIVISION-INDUSTRY-3 SECTOR)
*****

Dated: 12.2.2024

MINUTES OF THE 74th EXPERT APPRAISAL COMMITTEE (INDUSTRY-3 SECTOR) MEETING HELD ON 6th FEBRUARY, 2024

Venue: Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003 through Video Conferencing (VC)

Time: 10:30 AM onwards

(i) Opening Remarks by the Chairman

Prof. (Dr.) A.B. Pandit, Chairman welcomed the Committee members and opened the EAC meeting for further deliberations.

(ii) Details of Agenda items by the Member Secretary

The Member Secretary apprised the Committee that proposal of M/s Transworld Furtichem Pvt. Ltd [proposal no. IA/MH/IND3/437576/2023] was considered in the 69th EAC meeting of Industry-3 Sector held during 16-17 November, 2023 through Video Conferencing (VC) and the Committee noted that Dhatav Village is part of ESAs of Western Ghats as per the Draft Notification published vide S.O. 3072(E) dated 6.7.2022 and also desired to obtain views/comments of ESZ division. Accordingly, ESZ Division has provided the comments regarding the applicability of the Western Ghats ESA regulations for the instant industry. As far the applicability of the Western Ghats ESA regulations for the instant industry is concerned it is mentioned that as of now Dhatav village is part of Western Ghats ESA and is listed in draft notification. Therefore, all the provisions [prohibited/regulated activities; as stated in para '3' (1) & (2)], as contained in draft notification on Western Ghats ESA dated 6.7.2022 are applicable to the projects. It may be mentioned that while the draft Western Ghats ESA notification re-published on 06.07.2022 is under finalization, the directions issued by this Ministry vide its O.M No. 1-4/2012-RE(Pt), dated 13.11.2013 and its amendment issued vide O.M No. 1/9/2018-ESZ, dated 03.12.2018 are in force and valid on date. Therefore, the said case can not be considered by the EAC (Industry -3).

The Member Secretary then apprised the Committee about the details of Agenda items to be discussed during this Expert Appraisal Committee (EAC) meeting.

(iii) Confirmation of Minutes of the 73rd EAC Meeting held on 16th-17th January, 2024.

in manufacturing of 3 inorganic chemicals - Sodium Chloride, Ammonium Chloride & Potassium Chloride. Since production of inorganic compounds are not in purview of EIA Notification 2006, Environment Clearance was not required for production of existing inorganic products. The Committee noted that PP has not submitted the Certified compliance report issued by MPCB for the existing CTO. Accordingly, the committee suggested that PP shall submit the CCR highlighting compliance of each condition in the letter head of RO, MPCB.

- PP presented that industrial effluent will be segregated into Low TDS/COD and High TDS/COD effluent streams. Low TDS/COD effluent stream will be treated in the ETP comprising primary , secondary and tertiary treatment including RO. High TDS/COD will be treated through solvent stripper followed by Evaporator. Sewage will be treated in the STP. No effluent/treated water will be discharged outside the premises and ZLD will be followed. The Committee suggested to submit the same in writing.

Accordingly, proposal was deferred for want of above additional information. Above all additional information shall be submitted online to the PARIVESH portal for further consideration by EAC.

Agenda No.74. 2

Proposed project to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity, 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka - Mandvi, District - Kutch in the Gujarat state by "Greenfield Chemical Complex" of GHCL Ltd- Reconsideration of Environmental Clearance

[Proposal no: IA/GJ/IND3/408164/2022, File No. IA-J-11011/293/2021-IA-II(I)]

1. The proposal is for Environmental Clearance to the Proposed project to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity, 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka - Mandvi, District - Kutch in the Gujarat state by "Greenfield Chemical Complex" of GHCL Ltd

2. The project/activity is covered under Category 'A' of Item 4 (e) soda ash industry of Schedule of Environment Impact Assessment (EIA) Notification, 2006 (as amended) and requires appraisal at Central Level by the Expert Appraisal Committee (EAC) as the project is located outside the notified industrial area.

3. The ToR was issued by the Ministry, vide letter no. IA-J-11011/293/2021-IA-II(I) dated 10th August, 2021. The PP applied for the Environment Clearance in the Common Application Form and submitted the EIA/EMP Report and other documents. The PP in the CAF reported that it is a **Fresh**

EC case. The proposal was placed in 72nd EAC Meeting held on 2nd January, 2024 in which EAC deferred the proposal now the proposal is placed in this 74th EAC meeting held on 6th Februay,2024 where project was wherein the PP and an accredited Consultant, M/s. T. R Associates [NABET accreditation till **NABET Accreditation Number: NABET/EIA/2326/RA 0293 valid till 8th April, 2026**], made a detailed presentation on the salient features of the project and informed the following:

4. The PP reported that the Total land area is **5463200 m^2;** no additional land will be used **for proposed project** and no R& R is involved in the Project. The details of various products are as follows:

Sr. No.	**Name of the Product**	**Production Capacity (MT/Month)**	**CAS Number**	**End use**
1	Light Soda Ash	11,00,000 TPA	497-19-8	Manufacturing of glass, usage in chemical industry, paper and detergent manufacturing, and food industry
2	Dense Soda Ash	5,00,000 TPA	497-19-8	
3	Sodium bicarbonate	2,00,000 TPA	144-55-8	
Captive Co-generation Power plant Steam (CFBC boilers)			120 MW	
Emergency DG Set			5 MVA	
Note- The production capacities are planned in phased manner and for Phase 1 production capacity for LSA: 5,50,000 TPA, Dense Soda Ash: 2,50,000 TPA, SBC: 1,00,000 TPA and 60 MW for Captive Co-generation Power plant.				

5. The PP reported that there is no violation case as per the Notification No. S.O.804(E) dated 14.03.2017 and no direction is issued under E(P) Act/Air Act/Water Act.

6. The PP reported that there is no National Parks, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. **Marine National Park and Sanctuary, Jamnagar are located at 75 km aerial distance in South direction and Narayan Sarovar Sanctuary is located at more than 100 km aerial distance in North-West directions**. Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Gugal Schedule-I species were found in the study area for which conservation plan has been preapred and submitted to PCCF and Chief wildlife warden dated 9.11.2023.

7. The PP reported that the diversion of 0.9689 ha unclass forest for laying part of sea water intake and effluent disposal pipeline and passage for related construction equipment movement in Kachchh has been obtained vide ketter dated 18. 7.2023.

8. The PP reported the Unit has received the Final recommendation letter from GZMA vide file no ENV/ 10/ 2021/184/ T- cell dated 26.12.2023. CRZ details are as:

Activities	**Zone**
Construction of process plant and utilities etc.	Outside CRZ area
Effluent collection	Outside CRZ area
Seawater Intake system i.e. sump and pump house	CRZ III
Intake Pipeline	CRZ IA, CRZ IB and CRZ IV
Outfall Pipeline	CRZ IA, CRZ IB and CRZ IV

Laying of Seawater Intake and effluent disposal underground pipeline through tunnel from unclassified Forest area, Sand dune area, intertidal area outside project boundary.

9. The PP reported that Ambient air quality monitoring was carried out at 10 locations during December 2019 – February 2020. The baseline data indicates the ranges of concentrations as: PM_{10} (19 µg/m^3 to 53 µg/m^3), $PM_{2.5}$ (8 µg/ m3 to 17 µg/ m3), SO_2 (1 µg/m^3 to 14 µg/m^3), NOx (5 µg/m^3 to 16 µg/m^3), Ammonia (6 µg/m^3 to 19 µg/m^3), Ozone (2 µg/m^3 to 8 µg/m^3), Carbon Monoxide (0.09 mg/m^3 to 0.21 mg/m^3), Hydrocarbons [Methane hydrocarbons (0.23 µg/m^3 to 1.27 µg/m^3) and Non-Methane hydrocarbons (0.11 µg/m^3 to 0.19 µg/m^3)], Lead (Pb) (0.05 µg/m^3 to 0.27 µg/m^3), Arsenic (As) (0.02 ng/m^3 to 0.11 ng/m^3), Nickel (Ni) (0.11 ng/m^3 to 0.18 ng/m^3), Benzo(α)pyrene(B[a]P) (ND to 0.03 ng/m^3) and Benzene (ND to 0.16 µg/m^3). AAQ modeling study for point source emissions indicates that the maximum incremental GLCs after the proposed project would be 3.05 µg/m^3 in case of Lignite, Coal and Petcoke with respect to PM_{10}, 10.98 µg/m^3 in case of Lignite, 2.55 µg/m^3 in case of Coal and 13.26 µg/m^3 in case of Petcoke with respect to SO_2 and 11.37 µg/m^3 in case of lignite, 7.3 µg/m^3 in case of coal and 5.62 µg/m^3 in case of Petcoke with respect to NO_x. The resultant concentrations are within the National Ambient Air Quality Standards (NAAQS).

10. The PP reported that the Total water requirement for project will be 15,20,060 m^3/day in case of Dry Lime process or 13,63,878 m^3/day in case of Wet Lime process which will be met from Sea water. Total Effluent of 15,88,570 m^3/day (Domestic - 160 m^3/day + Industrial – 15,88,410 m^3/day) in case of Dry Lime process or 14,48,818 m^3/day (Domestic - 160 m^3/day + Industrial – 14,48,658

m^3/day) in case of Wet Lime process. The Process effluent generated i.e. from distiller waste, brine purification reject, RO/DM rejects will be disposed off along with once through return cooling water/fresh seawater into Arabian Sea as per recommendation of NIO. The characteristics of the discharge water are within the norms prescribed by CPCB.

11. The PP reported that the Power requirement for proposed project will be 120 MW and will be met from Captive Co-generation Power plant. D. G. Set (5 MVA X 1) [Fuel: HSD (60 KL)] shall be provided and used only in case of power failure. Stack (30 meter) and Retrofit shall provide as per CPCB norms to the DG sets. Industry will provide six Steam Boiler (150 TPH) for captive power plant, six lime kilns and D G sets

12. **Details of process emissions generation and its management:**

SR.NO.	**Stack attached to**	**Capacity**	**Height of the stack (m)**	**Fuel & its Consumption**	**Expected Pollutant**	**APC System**	**GPCB Limit**
1	CPP with flue gas desulphurization CFBC Boiler (6 Nos.)	150 TPH	130 m	Imported Coal/Lignite/ Pet coke (Imported Coal: 13,14,000 TPA, Lignite :19,71,000 TPA, Pet coke: 9,12,500 TPA)	SPM SO_2 NO_2 Hg	Individual ESP with each Boiler	PM ≤ 30 mg/Nm^3 SO_2 ≤ 100 mg/Nm^3 NO_2 ≤ 100 mg/Nm^3 Hg ≤ 0.03 mg/Nm^3
2	D G Set (2/3 Nos.)	5 MVA	30 m	HSD (60 KL)	HC CO PM NO_x	Retrofitting	NOx 710 ppmv NMHC 100 mg/Nm3

							PM 75 mg/Nm3 CO 150 mg/Nm3
3	Lime Kiln 1		68 m	Coke or Briquette or Anthracite (Coke - 1,30,000 TPA, Briquette- 1,55,000 TPA, Anthracite - 1,10,000 TPA)	SPM SO_2 NO_2	Scrubber and Dust Collector system	SPM ≤ 150 mg/Nm^3 SO_2 ≤ 100 ppm NO_2 ≤ 50 ppm
4	Lime Kiln 2		68 m			Scrubber and Dust Collector system	
5	Lime Kiln 3		68 m			Scrubber and Dust Collector system	
6	Lime Kiln 4		68 m			Scrubber and Dust Collector system	
7	Lime Kiln 5		68 m			Scrubber and Dust Collector system	
8	Lime Kiln 6		68 m			Scrubber and Dust Collector system	

SR.NO.	**Stack attached to**	**Height of the stack (m)**	**Expected Pollutant**	**APC System**
1	Ammonia Recovery system	42 m	Ammonia	Water scrubber

2	Lime grinding system / Slaker	65 / 20 m	PM / Water vapor	Bag filter / Adequate stack height
3	Calciner unit	37 m	PM	Scrubber, Bag filter
4	Densification	43 m	PM	Scrubber
5	Sodium Bi-Carbonate Unit	30 m	PM	Bag filter
6	Lime Kiln	Closed system	PM	Scrubber and Wet ESP

13. **Details of Solid Waste/ Hazardous Waste Generation and Its Management**:

Sr. No.	Type of Waste	Mode of Disposal
1	ETP Sludge from treatment of effluent generated from captive power plant & RO/DM Plant	The effluent from power plant, RO/DM plant will require only neutralization & it will have negligible BOD/COD. Sludge will be disposed off in nearby landfill site.
2	Used Oil / Used Cotton	It will be sold to MoEF&CC/CPCB registered recyclers only. Approx. 12 KL
3	Discarded Drums	It will be sold to approve traders. Approx. 5 MT/yr
	Discarded Bags	It will be sent back to supplier for reuse.
4	Spent Ion exchange resin	To be sold to authorized recyclers or will be incinerated at MoEF&CC/CPCB approved TSDF for which plant will obtain membership. Approx. 3000 l/yr
5	Lead acid Batteries	It will be sold to authorized agency through auction.
6	Ash (Fly ash & Bottom Ash) from Boiler	The Boiler ash will be used for cement Manufacturing/ Brick Manufacturing. Approx. 750 TPD
7	Limestone rejects	It can be used in Boiler for desulphurization and as a sweetener in cement industry, road making, pavement etc. 5% of lime stone consumption.

8	Settled sludge	Since settled sludge, non-hazardous in nature, it is proposed to be disposed off in Nearby landfill site.

14. The Budget earmarked towards the Environmental Management Plan (EMP) is ₹ **205.07 crore** (capital) and the Recurring Cost (operation and maintenance) will be about ₹ **6.98 Crore** per Annum. Industry proposes to allocate ₹ **18.04 Crore** towards CER.

15. The PP reported that Public Hearing for the Proposed project has been conducted by the State Pollution Control Board at the project site on **17.10.2022**. The main issues raised during the public hearing are related to the air pollutants, water pollutants, schedule 1 conservation plan, fishing, traffic etc.

16. The PP proposed to set up an Environment Management Cell (EMC) by engaging Environment officals for the functioning of EMC.

17. The PP submitted the Disaster and Onsite and Offsite Emergency Plans in the EIA report.

18. The estimated total project cost is **Rs 3550 Crores**. Total Employment will be **1200** persons as direct.

19. Intake pipeline and outfall pipeline fall in CRZ 1A, 1B and IV area as per demarcation. It was reported that construction of process plant and utilities fall outside the CRZ area. SCZMA recommendation has been obtained for Laying of Seawater Intake and effluent disposal underground pipeline through tunnel from unclassified Forest area, Sand dune area, intertidal area outside project boundary.

20. The Public Hearing earlier was scheduled to be held on 16-04-2022 at 11:00 Hrs, Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch, Public hearing was then time being postponed due to unavoidable circumstances. After that public hearing was completed on **17-10-2022 at 11.00 Hrs.** Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch, Gujarat. Which was presided over by Shri Chetan Mishan(GAS), Sub Divisonal Magistrate & Deputy Collector, Mundra- Kutch. Public hearing Details as given below:

S.No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
1	CSR–Fodder	4	Steps to be taken for cattle Care about Maldhari community Security regarding fodder supply for livestock.	Fodder will be provided as well as provision for veterinary doctor will be carried out by GHCL foundation under CSR activity.	• Activities for fodder supply will be carried out under CSR and CER activities for strengthening the bond between the project authorities and the local population. (refer Ch-8 and Table 10.4 in Ch-10). Fodder field will be developed on the Government/allocate land to nearby villages. • Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR activities for communities. • During year 2020-2021, GHCL foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting	• As per MoEF&CC Office Memorandum F.NO. 22-67/2017-IA III, MoEF&CC, New Delhi, dated on 1st May 2018 GHCL Ltd has earmarked 0.5 % of capital investment (appro. Rs. 18.04 crore), towards the Corporate Environment Responsibility in 5 years • GHCL Ltd will spend approx. **4.35 crore*** towards Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages as per requirement under CER activities (*value may defer as per actual requirement)	5 years	GHCL Limited
2	Employment	5	For employment of local villagers Number of employment opportunities to be Priority must be given to nearby 10 villages Regarding priority to nearby villages	Information on employment opportunities has given by Project Proponent that there are different types of employment opportunities in the two phase of the projects i.e. construction	• The proposed project has a potential for employment of skilled, semiskilled and unskilled employees during	• GHCL Ltd will spend approx. 2.25 crore towards Promoting activities for skill building to improve	During construction and Operation phase	GHCL Limited

S.No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			for labor work Regarding employment for local communities.	phase and operational phase of the project. GHCL will strive to provide these employment opportunities to the local people, for which work will be done for their skill development and employment opportunities will be provided to the local people. As per requirement, training will be given to local people in coordination with HR department. Priority will be given for employment of local people. In nearby villages a group of women can be formed so that they can work in Gruhudhyogs (Home- based business). M/s. GHCL shall provide employment to women as per their skills and qualification.	operational phase. The plant will create direct employment in phased manner for about 1200 (operational phase) skilled as well as semi-skilled staff and indirectly large number ofunskilled manpower will be engaged for the project. For Employment, local people will get first priority as per suitability and requirement. People will also get employed by the contractors for various project related activities. (Refer Ch-8 of EIA report) • GHCL foundation will carry out skill development Programme for local youth to improve their employment opportunities, women empowerment under CSR and CER activities.	employment opportunities and women empowerment in nearby villages under CER activities.		
3	CSR-Health	1	Regarding health facilities under CSR activities	Will provide mobile health van facility and upgradation of existing healthcare infrastructure	• Industry will provide Mobile Health Care, Health Camps, and Specialized Check Up Camps in nearby villages. Necessary support and help will be extended for advanced diagnosis and treatment wherever identified, Free medical health checkup under CSR and CER activities.(Refer Ch-8 of EIA report). We have already initiated mobile health van facility for nearby affected villages of project site.	• GHCL Ltd will spend approx.. 1.12 crore towards Infrastructure development Such as primary healthcare units and the fulfilment of the basic amenities in PHCs including mobile medical van and Provide Bala-Rasayana to Malnutrition Children in Aanganwadi and PHC of nearby Villages under CER activities. • GHCL Foundation will spend approx..	5 years	GHCL Limited
4	CSR-Education	3	Regarding scholarship under CSR activity Regarding skill development of youth and improvement of	Will build school in future as per requirement and will also upgrade the existing school infrastructure and will carry out	• Unit will be directed at two levels viz. school and skill building to improve employment opportunities. At		5 years	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Conditions To provide educational facilities	skill development activities	school level we intend to promote quality of education and learnability, develop infrastructure of Government schools, provide vocational training as per the requirement under CSR and CER activities. • GHCL foundation will support local government and NGO to make that program more effective. • GHCL foundation will carry out skill development Programme for local youth to improve their employment opportunities, women empowerment under CSR and CER activities. • During year 2020-2021, GHCL Foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation, Animal husbandry, health care, SHG, Infrastructure development etc.	towards Infrastructure development for quality of education, which will ultimately upgrade schools in nearby villages under CER activities.		
5	Air Pollutants (SOx, NOx, Dust)	6	Height of chimney to be installed Levels of Sox and NOx Regarding acid rain cause by Sox Emission of PM during transportation and Emission of heavy metal such as	For minimizing Air Pollution, requisite height of the stacks will be provided as per the NAAQS norms. Besides this, Modern technology equipment's like Dust collector, Electrostatic Precipitator, Scrubber will	• The best available technology-based pollution prevention and control shall used to meet the regulatory standards and these pollution control systems will be commissioned before	• Air pollution • Capital cost would include air pollution control devices like ESPs, Scrubbers, Dust extraction	During operation phase	GHCL Limited

S.No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			mercury. Regarding once through cooling for 120 MW. Regarding linkage of fuel and how they are going to use it	installed. As a result, the pollution level will be within standard limits. GHCL will continue to support development of green belt in the surrounding villages through various agencies including GHCL Foundation (AF). GHCL shall endorses AF tree plantation movement of planting trees in entire Mandvi Taluka and 50,000 trees that mentioned, GHCL shall surely nurture those plants for five years.	commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the operational units, so that failure of the control system shall shut down the respective operational unit. • High efficiency ESPs shall be provided in the flue gas path of the CFBC boilers for control of particulate matter. • Finely ground limestone will be added to the boiler combustion zone • together with coal/lignite to arrest the SO2 formed during combustion. • Lime stone dozing system to the furnace to be designed to achieve higher than 90% capture of SO2. Monitoring system(CEMS) of air pollutants SO2, NOx, NH3, PM10 and PM2.5 will be implemented. • So, the expected pollutants will be well within standard norms. • The air quality monitoring will be carried out on regular basis by approved agencies by CPCB/GSPCB. (refer Ch-6 and Ch-10 of EIA report) • GHCL will implement greenbelt /plantation program to ameliorate the pollutants and improve the aesthetics and ambient air quality. (refer Ch-10 of EIA report) • There is negligible cooling water requirement for power generation. There is no any alternative effective system is available for soda ash plant.	Stacks, Dry Fog system, Wind screen etc- 89.28 crore • recurring cost would include operation and maintenance of pollution control devices- 1.50 crore • **Environmental monitoring Programme** capital cost include OCEMS, online weather station etc- 3.4 crore • Recurring cost – 0.95 crore • Greenbelt • Capital Cost- 20 Crore • Recurring Cost- 0.5 crore		

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					• There is no readily available infrastructure for transportation of fuel i.e. rail or water way. So, we have to transport through road. Traffic study are shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. In future, any alternative option available will explore. • GHCL Foundation will also promoting plantation activities in nearby villages under CSR and CER activities			
6	Water pollutants (BOD,COD,Ammonia, Mercury, Sea Weed, Mangroves)	7	Regarding water related question by Koli society Regarding decrease in number of phytoplanktons and disruption of food chain Regarding temperature and presence of ammonia in waste water Regarding presence of mangroves Regarding setup of tunnel for intake of sea water, seismic zone in which company falls, liquification of land due to heat Regarding discharge of effluents into sea containing ammonia and high temperature and death of fishes at Sutrapada plant Regarding quality of effluent in terms of BOD and COD	Effluent will be highly alkaline so it will be mixed with HCL and then it will be disposed off in sea. Design of structure will have done according to seismic zone V. In soda ash industry impact of ammonia is very low.	• Industry will provide adequate effluent management and monitoring system for disposal of treated water • Proper seawater intake and treated effluent disposal (ensure maximum dilution) shall be done as per recommendation Marine EIA report. • The water monitoring results of (surface and groundwater and marine) should be carefully evaluated to identify significant changes, if any, adverse change from the baseline accordingly, corrective measures will be taken to ensure the sustenance of water quality. However, there is no ground water pollution is envisage in such soda ash plant, • The ammonia concentration in treated waste water well	• Capital cost would include cost of ETP, STP etc- 14 crore • recurring cost would include operation and maintenance of pollution control	During operation phase	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					within the limit specified by CPCB for soda ash industry. • There is no such fish kill cases due to treated effluent in existing plant. There are independent studies available which indicates there is no significant adverse impact on marine environment but there will be positive impact on environment. • During studies, there is no such mangroves identified in sea water intake and outfall line area. • Design of pipeline/tunnel will be done according to seismic zone V. In case of catastrophic failure/ liquification on land, there are no chances of flooding as water transport through gravity.			
7	Marine Life	1	Effect on marine life due to proposed project	No adverse impact on fish or marine animals and sea weed observed.	• Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. The effluent release scheme can then be adequately modified to ascertain necessary dilution, if required. The efficiency of the diffuser must be checked periodically and if necessary, it should be cleaned to revert back to the dilution ascertained through initial tracer studies. • There are independent studies available which indicates there is no significant adverse	• A provision of Rs. 1 crore to be earmarked for the biodiversity management plan to be implemented in the project area during construction phase and operation phase. • For periodic monitoring of the marine area environment during project • construction phase, a provision of Rs. 0.5 crore to earmarked. • For operation phase, Rs. 0.3 crore per year to be kept provision	During constructio n and Operation phase	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					impact on environment but there will be positive impact on environment. • Design of pipeline/tunnel will be done according to seismic zone V. In case of catastrophic failure/ liquification on land, there are no chances of flooding as water transport through gravity.			
8	Health & Hygiene(Ammonia Leakge)	2	Skin diseases due to Soda Ash Regarding the leakage of ammonia.	GHCL will take care of any such issues related to Health of local peoples and workers. All the necessary measures for handling of chemicals will be implemented to reduce its impact on health of peoples. This information is also provided in the EIA report. All the pockets will have leak detection and repair system technology. Moreover, periodical maintenance will also be carried out. GHCL will ensure that there will be no leakage and therefore, there will not be occupational health issues for workers or villagers working in the plant. Moreover, GHCL	• Ammonia tanks should have latest instrumentation provision for pressure indication, temperature indication and level indication. The provision of instrumentation should be within 100 percent redundancy. Continues recording of major parameters pertaining to the storages shall be maintained in the control room. • Unit will provide all the safety measure for ammonia storage	• Capital cost would include cost of OHS center, PPEs, fire & safety instruments, automation system for ammonia storage – 3.4 crore • Recurring cost would include maintenance charges and training, audit & health check-up etc.- 0.35	During operation phase	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					commissioned before commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the operational units, so that failure of the control system shall shut down the respective operational unit. There is no significant impact observed in the existing soda ash plants in Gujarat.. • There are rare possibilities of ammonia leakage			
9	CSR - Farmers	3	Facilities to be provided How hygenic the plant will How hygenic will be bada plant and what facility will be provided to the farmer.	GHCL Foundation is already providing subsidy for drip irrigation and GHCL will also consider to support this scheme further out of the CSR funds proposed for this project. To help agriculture, GHCL will help farmers as part of our CSR activity in consultation with villagers. The details and type of developmental work will be decided in consultation with villagers. GHCL foundation has been working for farmers through its different schemes like ground water recharge, water harvesting	• Industry will Promote environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of high-quality seeds/manure, efficient irrigation solutions, etc. under CSR and CER activities	• GHCL Ltd will spend approx.. 3.00 crore towards Promoting environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity	5 years	GHCL Limited
10	EIA Report & PH	14	EIA report is not correct	The terrestrial EIA report	• It is requested to note that as			GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
	advertisement		Regarding the alternative of site modhwa village. Regarding the NIO accreditation to prepare marine EIA report Regarding ToR granted and Study carried out prior of ToR granted. Regarding the advertisement of the PH Regarding NABET accreditation of consultant organization Regarding Marine EIA Regarding NEERI who has prepared EIA report Regarding the correction in EIA report Regarding the monitoring data collection Regarding accreditation certificate of additional studies for ecology.	prepared by CSIR NEERI and Marine EIA report is prepared by NIO, Mumbai	per OM number J-17011/8/92-IA-III dated 8th August, 2019, there are 7 institutes/agencies authorized for preparation of CZMPS in consonance with the provision of CRZ notification, 2019 vide GSR 37(e) dated 18/01/2019. IRS anna university Chennai has prepared the CRZ map for GHCL LTD. CSIR - NIO is Expert hired to carryout the Marine EIA study. • EIA report has been prepared by CSIR-NEERI, which is reputed governmental body and QCI NABET accredited consultant.			
11	Vipassana	3	Project site is near Vipassana meditation center The meditation center will be disturbed due to industry. Ammonia used in the industry. Related to presence of Vipassana center and other religious places in 15km radius of project site	--	• Environmental Management Plan envisages the plans for the proper implementation of mitigation measures to reduce the adverse impacts. • The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment.	• Cost of Environment management plant including various installations for Air	--	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					ash manufacturing industry. • It is reported in CSIR NEERI report that there are no significant impact expected on man-made sensitive installations and habitations. On basis of study of present environment condition near project area and impact prediction and control measures proposed by GHCL Ltd. The proposed project will not have any significant negative impact on environment. Company operations are limited to the plant boundary and no negative impacts on Vipassana Centre are anticipated. The company will have robust peripheral Green Belt in	• Recurring Cost- 0.5 crore		
12	CSR - Animal Husbandry	3	Regarding arrangements for Animal Regarding distribut Regarding number of cattle present in the area	GHCL Foundation will support nearby community by providing education and livelihood support to make them self – reliant.	• Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR activities. • Unit will also promote development Initiatives for Fishing Communities such as Creation of infrastructure like ice plants, cold storages as well as provide operational inputs such as fishing boats, nets and engines • We have already provided veterinary doctor for	• GHCL Ltd will spend approx.. 4.35 crore towards Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides	5 years	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
13	Site Selection	2	Regarding the alternative of site modhwa village. Regarding showing presence of marshy land near coastline	--	During the site selection, the alternative sites considered for setting-up of the proposed chemical complex project are given below: : Site 1 – Village Pingleswar, Taluka – Abdasa, Dist. Kutch Site 2 – Village Suthri, Taluka – Abdasa, Dist. Kutch Site 3 – Village Bambhdai, Taluka – Mandvi, Dist. Kutch Site 4 – Village Bada, Taluka – Mandvi, Dist. Kutch Site 5 – Village Modhva, Taluka Mandvi, Dist. Kutch The site at village bada is considered favorable based on the environmental and logistic advantages over other four sites. Justification	--	--	GHCL Limited
14	Sand Dunes	2	Concern of presence of sand dunes at bada coast Regarding digging of sand dunes for preparation of tunnels for water intake	--	• There is no disturbance to existing sand dunes. • Tunnelling work (much below ground level) for laying pipeline through sand dunes will be done by adopting proven construction methodology like micro tunnelling. The detailed Studies on sand dune mapping and morphological changes near the project site was carried by National Institute of	--	--	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
15	Turtle	3	Regarding presence of turtles on the coastline of bada Regarding information on endangered species not mentioned in EIA report Regarding hatching and presence of sea turtles	--	• Study on Status Survey and Conservation Plan for Sea Turtles along Mandvi Taluka, Bhuj, Gujarat by **Zoological Survey of India, Kolkata (April,2019)** is attached with EIA report. • ZSI study report mention that they did not any encounter any sea turtle and fresh/old nests or crawl marks of turtles on the beach. Since many of the factor for selection of a suitable nesting site are not conducive. • As per additional Ecological and Biodiversity study, suggests that the coast near the proposed project site may not be	• Contribution to Forest department for Sea Turtle Conservation Activities- 0.20 crore	10 years	GHCL Ltd
16	Schedule 1 species	4	Regarding presence of greater numbers of	--	• Details of schedule -1	• the proposed	10 years	GHCL Ltd

S. No.	Issue related to	Nos. Issues	Concern in PH	G HCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
	Sandha and indian Monitor Lizard)		stated in report Presence of reptiles and amphibians not reported Related to study of presence of Indian Monitor Lizard in study area Regarding presence of gugal trees,		already incorporated in EIA report. • GHCL shall make financial allocations for taking up wildlife mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • GHCL Ltd have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake	Allocation for conservation of Schedule 1 species for 10 years is 1.25 crore		
17	Conservation Plan	2	Regarding conservation plan for Schedule 1 species Concern regarding green sea turtles and conservation plan for them	--	• GHCL shall make financial allocations for taking up wildlife • mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • The unit have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle,	• the proposed budget allocation for conservation of Schedule 1 species for 10 years is 1.25 crore	10 Years	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					department of			
18	Form 1(Water Bodies, Temples, Schedule 1 Species)	5	Regarding presence of waterbody not shown in form-1 Regarding religious places and lakes not mentioned in PFR Waterbody not mentioned in form-1 Data given in form-1 and EIA are different Waterbody not mentioned in form-1	--	• Environmental settings are given in Chapter-1 and Chapter-5 of EIA report. Approximate distance of water bodies, temples etc are given in EIA report. • Through drainage studies of the area, it was observed that there is one stream of 1st order entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, will be diverted to nearby passing Vengadi River in the west. • There are also pond inside the premises. It is	• -Cost of drainage network of surface runoff, rainwater collection pond and rain water harvesting system – 53 crores (included in EMP)	--	GHCL LTD
19	Govt. Land	3	Regarding type of land to be procured by the industry Regarding status of government land to be procured Providing data for proving gauchar land	--	• There is no gauchar land within proposed project site. M/s GHCL has applied to Industries Commissioner and District Collector for allotment of aforesaid land. Industries Commissioner has granted In Principle approval for Bonafied Industrial Purpose. District Collector has initiated actions for	--	--	GHCL LTD
20	Fishing	8	Regarding details of Pagadia fisherman not mentioned and Marine EIA is misinterpreted	--	• Proper seawater intake and treated effluent disposal (ensure maximum	• A provision of Rs. 1 crore to be earmarked for the	During construction and	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Regarding disturbance to fishes due to presence of pipeline Regarding status of fishing near bada and Mandvi Related to number of fisherman not incorporated in study -- Related to presence of dead fishes not reported in study, fishing carried out for commercial purpose Regarding presence of fisherman in study area		Marine EIA report prepared by NIO Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. Details of Fishery and fishermen including their family and population are given in Chapter-3 of marine EIA report. Other than construction phase, there will be no any impact on pagadiya fisher men. As shore line will remain undisturbed. It is mentioned in marine EIA report that no large-scale commercial fishing operation prevail in the study area except for minor shore based and Gill net operations. There are independent studies available which indicates there is no significant adverse impact on environment but there will be positive impact on environment. Unit will also promote development Initiatives for Fishing Communities including pagadiya under CER and CSR activities	implemented in the project area during construction phase and operation phase. • For periodic monitoring of the marine area environment during project • construction phase, a provision of Rs. 0.5 crore to earmarked. • For operation phase, Rs. 0.3 crore per year to be kept provision for • the monitoring. • GHCL Ltd will spend approx.. 0.75 crore towards Development Initiatives for Fishing Communities	Operation phase	
21	Water Body (check dams)	2	Related to presence of seasonal river which passes near bada village and presence of dam over it	--	Through drainage studies of the area, it was observed that there is one stream of 1st order	• Cost of drainage network of surface	During construction and	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Related to distance of river from project site		entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, may be diverted to nearby passing Vengadi River in the west, which has two check dams, one for salinity ingress check and on upstream side for storing fresh water. This will not cause any adverse impact on the downstream. For channelizing the monsoon run off from the area adjacent to plant it is required to construct peripheral drain along plant boundary so that flooding is avoided and run off find its way to the natural slope towards Arabian Sea. So, the present hydrological setting of the area will remain unaffected. So, the present hydrological setting of the area will remain unaffected. The additional water enter into the vengadi river through drainage will not impact on check dam. As any additional water above the river and check dam shall overflow to the Arabian sea.	pond and rain water harvesting system – 53 crores (included in EMP)	Operation phase	
22	Traffic (RMH, Heavy Trucks, Road Usage)	4	Regarding number of trucks passing due to project for raw Related to traffic study not mentioned in ToR, impact not carried out Concern regarding public roads Regarding number of trucks passing	--	Traffic study are shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. We will use existing road network as no other transportation i.e. rail/water ways are available. We have carried out calculation on	--		GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					Traffic study (Level of Service) and added on Form Part-C.			
23	CSR General	1	Regarding past data of CSR	GHCL has proposed CSR budget in the EIA report which will be utilized based on need identification and village development meetings. CSR will be implemented with CSR implementing agencies including GHCL Foundation is working in following area. 1. Agro-livelihood and animal husbandry, 2. Education and skill development, 3. Health, water, and sanitation.	• GHCL's commitment towards the development of weaker sections of society has been a continuous initiative for more than two decades. Through its "GHCL Foundation Trust", GHCL has upgraded its CSR activities to cover a larger section of the society to provide support to the downtrodden, needy and marginalized citizens and also to create a social infrastructure for their sustenance. GHCL Foundation serves as the Corporate Social Responsibility arm of GHCL Limited and represents our commitment to the holistic development of our surrounding community. During year 2020-2021	--	--	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					Infrastructure d evelopment etc.			
			Regarding pollution to be caused by industry -- Regarding to dusting due to kiln and power plant,		• Environmental Management Plan envisages the plans for the proper implementation of mitigation measures to reduce the adverse	• Cost of Environment management plant including various installations for		GHCL Limited

24	Pollution and Environment General	4	Related to disposal of effluent water	Unit will follow all the rules and regulation with their subsequent amendments as directed by concerned authorities	impacts. • The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment	Air Pollution, Water Pollution, Noise Control, Greenbelt Development, Occupational Health and Safety and other related activities.- 205.07 crore	--	
25	Forest area	2	Related to distance of project site from forest area Details regarding families dependent on forest	There is no classified forest area.	• There is no forest land within the boundary of proposed project site. However, some part of the unclassed forest area located south of the project site outside boundary. Sea water intake and outfall pipeline will pass through underground micro tunnel in specific corridor to cross forest area. The permission from the Forest Department is	--	--	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					of 0.9689 Ha. of un-class forest			
26	Supporting for Industrial Development to GHCL LTD	--	For Employment For Infrastructure development in nearby village Social upliftment towards nearby villages Health facilities Women empower ment Skill	GHCL LTD team thanked for welcoming the industries	--	--	--	--
	Total	94						

21. The Proposal was considered in the 72nd **EAC Meeting held on 2.1.2024** wherein the EAC deferred the proposal for want of requisite information. Reply to the same was submitted by the PP vide letter dated 30.1.2024, which is as follows:

<table>
<tr><th>S. No.</th><th>Queries Raised by EAC</th><th>Reply by PP</th></tr>
<tr><td></td><td>Action plan for disposal of gypsum and fly ash generated from desulphursation plant</td><td>The Fly Ash and Gypsum generated from the Desulphurization plant is provided in the below table followed by the Action Plan for the Disposal of Fly Ash and Gypsum.
<table>
<tr><th>SR. NO.</th><th>FUEL</th><th>FUEL CONSUMPTION TPH</th><th>FLY ASH GENERATION, TPD</th><th>GYPSUM GENERATION, TPD</th><th>TOTAL GENERAT TPD</th></tr>
<tr><td>1</td><td>Coal</td><td>150</td><td>405.216</td><td>117.457</td><td>796.588</td></tr>
<tr><td>2</td><td>Lignite</td><td>225</td><td>765.828</td><td>880.924</td><td>2726.847</td></tr>
<tr><td>3</td><td>Pet Coke</td><td>104.17</td><td>10.675</td><td>741.519</td><td>1389.667</td></tr>
</table>

While utilization of Coal as fuel the percentage of Fly ash and Gypsum in the total Ash generated will be 50.87% and 14.74% respectively.
While utilization of Lignite as fuel the percentage of Fly ash and Gypsum in the total Ash generated will be 28.08% and 32.31 % respectively.
While utilization of Pet coke as fuel the percentage of Fly ash and Gypsum in the total Ash generated will be 0.77% and 53.36 % respectively.

➢ It is noted that gypsum and fly ash separation is not possible in the dry desulfurization system. However we assure that the unit will primarily use Coal and Lignite as fuel. Pet coke will only be utilized as a fuel alternative in the circumstances when Coal and Lignite are unavailable. Action Plan For The Disposal Of Fly Ash And Gypsum Letter From Cement Industry is submitted.</td></tr>
<tr><td></td><td>Action plan for management and disposal</td><td>PP reported that :
➢ Main source of $CaCl_2$ and $CaSO_4$ Contain wastewater will be from distillation process wastewater.</td></tr>
</table>

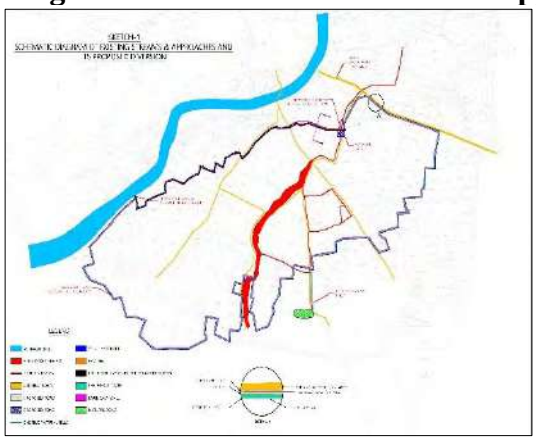
of $CaCl_2$ and $CaSO_4$.

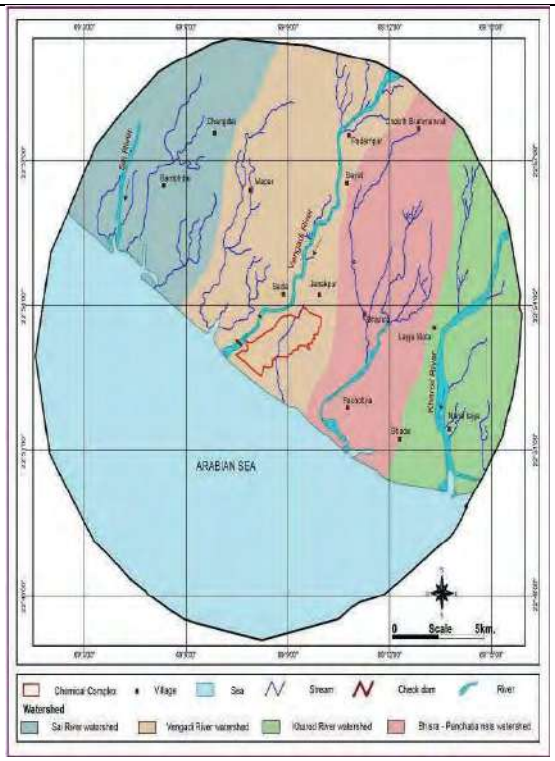
- The **concentration of $CaSO_4$ and $CaCl_2$** in the wastewater from Distillation unit will be **0.13 % and 11.35 %** respectively.
- The discharge of final effluent into the deep sea with an average **dilution of 30 to 40 times** will further **dilute the concentration of $CaSO_4$ and $CaCl_2$.**
- The concentration of **$CaSO_4$** in the final effluent will be reduced from **0.13 % to less than 0.07%** while the concentration of **$CaCl_2$** will be reduced from **11.35 % to less than 6.09%.**
- Other impurities in the final effluent will contain CaO, MgO, NaCl, $MgCl_2$, $CaCO_3$ and Silica etc.
- The characterization of the wastewater stream, suggests that the composite effluent discharged into the Arabian Sea will maintain the concentrations well within the CPCB norms.
- **As a result, it is anticipated that the effluent will have no adverse impact on the marine environment and the nearby terrestrial habitat.**

CHARACTERIZATION OF WASTEWATER STREAM

SR. NO.	**PARAMETERS**	**WASTEWATER STREAMS**						
		RO/DM PLANT REJECT	**BRINE PURIFICATION REJECT**	**DISTILLER WASTE**	**BOILER BLOWDOWN**	**ONCE THROUGH COOLING**	**FRESH SEA WATER FOR DILUTION**	**COMPOSITE EFFLUENT AT DISCHARGE POINT***
		EFFLUENT QUANTITY, m^3/day						
		97,160	2,550	27,000	120	8,07,000	5,14,678	14,48,508
1	pH	7.2	12	9.8	10.0	8.0	7.5	6.5- 9.0

		2	Temperature	30-35°C	30-35°C	95°C	90°C	30-35°C	30-35°C	Will not exceed 5°C above the ambient temperature of the receiving water body
		3	Suspended Solids	Nil	54,000 mg/l	45,430 mg/l	100 mg/l	Nil	Nil	<1000 mg/l
		4	Ammonical Nitrogen	Nil	Nil	40-45 mg/l	Nil	Nil	Nil	< 50 mg/l
		5	Oil & Grease	Nil	Nil	Nil	Nil	Nil	Nil	< 5.0 mg/l (Occasionally)

	Details of existing natural drains within the proposed project site as well as proposal for diversion if any. Details of measures to be taken to maintain the flow	➢ By conducting the drainage studies of the area, it is observed that there is a one stream of 1st order entering the plant area from north. ➢ Although, it has small catchment area, it is proposed that this stream, may be diverted to nearby passing Vengadi river in the west has two check dams, one for salinity ingress check and on upstream side for storing fresh water. ➢ It is proposed that this pond may be deepened by 2 metres so as to store entire annual surface runoff for ground water recharge and for plant use. ➢ With the proposed deepening, there will not be any possibility of any overflow in the plant. ➢ While the other two rivers will continue to flow as these are not being affected by the setting up of the plant. ➢ So, the present hydrological setting of the area will remain unaffected. ➢ Detailed Hydrogeology Assessment study report prepared by Hydro-Geosurvey Consultants Pvt. Ltd. , Jodhpur. Report is verified by **CSIR NEERI and T R Associates.** ➢ **Hydrogeological assessment Study is submitted which comprises of :** **Schematic arrangement for stream diversion and approach roads**  **DRAINAGE AND WATERSHED MAP OF BUFFER ZONE**



- Project Site is superimposed on the drainage and watershed map with red color boundary.
- Proposed project is fall under the Vengadi river Water shed.
- 1st order stream passing through the project site is demarcated in blue color.
- 1st order stream will be diverted into the Vengadi river followed by Arabian sea.

VENGADI WATERSHED

- Vengadi watershed within buffer zone covers area of **84.43 km^2** with gradient of about **2.20 m/km** towards Arabian sea.
- The catchment yield of Vengadi watershed is estimated as **4.40 mcm** taking average annual rain, which amounts to **434 mm.**
- Average value of Strange's run off percentage of the buffer area is calculated from Strange's monsoon rainfall-runoff curves considering the catchment area as good and the run off % for **catchments is found as 12%.**

CONSTRUCTION OF FLOOD DISCHARGE OF FOUR STREAMS IN BUFFER ZONE

The peak flood discharges of the stream have been calculated by Dicken's formula method:

Dicken's formula

Dicken's formula states that:

$QP = CA^{3/4}$

Where,

Q_P = High flood or peak discharge in cumec

A = Catchment area

C = A constant, taken c = 6 for the study area.

PEAK FLOOD DISCHARGE (QP) IN CUMECS

S. NO.	STREAM	TOTAL CATCHMENT AREA (KM^2)	DICKEN'S	LEAN PERIOD DISCHARGE (CUMEC)
1.	Sai river	194.89	312.96 cumecs	0cumec
2.	Vengadi river	160.80	270.93 cumecs	0cumec
3.	Bhisra-Panchatia nala	63.92	135.63 cumecs	0cumec
4.	Kharod river	329.52	464.04 cumecs	0cumec

The peak flood discharges of the stream have been calculated by Dicken's formula method:

Dicken's formula

Dicken's formula states that: **$QP = CA^{3/4}$**

Where,

Q_P = High flood or peak discharge in cumec

A = Catchment area = 0.12 km^2

C = A constant, taken c = 6 for the study area.

PEAK FLOOD DISCHARGE (Q_P) IN CUMEC	

S. NO.	CATCHMENT	DICKEN'S	LEAN PERIOD DISCHARGE (M^3/S)
1.	Plant stream	1.22 m^3/s	0 m^3/s

❖ **COST FOR NATURAL DRAIN DIVERSION**

- The cost incurred for the Drainage network and Nala diversion will be **44.60 Crores.**
- Cost is consider into the Environmental Management Plan cost.

<table>
<tr>
<td></td>
<td>Status of land acquisition including government and pvt. land as well as permission for landuse change for industrial purpose.</td>
<td>

The Status of land acquisition including Government as well as Private land along with permission for land use change for industrial purpose has been received from Industry Centre.
The type of land involved along with the area bifurcation into Government and private land.

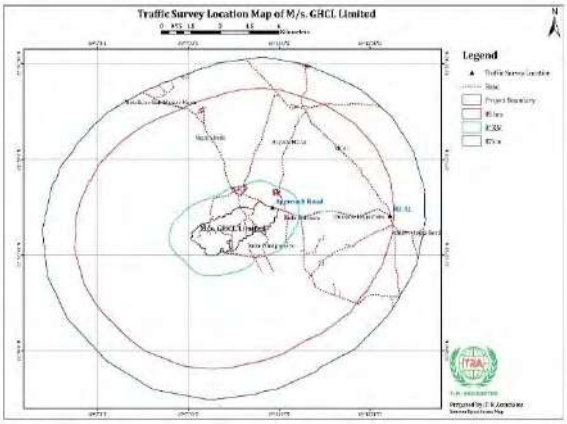
<table>
<tr><th>SR. NO.</th><th>TYPE OF LAND</th><th>AREA (SQ. M.)</th></tr>
<tr><td>1</td><td>Government Land</td><td>10,16,351</td></tr>
<tr><td>2</td><td>Private Land</td><td>48,06,632</td></tr>
<tr><td>3</td><td>Private Land with NA permission</td><td>1,72,473</td></tr>
<tr><td colspan="2">Total</td><td>59,95,456</td></tr>
</table>
M/s. GHCL Limited has applied for Environmental Clearance (EC) for plot area admeasuring <u>54,63,200 sq. mt.</u>
<u>Land acquisition letter is submitted.</u>
</td>
</tr>
<tr>
<td></td>
<td>It was observed that baseline study was conducted during December 2019 – February 2020, which is more than 3 years old.</td>
<td>

It is requested to note that as per OM F.No. IA3-22/10/2022-IA.III [E 177258] dated 08-06-2022 baseline data should not be older than three years at the time of submission of the proposal for the grant of Environmental Clearance (EC).
Project proponent have submitted EC proposal on Parivesh portal dated 30-11-2022.
The baseline period was December 2019 to February 2020 and the baseline data validity was up to December 2022. M/s GHCL informed that baseline data is line with OM dated 8.6.2022 for validity of baseline data, wherein it is mentioned that baseline data used for preparation of EIA/EMP report may be collected at any stage of the EC process or even before the grant of TOR. In this case, they have reconducted 3-month Baseline data from December, 2022 to February, 2023, which is less than 3 years old.

</td>
</tr>
</table>

	As per OM, PP shall conduct fresh 3 months study	➢ However, M/s GHCL had already appointed **T. R. Associates** for conducting the **3-month** Baseline Monitoring in November 2022. ➢ The Baseline study was conducted during the period **December, 2022 to February, 2023 and it is incorporated in Addendum of EIA Report submitted on 1.02.2024.** ➢ **Baseline details is submitted.**
	It was noted that EIA - EMP report is prepared by NEERI, which is not QCI /NABET accredited consultant for soda ash. PP informed that now T R Associate has been hired for the proposed project who is a QCI /NABET accredited consultant for soda ash. The Committee suggested that new consultant shall undertake site visit and verify/check the entire	➢ The authorization letter dated 10.01.2024 for engaging T.R. Associates, a QCI/NABET accredited consultant for the Soda Ash Industry, to verify and check the entire data and the EIA-EMP report prepared by NEERI. Further, M/s T.R. Associates has undertaken site visit and examine the existing EIA-EMP report. ➢ T. R. Associates vide letter dated 30.01.2024 have undertaken the task of visiting and thoroughly checking the entire data of the EIA-EMP report provided by NEERI. ➢ Additionally, it is important to note that T.R. Associates has subsequently prepared an Addendum to the EIA report. .

<table>
<tr><td></td><td>data as well as EIA - EMP report. They should give undertaking that they are satisfied with data and own the data provided in the EIA-EMP report. PP shall also submit authorizatio n letter for new Consultan</td><td></td></tr>
<tr><td></td><td>Revised water balance to be submitted. STP’s treatment process shall include secondary treatment</td><td>Revised water balance is submitted.
Initial processing of domestic wastewater occurs in a Sewage Treatment Plant (STP) with a focus on utilizing treated water for plantation and Greenbelt development in the vicinity.
The wastewater undergoes preliminary treatment involving a Bar Screen Chamber and an Oil & Grease Trap tank to capture extraneous and floating matter effectively.
Subsequently, the sewage is directed to a Collection Tank cum Equalization tank, where it undergoes equalization processes.
The equalized sewage is then pumped for secondary treatment in an Aeration tank and Secondary Clarifier, with the clear supernatant being collected in a holding tank.
Further as polishing treatment the effluent is passed through a two-stage process, involving a Pressure Sand Filter (PSF) and an Activated Carbon Filter (ACF).
Upon completion of the polishing treatment, the treated wastewater undergoes disinfection before being employed for landscaping and gardening purposes.
The biological sludge generated during the treatment process is directed to a sludge drying bed, with the resulting treated sludge utilized as manure in gardening activities
<table><tr><th>SR. NO.</th><th>NAME OF THE UNITS</th><th>NO. OF UNIT</th><th>CAPACITY OF UNIT</th></tr><tr><td>1</td><td>Bar Screen</td><td>1</td><td>10.5 m^3/hr</td></tr></table></td></tr>
</table>

		2	Oil and Grease trap Tank	1	60 KL
		3	Collection Tank cum Equalization tank	1	80 KL
		4	Aeration tank	1	80 KL
		5	Secondary Clarifier	1	40 KL
		6	Holding tank	1	80 KL
		7	Activated Carbon Filter	1	10.5 m^3/hr
		8	Pressure Sand Filter	1	10.5 m^3/hr
		9	Disinfection (Chlorine contact tank)	1	80 KL
(	PP informed that widening of approach road to project site is being carried out. PP shall submit road wideining action plan. Traffic study to be conducted	**TRAFFIC FLOW ANALYSIS** Traffic study was carried out on following roads: 1. **NH41 (old NH-8A)** i.e. Mandvi - Narayan Sarovar, which is 5.5 km (by road) away from project site in East direction (via Bhinsara - Mota Layja road) and 2. The **approach road** (Bada- Bhinsara- Mota Layaja road) to GHCL proposed site. **(Note: Government considered as Coastal Highway.)**  The traffic survey study was conducted for traffic flow on both sides. Studied route is shown in above figure.			

		Traffic Count Data existing - NH-41 [Narayan Sarovar to Mandvi is submitted **Traffic Count Data existing - NH-41 [Narayan Sarovar to Mandvi is submitted** **Traffic Count Data Existing-Approach Road (Bada- Bhinsara- Mota Layja Road) to M/s. GHCL Ltd is submitted.** **Traffic Count Data after proposed project - Approach Road (Bada- Bhinsara- Mota Layja Road) to M/s. GHCL Ltd is is submitted.** PP reported that it can be concluded that even for considering the worst case; there will be **minor increase in vehicular load** due to the Proposed project.
(	Air quality modeling for line source shall also be incorporate and cumulative impact of line and point source shall provided	➢ They have used AERMOD 12.0.0 latest version to perform Air Quality Modeling for Point Source . ➢ The Emission rate of (PM_{10}, SO_2, NOx) by utilization of different fuels is given in below table

Sr. No	**Fuel**	**% Ash**	**% Sulphur**	**% Nitrogen**	**SO_2 Emission rate, g/s**	**NOx Emission rate, g/s**	**PM_{10} Emission rate, g/s**
1	Coal	16.08	0.77	1.13	1.94	69.9	4.75
2	Lignite	20.26	3.85	0.39	14.45	38.17	4.92
3	Pet coke	0.61	7	1.77	12.16	74.91	4.57

Sr. No.	Process	NH_3 Emission rate, g/s
1	Ammonia Recovery system	1.04
2	Filtration/Calcination Vent	0.52

- The emission rates were calculated considering following efficiencies of Air Pollution Control Measures:

SR. NO.	APCM	Efficiency of APCM (%)
1	Dust Collector	60 %
2	Bag filter	92%
3	Scrubber	95%
4	Desulfurization system and injection of Sodium Bicarbonate	99.7%
5	Electrostatic Precipitator (ESP)	99.99%

The incremental concentration of (PM_{10}, SO_2, NOx,) by utilization of different fuels are given in below Table:

Sr. no.	Fuel	Incremental Concentration of PM_{10} ($\mu g/m^3$)	Incremental Concentration o SO_2 ($\mu g/m^3$)
1	Coal	1.21	0.229
2	Lignite	**1.23**	**1.71**
3	Pet coke	1.19	1.44

- The incremental concentration in case of NH_3 will be 2.39 $\mu g/m^3$.

Considering Worst Case Scenario the cumulative Concentrations of the PM_{10} ($\mu g/m^3$) will be

Sr. No.	Monitoring Location	Distance (km)	Direction	Existing monitored maximum PM_{10} Concentration ($\mu g/m^3$)	Maximum GLC from Point Source ($\mu g/m^3$)	Maximum GLC from Line Source ($\mu g/m^3$)	Total PM_{10} Concentrations ($\mu g/m^3$)
1	Panchotiya*	3.00	SE	81.53	1.23	1.3	84.06
2	Bada	0.34	NW	76.56			79.09
3	Bhinsara	2.28	E	68.99			71.52
4	Bhada*	5.68	SE	83.48			86.01
5	Mota Layja	7.00	NNE	59.73			62.26
6	Padampur	5.25	NNW	68.74			71.27
7	Mapar	5.09	NNW	65.94			68.47
8	Bambhadai	7.11	NW	72.99			75.52
9	Dedhiya	9.97	NNW	58.68			61.21
10	Nana Layja	7.25	ESE	81.98			84.51

- **After considering the worst case scenario the cumulative concentration of PM_{10} remains well within the NAAQS.**
- **After considering the worst case scenario the cumulative concentration of PM_{10} remains well within the NAAQS.**

Sr. No.	Monitoring Location	Distance (km)	Direction	Existing monitored maximum SO_2 Concentration ($\mu g/m^3$)	Predicted SO_2 Concentration ($\mu g/m^3$)	Total SO_2 Concentrations ($\mu g/m^3$)
1	Panchotiya *	3.00	SE	15.6	1.71	17.31
2	Bada	0.34	NW	14.82		16.53
3	Bhinsara	2.28	E	13.68		15.39
4	Bhada*	5.68	SE	16.92		18.63
5	Mota Layja	7.00	NNE	8.25		9.96
6	Padampur	5.25	NNW	12.92		14.63
7	Mapar	5.09	NNW	11.78		13.49
8	Bambhadai	7.11	NW	10.94		12.65
9	Dedhiya	9.97	NNW	9.85		11.56
10	Nana Layja	7.25	ESE	17.38		19.09

- **After considering the worst case scenario the cumulative concentration of SO_2 remains well within the NAAQS.**
- **Considering Worst Case Scenario the cumulative Concentrations of the NO_2 ($\mu g/m^3$) will be:**

Sr. No.	Monitoring Location	Distance (km)	Direction	Existing monitored maximum NO_2 Concentration ($\mu g/m^3$)	Maximum GLC from Point Source ($\mu g/m^3$)	Maximum GLC from Line Source ($\mu g/m^3$)	Total NO_2 Concentrations ($\mu g/m^3$)
1	Panchotiya*	3.00	SE	38.88	9.50	7.59	55.97
2	Bada	0.34	NW	33.67			50.76
3	Bhinsara	2.28	E	31.81			48.9
4	Bhada*	5.68	SE	41.49			58.58
5	Mota Layja	7.00	NNE	22.71			39.8
6	Padampur	5.25	NNW	30.38			47.47
7	Mapar	5.09	NNW	33.62			50.71
8	Bambhadai	7.11	NW	28.45			45.54
9	Dedhiya	9.97	NNW	25.65			42.74
10	Nana Layja	7.25	ESE	36.43			53.52

After considering the worst case scenario the cumulative concentration of NO_2 remains well within the NAAQS

- In addition, Baseline concentration of **NH_3** found at all the locations are **B.D.L(D. L - 21)**, however **incremental concentration is found 2.39 $\mu g/m^3$** by using AERMOD software, considering worst case scenario cumulative ammonia concentration is **well within the stipulated norms of NAAQS, 2009.**

		➢ Baseline concentration of **CO** found at all the locations are **B.D.L(D. L - 0.5 mg/m^3),** however Maximum GLC from Line Source is found **4.81 µg/m^3** by using AERMOD software, considering worst case scenario cumulative CO concentration is **well within the stipulated norms of NAAQS, 2009.** ➢ Baseline concentration of **HC** (Benzene and Benzo alpha Pyrene) found at all the locations are **B.D.L(D. L - 1 mg/m^3 of Benzene and D. L - 1 ng/m^3 of Benzo alpha Pyrene),** however Maximum GLC from Line Source is found **0.31 µg/m^3** by using AERMOD software, considering worst case scenario cumulative HC concentration is **well within the stipulated norms of NAAQS, 2009.**
(	As per point source air quality modeling, incremental levels of SO2 and NOx have been estimated to be 10.98 µg/m^3 and 11.37 µg/m^3, which are in higher side. PP shall reduce the incremental values after taking suitable pollution control measures	PP reported the same reply as mentioned in the above row.
(	Villages are located 500-600 m away	➢ The **nearest village Janakpur is located at 0.55 km** and **project site village Bada is at 0.58 km** from the proposed project site boundary.

	from the project site. PP shall elaborate various measures to be taken for the surrounding villages	➢ Moreover, the unit will install **adequate Air pollution control equipment** to abate the air pollution arising from the manufacturing unit. ➢ Also, the effluent generating from the unit will be properly disposed into deep sea which will not impose any risk to soil/land/ground water pollution. ➢ The Solid/Hazardous waste will be efficiently collected, stored and disposed to TSDF/CHWIF site or sold to registered recyclers or reused within premises. ➢ Additionally, the **unit will develop dense greenbelt all around the periphery of the project site.** ➢ The unit will provide **acoustic hood** at highly noise generated equipment's as well as **acoustic building** to abate the noise pollution generating from the process and machineries. ➢ The unit will also carry out various CSR activities for the upliftment of the surrounding villagers
(	Details representations received by SPCB/MoEF&CC agains the project, if any. Action plan to address the issues raised in writted/represntations received by SPCB /MoEF&CC	➢ The Public Hearing was scheduled to be held on 16-04-2022 at 11:00 Hrs, Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch, Public hearing was then time being postponed due to unavoidable circumstances. After that public hearing was completed on **17-10-2022 at 11.00 Hrs.** Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch, Gujarat. Which was presided over by Shri Chetan Mishan (GAS), Sub Divisional Magistrate & Deputy Collector, Mundra- Kutch. ➢ The public hearing was attended by **106 people.** ➢ Total 1154 written questions (representation received by GPCB) and 1066 verbal questions were asked by people in public hearing that we have summarized in 94 Concerns and it will further identified in 26 different head to address Public Hearing Action Plan. ➢ **The Action Plan Addressing the Written & Verbal Questions Received During Public Hearing is Submitted**
(	Details of issues raised by local fishermen if any. Action plan to address the said issues.	The issues raised by local fishermen have been addressed in the Public Hearing Action Plan **CONCERN IN PH** | **ACTION PLAN** | **FUND REQUIRED** | **RESPONSIBILITY**

		Regarding details of Pagadia fisherman not mentioned and Marine EIA is misinterpreted Regarding disturbance to fishes due to presence of pipeline Regarding status of fishing near Bada and Mandvi Related to number of fishermen not incorporated in study Related to presence of dead fishes not reported in study, fishing carried out for commercial purpose Regarding presence of fisherman in study area Regarding the impact due to project activities on fishes Regarding chances of reduction in number of fishes	• Other than construction phase, there will be no any impact on Pagadiya fisher men. As shore line will remain undisturbed. • Details of Fishery and fishermen including their family and population are given in **Chapter-3 of Marine EIA report** is prepared by CSIR - NIO. • It is mentioned in marine EIA report that no large-scale commercial fishing operation prevail in the study area except for minor shore based and Gill net operations.	• Biodiversity management plan to be implemented in the project area during construction phase and operation phase which is included in **EMP cost.** • For periodic monitoring of the marine area environment during project Construction phase, a provision of **Rs. 0.5 crore** to earmarked. • For operation phase**, Rs. 0.5 crore** per year to be kept provision for the monitoring. • GHCL Ltd will spend approx. **Rs.**	**GHCL Limited**

			• Unit will also promote development Initiatives for Fishing Communities including Pagadiya under CER activities. For the Development Initiatives for Fishing Communities Unit will provide **1 Crore Rupees.**	**1.0 crore** towards Development Initiatives for Fishing Communities including Pagadiya under CER activities.	
	Copy of stage I forest Clearance and SCZMA recommendations	Copy of stage I forest Clearance and stage II and SCZMA recommendations has been obtained vide letter ENV/10/2021/184/T-cell dated 26.12.2023.			
	Commitment for Disaster Management Plan in case of Tsunami, earthquake and cyclone to be prepared and submitted to the respective authority.	• Detailed Disaster Management Plan has been submitted. Additional Studies of the Environment Impact Assessment Report prepared by CSIR-NEERI. • Disaster Management Plan of Tsunami, Earthquake and Cyclone has been prepared and will be submitted to Director Industrial Safety and Health (DISH) after getting EC from the Concerned authority. Report is also submitted to MOEF&CC. • Disaster management plan is submitted.			

22. **Deliberations by the EAC:**

After detailed deliberations, EAC desired the following additional information:

(i) The Committee was of the view that PP shall compare the baseline data collected during December -February 2020 and data collected during December 2022 -February 2023. Accordingly, PP shall also carry out trend analysis of previous baseline data by conducting latest additional one-month baseline data.

(ii) The Committee noted that several representations have been received from various level of public raising several issues. The Committee was of the view that representations shall be forwarded to the PP for their response. The Committee also recommended that in the next meeting they will go through the video of proceedings of public hearing. The Committee will go through the response of PP then decide further course of action accordingly.

Accordingly, proposal was deferred for want of above additional information. Above all additional information shall be submitted online to the PARIVESH portal for further consideration by EAC.

List of the Expert Appraisal Committee (Industry-3) members participated during Video Conferencing (VC) meeting held on 06.02.2024

S. No	Name of Member	Designation
1.	**Prof. (Dr.) A.B. Pandit**	Chairman
2.	**Dr. Suresh Panwar**	Member
3.	**Dr. (ER.) Dibakar Swain**	Member
4.	**Shri Dinabandhu Gouda**	Member
5.	**Dr. Kishore Malviya**	Member
6.	**Dr. P. Jagannadha Rao**	Member
7.	**Shri Dinesh Runiwal,**	Member
8.	**Prof. (Dr.) Suneet Dwivedi**	Member
9.	**A N Singh**	Member Secretary
MOEFCC		
1.	**Dr. Kanchan Puri**	Scientist-B
2.	**Dr. S. Pradeep kumar**	Scientist-B

***

MOM approved by



(Prof. Aniruddha B. Pandit)
Chairman
***

-TRUE COPY-

ANNEXURE R/15

GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(IA DIVISION-INDUSTRY-3 SECTOR)
*****

Dated: 13.5.2024

MINUTES OF THE 78th EXPERT APPRAISAL COMMITTEE (INDUSTRY-3 SECTOR) MEETING HELD ON 30thAPRIL, 2024.

Venue: Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003 through Video Conferencing (VC)

Time: 10:30 AM onwards

(i) Opening Remarks by the Chairman

Prof. (Dr.) A.B. Pandit, Chairman welcomed the Committee members and opened the EAC meeting for further deliberations.

(ii) Details of Agenda items by the Member Secretary

The Member Secretary then apprised the Committee about the details of Agenda items to be discussed during this Expert Appraisal Committee (EAC) meeting.

Parivesh 1.0

Agenda No. 78.1

Proposed project to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity, 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka - Mandvi, District - Kutch in the Gujarat by "Greenfield Chemical Complex" of GHCL Ltd- Reconsideration of Environmental Clearance

[Proposal no: IA/GJ/IND3/408164/2022, File No. IA-J-11011/293/2021-IA-II(I)]

1. The proposal is for Environmental Clearance to the Proposed project to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity, 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka - Mandvi, District - Kutch in the Gujarat state by "Greenfield Chemical Complex" of GHCL Ltd

2. The project/activity is covered under Category 'A' of Item 4 (e) soda ash industry of Schedule of Environment Impact Assessment (EIA) Notification, 2006 (as amended) and requires appraisal at Central Level by the Expert Appraisal Committee (EAC) as the project is located outside the notified industrial area.

3. The ToR was issued by the Ministry, vide letter no. IA-J-11011/293/2021-IA-II(I) dated 10th August, 2021. The PP applied for the Environment Clearance in the Common Application Form and submitted the EIA/EMP Report and other documents. The PP in the CAF reported that it is a **Fresh EC case. The proposal was placed in 72nd EAC Meeting held on 2nd January, 2024**, **74th EAC meeting held on 6th Februay,2024 wherein the proposal was deferred for want of requisite information now the proposal is placed in this 78th EAC meeting ng held on 30th April,2024** where project was wherein the PP and an accredited Consultant, M/s. T. R Associates [NABET accreditation till **NABET Accreditation Number: NABET/EIA/2326/RA 0293 valid till 8th April, 2026**], made a detailed presentation on the salient features of the project and informed the following:

4. The PP reported that the Total land area is **5463200 m^2;** no additional land will be used **for proposed project** and no R& R is involved in the Project. The details of various products are as follows:

Sr. No.	**Name of the Product**	**Production Capacity (MT/Month)**	**CAS Number**	**End use**
1	Light Soda Ash	11,00,000 TPA	497-19-8	Manufacturing of glass, usage in chemical industry, paper and detergent manufacturing, and food industry
2	Dense Soda Ash	5,00,000 TPA	497-19-8	
3	Sodium bicarbonate	2,00,000 TPA	144-55-8	
Captive Co-generation Power plant Steam (CFBC boilers)			120 MW	
Emergency DG Set			5 MVA	
Note- The production capacities are planned in phased manner and for Phase 1 production capacity for LSA: 5,50,000 TPA, Dense Soda Ash: 2,50,000 TPA, SBC: 1,00,000 TPA and 60 MW for Captive Co-generation Power plant.				

5. The PP reported that there is no violation case as per the Notification No. S.O.804(E) dated 14.03.2017 and no direction is issued under E(P) Act/Air Act/Water Act.

6. The PP reported that there is no National Parks, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. **Marine National Park and Sanctuary,**

Jamnagar are located at 75 km aerial distance in South direction and Narayan Sarovar Sanctuary is located at more than 100 km aerial distance in North-West directions. Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Gugal Schedule-I species were found in the study area for which conservation plan has been prepared and submitted to PCCF and Chief wildlife warden dated 9.11.2023.

7. The PP reported that the diversion of 0.9689 ha un-class forest for laying part of sea water intake and effluent disposal pipeline and passage for related construction equipment movement in Kachchh has been obtained vide letter dated 18. 7.2023.

8. The PP reported the Unit has received the Final recommendation letter from GZMA vide file no ENV/ 10/ 2021/184/ T- cell dated 26.12.2023. CRZ details are as:

Activities	**Zone**
Construction of process plant and utilities etc.	Outside CRZ area
Effluent collection	Outside CRZ area
Seawater Intake system i.e. sump and pump house	CRZ III
Intake Pipeline	CRZ IA, CRZ IB and CRZ IV
Outfall Pipeline	CRZ IA, CRZ IB and CRZ IV

Laying of Seawater Intake and effluent disposal underground pipeline through tunnel from unclassified Forest area, Sand dune area, intertidal area outside project boundary.

9. The PP reported that Ambient air quality monitoring was carried out at 10 locations during December 2019 – February 2020. The baseline data indicates the ranges of concentrations as: PM_{10} (19 µg/m^3 to 53 µg/m^3), $PM_{2.5}$ (8 µg/ m3 to 17 µg/ m3), SO_2 (1 µg/m^3 to 14 µg/m^3), NOx (5 µg/m^3 to 16 µg/m^3), Ammonia (6 µg/m^3 to 19 µg/m^3), Ozone (2 µg/m^3 to 8 µg/m^3), Carbon Monoxide (0.09 mg/m^3 to 0.21 mg/m^3), Hydrocarbons [Methane hydrocarbons (0.23 µg/m^3 to 1.27 µg/m^3) and Non-Methane hydrocarbons (0.11 µg/m^3 to 0.19 µg/m^3)], Lead (Pb) (0.05 µg/m^3 to 0.27 µg/m^3), Arsenic (As) (0.02 ng/m^3 to 0.11 ng/m^3), Nickel (Ni) (0.11 ng/m^3 to 0.18 ng/m^3), Benzo(α)pyrene(B[a]P) (ND to 0.03 ng/m^3) and Benzene (ND to 0.16 µg/m^3). AAQ modeling study for point source emissions indicates that the maximum incremental GLCs after the proposed project would be 3.05 µg/m^3 in case of Lignite, Coal and Petcoke with respect to PM_{10}, 10.98 µg/m^3 in case of Lignite, 2.55 µg/m^3 in case of Coal and 13.26 µg/m^3 in case of Petcoke with respect to SO_2 and 11.37 µg/m^3 in case of lignite, 7.3 µg/m^3 in case of coal and 5.62 µg/m^3 in case of Petcoke with respect to NO_x. The resultant concentrations are within the National Ambient Air Quality Standards (NAAQS).

10. The PP reported that the total water requirement for project will be 15,20,060 m^3/day in case of Dry Lime process or 13,63,878 m^3/day in case of Wet Lime process which will be met from Sea water. Total Effluent of 15,88,570 m^3/day (Domestic - 160 m^3/day + Industrial – 15,88,410 m^3/day) in case of Dry Lime process or 14,48,818 m^3/day (Domestic - 160 m^3/day + Industrial – 14,48,658 m^3/day) in case of Wet Lime process. The Process effluent generated i.e. from distiller waste, brine purification reject, RO/DM rejects will be disposed off along with once through return cooling water/fresh seawater into Arabian Sea as per recommendation of NIO. The characteristics of the discharge water are within the norms prescribed by CPCB.

11. The PP reported that the Power requirement for proposed project will be 120 MW and will be met from Captive Co-generation Power plant. D. G. Set (5 MVA X 1) [Fuel: HSD (60 KL)] shall be provided and used only in case of power failure. Stack (30 meter) and Retrofit shall provide as per CPCB norms to the DG sets. Industry will provide six Steam Boiler (150 TPH) for captive power plant, six lime kilns and D G sets

12. **Details of process emissions generation and its management:**

SR.NO.	Stack attached to	Capacity	Height of the stack (m)	Fuel & its Consumption	Expected Pollutant	APC System	GPCB Limit
1	CPP with flue gas desulphurization CFBC Boiler (6 Nos.)	150 TPH	130 m	Imported Coal/Lignite/ Pet coke (Imported Coal: 13,14,000 TPA, Lignite :19,71,000 TPA, Pet coke: 9,12,500 TPA)	SPM SO_2 NO_2 Hg	Individual ESP with each Boiler	PM ≤ 30 mg/Nm^3 SO_2 ≤ 100 mg/Nm^3 NO_2 ≤ 100 mg/Nm^3 Hg ≤ 0.03 mg/Nm^3
2	D G Set (2/3 Nos.)	5 MVA	30 m	HSD (60 KL)	HC CO PM NO_x	Retrofitting	NOx 710 ppmv NMHC 100 mg/Nm3 PM 75 mg/Nm3

							CO 150 mg/Nm3
3	Lime Kiln 1		68 m	Coke or Briquette or Anthracite (Coke - 1,30,000 TPA, Briquette- 1,55,000 TPA, Anthracite - 1,10,000 TPA)	SPM SO_2 NO_2	Scrubber and Dust Collector system	SPM ≤ 150 mg/Nm^3 SO_2 ≤ 100 ppm NO_2 ≤ 50 ppm
4	Lime Kiln 2		68 m			Scrubber and Dust Collector system	
5	Lime Kiln 3		68 m			Scrubber and Dust Collector system	
6	Lime Kiln 4		68 m			Scrubber and Dust Collector system	
7	Lime Kiln 5		68 m			Scrubber and Dust Collector system	
8	Lime Kiln 6		68 m			Scrubber and Dust Collector system	

SR.NO.	**Stack attached to**	**Height of the stack (m)**	**Expected Pollutant**	**APC System**
1	Ammonia Recovery system	42 m	Ammonia	Water scrubber
2	Lime grinding system / Slaker	65 / 20 m	PM / Water vapor	Bag filter / Adequate stack height
3	Calciner unit	37 m	PM	Scrubber, Bag filter

4	Densification	43 m	PM	Scrubber
5	Sodium Bi-Carbonate Unit	30 m	PM	Bag filter
6	Lime Kiln	Closed system	PM	Scrubber and Wet ESP

13. **Details of Solid Waste/ Hazardous Waste Generation and Its Management**:

Sr. No.	Type of Waste	Mode of Disposal
1	ETP Sludge from treatment of effluent generated from captive power plant & RO/DM Plant	The effluent from power plant, RO/DM plant will require only neutralization & it will have negligible BOD/COD. Sludge will be disposed off in nearby landfill site.
2	Used Oil / Used Cotton	It will be sold to MoEF&CC/CPCB registered recyclers only. Approx. 12 KL
3	Discarded Drums	It will be sold to approve traders. Approx. 5 MT/yr
	Discarded Bags	It will be sent back to supplier for reuse.
4	Spent Ion exchange resin	To be sold to authorized recyclers or will be incinerated at MoEF&CC/CPCB approved TSDF for which plant will obtain membership. Approx. 3000 l/yr
5	Lead acid Batteries	It will be sold to authorized agency through auction.
6	Ash (Fly ash & Bottom Ash) from Boiler	The Boiler ash will be used for cement Manufacturing/ Brick Manufacturing. Approx. 750 TPD
7	Limestone rejects	It can be used in Boiler for desulphurization and as a sweetener in cement industry, road making, pavement etc. 5% of lime stone consumption.
8	Settled sludge	Since settled sludge, non-hazardous in nature, it is proposed to be disposed off in Nearby landfill site.

14. The Budget earmarked towards the Environmental Management Plan (EMP) is ₹ **205.07 crore** (capital) and the Recurring Cost (operation and maintenance) will be about ₹ **6.98 Crore** per Annum. Industry proposes to allocate ₹ **18.04 Crore** towards CER.

15. The PP reported that Public Hearing for the Proposed project has been conducted by the State Pollution Control Board at the project site on **17.10.2022**. The main issues raised during the public hearing are related to the air pollutants, water pollutants, schedule 1 conservation plan, fishing, traffic etc.

16. The PP proposed to set up an Environment Management Cell (EMC) by engaging Environment officals for the functioning of EMC.

17. The PP submitted the Disaster and Onsite and Offsite Emergency Plans in the EIA report.

18. The estimated total project cost is **Rs. 3550 Crores**. Total Employment will be **1200** persons as direct.

19. Intake pipeline and outfall pipeline fall in CRZ 1A, 1B and IV area as per demarcation. It was reported that construction of process plant and utilities fall outside the CRZ area. SCZMA recommendation has been obtained for Laying of Seawater Intake and effluent disposal underground pipeline through tunnel from unclassified Forest area, Sand dune area, intertidal area outside project boundary.

20. The Public Hearing earlier was scheduled to be held on 16-04-2022 at 11:00 Hrs, Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch, Public hearing was then time being postponed due to unavoidable circumstances. After that public hearing was completed on **17-10-2022 at 11.00 Hrs.** Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch, Gujarat. Which was presided over by Shri Chetan Mishan(GAS), Sub Divisonal Magistrate & Deputy Collector, Mundra- Kutch. Public hearing Details as given below:

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	
	CSR–Fodder	4	Steps to be taken for cattle Care about Maldhari community Security regarding fodder supply for livestock.	Fodder will be provided as well as provision for veterinary doctor will be carried out by GHCL foundation under CSR activity.	• Activities for fodder supply will be carried out under CSR and CER activities for strengthening the bond between the project authorities and the local population. (refer Ch-8 and Table 10.4 in Ch-10). Fodder field will be developed on the Government/allocate land to nearby villages. • Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR activities for communities. • During year 2020-2021, GHCL foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting	• As per MoEF&CC Office Memorandum F.NO. 22-67/2017-IA III, MoEF&CC, New Delhi, dated on 1st May 2018 GHCL Ltd has earmarked 0.5 % of capital investment (appro. Rs. 18.04 crore), towards the Corporate Environment Responsibility in 5 years • GHCL Ltd will spend approx. **4.35 crore*** towards Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages as per requirement under CER activities (* value may defer as per actual requirement)	5 years	C
	Employment	5	For employment of local villagers Number of employment opportunities to be Priority must be given to nearby 10 villages Regarding priority to nearby villages	Information on employment opportunities has given by Project Proponent that there are different types of employment opportunities in the two phase of the projects i.e. construction	• The proposed project has a potential for employment of skilled, semiskilled and unskilled employees during construction phase	• GHCL Ltd will spend approx. 2.25 crore towards Promoting activities for skill building to improve	During construction and Operation phase	C

o.	Issue related to	Nos. Issues	Concern in PH	GHCL L'TD reply	Action Plan	Fund Required	Timeline
			for labor work Regarding employment for local communities.	phase and operational phase of the project. GHCL will strive to provide these employment opportunities to the local people, for which work will be done for their skill development and employment opportunities will be provided to the local people. As per requirement, training will be given to local people in coordination with HR department. Priority will be given for employment of local people. In nearby villages a group of women can be formed so that they can work in Gruhudhyogs (Home- based business). M/s. GHCL shall provide employment to women as per their skills and qualification.	operational phase. The plant will create direct employment in phased manner for about 1200 (operational phase) skilled as well as semi-skilled staff and indirectly large number ofunskilled manpower will be engaged for the project. For Employment, local people will get first priority as per suitability and requirement. People will also get employed by the contractors for various project related activities. (Refer Ch-8 of EIA report) • GHCL foundation will carry out skill development Programme for local youth to improve their employment opportunities, women empowerment under CSR and CER activities.	employment opportunities and women empowerment in nearby villages under CER activities.	
3	CSR - Health	1	Regarding health facilities under CSR activities	Will provide mobile health van facility and upgradation of existing healt hcare infrastructure	• Industry will provide Mobile Health Care, Health Camps, and Specialized Check Up Camps in nearby villages. Necessary support and help will be extended for advanced diagnosis and treatment wherever identified, Free medical health checkup under CSR and CER activities.(Refer Ch-8 of EIA report). We have already initiated mobile health van facility for nearby affected villages of project site.	• GHCL Ltd will spend approx.. 1.12 crore towards Infrastructure development Such as primary healthcare units and the fulfilment of the basic amenities in PHCs including mobile medical van and Provide Bala-Rasayana to Malnutrition Children in Aanganwadi and PHC of nearby Villages under CER activities. • GHCL Foundation will spend approx..	5 years
4	CSR - Education	3	Regarding scholarship under CSR activity Regarding skill development of youth and improvement of	Will build school in future as per requirement and will also upgrade the existing school infrastructure and will carry out	• Unit will be directed at two levels viz. school and skill building to improve employment opportunities. At		5 years

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timelin e
			Conditions To provide educational facilities	skill development activities	school level we intend to promote quality of education and learnability, develop infrastructure of Government schools, provide vocational training as per the requirement under CSR and CER activities. • GHCL foundation will support local government and NGO to make that program more effective. • GHCL foundation will carry out skill development Programme for local youth to improve their employment opportunities, women empowerment under CSR and CER activities. • During year 2020-2021, GHCL Foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation, Animal husbandry, health care, SHG, Infrastructure development etc.	towards Infrastructure development for quality of education, which will ultimately upgrade schools in nearby villages under CER activities.	
5	Air Pollutants (SOx, NOx, Dust)	6	Height of chimney to be installed Levels of Sox and NOx Regarding acid rain cause by Sox Emission of PM during transportation and Emission of heavy metal such as	For minimizing Air Pollution, requisite height of the stacks will be provided as per the NAAQS norms. Besides this, Modern technology equipment's like Dust collector, Electrostatic Precipitator Scrubber will	• The best available technology-based pollution prevention and control shall used to meet the regulatory standards and these pollution control systems will be commissioned before	• Air pollution • Capital cost would include air pollution control devices like ESPs, Scrubbers, Dust extraction	During operati on phase

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline
			mercury. Regarding once through cooling for 120 MW. Regarding linkage of fuel and how they are going to use it	installed. As a result, the pollution level will be within standard limits. GHCL will continue to support development of green belt in the surrounding villages through various agencies including GHCL Foundation (AF). GHCL shall endorses AF tree plantation movement of planting trees in entire Mandvi Taluka and 50,000 trees that mentioned, GHCL shall surely nurture those plants for five years.	commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the operational units, so that failure of the control system shall shut down the respective operational unit. • High efficiency ESPs shall be provided in the flue gas path of the CFBC boilers for control of particulate matter. • Finely ground limestone will be added to the boiler combustion zone • together with coal/lignite to arrest the SO2 formed during combustion. • Lime stone dozing system to the furnace to be designed to achieve higher than 90% capture of SO2. Monitoring system(CEMS) of air pollutants SO2, NOx, NH3, PM10 and PM2.5 will be implemented. • So, the expected pollutants will be well within standard norms. • The air quality monitoring will be carried out on regular basis by approved agencies by CPCB/GSPCB. (refer Ch-6 and Ch-10 of EIA report) • GHCL will implement greenbelt /plantation program to ameliorate the pollutants and improve the aesthetics and ambient air quality. (refer Ch-10 of EIA report) • There is negligible cooling water requirement for power generation. There is no any alternative effective system is available for soda ash plant.	Stacks, Dry Fog system, Wind screen etc- 89.28 crore • recurring cost would include operation and maintenance of pollution control devices- 1.50 crore • **Environmental monitoring Programme** capital cost include OCEMS, online weather station etc- 3.4 crore • Recurring cost – 0.95 crore • Greenbelt • Capital Cost- 20 Crore • Recurring Cost- 0.5 crore	

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	R
					• There is no readily available infrastructure for transportation of fuel i.e. rail or water way. So, we have to transport through road. Traffic study are shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. In future, any alternative option available will explore. • GHCL Foundation will also promoting plantation activities in nearby villages under CSR and CER activities			
	Water pollutants (BOD,COD,Ammonia, Mercury, Sea Weed, Mangroves)	7	Regarding water related question by Koli society Regarding decrease in number of phytoplanktons and disruption of food chain Regarding temperature and presence of ammonia in waste water Regarding presence of mangroves Regarding setup of tunnel for intake of sea water, seismic zone in which company falls, liquification of land due to heat Regarding discharge of effluents into sea containing ammonia and high temperature and death of fishes at Sutrapada plant Regarding quality of effluent in terms of BOD and COD	Effluent will be highly alkaline so it will be mixed with HCL and then it will be disposed off in sea. Design of structure will have done according to seismic zone V. In soda ash industry impact of ammonia is very low.	• Industry will provide adequate effluent management and monitoring system for disposal of treated water • Proper seawater intake and treated effluent disposal (ensure maximum dilution) shall be done as per recommendation Marine EIA report. • The water monitoring results of (surface and groundwater and marine) should be carefully evaluated to identify significant changes, if any, adverse change from the baseline accordingly, corrective measures will be taken to ensure the sustenance of water quality. However, there is no ground water pollution is envisage in such soda ash plant, • The ammonia concentration in treated waste water well	• Capital cost would include cost of ETP, STP etc- 14 crore • recurring cost would include operation and maintenance of pollution control	During operation phase	G

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Respo
					within the limit specified by CPCB for soda ash industry. • There is no such fish kill cases due to treated effluent in existing plant. There are independent studies available which indicates there is no significant adverse impact on marine environment but there will be positive impact on environment. • During studies, there is no such mangroves identified in sea water intake and outfall line area. • Design of pipeline/tunnel will be done according to seismic zone V. In case of catastrophic failure/ liquification on land, there are no chances of flooding as water transport through gravity.			
	Marine Life	1	Effect on marine life due to proposed project	No adverse impact on fish or marine animals and sea weed observed.	• Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. The effluent release scheme can then be adequately modified to ascertain necessary dilution, if required. The efficiency of the diffuser must be checked periodically and if necessary, it should be cleaned to revert back to the dilution ascertained through initial tracer studies. • There are independent studies available which indicates there is no significant adverse	• A provision of Rs. 1 crore to be earmarked for the biodiversity management plan to be implemented in the project area during construction phase and operation phase. • For periodic monitoring of the marine area environment during project • construction phase, a provision of Rs. 0.5 crore to earmarked. • For operation phase, Rs. 0.3 crore per year to be kept provision	During constructio n and Operation phase	GHCL

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	F
					impact on environment but there will be positive impact on environment. • Design of pipeline/tunnel will be done according to seismic zone V. In case of catastrophic failure/ liquification on land, there are no chances of flooding as water transport through gravity.			
3	Health & Hygiene(Ammonia Leakge)	2	Skin diseases due to Soda Ash Regarding the leakage of ammonia.	GHCL will take care of any such issues related to Health of local peoples and workers. All the necessary measures for handling of chemicals will be implemented to reduce its impact on health of peoples. This information is also provided in the EIA report. All the pockets will have leak detection and repair system technology. Moreover, periodical maintenance will also be carried out. GHCL will ensure that there will be no leakage and therefore, there will not be occupational health issues for workers or villagers working in the plant. Moreover, GHCL will also provide PPE kits to workers for their safety.	• Ammonia tanks should have latest instrumentation provision for pressure indication, temperature indication and level indication. The provision of instrumentation should be within 100 percent redundancy. Continues recording of major parameters pertaining to the storages shall be maintained in the control room. • Unit will provide all the safety measure for ammonia storage as well as also prepare onsite and offsite emergency plan and all the APCM with respective units to mitigate the air pollution. The best available technology-based pollution prevention and control shall used to meet the regulatory standards and these pollution control systems will be	• Capital cost would include cost of OHS center, PPEs, fire & safety instruments, automation system for ammonia storage – 3.4 crore • Recurring cost would include maintenance charges and training, audit & health check-up etc.- 0.35 crore	During operation phase	G

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Res
					commissioned before commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the operational units, so that failure of the control system shall shut down the respective operational unit. There is no significant impact observed in the existing soda ash plants in Gujarat.. • There are rare possibilities of ammonia leakage observed in soda ash plant however, recommendation of Disaster management plan and risk assessment will be followed.			
	CSR - Farmers	3	Facilities to be provided to nearby How hygenic the plant will be? How hygenic will be bada plant and what facility will be provided to the farmer.	GHCL Foundation is already providing subsidy for drip irrigation and GHCL will also consider to support this scheme further out of the CSR funds proposed for this project. To help agriculture, GHCL will help farmers as part of our CSR activity in consultation with villagers. The details and type of developmental work will be decided in consultation with villagers. GHCL foundation has been working for farmers through its different schemes like ground water recharge, water harvesting, zero chemical farming, drip irrigation etc.	• Industry will Promote environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of high-quality seeds/manure, efficient irrigation solutions, etc. under CSR and CER activities	• GHCL Ltd will spend approx.. 3.00 crore towards Promoting environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of high-quality seeds/manure, efficient irrigation	5 years	GHC
0	EIA Report & PH	14	EIA report is not correct	The terrestrial EIA report	• It is requested to note that as			GHC

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Resp
	advertisement		Regarding the alternative of site modhwa village. Regarding the NIO accreditation to prepare marine EIA report Regarding ToR granted and Study carried out prior of ToR granted. Regarding the advertisement of the PH Regarding NABET accreditation of consultant organization Regarding Marine EIA Regarding NEERI who has prepared EIA report Regarding the correction in EIA report Regarding the monitoring data collection Regarding accreditation certificate of additional studies for ecology.	prepared by CSIR NEERI and Marine EIA report is prepared by NIO, Mumbai	per OM number J-17011/8/92-IA-III dated 8th August, 2019, there are 7 institutes/agencies authorized for preparation of CZMPS in consonance with the provision of CRZ notification, 2019 vide GSR 37(e) dated 18/01/2019. IRS anna university Chennai has prepared the CRZ map for GHCL LTD. CSIR -NIO is Expert hired to carryout the Marine EIA study. • EIA report has been prepared by CSIR-NEERI, which is reputed governmental body and QCI NABET accredited consultant. • An extensive study on the ecology and Biodiversity in the study area was conducted by the QCI NABET approved functional area expert.			
1	Vipassana	3	Project site is near Vipassana meditation center The meditation center will be disturbed due to industry. Ammonia used in the industry. Related to presence of Vipassana center and other religious places in 15km radius of project site	--	• Environmental Management Plan envisages the plans for the proper implementation of mitigation measures to reduce the adverse impacts. • The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment. • The monitoring of all valued environmental components will be monitored as per the norms prescribed by GPCB/CPCB and the time to- time guidelines issued for soda	• Cost of Environment management plant including various installations for Air Pollution, Water Pollution, Noise Control,	--	GHC

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibilit
					ash manufacturing industry. • It is reported in CSIR NEERI report that there are no significant impact expected on man-made sensitive installations and habitations. On basis of study of present environment condition near project area and impact prediction and control measures proposed by GHCL Ltd. The proposed project will not have any significant negative impact on environment. Company operations are limited to the plant boundary and no negative impacts on Vipassana Centre are anticipated. The company will have robust peripheral Green Belt in order to attenuate noise and air emission due to plant operations.	• Recurring Cost- 0.5 crore		
2	CSR - Animal Husbandry	3	Regarding arrangements for Animal husbandry to Regarding distribution of kits to fisherman Regarding number of cattle present in the area	GHCL Foundation will support nearby community by providing education and livelihood support to make them self – reliant.	• Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR activities. • Unit will also promote development Initiatives for Fishing Communities such as Creation of infrastructure like ice plants, cold storages as well as provide operational inputs such as fishing boats, nets and engines • We have already provided veterinary doctor for nearby affected villages.	• GHCL Ltd will spend approx.. 4.35 crore towards Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages under CER activities	5 years	GHCL Limite

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Res
3	Site Selection	2	Regarding the alternative of site modhwa village. Regarding showing presence of marshy land near coastline	--	During the site selection, the alternative sites considered for setting-up of the proposed chemical complex project are given below: : Site 1 – Village Pingleswar, Taluka – Abdasa, Dist. Kutch Site 2 – Village Suthri, Taluka – Abdasa, Dist. Kutch Site 3 – Village Bambhdai, Taluka – Mandvi, Dist. Kutch Site 4 – Village Bada, Taluka – Mandvi, Dist. Kutch Site 5 – Village Modhva, Taluka Mandvi, Dist. Kutch The site at village bada is considered favorable based on the environmental and logistic advantages over other four sites. Justification of Site selection are given in Chapter-5 of EIA report.	--	--	GH
4	Sand Dunes	2	Concern of presence of sand dunes at bada coast Regarding digging of sand dunes for preparation of tunnels for water intake	--	• There is no disturbance to existing sand dunes. • Tunnelling work (much below ground level) for laying pipeline through sand dunes will be done by adopting proven construction methodology like micro tunnelling. The detailed Studies on sand dune mapping and morphological changes near the project site was carried by National Institute of Oceanography (NIO), Goa. This report can be referred from CSIR NIO Marine EIA. • GHCL Ltd is committed for conservation plan for sea turtles and sand dunes as suggested by various studies.	--	--	GH

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	
5	Turtle	3	Regarding presence of turtles on the coastline of bada Regarding information on endangered species not mentioned in EIA report Regarding hatching and presence of sea turtles	--	• Study on Status Survey and Conservation Plan for Sea Turtles along Mandvi Taluka, Bhuj, Gujarat by **Zoological Survey of India**, **Kolkata (April,2019)** is attached with EIA report. • ZSI study report mention that they did not any encounter any sea turtle and fresh/old nests or crawl marks of turtles on the beach. Since many of the factor for selection of a suitable nesting site are not conducive. • As per additional Ecological and Biodiversity study, suggests that the coast near the proposed project site may not be suitable for sea turtle nesting due to narrow supra tidal region, steep slope, dense vegetation and presence of predators such as dogs and jackals. Though, observations suggest that there may be no or negligible probability of sea turtle nesting. • GUIDE is also engaged for study of turtle survey and preparing conservation	• Contribution to Forest department for Sea Turtle Conservation Activities- 0.20 crore	10 years	G
6	Schedule 1 species (Peacock	4	Regarding presence of greater numbers of peacocks nearby and not	--	• Details of schedule - 1 species and conservation	• the proposed	10 years	G

o.	Issue related to	Nos. Issues	Concern in PH	G HCL LTD reply	Action Plan	Fund Required	Timelin
	Sandha and indian Monitor Lizard)		stated in report Presence of reptiles and amphibians not reported Related to study of presence of Indian Monitor Lizard in study area Regarding presence of gugal trees,		already incorporated in EIA report. • GHCL shall make financial allocations for taking up wildlife mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • GHCL Ltd have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle, Chinkara and Gugal - Schedule –I species and Critically Endangered species) to CWLW department of Gujarat.	Allocation for conservation of Schedule 1 species for 10 years is 1.25 crore	
7	Conservation Plan	2	Regarding conservation plan for Schedule 1 species Concern regarding green sea turtles and conservation plan for them	--	• GHCL shall make financial allocations for taking up wildlife • mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • The unit have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle, Chinkara and Gugal - Schedule –I species and Critically Endangered species) to CWLW	• the proposed budget allocation for conservation of Schedule 1 species for 10 years is 1.25 crore	10 Years

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	R
					department of Gujarat.			
3	Form 1(Water Bodies, Temples, Schedule 1 Species)	5	Regarding presence of waterbody not shown in form-1 Regarding religious places and lakes not mentioned in PFR report. Waterbody not mentioned in form-1 Data given in form-1 and EIA are different Waterbody not mentioned in form-1	--	• Environmental settings are given in Chapter-1 and Chapter-5 of EIA report. Approximate distance of water bodies, temples etc are given in EIA report. • Through drainage studies of the area, it was observed that there is one stream of 1st order entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, will be diverted to nearby passing Vengadi River in the west. • There are also pond inside the premises. It is proposed that pond i.e. inside the premises will be used to store entire annual surface runoff plant use. If permitted by concern authority.	• -Cost of drainage network of surface runoff, rainwater collection pond and rain water harvesting system – 53 crores (included in EMP)	--	GH
9	Govt. Land	3	Regarding type of land to be procured by the industry Regarding status of government land to be procured Providing data for proving gauchar land	--	• There is no gauchar land within proposed project site. M/s GHCL has applied to Industries Commissioner and District Collector for allotment of aforesaid land. Industries Commissioner has granted In Principle approval for Bonafied Industrial Purpose. District Collector has initiated actions for allotment of Govt. waste land.	--	--	GH
0	Fishing	8	Regarding details of Pagadia fisherman not mentioned and Marine EIA is misinterpreted	--	• Proper seawater intake and treated effluent disposal (ensure maximum • dilution) shall be done as per	• A provision of Rs. 1 crore to be earmarked for the biodiversity management plan	During constructi o n and	GH

o.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeli
			Regarding disturbance to fishes due to presence of pipeline		Marine EIA report prepared by NIO Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. Details of Fishery and fishermen including their family and population are given in Chapter-3 of marine EIA report. Other than construction phase, there will be no any impact on pagadiya fisher men. As shore line will remain undisturbed. It is mentioned in marine EIA report that no large-scale commercial fishing operation prevail in the study area except for minor shore based and Gill net operations. There are independent studies available which indicates there is no significant adverse impact on environment but there will be positive impact on environment. Unit will also promote development Initiatives for Fishing Communities including pagadiya under CER and CSR activities	implemented in the project area during construction phase and operation phase. • For periodic monitoring of the marine area environment during project • construction phase, a provision of Rs. 0.5 crore to earmarked. • For operation phase, Rs. 0.3 crore per year to be kept provision for • the monitoring. • GHCL Ltd will spend approx.. 0.75 crore towards Development Initiatives for Fishing Communities including pagadiya under CER activities	Operatio phase
			Regarding status of fishing near bada and Mandvi				
			Related to number of fisherman not incorporated in study				
			--				
			Related to presence of dead fishes not reported in study, fishing carried out for commercial purpose				
			Regarding presence of fisherman in study area				
1	Water Body (check dams)	2	Related to presence of seasonal river which passes near bada village and presence of dam over it	--	Through drainage studies of the area, it was observed that there is one stream of 1st order	• Cost of drainage network of surface runoff, rainwater	During construc and

No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timelin
			Related to distance of river from project site		entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, may be diverted to nearby passing Vengadi River in the west, which has two check dams, one for salinity ingress check and on upstream side for storing fresh water. This will not cause any adverse impact on the downstream. For channelizing the monsoon run off from the area adjacent to plant it is required to construct peripheral drain along plant boundary so that flooding is avoided and run off find its way to the natural slope towards Arabian Sea. So, the present hydrological setting of the area will remain unaffected. So, the present hydrological setting of the area will remain unaffected. The additional water enter into the vengadi river through drainage will not impact on check dam. As any additional water above the river and check dam shall overflow to the Arabian sea.	pond and rain water harvesting system – 53 crores (included in EMP)	Operatio phase
2	Traffic (R MH, Heavy Trucks, Road Usage)	4	Regarding number of trucks passing due to project for raw Related to traffic study not mentioned in ToR, impact not carried out Concern regarding public roads Regarding number of trucks passing	--	Traffic study are shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. We will use existing road network as no other transportation i.e. rail/water ways are available. We have carried out calculation on	--	

No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	R
					Traffic study (Level of Service) and added on Form Part-C.			
3	CSR General	1	Regarding past data of CSR	GHCL has proposed CSR budget in the EIA report which will be utilized based on need identification and village development meetings. CSR will be implemented with CSR implementing agencies including GHCL Foundation is working in following area. 1. Agro-livelihood and animal husbandry, 2. Education and skill development, 3. Health, water, and sanitation.	• GHCL's commitment towards the development of weaker sections of society has been a continuous initiative for more than two decades. Through its "GHCL Foundation Trust", GHCL has upgraded its CSR activities to cover a larger section of the society to provide support to the downtrodden, needy and marginalized citizens and also to create a social infrastructure for their sustenance. GHCL Foundation serves as the Corporate Social Responsibility arm of GHCL Limited and represents our commitment to the holistic development of our surrounding c ommunity. During year 2020-2021	--	--	GH

No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline
					Infrastructure d evelopment etc.		
			Regarding pollution to be caused by industry -- Regarding to dusting due to kiln and power plant,		• Environmental Management Plan envisages the plans for the proper implementation of mitigation measures to reduce the adverse	• Cost of Environment management plant including various installations for	

4	Pollution and Environment General	4	Related to disposal of effluent water	Unit will follow all the rules and regulation with their subsequent amendments as directed by concerned authorities	impacts. • The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment	Air Pollution, Water Pollution, Noise Control, Greenbelt Development, Occupational Health and Safety and other related activities.- 205.07 crore	--
5	Forest area	2	Related to distance of project site from forest area Details regarding families dependent on forest	There is no classified forest area.	• There is no forest land within the boundary of proposed project site. However, some part of the unclassed forest area located south of the project site outside boundary. Sea water intake and outfall pipeline will pass through underground micro tunnel in specific corridor to cross forest area. The permission from the Forest Department is	--	--

No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Resp
					of 0.9689 Ha. of un-class forest			
	Supporting for Industrial Development to GHCL LTD	--	For Employment For Infrastructure development in nearby village Social upliftment towards nearby villages Health facilities Women empower ment Skill	GHCL LTD team thanked for welcoming the industries	--	--	--	--
	Total	94						

21. The Proposal was considered in the 72nd **EAC Meeting held on 2.1.2024** wherein the EAC deferred the proposal for want of requisite information. Reply to the same was submitted by the PP vide letter dated 30.1.2024, and again the proposal was considered in the 74th EAC meeting Reply for the same was submitted on 28.3.2024.

S. No.	Queries Raised by EAC	Reply by PP
(i)	The Committee was of the view that PP shall compare the baseline data collected during December -February 2020 and data collected during December 2022 -February 2023. Accordingly, PP shall also carry out trend analysis of previous baseline data by conducting latest additional one-month baseline data	T R Associates have compared the baseline data collected during December 2019 - February 2020 and data collected during December 2022 - February 2023. Accordingly, T R Associates have carried out the trend analysis of previous baseline data by conducting latest additional one-month (February 2024) baseline data.
(ii)	The Committee noted that several representations have been received from various level of public raising several issues. The Committee was of the view that representations shall be forwarded to the PP for their response. The Committee also recommended that in the next meeting they will go through the video of proceedings of public hearing. The Committee will go through the response of PP then decide further course of action accordingly	PP informed that same type of questions have been raised in approximately 410 emails. The concerns raise are similar to issue raised in public hearing and samr has been replied in public hearing MoM. The committee deliberated on the each issues raised.

13. **Deliberations by the EAC**

The Committee members have reviewed the public hearing proceeding during the 78th EAC meeting held on 30th April 2024. Committee members have observed that 1st public hearing was scheduled on 6th April 2022. Advertisement of the public hearing schedule was given in the local daily newspaper in Gujarati Newspaper: Divya Bhaskar, dated 3rd March 2022 and English Newspaper, Times of INDIA, dated 4th March 2022, which is 30 days before the Public hearing, as mentioned in the EIA notification 2006 and their amendment also Submitted Draft EIA report to Concern authorities and Executive summary to Affected villages in line with EIA notification. However, it was postponed due to unavoidable circumstances.

A public hearing was rescheduled to 17th October 2022, as per the notification date of 9th May 2022, which states that in the event of any such postponement, the time duration for convening the rescheduled public hearing should not be less than forty-five days from the date of the first advertisement already published in accordance with the initial date of the public hearing. It shall be ensured that a minimum notice period of fifteen days shall be provided to the public before the re-scheduled date of the public hearing to furnish the responses in writing. The rescheduled advertisement was circulated in the daily local newspaper Divya Bhaskar on 30th September 2022 and Times of INDIA on 1st October 2022, 15 days before the public hearing as given in to the EIA notification 2006 and their amendment. Also, GPCB has Submitted an EIA report to

Concerned authorities and an Executive summary to the Affected villages in line with EIA notification. PP informed that Approximately 1,000-1,500 individuals may have attended the public hearing. However, only 106 people signed the signature sheet circulated by the GPCB concerned person during the public hearing. Therefore, GPCB reported 106 attendees in the proceedings. In the video film, it was observed that people who were opposing the project, have been given full opportunity to raise the issues before PH committee. Further, 1066 no. Issues were raised by the local people, and a point-wise reply from the project proponent was provided to them. The public hearing continued for about 10-11 hours. Sufficient time was given, the procedure was duly followed, and the concerns raised by the public were addressed, too. 1154, no. of written representations were received, including concerns raised, supporting letters from the affected local people, and replies to the written representation, which were also incorporated into the public hearing proceedings. Most issues raised during the public hearing were the Conservation of sand dunes, Environmental management plan, Vipassana meditation center, Conservation of Ecology and Biodiversity, Accreditation of Consultants, environmentally sensitive receptor distances, employment and other support provided by the project proponent after plant commissioning, etc.

Concerning the project, the proponent informed that it is essential to note the significant contributions of various organizations. The Marine Environment Impact assessment report was prepared by NIO, Mumbai, while the CRZ classification report, complete with a 1:4000 scale demarcation map, was prepared by IRS, Chennai. The sand dune and Biodiversity Conservation plan was developed by GUIDE Institute, Kutch, and the Sea turtle conservation plan was prepared by the Zoological Survey of INDIA (ZSI). Each of these organizations played a crucial role in ensuring the project's compliance with environmental regulations and preserving local biodiversity.

Based on the above details, report representation to the technical committee of GCZMA and give recommendations for CRZ clearance to GHCL Limited. The unit has also received Stage I and II approval from the Concerned forest authority.

PP informed that in the point of NABET accreditation, the project proponent informed that they awarded the project to NEERI in 2018. No NABET-accredited consultant accredited under sector 4 (e) was available during that period. NEERI is a nationally reputed organisation, and it also prepared EIA reports earlier for similar soda ash industries. Later, the unit reviewed and revalidated the EIA report with the NABET-accredited consultant M/s. T R Associates. T R Associates has also submitted the undertaking that they have verified the EIA/EMP report and prepared an addendum report describing our findings and observations. T R Associates has presented the committee that they have not observed any significant deviation in the EIA report prepared by the national repute organisation NEERI. The report discussed in the public consultation is as good as the report prepared by the accredited consultant and is factually correct. Additionally, the structure of the EIA report was complied with according to the EIA notification 2006 and its amendments.

After detailed deliberation, the Committee was of the view that since proposal involves CRZ clearance, views/comments of the CRZ division may also be obtained on the proposal from CRZ angle. The Comments /views of CRZ Division may be placed before the EAC (Industry -3) for consideration of the project. PP shall also submit clearcut land holding title of the proposed project site.

Project proposal was deferred for want of above additional information. Additional information shall be submitted online to the PARIVESH portal for further consideration by EAC.

-TRUE COPY-

ANNEXURE R/16

GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(IA DIVISION-INDUSTRY-3 SECTOR)
*****

Dated:17.6.2024

MINUTES OF THE 80th EXPERT APPRAISAL COMMITTEE (INDUSTRY-3 SECTOR) MEETING HELD ON 7th JUNE, 2024

Venue: Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003 through Video Conferencing (VC)

Time: 10:30 AM onwards

(i) Opening Remarks by the Chairman

Prof. (Dr.) A.B. Pandit, Chairman welcomed the Committee members and opened the EAC meeting for further deliberations.

(ii) Details of Agenda items by the Member Secretary

The Member Secretary then apprised the Committee about the details of Agenda items to be discussed during this Expert Appraisal Committee (EAC) meeting.

(iii) Confirmation of Minutes of the 79th EAC Meeting held on 8th-9th May, 2024.

The EAC noted that the final minutes of the above meeting were issued after incorporating the comments offered by the members and approved by the Chairman.

Parivesh 1.0

Agenda No.1

Proposed project to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity, 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka - Mandvi, District - Kutch in the Gujarat by "Greenfield Chemical Complex" of GHCL Ltd- Reconsideration of Environmental Clearance

[Proposal no: IA/GJ/IND3/408164/2022, File No. IA-J-11011/293/2021-IA-II(I)]

1. The proposal is for Environmental Clearance to the Proposed project to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity, 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka - Mandvi, District - Kutch in the Gujarat state by "Greenfield Chemical Complex" of GHCL Ltd

2. The project/activity is covered under Category 'A' of Item 4 (e) soda ash industry and 1(d) of Schedule of Environment Impact Assessment (EIA) Notification, 2006 (as amended) and requires appraisal at Central Level by the Expert Appraisal Committee (EAC) as the project is located outside the notified industrial area.

3. The ToR was issued by the Ministry, vide letter no. IA-J-11011/293/2021-IA-II(I) dated 10th August, 2021. The PP applied for the Environment Clearance in the Common Application Form and submitted the EIA/EMP Report and other documents. The PP in the CAF reported that it is a **Fresh EC case. The proposal was placed in 72nd EAC Meeting held on 2nd January, 2024**, **74th EAC meeting held on 6th Februay,2024, 78th EAC meeting held on 30th April,2024 wherein the proposal was deferred for want of requisite information now the proposal is placed in this 80th EAC meeting held on 7th June, 2024** where project was wherein the PP and an accredited Consultant, M/s. T. R Associates [NABET accreditation till **NABET Accreditation Number: NABET/EIA/2326/RA 0293 valid till 8th April, 2026**], made a detailed presentation on the salient features of the project and informed the following:

4. The PP reported that the Total land area is **5463200 m^2;** no additional land will be used **for proposed project** and no R& R is involved in the Project. The details of various products are as follows:

Sr. No.	**Name of the Product**	**Production Capacity (MT/Month)**	**CAS Number**	**End use**
1	Light Soda Ash	11,00,000 TPA	497-19-8	Manufacturing of glass, usage in chemical industry, paper and detergent manufacturing, and food industry
2	Dense Soda Ash	5,00,000 TPA	497-19-8	
3	Sodium bicarbonate	2,00,000 TPA	144-55-8	
Captive Co-generation Power plant Steam (CFBC boilers)			120 MW	
Emergency DG Set			5 MVA	
Note- The production capacities are planned in phased manner and for Phase 1 production capacity for LSA: 5,50,000 TPA, Dense Soda Ash: 2,50,000 TPA, SBC: 1,00,000 TPA and 60 MW for Captive Co-generation Power plant.				

5. The PP reported that there is no violation case as per the Notification No. S.O.804(E) dated 14.03.2017 and no direction is issued under E(P) Act/Air Act/Water Act.

6. The PP reported that there is no National Parks, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. **Marine National Park and Sanctuary, Jamnagar are located at 75 km aerial distance in South direction and Narayan Sarovar Sanctuary is located at more than 100 km aerial distance in North-West directions**. Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Gugal Schedule-I species were found in the study area for which conservation plan has been prepared and submitted to PCCF and Chief wildlife warden dated 9.11.2023.

7. The PP reported that the diversion of 0.9689 ha un-class forest for laying part of sea water intake and effluent disposal pipeline and passage for related construction equipment movement in Kachchh has been obtained vide letter dated 18. 7.2023.

8. The PP reported the Unit has received the Final recommendation letter from GZMA vide file no ENV/ 10/ 2021/184/ T- cell dated 26.12.2023. CRZ details are as:

Activities	**Zone**
Construction of process plant and utilities etc.	Outside CRZ area
Effluent collection	Outside CRZ area
Seawater Intake system i.e. sump and pump house	CRZ III
Intake Pipeline	CRZ IA, CRZ IB and CRZ IV
Outfall Pipeline	CRZ IA, CRZ IB and CRZ IV

Laying of Seawater Intake and effluent disposal underground pipeline through tunnel from unclassified Forest area, Sand dune area, intertidal area outside project boundary.

9. The PP reported that **Ambient air** quality monitoring was also carried out at **10 locations** during **December 2022 – February 2023**. The baseline data indicates the ranges of concentrations as: PM_{10} (50.31 **µg/m^3 to 83.48 µg/m^3**), $PM_{2.5}$ (**21.65 µg/ m^3 to 51.31 µg/ m^3**), SO_2 (BDL (DL=5) **to 17.38 µg/m^3**), NOx (**16.38 µg/m^3 to 41.49 µg/m^3**), Ozone (BDL (DL=10) **to 19.62 µg/m^3**), Ammonia, Carbon Monoxide, Lead (Pb), Arsenic (As), Nickel (Ni), Benzo(α)pyrene(B[a]P) and Benzene results were observed Below Detectable Limit. AAQ modelling study for point source emissions indicates that the maximum incremental GLCs after the proposed project would be **1.23** µg/m^3 in case of Lignite, **1.21** µg/m^3 in case of Coal and **1.19** µg/m^3 in case of Petcoke with respect to PM10, **1.71** µg/m^3 in case of Lignite, **0.229** µg/m^3 in case of Coal and **1.44** µg/m^3 in case of Petcoke with respect to SO_2 and **5.08**

$\mu g/m^3$ in case of lignite, **8.82** $\mu g/m^3$ in case of coal and **9.50** $\mu g/m^3$ in case of Petcoke with respect to NO_x, 2.39 $\mu g/m^3$ in case of NH_3. The resultant concentrations are within the National Ambient Air Quality Standards (NAAQS).

10. The PP reported that the total water requirement for project will be **14,61,038 m^3/day** which will be met from **Sea water.** Total Effluent of **14,48,508 m^3/day** [Domestic - **160 m^3/day** + Industrial – **14,48,348 m^3/day** (fresh seawater for dilution – 5,14,678 m^3/day + effluent generation from soda ash & CPP plant – 1,26,830 m^3/day + once through cooling – 8,07,000 m^3/day] will be generated. The industrial effluent generated (14,48,508 m^3/day) i.e. from RO/DM rejects, brine purification reject, distiller waste and boiler blowdown will be mixed with fresh seawater for dilution and wastewater from once-through cooling and treated and disposed into the Arabian Sea as per the recommendation of NIO. The characteristics of the discharge water are within the norms prescribed by CPCB. Domestic effluent (**160 m^3/day**) will be treated in sewage treatment plant and treated sewage will be reused in landscaping & gardening purposes.

11. The PP reported that the Power requirement for proposed project will be 120 MW and will be met from Captive Co-generation Power plant. D. G. Set (5 MVA X 1) [Fuel: HSD (60 KL)] shall be provided and used only in case of power failure. Stack (30 meter) and Retrofit shall provide as per CPCB norms to the DG sets. Industry will provide six Steam Boiler (150 TPH) for captive power plant, six lime kilns and D G sets

12. **Details of process emissions generation and its management:**

SR.NO.	Stack attached to	Capacity	Height of the stack (m)	Fuel & its Consumption	Expected Pollutant	APC System	GPCB Limit
1	CPP with flue gas desulphurization CFBC Boiler (6 Nos.)	150 TPH	130 m	Imported Coal/Lignite/ Pet coke (Imported Coal: 13,14,000 TPA, Lignite :19,71,000 TPA, Pet coke: 9,12,500 TPA)	SPM SO_2 NO_2 Hg	Individual ESP with each Boiler	PM ≤ 30 mg/Nm^3 $SO_2 \leq 100$ mg/Nm^3 $NO_2 \leq 100$ mg/Nm^3 $Hg \leq 0.03$ mg/Nm^3

2	D G Set (2/3 Nos.)	5 MVA	30 m	HSD (60 KL)	HC CO PM NO_x	Retrofitting	NOx 710 ppmv NMHC 100 mg/Nm3 PM 75 mg/Nm3 CO 150 mg/Nm3
3	Lime Kiln 1		68 m	Coke or Briquette or Anthracite (Coke - 1,30,000 TPA, Briquette- 1,55,000 TPA, Anthracite - 1,10,000 TPA)	SPM SO_2 NO_2	Scrubber and Dust Collector system	SPM ≤ 150 mg/Nm^3 SO_2 ≤ 100 ppm NO_2 ≤ 50 ppm
4	Lime Kiln 2		68 m			Scrubber and Dust Collector system	
5	Lime Kiln 3		68 m			Scrubber and Dust Collector system	
6	Lime Kiln 4		68 m			Scrubber and Dust Collector system	
7	Lime Kiln 5		68 m			Scrubber and Dust Collector system	
8	Lime Kiln 6		68 m			Scrubber and Dust Collector system	

SR.NO.	**Stack attached to**	**Height of the stack (m)**	**Expected Pollutant**	**APC System**

1	Ammonia Recovery system	42 m	Ammonia	Water scrubber
2	Lime grinding system / Slaker	65 / 20 m	PM / Water vapor	Bag filter / Adequate stack height
3	Calciner unit	37 m	PM	Scrubber, Bag filter
4	Densification	43 m	PM	Scrubber
5	Sodium Bi-Carbonate Unit	30 m	PM	Bag filter
6	Lime Kiln	Closed system	PM	Scrubber and Wet ESP

13. **Details of Solid Waste/ Hazardous Waste Generation and Its Management**:

Sr. No.	Type of Waste	Category	Quantity	Mode of Disposal
1	Settled Sludge from treatment of effluent generated from captive power plant & RO/DM Plant	35.3	1.0 MT/Annum	Collection, storage and disposal at approved TSDF site
2	Used Oil	5.1	12 KL	Collection, storage and used within premises as a lubricant / sold to registered recycler
3	Discarded Drums and Bags	33.1	6.45 MT/Annum	Collection, storage & sold to authorized vendor
4	Spent Ion exchange resin	35.2	3000 Lit/Annum	Collection, storage and disposal at approved TSDF site
5	Used Cotton	33.2	5 MT/Annum	Collection, storage and disposal at approved CHWIF site
6	Lead acid Batteries	Schedule-IV (17)	5 MT	Collection, storage & sold to authorized agency through auction

7	E-Waste	Schedule-I of E-Waste (Management) Rules, 2022	5 MT/ Annum	Collection, storage & sold to authorized agency through auction
8	Plastic Waste	-	2295 MT/Annum	Collection, Storage and Disposal to CPCB/SPCB authorized recyclers under EPR of Plastic Waste Management
9	Bio-medical Waste	-	0.035 MT/Annum	Collection, storage and disposal at as per Bio-medical Waste Management Rules, 2016
10	Construction and Demolition Waste	-	20 TPD	Collection, storage and utilize internally for area filling, road making etc.

Non-Hazardous Solid Waste Details

Sr. No.	Type of Waste	Source of Generation	Quantity	Mode of Disposal
1	STP sludge	STP	1152 MT/Annum	Reused as Manure in Greenbelt Development
2	Kitchen Waste	Canteen	0.01 MT/Day	Collected and composted in Composter and further used as manure for gardening in the premises
3	Ash (Fly ash & Bottom Ash)	Boiler	2726.847 TPD	Collection, storage & sold to cement Manufacturing/ Brick Manufacturing
4	Limestone rejects	Desulphurization Process	1,00,000 MT/Annum	Collection and reused in Boiler for desulphurization and as a sweetener in cement industry, road making, pavement etc.

14. The Budget earmarked towards the Environmental Management Plan (EMP) is ₹ **318.08 crore** (capital) and the Recurring Cost (operation and maintenance) will be about ₹ **6.98 Crore** per Annum. Industry proposes to allocate ₹ **18.04 Crore** per annum towards CER.

15. The PP proposed to set up an Environment Management Cell (EMC) by engaging Environment officals for the functioning of EMC.

16. The PP submitted the Disaster and Onsite and Offsite Emergency Plans in the EIA report.

17. The estimated total project cost is **Rs. 3563.08 Crores**. Total Employment will be **1200** persons as direct.

18. Intake pipeline and outfall pipeline fall in CRZ 1A, 1B and IV area as per demarcation. It was reported that construction of process plant and utilities fall outside the CRZ area. SCZMA recommendation has been obtained for Laying of Seawater Intake and effluent disposal underground pipeline through tunnel from unclassified Forest area, Sand dune area, intertidal area outside project boundary.

19. The Public Hearing earlier was scheduled to be held on 17.10.2022 at 11:00 Hrs, Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch, Public hearing was then time being postponed due to unavoidable circumstances. After that public hearing was completed on **17-10-2022 at 11.00 Hrs.** Venue: Project Site, Survey no. 432, Village: Bada, Taluka: Mandvi, District: Kutch, Gujarat. Which was presided over by Shri Chetan Mishan(GAS), Sub Divisonal Magistrate & Deputy Collector, Mundra- Kutch. Public hearing Details as given below:

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
1	CSR – Fodder	4	Steps to be taken for cattle Care about Maldhari Security regarding fodder supply for livestock.	Fodder will be provided as well as provision for veterinary doctor will be carried out by GHCL foundation under CSR activity.	Activities for fodder supply will be carried out under CSR and CER activities for strengthening the bond between the project authorities and the local population. (refer Ch-8 and Table 10.4 in Ch-10). Fodder field will be developed on the Government/allocate land to nearby villages. Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR activities for communities. During year 2020-2021, GHCL foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting	As per MoEF&CC Office Memorandum F.NO. 22-67/2017-IAIII, MoEF&CC, New Delhi, dated on 1st May 2018 GHCL Ltd has earmarked 0.5 % of capital investment (appro. Rs. 18.04 crore), towards the Corporate Environment Responsibility in 5 years GHCL Ltd will spend approx. 4.35 crore* towards Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages as per requirement under CER activities (* value may defer as per actual requirement)	5 years	GHCL Limited
2	Employment	5	For employment of local villagers Number of employment opportunities to be generated Priority must be given to nearby 10 villages Regarding priority to nearby villages	Information on employment opportunities has given by Project Proponent that there are different types of employment opportunities in the two phase of the projects i.e. construction	The proposed project has a potential for employment of skilled, semiskilled and unskilled employees during construction phase as well as	GHCL Ltd will spend approx. 2.25 crore towards Promoting activities for skill building to improve	During construction and Operation phase	GHCL Limited

S.No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			for labor work Regarding employment for local communities.	phase and operational phase of the project. GHCL will strive to provide these employment opportunities to the local people, for which work will be done for their skill development and employment opportunities will be provided to the local people. As per requirement, training will be given to local people in coordination with HR department. Priority will be given for employment of local people. In nearby villages a group of women can be formed so that they can work in Gruhudhyogs (Home- based business). M/s. GHCL shall provide employment to women as per their skills and qualification.	operational phase. The plant will create direct employment in phased manner for about 1200 (operational phase) skilled as well as semi-skilled staff and indirectly large number of unskilled manpower will be engaged for the project. For Employment, local people will get first priority as per suitability and requirement. People will also get employed by the contractors for various project related activities. (Refer Ch-8 of EIA report) GHCL foundation will carry out skill development Programme for local youth to improve their employment opportunities, women empowerment under CSR and CER activities.	employment opportunities and women empowerment in nearby villages under CER activities.		
3	CSR - Health	1	Regarding health facilities under CSR activities	Will provide mobile health van facility and upgradation of existing healthcare infrastructure	Industry will provide Mobile Health Care, Health Camps, and Specialized Check Up Camps in nearby villages. Necessary support and help will be extended for advanced diagnosis and treatment wherever identified, Free medical health checkup under CSR and CER activities.(Refer Ch-8 of EIA report). We have already initiated mobile health van facility for nearby affected villages of project site.	• GHCL Ltd will spend approx.. 1.12 crore towards Infrastructure development Such as primary healthcare units and the fulfilment of the basic amenities in PHCs including mobile medical van and Provide Bala-Rasayana to Malnutrition Children in Aanganwadi and PHC of nearby Villages under CER activities.	5 years	GHCL Limited
4	CSR - Education	3	Regarding scholarship under CSR activity Regarding skill development of youth and improvement of	Will build school in future as per requirement and will also upgrade the existing school infrastructure and will carry out	• Unit will be directed at two levels viz. school and skill building to improve employment opportunities. At • GHCL Foundation will spend approx..		5 years	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Conditions To provide educational facilities	skill development activities	school level we intend to promote quality of education and learnability, develop infrastructure of Government schools, provide vocational training as per the requirement under CSR and CER activities. • GHCL foundation will support local government and NGO to make that program more effective. • GHCL foundation will carry out skill development Programme for local youth to improve their employment opportunities, women empowerment under CSR and CER activities. • During year 2020-2021, GHCL Foundation has spent INR 9.03 Crores towards CSR activities. CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation, Animal husbandry, health care, SHG, Infrastructure development etc.	towards Infrastructure development for quality of education, which will ultimately upgrade schools in nearby villages under CER activities.		
5	Air Pollutants (SOx, NOx, Dust)	6	Height of chimney to be installed Levels of Sox and NOx Regarding acid rain cause by Sox Emission of PM during transportation and Emission of heavy metal such as	For minimizing Air Pollution, requisite height of the stacks will be provided as per the NAAQS norms. Besides this, Modern technology equipment's like Dust collector, Electrostatic Precipitator, Scrubber will	• The best available technology-based pollution prevention and control shall used to meet the regulatory standards and these pollution control systems will be commissioned before	• Air pollution • Capital cost would include air pollution control devices like ESPs, Scrubbers, Dust extraction	During operation phase	GHCL Limited

S.No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			mercury. Regarding once through cooling for 120 MW. Regarding linkage of fuel and how they are going to use it	installed. As a result, the pollution level will be within standard limits. GHCL will continue to support development of green belt in the surrounding villages through various agencies including GHCL Foundation (AF). GHCL shall endorses AF tree plantation movement of planting trees in entire Mandvi Taluka and 50,000 trees that mentioned, GHCL shall surely nurture those plants for five years.	commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the operational units, so that failure of the control system shall shut down the respective operational unit. • High efficiency ESPs shall be provided in the flue gas path of the CFBC boilers for control of particulate matter. • Finely ground limestone will be added to the boiler combustion zone • together with coal/lignite to arrest the SO2 formed during combustion. • Lime stone dozing system to the furnace to be designed to achieve higher than 90% capture of SO2. Monitoring system(CEMS) of air pollutants SO2, NOx, NH3, PM10 and PM2.5 will be implemented. • So, the expected pollutants will be well within standard norms. • The air quality monitoring will be carried out on regular basis by approved agencies by CPCB/GSPCB. (refer Ch-6 and Ch-10 of EIA report) • GHCL will implement greenbelt /plantation program to ameliorate the pollutants and improve the aesthetics and ambient air quality. (refer Ch-10 of EIA report) • There is negligible cooling water requirement for power generation. There is no any alternative effective system is available for soda ash plant.	Stacks, Dry Fog system, Wind screen etc- 89.28 crore • recurring cost would include operation and maintenance of pollution control devices- 1.50 crore • **Environmental monitoring Programme** capital cost include CCEMS, online weather station etc- 3.4 crore • Recurring cost – 0.95 crore • Greenbelt • Capital Cost- 20 Crore • Recurring Cost- 0.5 crore		

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					• There is no readily available infrastructure for transportation of fuel i.e. rail or water way. So, we have to transport through road. Traffic study are shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. In future, any alternative option available will explore. • GHCL Foundation will also promoting plantation activities in nearby villages under CSR and CER activities			
6	Water pollutants (BOD,COD,Ammonia, Mercury, Sea Weed, Mangroves)	7	Regarding water related question by Koli society Regarding decrease in number of phytoplanktons and disruption of food chain Regarding temperature and presence of ammonia in waste water Regarding presence of mangroves Regarding setup of tunnel for intake of sea water, seismic zone in which company falls, liquification of land due to heat Regarding discharge of effluents into sea containing ammonia and high temperature and death of fishes at Sutrapada plant Regarding quality of effluent in terms of BOD and COD	Effluent will be highly alkaline so it will be mixed with HCL and then it will be disposed off in sea. Design of structure will have done according to seismic zone V. In soda ash industry impact of ammonia is very low.	• Industry will provide adequate effluent management and monitoring system for disposal of treated water • Proper seawater intake and treated effluent disposal (ensure maximum dilution) shall be done as per recommendation Marine EIA report. • The water monitoring results of (surface and groundwater and marine) should be carefully evaluated to identify significant changes, if any, adverse change from the baseline accordingly, corrective measures will be taken to ensure the sustenance of water quality. However, there is no ground water pollution is envisage in such soda ash plant, • The ammonia concentration in treated waste water well	• Capital cost would include cost of ETP, STP etc- 14 crore • recurring cost would include operation and maintenance of pollution control	During operation phase	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					within the limit specified by CPCB for soda ash industry. • There is no such fish kill cases due to treated effluent in existing plant. There are independent studies available which indicates there is no significant adverse impact on marine environment but there will be positive impact on environment. • During studies, there is no such mangroves identified in sea water intake and outfall line area. • Design of pipeline/tunnel will be done according to seismic zone V. In case of catastrophic failure/ liquification on land, there are no chances of flooding as water transport through gravity.			
7	Marine Life	1	Effect on marine life due to proposed project	No adverse impact on fish or marine animals and sea weed observed.	• Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. The effluent release scheme can then be adequately modified to ascertain necessary dilution, if required. The efficiency of the diffuser must be checked periodically and if necessary, it should be cleaned to revert back to the dilution ascertained through initial tracer studies. • There are independent studies available which indicates there is no significant adverse	• A provision of Rs. 1 crore to be earmarked for the biodiversity management plan to be implemented in the project area during construction phase and operation phase. • For periodic monitoring of the marine area environment during project • construction phase, a provision of Rs. 0.5 crore to earmarked. • For operation phase, Rs. 0.3 crore per year to be kept provision	During constructio n and Operation phase	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					impact on environment but there will be positive impact on environment. • Design of pipeline/tunnel will be done according to seismic zone V. In case of catastrophic failure/ liquification on land, there are no chances of flooding as water transport through gravity.			
8	Health & Hygiene(Ammonia Leakge)	2	Skin diseases due to Soda Ash Regarding the leakage of ammonia.	GHCL will take care of any such issues related to Health of local peoples and workers. All the necessary measures for handling of chemicals will be implemented to reduce its impact on health of peoples. This information is also provided in the EIA report. All the pockets will have leak detection and repair system technology. Moreover, periodical maintenance will also be carried out. GHCL will ensure that there will be no leakage and therefore, there will not be occupational health issues for workers or villagers working in the plant. Moreover, GHCL will also provide PPE kits to workers for their safety.	• Ammonia tanks should have latest instrumentation provision for pressure indication, temperature indication and level indication. The provision of instrumentation should be within 100 percent redundancy. Continues recording of major parameters pertaining to the storages shall be maintained in the control room. • Unit will provide all the safety measure for ammonia storage as well as also prepare onsite and offsite emergency plan and all the APCM with respective units to mitigate the air pollution. The best available technology-based pollution prevention and control shall used to meet the regulatory standards and these pollution control systems will be	• Capital cost would include cost of OHS center, PPEs, fire & safety instruments, automation system for ammonia storage – 3.4 crore • Recurring cost would include maintenance charges and training, audit & health check-up etc.- 0.35 crore	During operation phase	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					commissioned before commencement of operation of the project. Wherever possible, the control systems shall be interlinked with the operational units, so that failure of the control system shall shut down the respective operational unit. There is no significant impact observed in the existing soda ash plants in Gujarat.. • There are rare possibilities of ammonia leakage observed in soda ash plant however, recommendation of Disaster management plan and risk assessment will be followed.			
9	CSR - Farmers	3	Facilities to be provided to nearby How hygenic the plant will be? How hygenic will be bada plant and what facility will be provided to the farmer.	GHCL Foundation is already providing subsidy for drip irrigation and GHCL will also consider to support this scheme further out of the CSR funds proposed for this project. To help agriculture, GHCL will help farmers as part of our CSR activity in consultation with villagers. The details and type of developmental work will be decided in consultation with villagers. GHCL foundation has been working for farmers through its different schemes like ground water recharge, water harvesting, zero chemical farming, drip irrigation etc.	• Industry will Promote environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of high-quality seeds/manure, efficient irrigation solutions, etc. under CSR and CER activities	GHCL Ltd will spend approx.. 3.00 crore towardsPromoting environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of high-quality seeds/manure, efficient irrigation solutions, etc under CER activities.	5 years	GHCL Limited
10	EIA Report & PH	14	EIA report is not correct	The terrestrial EIA report	• It is requested to note that as			GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
	advertisement		Regarding the alternative of site modhwa village. Regarding the NIO accreditation to prepare marine EIA report Regarding ToR granted and Study carried out prior of ToR granted. Regarding the advertisement of the PH Regarding NABET accreditation of consultant organization Regarding Marine EIA Regarding NEERI who has prepared EIA report Regarding the correction in EIA report Regarding the monitoring data collection Regarding accreditation certificate of additional studies for ecology.	prepared by CSIR NEERI and Marine EIA report is prepared by NIO, Mumbai	per OM number J-17011/8/92-IA-III dated 8th August, 2019, there are 7 institutes/agencies authorized for preparation of CZMPS in consonance with the provision of CRZ notification, 2019 vide GSR 37(e) dated 18/01/2019. IRS anna university Chennai has prepared the CRZ map for GHCL LTD. CSIR - NIO is Expert hired to carryout the Marine EIA study. EIA report has been prepared by CSIR-NEERI, which is reputed governmental body and QCI NABET accredited consultant. An extensive study on the ecology and Biodiversity in the study area was conducted by the QCI NABET approved functional area expert.			
11	Vipassana	3	Project site is near Vipassana meditation center The meditation center will be disturbed due to industry. Ammonia used in the industry. Related to presence of Vipassana center and other religious places in 15km radius of project site	--	Environmental Management Plan envisages the plans for the proper implementation of mitigation measures to reduce the adverse impacts. The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment. The monitoring of all valued environmental components will be monitored as per the norms prescribed by GPCB/CPCB and the time to- time guidelines issued for soda	Cost of Environment management plant including various installations for Air Pollution, Water Pollution, Noise Control, Greenbelt Development, Occupational Health and Safety and other related activities.- 205.07 crore	--	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					ash manufacturing industry. It is reported in CSIR NEERI report that there are no significant impact expected on man-made sensitive installations and habitations. On basis of study of present environment condition near project area and impact prediction and control measures proposed by GHCL Ltd. The proposed project will not have any significant negative impact on environment. Company operations are limited to the plant boundary and no negative impacts on Vipassana Centre are anticipated. The company will have robust peripheral Green Belt in order to attenuate noise and air emission due to plant operations.	• Recurring Cost- 0.5 crore		
12	CSR - Animal Husbandry	3	Regarding arrangements for Animal husbandry to Regarding distribution of kits to fisherman Regarding number of cattle present in the area	GHCL Foundation will support nearby community by providing education and livelihood support to make them self – reliant.	• Unit will do promotion through providing support for breed improvement, animal health care, fodder improvement and providing veterinary doctor in nearby villages under CER and CSR activities. • Unit will also promote development Initiatives for Fishing Communities such as Creation of infrastructure like ice plants, cold storages as well as provide operational inputs such as fishing boats, nets and engines • We have already provided veterinary doctor for nearby affected villages.	• GHCL Ltd will spend approx.. 4.35 crore towards Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages under CER activities	5 years	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
13	Site Selection	2	Regarding the alternative of site modhwa village. Regarding showing presence of marshy land near coastline	--	During the site selection, the alternative sites considered for setting-up of the proposed chemical complex project are given below: : Site 1 – Village Pingleswar, Taluka – Abdasa, Dist. Kutch Site 2 – Village Suthri, Taluka – Abdasa, Dist. Kutch Site 3 – Village Bambhdai, Taluka – Mandvi, Dist. Kutch Site 4 – Village Bada, Taluka – Mandvi, Dist. Kutch Site 5 – Village Modhva, Taluka Mandvi, Dist. Kutch The site at village bada is considered favorable based on the environmental and logistic advantages over other four sites. Justification of Site selection are given in Chapter-5 of EIA report.	--	--	GHCL Limited
14	Sand Dunes	2	Concern of presence of sand dunes at bada coast Regarding digging of sand dunes for preparation of tunnels for water intake	--	• There is no disturbance to existing sand dunes. • Tunnelling work (much below ground level) for laying pipeline through sand dunes will be done by adopting proven construction methodology like micro tunnelling. The detailed Studies on sand dune mapping and morphological changes near the project site was carried by National Institute of Oceanography (NIO), Goa. This report can be referred from CSIR NIO Marine EIA. • GHCL Ltd is committed for conservation plan for sea turtles and sand dunes as suggested by various studies.	--	--	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
15	Turtle	3	Regarding presence of turtles on the coastline of bada Regarding information on endangered species not mentioned in EIA report Regarding hatching and presence of sea turtles	--	• Study on Status Survey and Conservation Plan for Sea Turtles along Mandvi Taluka, Bhuj, Gujarat by **Zoological Survey of India**, **Kolkata (April,2019)** is attached with EIA report. • ZSI study report mention that they did not any encounter any sea turtle and fresh/old nests or crawl marks of turtles on the beach. Since many of the factor for selection of a suitable nesting site are not conducive. • As per additional Ecological and Biodiversity study, suggests that the coast near the proposed project site may not be suitable for sea turtle nesting due to narrow supra tidal region, steep slope, dense vegetation and presence of predators such as dogs and jackals. Though, observations suggest that there may be no or negligible probability of sea turtle nesting. • GUIDE is also engaged for study of turtle survey and preparing conservation	• Contribution to Forest department for Sea Turtle Conservation Activities- 0.20 crore	10 years	GHCL Ltd
16	Schedule 1 species (Peacock	4	Regarding presence of greater numbers of peacocks nearby and not	--	• Details of schedule - 1 species and conservation	• the proposed	10 years	GHCL Ltd

S. No.	Issue related to	Nos. Issues	Concern in PH	G HCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
	Sandha and indian Monitor Lizard)		stated in report Presence of reptiles and amphibians not reported Related to study of presence of Indian Monitor Lizard in study area Regarding presence of gugal trees,		already incorporated in EIA report. • GHCL shall make financial allocations for taking up wildlife mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • GHCL Ltd have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle, Chinkara and Gugal - Schedule –I species and Critically Endangered species) to CWLW department of Gujarat.	Allocation for conservation of Schedule 1 species for 10 years is 1.25 crore		
17	Conservation Plan	2	Regarding conservation plan for Schedule 1 species Concern regarding green sea turtles and conservation plan for them	--	• GHCL shall make financial allocations for taking up wildlife • mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife. • The unit have submitted Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle, Chinkara and Gugal - Schedule –I species and Critically Endangered species) to CWLW	• the proposed budget allocation for conservation of Schedule 1 species for 10 years is 1.25 crore	10 Years	GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					department of Gujarat.			
18	Form 1(Water Bodies, Temples, Schedule 1 Species)	5	Regarding presence of waterbody not shown in form-1 Regarding religious places and lakes not mentioned in PFR report. Waterbody not mentioned in form-1 Data given in form-1 and EIA are different Waterbody not mentioned in form-1	--	• Environmental settings are given in Chapter-1 and Chapter-5 of EIA report. Approximate distance of water bodies, temples etc are given in EIA report. • Through drainage studies of the area, it was observed that there is one stream of 1st order entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, will be diverted to nearby passing Vengadi River in the west. • There are also pond inside the premises. It is proposed that pond i.e. inside the premises will be used to store entire annual surface runoff plant use. If permitted by concern authority.	• -Cost of drainage network of surface runoff, rainwater collection pond and rain water harvesting system – 53 crores (included in EMP)	--	GHCL LTD
19	Govt. Land	3	Regarding type of land to be procured by the industry Regarding status of government land to be procured Providing data for proving gauchar land	--	• There is no gauchar land within proposed project site. M/s GHCL has applied to Industries Commissioner and District Collector for allotment of aforesaid land. Industries Commissioner has granted In Principle approval for Bonafied Industrial Purpose. District Collector has initiated actions for allotment of Govt. waste land.	--	--	GHCL LTD
20	Fishing	8	Regarding details of Pagadia fisherman not mentioned and Marine EIA is misinterpreted	--	• Proper seawater intake and treated effluent disposal (ensure maximum • dilution) shall be done as per	• A provision of Rs. 1 crore to be earmarked for the biodiversity management plan	During constructi o n and	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Regarding disturbance to fishes due to presence of pipeline Regarding status of fishing near bada and Mandvi Related to number of fisherman not incorporated in study -- Related to presence of dead fishes not reported in study, fishing carried out for commercial purpose Regarding presence of fisherman in study area		Marine EIA report prepared by NIO Industry should be ensured that the effluent released to the sea meets the prescribed GPCB/ CPCB norms at all times. This should be verified through tracer studies after the outfall becomes operational. Details of Fishery and fishermen including their family and population are given in Chapter-3 of marine EIA report. Other than construction phase, there will be no any impact on pagadiya fisher men. As shore line will remain undisturbed. It is mentioned in marine EIA report that no large-scale commercial fishing operation prevail in the study area except for minor shore based and Gill net operations. There are independent studies available which indicates there is no significant adverse impact on environment but there will be positive impact on environment. Unit will also promote development Initiatives for Fishing Communities including pagadiya under CER and CSR activities	implemented in the project area during construction phase and operation phase. • For periodic monitoring of the marine area environment during project • construction phase, a provision of Rs. 0.5 crore to earmarked. • For operation phase, Rs. 0.3 crore per year to be kept provision for • the monitoring. • GHCL Ltd will spend approx.. 0.75 crore towards Development Initiatives for Fishing Communities including pagadiya under CER activities	Operation phase	
21	Water Body (check dams)	2	Related to presence of seasonal river which passes near bada village and presence of dam over it	--	Through drainage studies of the area, it was observed that there is one stream of 1st order	• Cost of drainage network of surface runoff, rainwater	During construction and	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
			Related to distance of river from project site		entering the plant area from north. Although, it has small catchment area, it is proposed that this stream, may be diverted to nearby passing Vengadi River in the west, which has two check dams, one for salinity ingress check and on upstream side for storing fresh water. This will not cause any adverse impact on the downstream. For channelizing the monsoon run off from the area adjacent to plant it is required to construct peripheral drain along plant boundary so that flooding is avoided and run off find its way to the natural slope towards Arabian Sea. So, the present hydrological setting of the area will remain unaffected. So, the present hydrological setting of the area will remain unaffected. The additional water enter into the vengadi river through drainage will not impact on check dam. As any additional water above the river and check dam shall overflow to the Arabian sea.	pond and rain water harvesting system – 53 crores (included in EMP)	Operation phase	
22	Traffic (RMH, Heavy Trucks, Road Usage)	4	Regarding number of trucks passing due to project for raw material Related to traffic study not mentioned in ToR, impact not carried out Concern regarding public roads Regarding number of trucks passing	--	Traffic study are shown in section 3.2.3 of chapter-3 and impact due to transportation is show in 4.1.4.3 and 4.2.3 of Chapter-4 in EIA report. We will use existing road network as no other transportation i.e. rail/water ways are available. We have carried out calculation on	--		GHCL Limited

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					Traffic study (Level of Service) and added on Form Part-C.			
23	CSR General	1	Regarding past data of CSR	GHCL has proposed CSR budget in the EIA report which will be utilized based on need identification and village development meetings. CSR will be implemented with CSR implementing agencies including GHCL Foundation is working in following area. 1. Agro-livelihood and animal husbandry, 2. Education and skill development, 3. Health, water, and sanitation.	GHCL's commitment towards the development of weaker sections of society has been a continuous initiative for more than two decades. Through its "GHCL Foundation Trust", GHCL has upgraded its CSR activities to cover a larger section of the society to provide support to the downtrodden, needy and marginalized citizens and also to create a social infrastructure for their sustenance. GHCL Foundation serves as the Corporate Social Responsibility arm of GHCL Limited and represents our commitment to the holistic development of our Surrounding community. During year 2020-2021 GHCL has spent INR 9.03 Crores towards CSR activities. During year 2021-2022 GHCL has spent INR 10.62 Crores towards CSR activities CSR projects/activities worth INR 19.09 Cr. were implemented. GHCL wide range of CSR projects have touched and benefitted more than 90,200 lives over the years. Promoting such activities like water conservation, Animal husbandry, health care, SHG,	--	--	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					Infrastructure d evelopment etc.			

24	Pollution and Environment General	4	Regarding pollution to be caused by industry -- Regarding to dusting due to kiln and power plant, temperature of Related to disposal of effluent water	Unit will follow all the rules and regulation with their subsequent amendments as directed by concerned authorities	• Environmental Management Plan envisages the plans for the proper implementation of mitigation measures to reduce the adverse impacts. • The EMP implementation will minimize the impact of atmospheric emissions, liquid effluents, solid wastes and noise generation on the surrounding environment. • The monitoring of all valued environmental components will be • monitored as per the norms prescribed by GPCB/CPCB and the time to time guidelines issued for soda ash manufacturing industry.	• Cost of Environment management plant including various installations for Air Pollution, Water Pollution, Noise Control, Greenbelt Development, Occupational Health and Safety and other related activities.-205.07 crore • Recurring cost include maintaining and monitoring of all components-6.98 crore	--	GHCL Limited
25	Forest area	2	Related to distance of project site from forest area Details regarding families dependent on forest	There is no classified forest area.	• There is no forest land within the boundary of proposed project site. However, some part of the unclassed forest area located south of the project site outside boundary. Sea water intake and outfall pipeline will pass through underground micro tunnel in specific corridor to cross forest area. The permission from the Forest Department is under process. • There will be no major impact on families dependent on forest. As the pipeline will be laid under ground	--	--	GHCL LTD

S. No.	Issue related to	Nos. Issues	Concern in PH	GHCL LTD reply	Action Plan	Fund Required	Timeline	Responsibility
					of 0.9689 Ha. of un-class forest			
26	Supporting for Industrial Development to GHCL LTD	--	For Employment For Infrastructure development in nearby village Social upliftment towards nearby villages Health facilities Women empower ment Skill	GHCL LTD team thanked for welcoming the industries	--	--	--	--
	Total	94						

21. The proposal was considered by the EAC in its meetings held on 2nd January 2024, 6th, February, 2024, 30th April 2024, & 28.3.2024 and reply of the queries raised during the last meeting are as follows:

<table>
<tr><th>S. No.</th><th>Queries Raised by EAC</th><th>Reply by CRZ division</th></tr>
<tr><td></td><td>The Committee was of the view that since proposal involves CRZ clearance, views/comments of the CRZ division may also be obtained on the proposal from CRZ angle. The Comments /views of CRZ Division may be placed before the EAC (Industr</td><td>Comments of CRZ have been obtained. It was informed that the project activity is permissible as per para 3 (I) (a), 4(ii) (d), 8 I(i) (b), (ii) (b), 8 III A(iii)j,k, 8(IV) of CRZ Notification 2011. The Gujarat CZMA has recommended the proposal vide letter dated ENV/10/2021/187/T-Cell, dated 26/12/2023.

CRZ Division suggested that the adequacy of the Marine Environment Plan, DMP, studies carried out by CSIR-NIO, GUIDE and ZSI, and proposed mitigation measures related to the project may be examined along with GCZMA recommended conditions by the concerned EAC / Sector (Industry-3) during the appraisal process of the project. Accordingly, the Committee deliberated upon the reports submitted.

The proposed project site area of M/s. GHCL Limited has acquired 375.558 ha., including government and private land.

The unit has acquired 76.9669 ha. of government land and 298.5911 ha. of private land in the core plant area
The Status of land acquisition including Government as well as Private land along with permission for land use change for industrial purpose has been received from Industry Centre.
The type of land involved along with the area bifurcation into Government and private land is provided in below table

<table>
<tr><th>SR. NO.</th><th>TYPE OF LAND</th><th>TOTAL LAND SANCTIONED (Ha.)</th></tr>
<tr><td>1</td><td>Private Land</td><td>444.6849</td></tr>
</table>
</td></tr>
</table>

y -3) for consideration of the project. PP shall also submit clear-cut land holding title of the proposed project site.

2	Government Land	101.6351	76.9669
Total		546.3200	375.558

M/s. GHCL Limited has applied for Environmental Clearance (EC) for a plot area measuring 546.32 Ha.

- **M/s. GHCL Limited** has **acquired 76.9669 hectares**.
- Correspondence regarding the land allocation includes:
  - **A letter from the Industry Centre regarding the allotment of 101.6351 hectares of government land to M/s. GHCL Limited.**
  - **An allotment letter from the Government of Gujarat (GOG) to the Collector.**
  - **A letter from the Collector to M/s. GHCL Limited for the plot area measuring 76.9669 hectares.**
  - **The challan paid for the government land by M/s. GHCL Limited.**

These documents are provided in the subsequent slides

SR. NO.	TYPE OF LAND	TOTAL LAND SANCTIONED (Ha.)	LAND ACQUIRED (Ha.)	LAND ACQUISITION UNDER PROCESS (Ha.)
1	Government Land	101.6351	76.9669	24.6682

Land Acquisition letter regarding opinion regarding giving prior permission for certified Industrial Use M/s GHCL Limited vide letter dated 22.1.2024 is submitted.

Allotment letter of Government land to M/s GHCL Limited vide letter 16.5.2024 has been submitted.

Challan Paid for the Government land by the industry has been submitted.

STATUS OF PRIVATE LAND ACQUISITION

- **M/s. GHCL Limited** has **acquired 298.5911 hectares.**

SR. NO.	TYPE OF LAND	TOTAL LAND SANCTIONED (Ha.)	LAND ACQUIRED (Ha.)	LAND ACQUISITION UNDER PROCESS (Ha.)
1	Private Land	444.6849	298.5911	146.0938

13. **Deliberations by the EAC**

The Committee deliberated upon the additional information provided by the PP.

The Committee noted that there is an OM dated 7th October, 2014 for status of land acquisition w.r.t. project site while considering the case for environment clearance under EIA Notification, 2006. PP has submitted the relevant information in compliance to the said OM.

The committee was satisfied with the response provided by PP on above information. Further, Committee desired to submit the above information in writing. Accordingly, PP has submitted the desired information and EAC found the information/commitments satisfactory.

The Committee noted that Terms of reference (TOR) were granted by MoEF&CC on 10 August 2021. Further, PP has carried out various studies required for EIA and CRZ clearance namely (i) EIA Report; (ii) Marine EIA Report prepared by CSIR- NIO (Mumbai, Goa); (iii) Marine EIA Addendum Report prepared by CSIR- NIO (Mumbai, Goa); (iv) CRZ Report prepared by IRS, Anna University, Chennai; (v) CRZ Approved Maps prepared by IRS, Anna University, Chennai; (vi) Conservation Plan of Sea Turtle prepared by ZSI, Kolkata; (vii) Conservation & management plan for the conservation of Significant species prepared by GUIDE, Kachchh (viii) Conservation Plan of Sand Dune by CSIR-NIO, Mumbai etc. Further, based on EAC recommendations, M/s T R Associates, NABET-accredited consultant has carried out additional 3 months data collection as well as additional 1 month data to valid the existing study and also submitted the undertaking that they have verified the EIA/EMP report and prepared an addendum report describing findings and observations. It was also presented that they have not observed any significant deviation in the

EIA report prepared by the national repute organisation NEERI. The Committee also noted that PP has obtained CRZ Recommendation letter from GCZMA; Approval for Conservation Plan of Significant Species from PCCF, Gandhinagar as well as Stage-I and Stage-II Forest Clearances.

It was also noted that the public hearing was conducted on 17.10.2022 presided by SDM/Dy Collector as per Notification dated 9th May 2022. Approximately 1,000-1,500 individuals have attended the public hearing. The Committee also saw video of public proceedings and observed that several people are against the project while several others in favour of project. However, only 106 people signed the signature sheet circulated by the GPCB concerned person during the public hearing. Therefore, GPCB reported 106 attendees in the proceedings. Further, 1066 Issues were raised by the local people, and a point-wise reply from the project proponent was provided. The public hearing continued for about 10-11 hours. As per SPCB, sufficient time was given, the procedure was duly followed, and the concerns raised by the public were addressed. 1154, no. of written representations was received, including concerns raised and supporting letters from the affected local people and replies to the written representation, which were also incorporated into the public hearing proceedings. The action plan, including the public hearing issues, was incorporated into the Final EIA report and submitted seeking environmental clearance. The Matter was also examined by the CRZ Division,

The proposal was considered by the EAC in its meetings held on 2nd January 2024, 6th, February, 2024, 30th April 2024, & 28.3.2024 and deliberated on the above issues. Accordingly, the proposal of M/s GHCL **namely Greenfield Chemical Complex** may be recommended for grant of environmental clearance and CRZ clearance subject compliance of the following specific and General conditions:

The committee was satisfied with the response provided by PP on above information. Further, Committee desired to submit the above information in writing. Accordingly, PP has submitted the desired information and EAC found the information/commitments satisfactory.

The EAC constituted under the provisions of the EIA Notification, 2006 comprising expert members /domain experts in various fields, examined the proposal submitted by the PP in desired format along with the EIA/EMP reports prepared and submitted by the Consultant accredited by the QCI/ NABET on behalf of the PP.

The EAC noted that the PP has given an undertaking that the data and information given in the application and enclosures are true to the best of his knowledge and belief and no information has been suppressed in the EIA/EMP reports. If any part of data/information submitted is found to be false/ misleading at any stage, the project will be rejected and Environmental Clearance given, if any, will be revoked at the risk and cost of the PP.

The EAC noted that the EIA reports are in compliance with the ToR issued for the project, reflecting the present environmental status and the projected scenario for all the environmental components. The EAC deliberated on the proposed mitigation measures towards Air, Water, Noise

and Soil pollutions. The EAC advised that the storage of toxic/explosive raw materials/products shall be undertaken with utmost precautions and following the safety norms and best practices.

The EAC deliberated on the Onsite and Offsite Emergency plans and various mitigation measures to be proposed during the implementation also of the project and advised the PP to implement the provisions of the Rules and guidelines issued under the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, as amended time to time, and the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996.

The EAC deliberated on the proposal with due diligence in the process as notified under the provisions of the EIA Notification, 2006, as amended from time to time and accordingly made the recommendations to the proposal. The expert members of the EAC found the proposal in order and recommended for grant of environmental clearance.

The EAC is of the view that its recommendation and grant of environmental clearance by the regulatory authority to the project/activity is strictly under the provisions of the EIA Notification 2006 and its subsequent amendments. It does not tantamount/construe to approvals/consent/permissions etc. required to be obtained or standards/conditions to be followed under any other Acts/ Rules/ Subordinate legislations, etc., as may be applicable to the project. The PP shall obtain necessary permission as mandated under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981, as applicable from time to time, from the State Pollution Control Board, prior to construction & operation of the project.

23. **The EAC, after detailed deliberations, <u>recommended</u> the project for the grant of environmental clearance, <u>subject to the compliance of the terms and conditions</u> as under, and general terms and conditions in Annexure-I:**

(i) PP shall ensure that recommendations of SCZMA issued vide letter dated ENV/10/2021/187/T-Cell, dated 26/12/2023 for proposed greenfield chemical complex, sea water intake and effluent disposal facilities shall be implemented. Recommendations mentioned in Marine EIA Report; Conservation Plan of Sea Turtle report; Conservation & management plan for the conservation of Significant species prepared by GUIDE, Kachchh; Conservation Plan of Sand Dune by CSIR-NIO, Mumbai.

(ii) PP shall ensure that condition stipulated in letter dated 18.07.2023 for diversion of 0.96ha unclass forest and letter dated 4.01.2024 for final stage II.

(iii) ESP alongwith Stack height of 130 m shall be provided to Imported Coal/Lignite/ Pet coke fired with flue gas desulphurization 150TPH CFBC Boiler (6 Nos.) to control the particulate emission as per CPCB norms. Stack height of 30 m shall be provided to 5 MvA

DG set(2/3 nos). Scrubber and Dust Collector system alongwith stack height of 68 m shall be provided to Coke or Briquette or Anthracite fired lime kiln to control the particulate emission as per CPCB norms. Water scrubber system alongwith stack height of 42m shall be provided to ammonia recovery system. Bagfilter alongwith adequate stack height shall be provided to lime grinding system/slaker. Scrubber, Bag filter shall be provided to Calciner unit. Scrubber shall be provided to Densification. Bagfilter shall be provided to Sodium bicarbonate unit. ESP and wet Scrubber shall be provided to lime kiln.

(iv) Total fresh water requirement from sea water shall not exceed 14,61,038 m^3/day.

(v) NOC from the Concerned Local authority shall be obtained before start of the construction of plant and drawing of the ground water for the project activities, State Pollution Control Board / Pollution Control Committees shall not issue the Consent to Operate (CTO) under Air (Prevention and Control of Pollution) Act and Water (Prevention and Control of Pollution) Act till the project proponent shall obtain such permission.

(vi) Total Effluent generation shall not exceed **14,48,508 m^3/day** [Domestic - **160 m^3/day** + Industrial – **14,48,348 m^3/day** (fresh seawater for dilution – 5,14,678 m^3/day + effluent generation from soda ash & CPP plant – 1,26,830 m^3/day + once through cooling – 8,07,000 m^3/day]. The industrial effluent generated (14,48,508 m^3/day) i.e. from RO/DM rejects, brine purification reject, distiller waste and boiler blowdown shall be mixed with fresh seawater for dilution and wastewater from once-through cooling and treated and disposed into the Arabian Sea as per the recommendation of NIO and after achieving the prescribed norms of CPCB/SPCB. Domestic effluent (**160 m^3/day**) shall be treated in sewage treatment plant and treated sewage will be reused in landscaping & gardening purposes.

(vii) The unit shall meet the effluent norms notified by MoEF&CC vide GSR(424 E) dated 01.06.2011 for soda ash industry.

(viii) The PP shall develop greenbelt of at least 5-10 m width over an area of 18,02,856 m^2 (33%) within the project site mainly along the plant periphery, preferably within a year of the grant of EC. The tree saplings selected for the plantation should be of sufficient height, preferably 6-ft shall be planted in greenbelt area. The budget earmarked for the plantation shall be kept in a separate account and should be audited annually. The PP shall annually submit the audited statement along with proof of activities viz. photographs (before & after with geo-location date & time), details of expert agency engaged, details of species planted, number of species planted, survival rate, density of plantation etc. to the Regional Office of MoEF&CC before 1st July of every year for the activities carried out during previous year.

(ix) A separate Environmental Management Cell (having qualified persons with Environmental Science/Environmental Engineering/specialization in the project area) equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions and shall also engage Environment Officials. IN addition to this one

safety & health officer as per the qualification given in Factories Act 1948 shall be engaged within a month of grant of EC. PP should annually submit the audited statement of amount spent towards the engagement of qualified persons in EMC along with details of person engaged to the Regional Office of MoEF&CC before 1st July of every year for the activities carried out during previous year.

(x) The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, and risk mitigation measures relating to the project shall be implemented. The budget proposed under EMP is ₹ 318.08 crore (Capital cost) and ₹ 7.53 Crore per annum (Recurring cost) shall be kept in separate account and should be audited annually. The PP should submit the annual audited statement along with proof of implementation of activities proposed under EMP duly supported by photographs (before & after with geo-location date & time) and other document as applicable to the Regional Office of MoEF&CC before 1st July of every year for the activities carried out during previous year.

(xi) No banned chemicals shall be manufactured by the project proponent. No banned raw materials shall be used in the unit. The project proponent shall adhere to the notifications/guidelines of the Government in this regard.

(xii) The project proponent shall utilize modern technologies for capturing of carbon emitted and shall also develop carbon sink/carbon sequestration resources capable of capturing more than emitted. The implementation report shall be submitted to the IRO, MoEF&CC in this regard.

(xiii) All the hazardous waste shall be managed and disposed as per the HWM Rules 2016. Hazardous waste such as Distillation Residue and Off Specification Products shall be either sent to common incineration site or sent for coprocessing. Solid waste shall be segregated into dry and wet garbage at site in accordance to the Solid Waste Management Rules, 2016. Wet waste shall be converted into compost and used as manure for greenbelt development. Fly ash shall be stored in silos and handed over to the Cement manufacturers/ Cement Industry.

(xiv) All necessary precautions shall be taken to avoid accidents and action plan shall be implemented for avoiding accidents. The project proponent shall implement the onsite/offsite emergency plan/mock drill etc. and mitigation measures as prescribed under the rules and guidelines issued in the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, as amended time to time, and the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996. The occupier of new as well as expansion projects shall be required to comply with the provisions of the MSHIC Rules, 1989 including notifying their activities or seeking site approval from the concerned authorities, to address operational

safety aspects. In doing so, various schedule, particularly Schedule-5 of the said rules may be referred.

(xv) The volatile organic compounds (VOCs)/Fugitive emissions shall be controlled at 99.97 % with effective chillers/modern technology. Regular monitoring of VOCs shall be carried out.

(xvi) Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB servers. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel/drain carrying effluent within the premises.

(xvii) The storage of toxic/hazardous raw material shall be bare minimum with respect to quantity and inventory. Quantity and days of storage shall be submitted to the Regional Office of Ministry and SPCB along with the compliance report.

(xviii) The occupational health centre for surveillance of the worker's health shall be set up. The health data shall be used in deploying the duties of the workers. All workers & employees shall be provided with required safety kits/mask for personal protection.

(xix) Training shall be imparted to all employees on safety and health aspects for handling chemicals. Safety and visual reality training shall be provided to employees. Action plan for mitigation measures shall be properly implemented based on the safety and risk assessment studies.

(xx) The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire-fighting system shall be as per the norms.

(xxi) The solvent management shall be carried out as follows: (a) Reactor shall be connected to chilled brine condenser system. (b) Reactor and solvent handling pump shall have mechanical seals to prevent leakages. (c) Solvents shall be stored in a separate space specified with all safety measures. (d) Proper earthing shall be provided in all the electrical equipment wherever solvent handling is done. (e) Entire plant shall be fire proof. The solvent storage tanks shall be provided with breather valve to prevent losses. (f) All the solvent storage tanks shall be connected with vent condensers with chilled brine circulation.

(xxii) The storm water from the roof top shall be channelized through pipes to the storage tank constructed for harvesting of rain water in the premises and harvested water shall be used for various industrial processes in the unit. No recharge shall be permitted within the premises. Process effluent/ any wastewater shall not be allowed to mix with storm water.

(xxiii) The PP shall undertake waste minimization measures as below (a) Metering and control of quantities of active ingredients to minimize waste; (b) Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. (c) Use of automated filling to minimize spillage. (d) Use of Close Feed system into batch reactors. (e) Venting equipment through vapor recovery system. (f) Use of high pressure-hoses for equipment cleaning to reduce wastewater generation.

(xxiv) PP shall sensitize and create awareness among the people working within the project area as well as its surrounding area on the ban of Single Use Plastic in order to ensure the compliance of Notification published by MOEFCC on 12th August, 2021. A report along with photographs on the measures taken shall also be included in the six-monthly compliance report being submitted to concerned authority.

(xxv) The activities and the action plan proposed by the project proponent to address the issues raised during the public hearing as well as the related socio-economic issues in the study area shall be completed as per the schedule presented before the Committee and as described in the EIA report in letter and spirit.

Agenda No. 2.0

Establishment of new natural and synthetic surfactant chemical manufacturing unit Mouza Kulepairi, P.S. Bagnan, Dist-Howrah, West Bengal by M/s Detergeo Chem (EAST) Private Limited (DCEPL) - Consideration of Environmental Clearance

[Proposal No.: IA/WB/IND3/256360/2020, File No.: IA-J-11011/1/2020-IA-II(I)]

1. The proposal is for Environmental Clearance to the Establishment of new natural and synthetic surfactant chemical manufacturing unit Mouza Kulepairi, P.S. Bagnan, District -Howrah, West Bengal by M/s Detergeo Chem (EAST) Private Limited (DCEPL).

Annexure-II

List of members of the Expert Appraisal Committee (Industry-3) attended Video Conferencing (VC) meeting in Day -2

S. No.	Name of Member	Designation
1.	**Prof. (Dr.) A.B. Pandit**	Chairman
2.	**Dr. Suresh Panwar**	Member
3.	**Prof. (Dr.) Vijayanand S. Moholkar**	Member
4.	**Dr. (ER.) Dibakar Swain**	Member
5.	**Shri Dinabandhu Gouda**	Member
6.	**Dr. Kishore Malviya**	Member
7.	**Shri Dinesh Runiwal,**	Member
8	**Prof. (Dr.) Suneet Dwivedi**	Member
9	**Dr. P. Jagannadha Rao**	Member
10.	**Dr. D. S. Pai**	Member
11.	**Shri A N Singh**	Member Secretary
MOEFCC		
1.	**Dr. Kanchan Puri**	Scientist-B
2.	**Dr. S. Pradeep Kumar**	Scientist-B
3.	**Dr. Bhawana Kapkoti Negi**	Technical Officer

(Day-2)

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MOM approved by



(Prof. Aniruddha B. Pandit)

Chairman

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have satisfactorily complied with the conditions stipulated in the existing EC(s) and satisfactorily fulfilled all the commitments made during the earlier public hearing/consultation proceedings and also the commitments given while granting previous expansion, as may be applicable. This shall be duly recorded in the certified compliance report (CCR) issued by the IRO/CPCB/SPCB, which should not be more than one year old at the time of submission of application." The Committee was of the view that the ATR on the partly complied point was not verified by the IRO. Therefore, the same should be verified and should be recorded in the CCR by the IRO for further consideration of the proposal by EAC (Industry -3).

(iii) Water balance for monsoon and non-monsoon season to be submitted.

Accordingly, proposal was deferred for want of above additional information. Above all additional information shall be submitted online to the PARIVESH portal for further consideration by EAC.

Any Other Item

Agenda No. 84.20

Proposed project to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity, 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka - Mandvi, District - Kutch in the Gujarat by "Greenfield Chemical Complex" of GHCL Ltd- Reconsideration of Environmental Clearance

[Proposal no: IA/GJ/IND3/408164/2022, File No. IA-J-11011/293/2021-IA-II(I)]

1. Ministry has received project proposal seeking environmental clearance to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity, 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka - Mandvi, District - Kutch in the Gujarat by "Greenfield Chemical Complex" of GHCL Ltd.
2. The proposal was considered by the EAC (Industry-3) in its 80thmeeting held on 7th June, 2024 and recommended the proposal for environmental clearance. Further, matter was examined in the Ministry and observed that the large number of written representations received in the ministry and the issues involved. Accordingly, it was decided to undertake site visit by the sub-committee of EAC (Industry -3) to understand the ground situation. Based on the outcome of the same, project may be reconsidered by the EAC for further decision.
3. After detailed deliberations, the EAC constituted a sub-Committee comprising the members namely Dr. Suresh Panwar, Dr. Kishore Malviya and representative of the Ministry to undertake a site visit and submit the report to the Committee for further consideration of the proposal.

ANNEXURE-II

GENERAL EC CONDITIONS

- No further expansion or modifications in the plant, other than mentioned in the EIA Notification, 2006 and its amendments, shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change/SEIAA, as applicable. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry/SEIAA, as applicable, to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.
- The PP shall strictly comply with the rules and guidelines issued under the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, as amended time to time, the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996, and Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016 and other rules notified under various Acts.
- The energy source for lighting purpose shall be preferably LED based, or advanced having preference in energy conservation and environment betterment.
- The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under the Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).
- The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. The activities shall be undertaken by involving local villages and administration. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.
- The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.
- A copy of the clearance letter shall be sent by the PP to concerned Panchayat, ZillaParishad/Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.
- The PP shall also upload/submit six monthly reports on PARIVESH Portal on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data to the respective Integrated Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.
- The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Integrated Regional Office of MoEF&CC by e-mail.
- The PP shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry and at **https://parivesh.nic.in/**. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are

widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.

- The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.
- This Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, if any, as may be applicable to this project.

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Annexure-I

List of the Expert Appraisal Committee (Industry-3) members participated in Day -I during Video Conferencing (VC) meeting

S. No.	Name of Member	Designation
1.	Prof. (Dr.) A.B. Pandit	Chairman
2.	Dr. Suresh Panwar	Member
3.	Dr. (ER.) Dibakar Swain	Member
4.	Shri Dinabandhu Gouda	Member
5.	Dr. Kishore Malviya	Member
6.	Shri Amit Vashisht	Member
7.	Dr. P. Jagannadha Rao	Member
8.	Prof. (Dr.) Vijay S. Moholkar	Member
9.	Sh. Ashok Kumar Patre	Member
10.	Shri A N Singh	Member Secretary
MoEFCC		
1.	Dr. Kanchan Puri	Scientist-B
2.	Dr.Bhawana Kapkoti Negi	Technical Officer

List of the Expert Appraisal Committee (Industry-3) members participated in Day -II during Video Conferencing (VC) meeting

S. No.	Name of Member	Designation
1.	Prof. (Dr.) A.B. Pandit	Chairman
2.	Dr. Suresh Panwar	Member
3.	Dr. (ER.) Dibakar Swain	Member
4.	Shri Dinabandhu Gouda	Member
5.	Dr. Kishore Malviya	Member
6.	Shri Amit Vashisht	Member
7.	Dr. P. Jagannadha Rao	Member
8.	Prof. (Dr.) Vijay S. Moholkar	Member
9.	Sh. Ashok Kumar Patre	Member
10.	Shri A N Singh	Member Secretary
MoEFCC		
1.	Dr. Kanchan Puri	Scientist-B
2.	Dr.Bhawana Kapkoti Negi	Technical Officer

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MoM approved by



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ANNEXURE R/18

GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(IA DIVISION-INDUSTRY-3 SECTOR)
*****

Dated: 24.10.2024

MINUTES OF THE 87th EXPERT APPRAISAL COMMITTEE (INDUSTRY-3 SECTOR) MEETING FOR PROJECTS LISTED FROM "PARIVESH 1 PORTAL" HELD ON 21st October 2024

Venue: Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003 through Video Conferencing (VC)

Time: 10:30 AM onwards

(i) Opening Remarks by the Chairman

Prof. (Dr.) A.B. Pandit, Chairman welcomed the Committee members and opened the EAC meeting for further deliberations.

(ii) Details of Agenda items by the Member Secretary

The Member Secretary then apprised the Committee about the details of Agenda items to be discussed during this Expert Appraisal Committee (EAC) meeting.

(iii) Confirmation of Minutes of the 86th EAC Meeting held on 30th September & 1st October, 2024.

The EAC noted that the final minutes of the above meeting were issued after incorporating the comments offered by the members and approved by the Chairman.

PARIVESH 1 Portal

Agenda No. 87.1

Proposed expansion project for manufacturing of Marine Chemicals, Fertilizers and Captive Co-Gen Power Plant located at Greater Rann of Kutch, Nr. Village Dhordo, Tal: Bhuj, Dist. Kutch, Gujarat by M/s. Agrocel Industries Pvt. Ltd. - Consideration of Environmental Clearance

[Proposal no: IA/GJ/IND3/277411/2020, F.NO.: IA-J-11011/269/2020-IA-II(I)]

1. The proposal is for the environmental clearance Proposed expansion project for manufacturing of Marine Chemicals, Fertilizers and Captive Co-Gen Power Plant located at Greater Rann of Kutch, Nr. Village Dhordo, Tal: Bhuj, Dist. Kutch, Gujarat by M/s. Agrocel Industries Pvt. Ltd.

2. The project/activity is covered under Category 'A' of item 5 (a)- **Chemical fertilizers** of Schedule of Environment Impact Assessment (EIA) Notification, 2006 (as amended).

3. ToR letter was granted from MoEFCC vide File No. IA-J-11011/269/2020-IA-II(I) dated 07th November 2020. The PP reported that it is an **expansion case**. The proposal is placed in the 87th EAC meeting 21-22 October 2024. Project Proponent and an accredited Consultant, San Envirotech Pvt. Ltd.,

Any Other Item(s)

Item No. 1

Proposed project to produce Light Soda Ash (LSA) of 11,00,000 TPA capacity; 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka – Mandvi, District – Kutch in the Gujarat by "Greenfield Chemical Complex" of GHCL Ltd. – Reconsideration of Environmental Clearance

[Proposal No.: IA/GJ/IND3/408164/2022, File No.: IA-J-11011/293/2021-IA-II(I)]

1. **Deliberations by the EAC:**

The proposed production of Light Soda Ash (LSA) of 11,00,000 TPA capacity, 5,00,000 TPA of Dense Soda Ash (DSA) and 2,00,000 TPA Sodium Bicarbonate (SBC) located at near village Bada, Taluka - Mandvi, District - Kutch in the Gujarat by "Greenfield Chemical Complex" of GHCL Ltd.- Site Visit Report

As per minutes of the 84th Expert Appraisal Committee (Industry-3) meeting held during 21st - 22nd August, 2024, a site visit of **"Greenfield Chemical Complex" of GHCL Ltd.** was undertaken by the sub-Committee comprising Dr. Suresh Panwar, Dr. Kishore Malviya and Sh. A N Singh, Scientist F, Ministry of Enonment, Forest & Climate Change to assess the existing environmental scenario of the proposed project site.

The Sub-Committee alongwith Dr. Yogesh Kumar, Scientist – C, IRO, MoEF&CC, Gandhinagar and Mr Naresh Chaudhari, GPCB RO Kutch (West) visited the site of **"Greenfield Chemical Complex" of GHCL Ltd.** on 09.10.2024.

(A) **The following officials of GHCL Ltd. were present at site during inspection:**

1. (A) Mr N N Radia- COO- GHCL
2. Mr Jayesh Patel- Projected Head GHCL
3. Mr Malav Dalwadi- CEO T R Associates and Environment Pvt Ltd.
4. Mr Jay Ram- Environmental Engineer GHCL

At the outset, Officials of **M/s. GHCL Ltd. welcomed the Sub-committee and** briefed the Sub-Committee about the proposed project, location of unit, land acquisition status, layout map, entry and exit of the proposed plant area, seawater intake and outfall pipeline area, proposed air emissions control system, effluent management system, greenbelt etc. The Sub-Committee visited the project site and had general round of the proposed project site, outfall point.

A. Background

(i) Project location

The proposed project site is located near village Bada Village in Mandavi Taluka, District Kutch, Gujarat, which is geographically located at the Arabian Sea Coast off Bada Village. It is located about 70 km from district headquarter Bhuj, 25 km from Mandavi and the road connectivity of Bada Village through NH 41 which is connecting Mandavi and Naliya.

(ii) The details of various proposed products to be manufactured are as follows:

Sr. No.	Name of the Product	Production Capacity (MT/Month)	CAS Number	End use
1	Light Soda Ash	11,00,000 TPA	497-19-8	Manufacturing of glass, usage in chemical industry, paper and detergent manufacturing, and food industry
2	Dense Soda Ash	5,00,000 TPA	497-19-8	
3	Sodium bicarbonate	2,00,000 TPA	144-55-8	
Captive Co-generation Power plant Steam (CFBC boilers)			120 MW	
Emergency DG Set			5 MVA	
Note- The production capacities are planned in phased manner and for Phase 1 production capacity for LSA: 5,50,000 TPA, Dense Soda Ash: 2,50,000 TPA, SBC: 1,00,000 TPA and 60 MW for Captive Co-generation Power plant.				

The proposed project also involves sea water intake pump house of 16 x 10^5 m^3/day (2x 8 x 10^5 m^3/day) and Effluent disposal facility of 15.8 x 10^5 m^3/day (2x 7.9x 10^5 m^3/day).

The soda ash process is in principal based on the well known (solvay) ammonia process.

(iii) Plot Area

As per EIA report, total plot area required for the proposed project is 546 ha. Break up of land and its acquisition details are as given below:

S.N.	Type of Land	Total Land Sanctioned (Ha)	Land Acquired	Remaining land acquisition under finalisation	Total acquired /finalisation	Remaining land acquisition under process
1	**Government Land**	**101.6351 (Letter from Industry Centre has been submitted**	**76.9669 (Letter from Collector to GHCL for**	**24.6682**	**101.6351**	**--**

		for allotment of land)	acquired plot)			
2	Private Land	444.6849	298.5911 (M/s GHCL has acquired)	23.3502	321.9413	122.7357
		546.32	375.558	48.0184	423.5764	122.74

It is proposed that out of 546.32 ha land, area earmarked for greenbelt is 180 .2856 ha (33 %).

As per proposal, M/s GHCL will withdraw water from two intake locations and disposal of effluent at two outfall locations and length of sea water intake and outfall effluent disposal is as given below:

- **(i) Intake pipeline 1 length is 1381.99 m.**
- **(ii) Intake pipeline 2 length is 1388.64 m**
- **(iii) Outfall pipeline 1 length is 2770.17 m**
- **(iv) Outfall pipeline 2 length is 3281.88 m**

It is reported that Pipelines will be laid through micro tunnelling. The pipelines for sea water intake and effluent disposal will be laid in a safe manner so that sand dunes stretch between the plant boundary and respective land fall points (LFP) are protected without any disturbance to their natural appearance and stability.

GCZMA recommendations

Forest & Environment Department, Government of Gujarat vide file no ENV/10/2021/184/T-Cell dated 26th December, 2023 has conveyed the GCZMA recommendations for grant of CRZ clearance for seawater intake and effluent disposal facilities. Baseline Marine Environmental Assessment, Effluent Dispersion Modeling Sand Dune Morphology study have been carried out by CSIR, NIO, Goa, Mumbai. It is reported that as per findings, suitable corridor for laying seawater intake and outfall were identified. Coast near site is stable based on satellite image analysis and sand dunes are found to be stable and suitable for tunnelling activities. A study on status survey and conservation plan for sea turtles along Mandavi Taluka of Bhuj, Gujarat was conducted by Zoological Survey of India and submitted its report in April, 2019. It is reported that Mandvi taluka is reported to have maximum sandy beaches and no presence of mangroves. The Kutch coastlines reported to have stabilized dunes specially around Mandavi. It is reported that no sea turtle nest/ fresh crawl marks were observed along the shore /beach surveyed. It is also reported that there is no existence of mangroves in proposed project area along route of the proposed lying intake and outfall pipelines and there would not be any impact on mangroves due to proposed activities.

Forest Clearance :

Regional Office, Gandhinagar, MoEF&CC vide letter dated 04.01.2024 has granted final (stage - II) approval of Central Government under Forest (Conservation) Act, 1980 for proposed diversion of 0.9689 ha un class forest land for laying part of sea water intake and effluent disposal pipeline and passage for related construction pipeline and passage for construction equipment movement in Kachchh District. One of the conditions stipulated is compensatory afforestation shall be taken up by the Forest Department over 2.00 ha de-graded forest land at Village Dhokda, Taluka Mandavi, District Kuchchh at the cost of user agency.

NABET-accredited consultant

Initially EIA-EMP report for the proposed **Greenfield Chemical Complex of M/s GHCL Ltd.** was prepared by CSIR, NEERI. Further based on recommendation of the EAC (Industry -3), EIA-EMP report was updated and validated by QCI-NABET Environmental Consultant for item 4 (e) category A of schedule of EIA Notification 2006, namely by M/s T R Associates. NABET-accredited consultant has carried out additional 3 months data collection as well as additional 1 month data to validate the existing study and also submitted the undertaking that they have verified the EIA/EMP report and prepared an addendum report describing findings and observations. It was also presented that they have not observed any significant deviation in the EIA report prepared by the national repute organisation NEERI.

Conservation of Ecology and Biodiversity

As per report prepared by Gujarat Institute of Desert Ecology, the project site does not fall in 10 km periphery of any protected areas such as National Park or Sanctuary or Eco-sensitive Zone. Major landuse land cover in the study area observed to be waste land, rain fed agriculture land, water bodies, Arabian sea and sand dunes and transport network. Due to sandy nature of shoreline the mangrove system is found to be absent at project site.

Approval of conservation plan for schedule – 1 species :

Chief Wildlife Warden, Gujarat vide letter no WLP/32/A/50-52/2023-24 dated 24.04.2023 has granted approval of conservation plan of selected schedule -1 species for greenfield project of M/s GHCL at Bada Village, Mandavi, Kutch, Gujarat. The Conservation plan of Rs. 136.50 Lakhs has been approved which includes components of Habitat Conservation, Protection and improvement; Research and Monitoring; Education and Awareness; Miscellaneous and monitoring.

Environmental Management Plan

1. **Details of process emissions generation and its management:**

SR.NO.	Stack attached to	Capacity	Height of the stack (m)	Fuel & its Consumption	Expected Pollutant	APC System	GPCB Limit
1	CPP with flue gas desulphurization CFBC Boiler (6 Nos.)	150 TPH	130 m	Imported Coal/Lignite/ Pet coke (Imported Coal: 13,14,000 TPA, Lignite :19,71,000 TPA,	SPM SO_2 NO_2 Hg	Individual ESP with each Boiler with desulphurisation	PM ≤ 30 mg/Nm^3 SO_2 ≤ 100 mg/Nm^3 NO_2 ≤ 100

				Pet coke: 9,12,500 TPA)			mg/Nm^3 Hg ≤ 0.03 mg/Nm^3
2	D G Set (2/3 Nos.)	5 MVA	30 m	HSD (60 KL)	HC CO PM NO_x	Retrofitting	NOx 710 ppmv NMHC 100 mg/Nm3 PM 75 mg/Nm3 CO 150 mg/Nm3
3	Lime Kiln 1		68 m	Coke or Briquette or Anthracite (Coke - 1,30,000 TPA, Briquette- 1,55,000 TPA, Anthracite - 1,10,000 TPA)	SPM SO_2 NO_2	Scrubber and Dust Collector system	SPM ≤ 150 mg/Nm^3 SO_2 ≤ 100 ppm NO_2 ≤ 50 ppm
4	Lime Kiln 2		68 m			Scrubber and Dust Collector system	
5	Lime Kiln 3		68 m			Scrubber and Dust Collector system	
6	Lime Kiln 4		68 m			Scrubber and Dust Collector system	
7	Lime Kiln 5		68 m			Scrubber and Dust Collector system	
8	Lime Kiln 6		68 m			Scrubber and Dust Collector system	

SR.NO.	**Stack attached to**	**Height of the stack (m)**	**Expected Pollutant**	**APC System**
1	Ammonia Recovery system	42 m	Ammonia	Water scrubber followed by acid aquas solution
2	Lime grinding system / Slaker	65 / 20 m	PM / Water vapor	Bag filter / Adequate stack height

3	Calciner unit	37 m	PM	Scrubber, Bag filter
4	Densification	43 m	PM	Scrubber
5	Sodium Bi-Carbonate Unit	30 m	PM	Bag filter
6	Lime Kiln	Closed system	PM	Scrubber and Wet ESP

2. **Details of Solid Waste/ Hazardous Waste Generation and Its Management**:

Sr. No.	Type of Waste	Category	Quantity	Mode of Disposal
1	Settled Sludge from treatment of effluent generated from captive power plant & RO/DM Plant	35.3	1.0 MT/Annum	Collection, storage and disposal at approved TSDF site
2	Used Oil	5.1	12 KL	Collection, storage and used within premises as a lubricant / sold to registered recycler
3	Discarded Drums and Bags	33.1	6.45 MT/Annum	Collection, storage & sold to authorized vendor
4	Spent Ion exchange resin	35.2	3000 Lit/Annum	Collection, storage and disposal at approved TSDF site
5	Used Cotton	33.2	5 MT/Annum	Collection, storage and disposal at approved CHWIF site
6	Lead acid Batteries	Schedule-IV (17)	5 MT	Collection, storage & sold to authorized agency through auction
7	E-Waste	Schedule-I of E-Waste (Management) Rules, 2022	5 MT/ Annum	Collection, storage & sold to authorized agency through auction
8	Plastic Waste	-	2295 MT/Annum	Collection, Storage and Disposal to CPCB/SPCB authorized recyclers under EPR of Plastic Waste Management

9	Bio-medical Waste	-	0.035 MT/Annum	Collection, storage and disposal at as per Bio-medical Waste Management Rules, 2016
10	Construction and Demolition Waste	-	20 TPD	Collection, storage and utilize internally for area filling, road making etc.

Non-Hazardous Solid Waste Details

Sr. No.	Type of Waste	Source of Generation	Quantity	Mode of Disposal
1	STP sludge	STP	1152 MT/Annum	Reused as Manure in Greenbelt Development
2	Kitchen Waste	Canteen	0.01 MT/Day	Collected and composted in Composter and further used as manure for gardening in the premises
3	Ash (Fly ash & Bottom Ash)	Boiler	2726.847 TPD	Collection in silo, storage & sold to cement Manufacturing/ Brick Manufacturing
4	Limestone rejects	Desulphurization Process	1,00,000 MT/Annum	Collection and reused in Boiler for desulphurization and as a sweetener in cement industry, road making, pavement etc.

3. Wastewater management :

The liquid effluents from the soda ash process includes wastewater from distillation, brine purification and cooling waters from lime kiln gas washers, absorption, distillation towers and calcination. Wastewater shall be treated and solids will be separated in the Effluent Treatment Plant. The treated and diluted effluents will be disposed off into Arabian sea at designated point as per dispersion modelling studies and recommendation of SCZMA. Online pH, temperature, flow meter, SS and TOC analyser shall be provided for online monitoring and records shall be maintained. Sewage will be treated in the STP and treated water will be recycled for horticulture purpose.

4. Capital Cost and recurring cost earmarked for EMP and its break up is as given below:

S.N	EMP			Capital cost in Rs Crore	Recurring cost Crore per annum
		Components	Cost		

1	Air Pollution	Flue Gas Emissions Individual ESP with 6 No. Boiler Scrubber and Dust Collector system with 6 No. Lime Kiln	12.03	89.280	1.5
		Process Gas Emissions Water Scrubber with Ammonia Recovery system (Including 2 no of stack)	2.70		
		Bag Filters & Scrubbers	11.45		
		ESP- CFBC	30		
		Dust Suppression& Bed Ash System(Fly ash management) including Wind Screen	6.2		
		Various Stacks	26		
		Dry Fog system	0.9		
2	Water Pollution	ETP & STP	14	14	0.12
3	Environmental Monitoring	Continuous Emission & Effluent Monitoring System	3.4	3.4	1.3
4	Noise Pollution	Acoustic Enclosures	2.9	2.9	0.0035
5	Hazardous /Solid Waste Management	Storage area & Membership Charges	1.05	1.05	1.10
6	Greenbelt Development	Thick Greenbelt Development as per EMP	20	20	0.5
7	Fire & Safety	Fire Hydrant System	2.539	2.916	0.2
		Fire extinguisher	0.227		
		Automation for Chlorine and ammonia storage area	0.15		

8	Occupational Health & Safety	OHC, PPE'S, Mock drill, Safety Audit, & Misc	0.444	0.444	0.15
9	Miscellaneous	Rain water harvesting System, Env. Lab & Misc.	8.40	53	2.66
		Drainage Network for rain water	44.6		
10	CER	Promoting renewable energy, skill development Programme, Organic farming, water conservation (like village pond deepening), forestry etc. and develop infrastructure of schools, health facilities, Fishing activities, roads in nearby villages	18.04	18.04	-
	Total A			205.03	7.53
11	Renewable Energy (B)	Installation of Solar + Windmill (Capacity – 20 MW)	113	113	--
	Total A + B			318.03	7.53

Break up of CER activities is as given below:

S.N	Type of Activities	Yearly amount to be spent in CER activities (Rs. In Crore)					Total Amount to be spent (Rs. in crore)
1	Provision of Solar light, solar panel and its maintenance in nearby villages within 10 km of study area;	0.1	0.1	0.1	0.1	0.1	0.5
2	Infrastructure development Such as primary healthcare units and the fulfilment of the basic amenities in PHCs including	0.00	0.27	0.29	0.31	0.35	1.22

	mobile medical van and Provide Bala-Rasayana to Malnutrition Children in Aanganwadi and PHC of nearby Villages						
3	Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages	0.8	0.85	0.9	0.9	0.9	4.35
4	Infrastructure development for quality of education, which will ultimately upgrade schools in nearby villages	0.25	0.27	0.29	0.31	0.35	1.47
5	Development Initiatives for Fishing Communities such as Creation of infrastructure like ice plants, cold storages as well as provide operational inputs such as fishing boats, nets and engines	0.15	0.15	0.15	0.15	0.15	0.75
6	Promoting environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of highquality seeds/manure, efficient irrigation solutions, etc.	0.6	0.6	0.6	0.6	0.6	3.0
7	Promoting activities for skill building to improve employment	0.45	0.45	0.45	0.45	0.45	2.25

	opportunities and women empowerment in nearby villages						
8	Development of facilities within nearby villages such as roads	0.20	0.20	0.20	0.20	0.20	1.00
9	Activities for water conservation like deepening of nearby village ponds for storage of rainwater for domestic use of villagers	0.50	0.50	0.50	0.50	0.50	2.5
10	Promoting plantation activities through Forests by Heartfulness Institute in nearby villages	0.20	0.20	0.20	0.20	0.20	1.00
	Total	3.25	3.59	3.68	3.72	3.80	18.04

B. <u>During site visit, following observations were made:</u>

Visit Point 1: Project Site Entry

The starting plot while coming from Bhuj was explained and showcased on the toposheet. Enough road width was observed for the entry and exit point for at the proposed project site. It was observed that Bada village is quite away from the project site entry and it was informed by the PP that the raw material and finished goods trucks will never move towards the village. During visit, no construction activities at the project site was observed. It was observed that cotton cultivation was taking place at vacant land of the project site and its surrounding. PP informed that they are using the proposed land for temporary agriculture purpose and land use has been changed for non-agriculture purpose /industrial purpose for the acquired land. The surrounding land are private land owned by people. The study area is located in arid landscape with minimum rainfall. In the buffer area of the study area i.e. outside the project site, check dam was observed at northern side of buffer area within 10 km distance of project site and these also include seasonal rivers, rivulets streams and small nallahs in buffer area.

It was suggested by the committee to develop enough parking space inside the premises, with full fledge infrastructure for truck drivers. Parking area should be paved to avoid fugitive dust emissions. There should be a learning centre over road behaviour for the drivers. At no point of time the trucks should create any hindrance to the local movements of the nearby villagers.

Following statistics have brought into the notice of EAC Committee:

<u>Population</u>

- Bada population – 2011 census – 2719 Nos, 592 houses .
- Details of Distance w.r.t. plot boundary and main plant as given below:

S.N.	Locations	Distance from Plot Boundary (mtrs)	Distance from Main Plant (mtrs)
1	Vipasana Center	630	1800
2	Government High School	920	2330
3	Bada Primary School	610	2290
4	Bada Village	580	2000
5	Bhimnath Mahadev (It is a shrine worship place for specific Community)	190	1500

Note: All distances are from 546.32 Ha (Land Boundary). All the above locations are towards N and NW direction from the project site. It was noted that Vipasana Centre is located at an arial distance of 630 m from the project boundary, which is also separated by a seasonal water stream i.e. situated opposite bank of seasonal stream.
It is observed that the seasonal water stream width starts from 81m to 96.6 m at the tip of the vipassana land. The water stream's check dam is 316m wide at the check dam point and the Vipasana center is 630m away from the plant boundary. Seasonal water stream is 314 m away from the proposed plant boundary. It was informed that land between stream and boundary is a private land acquired by people and same is not a part of proposed project. The wind rose diagram submitted in the EIA report and the orientation of wind mills in the area clearly describes that there will be minimal impact from the stack of the proposed plant.

The committee travelled all the area along seasonal stream banks to gain the holistic view on the impact of emissions from the plant on Vipasanna meditation center. Taking the distance from the plant boundary, river width and the wind direction into consideration, there will be minimal impact on the vipassana centre due to upcoming project. However, as a precautionary measures, the sub-Committee has further advised to develop 100m width green belt as buffer along the boundary towards Vipasana meditation centre. It was also advised that PP shall ensure that no /untreated/treated water from the project site shall be discharged into seasonal water stream.

Visit Point 2: Seawater Intake
The committee saw the sea water intake point which is passing under the sand dunes along the coast. It was observed that Dune height was varied from 1.5 to 5 m height with beach grass and binder. It was stabilized dunes. It was observed that flat sandy seashore. It was noted that Plant/complex will be established away from shore line and sand dune area. The sand dune and shore area will be used for laying seawater intake and effluent disposal pipelines. The pipelines will be laid through tunnelling in sand dune stretch to avoid and disturbance to sand dune area. The laying of pipeline will be one-time activities and restricted only for construction only. Since the line will be placed through tunnelling, there will be minimal adverse impact on the sand dunes of the area.

It was observed that wind mills are located in and around the project site. It was informed that out of which, four wind mills are located inside the proposed site. out of which two windmills will be relocated outside from the plant boundary. NOC has been given by the M/s GSFC. The same has no adverse impact on the proposed project.

Visit point 3: Seawater out fall point:

The committee walked down along the unclassified forest area, crossed sand dunes and reached upto the seashoreline area. No habitation was observed on the way of passing through forest area towards seaside. The area was dominated by plant species namely *Prosopis juliflora*, in certain patches a dominant herbs was seen which plays an important role in sand dune stabilization. It was advised to conserve plant species and try to increase the density in the sand dune area by artificial plantation. The best model in Gujarat for sand dunes stabilization and density improvement shall be taken up by the project proponent in consultation with State Forest Department.

It was observed that, proposed route of the outer pipeline is passing through stable sand dunes. There are no sand dunes observed near the outfall of seasonal water stream into sea. It is observed that outfall of natural water stream to sea is a rocky beach. It was observed that steep slope is there and high tide water line marking was seen up to sand dune bottom. No fishing boats were observed at seashore side. However, Paghadiya fishing nets were observed.

It was informed that the tunnelling of pipelines will not cause any hindrance to local fisherman if they want to carry out any fishing activity. The effluent will be monitored regularly by the concerned authorities and additional studies will be carried out periodically by institute of repute like NIO.

Visit point 4: Vipassana Centre

The committee moved around the area of vipasana centre and observed that the sewage water is accumulated into the pond beside the premises of vipasana centre. In addition, experts had visited into the Vipassana centre but no communication had been established at the site. It brought into the notice of Committee that the M/s GHCL will take up initiatives to restore the water quality of the pond under CSR. The committee moved around the Bada village and observed that the government school Bada village is approx. at an arial distance of 960 m from the project site. It was informed that approach road to the project site is much before the Bada village so there will be no adverse impact towards village side due to transportation activities.

Visit point 5: Visit of vocational training centre

It was informed that three courses were undergoing, which are approved under National Skill Development Centre. These courses provided by GHCL foundation under CSR at free of cost to the youths of surrounding villages.

GHCL is carrying out CSR activities in the area of education, animal husbandry including fodder, fodder plot development, veterinary service with veterinary van. GHCL is also working in area of health with mobile clinic, agriculture and fisheries. They have spent around 6.5 crores in last three years in surrounding villages under CSR.

The committee had discussed regarding the dust emission due to transportation of the lignite/coal in which project proponent informed that covered vehicles, covered shed, covered gantry will be provide for storage and conveying of fuel. Over and above said precaution sprinklers and windshield shall be utilise to avoid any fugitive emission. After above said precaution there will be dense green belt as advised by MoEF&CC.

Recommendations of the Sub-Committee:

(i) Storage of raw materials shall be either in silos or in covered areas to prevent dust pollution and other fugitive emissions. All stockpiles should be constructed over impervious soil and garland drains with catch pits to trap runoff material shall be provided. coal shall be stored in covered sheds and wind breaking walls/curtains shall be provided around biomass storage area to prevent its suspension during high wind speed. Fly ash shall be collected in Silo. All Internal roads shall be paved. Industrial vacuum cleaner shall be provided to sweep the internal roads. The Air Pollution Control System shall be interlocked with process plant/machinery for shutdown in case of operational failure of Air Pollution Control Equipment.

(ii) There shall be adequate space inside the plant premises earmarked for parking of vehicles for raw materials and finished products and no parking to be allowed outside on public places. Out of the total project area, 15% shall be allotted solely for parking purposes with facilities like rest rooms with full fledge infrastructure for truck drivers etc. Parking area should be paved to avoid fugitive dust emissions. There should be a learning centre over road behaviour for the drivers.

(iii) PP shall develop 100m thick green belt as buffer along the boundary of project site towards Vipasana meditation centre.

(iv) PP shall install continuous air quality monitoring station towards Vipasana Centre to monitor real time ambient air quality status of the area.

(v) Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. In case of the treated effluent is to be utilized for gardening, real time monitoring system shall be installed at the ETP outlet.

(vi) PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground. A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis. Any non- compliance or infringement should be reported to the concerned authority.

(vii) The Pipeline of seawater intake and effluent disposal shall be laid in a safe manner (using tunnelling) so that the sand dunes stretch between the plant boundary and respective land fall points are protected without any disturbance to their natural appearance and stability.

(viii) PP shall ensure that no /untreated/treated water from the project site shall be discharged into seasonal water stream.

(ix) PP shall ensure the implementation of conservation plan of Rs. 136.50 Lakhs for schedule – I species as approved by Chief Wildlife Warden, Gujarat vide letter no WLP/32/A/50-52/2023-24 dated 24.04.2023 for greenfield project of M/s GHCL at Bada Village, Mandavi, Kutch, Gujarat.

(x) PP shall ensure the time bound implementation of CER activities of Rs. 18.01 Crores.

(xi) M/s GHCL shall take up initiatives to restore the water quality of the water pond located near Vipasna Centre. M/s GHCL shall carry out tree plantation drive along road of Bada Village in consultation with Village Administration.

(xii) PP shall provide training to 10 local youth every quarter on environment management including air pollution control device, ETP, solid waste management, fly ash based brick manufacturing, green belt development as part of skill development programme.

(xiii) PP shall set up occupational health Centre for surveillance of the worker's health within and outside the plant on a regular basis. The health data shall be used in deploying the duties of the workers. All workers & employees shall be provided with required safety kits/mask for personal protection.

(xiv) Comprehensive water audit to be conducted on annual basis and report to the concerned Regional Office of MEF&CC. Outcome from the report to be implemented for conservation scheme.

The proposal was considered by the EAC in its meeting held on 21st October, 2024 and the Committee discussed the site visit report undertaken by the Sub- Committee. Further the issues were also discussed with project proponent.

The Committee noted that the proposal was earlier considered by the EAC in its 80th meeting held on 7th June, 2024 and the Committee recommended the proposal for grant of EC.

Deliberations by the EAC (Industry -3) :

i. PP informed the following :

1. M/s. GHCL Limited will acquire a total of **546.3200 hectares** for the proposed project. In alignment with this requirement, steps have been initiated in accordance with the terms outlined in a Memorandum of Understanding (MOU) with consolidators. While the acquisition process is progressing, advances related to this have been planned and are being executed to ensure the necessary land acquisitions are in place prior to the commissioning of the project. Furthermore, 33% of the total identified area will be allocated for the development of a dedicated greenbelt, reinforcing our environmental commitment.
2. That M/s. GHCL Limited is committed to developing and maintaining an average **100 m wide greenbelt** (towards Vipassana centre/Bada village) in NW and North direction facing the

entrance road. Also approximately an average **30-50 m wide greenbelt** in NE direction within the plant boundary, as per its environmental responsibility, which will be a part of total 33% greenbelt area.

3. That M/s. GHCL Limited will provide a Continuous Ambient Air Quality Monitoring Station (CAQMS) within the plant, towards the Vipassana Center, to ensure continuous monitoring and compliance.
4. That the M/s. GHCL Limited will provide an intermittent sprinkling system on both sides of the road and transportation route within plant, extending up to the storage yard, to effectively mitigate and control fugitive emissions during the transportation.
5. That the M/s. GHCL Limited ensures that paghadiya fishing activities will not be disrupted due to the project activities, during both the construction and operation phases due to micro tunnelling operation in inter-tidal zone. The company commits to taking all necessary measures to prevent any interference with local paghadiya fishing practices.
6. That the M/s. GHCL limited will install flow meters at the effluent discharge system. Also, SS monitoring system shall be installed if reliable system is available.
7. PP informed that the depth of micro-tunnelling depends on the topography. It will be approximately 14-15 meters below MSL and 5-6 meters below the seabed, extending beyond the intertidal zone.
8. The PP informed that local employment will be provided for the project as per the norms of State Government .
9. PP submitted the following revised CER activities :

Sr. No.	**Type of Activities**	**Yearly amount to be spent in CER activities (Rs. In Crore)**					**Total Amount to be spent (Rs. in crore)**
		1st Year	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	
1.	**Provision of Solar light, solar panel and its maintenance in nearby villages within 10 km of study area.**	**0.10**	**0.10**	**0.10**	**0.10**	**0.10**	**0.50**
2.	**Infrastructure development Such as primary healthcare units and the fulfilment of the basic amenities in PHCs including mobile medical van and Provide Bala-Rasayana to Malnutrition Children in Aanganwadi and PHC of nearby Villages.**	**0.00**	**0.27**	**0.29**	**0.31**	**0.35**	**1.22**

3.	**Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages.**	**0.80**	**0.85**	**0.90**	**0.90**	**0.90**	**4.35**
4.	**Infrastructure development for quality of education, which will ultimately upgrade schools in nearby villages.**	**0.25**	**0.27**	**0.29**	**0.31**	**0.35**	**1.47**
5.	**Development Initiatives for Fishing Communities such as Creation of infrastructure like ice plants, cold storages as well as provide operational inputs such as fishing boats, nets and engines.**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.75**
6.	**Promoting environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of highquality seeds/manure, efficient irrigation solutions, etc.**	**0.60**	**0.60**	**0.60**	**0.60**	**0.60**	**3.00**
7.	**Promoting activities for skill building to improve employment opportunities and women empowerment in nearby villages.**	**0.45**	**0.45**	**0.45**	**0.45**	**0.45**	**2.25**
8.	**Development of facilities within nearby villages such as roads.**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**1.00**

9.	**Activities for water conservation like deepening of nearby village ponds for storage of rainwater for domestic use of villagers.**	**0.50**	**0.50**	**0.50**	**0.50**	**0.50**	**2.50**
10.	**Promoting plantation activities through Forests by Heartfulness Institute in nearby villages.**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**1.00**
11.	**Installation of 100 solar street lights in nearby villages, namely Bada, Janakpur, Bhinsara, Panchotiya, Layja Mota, Layja Nana, Bhada, Bayath, Mapar, Bambhadai, Modhkuba and Padamapar. (Already 200 solar lights have been considered in point no. 1)**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.25**
12.	**Installation of a suitable capacity Sewage Treatment Plant with proper consultation with local administration in Bada Village.**	**-**	**0.10**	**2**	**0.30**	**-**	**2.40**
Total		3.30	3.74	5.73	4.07	3.85	20.69

10. PP submitted the revised capital cost and recurring cost earmarked for implementation of EMP

ASPECT OF ENVIRONMENTAL MANAGEMENT	**COST IN CRORE [RS.]**	**RECURRING COST (CRORE /ANNUM) [RS.]**	**REMARKS**
Air Pollution	89.28	1.50	Capital cost would include air pollution control devices like ESPs, Scrubbers, Dust extraction and suppression systems, Stacks, Dry Fog system, Wind screen and the recurring cost would include operation and maintenance of pollution control devices

Water Pollution	14	0.12	Capital cost would include cost of ETP, STP and recurring cost would include operation and maintenance of pollution control devices
Noise Pollution	2.9	0.0035	Capital cost would include providing adequate sound enclosures for TG, CO- compressor, DG Set
Hazardous / Solid Waste Management	1.05	1.10	Capital cost would include expense for providing storage area for hazardous waste and membership charges of TSDF/CHWIF Site and recurring cost would be for solid/ hazardous waste disposal charges and Sampling & analysis charges of solid waste.
Environmental monitoring Programme	3.4	1.30	Capital cost would include expense OCEMS, Online weather station, online pH, NH3-N, Temp meter and recurring cost would include monitoring and analysis of noise level., Sample analysis charges & ambient air & fugitive emission sampling & analysis charges etc., Fresh water & wastewater sample analysis charges etc. Soil: recurring cost would be for Soil Sample analysis., Marine area environment monitoring
Green Belt	20	0.5	Capital cost would include development of green belt within the project premises and recurring cost would include maintenance charges and manpower salary etc.
Renewable Energy	113	--	Capital cost would include Installation of Solar and Windmill
Fire safety & Occupational Health & Safety	3.41	0.35	Capital cost would include cost of OHS center, PPEs, fire & safety instruments and recurring cost would include maintenance charges and training, audit & health check-up etc.

Miscellaneous	53	2.66	Miscellaneous activity such as development of rain water harvesting system, Drainage Network for rain water, Environmental laboratory, Environmental Management system, miscellaneous study, statutory application fees, audit, training cost etc. and recurring cost would include biodiversity management plan, hiring of EMC and Conservation Plan for Schedule 1 species.
CER	20.69	--	Capital cost would include cost of CER activities such as promoting renewable energy, skill development Programme, Organic farming, water conservation (like village pond deepening), forestry etc. and develop infrastructure of schools, health facilities, Fishing activities, roads in nearby villages, Installation of additional solar street lights in nearby villages and Installation of a suitable capacity Sewage Treatment Plant with proper consultation with local administration in Bada Village.
Total (EMP + CER)	320.73	7.53	

23. **The EAC, after detailed deliberations, recommended the project for the grant of environmental clearance, subject to the compliance of the terms and conditions as under, and general terms and conditions in Annexure-I:**

(i) PP shall ensure that recommendations of SCZMA issued vide letter dated ENV/10/2021/187/T-Cell, dated 26/12/2023 for proposed greenfield chemical complex, sea water intake and effluent disposal facilities shall be implemented. Recommendations mentioned in Marine EIA Report; Conservation Plan of Sea Turtle report; Conservation & management plan for the conservation of Significant species prepared by GUIDE, Kachchh; Conservation Plan of Sand Dune by CSIR-NIO, Mumbai.

(ii) PP shall ensure that condition stipulated in letter dated 18.07.2023 for diversion of 0.96ha unclass forest and letter dated 4.01.2024 for final stage II.

(iii) ESP alongwith Stack height of 130 m shall be provided to Imported Coal/Lignite/ Pet coke fired with flue gas desulphurization 150TPH CFBC Boiler (6 Nos.) to control the particulate emission as per CPCB norms. Stack height of 30 m shall be provided to 5 MvA DG set(2/3 nos). Scrubber and Dust Collector system alongwith stack height of 68 m shall be provided to Coke or Briquette or Anthracite fired lime kiln to control the particulate emission as per CPCB norms. Water scrubber system alongwith stack height of 42m shall be provided to ammonia recovery system. Bagfilter

alongwith adequate stack height shall be provided to lime grinding system/slaker. Scrubber, Bag filter shall be provided to Calciner unit. Scrubber shall be provided to Densification. Bagfilter shall be provided to Sodium bicarbonate unit. Scrubber and wet ESP shall be provided to lime kiln.

(iv) PP shall install continuous ambient air quality monitoring station towards Vipasana Centre to monitor real time ambient air quality status of the area.

(v) Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB servers. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel/drain carrying effluent within the premises.

(vi) Total fresh water requirement from sea water shall not exceed 14,61,038 m^3/day.

(vii) NOC from the Concerned Local authority shall be obtained before start of the construction of plant and drawing of the ground water for the project activities, State Pollution Control Board / Pollution Control Committees shall not issue the Consent to Operate (CTO) under Air (Prevention and Control of Pollution) Act and Water (Prevention and Control of Pollution) Act till the project proponent shall obtain such permission.

(viii) Total Effluent generation shall not exceed **14,48,508 m^3/day** [Domestic - **160 m^3/day** + Industrial – **14,48,348 m^3/day** (fresh seawater for dilution – 5,14,678 m^3/day + effluent generation from soda ash & CPP plant – 1,26,830 m^3/day + once through cooling – 8,07,000 m^3/day]. The industrial effluent generated i.e. from RO/DM rejects, brine purification reject, distiller waste and boiler blowdown shall be mixed with fresh seawater for dilution and wastewater from once-through cooling and treated and disposed into the Arabian Sea as per the recommendation of NIO and after achieving the prescribed norms of CPCB/SPCB. Domestic effluent (**160 m^3/day**) shall be treated in sewage treatment plant and treated sewage will be reused in landscaping & gardening purposes.

(ix) The Pipeline of seawater intake and effluent disposal shall be laid in a safe manner (using tunnelling) so that the sand dunes stretch between the plant boundary and respective land fall points are protected without any disturbance to their natural appearance and stability.

(x) GHCL Limited shall ensure that paghadiya fishing activities shall not be disrupted due to the project activities, during both the construction and operation phases due to micro tunnelling operation in inter-tidal zone. The company commits to taking all necessary measures to prevent any interference with local paghadiya fishing practices

(xi) PP shall ensure that no /untreated/treated water from the project site shall be discharged into seasonal water stream.

(xii) PP shall ensure the implementation of conservation plan of Rs. 136.50 Lakhs for schedule – I species as approved by Chief Wildlife Warden, Gujarat vide letter no WLP/32/A/50-52/2023-24 dated 24.04.2023 for greenfield project of M/s GHCL at Bada Village, Mandavi, Kutch, Gujarat.

(xiii) The PP shall develop greenbelt of at least 30-50 m width over an area of 18,02,856 m^2 (33%) within the project site mainly along the plant periphery, preferably within a year of the grant of EC. PP shall develop and maintain an average **100 m wide greenbelt** (towards Vipassana centre/Bada village) in NW and North direction facing the entrance road. Also approximately an average **30-50 m wide greenbelt** in NE direction within the plant boundary, as per its environmental responsibility, which will be a part of total 33% greenbelt area. The tree saplings selected for the plantation should be of sufficient height, preferably 6-ft shallbe planted in greenbelt area. The budget earmarked for the plantation shall be kept in a separate account and should be audited annually. The PP shall annually submit the audited statement along with proof of activities viz. photographs (before & after with geo-location date & time), details of expert agency engaged, details of species planted, number of species planted, survival rate, density of plantation etc. to the Regional Office of MoEF&CC before 1st July of every year for the activities carried out during previous year.

(xiv) Plantation of saplings shall be carried out as a part of tree plantation campaign "EK PED MA ke NAAM" and details of the same to be uploaded in the MeriLiFE portal (https://merilife.nic.in) in respect to this Ministry's OM No. IA3-22/3/2024-IA.III(E-241594) dated 24th July 2024.

(xv) A separate Environmental Management Cell (having qualified persons with Environmental Science/Environmental Engineering/specialization in the project area) equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions and shall also engage Environment Officials. IN addition to this one safety & health officer as per the qualification given in Factories Act 1948 shall be engaged within a month of grant of EC. PP should annually submit the audited statement of amount spent towards the engagement of qualified persons in EMC along with details of person engaged to the Regional Office of MoEF&CC before 1st July of every year for the activities carried out during previous year.

(xvi) The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, and risk mitigation measures relating to the project shall be implemented. The budget proposed under EMP is ₹ 320 crore (Capital cost) and ₹ 7.53 Crore per annum (Recurring cost) shall be kept in separate account and should be audited annually. The PP should submit the annual audited statement along with proof of implementation of activities proposed under EMP duly supported by photographs (before & after with geo-location date & time) and other document as applicable to the Regional Office of MoEF&CC before 1st July of every year for the activities carried out during previous year.

(xvii) PP shall ensure the time bound implementation of CER activities of Rs. 20.69 Crores

(xviii) M/s GHCL shall take up initiatives to restore the water quality of the water pond located near Vipasna Centre. M/s GHCL shall carry out tree plantation drive along road of Bada Village in consultation with Village Administration.

(xix) No banned chemicals shall be manufactured by the project proponent. No banned raw materials shall be used in the unit. The project proponent shall adhere to the notifications/guidelines of the Government in this regard.

(xx) The project proponent shall utilize modern technologies for capturing of carbon emitted and shall also develop carbon sink/carbon sequestration resources capable of capturing more than emitted. The implementation report shall be submitted to the IRO, MoEF&CC in this regard.

(xxi) All the hazardous waste shall be managed and disposed as per the HWM Rules 2016. Hazardous waste such as Distillation Residue and Off Specification Products shall be either sent to common incineration site or sent for coprocessing. Solid waste shall be segregated into dry and wet garbage at site in accordance to the Solid Waste Management Rules, 2016. Wet waste shall be converted into compost and used as manure for greenbelt development. 570 MT/A Fly ash shall be stored under covered silos handed over to the Cement manufacturers/ Cement Industry.

(xxii) Storage of raw materials shall be either in silos or in covered areas to prevent dust pollution and other fugitive emissions. All stockpiles should be constructed over impervious soil and garland drains with catch pits to trap runoff material shall be provided. coal shall be stored in covered sheds and wind breaking walls/curtains shall be provided around biomass storage area to prevent its suspension during high wind speed. Fly ash shall be collected in Silo. All Internal roads shall be paved. Industrial vacuum cleaner shall be provided to sweep the internal roads. The Air Pollution Control System shall be interlocked with process plant/machinery for shutdown in case of operational failure of Air Pollution Control Equipment.

(xxiii) There shall be adequate space inside the plant premises earmarked for parking of vehicles for raw materials and finished products and no parking to be allowed outside on public places. Out of the total project area, 15% shall be allotted solely for parking purposes with facilities like rest rooms with full fledge infrastructure for truck drivers etc. Parking area should be paved to avoid fugitive dust emissions. There should be a learning centre over road behaviour for the drivers.

(xxiv) All necessary precautions shall be taken to avoid accidents and action plan shall be implemented for avoiding accidents. The project proponent shall implement the onsite/offsite emergency plan/mock drill etc. and mitigation measures as prescribed under the rules and guidelines issued in the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, as amended time to time, and the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996. The occupier of new as well as expansion projects shall be required to comply with the provisions of the MSHIC Rules, 1989 including notifying their activities or seeking site approval from the concerned authorities, to address operational safety aspects. In doing so, various schedule, particularly Schedule-5 of the said rules may be referred.

(xxv) The volatile organic compounds (VOCs)/Fugitive emissions shall be controlled at 99.97 % with effective chillers/modern technology. Regular monitoring of VOCs shall be carried out.

(xxvi) The storage of toxic/hazardous raw material shall be bare minimum with respect to quantity and inventory. Quantity and days of storage shall be submitted to the Regional Office of Ministry and SPCB along with the compliance report.

(xxvii) PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground. A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis. Any non- compliance or infringement should be reported to the concerned authority

(xxviii) PP shall set up occupational health Centre for surveillance of the worker's health within and outside the plant on a regular basis. The health data shall be used in deploying the duties of the workers. All workers & employees shall be provided with required safety kits/mask for personal protection.

(xxix) Training shall be imparted to all employees on safety and health aspects for handling chemicals. Safety and visual reality training shall be provided to employees. Action plan for mitigation measures shall be properly implemented based on the safety and risk assessment studies.

(xxx) PP shall provide training to 10 local youth every quarter on environment management including air pollution control device, ETP, solid waste management, fly ash based brick manufacturing, green belt development as part of skill development programme.

(xxxi) Comprehensive water audit to be conducted on annual basis and report to the concerned Regional Office of MEF&CC. Outcome from the report to be implemented for conservation scheme.

(xxxii) The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire-fighting system shall be as per the norms.

(xxxiii) The solvent management shall be carried out as follows: (a) Reactor shall be connected to chilled brine condenser system. (b) Reactor and solvent handling pump shall have mechanical seals to prevent leakages. (c) Solvents shall be stored in a separate space specified with all safety measures. (d) Proper earthing shall be provided in all the electrical equipment wherever solvent handling is done. (e) Entire plant shall be fire proof. The solvent storage tanks shall be provided with breather valve to prevent losses. (f) All the solvent storage tanks shall be connected with vent condensers with chilled brine circulation.

(xxxiv) The storm water from the roof top shall be channelized through pipes to the storage tank constructed for harvesting of rain water in the premises and harvested water shall be used for various industrial processes in the unit. No recharge shall be permitted within the premises. Process effluent/ any wastewater shall not be allowed to mix with storm water.

(xxxv) The PP shall undertake waste minimization measures as below (a) Metering and control of quantities of active ingredients to minimize waste; (b) Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. (c) Use of automated filling to minimize spillage. (d) Use of Close Feed system into batch reactors. (e) Venting equipment through vapor recovery system. (f) Use of high pressure-hoses for equipment cleaning to reduce wastewater generation.

(xxxvi) PP shall sensitize and create awareness among the people working within the project area as well as its surrounding area on the ban of Single Use Plastic in order to ensure the compliance of Notification published by MOEFCC on 12th August, 2021. A report along with photographs on the measures taken shall also be included in the six-monthly compliance report being submitted to concerned authority.

(xxxvii) The activities and the action plan proposed by the project proponent to address the issues raised during the public hearing as well as the related socio-economic issues in the study area shall be completed as per the schedule presented before the Committee and as described in the EIA report in letter and spirit.

Annexure-I

List of the Expert Appraisal Committee (Industry-3) members participated in Day - I during Video Conferencing (VC) meeting

S. No.	Name of Member	Designation
1.	Prof. (Dr.) A.B. Pandit	Chairman
2.	Dr. Suresh Panwar	Member
3.	Dr. (ER.) Dibakar Swain	Member
4.	Shri Dinabandhu Gouda	Member
5.	Dr. Kishore Malviya	Member
6.	Shri Amit Vashisht	Member
7.	Dr. P. Jagannadha Rao	Member
8.	Dr. Vijay S Moholkar	Member
9.	Prof. Suneet Dwivedi	Member
10.	Shri A N Singh	Member Secretary
MoEFCC		
1.	Dr. Kanchan Puri	Scientist-B
2.	Dr. Bhawana Kapkoti Negi	Technical Officer

***

MoM approved by

(Prof. Aniruddha B. Pandit)
Chairman

-TRUE COPY-

GHCL Limited

To,
Director and Member Secretary (Industry III),
Ministry of Environment, Forest & Climate Change,
3rd Floor, Vayu Wing, Indira Paryavaran Bhavan,
Jor Bagh Road, Ali Ganj,
New Delhi- 110003.

Date: 25/10/2024

Subject: Submission of ADS reply to obtain Environmental Clearance for the Proposed Greenfield project of M/s. GHCL Limited
Proposal no.: IA/GJ/IND3/408164/2022

Respected Sir,

We are submitting our responses to the concerns raised during the 87th EAC meeting held on 21.10.2024. The point-wise replies are provided below:

SR NO.	POINTS	REPLY
1	Provide an undertaking for the following: • Intention for land acquisition. • Greenbelt development, including a 100-meter-wide greenbelt towards the Vipassana Center/Bada village and towards entrance road. Also, provide 30-50 m wide greenbelt in the northeast direction. • Installation of a Continuous Ambient Air Quality Monitoring Station (CAQMS) at the plant, facing the Vipassana Center. • Installation of a sprinkling system on both sides of the road leading to the storage yard. • Confirmation that paghadiya fishing activities will not be disturbed due to project activities. • Provide flow meters at the effluent discharge system along with SS monitoring system.	We, M/s. GHCL Limited, acknowledge the concerns raised by the Expert Appraisal Committee (EAC) regarding our proposed project. We hereby confirm that we will fully address the points raised, and the formal undertaking, covering all aspects as required by the EAC, is attached as **Annexure 1** for your kind reference.

2	Provide information regarding the CER activities to be carried out as part of the additional CER, and include their costs in the EMP.	Please note that, as per the committee's suggestions, we are willing to provide the following as part of the additional CER activities. • Installation of 100 solar street lights in nearby villages, namely Bada, Janakpur, Bhinsara, Panchotiya, Layja Mota, Layja Nana, Bhada, Bayath, Mapar, Bambhadai, Modhkuba and Padamapar. • Installation of a suitable capacity Sewage Treatment Plant with proper consultation with local administration in Bada Village. • The additional CER will be implemented over a period of 5 years is attached as **Annexure 2**. It has been included in the EMP, and the revised EMP is attached as **Annexure 3** for your reference.
3	Provide information regarding the depth of the micro-tunneling.	The depth of micro-tunnelling depends on the topography. It will be approximately 14-15 meters below MSL and 5-6 meters below the seabed, extending beyond the intertidal zone.
4	Confirm the length of the intake and outfall pipelines from the plant boundary.	It is requested to note that the plant boundary falls within the CRZ area (500-meter line). The total lengths of the intake and outfall pipelines as per the GCZMA recommendation dated 26 December 2023 which are as follows:

Pipeline	Length of pipeline as per GCZMA recommendation in meters
Intake Pipeline 1	1381.99
Intake Pipeline 2	1388.64
Outfall Pipeline 1	2770.17
Outfall Pipeline 2	3281.88

Thanking You.
Yours faithfully,

GHCL LIMITED AHMEDABAD

For GHCL Ltd.
[N. N. Radia - Chief Operating officer]

GHCL Limited

Undertaking

I, **N.N. Radia**, Chief Operating Officer of **M/s. GHCL Limited**, located at Village Bada, Taluka Mandvi, District Kutch, Gujarat, do hereby solemnly affirm and state as follows:

1. M/s. GHCL Limited will acquire a total of **546.3200 hectares** for the proposed project. In alignment with this requirement, steps have been initiated in accordance with the terms outlined in a Memorandum of Understanding (MOU) with consolidators. While the acquisition process is progressing, advances related to this have been planned and are being executed to ensure the necessary land acquisitions are in place prior to the commissioning of the project. Furthermore, 33% of the total identified area will be allocated for the development of a dedicated greenbelt, reinforcing our environmental commitment.
2. That M/s. GHCL Limited is committed to developing and maintaining an average **100 m wide greenbelt** (towards Vipassana centre/Bada village) in NW and North direction facing the entrance road. Also approximately an average **30-50 m wide greenbelt** in NE direction within the plant boundary, as per its environmental responsibility, which will be a part of total 33% greenbelt area.
3. That M/s. GHCL Limited will provide a Continuous Ambient Air Quality Monitoring Station (CAQMS) within the plant, towards the Vipassana Center, to ensure continuous monitoring and compliance.
4. That the M/s. GHCL Limited will provide an intermittent sprinkling system on both sides of the road and transportation route within plant, extending up to the storage yard, to effectively mitigate and control fugitive emissions during the transportation.
5. That the M/s. GHCL Limited ensures that paghadiya fishing activities will not be disrupted due to the project activities, during both the construction and operation phases due to micro tunnelling operation in inter-tidal zone. The company commits to taking all necessary measures to prevent any interference with local paghadiya fishing practices.
6. That the M/s. GHCL limited will install flow meters at the effluent discharge system. Also, SS monitoring system shall be installed if reliable system is available.

This undertaking is given in good faith to meet the specific environmental condition and with full understanding of my obligations under the law.

Date: 25.10.2024
Place: Mandvi

GHCL LIMITED AHMEDABAD

N.N. Radia
Chief Operating Officer
M/s. GHCL Limited, Village Bada, Taluka Mandvi, District Kutch, Gujarat

Annexure 2- Proposed CER Activities

Sr. No.	Type of Activities	Yearly amount to be spent in CER activities (Rs. In Crore)					Total Amount to be spent (Rs. in crore)
		1st Year	2nd Year	3rd Year	4th Year	5th Year	
1.	Provision of Solar light, solar panel and its maintenance in nearby villages within 10 km of study area.	0.10	0.10	0.10	0.10	0.10	0.50
2.	Infrastructure development Such as primary healthcare units and the fulfilment of the basic amenities in PHCs including mobile medical van and Provide Bala-Rasayana to Malnutrition Children in Aanganwadi and PHC of nearby Villages.	0.00	0.27	0.29	0.31	0.35	1.22
3.	Animal husbandry promotion through providing support for breed improvement, animal health care, Veterinary doctor and others as well as provides Fodder for cattle feeding nearby villages.	0.80	0.85	0.90	0.90	0.90	4.35
4.	Infrastructure development for quality of education, which will ultimately upgrade schools in nearby villages.	0.25	0.27	0.29	0.31	0.35	1.47
5.	Development Initiatives for Fishing Communities such as Creation of infrastructure like ice plants, cold storages as well as provide operational inputs such as fishing boats, nets and engines.	0.15	0.15	0.15	0.15	0.15	0.75
6.	Promoting environment friendly and nature-based solutions to enhance productivity of farming (Organic Farming) activities. It covers capacity building on farming techniques, provision of highquality seeds/manure, efficient irrigation solutions, etc.	0.60	0.60	0.60	0.60	0.60	3.00

7.	Promoting activities for skill building to improve employment opportunities and women empowerment in nearby villages.	0.45	0.45	0.45	0.45	0.45	2.25
8.	Development of facilities within nearby villages such as roads.	0.20	0.20	0.20	0.20	0.20	1.00
9.	Activities for water conservation like deepening of nearby village ponds for storage of rainwater for domestic use of villagers.	0.50	0.50	0.50	0.50	0.50	2.50
10.	Promoting plantation activities through Forests by Heartfulness Institute in nearby villages.	0.20	0.20	0.20	0.20	0.20	1.00
11.	Installation of 100 solar street lights in nearby villages, namely Bada, Janakpur, Bhinsara, Panchotiya, Layja Mota, Layja Nana, Bhada, Bayath, Mapar, Bambhadai, Modhkuba and Padamapar. (Already 200 solar lights have been considered in point no. 1)	0.05	0.05	0.05	0.05	0.05	0.25
12.	Installation of a suitable capacity Sewage Treatment Plant with proper consultation with local administration in Bada Village.	-	0.10	2	0.30	-	2.40
	Total	**3.30**	**3.74**	**5.73**	**4.07**	**3.85**	**20.69**

Annexure 3- Revised EMP

ASPECT OF ENVIRONMENTAL MANAGEMENT	COST IN CRORE [RS.]	RECURRING COST (CRORE /ANNUM) [RS.]	REMARKS
Air Pollution	89.28	1.50	Capital cost would include air pollution control devices like ESPs, Scrubbers, Dust extraction and suppression systems, Stacks, Dry Fog system, Wind screen and the recurring cost would include operation and maintenance of pollution control devices
Water Pollution	14	0.12	Capital cost would include cost of ETP, STP and recurring cost would include operation and maintenance of pollution control devices
Noise Pollution	2.9	0.0035	Capital cost would include providing adequate sound enclosures for TG, CO- compressor, DG Set
Hazardous / Solid Waste Management	1.05	1.10	Capital cost would include expense for providing storage area for hazardous waste and membership charges of TSDF/CHWIF Site and recurring cost would be for solid/ hazardous waste disposal charges and Sampling & analysis charges of solid waste.
Environmental monitoring Programme	3.4	1.30	Capital cost would include expense OCEMS, Online weather station, online pH, NH3-N, Temp meter and recurring cost would include monitoring and analysis of noise level., Sample analysis charges & ambient air & fugitive emission sampling & analysis charges etc., Fresh water & wastewater sample analysis charges etc. Soil: recurring cost would be for Soil Sample analysis., Marine area environment monitoring
Green Belt	20	0.5	Capital cost would include development of green belt within the project premises and recurring cost would include maintenance charges and manpower salary etc.
Renewable Energy	113	--	Capital cost would include Installation of Solar and Windmill

Fire safety & Occupational Health & Safety	3.41	0.35	Capital cost would include cost of OHS center, PPEs, fire & safety instruments and recurring cost would include maintenance charges and training, audit & health check-up etc.
Miscellaneous	53	2.66	Miscellaneous activity such as development of rain water harvesting system, Drainage Network for rain water, Environmental laboratory, Environmental Management system, miscellaneous study, statutory application fees, audit, training cost etc. and recurring cost would include biodiversity management plan, hiring of EMC and Conservation Plan for Schedule 1 species.
CER	20.69	--	Capital cost would include cost of CER activities such as promoting renewable energy, skill development Programme, Organic farming, water conservation (like village pond deepening), forestry etc. and develop infrastructure of schools, health facilities, Fishing activities, roads in nearby villages, Installation of additional solar street lights in nearby villages and Installation of a suitable capacity Sewage Treatment Plant with proper consultation with local administration in Bada Village.
Total (EMP + CER)	**320.73**	**7.53**	

O/C

ANNEXURE R/20

GHCL Limited

Date: 09.11.2022

To,
PCCF & Chief Wildlife Warden
Govt. of Gujarat State,
Aranya Bhavan, Near Central Water Commission,
Near CH-3 Circle, CH Rd, Sector 10A,
Sector 10, Gandhinagar,
Gujarat 382010.

Subject: Request to obtain Approval of Conservation Plan (Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle, Chinkara and Gugal - Schedule –I species and Critically Endangered species) For **M/s. GHCL Ltd.**

Respected Sir,

It is requested to note that **M/s. GHCL Ltd.** is a proposed Greenfield Chemical Complex (Soda Ash & Sodium Bi-carbonate plants, Captive co-generation power plant, Sea water intake and effluent disposal) located at **Village: Bada, Taluka: Mandvi, Dist: Kutch, Gujarat, India.** For that we hired NABET, QCI Approved FAE in Ecology & Biodiversity, **Dr. Bharat Jethva** to conduct Ecological Study & prepare Wildlife Conservation Plan. According to study conducted by Dr. Bharat Jethva in **July 2019; Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle, Chinkara and Gugal - Schedule –I species and Critically Endangered species** were observed in the 10 km radius from the project site. We have attached Ecology biodiversity report and conservation plan prepared by Dr. Bharat Jethva as Annexure-1.

The project has applied for Environmental Clearance (EC) at MoEF&CC, New Delhi. In connection with that; unit has received Terms of Reference (TOR) copy from MoEF&CC, New Delhi with proposal number: **IA/GJ/IND3/222096/2021 dated on 10th August 2021**. In TOR no 5(v), project proponent has to submit approved conservation plan in the ministry before EC appraisal presentation. TOR copy is attached as Annexure-2 for your ready reference.

We request you to give us the Approval of Conservation Plan **(Flap shell turtle, Green Sea turtle, Indian monitor lizard, Olive Ridley Sea turtle, Black shoulder kite, Eurasian Spoonbill, Indian Peafowl, Marsh Harrier, Oriental Honey Buzzard, Shikra, Short-toed Snake Eagle, Chinkara and Gugal - Schedule –I species and Critically Endangered species)** For **M/s. GHCL Ltd.** as soon as possible, so that we can submit the same to concern authority.

Please do the needful.

Thanking you.

GHCL LIMITED

Yours truly,
For M/s. GHCL Ltd.

Enclosed:

1. Annexure 1: Ecology biodiversity report and Conservation plan.
2. Annexure 2: TOR copy.

GHCL House, Swastik Society, Opp. Punjabi Hall, Navrangpura, Ahmedabad, Gujarat-380009, India Ph. : +91-079-26434100
CIN : L24100GJ1983PLC006513, E-mail : ghclinfo@ghcl.co.in, Website : www.ghcl.co.in

Head Office : GHCL House, B - 38, Institutional Area, Sector - 1, Noida, Uttar Pradesh - 201301, India. Ph. : +91-120-2535335, 3358000, Fax : +91-120-2535209

6. Conservation Plan for Schedule-I Species

Based on our field observations and literature survey we found several species important plant species as well as Schedule-I wildlife species in the study area (Table-6.1). We reported one plant species and 13 animal species. The faunal wildlife species include 4 species of Reptiles, 7 species of birds and 1 species of mammals.

Table-6.1: Schedule-I fauna and Critically Endangered plant species reported from the study area.

No.	Taxa	Name of Species		IWPA Status	IUCN Status
		Common Name	Scientific Name		
1	Reptile	Flap shell Turtle	*Lissemus punctatea*	Sch-I	LC
2	Reptile	Green Seaturtle	*Chelonia mydas*	Sch-I	**EN**
3	Reptile	Indian monitor lizard	*Varanus bengalensis*	Sch-I	LC
4	Reptile	Olive Ridley Seaturtle	*Lepidochelys olivacea*	Sch-I	**VU**
5	Bird	Black shoulder kite	*Elanus caeruleus*	Sch-I	LC
6	Bird	Eurasian Spoonbill	*Platalea leucorodia*	Sch-I	LC
7	Bird	Indian Peafowl	*Pavo cristatus*	Sch-I	LC
8	Bird	Marsh Harrier	*Circus aeruginosus*	Sch-I	LC
9	Bird	Oriental Honey Buzzard	*Pernis ptilorhyncus*	Sch-I	LC
10	Bird	Shikra	*Accipiter badius*	Sch-I	LC
11	Bird	Short-toed Snake Eagle	*Circaetus gallicus*	Sch-I	LC
12	Mammal	Chinkara	*Gazella bennettii*	Sch-I	LC
13	Plant	Gugal	*Commiphora wightii*	--	CR

6.1. Impact – mitigation matrix

Based on our observation, literature review and consultation with local people, and NGO, we formulated following impact vs mitigation matrix. It is advised that company shall follow the suggestions provided in the following Table-6.2.

Table-6.2: General Impacts vs. mitigation matrix & Conservation plan.

Issues		Risk level	Reason/Status in relation to project site	Suggestions
Species	Rare/ Threatened	Med	Threatened species (Green Seaturtle, Olive Ridley Turtle and *Commiphora wightii*) are reported from the study area.	• Ensure no damage or disturbance is caused to these species and their habitats by project activities or people involved in project. • Take up conservation, protection and propagation measures for these species in the study area. • Periodically monitor these areas for their status as part of comprehensive biodiversity monitoring plan.
	Endemic Species	Low	No endemic species of any fauna or flora were recorded during study in the core area and buffer area.	Nil
Important Natural Habitats	Protected Areas	Nil	No protected area present in close vicinity	Nil
	Eco-sensitive zone identified by government	Nil	No protected area or their eco-sensitive zones are present within 10 km periphery of the proposed project site	Nil
	Important Bird Areas	Nil	No Important Bird Area (Birdlife International) is present in core or buffer area.	Nil
	Ramsar site	Nil	No Ramsar sites present in Kutch	Nil
	Wetlands of National Importance	Nil	Great Rann, Little Rann of Kutch and Chharidhandh are located at more than 75 km distances	Nil
	Wetlands of international Importance	Nil	No wetlands of international importance present in 70 km periphery of the project site	Nil
	Wildlife Corridors	Nil	No notified or officially identified wildlife corridor present in and around project site.	Nil
	Forest Area	Med	Patches of open tropical thorn forest or scrub forest are present in the buffer area of the proposed project site.	• Ensure no damage is caused to forest area due to pollution, dust, movement of vehicle, people through forest areas. • Ensure thick green belt on project site periphery to control pollution.

	Mangroves	Nil	No mangroves are present on the coast due to sandy beach. In the study area.	• Nil
	Corals	Nil	No coral reef area present on the coast falling in the study area.	Nil
	Breeding/ nesting areas	Med	Sandy beach stretch between Nana Layja to Bambhdai falling in the buffer area /study area is known for sporadic nesting of two species of Seaturtles.	• Ensure no damage, disturbance is caused due to any of the project activities, pollution, dusting, material flow etc. during construction or operation phase. • Promote conservation, protection and propagation of these species . • Monitor status of this habitat as part of comprehensive biodiversity monitoring plan.

6.2. Conservation Plan for Schedule-I species

6.2.1. Conservation Plan for Critically Endangered Plant Species:

Gugal: (*Commiphora wightii*)

Status: Our field survey in the proposed project area revealed that there is a critically endangered plant species present in the open scrubland as well as forest areas present in the buffer area. This plant was found with low density in the buffer area. This plant has high medicinal values and is facing the threats of extinction by overexploitation for commercial purpose (Silori et al., 2004; Joshi, 2002; GUIDE 2009) from Kutch. However, recently Gujarat Forest Department has accomplished a large scale project on plantation of *Commiphora wightii* in Gujarat. Through this project thousands of plants were raised and planted in entire Kutch region.



This project has improved the number and density of the species in the region.

Impacts: The construction of Soda Ash, Sodium Bicarbonate plant along with Co-generation power plant and related facilities would involve large scale movement of heavy vehicles, excavation, loading unloading, material handling, creation or widening of roads etc. Dusting and pollution due to these activities could potentially affect surrounding habitats where this species thrives. Apart from these the air borne dusting and pollution due to operation phase could also settle in the surrounding area and the forest areas where these plants are present. Therefore, dusting and pollution during construction and operation phases can potentially affect the density and distribution of this species in the buffer area.

Recommendations: GHCL shall put in place all kind of pollution control measures so that the surrounding vegetation is not degraded and this species along other plants survive normally in the study area. GHCL shall carryout comprehensive biodiversity monitoring at regular intervals in order to check impact of their project activities on surrounding area and special emphasis shall be given to this species. It is also recommended that company should take up plantation of *Commiphora wightii* by involving local forest department, which has vast experience of carrying out plantation of this specialized plant species. GHCL and the Kutch West Forest Division shall mutually design the plantation activity.

6.3. Conservation Plan for Schedule-I Fauna

Among the fauna, we reported total 14 animal species. As mentioned above, the faunal wildlife species include a species of Reptiles, 8 species of birds and 5 species of mammals.

6.3.1. Reptile/ Indian Flap Shell Turtle

Status: During our study this species of reptile was recorded form the small village ponds in the study area. The species is resident and breeding in the buffer areas. The Indian Flap shell Turtle (*Lissemys punctata*) is a freshwater species of turtles are widespread and common in the South Asian

provinces. They are listed as Schedule-I species under Wildlife Protection Act 1972 and as Least Concerned as per IUCN threat categories.

Impacts: Since this species is an aquatic, it may be subjected to impacts related to water pollution and hydrological impacts arising due to project activities. These may include dusting, pollution, degradation of water sources, soil characteristics, choking of drainages etc. This species is otherwise not hunted or eaten by the people. Therefore, changes of degradation of overall aquatic habitat qualities in the buffer area are likely to affect these species and their distribution.



Recommendations: GHCL shall put all kind of pollution control measures in place so that surrounding area ecological conditions are not degraded. During construction it shall be seen that no drainage, ponds etc. are damaged or altered. GHCL shall carryout biodiversity monitoring at regular intervals in order to check impact of their project activities on surrounding area and special emphasis shall be given to monitoring of surface (drainage, check dams, ponds) water and wetlands in the buffer area.

6.3.2. Reptile/Seaturtle

A coastal beach admeasuring total 23 km lies in the study area on the coast of Bambhdai-Bada-Pachotiya-Bhada–Nana Layja villages. Most part of the coastal area falling in the study area is sandy and has presence of sand dunes of varying height and width. The southern boundary of proposed project site is located near the sea coast of Bada village which covers a stretch of approximately 2.0 km length. The coastal area near project site has narrow beach width and get inundated regularly during high tides. Our field observations, literature review and consultation with local NGOs suggest presence of sporadic nesting activities of 2 species of Seaturtle on 19.5 km long sandy coastal stretch from Bambhdai to Nana Layja. According to literature survey (*Sunderraj et al 2013*) the coastal stretch between Bambhdai –Bada-

Nana Layja has reported density of 1.4 seaturtle nests per kilometre. This density of nests could be considered sporadic in nature compared to mass seaturtle nesting activities occurring on eastern coast of India. Moreover, as per our field survey, we observed that width of supra tidal areas on the coast near the proposed project boundary is narrow and has dense vegetation and steep slope. These conditions may not be very suitable for nesting activities of seaturtle on the coastal stretch of 2.0 km that is located south of the proposed project boundary. However, the proposed project in absence of mitigation measures could result in following impacts on seaturtle.

Direct loss of habitat: The project facilities would include laying of intake and outfall pipelines from the southern boundary of the project area into the Arabian Sea. The laying of seawater intake and outfall pipelines corridors would required to be carried out through the sand dune area and the intertidal area on the coast. The area required/occupied (approximately 50 mtrs width) for laying of pipelines could result in the direct loss of coastal habitat i.e. sand dunes and intertidal areas. This would occupy a very small coastal habitat and resultant impact in terms of loss of habitat could be considered negligible.

Changes in morphology of coast: The activity of laying of intake and outfall pipeline corridors may damage or change the morphology of the sand dunes and the intertidal areas on the coast. This might affect the nesting activities of seaturtle. Moreover, as per CRZ notification sand dunes are classified as ecologically sensitive areas.

It is therefore recommended that laying of intake and outfall pipeline corridors shall be done underground without disturbing the morphology of sand dune, forest area (mostly dominated with *Prosopis juliflora*) or the intertidal area. The pipeline corridors shall be laid underground on entire length of sand dunes and intertidal area i.e. landward end of sand dune to the low tide line in the seaward side. This would ensure no damage, or alteration of the morphology of coastal habitats. Apart from this, if there is any alteration in the coastal habitat caused by construction activities, movement of heavy vehicles etc. shall be restored.

Direct disturbance to nesting: The construction activities would enhance presence of people, machines, lightings etc. These activities may deter the females approaching for nesting on the beach during breeding season. This may affect nesting activity of two species of seaturtle if appropriate mitigation measures are not considered. It is therefore recommended that laying of intake and outfall pipeline corridors on coast shall not be carried out during peak breeding seasons of the two species of the seaturtle.

Increase in artificial illumination on the coast: The proposed project boundary lies near sea coast. The industrial development on the coast also results in higher illumination near beach areas, this is one of the major impacts of coastal development known to disturb and distract seaturtle nesting and hatchlings. The artificial beachfront lighting problem may be the most manageable of the human-caused sea turtle disturbances. Although some beachfront lighting is necessary for safety and security, light management measures can help prevent interference with sea turtle nesting habitat while still addressing human safety concerns. These measures include following.

- Turning off unnecessary lights during the nesting season.
- using a smaller number or lower wattage of lights; repositioning, shielding, redirecting, lowering, or recessing fixtures so light does not reach the beach;
- Moreover, sea turtles are less affected by red, yellow, and low-pressure sodium-vapor lights, which can be substituted for ordinary lights.

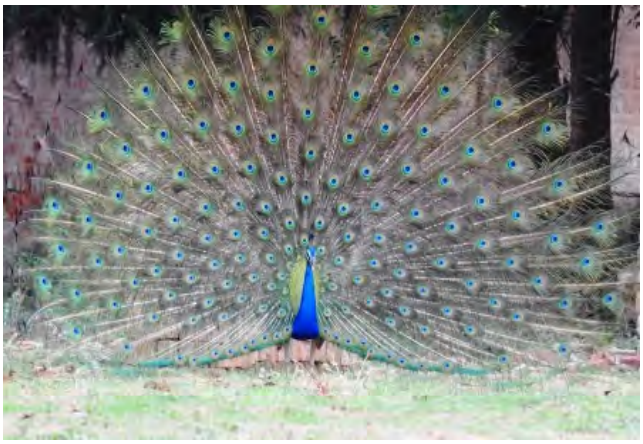
Pollution on Coast: Since the proposed project lies near the coast, the airborne fugitive dusts and other pollutants during construction and operation phases could pollute beach and cause changes in physical and chemical property of natural beach. It is therefore, recommended to control all types of pollution by strictly adhering to pollution control measures. Thick green belt of local hardy species shall be created to control air pollution.

Apart from above mentioned mitigation measures, the project proponent as part of their Corporate Environment Responsibility (CER), shall monitor nearby coast along project area for seaturtle nesting and in case of significant changes, proper mitigation measures shall be taken in consultation with experts and the

forest department. The project proponent though their CER budget shall also financially support research and conservation activities carried out for seaturtle by Gujarat Forest Department.

6.3.3. Birds/ Indian Peafowl

Status: The Indian Peafowl *(Pavo cristatus*) was recorded from the surrounding scrubland, villages, agriculture fields etc. in the buffer area. It is a resident breeder in the Indian subcontinent. The bird was justifiably declared as the national bird of India in year 1963 due to its 'flagship' value founded on its glorious position in mythology and its widespread distribution in the country. The species is found in dry semi-desert, scrub and deciduous forests. It forages and nests on the ground but roosts on top of trees. It eats seeds, insects, fruits, small mammals and reptiles. The Indian Peafowl is a ground nesting bird and it lays a clutch of 4-8 eggs which take 28 days to hatch. The eggs are light brown and are laid every other day usually in the afternoon. The male does not assist with the rearing, and is polygamous. Poaching of peacocks for their feathers and poisoning by feeding on pesticide treated seeds are known threats to wild birds. Under the law, collection of tail feathers is allowed only when the bird sheds them. The Indian peafowl is under various threats that include the demand for feathers and wild meat, conflict with farmers during cropping season, increased use of chemical fertilizers and pesticides and habitat degradation.



Impacts: Our field study reported presence of Indian Peafowl in the buffer areas of project site. The species was observed in the buffer area of 10 km radius particularly near human habitations, villages and agriculture fields. Since our study reported presence of Indian Peafowl in the buffer area, its possibility of nesting in buffer area could not be ruled out. Since Indian Peafowl is a ground nester, several project activitie can have adverse impacts on their nesting

grounds such as pollution, degredation of soil and vegetation from surrounding ara and in the forest areas. Direct disturbance by presence of people, vehicle, their noise, vibrations, lights etc. can potentially disturb most of the bird species.

Recommendations: following actions for the conservation and protection are suggested in wildlife conservation action plan to reduce impacts of project related activities on the species. Based on our field observation on the distribution, behavioral ecology, conservation need, and envisaged impacts of proposed project, we identified several species specific actions that would help reduce the impacts of project activities on Indian Peafowl as under.

i. Since Indian Peafowl is a ground nesting bird, heavy vehicle movement, presence of people, excavation activities could disturb their nesting activities.

ii. Avoid vehicle movement in the area where nesting is found. The movement of vehicles or humans shoul be prohibited in vicinity of the nesting area.

iii. Electric lines shall be designed to minimize the potential for electrocution of indian peafowl and other such large birds.

iv. Lightings within the project area could potentially deter the species presence. Therefore, GHCL shall ensure that minimum illumination comes out from the project area. This can be done by adjusting the angles of the light sources and using low intensity focused bulbs inside the project area.

v. Tree Plantation shall be carried out by GHCL in the surrounding villages and schools etc. in the buffer area. This would help the species and provide them much needed roosting place.

vi. Staff involved in construction activities shall be trained and made aware of Indian Peafowl's status as National Bird of India, and Schedule-I species protected under Indian Wildlife Protection Act 1972. This is important because if there are any casualties with this species occurs

then they should report it to the project authorities and the local forest department to carryout further necessary actions.

vii. Thick green belt of local hardy species shall be created to control air pollution.

6.3.4. Birds/ Schedule-I Raptors

Status: Total 5 bird species i.e. terrestrial Raptors belonging to Schedule-I of Wildlife Protection Act 1972 are reported from the study area. These species are Black shoulder kite, Oriental Honey Buzzard, Marsh Harrier, Shikra and Short-toed Snake Eagle. Of these 5 species of Raptors, none are reported from the core area and all 5 are reported from buffer area. Except Marsh Harriers rest all 4 species of raptors are resident breeders of India, Gujarat and Kutch. Almost all the raptor species are recently added to Schedule-I list through amendment made in year 2013. All the reported species are listed as Least Concerned category by IUCN. Marsh Harrier is migratory raptor species that arrives in this area during winter season.



Impacts: These 5 species of terrestrial raptors are predators and occupies tertiary consumers positions in the food chain and ecological pyramids. Therefore, any change in primary productivity would affect their distribution, density and population in the region. Therefore, project activities resulting in air, water and noise pollution, degradation of vegetation could potentially affect the habitat of these bird species and their population in the study area. Moreover, direct disturbance by presence of people, vehicle, their noise, vibrations, lights etc. can potentially displace most of the raptors species from the project area and its immediate surroundings.

Recommendations: It is recommended that GHCL shall take utmost care in controlling dust, fugitive emissions using state of the art technologies and put in

place all types of pollution control measures during construction and operation phases which would ensure minimum degradation of surrounding vegetation, forest area vegetation and waterbodies. Minimize vehicle movements around the project areas. Adjust lightings within core area and ensure minimum illuminations spreads outside the project area. Keep all the machineries maintained so that minimum noise and vibrations are generated in the surrounding area. Thick green belt of local hardy species shall be created to control air pollution.

6.3.5. CHINKARA (*Gazella bennettii*)

Status: The important herbivore present in the buffer area is Chinkara which is protected as Schedule-I species in Wildlife Protection Act 1972. During our survey, we reported presence of Chinkara through direct sightings in the buffer area in the study area. Indian gazelle is a shy animal and avoids human habitation. It stands at 65 centimetres and weighs about 23 kilograms. It can go without water for long periods and can get sufficient fluids from plants and dew. Although most individuals are seen alone, they can sometimes be spotted in groups of up to four animals. It lives in grasslands and desert areas in India. Its population is on the decline due to it being hunted for game. Narayan Sarovar Wildlife Sanctuary and its surrounding areas in Abdasa Taluka of Kutch are known for Chinkara population. The species is common in landscape of Kutch and North Gujarat. The species is listed as Schedule-I in Wildlife Protection Act 1972 and as 'Least Concerned' by IUCN. The species needs safe, undisturbed arid semi arid plains with open and sparse vegetation.



Impacts: This species is likely to be using open scrubland areas and forest areas for their feeding and breeding. They are also likely to be using waterbodies in the buffer area for their requirement of water. The impacts of project activities on herbivore are likely to be direct as they are primary consumers in the eco-system. Degradation of soil, vegetation and habitat due to

chronic pollution loads, the species would lose its feeding ground and breeding area. Therefore, changes in overall habitat qualities in the buffer area are likely to affect these species. The direct disturbance to these species by vehicle traffic, human intrusion is also issue of some concern.

Recommendations: It is recommended that company shall take up strict pollution control measures (air, water and noise) which would take care of major issue of habitat degradation for the species. Thick green belt of local hardy species shall be created to control air pollution. GHCL shall also support forest department in conducting awareness of local people towards wildlife conservation and law reinforcement and anti poaching activities in the study area. During construction and operation phases, GHCL shall inform their workers and staff not to engage in chasing, teasing or hunting of Chinkara as it is prohibited under wildlife protection act 1972.

6.4. Wildlife & Ecological Mitigation Measures

Based on our field study, information collected and consultation with project proponent, we recommend following mitigation measures as self regulatory, monitoring and compensatory measures for protection, conservation and betterment of wildlife and ecology in the surrounding area of project site.

6.4.1. Regulatory Mitigation Measures & Recommendations

i. Laying of intake and outfall pipeline corridors shall be done underground without disturbing the morphology of sand dune or the intertidal area. This would ensure no damage, or alteration of the morphology of coastal habitats. Even if there is any alteration in the coastal habitats caused by construction activities, movement of heavy vehicles etc. it shall be restored.

ii. Adjust lightings within and outside the project area in such a way so that there is less disturbance and distraction to wildlife. Lighting towards the coastal area boundary shall be adjusted with special care so that seaturtle are not affected.

iii. Strict control on dust pollution using various methods and technologies shall be carried out.
iv. During construction water sprinkling on roads and soil dumps shall be carried out to control dust pollution.
v. During operation phase Air quality standards (emission of pollutants like Particulate Matter) must be maintained as per GPCB/CPCB norms in and around the project site.
vi. Ambient noise pollution and vibrations during construction and operation phases shall be within limits of the standards mentioned.
vii. Plantation of thick green belt on periphery of the project site shall be created using local and hardy species.
viii. Ensure minimum movements of vehicles or people on the coast and no unauthorized movement through the Forest Areas located nearby in the study area.
ix. Ensure safe passage of runoff through drainages located nearby the project area.
x. Ensure no fly ash, sediments, pollutants, or any raw materials are spill out and flow into nearby drainage during construction or operation phase of the project.
xi. GHCL shall ensure that their construction workers and other workers during construction or operational phase shall not be involved in chasing, teasing, poaching and hunting activities of birds, reptiles or mammals around the project site.
xii. All other general measures to keep environmental parameters within permissible standards.

6.4.2. Compensatory Measures & Recommendations

There are few ecologically important habitats and Threatened species of plants and animals are present in the study area. Therefore, GHCL shall take utmost care during construction and operation phases so that these areas and species are not affected by their activities. Following are some of the recommendations that would help in propagation, protection and conservation of such habitats and species in the study area.

xiii. In order to compensate for the potential degradation of *Commiphora wightii* habitats GHCL shall carry out its plantation through Kutch-West Forest Division, Bhuj.

xiv. Sandy coastal stretch of Nanalayja to Bambhdai villages has been identified as an important Seaturtle nesting beach in the study area. Since coast near proposed project area is less likely to support nesting activities of seaturtles, no significant impacts are envisaged. However, GHCL shall ensure that no materials (dust, fly Ash or sediments) form their premises flows through air to the coastal areas and alter the texture of sandy beach. It is recommended that GHCL through their CER budget shall financially support Seaturtle conservation activities being carried out by the forest department.

xv. Since India Peafowl and other Schedule-I bird species are recorded in the study area, GHCL shall carryout tree plantation in the surrounding villages, schools, roads so that these species are provided with more safer roosting places in the study area.

6.4.3. Monitoring Measures & Recommendations

xvi. After commencement of the project GHCL shall carryout ecological & biodiversity monitoring at every 5 years for 10 years and take necessary corrective measures accordingly. GHCL shall bear the cost of third party monitoring. Monitoring of status of biodiversity and wildlife shall be monitored with specific emphasis on status of Seaturtle nesting, sand dunes, *Commiphora wightii*, forest areas, waterbodies in the study area.

6.5. Implementation of Mitigation Plan

Since the project is located outside the protected areas and their eco-sensitive zones in Kutch, most of the wildlife mitigation recommendations are self regulatory for user agency, therefore the implementation of these mitigation measures shall be carried out by the project proponent (GHCL) through their own staff and CER budget. However, there are several recommended activities which would be carried out by Kutch West Forest Division, Bhuj. GHCL shall

provide financial support through their CER budget to Kutch West Forest Division to carry out these recommended ecology/wildlife mitigation activities.

A special emphasis on ecological conservation shall be given by extending special responsibility to senior environment authority within the management of the proposed project authority. A senior ecologist shall be consulted on regular basis to oversee ecological/wildlife conservation activates under CER/CSR. The senior personal responsible for the conservation of ecology shall report directly to the head of the organization.

6.6. Monitoring of Mitigation Plan & Compliances

Though, most of the recommendations are self regulatory for user agency, monitoring of these recommendations and other conditions imposed by various agencies towards wildlife mitigation measures shall be monitored by a third party agency. Third party monitoring would involve ecological/biodiversity study at interval of 5 years for 10 years. These studies shall be carried out to evaluated long term impacts of the proposed project activities on the wildlife, biodiversity, waterbody, ecology and forest areas present in the 10 km periphery of the project site. Therefore, as per guidelines issued by the Principle Chief Conservator of Forests, Wildlife dated 13th August 2018, user agency shall allocate up to 5% of the total cost of mitigation plan as third party monitoring cost. Total Rs. 10.0 Lakh shall be allocated by the GHCL for monitoring of mitigation plan for the period of 10 years.

Since the area falls under the jurisdiction of Kutch West Forest Division, the overall official monitoring of the implementation of mitigation plan would be carried out by the Kutch West Forest Division, Bhuj. Therefore, as per guidelines issued by the Principle Chief Conservator of Forests, Wildlife dated 13th August 2018, user agency shall allocate and pay the monitoring and administrative cost to the forest department. For carrying out overall monitoring activities, user agency shall pay Rs. 10.0 Lakh for monitoring and administrative cost to the Kutch West Forest Division.

6.7. Financial Allocation for Wildlife Conservation Activities

Following is the proposed budget allocation for 10 years after approval from all statutory bodies permitting the construction and commencement of the project (Table-6.3). GHCL shall make financial allocations for taking up wildlife mitigation measures and for contribution to forest department for carrying out activities towards propagation, protection and conservation of wildlife from their CER budget. GHCL shall also carry out several activities through their own budget and staff.

Table-6.3: Proposed financial allocation for mitigation and conservation measures.

S. No	Activity	Implemen-ting Agency	Duration Years	Rate/Year (Lakh)	Total Amount (Lakh)
A	**Implementation Activities**				
1	Carryout Tree plantation in the villages, schools roadsides etc. areas in study area.	GHCL	10 years	5.0	50.0
2	Carryout plantation of *Commiphora wightii* in RF areas and maintenance (to be paid by GHCL)	KWFD	5 yeas	2.0	10.0
3	Contribution to Forest department for Sea Turtle Conservation Activities (to be paid by GHCL)	KWFD	10 years	2.0	20.0
				Subtotal	**80.0**
B	**Monitoring & Compliances Activities**				
6	Ecological & Biodiversity monitoring by third party once every 5 years for 10 years after commencement of project	GHCL	At every 5 year for 10 years	7.5	15.0
7	Monitoring and administrative activity (to be paid by GHCL) by Kutch West Forest Division	KWFD	First year		10.0
8	Documentation and preparation of Annual compliance report. 10 years	GHCL	Annual	2.0	20.0
				Subtotal	**45**
				Total (A=B) Amount in Lakh	**125.0**

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ANNEXURE R/21

CONSERVATION AND MANAGEMENT PLAN FOR CONSERVATION SIGNIFICANT SPECIES

PROPOSED GREENFIELD CHEMICAL COMPLEX

VILLAGE BADA,TALUKA - MANDVI,
DISTRICT - KACHCHH, GUJARAT

Final Report



Submitted to

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February 2023

Foreword

GHCL Ltd. is a leading Soda Ash manufacturing chemical unit, established in 1983 located at Sutrapada of Gir Somnath district in the State of Gujarat. This was India's first integrated Soda Ash plant based on Akzo's Dry Liming Technology. It caters to about 25% of domestic soda ash demand in the country. GHCL, is now proposing to set-up a Greenfield Chemical Complex to produce \ Light Soda Ash Plant having capacity of 11,00,000 TPA, dense soda ash plant with the capacity of 5,00,000 TPA and sodium bicarbonate plant with the capacity of 2,00,000 TPA near the village Bada, Taluka – Mandvi, District Kachchh in Gujarat state. Along with above production capacities necessary utilities like Captive Power plant of 120 MW capacity, seawater intake and effluent disposal system were also planned to support manufacturing infrastructure.

Industrial developments are essential for the economic growth and creating employment opportunity in the state. Needless to mention that the development projects should respect the ecological integrity, biodiversity values and social feasibility of the region as these are going to be the determinants of the quality of environment as well as the sustainability of the development interventions.

Keeping these in view and considering the statuary requirement of environmental clearance and conservation of wildlife, the GHCL planned to take up a rapid study to assess the status of biodiversity and wildlife, and its conservation and management measures for the existing biodiversity in core and buffer areas around the proposed projects. In this connection, the GHCL have given the study to Gujarat Institute of Desert Ecology (GUIDE), Bhuj.

The details of the status of biodiversity in core zones and buffer zones of the project area were presented in the report. The possible impacts on biodiversity due to proposed project and its associated developments in the core and buffer zones were assessed and Conservation and Management Plan (CMP) is framed to mitigate the possible impacts on conservation significant wildlife in study area due to project development and its associated activities. The Conservation and Management Plan also addressed the suggestions given by the concerned officials.

Dr. V. Vijay Kumar
Director
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Conservation and Management plan for Conservation Significant Species

Proposed Greenfield Chemical complex

Village Bada,Taluka - Mandvi, District - Kachchh, Gujarat

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1. INTRODUCTION

Biodiversity refers to the variety of species and ecosystems thriving on Earth (Gaston, 2000). Biodiversity supports human societies on ecological, economical, cultural and spiritual levels (MEA 2005). Its benefits are, however, compromised by anthropogenic activity which, in conjunction with population growth, results in the rapid deterioration of earth ecosystems and a decline in the number of species and their genetic heterogeneity (Prescott *et al*., 2000).

The biodiversity and wildlife conservation is referred as the development of habitats in a rational and scientific manner to sustain and flourish the entire biodiversity and genetic resources for the welfare of human society and maintenance of inherent ecological balance in a long-term manner in a geographical region. The natural ecosystems of the planet support human life by providing energy, food, water, and other resources.

During the last few decades, there is a massive decline as well as alteration of wildlife habitats and wild population, attributed by the tremendous increase in human and livestock population, destruction of habitats for the development of agriculture, increased dependency on natural resources from forests, development of infrastructure, mining, industrialization and urbanization, etc. Anthropogenic activities like agricultural expansion, road construction, urbanization, and other developmental activities are envisaged as major threats to biodiversity that have resulted in the extinction of species at a rate of 1000 to 10,000 times faster than the ancient times (Wilson, 1988). Thus, the conservation of wildlife becomes a global responsibility.

Development projects in any given region should respect the ecological integrity and biodiversity values of the region as these are going to make an impact on environmental quality as well as the sustainability of the developmental interventions. With determination and effort, these unwanted consequences that emerge from a development initiative can be reduced or prevented or mitigated substantially through technological innovations and managerial skills. Due to the manifold pressure from natural as well as anthropogenic causes, many of the species which are familiar to us are now disappearing on daily basis. Some of the species are facing threats of extinction locally, nationally and globally. Therefore, conservation of biodiversity is our prime duty for our

very survival and sustainable utilization of biological resources (MEA 2005). At this juncture, it is crucial to develop appropriate policy and plan for the sustainable utilization of resources along with conservation and management of biodiversity.

Gujarat state is bestowed with rich mineral resources which accounts for 18 major minerals and the state is placed at 3rd position in production of major mineral within India. Soda Ash the common name given for the technical grade anhydrous sodium carbonate (Na_2CO_3) forms an important part of Indian inorganic chemical industry. It is a high volume, low-value product and finds application mainly in the production of detergents (42% light soda ash), glass (23% dense soda ash), chemicals (17% mainly light soda ash), sodium silicate, pulp & paper industries, and water treatment. India has the advantage of the abundance of raw materials viz. limestone and salt and growing domestic demand that favours the establishment of soda ash plants in the state of Gujarat. GHCL Ltd. is one of the largest Soda Ash manufacturing companies in India and caters to around 25% of country domestic demand. The proposed soda ash plant at Kachchh will meet the increased domestic and industrial demand.

1.1 ABOUT GHCL LIMITED

Gujarat Heavy Chemicals Limited (hereafter GHCL) is a reputed Soda Ash manufacturing chemical unit, established in 1983 located at Sutrapada of Gir Somnath district in the State of Gujarat. This was India's first integrated Soda Ash plant based on Akzo's Dry Liming Technology. The Sutrapada plant was commissioned in the year 1988 with the production capacity of 4,20,000 tons per annum (TPA) capacity. Over the time capacity has been expanded up to 11,00,000 TPA.

GHCL, is now proposing to set-up a Greenfield Chemical Complex to produce the Light Soda Ash Plant having the capacity of 11,00,000 TPA, dense soda ash plant with the capacity of 5,00,000 TPA and sodium bicarbonate plant with the capacity of 2,00,000 TPA near the village Bada, Taluka – Mandvi, District Kutch in Gujarat state. Along with above products, salt based derivative plants will also be planned in the future. The Soda Ash process requires uninterrupted and stable power supply, which will be met from the proposed 120 MW solid fuel based captive cogeneration power plant. The entire envisaged capacity will be achieved in two phases. The major raw materials are solar salt, chemical grade limestone, fossil fuel and other chemicals. The process is being

exothermic and requires a large quantity of seawater for cooling purpose, RO-DM and diluting process effluent to meet statutory norms. Seawater will be withdrawn from nearby Arabian Sea. The other associated utilities will be part of the project. The diluted/treated effluent generated from various process units and utility rejects will be dispersed through the marine outfall system in the Arabian Sea.

1.2 RATIONALE

M/s GHCL Limited was incorporated in 1983. The company is mainly in business of Soda Ash and Sodium Bi-carbonate manufacturing. The manufacturing plants are located at Sutrapada, of Gir-Somanth District, in the State of Gujarat, India. It contributes to almost 25% to 29% of the annual domestic demand. Soda Ash product is significant because of its use in major consumption related sectors like chemicals, detergents, water treatment, glass manufacturing, pulp and paper, textile and mining industry etc. Sodium Bicarbonate is widely used in Food industry.

GHCL Ltd. has signed an M.O.U with Govt. of Gujarat during the Vibrant Gujarat Summit in 2017 for the establishment of Greenfield Chemical Complex in Kachchh District. Thus, in order to create new Greenfield capacity for Soda ash and Sodium bicarbonate to meet the growing demand from user industry and to honor the commitment made during Vibrant Gujarat Summit (VGS), it has proposed to set up Greenfield Chemical Complex in KachchhDistrict. The Greenfield Chemical Complex comprise of manufacturing units for Soda Ash (Light and dense), Sodium Bicarbonate, Captive Power plant and Seawater Intake and Effluent Disposal System.

The MoEF&CC had granted TOR for the project in August 2021. GHCL had engaged CSIR-NEERI and CSIR-NIO for the preparation of EIA reports with respect toTerrestrial and Marine environment. Company has also engaged CSIR-NIO Goa unit for carrying out Sand Dune morphology study and Wildlife and ecology related studies had been carried out by a NABET accredited Functional Area Expert. There are some literatures available on the nesting of Sea Turtles along the sandy coast of Mandvi. The study related to Sea Turtles Status Survey and Conservation had been carried out by Zoological Survey of India (ZSI). Therefore, GHCL has consulted Gujarat Institute of Desert Ecology (GUIDE), Bhuj for preparation of Conservation plan for Schedule-I species including Sea Turtles as part of TOR compliance and GCZMA meeting minutes.

1.3 OBJECTIVES AND SCOPE OF THE STUDY

The following scope of work had been formulated under the study on the proposed Greenfield Chemical complex project.

1. ***Identify and assess the status of floral components of different habitats within core and buffer zones of the proposed project site***
2. ***Identify and assess the status of major faunal components of different habitats within core and buffer zones of the proposed project site.***
3. ***Identify and evaluate species and habitat of conservation significance (Threatened species and crucial habitats) within the project area.***
4. ***Suggest mitigation measures to minimize the identified impacts on the project components***
5. ***Prepare the Species Conservation Management Plan for the proposed project.***

2. STUDY AREA

Project Location

The proposed Project site and the study area are located on the coast of Bada village, in Mandvi Taluka of Kachchh district in the state of Gujarat (Map-1).

For the convenience of the study and the user agencies, the study area was divided into two major parts i.e. 1) Core area/project area and 2) Buffer area i.e. 10.0 km, in the periphery of the project boundary (Map-2).

1. Core Area

The core area is the proposed land area for the establishment of the project plant (Map 2), that covers about 1350 Acres of private, unirrigated agricultural land and Sarkar-shree land/Government land, near the Bada village of Mandvi Taluka in Kachchh district. The proposed project area is composed of sparsely distributed thorny scrub species, dominated by invasive species *Prosopis juliflora.* There are no rivulets or drainage traversing through the project area.

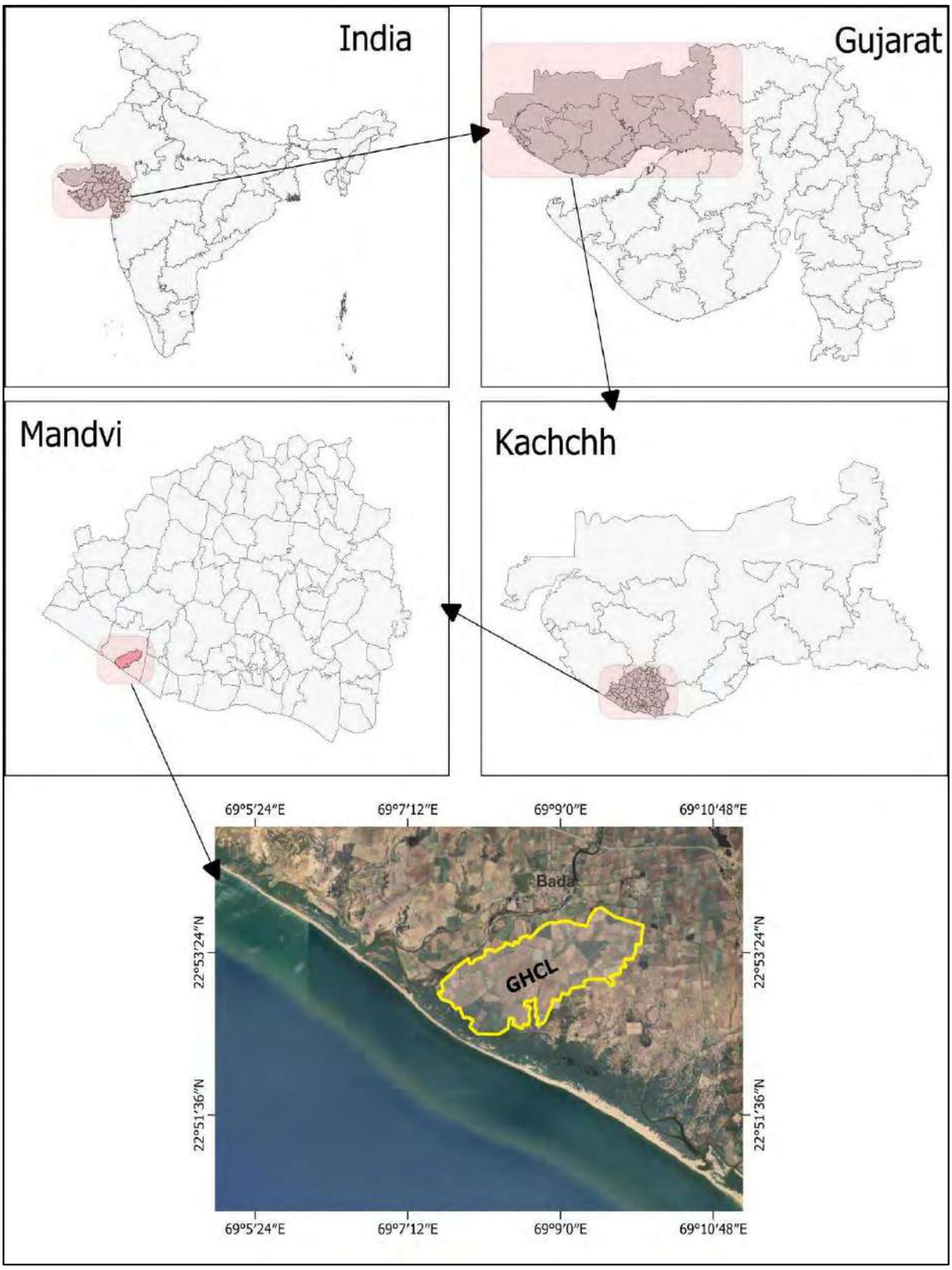
The Arabian Sea coast is located south of the proposed boundary of the project. The area is located at 6.0 km distance from the National Highway NH-41. As there is no major natural vegetation and human settlements present within the proposed land, therefore there is no requirement for relocation of any human settlements from the project site. The project site does not fall in 10.0 km periphery of any protected areas such as National Park or Sanctuary or eco-sensitive zones.

2. Buffer Area

The representative sampling locations within the villages within the 10 km buffer area are as below:

Table-1: Sampling locations in villages within 10 km buffer area

Sr. No.	Village Name	Sr No.	Village Name
1	Bada	7	Bhisara
2	Bhamdai	8	Panchatiya
3	Padampur	9	Bhada
4	Janakpur	10	Layija Nana
5	Chagdai	11	Laiyja Mota
6	Mapar	12	Bayath



Map- 1: Proposed project location near Bada village of Mandvi Taluka of Kachchh district in Gujarat

3. APPROACH AND METHODOLOGY

1. Reconnaissance Survey

A reconnaissance survey was conducted during March and April 2022 in core and buffer areas of the proposed Greenfield Chemical complex project site to take a note of existing flora, fauna and eco-sensitivity zone status.

The survey was conducted to identify various habitats within the study area and fix the sampling locations for the intensive survey and data collection on various aspects of the present study.

2. Land use and Land Cover Classification

The reconnaissance field survey was undertaken to get acquainted with the general land cover pattern of the area. Field observations were carried out along the core and buffer area for ground truthing to understand the patterns and characters using satellite imageries. Various features identified during the ground truthing were correlated with the information collated from the satellite imageries.

Major land use land cover in the study area observed to be waste land, rain fed agriculture land, water bodies, Arabian Sea and sand dunes and transport network. Due to sandy nature of shoreline the mangrove system is found to be absent in site.

3. Intensive Survey

Intensive field surveys were carried out from March to April 2022 for the data collection on the existing flora and fauna within the core and buffer zone of the study area.

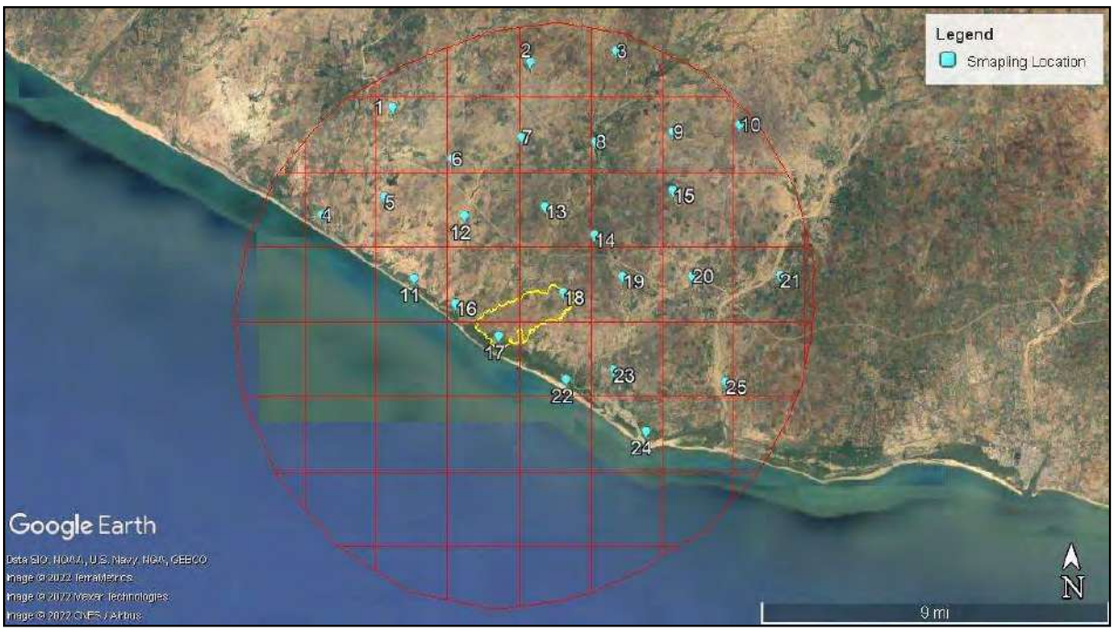
Sampling Locations

In order to assess the biodiversity status of the project study area, 25 locations (Transects) (Map 2) were sampled covering different habitats. These locations were randomly selected based on the availability of extent of area falling under different habitat types.

Distribution of sampling locations

Among the 25 sampling transects, 04 were selected within the Project Area (Core area) and the rest are in Buffer Area. Since the site is predominated by single crop

Agricultural habitat, wasteland with *Prosopis* thickets and Scrub land, maximum of 25 locations were sampled in this area.



Map-2: Core and Buffer area with sampling location of proposed plant in Kachchh, Gujarat.

The approach and methodology applied for assessing terrestrial biodiversity of the study area is described in respective sections below.

3.1. Terrestrial Biodiversity

Micro level approach mainly involving field based primary data collection on faunal diversity in the core and buffer zones within study area was undertaken. The various groups of faunal species including mammal, bird, reptile and amphibian were surveyed using standard methods in habitats such as forest, wetland, scrubland, grassland, human habitation, fallow land, mudflats, creeks, and agriculture, etc.

3.1.1. Floral status

Floral species existing was surveyed in all the representative habitats covering wetland, forest, grassland, scrubland and wastelands in core and buffer area of the proposed project site. Quantitative data on floristic diversity were collected using Standard Quadrate Sampling Methods followed by Mueller-Dombois and Ellenberg (1967), Kershaw and Wright (1980). Random vegetation surveys were also made at some locations to assess the plant diversity.

4.2 Status of Species Diversity

During the study period different plant and animal species belonging to both terrestrial and marine environments were recorded. An account of the floral and faunal diversity recorded during the study is given in the following sections.

4.2.1 Floral Diversity

Based on the preliminary survey on flora of the study area, a total of 110 species (Annexure I) of plants belong to 96 genera and 39 families were recorded (Figure 4.1). Among the recorded plants, 13 species were trees, 11 species of shrub, 47 species of herbs, 24 species of Grass and 15 species of climbers (Figure 4.2).

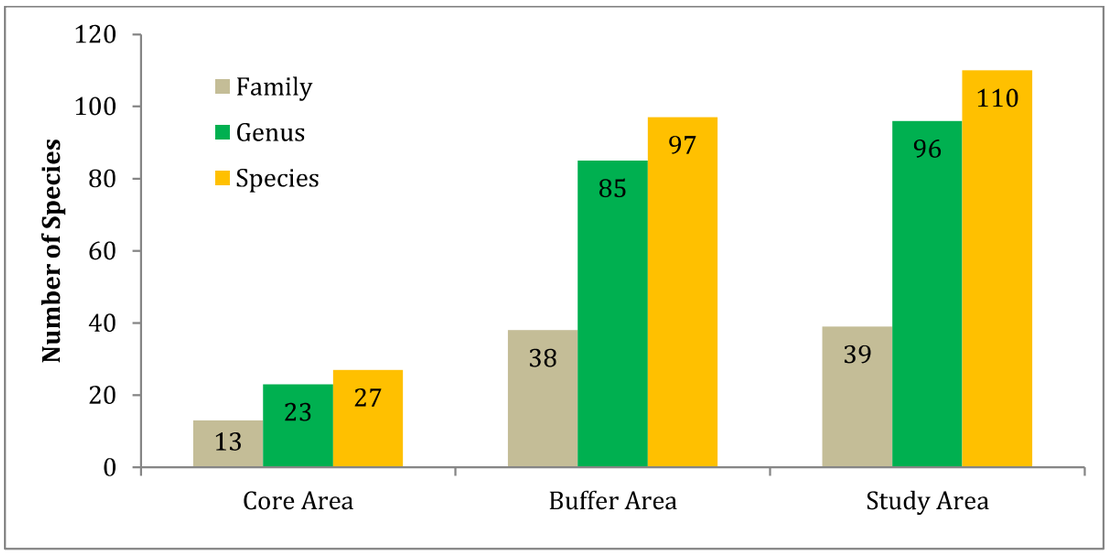


Figure 4.1: Floral Species diversity of the study area of GHCL, Kachchh

The buffer area of 447.24 km^2 was surveyed for biodiversity assessment and21 transects (for faunal survey) and 105 quadrates (for vegetation assessment) were laid. Nested quadrate sampling for trees (10 x10 m), shrubs and climbers (5 x5 m) and herbs (1 x1 m) were carried out. A total of 97 plant species were recorded belonging to 38 families and 85 genera. The species diversity of the recorded plants in the buffer area highlights that the highest number of plants were Herbs and Grasses (59) followed by Climber (15), Tree (13) and Shrub (10). The value of Shannon-wiener diversity index H' was 2.34 which depicted medium species diversity in the buffer area.

5. Threatened Biodiversity/Wildlife

5.1 Threatened Plant: There were no rare, endangered or conservation concern species present in the core area of the project site, however the sporadic occurrence of *Commiphora wightii*(Critically Endangered)with low abundance and frequency of occurrences in buffer zone was observed. The important and noteworthy plant species observed in the study area are, *Commiphora wightii, Hallopyrum mucronatu, Citrulus colosysnthis, Prosopis cenaraia, Tribulus terrestris* etc.

5.2 Threatened herpetofauna: In the present study we identified a total of 8 species of reptiles within the core area and 15 species in the buffer area (Table 4.1). The Mugger reported from the buffer area is listed as Schedule-I in the Wildlife (protection) Act, 1972 and vulnerable by the IUCN. The Indian Flap-shell turtle and Indian monitor lizard were also reported from the buffer area. These two species are common throughout the country and listed as Schedule-I in the Wildlife (Protection) Act, 1972 and least concerned by the IUCN. Among the other species Spiny-tailed Lizard belongs to Schedule-II whereas, rest of the species belongs to Schedule-IV. Majority of the reptiles (except Green and Olive Ridley Sea turtles which were added in the list from literature review of previous published reports) reported from the buffer area falls under 'Least Concern' category of IUCNRed list of threatened species. No endangered, rare, threatened or endemic species of reptiles was reported from the project core area.

The sandy stretches of Kachchh district are known for sporadic nesting of two species of sea turtles *i.e.*, Olive ridley (*Lepidochelys olivacea*) and Green Sea turtle (*Chelonia mydas*). Gujarat Ecology Commission a Government of Gujarat Organization has carried out a study as part of World Bank aided Integrated Coastal Zone Management (ICZM) Project titled "*Evaluation of Sea Turtle Nesting Population and Threats to Nesting Beaches: Suggest Conservation and Management Strategies" (*also referred as Sunderraj *et. al.,* 2013*).* The study based on secondary data (from Gujarat Forest Department and Sunderraj *et. al.,* 2002) identified total 10 stretches of Sea turtle nesting beaches on Kachchh coast.

The survey of 2000-2001 (Sunderraj *et. al.* 2002) is mentioned and considered by ZSI experts also while making site specific observation and report writing for the GHCL. The report mentions about sea turtle nesting information available for Kachchh coast is based on the data collected from Forest department, except for one-time survey by

Sunderraj *et. al.* (2002). However, ZSI has carried out site specific survey in 2019 for the proposed project and they did not sight or recorded any sea turtle in the study area. Further, there were no direct or indirect evidences on the nesting of Sea turtle on the Bada coast near to the project site was recorded during the rapid field visits carried out in the month of March and April 2022. Also, during the field visits the presence of rock was recorded in all over the beach during the low tide, with abrupt slope and dense vegetation in the supra tidal region on the beach near proposed project site. Presence of vegetation such as *Prosopis juliflora* is seen to hold sand and stabilized sand dunes. We also observed higher presence of predators such as jackals and dogs along the beach.

Based on the above primary observations it can be depicted that due to the presence of rocky patches, tidal inundation due to narrow strip, abrupt slope, dense thorny vegetation and presence of predators such as dogs and jackals, sea turtle nesting might have been hindered near the proposed study area. However, it is envisaged that sandy beach along the coast of Bambhdai, Pachotiya, Bhada and Nana Layja appear to be an ideal and viable habitat for sea turtle nesting based on the suitable habitat in terms of morphology and past records. Therefore, a detailed study is required to understand the exact status and nesting of Sea turtles.

Threatened birds: During the study a total of 91 bird species was observed in the study area. Majority of the species (67) are resident species whereas only 17 species were found to be migratory and seven species are resident migratory (Annexure II). Of these 91 bird species recorded, 84 belong to 'Least Concern' category rated by IUCN, whereas total 4 species *i.e.* Painted Stork (*Mycteria leucocephala*), Oriental White Ibis (*Threskiornisme lanocephalus*), Eurasian Curlew (*Numenius arquata*), and Pallied harrier (*Circus macrourus*) belong to Near Threatened category (Annexure II) and one species i.e. River Tern (*Sterna aurantia*) falls under Vulnerable category. Of the recorded species, five species belong to Schedule-I, 85 species belong to Schedule-IV and one species belong to Schedule-V.

Threatened Mammals: Total 16 mammal species was recorded from buffer area and seven from core area of the project site (Table-4.7). The common mammalian species that were directly observed in the core area include Wild boar (*Sus scrofa*), Grey Mongoose (*Herpestes edwardsii*), Indian Hare (*Lepus nigricollis*), Nilgai (*Boselaphustra*

gocamelus), Pale Hedgehog (*Ghemiechinus collaris*) and Five Striped Squirrel (*Funambulus pennantii*), etc. There were no Threatened or Schedule-I species reported from the core area of the project site (Table-4.7). Chinkara (*Gazella gazelle bennettii*) is the only Schedule-I species reported from the buffer area. Jackal (*Canis aureus*), Jungle cat (*Felis chaus*), Indian Fox (*Vulpus bengalensis*), Common Mongoose (*Herpestes javanicus*) belongs to Schedule-II of Indian Wildlife (Protection) Act, 1972. Whereas, Nilgai (*Boselaphustrago camelus*), Wild boar (*Sus Scrofa*) belong to Schedule-III. Rest of the species belong to Schedule-IV of IWPA, 1972. Majority of the common mammalian species recorded during the survey in the core and buffer area are present throughout semi-arid, non-forested and non-protected landscapes especially in Kachchh region.

Table-5.1: Species of high conservation significance (Threatened/Sch.-I) present in the study area.

No.	Taxa	Name of Species		IWPA Status	IUCN Status
		Common Name	**Scientific Name**		
1	Reptile	Flap shell Turtle	*Lissemus punctatea*	Sch.-I	LC
2	**Reptile**	***Green Sea turtle**	***Chelonia mydas***	**Sch.-I**	**EN**
3	Reptile	Indian monitor lizard	*Varanus bengalensis*	Sch.-I	LC
4	**Reptile**	***Olive Ridley Sea turtle**	***Leoidochelys olivacea***	**Sch.-I**	**VU**
5	**Reptile**	**Mugger/Crocodile**	***Crocodylus palustris***	**Sch.-I**	**VU**
6	Bird	Black shoulder kite	*Elanus caeruleus*	Sch.-I	LC
7	Bird	River Tern	*Sterna aurantia*	Sch.-IV	VU
8	Bird	Indian Peafowl	*Pavo cristatus*	Sch.-I	LC
9	Bird	Marsh Harrier	*Circus aeruginosus*	Sch.-I	LC
10	Bird	Pallid Harrier	*Circus macrourus*	Sch.-I	NT
11	Bird	Shikra	*Accipiter badius*	Sch.-I	LC
12	Bird	Short-toed Snake Eagle	*Circaetus gallicus*	Sch.-I	LC
13	Mammal	Chinkara	*Gazalla bennettii*	Sch.-I	LC
14	Plant	Gugal	*Commiphora wightii*	-	CR
	*Green Sea turtle and Olive Ridley Sea turtle were reported through secondary data. Sea Turtle visit only during the breeding season. However, no study has established exact breeding season and timing for the regions in study area. Mugger also reported from the study area.				

7. Conservation and Management Plan for Biodiversity and Wildlife

Wildlife conservation and management include "the management of wildlife populations in the context of the ecosystem, providing them suitable habitat and resources for feeding, breeding, roosting, nesting, and movement".

Most critical aspect of wildlife conservation is habitat management. Habitat loss presents the greatest threat to wildlife. Habitats management is the foremost need in order to support wildlife. Majority of the developmental activities now-a-days, reducing the natural habitat of wildlife and as a result certain population of wildlife is getting locally extinct day by day. Therefore, balance is needed to maintain between management of wildlife habitat and developmental activities.

Every habitat has a carrying capacity to support vital resources viz. food, water, cover to certain quantity of wildlife for a period of time. Maintaining carrying capacity of a habitat is a challenging task for the wildlife managers.

The formulation of a biodiversity and wildlife conservation and management plan for developmental project is one of the steps towards the environmental conservation. There are some basic principles that should always be considered when creating a long-term vision for successful species conservation and its management. These include:

- Conservation of populations within the major ecological settings across the species' natural range; and conservation of the species' genetic diversity across that range;
- Ecological functionality for Conservation of large populations requires enough habitat to support self-sustaining populations interacting with the full range of the species' natural predators, parasites, competitors, and prey and/or food plants;
- Human socio-economic and cultural needs and desires for conservation and management of the species across the geographic range, mainly to ensure the basic socio-economic and cultural needs of the human beings in a manner consistent with the above principles

This Conservation and Management Plan (CMP) is for Schedule-I faunal species as per the Indian Wildlife (Protection) Act, 1972 recorded in the study area (core and buffer) of proposed Greenfield Chemical Complex located in Mandvi taluka, Kachchh district of Gujarat. A total of Twelve species under Schedule-I fauna were recorded from the study area. The wildlife conservation plan for each of the conservation significant species is given in Table 7.1 to Table 7.6. It is also recommended that GHCL Ltd. shall follow Conservation measures mentioned in Status Survey Report for Sea Turtles prepared by ZSI, Kolkata for Greenfield Project. Conservation and management plan for rest of Schedule-I faunal species is given in table 7.6.

Mugger Crocodile (*Crocodylus palustris*)

Habit and Habitat: The mugger is a medium-sized crocodile (maximum length ca. 4-5m), and has the broadest snout of any living member of the genus *Crocodylus.* This species is found in freshwater habitats including, rivers, lakes, reservoirs, hill streams, village ponds and manmade tanks. It may also be found in coastal saltwater lagoons. Mugger is a hole-nesting species, with egg-laying taking place during the annual dry season. Females become sexually mature at approximately 1.8-2 m, and lay 25-30 eggs (Whitaker and Whitaker 1989). Nests are located in a wide variety of habitats, and females have even been known to nest at the opening of, or inside, their burrow. Like a number of other crocodilians, *C. palustris* is known to dig burrows. These burrows play a critical role in the survival of crocodiles living in harsh environments (Whitaker *et al*. 2007), allowing them to avoid exposure to excessively low and high temperatures.

Distribution: Muggers are principally restricted to the Indian subcontinent (India, Sri Lanka, Pakistan, Nepal and possibly from Bangladesh) where they may be found in a number of freshwater habitat types including rivers, lakes and marshes. In India and Sri Lanka, mugger crocodiles have adapted well to reservoirs, irrigation canals and manmade ponds, and in some areas may even be found in coastal saltwater lagoons (Whitaker and Whitaker 1989). The species has become locally extinct over large parts of its range, and viable populations only occur in protected areas (Santiapillai and Silva 2001). In Gujarat a sizable number of mugger crocodiles are found in many water bodies located in various parts of the state.

Population Trend: Stable

Muggers are reported from 15 States of India and the wild population is tentatively estimated as 3,021 to 4,287 non-hatchlings (Whitaker and Andrews 2003).

Threats: The current threats to the mugger crocodile are principally habitat destruction due to agricultural and industrial expansion, entanglement and drowning in fish nets, egg predation by people, and the use of crocodile parts for medicinal purposes (Groombridge 1982). Adequate survey data exist only for India and Sri Lanka, and indicate that populations while generally small and isolated, are widespread. There are increasing incidents of human conflict with this species and this is due to encroachment by humans into the species' natural habitats.

Conservation Status: IUCN: Vulnerable; **CITES**: Appendix-I; **IWPA, 1972**: Schedule-I

Conservation Measure Undertaken: Management of the species is largely based on the legal protection of wild populations and captive breeding for restocking natural populations. In India, a large-scale captive rearing program was initiated in 1975. The project has collected eggs from the wild, as well as produced young from captive adult breeding stock. The resulting juveniles have been used to restock natural populations in 28 national parks, wildlife reserves and crocodile sanctuaries throughout the country.

Olive Ridley, *Lepido chelysolivacea*

Distribution: The Olive Ridley sea turtle has a circumtropical distribution, with nesting occurring throughout tropical waters and migratory circuits in tropical and some subtropical areas (eg. Indian Ocean). Nesting occurs in nearly 60 countries worldwide. The coastal stretch between Mandvi to Pingleshwar is important nesting site of this species.

Population trend: Decreasing

Habit and Habitat: Olive Ridleys display a complex life cycle, which requires a range of geographically separated localities and multiple habitats (Márquez *et al.*, 1998). Females lay their nests on coastal sandy beaches from which neonates emerge and enter the marine environment to continue their development. They remain in a pelagic phase, drifting passively with major currents that disperse far from their natal sites, with juveniles sharing some of the adults' habitats (Kopitsky *et al.* 2000) until sexual

Conservation Plan: The conservation plan for the species in buffer areas of GHCL is given in table 7.5.

Conservation and Management plan of other Schedule I species is given in Table 7.6.

7.1. Marine Environment Management Plan (Suggested by CSIR-NIO)

The Marine Environment Impact assessment carried out for Seawater Intake and and Effluent Disposal for Greenfield Chemical Complex off Bada Coast, Arabian Sea has been carried out by Council of Scientific & Industrial Research (CSIR) – National Institute of Oceanography (NIO), Mumbai. The Executive Summary of the report is annexed along with this report. However, the findings of effluent release are mentioned as below:

The proponent proposed to release the effluent into the sea at two sites (CSIR-NIO EIA report 2021). Both the effluent release site would attain the ambient levels within 300m (max) distance. Since the area is devoid of mangroves and corals their destruction due to the development is unlikely. Well established sand dunes of sea shore would not be disturbed as the land base pipe line will be through tunnelling.

Based on the results of the Buoyant / Forced-Jet Model, it is suggested that the effluent should be released with a minimum initial jet velocity of 3.01 m/s through a 20 port diffuser at 9.47 m and 10.71 m below CD depth above 0.5 m from the bottom. As the effluent plume descends through the water column, it would attain initial dilution by 30-40 times.

Operation phase Impacts:

Effect on Water quality: The predicted maximum water temperature in a small area around the diffuser would be 33°C which is lower than the threshold of 35°C considered for tropical marine areas. Hence the release of the effluent is unlikely to cause thermal shock to the flora and fauna even in the vicinity of the diffuser. An incremental increase of Suspended Solids (SS hereafter) in a small area is unlikely to negatively influence the biota even in the vicinity of the diffuser. The ambient conditions would be attained within 300 m distance from the outfall location. A major fraction of the SS would settle but fine particles would remain in suspension for a longer duration. This would impart a milky hue to the water around the diffuser under continuous release of effluent. This however would not affect the flora and fauna since the SS in the effluent in non-toxic.

Effect on Sediment quality: The SS in the effluent is inorganic in nature and largely composed of constituents commonly occurring in the marine environment. Considering the sediment type off Bada, the settlement of the effluent associated SS is unlikely to grossly modify sediment character of the region.

Effect on Flora and fauna: The general water quality of the coastal area would not be affected negatively. Hence, by and large, the biological characteristics of the region would not be affected adversely except for some negative impact on macro-benthos in the vicinity of the diffuser, due to the settlement of SS. The SS though not harmful, it may change the sediment character locally and the macro-benthos community would have to adjust to this modified habitat.

Hence, as per the Marine EIA report submitted by CSIR-NIO, it is recommended that M/s GHCL can withdraw 16,00,000 M^3/day of water from two intake locations (IT1: 22o 52' 1.07''N; 69o 07' 28.96''E and IT2: 22°51'57.44" N; 69°07'32.44" E).

The disposal of 15,80,000 M^3/day at two out fall locations OF2_1: 22°52'15.79"N; 69°06'14.35"E (depth 9.47 m below CD), OF2_2: 22°52'6.65" N; 69°05' 59.08"E (depth 10.71 m below CD) will not impact the marine environment. The GHCL has to take approval from concerned authorities before commencement of the work.

Table 7.1

Conservation and Management Plan of Mugger Crocodile in Buffer areas of GHCL, Mandvi Taluka, Kachchh District

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
1	Habitat Conservation and Protection	Conservation and Protection of freshwater bodies like pond, lake, river, etc.	√	√	√	-	-	√	-	-	-	√	-
		Protection of hedge of river and nala which are important site for making borrow by the crocodile.	-	√	-	-	-	-	-	-	-	√	√
2	Habitat Improvement	Development of new water bodies in the area for the animal.	√	√	√	-	-	-	-	-	-	√	-
3	Minimise road killing	Crocodiles are migrating from one water body to another water body during breeding season through movement in land. Therefore, appropriate measure should be taken to avoid road killing of this animal by vehicular traffic.	√	√	√	√	-	-	-	√	√	-	-
4	Research and Monitoring	Regular Monitoring the crocodile in nearby water bodies to understand their local population.	-	√	√	-	-	-	-	-	√	√	√
		Research should be conducted on its population, dispersal patterns, breeding, etc.	-	√	√	-	-	-	-	-	√	√	√

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
5	Conservation education	Organization of Nature Education Program included creating awareness in the local community, college students, school children, etc. in regular basis.	√	√	√	-	-	-	-	√	√	√	√
6	Awareness generation	Creating awareness about Mugger Crocodile conservation can be done with active participation from the community, NGOs, school students, forest staffs for achieving educational goals.	√	√	√	-	-	-	-	√	√	√	√
7	Enhancing cooperation	Putting of boards with animal photographs/slogan along road sides, public places, schools, etc. to increase awareness about wildlife conservation.	-	√	√	-	-	-	-	-	√	-	-
		Interdepartmental cooperation, public private partnership, NGOs, Institutions and local community relationship need to be enhance conservation of Mugger crocodile	√	√	√	-	-	-	-	-	-	√	√
8	Pollution Control	Appropriate measure should be taken to minimize water pollution in all water bodies in the area.	√	√	√	√	√	-	-	-	√	√	√
9	Capacity building	Training is needed for forest staffs, community members, and local NGOs for rescue, captive breeding and conservation of Mugger crocodile.	-	√	√	-	-	-	-	√	-	√	√

Table 7.2

Conservation and Management Plan of Olive Ridley in Buffer areas of GHCL, Mandvi Taluka, Kachchh District

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
1	Habitat Conservation and Protection	Conservation and Protection of Sandy beaches which are natural sites for its nesting and egg lying.	√	√	√	-	-	-	-	-	-	√	-
		Protection of coastal sites from all kinds of pollution to manage its natural egg lying habitat	-	√	-	-	-	-	-	-	-	-	√
2	Habitat Improvement	Development of sandy beaches for nesting and egg laying and free from all kinds of disturbance	√	√	√	-	-	-	-	-	-	√	-
3	Reduce mortality due to accidental catch by marine fishing	Awareness generation among local fishermen about the accidental catch of this species.	√	√	√	√	-	-	-	√	√	-	-
		Rescue of the accidental individuals and release in sea or in rescue centre of forest department	√	√	√	√	-	-	-	√	√	-	-
4	Research and Monitoring	Regular Monitoring the sandy beaches located along the coastal stretch between Mandvi to Pingleshvar to understand their nesting ecology.	√	√	√	-	-	-	-	-	√	√	√

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
		Research should consist of its population dynamics, dispersal patterns, movement, nesting and breeding ecology, etc.	√	√	√	-	-	-	-	-	√	√	√
5	Conservation education	Organization of Nature Education Program included creating awareness in the local community, college students, school children, etc. in regular basis.	√	√	√	-	-	-	-	√	√	√	√
6	Awareness generation	Putting of boards with animal photographs/slogan along coastal areas, fish landing centres, fish market, etc. to aware fisherman and local community about the importance of marine turtle.	√	√	√	-	-	-	-	√	√	√	√
		Preparation of leaflets in local language highlighting the importance of this species and its conservation. The leaflets should be distributed among the fisherman communities.	√	√	√	-	√	√	-	√	√	√	√
		Creating awareness about sea turtle conservation through active participation from the community, NGOs, school students, forest staffs for achieving educational goals.	√	√	√	-	√	√	-	√	√	√	√

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
7	Enhancing cooperation	Interdepartmental cooperation, public private partnership, NGOs, Institutions and local community relationship need to be enhance to share the information about the wildlife, its rescue and its conservation	√	√	√	-	√	√	-	√	√	√	√
8	Pollution Control	Control of all source of pollution in coastal areas which are directly or indirectly impact on the marine turtle population.	√	√	√	√	√	-	-	-	√	√	√

(GHCL: Gujarat Heavy Chemical Ltd., FD: Forest Dept., GBB: Gujarat Biodiversity Board, GPCB: Gujarat Pollution Control Board, Short Term: 2 years, Medium term: 5 Years, Long Term: 10 years)

Table 7.3

Conservation and Management Plan of Green Sea Turtle in Buffer areas of GHCL, Mandvi Taluka, Kachchh District

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
1	Habitat Conservation and Protection	Conservation and Protection of Sandy beaches which are natural sites for its nesting and egg lying.	√	√	√	-	-	-	-	-	-	√	-
		Protection of coastal sites from all kinds of pollution to manage its natural egg lying habitat	-	√	-	-	-	-	-	-	-	-	√
2	Habitat Improvement	Development of sandy beaches for nesting and egg laying and free from all kinds of disturbance	√	√	√	-	-	-	-	-	-	√	-
3	Reduce mortality due to accidental catch by marine fishing	Awareness generation among local fishermen about the accidental catch of this species.	√	√	√	√	-	-	-	√	√	-	-
		Rescue of the accidental individuals and release in sea or in rescue centre of forest department	√	√	√	√	-	-	-	√	√	-	-
4	Research and Monitoring	Regular Monitoring the sandy beaches located along the coastal stretch between Mandvi to Pingleshvar to understand their nesting ecology.	√	√	√	-	-	-	-	-	√	√	√

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
		Research should consist of its population dynamics, dispersal patterns, movement, nesting and breeding ecology, etc.	√	√	√	-	-	-	-	-	√	√	√
5	Conservation education	Organization of Nature Education Program included creating awareness in the local community, college students, school children, etc. in regular basis.	√	√	√	-	-	-	-	√	√	√	√
6	Awareness generation	Putting of boards with animal photographs/slogan along coastal areas, fish landing centres, fish market, etc. to aware fisherman and local community about the importance of marine turtle.	√	√	√	-	-	-	-	√	√	√	√
		Preparation of leaflets in local language highlighting the importance of this species and its conservation. The leaflets should be distributed among the fisherman communities.	√	√	√	-	√	√	-	√	√	√	√
		Creating awareness about sea turtle conservation through active participation from the community, NGOs, school students, forest staffs for achieving educational goals.	√	√	√	-	√	√	-	√	√	√	√

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
7	Enhancing cooperation	Interdepartmental cooperation, public private partnership, NGOs, Institutions and local community relationship need to be enhance to share the information about the wildlife, its rescue and its conservation	√	√	√	-	√	√	-	√	√	√	√
8	Pollution Control	Control of all source of pollution in coastal areas which are directly or indirectly impact on the marine turtle population.	√	√	√	√	√	-	-	-	√	√	√

(GHCL: Gujarat Heavy Chemical Ltd., FD: Forest Dept., GBB: Gujarat Biodiversity Board, GPCB: Gujarat Pollution Control Board, Short Term: 2 years, Medium term: 5 Years, Long Term: 10 years)

Table 7.4

Conservation and Management Plan of Peafowl in Buffer areas of GHCL, Mandvi Taluka, KachchhDistr

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
1	Habitat Conservation and Protection	Conservation and Protection of Scrubland, River bed, Agriculture, wasteland, etc.	√	√	√	-	-	-	-	-	-	√	-
		Conservation of Mandvi taluka Reserve Forest is very much essential to conserve this species in the areas	-	√	-	-	-	-	-	-	-	-	√
2	Habitat Improvement	Development of scrubland and grassland patches which are site for nesting and egg laying	√	√	√	-	-	-	-	-	-	√	-
3	Reduce mortality due to vehicular traffic	Vehicular traffic and its speed limit should be minimised to check the chance of accident of animal along the coastal highway between Mandvi and Suthri.	√	√	√	√	-	-	-	√	√	-	-
4	Research and Monitoring	Regular Monitoring the Peafowl population is essential to understand their population dynamics.	√	√	√	-	-	-	-	-	√	√	√
		Research should consist of its population dynamics, social organization and dispersal patterns, movement, breeding, etc.	√	√	√	-	-	-	-	-	√	√	√

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
5	Conservation education	Organization of Nature Education Program included creating awareness in the local community, college students, school children, etc. in regular basis.	√	√	√	-	-	-	-	√	√	√	√
6	Awareness generation	Creating awareness about peacock conservation can be done with active participation from the community, NGOs, school students, forest staffs for achieving educational goals.	√	√	√	-	-	-	-	√	√	√	√
7	Enhancing cooperation	Putting of boards with animal photographs/slogan along road sides, public places, schools, etc. to increase awareness about wildlife conservation.	-	√	√	-	-	-	-	-	√	-	-
		Interdepartmental cooperation, public private partnership, NGOs, Institutions and local community relationship need to be enhance its conservation	√	√	√	-	-	-	-	-	-	√	√
8	Pollution Control	Control of water, soil and sound pollution created by various sources which are directly or indirectly impact on the Peafowl population.	√	√	√	√	√	-	-	-	√	√	√

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
9	Organic cultivation and cultivation of folk varieties	Emphasis should be given for organic cultivation and cultivation of folk/traditional varieties of crop to increase prey base of this animal in agricultural habitat	-	-	√	-	-	-	√	-	-	√	√

(GHCL: Gujarat Heavy Chemical Ltd., FD: Forest Dept., GBB: Gujarat Biodiversity Board, GPCB: Gujarat Pollution Control Board, Short Term: 2 years, Medium term: 5 Years, Long Term: 10 years)



Table 7.5

Conservation Plan for Chinkara in Buffer areas of GHCL, Mandvi taluka, Kachchh District

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
1	Habitat Conservation and Protection	Conservation and Protection of *Prosopis* Scrubland, patches of grassland and coastal sand dune which are the probable habitat of Chinkara.	-	√	√	-	-	-	-	-	-	√	√
		Conservation of Mandvi taluka Reserve Forest is very much essential to conserve this species in the areas	-	√	-	-	-	-	-	-	-	√	√
2	Habitat Improvement	Water hole exclusively fresh water and salt licking sites should be developed along the costal belt.	√	√	√	-	-	-	-	-	√	√	-
		Development of grassland patches and scrubland in the areas for fodder security of this species.	-	√	√	-	-	-	-	-	√	√	-
3	Protection of home range	Protection of the home range of this animal along coastal belt is required to manage the population	-	√	√	-	-	-	-	-	-	√	√
4	Reduce mortality due to vehicular traffic	Vehicular traffic should be minimised to check the chance of accident along the coastal highway between Mandvi and Suthari	-	√	√	-	-	-	-	-	-	√	√

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
5	Research and Monitoring	Regular Monitoring the Chinkara population is essential to understand their population dynamics.	-	√	√	-	-	-	-	-	√	√	√
		Research should consist of basic demographics parameters, Social organization and dispersal patterns, Home range, breeding, etc.	-	√	√	-	√	-	-	-	-	√	√
6	Conservation education	Organization of Nature Education Program included creating awareness in the local community, college students, school children, etc. in regular basis.	√	√	√	-	-	-	-	-	√	√	-
7	Awareness generation	Creating awareness about Chinkara conservation can be done with active participation from the community, NGOs, school students, forest staffs for achieving educational goals.	√	√	√	-	-	-	-	-	√	√	-
		Putting of boards with animal photographs/slogan along road sides, public places, schools, etc. to increase awareness about wildlife conservation.	√	√	√	-	-	-	-	-	√	√	-

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/Responsibilities								Timeline		
			GHCL	Forest Dept.	GBB	GPCB	CRZ	Fisheries Dept	Agri. Dept	NGOs	Short term	Medium term	Long term
8	Enhancing cooperation	Interdepartmental cooperation, public private partnership, NGOs, Institutions and local community relationship need to be enhance to share the information about the wildlife, its rescue and its conservation	√	√	√	√	√	√	√	√	-	√	√
9	Pollution Control	Control of sound pollution due to vehicular traffic along state highways during night hours.	√	√	√	-	-	-	-	-	√	√	-

(GHCL: Gujarat Heavy Chemical Ltd., FD: Forest Dept., GBB: Gujarat Biodiversity Board, GPCB: Gujarat Pollution Control Board, Short Term: 2 years, Medium term: 5 Years, Long Term: 10 years)

Table 7.6

Conservation Plan for other Schedule-1 Wildlife (Hyena, Raptors, Lizards) fauna existing in Buffer areas of GHCL, Mandvi taluka, Kachchh district

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/ Responsibilities			Implementation area	Implementing agency	Funding agency	Time-line	
			GHCL	FD	GBB				Short term	Long term
1	Habitat conservation and protection	Protection measures need to be undertaken for conservation of natural/suitable habitats of species *viz*. tropical thorn forests, scrub forests, grassland, wetlands, etc. of the area. Along with protection, it is also crucial to develop these habitats by planning suitable site-specific plant species.	-	√	√	NSS & OSA	FD & GHCL	GHCL	-	√
		Species like; *Acacia leucopholea, Prosopis cineraria, Acacia auriculiformis* and *Salvadora persica* could be planted near water bodies. These species could also be planted in village gaucher and Common Property Land Resources (CPLRs) at the density of 30 trees per hectare. These species provide nesting, roosting site for birds, and shades for animal and also some extend of fodder to herbivores.	√	√	√	Bada, Bambhadai, Pachotiya	FD & GHCL	GHCL	-	√
		Development of scrubland and grassland patches which are site for nesting and egg laying of many species of birds, reptile and small mammals should be carried out.	-	√	√	RFs	FD & GHCL	GHCL	-	√

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/ Responsibilities			Implementation area	Implementing agency	Funding agency	Time-line	
			GHCL	FD	GBB				Short term	Long term
		Large trees are normally used for nesting and roosting purposes by many of wildlife species. Therefore, large trees need to be conserved and plantation of suitable trees in the buffer areas needs to be undertaken.	√	√	√	RFs	FD & GHCL	GHCL	-	√
		Yearly monitoring of habitats of threatened species which are frequently utilized for feeding, nesting and breeding purpose should be done.	-	√	-	NSS & OSA	GUIDE	GHCL	√	-
2	Habitat improvement / management	Management and protection of natural water bodies with minimum human interventions. If possible, new water bodies should be constructed in forest and its adjoining areas or areas having dense population of wildlife. Also, cemented water holes need to be developed and frequent wildlife movement areas and is to be regularly filled through tankers for constant supply of water for wildlife and free grazing livestock.	-	√	-	Buffer area villages	FD & GHCL	GHCL	-	√
		Prosopis juliflora invasion in natural areas should be controlled. Pruning is also essential for maintaining this species. During fruiting season, the pods falling on the ground needs to be removed manually for preventing its spread through livestock.	-	√	√	Bada, Bambhadai,	FD & GHCL	GHCL	-	√

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/ Responsibilities			Implementation area	Implementing agency	Funding agency	Time-line	
			GHCL	FD	GBB				Short term	Long term
		Plantation in community places like road sides, school campus, gardens, and wasteland for improving general environment. *Ficusbenghalensis, Ficusracemosa, Salvadora persica* and some of other suitable species (given in Annexure V) for planting along the road sides, school campuses and gardens.	√	√	-	Within buffer area villages	FD & GHCL	GHCL	√	-
		Preference to be given for plantation of natural species of plants in greenbelt or suitable areas to provide habitat for feeding, resting and nesting of species.	√	-	-	Bada, Bambhdai,	GHCL	GHCL	-	√
		Grassland development should be done in suitable areas for fodder security of livestock and ecological securities of dependent biodiversity. *Chloris, Dactyloctenium, Cenchrus, Sporobolus,* etc. are some of the productive and nutritive grasses suitable for grassland development in the area.	-	√	√	Bada Bambhadai.	GHCL	GHCL	-	√
		Plantation of large tree species in some areas which are used for nesting by some bird species like raptors should be done.	√	√	-	Buffer villages	GHCL	GHCL	√	-

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/ Responsibilities			Implementation area	Implementing agency	Funding agency	Time-line	
			GHCL	FD	GBB				Short term	Long term
3	Protection and management of wildlife Population	The movement corridor used by various wildlife animal viz. carnivore, herbivore, reptile, birds need to be protected.	√	√	√	NSS & OSA	FD	FD	-	√
		The river bed, its tributaries, natural nala, wasteland which is used as a corridor by the wild animal should be protected.	-	√	√	NSS & OSA	FD	FD	-	√
		Yearly monitoring and population census of Schedule-1 species (WPA, 1972) / Threatened species should be recorded in the buffer zone of the study area.	√	√	-	NSS & OSA	GUIDE	GHCL	√	-
		Food and water availability for wildlife especially in drought period/summer season should be ensured.	-	√	-	NSS & OSA	FD	FD	-	√
		Speed and vehicular traffic should be minimised to check the chance of accident along the road used for project related activities, especially during evening and early morning hours.	√	-	-	Along roads in buffer area	Transport Dept.	GHCL	√	-

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/ Responsibilities			Implementation area	Implementing agency	Funding agency	Time-line	
			GHCL	FD	GBB				Short term	Long term
		Measures should be taken for controlling spreads of wildlife diseases like infectious and epidemic diseases by way of vaccination to livestock. Maintaining precautionary measures where wildlife and domestic animal share common feeding grounds.	-	√	-	NSS & OSA	FD	GHCL	-	√
4	Conservation education/ Awareness and Outreach activities	Conservation education/awareness programme like nature education camp involving local forest departments/NGOs to create awareness among various stakeholders with active participation from the community, school students, and local industrial houses for achieving conservation goals should be conducted.	√	-	-	Buffer area of GHCL	GHCL& GUIDE	GHCL	√	-
		Preparation of booklets, leaflets, pamphlets, calendars, and other printing material on biodiversity and its conservation importance to distribute among various stakeholders like local communities, schools, other departments, NGOs, etc.	√	√	√	NA	GHCL	GHCL	-	√
		Fixing of boards with animal photographs/slogan along road sides, public places, schools, etc. to increase awareness about biodiversity/wildlife conservation.	√	-	-	NA	GHCL& GUIDE	GHCL	√	-

Sl. No.	Specific Conservation and Management Objective	Conservation and Management Action	Role/ Responsibilities			Implementation area	Implementing agency	Funding agency	Time-line	
			GHCL	FD	GBB				Short term	Long term
		Supports Local NGOs/Vanya Prani Mitra/Eco-clubs of schools and colleges for wildlife conservation activities	√	-	-	NA	GHCL	GHCL	√	√
5	Pollution Control	Avoid water, soil and air pollution in project areas and roads uses for transportation	√	-	-	Buffer area of GHCL	GHCL& GUIDE	GHCL	√	-
		Plantation of dust capturing trees species (Annexure VI)	√	-	-				√	√
		Control of sound pollution created by project related activities/ transportation along the roads passing through wildlife habitat especially during night hours.	√	-	-				√	-

(GHCL: Gujarat Heavy Chemical Ltd., GBB: Gujarat Biodiversity Board, FD: Forest Dept., NSS: Narayan Sarovar Sanctuary, RFs: Reserve Forests, OSA: Outside Sanctuary Area, RFs: Reserve Forests, Short Term: 2 years, Long term: 5 Years)

8. Fund Allocation for Implementation of Conservation Plan

The successful conservation and protection of wildlife in natural habitat is prime duty of all stakeholders using the natural resources of such area for their livelihood. The detailed plan for the conservation and management of wildlife in the buffer areas of proposed Greenfield Chemical Complex of GHCL is given in table 7.1 to table 7.6. Since there is a good population of Chinkara and Peafowl present outside sanctuary areas, special focus is required to ensure effective conservation measures of Schedule-I faunal species through habitat improvement programmes.

To implement the above-mentioned Wildlife Conservation and Management Plan in the buffer areas of proposed Greenfield Chemical Complex of GHCL the budget is proposed (breakup given in table 8.1) for each activity to meet the goal of successful conservation of Schedule-I wildlife species. The proposed estimated budget of Rs. 1,26,00,000/- (One crore twenty-six lakhs only) has been allocated for upcoming 10 years from the date of inception of the project to implement various conservation actions as suggested in table 7.1 to table 7.6. The budget has been estimated as per the present market price/ Schedule of Rate (SoR) of activities. The estimated budget for some activities under wildlife conservation plan as mentioned in table 8.1 will be revised on yearly basis as per the current market rate/Schedule of Rate (SoR) of the Government of Gujarat to the implementation of such activities.

In addition to the fund allocation made for conservation and management activities of Schedule-I faunal species located in buffer areas of the GHCL, environmental/ habitat improvement programmes could be undertaken as part of CSR activities focussing on the conservation of Schedule-I faunal species. Along with that the budget is already allocated for the conservation of marine environment given in Marine EIA report prepared by the CSIR-NIO.

Table 8.1: Budget estimate (10 year plan) for Implementation of the Wildlife Conservation Plan for Bada Soda Ash Plant of GHCL

Sl. No.	Conservation Objective	Activities	Location of activities	Implementing Agency	Year of Implementation & Targets										Rate/Cost (In Rupees)	Rs in Lakhs
					1	2	3	4	5	6	7	8	9	10		
1	Habitat Conservation, Protection and Improvement	Plantation & Greenbelt development	Soda Ash Plant area and Periphery of plant (30 ha)	GHCL	LP	10 ha	10 ha	10 ha	GF	GF	GF	GF	GF	GF	Rs. 52000/ha	15.60
			Roadside plantation to minimise pollution& attract birds (20 ha)	GHCL	LP	5 ha	5 ha	10 ha	GF	GF	GF	GF	GF	GF	Rs. 52000/ha	10.40
			Bada, Bambhadai and other RF. (50 ha) (Location will be decided by FD)	FD	LP	20 ha	20 ha	10 ha	GF	GF	GF	GF	GF	GF	Rs. 52000/ha	26.00
		SMC Work	Reserve forest area (creation of water hole structures)	FD	-	10 St	20 St	20 St	-	-	-	-	-	-	Rs. 10000/ structure	5.00
		Plantation management	Water tanker* (1) and Tractor* (1)	FD	-	√	-	-	-	-	-	-	-	-	Rs. 2000000	20.00
			Utility vehicle* (1)	FD	-	√	-	-	-	-	-	-	-	-	Rs. 1200000	12.00
2	Research and Monitoring	Plantation Monitoring	Plantation Area	3rd Party Monitoring	-	-	√	-	√	-	-	√	-	-	Rs. 600000	6.00
		Wildlife Monitoring	Narayan Sarovar Sanctuary & Reserve Forests area	FD and GUIDE	-	-	√	-	√	-	-	√	-	-	Rs. 1000000	10.00
3	Education & Awareness	Workshop, NEC, Sign board, etc.	GHCL& Nearby Schools & Colleges	FD and GUIDE	-	√	-	√	-	√	-	√	-	√	Rs. 1000000	10.00
4	Miscellaneous	Contingency	-	GHCL & FD	√	√	√	√	√	√	√	√	√	√	Lump sum	5.00
															Sub-total	**120.00**
	Monitoring of works		Implementation Areas of WCP	FD	-	√	-	√	-	√	-	√	-	√	@5% of total	6.00
															Grand Total	**126.00**

GHCL: Gujarat Heavy Chemical Ltd.; FD: Forest Dept; GUIDE: Gujarat Institute of Desert Ecology; LP: Land preparation; GF: Gap filling; NEC: Nature Education Camp

*Note: Vehicles are required for the efficient management of plantation activities and it will be the asset for the forest department in future.

8.1 Review and Monitoring of Wildlife Conservation Plan

The conservation plan proposed for the Schedule-I fauna existing in buffer area of GHCL should be monitored continuously to assess any short comings and to remediate further and implement the plan to achieve the goal for conservation and improvement of the wildlife population and its habitat. In order to do this a team comprising experts from the field of ecology, environment and wildlife from a reputed organization will monitor the works implemented for conservation of threatened and Schedule-I fauna by the GHCL Ltd. The team will review the progress and evaluate the works and submit reports periodically. The report should also suggest remedial measures for effective conservation and management of the threatened and Schedule-I faunal species.

8.2 Field Monitoring

It will be difficult to assess the results and success of this proposed conservation plan unless the status of threatened I fauna, associated wild animals and its habitat are monitored on a regular or timeline basis. This monitoring can be done scientifically through experienced wildlife experts/Institute/Organization with the support of local Forest Department and result needs to be submitted to the monitoring committee for further discussion and future policy implementation with necessary changes. The field monitoring can preferably do at the post-monsoon period or winter season of every 3 year. The above activities will be monitored by MoEF& CC and respective agencies.

8.3 Success Indicators

Following factors will be undertaken as measurable indicators of success of the plan:

1. Increase in vegetation density and ground cover in buffer area.
2. Increase in population and abundance of rare, threatened and Schedule-I faunal species as mentioned in the plan.
3. Increase in population and abundance of biodiversity and other wildlife in the area.
4. Overall health of the habitat and ecosystem in buffer areas

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-TRUE COPY-

D. M. Thaker
Director (Environment) &
Member Secretary (GCZMA)

Government of Gujarat
Forest & Environment Department
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E-mail: direnv@gujarat.gov.in

File no. ENV/10/2021/184/T-cell Date: 26 DEC 2023

To,
Dr. H. Kharkwal
Director (CRZ)
Ministry of Environment, Forest and Climate Change,
Government of India,
Room No. 215, 2nd Floor, Agni Block
Indira Paryavaran Bhavan, Jor Baugh,
Aliganj Road, New Delhi – 110 003.

Subject: CRZ Clearance for Proposed Greenfield Chemical Complex seawater intake and effluent disposal facilities at village Bada, Ta –Mandvi, Dist-Kutchh by M/s.Gujarat Heavy Chemicals Limited(GHCL).

Reference: CRZ application dated.11.10.2021

Dear Sir,

M/s. Gujarat Heavy Chemicals Limited (GHCL)vide application dated. 11-10-2021 submitted an application seeking recommendation from Gujarat Coastal Zone Management Authority (GCZMA) for obtaining CRZ Clearance from the Ministry of Environment, Forests and Climate Change, Government of India for Greenfield Chemical Complex seawater intake and effluent disposal facilities at village Bada, Taluka Mandvi, Dist-Kutchh.

M/s. GHCL has submitted the following documents along with their application and processing fees:

1. Form -1 as per CRZ Notification 2011,

2. CRZ Maps in 1:4000 scale, prepared by Institute of Remote sensing, Anna University, Chennai,
3. EIA report prepared by Council of Scientific & Industrial Research (CSIR) and NEERI.
4. Marine EIA prepared by CSIR- National Institute of Oceanography.
5. Feasibility study report by STUP Consultant Private Limited, Ahmedabad.
6. Consent to Establish from Gujarat Pollution Control Board issued on 09.09.2011.
7. NOC from GMB issued on 10.02.2022.
8. Various Undertaking Submitted by Project Proponent for CRZ Clearance.

M/s. Gujarat Heavy Chemicals Limited (GHCL) submitted EIA report including introduction and project overview (chapter – 1), Project Description (Chapter - 2), Description Environment (chapter – 3), Anticipated impacts & Mitigation Measures (chapter – 4), Analysis of Alternatives (chapter – 5), Environmental Monitoring Program (chapter – 6), Additional Studies (chapter – 7), Project Benefits (chapter – 8), Environmental Cost Benefit Anlysis (chapter – 9), Environmental Management Plan (chapter – 10), Summary and Conclusions (chapter – 11) and Disclosure of Consultant Engaged (chapter – 12). Council of Scientific & Industrial Research (CSIR) and NEERI consultant carried out EIA.

The Proposal of GHCL was discussed in the GCZMA committee during 67th meeting held on 4th August 2023.

The Member Secretary, GCZMA apprised the Authority that M/s. GHCL presented their case in GCZMA meeting held on 17.01.2022. Additional detail sought (ADS) by GCZMA via mail on 01.02.22. PP replied on 29.11.22 & 26.12.22 and requested for conducting site-visit. GCZMA constituted a sub- committee and got visited the site on 27.04.23.

PP submitted details sought by the committee vide its letter dated 29.04.23. PP submitted final EIA report and public hearing details submitted on 29.11.22 to GCZMA. As forestland involved in the proposed project, they got Stage-1 approval on

18.07.23 and submitted Olive Riddly Turtle conservation plan approved on 24.04.23 from Forest Department along with Sand dunes conservation plan on 29.11.22.

The representative of M/s GHCL Ltd made a detailed presentation before the Authority and submitted that GHCL is a diversified company with footprint in Chemicals, Textiles and Consumer product segment. In Chemical sector, the company is mainly in the business of manufacturing Soda Ash (i.e. Anhydrous Sodium Carbonate) and Sodium Bicarbonate. It is one of the leading producers of Soda Ash in the country since 1988.

- The site is in proximity to Sea, which is the only source available for uninterrupted water supply to manufacturing plant. Seawater is required for meeting requirements for RO-DM plant, process cooling, dilution requirements, domestic use etc.

- A huge and increasing focus on renewable energy with government and private sector investment in such sources is strongly driving global demand for soda ash. This project will also support the demand of Soda Ash as it is a key raw material in the processing of lithium, a key component of lithium-ion batteries which is used in electric vehicles. Another key downstream product manufactured from Soda Ash, is emerging as a solution of choice for emission control applications.

- GHCL had signed an M.O.U in Jan-2017 during Vibrant Gujarat Summit, 2017 for establishment of Greenfield Chemical complex in district Kutch, Gujarat. GHCL proposes to set up a Greenfield Chemical complex having
  - ✓ Light Soda Ash (11,00,000 TPA),
  - ✓ Dense Soda Ash (5,00,000 TPA) and
  - ✓ Sodium bicarbonate (2, 00,000 TPA) manufacturing plants
  - ✓ supported by utilities like solid fuel based captive Co-generation power plant (120 MW),
  - ✓ seawater intake (16,00,000 m3/day) and
  - ✓ effluent outfall system (15, 80,000 m3/day),
  - ✓ RO-DM system and associated infrastructure.

- As per the proposal, M/s GHCL will withdraw 16,00,000 m^3/day of water from two intake locations and the disposal of 15,80,000 m^3/day of effluent at two out fall locations and its co-ordination are as follows,

Label	Latitude	
Intake Point 1	22^0 52' 1.070'' N	69^0 7' 28.900'' E
Intake Point 2	22^0 51' 57.440'' N	69^0 7' 32.440'' E
Outfall Point 1	22^0 52' 15.790'' N	69^0 6' 14.350'' E
Outfall Point 2	22^0 52' 6.650'' N	69^0 5' 59.080'' E

- Total length of sea water intake and out fall effluent disposal pipeline falls in various CRZ area are as follows,

Pipeline	CRZ- Classification	Length in m
Intake Pipeline 1	CRZ IA	267.17
	CRZ IB	60.25
	CRZ III (200 m to 500 m from HTL)	105.81
	CRZ IVA	948.76
	Total	**1381.99**
Intake Pipeline 2	CRZ IA	270.37
	CRZ IB	57.44
	CRZ III (200 m to 500 m from HTL)	98.57
	CRZ IVA	962.26
	Total	**1388.64**
Outfall Pipeline 1	CRZ IA	380.92
	CRZ IB	81.78
	CRZ III (No Development Zone)	17.88
	CRZ III (200 m to 500 m from HTL)	66.4
	CRZ IVA	2101.48
	Outside CRZ	121.71
	Total	**2770.17**
Outfall Pipeline 2	CRZ IA	379.67
	CRZ IB	83.36
	CRZ III (No Development Zone)	17.88
	CRZ III (200 m to 500 m from HTL)	67.66
	CRZ IVA	2623.88
	Outside CRZ	110.03
	Total	**3281.88**

As per the CRZ map prepared by the Institute of Remote Sensing, Anna University, Chennai. Proposed project activities are permissible under the clauses no. 3 (I) (a) , 4 (II) (d), 8 I (i)-b, (ii)- b, 8 III A(iii) j, k , 8 (IV) a of CRZ notification, 2011. Activity wise details of CRZ zone are as under:

Activities	Zone
Construction of process plant and utilities etc.	outside CRZ area
Effluent collection	outside CRZ area
Seawater Intake system i.e. sump and pump house	CRZ III
Intake Pipeline	CRZ IA, CRZ IB and CRZ IV
Outfall Pipeline	CRZ IA, CRZ IB and CRZ IV

Following Studies have been conducted by Project Proponent:

- Baseline Marine Environmental assessment, Effluent Dispersion Modeling, Sand dune Morphology by CSIR NIO (Goa, Mumbai). As per the findings, Suitable Corridor for laying seawater intake and outfall identified. Coast near site is Stable based on satellite image analysis and Sand dunes are found to be stable and suitable for tunneling activity.
- Conservation plan of Schedule - 1 Species by Gujarat Institute of Desert Ecology, Gujarat
- Status Survey and Conservation by Zoological Survey of India, Kolkata: Finding of the study stated that during monitoring period any turtle, fresh /old nests or crawl marks were not found. Due to narrow beach width, vegetation cover, slope, presence of pebbles and rubbles and presence of predators at project site which are unfavorable for sea turtle nesting.
- Gujarat Sea Turtle: Status Survey and Conservation by Gujarat Institute of Desert Ecology,
- Seawater Intake & Effluent Disposal Feasibility Consultancy by STUP Consultancy, Ahmedabad.

As the study on Biodiversity and Wild life, No notified protected area within Study area, Presence of critically endangered plant species Commiphora wightii in

buffer area, Conservation plan suggested for Schedule I Flora and Fauna & approved by forest department and No important wetland or bird areas are located within project vicinity.

Design and detailed construction methodology:

- Micro tunneling are done using the pipe jacking method. The pipelines for seawater intake and effluent disposal are required to be laid in a safe manner so that the sand dunes stretch between the plant boundary and respective land fall points (LFP) are protected without any disturbance to their natural appearance and stability.
- In such sensitive and difficult terrains tunneling offers a reliable technological solution. The treated effluent will be discharged at a suitable location off Bada coast through buried pipeline up to shore and submarine pipeline up to disposal location in sea.
- Minor change of alignment of pipeline may be required as per required depth for intake well construction & hydraulics requirement without changing landfall point and CRZ corridor. Reputed agency M/s RHDHV is engaged .
- For sand dune stretch the effluent disposal pipeline will be laid through tunneling. There will be no disturbance to stable sand dunes along the coast, as pipeline will be laid underground through micro tunneling method.
- The predicted max. water temperature in a small area around diffuser 33°Which is lower than threshold of 35°C. Incremental increase of SS in a limited area around diffuser is unlikely to negatively influence the biota even in the vicinity of diffuser. Fine SS particles would remain in suspension for longer duration and impart a milky hue around diffuser, as SS in effluent is non toxic this will not impact the water quality. Estimated benthic loss due to seawater intake is about 141.6 kg. and 331 kg. For outfall. Such loss is unlikely to be reflected on overall bio potential of Bada coast. This loss would be temporary and benthos will recolonize in due course after construction phase gets completed. The new structures will provide additional surface area for sub-tidal benthos to colonies.
- As the study on Biodiversity and Wild life, No notified protected area within Study area, Presence of critically endangered plan species Commiphora wightii

in buffer area, Conservation plan suggested for Schedule I Flora and Fauna & approved by forest department and No important wetland or bird areas are located within project vicinity.

- It was further submitted by the representative of GHCL that there is no existence of mangrove in proposed project areas for lying of intake and outfall pipelines and there would not be any impact on mangroves due to proposed activities.

Diffuser details:

Installation depth of water at the outfall location-OF2_1	: 9.4 m CD
Installation depth of water at the outfall location-OF2_2	: 10.7 m CD
Outfall Pipe Diameter (ID)	: 2.0 m
Number of outfall pipelines	: 2 Nos.
Length of the pipelines(L)	: 2185 & 2686 m
Design outfall flow rate (Q)	: 1580 MLD
HDPE Inner Diameter of Pipe	: 2000 mm
Pipe friction factor	: 0.001
Density of sea water	: 1025 kg/m^3
Effective depth for dilution	: 9.4 to 10.7m
No. of ports provided	: 20 in each diffuser
Diameter of port	: 440 mm
Length of Diffuser Block	: 100m each
Height of vertical riser	: 1.0m
Ports space	:@ 6000 mm c/c
The main diffuser pipe is buried	:2.0 m below the sea bed
Initial dilution estimated as	30 to 40 times.
Diffuser Port Velocity	: 3.01 m/sec

The port configuration consists of a riser pipe of 440 mm diameter at 15 degrees to the main diffuser pipe segment with a height of 1500 mm below the sea bed and 500 mm above the sea bed. From the model results, it is found that the average dilutions of 30 to 40 times would be achieved along with the tidal variation in the case of 1580000 m^3/day discharge. To get this dilution time, the diffuser system should

contain 40 ports having a 0.44 m diameter. The diffusers should be separated at a distance of 6 m. The elevation of ports from the sea bed should be 0.5 m. The velocity of release of effluent should be maintained at 3.01 m/s.

Details of Environment Protection Measures:

- It was submitted that as per the numerical flow model run for seawater intake of 1600 MLD and dispersion model for effluent disposal of 1580 MLD, Model run for post monsoon and pre monsoon for various tidal conditions. No significant changes in flow regime are observed due to continuous withdrawal from recommended seawater intake locations.
- CSIR NIO has recommended effluent disposal points after evaluating 03 alternative options.
- Ambient conditions for temperature, SS, Ammonical nitrogen will be attained within 300 m distance from the diffuser.
- CSIR NIO Goa study suggested that sand dunes along the coast are stable and recommended suitable Landfall points and tunneling method for pipelines.
- From the model results, it is found that the average dilutions of 30 to 40 times would be achieved along with the tidal variation in the case of 1580000 m^3/day discharge. To get this dilution time, the diffuser system should contain 40 ports having a 0.44 m diameter. The diffusers should be separated at a distance of 6 m.
- The elevation of ports from the sea bed should be 0.5 m. The velocity of release of effluent should be maintained at 3.01 m/s.

MS, GCZMA appraised the authority that, GCZMA constituted a sub- committee and got visited the site on 27.04.23. As per the report of the sub-committee, GHCL submitted final EIA, public hearing details, copy of approved conservation plan for significant species, conservation management plan for sand dunes. As included in the report there will no impact on sand dunes due to underground construction of tunnel for the sea water suction and disposal of treated water into sea. As informed by PP, they will use highest technology to underground tunnel construction and due to which no major impacts will be on the sand dunes.

After the detailed discussion and deliberation on the presentation, it was decided by the GCZMA to recommend the project of M/s Gujarat Heavy Chemicals Limited located

at village Bada, ta - Mandvi, District -Kutch for Proposed Greenfield Chemical Complex seawater intake and effluent disposal facilities to the Ministry of Environment, Forest and Climate Change, Government of India for granting CRZ clearance with specific condition.

In view of the above the State Government hereby recommend to the Ministry of Environment, Forests and Climate Change, Government of India grant CRZ clearance for Proposed Greenfield Chemical Complex seawater intake and effluent disposal facilities of M/s. Gujarat Heavy Chemicals Limited with following conditions:

1. The effluent not meeting with the GPCB norms shall not be discharged and shall be stored in the Guard Ponds and recycled back into the Effluent Treatment Plant for further treatment to achieve the GPCB norms. M/s GHCL shall install necessary facilities for this purpose and shall strictly ensure the compliance with the GPCB norms, round the clock.
2. The pipelines for seawater intake and effluent disposal shall be laid in a safe manner so that the sand dunes stretch between the plant boundary and respective land fall points (LFP) are protected without any disturbance to their natural appearance and stability.
3. The pipeline shall be monitored regularly by the company and it shall be ensured that there is no leak from the pipeline. In case of any such eventualities, the company shall immediately stop disposal through the said pipeline and take the corrective measures in consultation with the GPCB and the District Collector.
4. There shall not be any blockage of creek/river etc. due to laying of pipeline and free flow of water shall be maintained.
5. M/s. GHCL shall carry out mangrove plantation in 50 ha area in consultation with Forest Department/Gujarat Ecology Commission (GEC). The amount for the same shall be deposited within 06 months to Forest Department/GEC.
6. All the recommendations and mitigation measures suggested for sea turtle conservation plan shall be complied with by the GHCL.
7. The GHCL shall ensure that there will not disturbance to nearby Ecologically Sensitive area for their proposed project.

8. The pipeline shall be monitored regularly by the company and it shall be ensured that there is no leak from the pipeline. In case of any such eventualities, the company shall take immediate corrective measures.
9. Project proponent (PP) shall have to carry out marine water quality environment monitoring regularly on quarterly basis and submit the report to GCZMA, GPCB, IRO & MOEF & CC, GoI.
10. PP shall contribute through its CER fund for environmental infrastructure up-gradation, awareness programs etc.
11. PP shall obtain all necessary clearances from competent authorities/ departments before construction and commissioning of the activities.
12. No groundwater shall be taped to meet with the water requirements during the construction and/or operation phases.
13. There shall no discharge of any kind of wastewater / sewage / effluent/ wastes into the creek or sea or in CRZ areas except allowed by this permission.
14. PP shall implement all the suggestions / recommendations given by their consultants in their EIA report.
15. PP shall develop 33% greenbelt within premises and shall maintain greenbelt.
16. PP shall prepare and execute Disaster Management Plan and submit to the concerned offices including the District Authorities.
17. PP shall ensure that the labour construction camps are kept outside the CRZ areas and the construction labour are provided with adequate amenities like drinking water, fuel, sanitation, etc. to ensure that the existing environmental condition is not deteriorated by them.
18. PP shall bear the cost of the external agency that may be appointed by this Department for supervision / monitoring of proposed activities.
19. PP shall take up socio-economic upliftment activities in consultation with the District Collector / DDO. A separate budget shall be provided for this purpose.
20. PP shall regularly submit the half-yearly compliance report on the conditions stipulated by this Department/GCZMA/ MoEFCC.
21. The provisions of the CRZ notification, 2011 and as amended from time to time shall be strictly adhered to by the PP.
22. PP shall obtain consents/ authorisation/ permission of the Gujarat Pollution Control Board under applicable Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act'1981 and Rules made

under Environment (Protection) Act' 1986. Discharge of pollutants shall not exceed the limits prescribed under the Environmental Acts/ Rules.

23. PP shall adopt the necessary soil conservation measures to prevent any exposed soil from being eroded or blown over.
24. A Disaster Management Plan to meet with any eventualities that may arise during construction and/or operation phase shall be prepared and implemented.
25. A separate Environmental Cell with qualified personnel shall be created to implement the Environmental Management Plan and a separate budget shall be provided for this purpose.
26. Any additional conditions that may be imposed by MoEF&CC, this Department/GCZMA shall be complied by the PP

Thanking you,

D. M. Thaker 26/12/2013

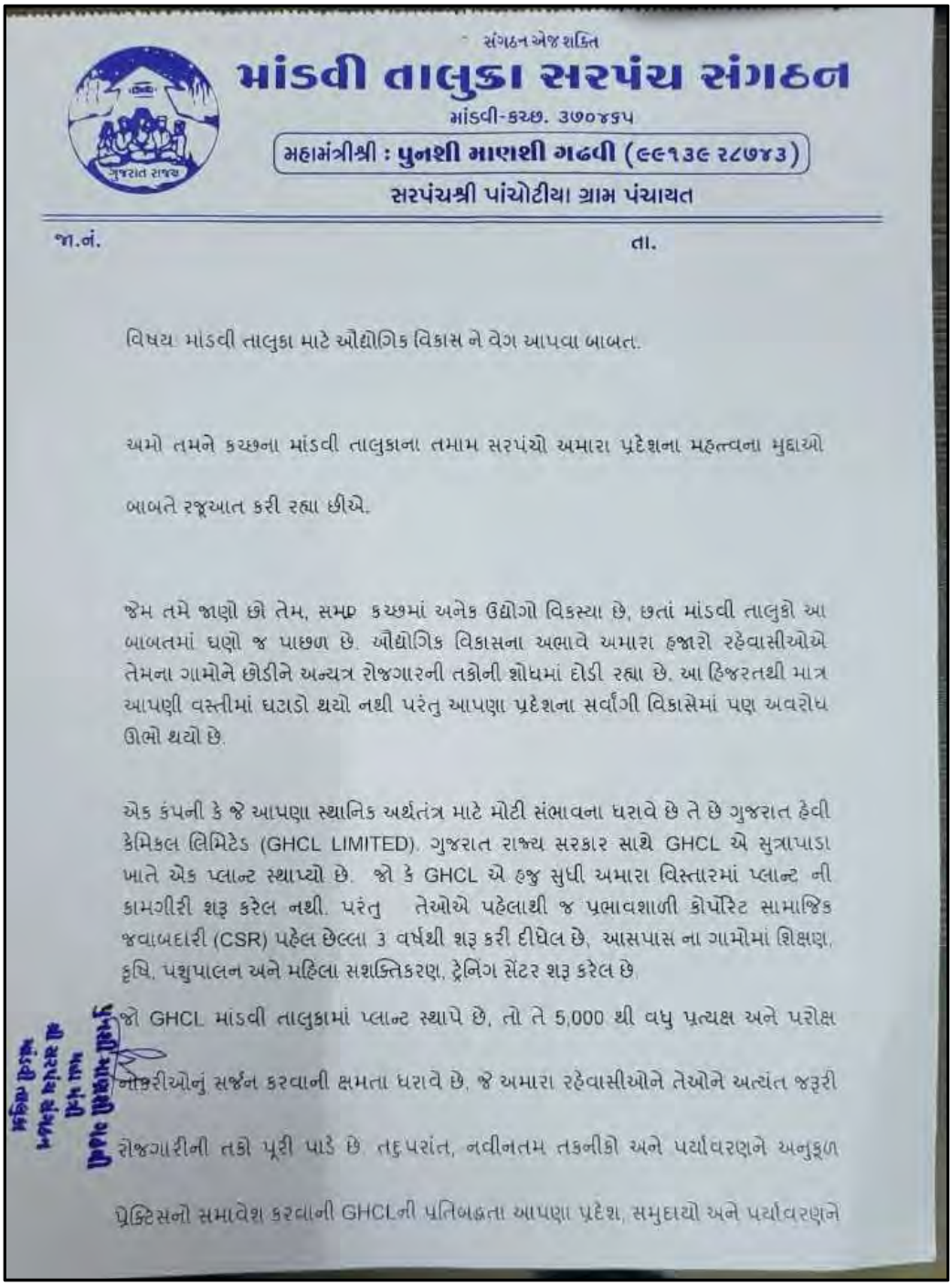
(D. M. Thaker)

Copy to:
Chief Operating Officer,
M/s. Gujarat Heavy Chemical Limited,
GHCL House, Swastik Society, opp Punjabi Hall, Navarangpura ,
Ahmedabad-380009---------- For Your kind information

-TRUE COPY-

- **Various Supporting Letters**

1) **Letter from Mandvi Taluka Sarpanch Sangathan – Sarpanch Shri – Panchotiya Gram Panchayat**
This letter was handed over to Chief Minister-Gujarat during his visit to Mandvi



સંગઠન એજ શક્તિ

માંડવી તાલુકા સરપંચ સંગઠન

માંડવી-કચ્છ. ૩૭૦૪૬૫

મહામંત્રીશ્રી : પુનશી માણશી ગઢવી (૯૯૧૩૯ ૨૮૭૪૩)

સરપંચશ્રી પાંચોટીયા ગ્રામ પંચાયત

જા.નં. તા.

વિષય: માંડવી તાલુકા માટે ઔદ્યોગિક વિકાસ ને વેગ આપવા બાબત.

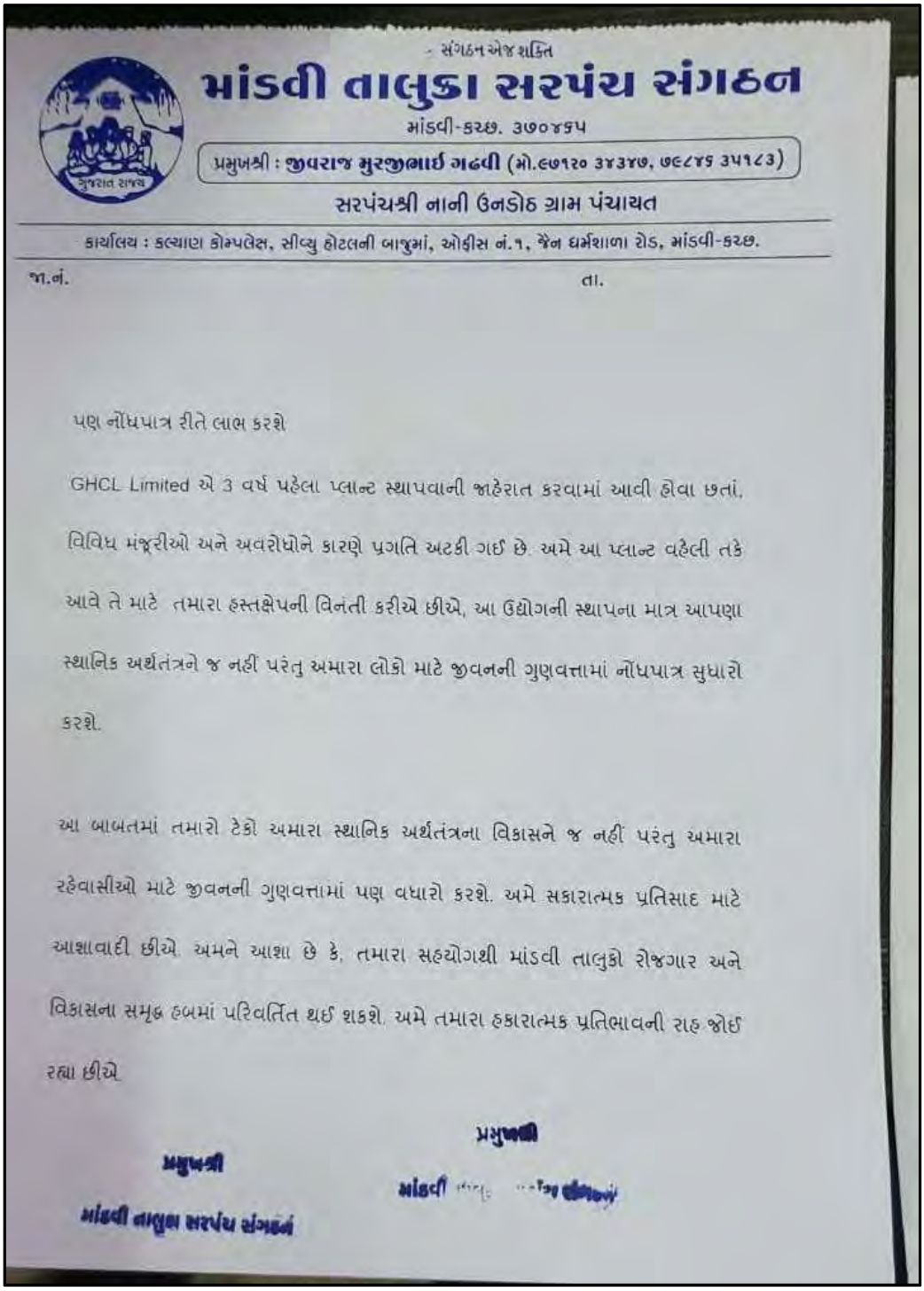
અમો તમને કચ્છના માંડવી તાલુકાના તમામ સરપંચો અમારા પ્રદેશના મહત્વના મુદ્દાઓ બાબતે રજૂઆત કરી રહ્યા છીએ.

જેમ તમે જાણો છો તેમ, સમગ્ર કચ્છમાં અનેક ઉદ્યોગો વિકસ્યા છે, છતાં માંડવી તાલુકો આ બાબતમાં ઘણો જ પાછળ છે. ઔદ્યોગિક વિકાસના અભાવે અમારા હજારો રહેવાસીઓએ તેમના ગામોને છોડીને અન્યત્ર રોજગારની તકોની શોધમાં દોડી રહ્યા છે. આ હિજરતથી માત્ર આપણી વસ્તીમાં ઘટાડો થયો નથી પરંતુ આપણા પ્રદેશના સર્વાંગી વિકાસમાં પણ અવરોધ ઊભો થયો છે.

એક કંપની કે જે આપણા સ્થાનિક અર્થતંત્ર માટે મોટી સંભાવના ધરાવે છે તે છે ગુજરાત હેવી કેમિકલ લિમિટેડ (GHCL LIMITED). ગુજરાત રાજ્ય સરકાર સાથે GHCL એ સુત્રાપાડા ખાતે એક પ્લાન્ટ સ્થાપ્યો છે. જો કે GHCL એ હજુ સુધી અમારા વિસ્તારમાં પ્લાન્ટ ની કામગીરી શરૂ કરેલ નથી. પરંતુ તેઓએ પહેલાથી જ પ્રભાવશાળી કોર્પોરેટ સામાજિક જવાબદારી (CSR) પહેલ છેલ્લા 3 વર્ષથી શરૂ કરી દીધેલ છે. આસપાસ ના ગામોમાં શિક્ષણ, કૃષિ, પશુપાલન અને મહિલા સશક્તિકરણ, ટ્રેનિંગ સેંટર શરૂ કરેલ છે.

જો GHCL માંડવી તાલુકામાં પ્લાન્ટ સ્થાપે છે, તો તે 5,000 થી વધુ પ્રત્યક્ષ અને પરોક્ષ નોકરીઓનું સર્જન કરવાની ક્ષમતા ધરાવે છે, જે અમારા રહેવાસીઓને તેઓને અત્યંત જરૂરી રોજગારીની તકો પૂરી પાડે છે. તદુપરાંત, નવીનતમ તકનીકો અને પર્યાવરણને અનુકૂળ પ્રેક્ટિસનો સમાવેશ કરવાની GHCLની પ્રતિબદ્ધતા આપણા પ્રદેશ, સમુદાયો અને પર્યાવરણને

2) Letter from Mandvi Taluka Sarpanch Sangathan – Sarpanch Shri – Nani Undoth Gram Panchayat



- સંગઠન એજ શક્તિ

માંડવી તાલુકા સરપંચ સંગઠન

માંડવી-કચ્છ. ૩૭૦૪૫૫

પ્રમુખશ્રી : જીવરાજ મુરજીભાઈ ગઢવી (મો.૯૭૧૨૦ ૩૪૩૪૭, ૭૯૮૪૬ ૩૫૧૮૩)

સરપંચશ્રી નાની ઉનડોઠ ગ્રામ પંચાયત

કાર્યાલય : કલ્યાણ કોમ્પલેક્ષ, સીવ્યુ હોટલની બાજુમાં, ઓફીસ નં.૧, જૈન ધર્મશાળા રોડ, માંડવી-કચ્છ.

જા.નં. તા.

પણ નોંધપાત્ર રીતે લાભ કરશે.

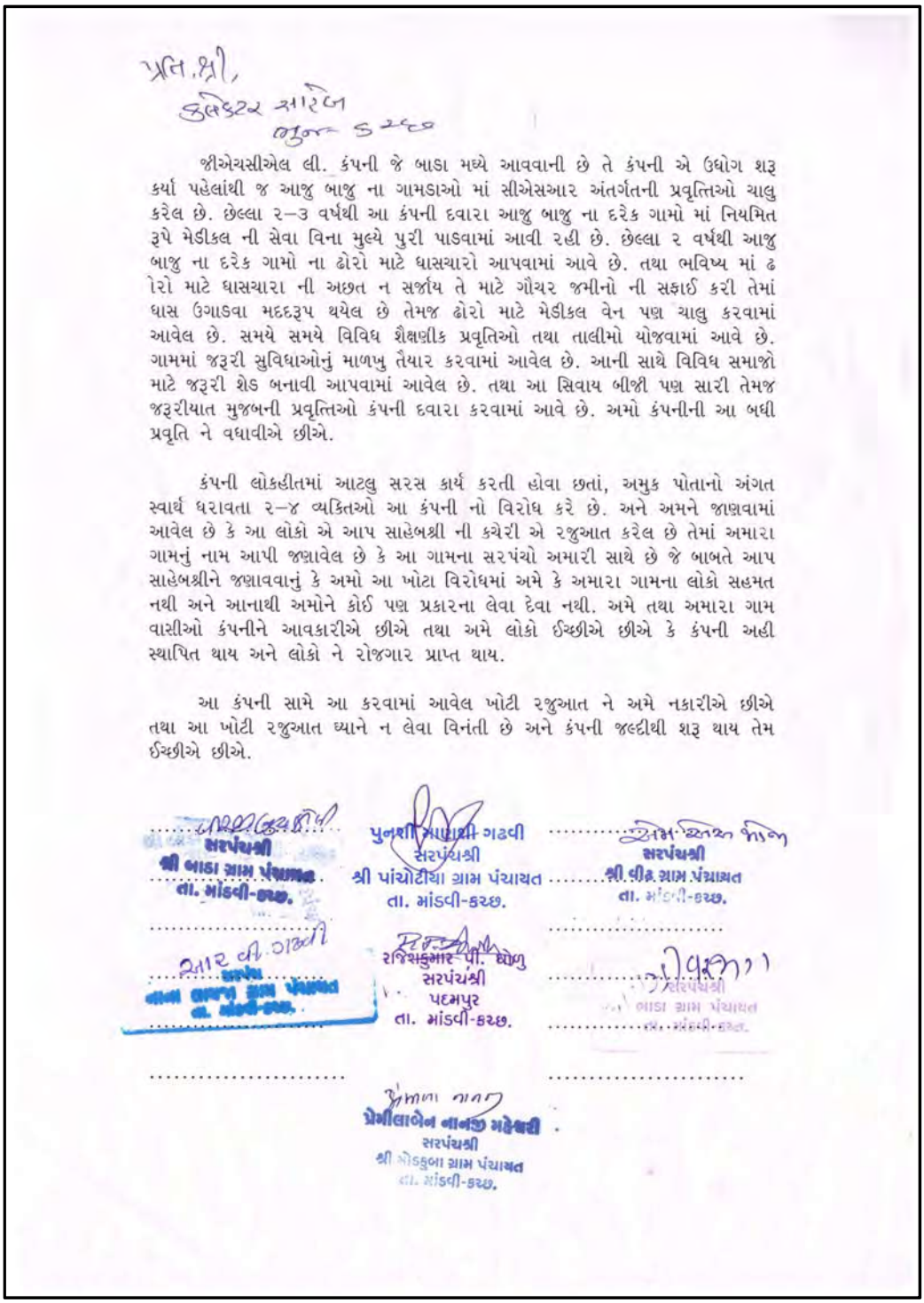
GHCL Limited એ 3 વર્ષ પહેલા પ્લાન્ટ સ્થાપવાની જાહેરાત કરવામાં આવી હોવા છતાં, વિવિધ મંજૂરીઓ અને અવરોધોને કારણે પ્રગતિ અટકી ગઈ છે. અમે આ પ્લાન્ટ વહેલી તકે આવે તે માટે તમારા હસ્તક્ષેપની વિનંતી કરીએ છીએ, આ ઉદ્યોગની સ્થાપના માત્ર આપણા સ્થાનિક અર્થતંત્રને જ નહીં પરંતુ અમારા લોકો માટે જીવનની ગુણવત્તામાં નોંધપાત્ર સુધારો કરશે.

આ બાબતમાં તમારો ટેકો અમારા સ્થાનિક અર્થતંત્રના વિકાસને જ નહીં પરંતુ અમારા રહેવાસીઓ માટે જીવનની ગુણવત્તામાં પણ વધારો કરશે. અમે સકારાત્મક પ્રતિસાદ માટે આશાવાદી છીએ. અમને આશા છે કે, તમારા સહયોગથી માંડવી તાલુકો રોજગાર અને વિકાસના સમૃદ્ધ હબમાં પરિવર્તિત થઈ શકશે. અમે તમારા હકારાત્મક પ્રતિભાવની રાહ જોઈ રહ્યા છીએ.

પ્રમુખશ્રી
માંડવી તાલુકા સરપંચ સંગઠન

પ્રમુખશ્રી
માંડવી

3) Letter From Bada and surrounding villages



પ્રતિ,શ્રી,
કલેક્ટર સાહેબ
મુન્દ્રા કચ્છ

જીએચસીએલ લી. કંપની જે બાડા મધ્યે આવવાની છે તે કંપની એ ઉધોગ શરૂ કર્યા પહેલાંથી જ આજુ બાજુ ના ગામડાઓ માં સીએસઆર અંતર્ગતની પ્રવૃત્તિઓ ચાલુ કરેલ છે. છેલ્લા ૨–૩ વર્ષથી આ કંપની દવારા આજુ બાજુ ના દરેક ગામો માં નિયમિત રૂપે મેડીકલ ની સેવા વિના મુલ્યે પુરી પાડવામાં આવી રહી છે. છેલ્લા ૨ વર્ષથી આજુ બાજુ ના દરેક ગામો ના ઢોરો માટે ઘાસચારો આપવામાં આવે છે. તથા ભવિષ્ય માં ઢ ોરો માટે ઘાસચારા ની અછત ન સર્જાય તે માટે ગૌચર જમીનો ની સફાઈ કરી તેમાં ઘાસ ઉગાડવા મદદરૂપ થયેલ છે તેમજ ઢોરો માટે મેડીકલ વેન પણ ચાલુ કરવામાં આવેલ છે. સમયે સમયે વિવિધ શૈક્ષણીક પ્રવૃતિઓ તથા તાલીમો યોજવામાં આવે છે. ગામમાં જરૂરી સુવિધાઓનું માળખુ તૈયાર કરવામાં આવેલ છે. આની સાથે વિવિધ સમાજો માટે જરૂરી શેડ બનાવી આપવામાં આવેલ છે. તથા આ સિવાય બીજી પણ સારી તેમજ જરૂરીયાત મુજબની પ્રવૃત્તિઓ કંપની દવારા કરવામાં આવે છે. અમો કંપનીની આ બધી પ્રવૃતિ ને વધાવીએ છીએ.

કંપની લોકહીતમાં આટલુ સરસ કાર્ય કરતી હોવા છતાં, અમુક પોતાનો અંગત સ્વાર્થ ધરાવતા ૨–૪ વ્યકિતઓ આ કંપની નો વિરોધ કરે છે. અને અમને જાણવામાં આવેલ છે કે આ લોકો એ આપ સાહેબશ્રી ની કચેરી એ રજુઆત કરેલ છે તેમાં અમારા ગામનું નામ આપી જણાવેલ છે કે આ ગામના સરપંચો અમારી સાથે છે જે બાબતે આપ સાહેબશ્રીને જણાવવાનું કે અમો આ ખોટા વિરોધમાં અમે કે અમારા ગામના લોકો સહમત નથી અને આનાથી અમોને કોઈ પણ પ્રકારના લેવા દેવા નથી. અમે તથા અમારા ગામ વાસીઓ કંપનીને આવકારીએ છીએ તથા અમે લોકો ઈચ્છીએ છીએ કે કંપની અહી સ્થાપિત થાય અને લોકો ને રોજગાર પ્રાપ્ત થાય.

આ કંપની સામે આ કરવામાં આવેલ ખોટી રજુઆત ને અમે નકારીએ છીએ તથા આ ખોટી રજુઆત ધ્યાને ન લેવા વિનંતી છે અને કંપની જલ્દીથી શરૂ થાય તેમ ઈચ્છીએ છીએ.

સરપંચશ્રી
શ્રી બાડા ગ્રામ પંચાયત
તા. માંડવી-કચ્છ.

પુનશી આણારામ ગઢવી
સરપંચશ્રી
શ્રી પાંચોટીયા ગ્રામ પંચાયત
તા. માંડવી-કચ્છ.

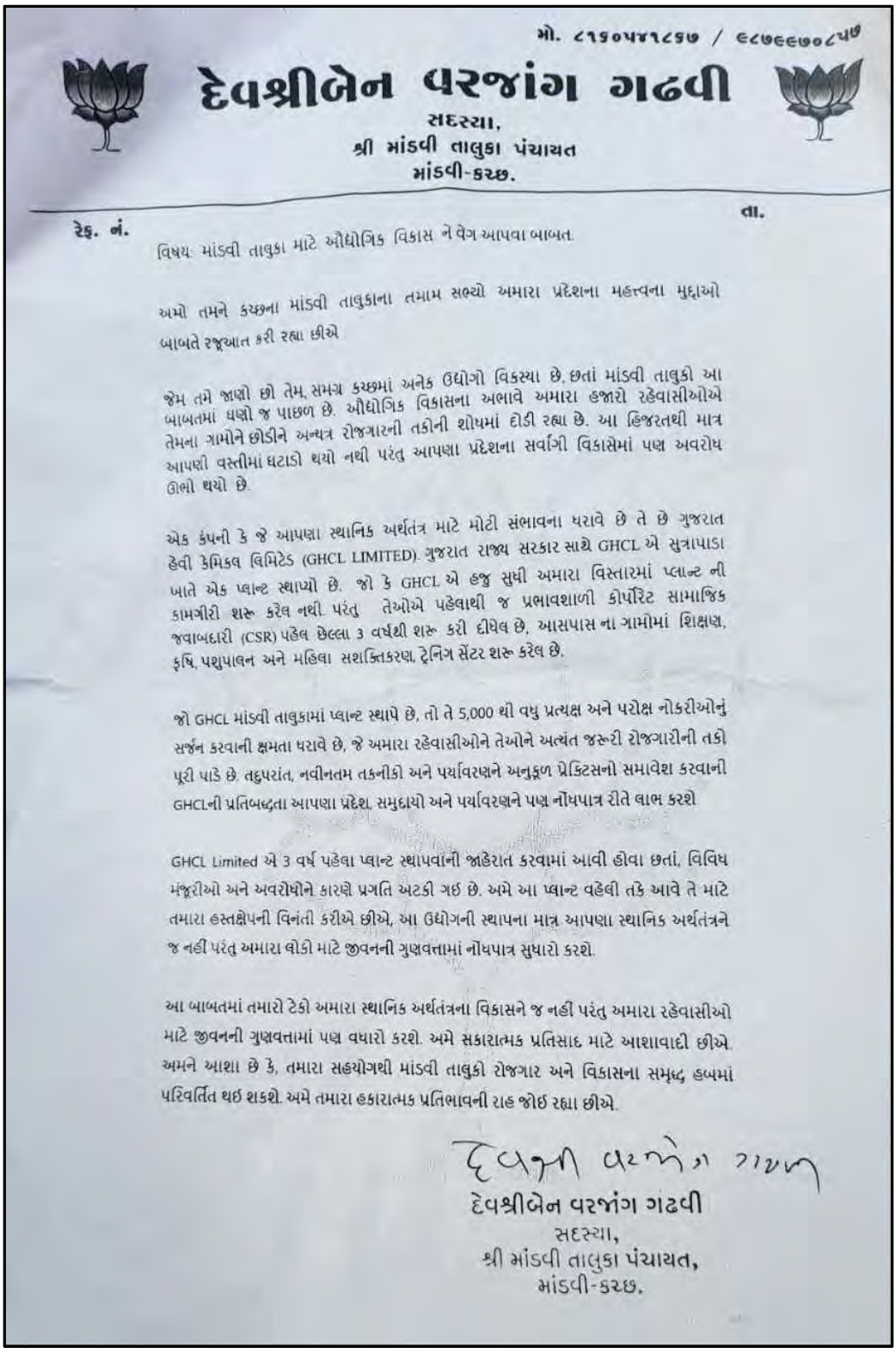
સરપંચશ્રી
શ્રી વીરા ગ્રામ પંચાયત
તા. માંડવી-કચ્છ.

રજનીકુમાર પી. છોછુ
સરપંચશ્રી
પદમપુર
તા. માંડવી-કચ્છ.

સરપંચશ્રી
બાડા ગ્રામ પંચાયત
તા. માંડવી-કચ્છ.

પ્રેમીલાબેન નાનજી મહેશ્વરી
સરપંચશ્રી
શ્રી મોડકુબા ગ્રામ પંચાયત
તા. માંડવી-કચ્છ.

4) Devshriben Varjang Gadhvi



મો. ૮૧૬૦૫૪૧૮૬૭ / ૯૮૭૬૬૭૦૮૫૭

દેવશ્રીબેન વરજાંગ ગઢવી

સદસ્યા,
શ્રી માંડવી તાલુકા પંચાયત
માંડવી-કચ્છ.

રેફ. નં. તા.

વિષય: માંડવી તાલુકા માટે ઔદ્યોગિક વિકાસ ને વેગ આપવા બાબત.

અમો તમને કચ્છના માંડવી તાલુકાના તમામ સભ્યો અમારા પ્રદેશના મહત્ત્વના મુદ્દાઓ બાબતે રજૂઆત કરી રહ્યા છીએ

જેમ તમે જાણો છો તેમ, સમગ્ર કચ્છમાં અનેક ઉદ્યોગો વિકસ્યા છે, છતાં માંડવી તાલુકો આ બાબતમાં ઘણો જ પાછળ છે. ઔદ્યોગિક વિકાસના અભાવે અમારા હજારો રહેવાસીઓએ તેમના ગામોને છોડીને અન્યત્ર રોજગારની તકોની શોધમાં દોડી રહ્યા છે. આ હિજરતથી માત્ર આપણી વસ્તીમાં ઘટાડો થયો નથી પરંતુ આપણા પ્રદેશના સર્વાંગી વિકાસમાં પણ અવરોધ ઊભો થયો છે.

એક કંપની કે જે આપણા સ્થાનિક અર્થતંત્ર માટે મોટી સંભાવના ધરાવે છે તે છે ગુજરાત હેવી કેમિકલ લિમિટેડ (GHCL LIMITED). ગુજરાત રાજ્ય સરકાર સાથે GHCL એ સુત્રાપાડા ખાતે એક પ્લાન્ટ સ્થાપ્યો છે. જો કે GHCL એ હજુ સુધી અમારા વિસ્તારમાં પ્લાન્ટ ની કામગીરી શરૂ કરેલ નથી. પરંતુ તેઓએ પહેલાથી જ પ્રભાવશાળી કોર્પોરેટ સામાજિક જવાબદારી (CSR) પહેલ છેલ્લા 3 વર્ષથી શરૂ કરી દીધેલ છે, આસપાસ ના ગામોમાં શિક્ષણ, કૃષિ, પશુપાલન અને મહિલા સશક્તિકરણ ટ્રેનિંગ સેંટર શરૂ કરેલ છે.

જો GHCL માંડવી તાલુકામાં પ્લાન્ટ સ્થાપે છે, તો તે 5,000 થી વધુ પ્રત્યક્ષ અને પરોક્ષ નોકરીઓનું સર્જન કરવાની ક્ષમતા ધરાવે છે, જે અમારા રહેવાસીઓને તેઓને અત્યંત જરૂરી રોજગારીની તકો પૂરી પાડે છે. તદુપરાંત, નવીનતમ તકનીકો અને પર્યાવરણને અનુકૂળ પ્રેક્ટિસનો સમાવેશ કરવાની GHCLની પ્રતિબદ્ધતા આપણા પ્રદેશ, સમુદાયો અને પર્યાવરણને પણ નોંધપાત્ર રીતે લાભ કરશે

GHCL Limited એ 3 વર્ષ પહેલા પ્લાન્ટ સ્થાપવાની જાહેરાત કરવામાં આવી હોવા છતાં, વિવિધ મંજૂરીઓ અને અવરોધોને કારણે પ્રગતિ અટકી ગઇ છે. અમે આ પ્લાન્ટ વહેલી તકે આવે તે માટે તમારા હસ્તક્ષેપની વિનંતી કરીએ છીએ, આ ઉદ્યોગની સ્થાપના માત્ર આપણા સ્થાનિક અર્થતંત્રને જ નહીં પરંતુ અમારા લોકો માટે જીવનની ગુણવત્તામાં નોંધપાત્ર સુધારો કરશે.

આ બાબતમાં તમારો ટેકો અમારા સ્થાનિક અર્થતંત્રના વિકાસને જ નહીં પરંતુ અમારા રહેવાસીઓ માટે જીવનની ગુણવત્તામાં પણ વધારો કરશે. અમે સકારાત્મક પ્રતિસાદ માટે આશાવાદી છીએ. અમને આશા છે કે, તમારા સહયોગથી માંડવી તાલુકો રોજગાર અને વિકાસના સમૃદ્ધ હબમાં પરિવર્તિત થઇ શકશે. અમે તમારા હકારાત્મક પ્રતિભાવની રાહ જોઇ રહ્યા છીએ.

દેવશ્રીબેન વરજાંગ ગઢવી
સદસ્યા,
શ્રી માંડવી તાલુકા પંચાયત,
માંડવી-કચ્છ.

-TRUE COPY-

Mandvi Taluka Sarpanch Association

Mandvi-Kutch. 370475

(Secretary General: Punshi Manshi Gadvi (99139 28743)

Sarpanchshree Panchotia Gram Panchayat

Subject: Regarding promoting industrial development for Mandvi Taluka.

We are presenting this to you on behalf of all the Sarpanches of Mandvi Taluka in Kutch regarding the important issues of our region.

As you know, many industries have flourished in Kutch. However, Mandvi taluk is far behind in this regard. Lack of industrial development has forced thousands of our residents to leave their villages and seek employment opportunities elsewhere. This migration has not only reduced our population but also hindered the overall development of our region.

One company that holds great potential for our local economy is Gujarat Heavy Chemical Limited (GHCL LIMITED), GHCL with Gujarat State Government has set up a plant at Sutrapada. However, GHCL has not yet started plant operations in our area. But they have already launched impressive Corporate Social Responsibility (CSR) initiatives for the past 3 years. Education, agriculture, animal husbandry and women empowerment, training centers have been started in surrounding villages.

If GHCL sets up a plant in Mandvi taluka, it will create more than 5,000 direct and indirect jobs.

It has the potential to create jobs, which our residents desperately need.

Provides employment opportunities. Moreover, latest technologies and environment friendly.

GHCL’s commitment is to incorporate practices into our region for communities and environment.

Mandvi Taluka Sarpanch Association

Mandvi-Kutch. 370475

President: Jivraj Murjibhai Gadhvi (Mb. 97120 34347, 79846 35183)

Sarpanch Nani Undoth Gram Panchayat

Office: Kalyan Complex, Beside Seaview Hotel, Office No.1, Jain Dharamshala Road, Mandvi-Kutch.

Although GHCL Limited has announced to set up the plant 3 years ago, progress has stalled due to various clearances and hurdles. We request your intervention for early arrival of this plant. The establishment of this industry will not only improve our local economy but will significantly improve the quality of life for our people.

Your support in this matter will not only enhance the growth of our local economy but also enhance the quality of life for our residents. We are hopeful for a positive response. We hope, with your cooperation, Mandvi Taluk can be transformed into a thriving hub of employment and development. We are waiting for your positive response.

To Mr.

[illegible]

GHCL Ltd., the company which is going to come up has started CSR activities in the neighboring villages even before starting the project. For the last 2-3 years, this company has been providing free medical services regularly in every village around Dawara. For the last 2 years, fodder is provided for the cattle of all the neighboring villages. And in the future, in order not to create a deficit of fodder for cattle, cleaning of gauchar lands has helped to grow fodder and medical van for cattle has also been started. Various educational activities and trainings are organized from time to time. A framework of necessary facilities has been prepared in the village. Along with this, necessary facilities have been made for various societies. And apart from this, other good and necessary activities are done by the company. We appreciate all these activities of this company.

Even though the company is doing so well, some 2-4 people with their own selfish interests are hating this company. And we have been informed that these people are the office of your sir, in which we have given the name of our village and stated that the sarpanch of this village is with us. We and our village welcome the company and we the people want the company to establish itself here and provide employment to the people.

We reject the false representation made with this company and request not to entertain this false representation and wish the company to start soon.

Devshriben Varjang Gadhvi

Member, Sri Mandvi Taluka Panchayat

Mandvi - Kutch

Subject Matter to boost industrial development for Mandvi Taluka.

We are presenting to you all the members of Mandvi Taluka regarding the important issues of our region.

As you know many industrialists have flourished all over Kutch. However, Mandvi taluk is far behind in this regard. Lack of industrial development has forced thousands of our residents to leave their villages and run for employment opportunities elsewhere. This migration has not only reduced our population but also hindered the overall development of our region.

One company that holds great potential for our local economy is Gujarat Heavy Chemical Limited (GHCL LIMITED) GHCL has set up a plant at Sutrapada with Gujarat State Government. Although GHCL is yet to start plant operations in our area but they have already launched impressive Corporate Social Responsibility (CSR) initiatives for the past 3 years. Education, Agriculture, Animal Husbandry and Women Empowerment Training Centers have been started in surrounding villages.

If GHCL sets up a plant in Mandvi taluk. It has the potential to create more than 5,000 direct and indirect jobs, providing our residents with much-needed employment opportunities. Moreover, GHCL's commitment to incorporating the latest technologies and environment-friendly practices will also significantly benefit our region's communities and environment.

Although GHCL Limited was announced to set up the plant 3 years ago, progress has stalled due to various approvals and hurdles. We request your intervention to come up with this plant at the earliest, the establishment of this industry will not only

improve our local economy but also significantly improve the quality of life for our people.

Your support in this matter will not only enhance the growth of our local economy but also enhance the quality of life for our residents. We are hopeful for a positive response and we hope that with your support, Mandvi Taluk can be transformed into a thriving hub of employment and development. We are waiting for your positive response.

''सत्यमेव जयते'' ''वंदे मातरम्'' ''मारुं गाम स्वच्छ गाम''

શ્રી પદમપુર ગ્રામ પંચાયત

પદમપુર, તા. માંડવી-કચ્છ.

જાવક નં . તા. 14 /10 /2022

પ્રતિ શ્રી

ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડની કચેરી

ગાંધીનગર ગુજરાત

વિષય મે જી એચ સી એલ લિમિટેડ દ્વારા સૂચિત સોડા એસ ગ્રીનફિલ્ડ પ્રોજેક્ટ ને સત્વરે પર્યાવરણી મંજૂરી આપી કચ્છના ઔધોગિક વિકાસને વેગ આપવા અંગે

માન. સાહેબ શ્રી,

ઉપરોક્ત વિષય જય ભારત સહ જણાવવાનું કે કચ્છ જિલ્લાના બાડા ગામ ખાતે જીએચસીએલ થકી સમગ્ર કચ્છ જિલ્લો વિકાસની હરણફાળ ભરશે તેના કારણે આજે કચ્છ જિલ્લો તેમજ સમગ્ર પ્રદેશના હજારો લોકો રોજગારી મેળવશે ત્યારે જીએચસીએલ કંપની દ્વારા સ્થાપનારા સોડાએસ ગ્રીનફિલ્ડ પ્રોજેક્ટને અમો આવકારીએ છીએ અને આ નવા પ્રોજેક્ટને કચ્છમાં સ્થાપવા માટે જીએચસીએલ નો આભાર માનીએ છીએ અત્રે ઉલ્લેખનીય છે કે સુત્રાપાડા ગામમા જીએચસીએલ કંપની આવ્યા પહેલા જે પરિસ્થિતિ હતી અને આજે ઔધોગિક વિકાસના કારણે લોકોના જીવન ધોરણમા બદલાવ આવ્યો છે તેમજ લોકોનું જીવન ધોરણ પણ ઊચુ આવ્યું છે તેનું આકલન કરવામાં આવે તો આ કામ જીએચસીએલ જુથ થકી સંભવ બન્યું છે આજે દેશ અને દુનિયામા જીએચસીએલ જુથ થકી કચ્છનું નામ રોશન થશે ત્યારે ઔધોગિક વિસ્તારમા નવા પ્રકલ્પો સ્થાપાય તે સમસ્ત કચ્છ જિલ્લાના અને દેશ હિતમા છે તથા દેશને આત્મ નિર્ભર બનવા માટે પણ તેમનો સહયોગ રહેશે તેવું અમારુ માનવું છે સમગ્ર કચ્છના અને દેશ હિતમા નવા કચ્છના અને દેશના હિતમા જીએચસીએલ ના નવા પ્લાન્ટને સત્વરે પરવાણીને મંજૂરી આપાય તેવી અમારી આગ્રહ ભરી વિનંતી છે

આ નવા પ્રોજેક્ટને અમારા ગામના ગ્રામજનોને રોજગારી તેમજ ખેતીવાડી પશુપાલન શિક્ષણ આરોગ્યને લગતી સેવાઓ પૂરી પાડશે તેમજ અમારા ગામમાં પાણી ઇન્ફ્રાસ્ટ્રક્ચર વિવિધ વિકાસના કામો કરશે તેમજ અમારા એસએજી ગ્રુપોને રોજગાર લક્ષી ટ્રેનિંગ આપી અને તેમને રોજગારી પૂરી પાડવામાં મદદરૂપ થશે તેવી અમોને આશા છે અમારા ગામના યુવાનોને રોજગારી આપશે તેમ જ પશુપાલન ની અંદર ચારો કે દવાઓ એ વિવિધ પ્રકારના કામો કરશે એવી અમોને આશા છે ઉપરોક્ત માગણીઓ લેખિતમાં અમોને આપવામા આવશે તો જ અમે જીએમએલ કંપનીને સ્વીકારીએ છીએ આવકાર્ય છે

અત્રે ઉલ્લેખનીય છે કે સુત્રાપાડા ગામમા જીએચસીએલ કંપની આવ્યા પહેલા જે પરિસ્થિતિ હતી અને આજે ઔધોગિક વિકાસના કારણે લોકોના જીવન ધોરણમા બદલાવ આવ્યો છે તેમજ લોકોનું જીવન ધોરણ પણ ઊચું આવ્યું છે તેનું આકલન કરવામાં આવે તો આ કામ જુથ થકી સંભવ બન્યું છે આજે દેશ અને દુનિયામાં જીએચસીએલ જુથ થકી કચ્છનું નામ રોશન થશે ત્યારે ઔધોગિક વિસ્તારમા નવા પ્રકલ્પો સ્થાપાય તે સમસ્ત કચ્છ જિલ્લાના અને દેશ હિતમા છે તથા દેશને આત્મ નિર્ભર બનવા માટે પણ તેમનો સહયોગ રહેશે તેવું અમારું માનવું છે સમગ્ર કચ્છના હિતમા અને દેશના હિતમાં જીએચસીએલ ના નવા પ્લાન્ટને સત્વરે પર્યાવરણીય મંજૂરી આપાય તેવી અમારી આગ્રહ ભરી વિનંતી છે

નકલ રવાના

૧.પ્રશાત શ્રી,કલેકટર સાહબે કલેકટર કચેરી,ભજ -કચ્છ,

૨.પ્રશાત શ્રી, પ્રાદેશિક અધિકારી સાહબે ,G.P.C.B ભજ -કચ્છ.

R.P. Dholu
(રાજુભાઈ પી. ધોળુ)
સરપંચશ્રી
પદમપુર
તા. માંડવી-કચ્છ.

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Shri Padampur Gram Panchayat

Padampur, Mandvi Taluka

14.10.2022

To

Office of Gujarat Pollution Control Board

Gandhinagar Gujarat

SUBJECT: Environmental Clearance for Soda Ash Greenfield Project proposed by GHCL Limited to accelerate industrial development of Kutch.

Dear Sir,

On the above subject, it is stated that through GHCL's project at Bada Village of Kutch District, the entire Kutch District will benefit from the development. Today thousands of people of Kutch District and the entire region will get employment, and so we welcome the Soda Ash Greenfield project established by GHCL company and thank GHCL for setting up this new project in Kutch. It is worth mentioning here that in Sutrapada village itself, if we consider the situation that existed before and after the company established its operations, today due to industrial development the standard of living of the people has changed and the standard of living of the people has also increased. In the interest of Kutch and the country, it is our urgent request that the new plant of GHCL be given permission for the new plant in the interest of Kutch and the country.

We hope that this new project will provide employment to the villagers of our village as well as contribute to agriculture, animal husbandry, education, health related services, water infrastructure, various development works in our village, and will provide employment oriented training and help in providing employment to the youth of our village. So, we welcome GHCL company.

It is worth mentioning here that the situation that existed before the arrival of GHCL company in Sutrapada village and today due to industrial development, the standard of living of the people has changed and the standard of living of the people has also increased. We believe that their cooperation will be there for the sake of Kutch as a whole and in the interest of the country.

Copied to:

1. Collector, Collector Office, Kutch,

2. Regional Office, G.P.C.B -Kutch.

Shri Padampur Gram Panchayat (Mandvi)

Sarpanch

ANNEXURE R/24
[Colly]





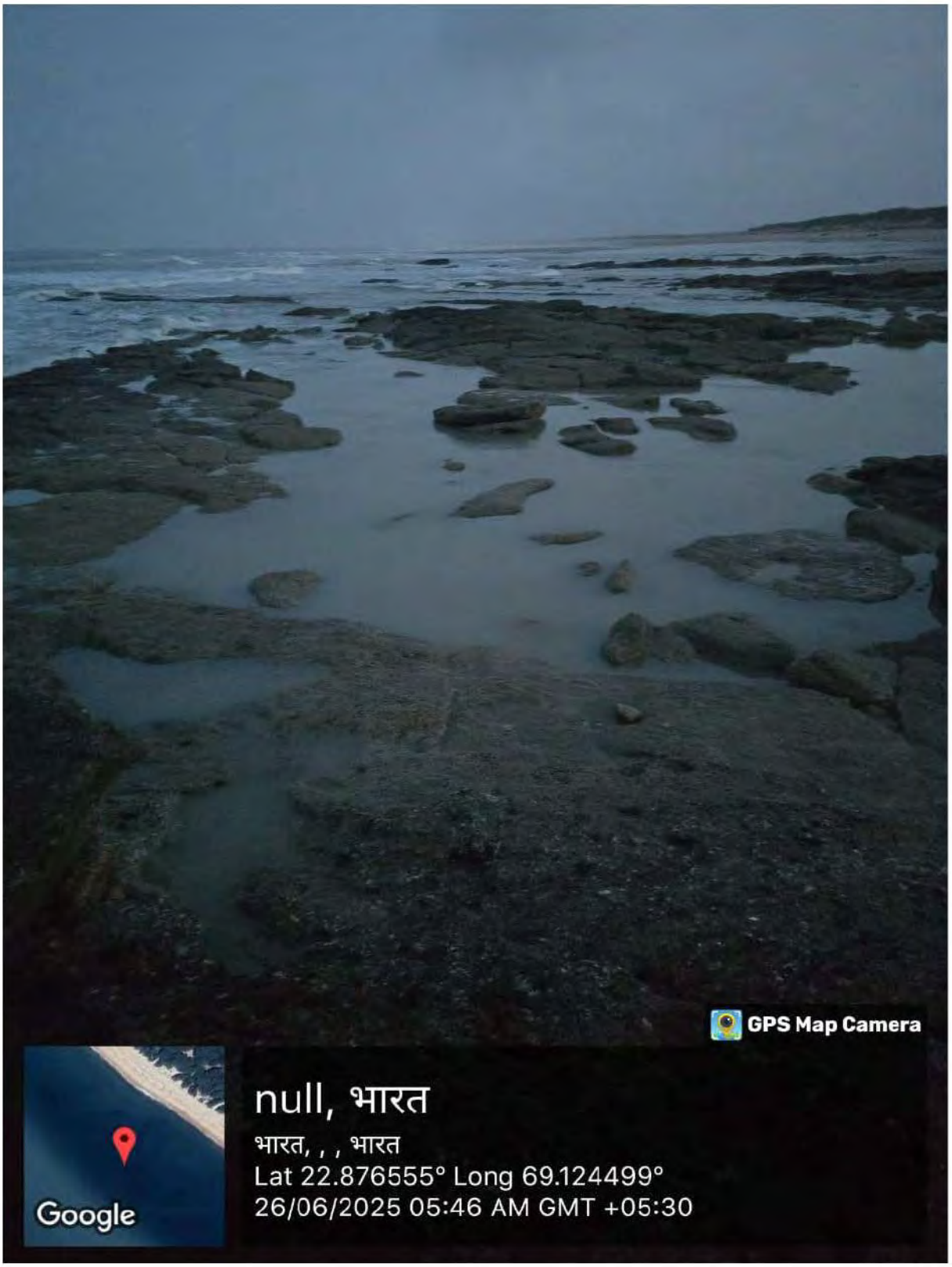






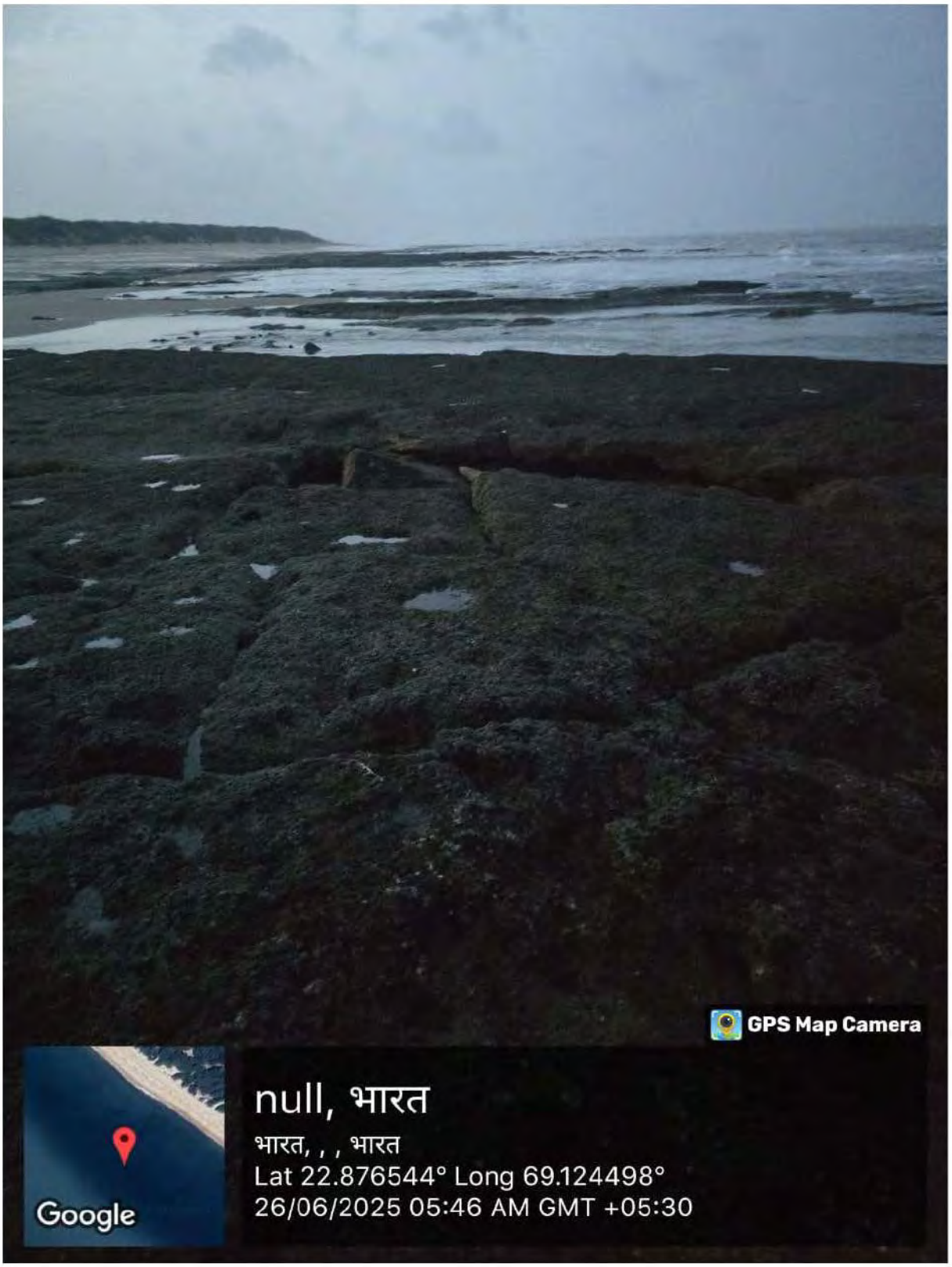
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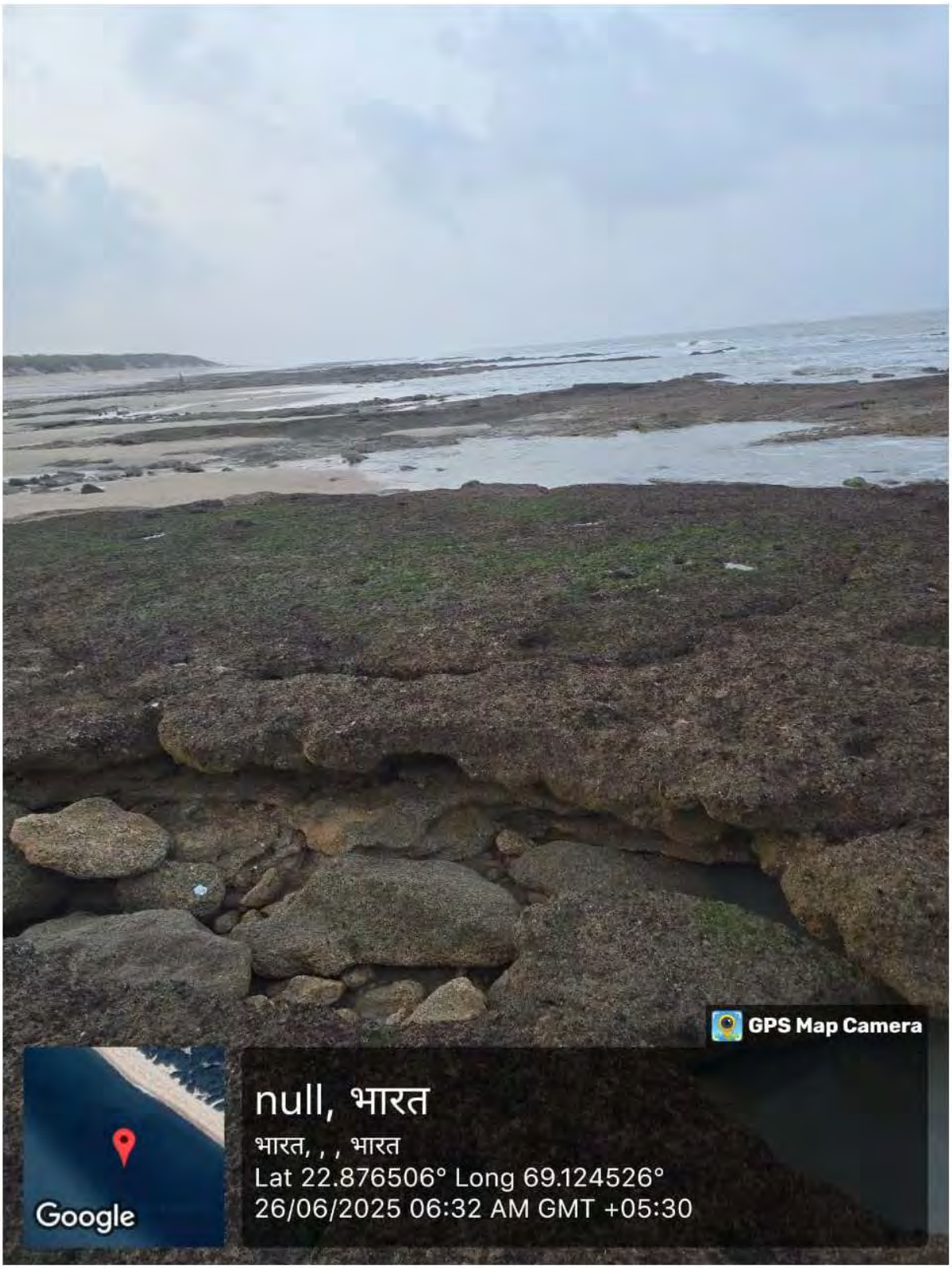

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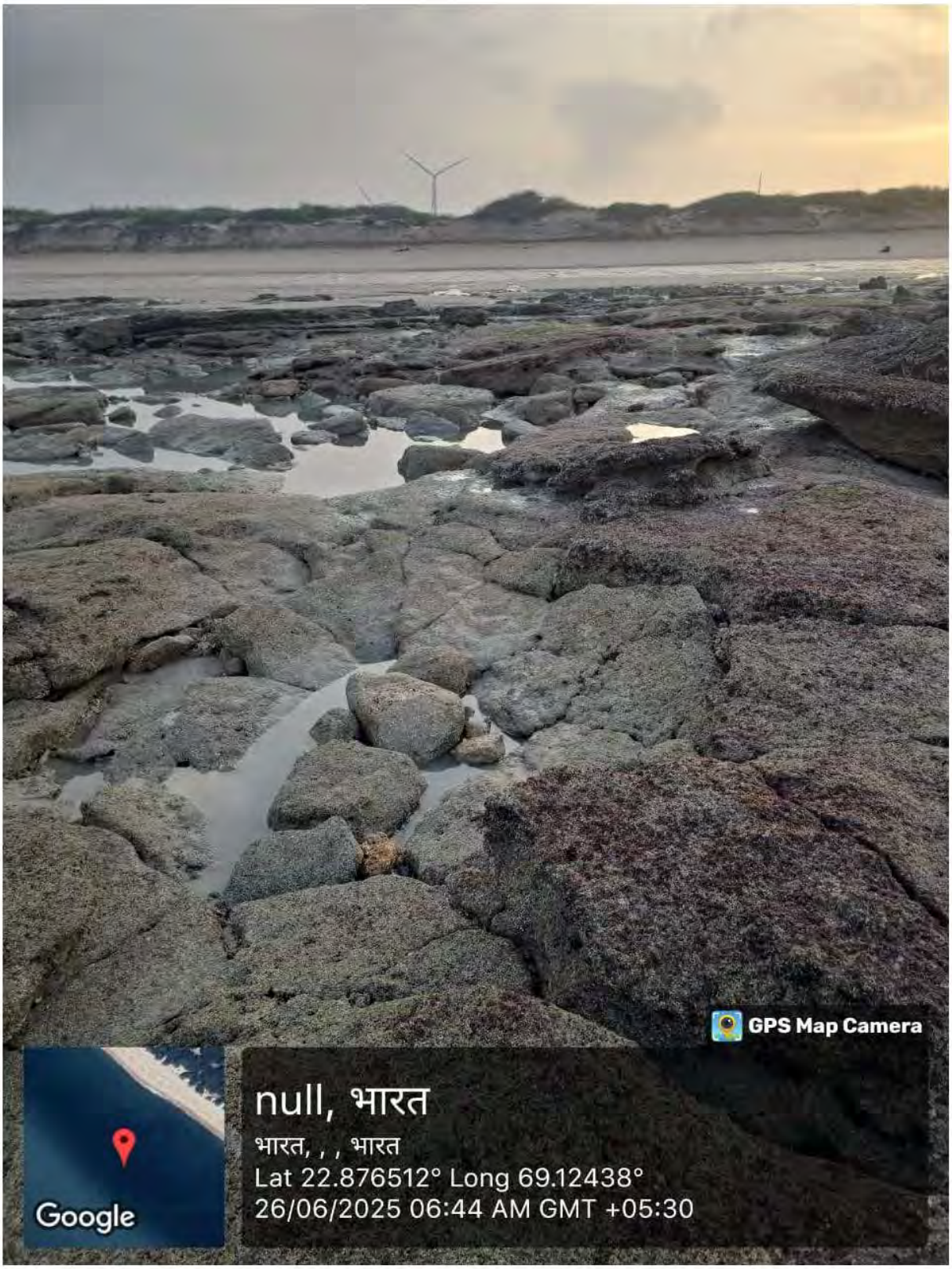

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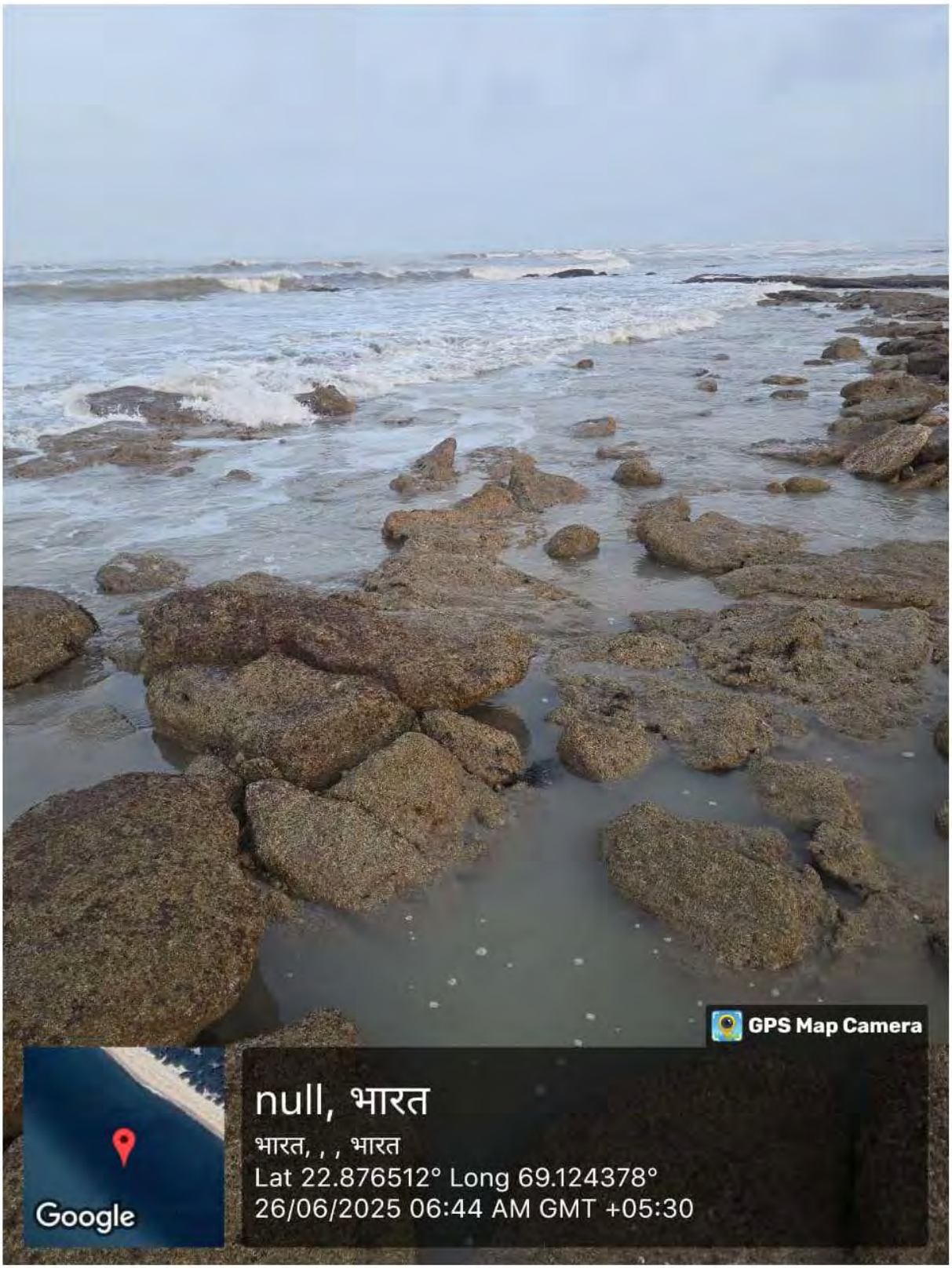

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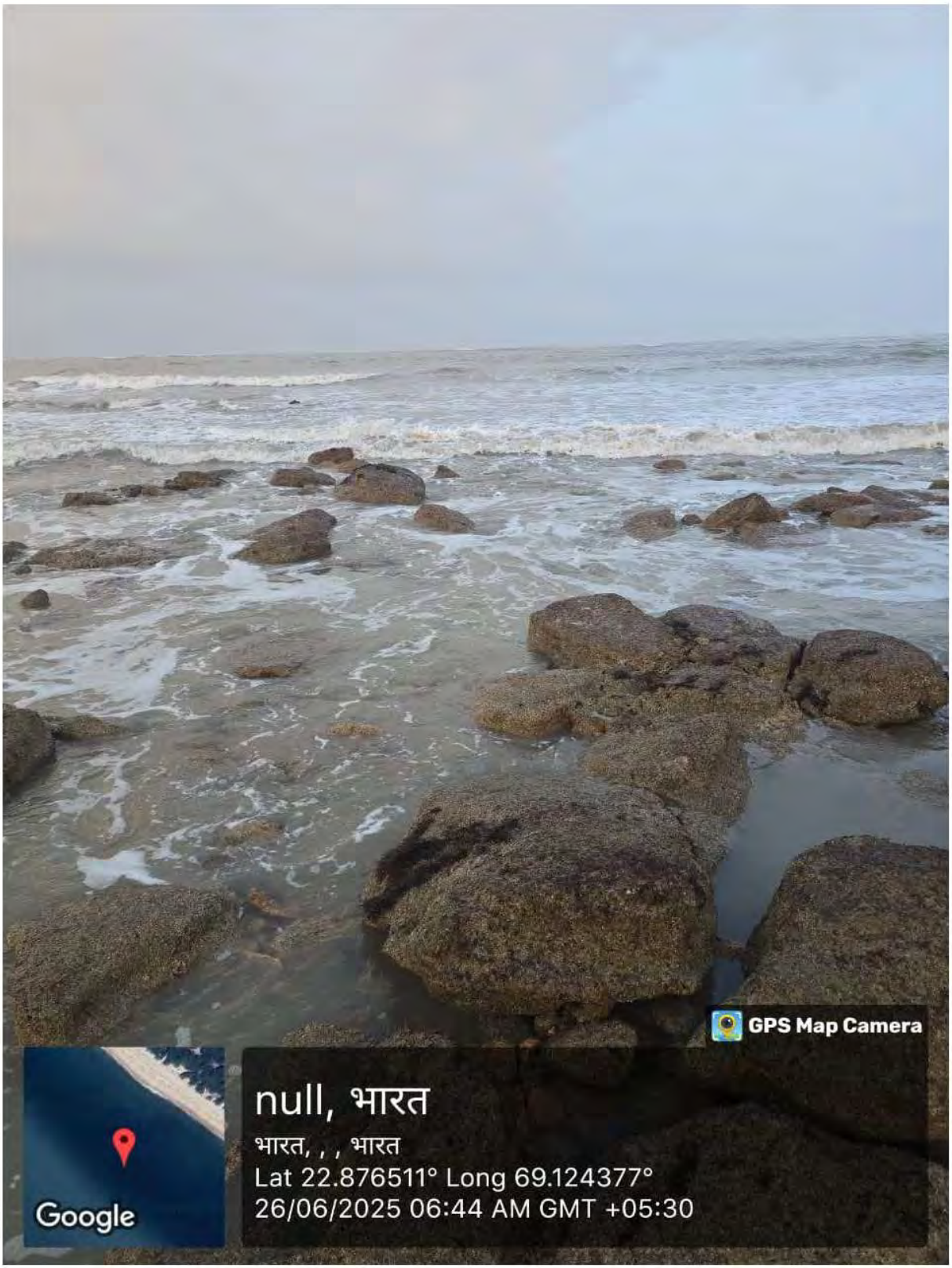

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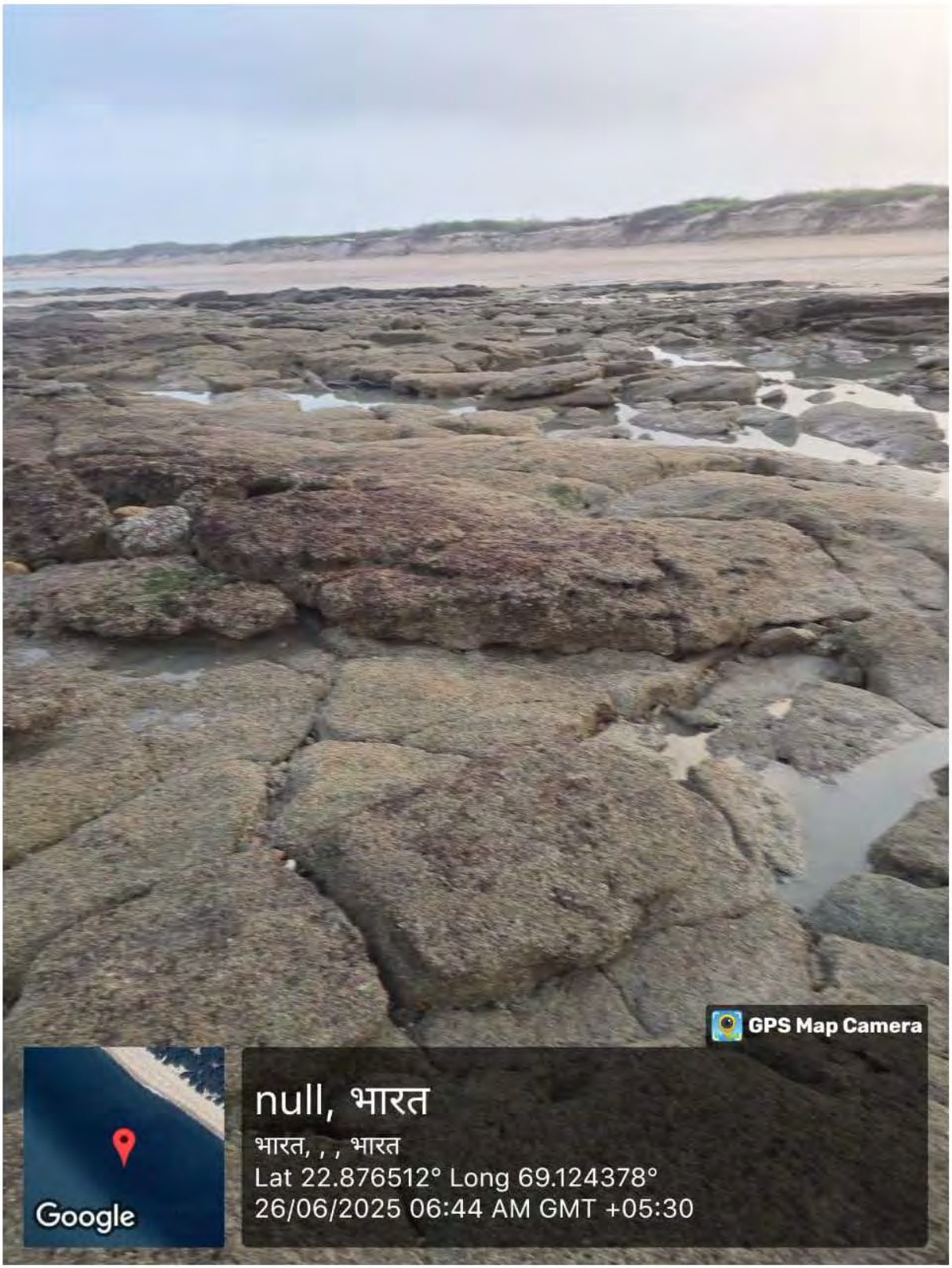
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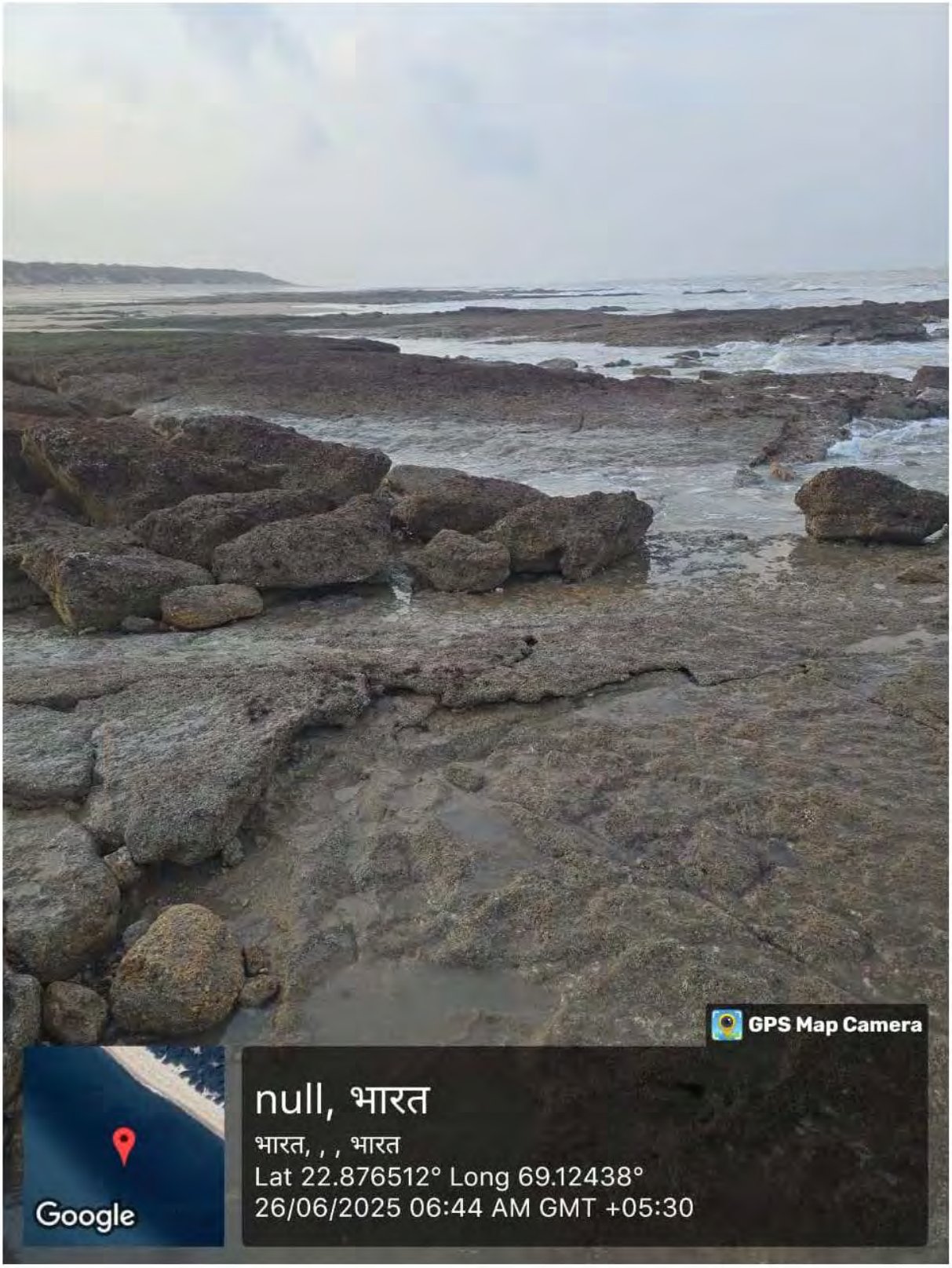

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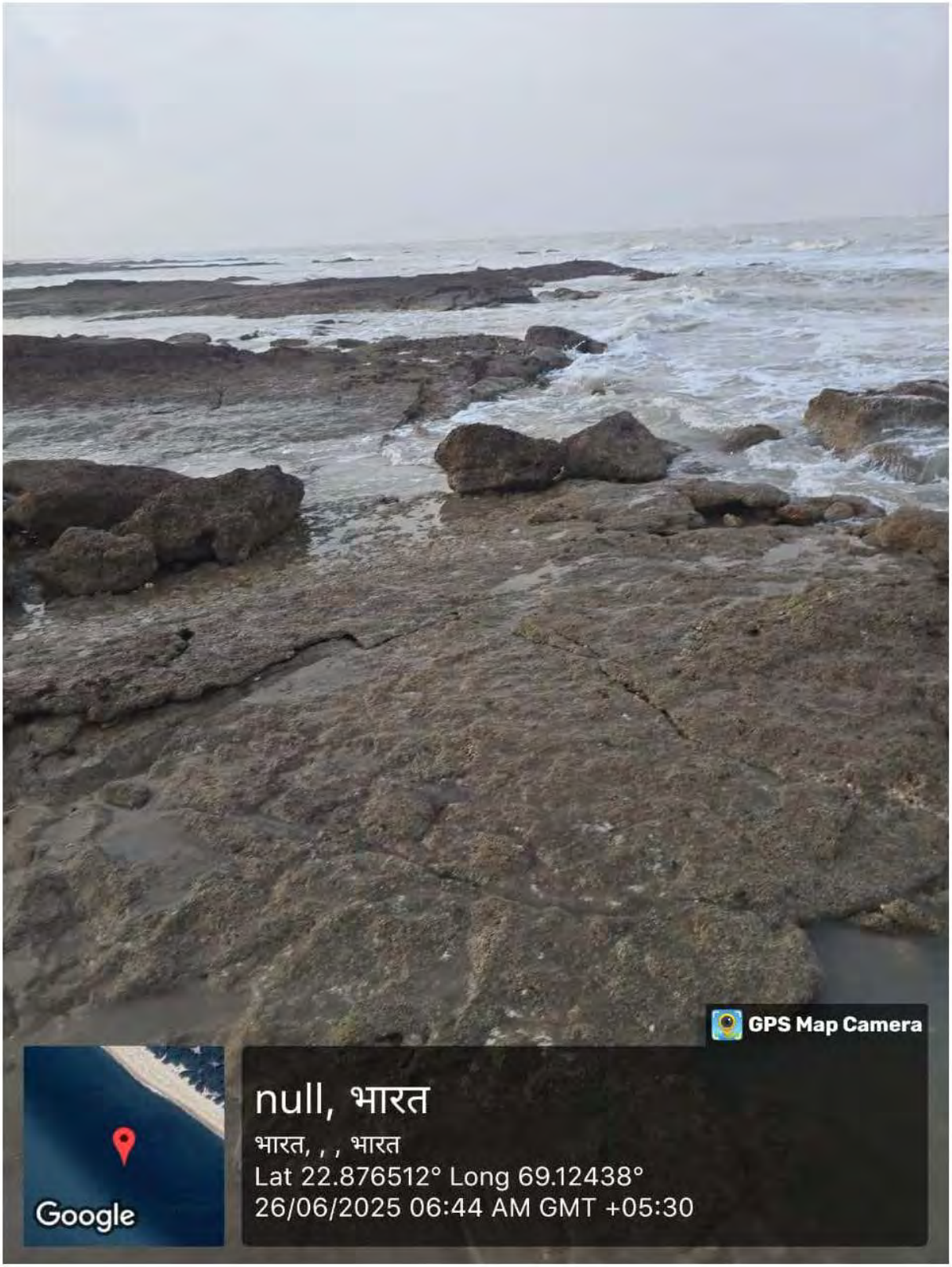

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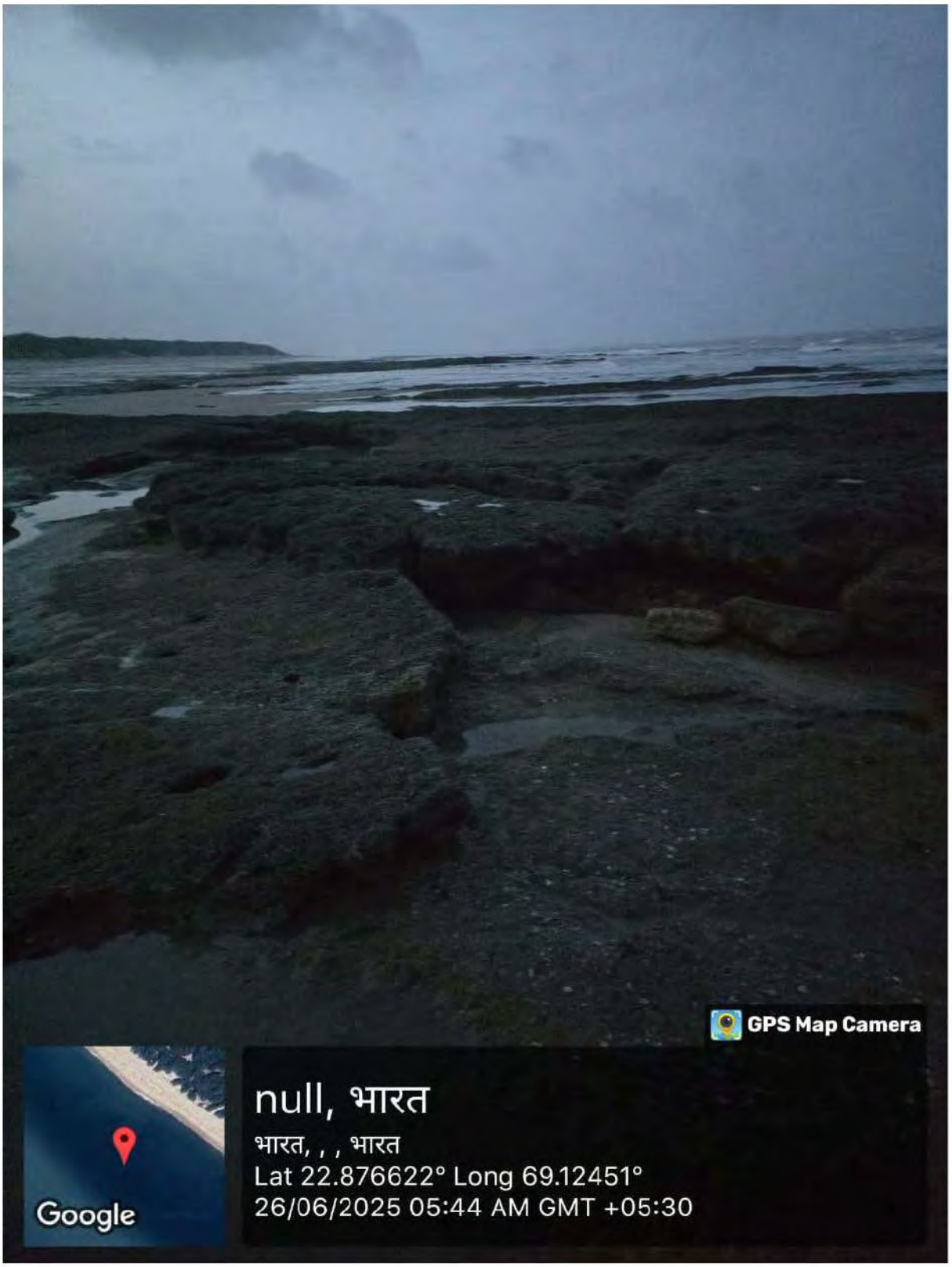
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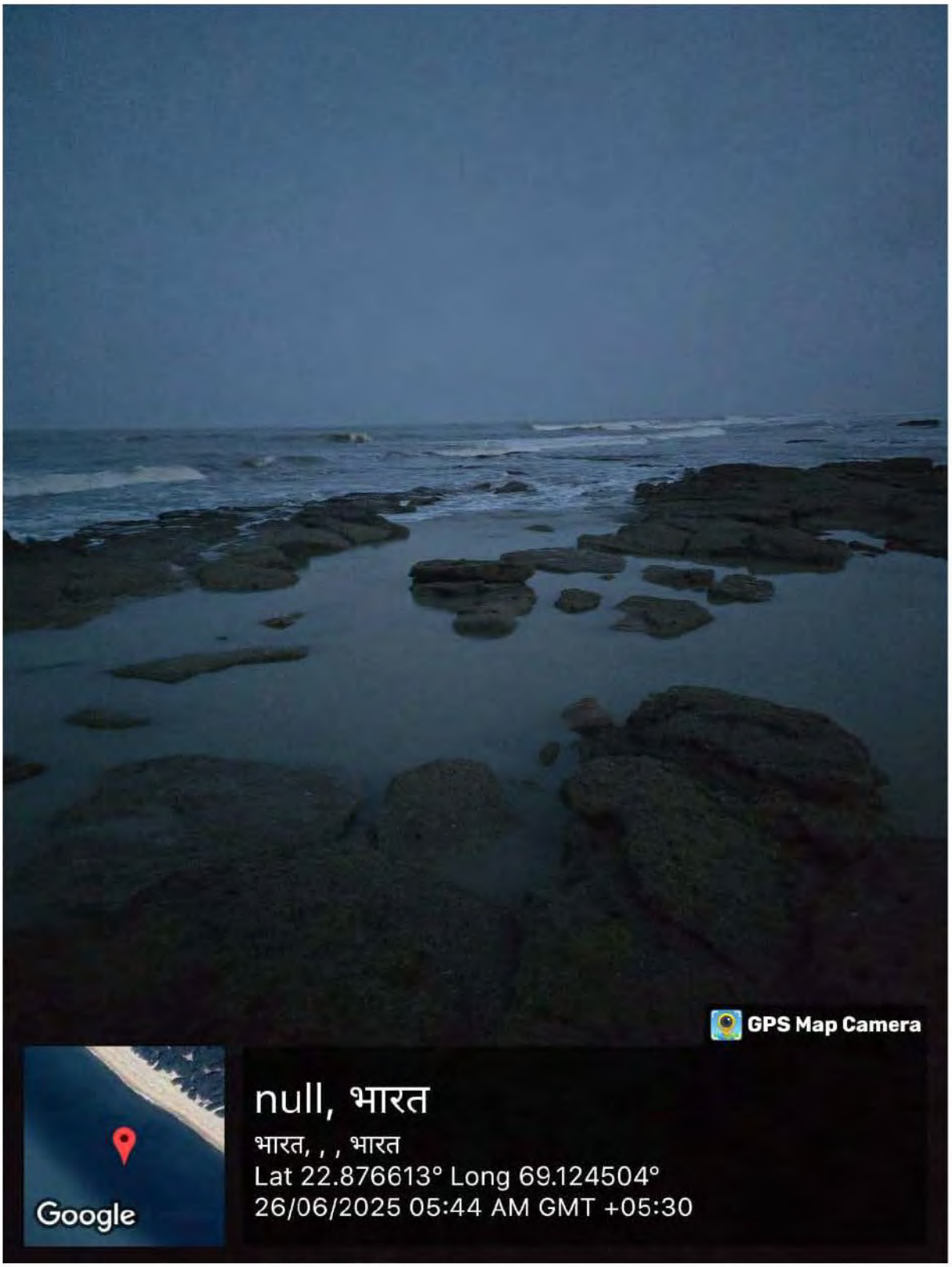
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-TRUE COPY-

सत्यमेव जयते

Ministry of Environment, Forest and Climate Change

National Marine Turtle Action Plan

Government of India
Ministry of Environment, Forest & Climate Change

(2021-2026)



National Marine Turtle Action Plan

Government of India
Ministry of Environment, Forest & Climate Change

(2021-2026)

Cover photograph Daniel Torobekov

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मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन,
सूचना एवं प्रसारण और
भारी उद्योग एवं लोक उद्यम
भारत सरकार

MINISTER
ENVIRONMENT, FOREST & CLIMATE CHANGE,
INFORMATION & BROADCASTING AND
HEAVY INDUSTRIES & PUBLIC ENTERPRISES
GOVERNMENT OF INDIA

प्रकाश जावडेकर
Prakash Javadekar



MESSAGE

India is blessed with its rich and varied biodiversity. We have always taken pride in conserving this natural heritage. Our marine biodiversity is no exception to this. Marine Turtles have always captured our imagination and has been conserved since the ages. Marine Turtles are considered to be flagship species in various marine habitats such as coral reefs, sea grass meadows, sandy beaches, etc.

Besides being home to one of the largest congregations of nesting of the Olive Ridley Turtles, five species of marine turtles are found in India. These species found in Indian waters have been listed in the Schedule-I of the Wild Life (Protection) Act, 1972 and therefore, accorded very high protection status. Considering the importance of conservation of marine turtles, the Ministry had included marine turtles as one of the 22 species for taking up focussed conservation programme under the Centrally Sponsored Scheme- Development of Wildlife Habitats.

I am happy to note that the Ministry has now prepared a 'National Marine Turtle Action Plan' through an extensive consultative process with relevant stakeholders. This Action Plan focuses on reducing threats, conserving critical habitat, exchanging scientific data, increasing public awareness and most importantly emphasizes on a participatory approach in conservation of marine turtles and its habitats. The Action Plan will enable the stakeholders to perform their roles in a coordinated manner and take effective measures for the conservation of marine turtles.

I am confident that this 'National Marine Turtle Action Plan' will provide a fresh impetus to work towards conserving these magnificent species and their habitats and provide them with safe havens for their future and for a healthy planet.

With best wishes.

Date: 19.01.2021

(Prakash Javadekar)

पर्यावरण भवन, जोर बाग रोड़, नई दिल्ली–110003, फोनः 011–24695136, 24695132, फैक्सः 011–24695329
Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003 Tel.: 011-24695136, 24695132, Fax: 011-24695329
ई–मेल/E-mail: minister-efcc@gov.in

Babul Supriyo
Union Minister of State
Ministry of Environment, Forest & Climate Change
Government of India

बाबुल सुप्रियो
केन्द्रीय राज्य मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
भारत सरकार

स्वच्छ भारत
एक कदम स्वच्छता की ओर



MESSAGE

Marine turtles play a variety of ecological roleslike controlling prey populations, supporting coastal vegetation through their hatchlings etc.in maintaining healthy marine habitats.They are key indicators of healthy marine habitats.

Numerous direct and indirect pressures arising from various factors adversely impact marine turtle populations and their habitat. This includes man made factors such as pollution, habitat destruction, bycatch, etc. and also includes natural disasters such as tsunamis, cyclones, hurricanes and storms. With a view to conserve marine turtles, associated species and their habitats, the Ministry of Environment, Forest and Climate Change, Government of India has prepared this "National Marine Turtle Action Plan, 2021-2026" with a vision to create a viable and healthy marine ecosystem for marine turtles and associated species through a coordinated and participatory mechanismto ensure long term survival of marine turtles.

The National Marine Turtle Action Plan, 2021-2026 would be implemented at the National and State Government level with the following objectives:

a. Reduce direct and indirect causes of marine turtle mortality;
b. Protect, conserve and rehabilitate marine turtle habitats;
c. Improve understanding of marine turtle ecology and populations through research, monitoring and information exchange;
d. Increase public awareness of the threats to marine turtles and their habitats, and enhance public participation in conservation activities;
e. Enhance national, regional and international cooperation.

I wish all the best for the successful implementation of the "National Marine Turtle Action Plan, 2021-2026".

(Babul Supriyo)

Office: 5th Floor, Aakash Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110 003
☎ (+91) 11- 24621921/22 • Fax : (+91) 11- 24695313
Cell : (+91) 9811777143 • 9810711980
E-mail : mos4ef.cc@gmail.com

Important Marine Turtle Habitats in India

State	Important Turtle Habitats (Catchment District)	Remarks / Clarification	Major Threats
Odisha	Rushikulya river (Kandhamal and Ganjam)	Mass nesting ground of Olive Ridley	Erosion, Nest predation, plastic pollution, light pollution and bycatch
Odisha	Gahirmatha river (Kandhamal and Ganjam)	Mass nesting ground of Olive Ridley	Erosion and Nest predation, bycatch
Odisha	Devi River (Jagatsinghpur, Puri)	Sporadic mass nesting ground of Olive ridley	Nest predation, plastic pollution, light pollution, plantation and bycatch
Andaman & Nicobar Islands	Galathea bay, Indira point, Hingloi, Alexandria, Dagmar, and Renhongbeaches (Great Nicobar Island)	Largest Leatherback turtle nesting ground in India	Nest predation
Andaman & Nicobar Islands	Bahua, Muhincohn and Kiyang beaches (Little Nicobar Island)	Leatherback, Green, Hawksbill and Olive ridley	Nest predation and bycatch
Andaman & Nicobar Islands	West Bay, Jackson Creek beaches (Little Andaman Island)	Leatherback nesting ground, currently largest in the Andaman group	Nest predation and bycatch
Andaman & Nicobar Islands	Cuthbert Bay, (Middle Andamans)	Leatherback, Green, hawksbill, and Olive ridley	Nest predation
Andaman & Nicobar Islands	South Reef Island, (Middle Andamans)	Best hawksbill turtle nesting ground in India	Nest predation
Lakshdweep Islands	Lagoons of Lakshdweep Islands (Agatti, Kadmat, Kavaratti and other islands)	Foraging ground of Green turtle	Erosion, over grazing, conflict with fishermen, nest predation and bycatch
Lakshdweep Islands	Suhelilsland, (Lakshadweep)	Olive ridley / Hawksbill / Green turtle nesting ground (sympatric habitat for three species)	Erosion and bycatch
Andhra Pradesh	Godavari River Mouth (Sacramentoshoal, East Godavari)	Very high sporadic nesting of Olive ridleys (approx. 500 to 1000/year),	Nest predation, plastic pollution, light pollution, habitat degradation and bycatch
Andhra Pradesh	Kapasukuddi (Bahuda river mouth), Nagavali, Bamsadhara (Srikakulam)	High sporadic nesting of Olive ridleys	Nest predation, plastic pollution, light pollution, habitat degradation and bycatch
Andhra Pradesh	Beaches along Krishna River and Penneru river mouth (Nellore)	Moderate sporadic nesting of Olive Ridley	Nest predation, plastic pollution, light pollution, habitat degradation and bycatch

Important Marine Turtle Habitats in India

Puducherry	Nallavadu,Pannithittu, Narambi and Moorthikuppam villages (Puducherry) and beaches around Arasalar River (Karaikal)	High sporadic nesting of Olive Ridley	Nest predation, by-catch, erosion, habitat degradation, plantation, plastic and light pollution
Tamil Nadu	Gulf of Mannar Biosphere Reserve (Thoothukkudi and Ramanathapuram)	Foraging ground of green and Olive ridley, good seagrass beds	Nest predation, plastic pollution, habitat degradation, poaching, bycatch
Tamil Nadu	Chennai coast, (northern Tamil Nadu)	Sporadic nesting ground of Olive ridley turtles with conservation programmes from 1973	Nest predation, by-catch, plastic pollution, light pollution, egg poaching, habitat degradation
Gujarat	Western Saurashtra coast, Gujarat (Junagadh, Jamnagar and Porbandar)	Green and -Olive ridley turtle nesting grounds	Nest predation, by-catch, plastic pollution, habitat degradation
Maharashtra	Sindhudurg Coasts (Raigad and Ratnagiri)	Sporadic nesting of Olive ridley and Green	Nest predation, bycatch, plastic pollution, habitat degradation
Goa	Galgibaga beach (South Goa)	Sporadic nesting of Olive Ridley	Nest predation, by-catch, plastic pollution, lighting, tourism, habitat degradation



ANNEXURE R/26

National Accreditation Board for Education and Training

NABET

QCI

QCI/NABET/ENV/GHCL/23/2652 January 27, 2023

To,

Sh. N. N. Radia
Chief Operating Officer (COO),
GHCL Ltd.
Sutrapada, Distt. Gir-Somnath,
Gujarat-362275

Sub.: Clarification on the starting date of accreditation of consultants for sector-4(e), i.e., Soda ash Industry
Ref.: Letter no- GHCL/AHD/ENVMOEF&CC/22-23/03 dated 24.1.2023

Dear Sir,

This refers to the communication (in hard and soft copy) received through the letter and subject as mentioned above.

2. QCI-NABET may like to submit that the EIA consultant organizations are accredited for the sectors listed as per the schedule of EIA notification, 2006, who fulfills the requirements of the QCI-NABET's scheme for the Accreditation of EIA Consultant Organizations. The scheme was voluntarily launched in August 2007. Thereafter, made mandatory by MoEF&CC through a gazetted notification dated March 2016. The existing version 3 of the scheme is effective from September 1, 2015.

3. Further, M/s T. R. Associates, Ahmedabad was the first organization that received accreditation from QCI-NABET in sector-4(e)/Soda Ash Industry in December 2019.

4. Also, two more consultant organizations namely M/s Kadam Environmental Consultants, Vadodara, and M/s Aqua-Air Environmental Engineers Pvt. Ltd., Surat accredited in the same sector i.e., sector-4(e).

With best regards.

(A K Jha)
Senior Director
QCI-NABET

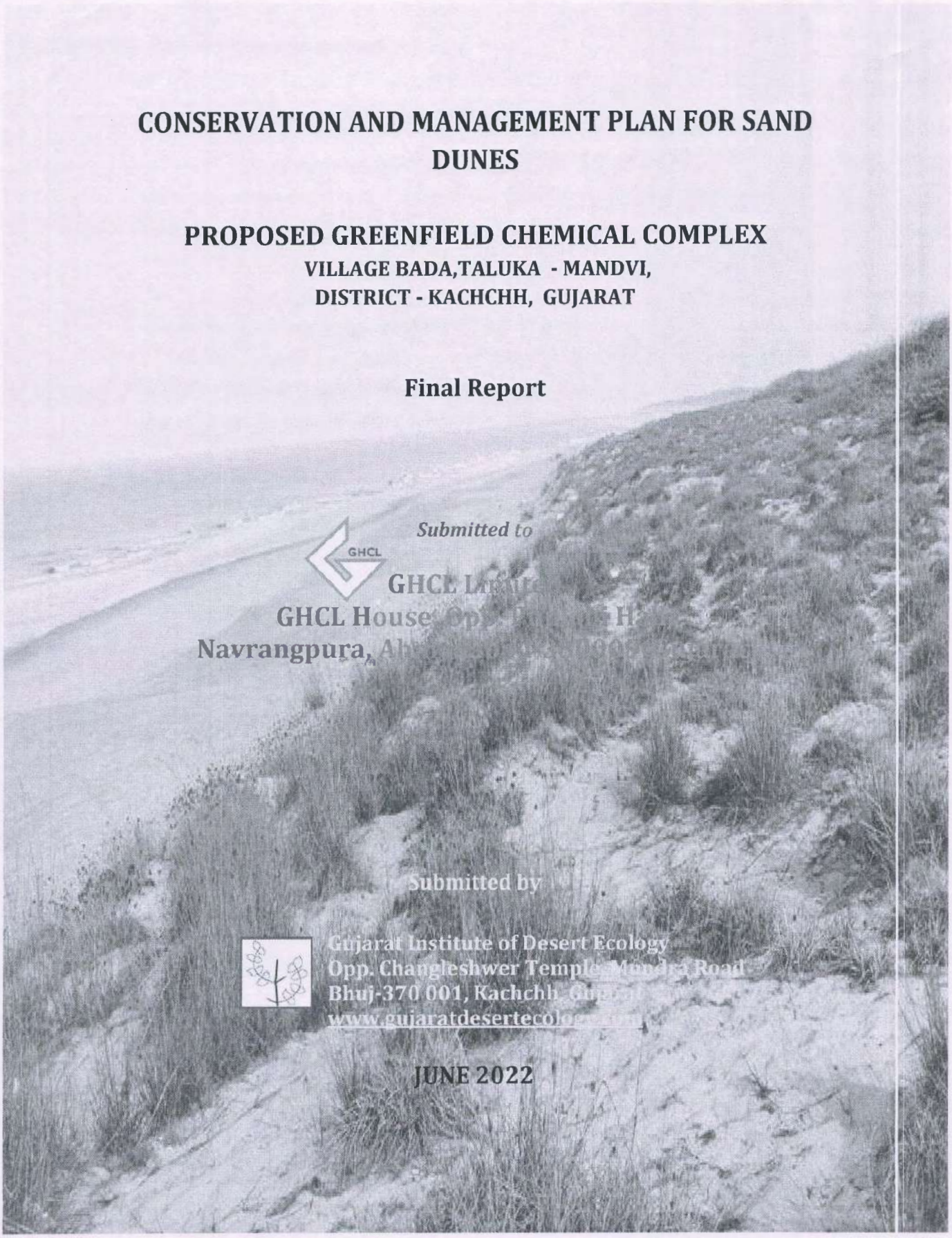
Institute of Town Planners India, 6th Floor, 4-A, Ring Road, I.P Estate, New Delhi-110 002, India
Tel. : +91-11-233 23 416, 417, 418, 419, 420, 421, 423 E-mail : ceo.nabet@qcin.org Website : www.qcin.org

CONSERVATION AND MANAGEMENT PLAN FOR SAND DUNES

PROPOSED GREENFIELD CHEMICAL COMPLEX

VILLAGE BADA,TALUKA - MANDVI,
DISTRICT - KACHCHH, GUJARAT

Final Report



Submitted to

GHCL

GHCL Limited
GHCL House, Opp. [illegible]
Navrangpura, Ahmedabad-380 009

Submitted by

Gujarat Institute of Desert Ecology
Opp. Changleshwer Temple, Mundra Road
Bhuj-370 001, Kachchh, Gujarat
www.gujaratdesertecology.org

JUNE 2022

FINDINGS OF THE STUDY

Status of Vegetation on Sand Dunes:

Presence of sand dunes in the study area suggests high energy wave dominated sea coast. These sand dunes are formed due to deposition of fine to medium, well sorted sand particles. Sediments of the dunes consist of windblown deposits of fine to very fine sand and silt.

The survey for sand dune has been done in the 10 km long stretch along the coast (5 km on either side). Around 18-20 different points have been surveyed along the 10 km stretch. Most of the sand dunes are covered with 70-80% dense grass vegetation while 20-30% sand area is covered with sparse vegetation. The density of *Prospis juliflora* increases away from the sea.

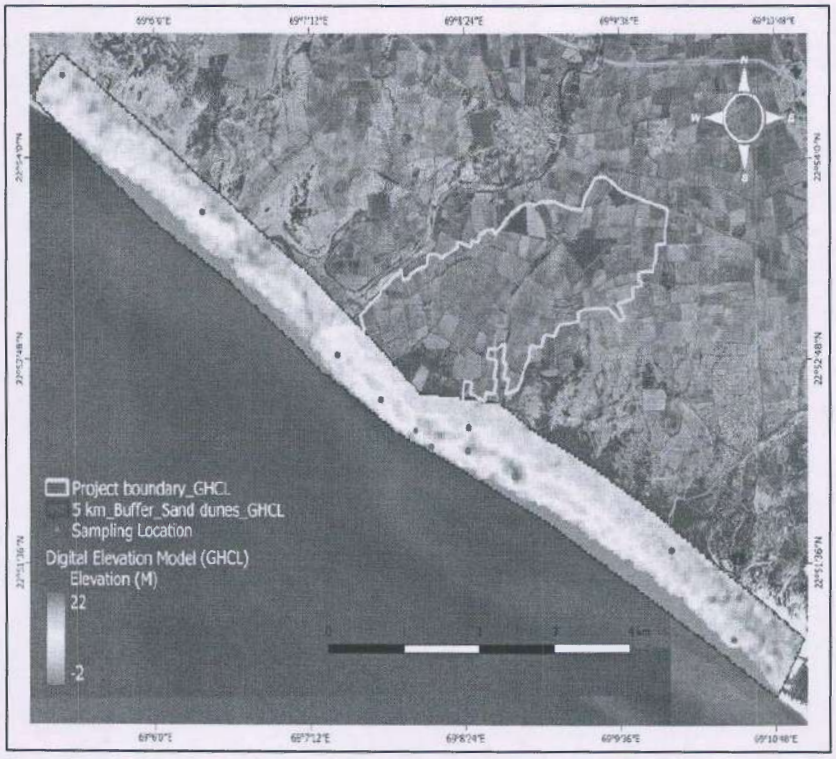


Figure 2. Digital Elevation Models of the Study Area and Sampling Location Around the Study Area

SAND DUNE CONSERVATION MEASURES

Conservation and management of natural ecosystem and habitat are the prime importance in recent time for ecological balance, natural flow of ecosystem services, conservation of biodiversity and our sustainable development. Sand dune are one among the threatened ecosystem which are critical in view of the recent developmental activities along the coastal areas all over the world.

Though the sand dune present in vicinity of the proposed project is very much stable sand dune system due to its vegetation cover except some cliff areas and minimum human interference or activities are observed in the area (due to the narrowness of the beach, lack of approachable roads, etc.). However, in the event of coastal development activities, increasing anthropogenic pressure and ongoing climate change, impact on the sand dune couldn't be neglected in future. Therefore, priority should be given for sand dune conservation and management measures may involve access way construction, signage and a community awareness program. It is applicable to the nearby coastal areas of GHCL Project area.

Therefore, some suitable measure and implementable action to be undertaken for conservation and management of the natural sand dune in the area which are as follows:

1. ***Erosion Control***

The sand dune may face erosion threats due to high wind and tidal action prevailing in the area. The erosion of sand dune is likely in cliff areas facing towards the coastline due the lack of substantial vegetation. The coastal dunes are relying primarily on maintaining a uniform protective cover of suitable vegetation. Therefore, plantation of the cliff area is required with suitable native species of grasses, herbs and shrub which naturally grows on sand.

To provide sufficient plant cover to protect fragile dunes against wind erosion, species that are native to the coastal dunes are adapted to survive the hostile environment of drifting sand, strong winds, salt spray and infertile soils. The plantation activity may be promoted by using CBO (Community Based Organisation) or Forest Department They provides long term stability.

2. Sand Dune Restoration

Tropical storms are primarily responsible for the damage in many parts of the coastal dune ecosystem. Restoring vegetation on coastal dunes is important because vegetation helps stabilize dunes and provides essential habitat and food for many species of wildlife naturally dependent on sand dune. Therefore, key species of plants needs to be planted with coordinated efforts to restore degraded sites within the sand dune area.

3. Stabilising Sand Dune Through Re-vegetation (Sand Dune with Sparse or without Vegetation Cover)

Re-vegetation is a general term that includes stabilising a land surface with plants that need not be native. In coastal dune management the emphasis should be on regeneration; re-establishing a range of indigenous plants that would occur normally in the local environment. This is applicable in the areas or patches of sand dune where there is no vegetation or sparse vegetation. For this there is no need for removing existing vegetation from the dunes.

A healthy dune ecosystem will display a range of plant communities and locally indigenous species that reflect the geographical distribution of species along the coast, zonation within the dune system and the age of the dunes. These communities provide habitats for a diverse range of native fauna, providing them with resources such as food, breeding sites and protection from predators.

For the re-vegetation suitable seed collection is prime important and this can be done through selecting the target plants, establish their locations, understand their fruiting times and the logistics of gathering their seed. Collect local progeny from naturally occurring remnant vegetation as close as possible to the project site. To obtain good genetic quality for each species by collecting from healthy, vigorous plants. Further, it should be ensuring that plants and populations are not over exploited, and collect small amounts of seed from a large number of individual plants that are well separated from each other.

4. Plantation of Native Sand Dune Adopted Vegetation (Psammophytes):

Sand dunes are maintained with the help of sand dune vegetation as wind traps, sand binders of dune stabilizers. Dunes can be stabilized using indigenous grasses and

other plants which can help by "reducing the velocity of waves and absorbing their energy". These plants take root and begin to form a strong, thick barrier which anchors the sand dune and helps keep sand in place. Planting takes an extensive amount of work to complete. First, indigenous plant seeds must be obtained, then site preparation, planting, fertilization, and mulching are required. Following the planting process, irrigation needs to be done in order to maintain required moisture level. Installing dune stabilization vegetation and structures is not the end of the process. The dune must be continuously maintained. Beach grasses are pioneer plants in stabilization of coastal sand dunes. They create an environment more attractive to other species of flora and thus encourages colonization by fauna subsequently changes the dune characteristic features. However, as the plants become established, the dune becomes more stable.

5. Fire Control and Management

Naturally occurring fires are not considered to be a regular feature of the coastal dune environment. It is recognised that active fire management may be required to reduce the risk of wildfire to life and property that has been built in the dune environment.

Though, the present sand dune area has no any sign of fire in present time, however, increasing human population in the event of plant establishment chance of fire cannot be neglected. Therefore, care should be taken to manage fire or fire management system needs to be installed, if fire occurs in future so that vegetation to be managed to conserve the dune environment.

6. Control of Invasive Species

Presently, most of the sand dune area has been covered by the *Prosopis juliflora*. Though, it acts as a sand stabiliser in the area, however, further, invasion of *P. juliflora* to be checked and focus to be given for the plantation or re-vegetation of native species for sand dune conservation.

7. Minimise Anthropogenic Activity in Coastal Ecosystem

Increased human activity such as recreational tourism, fishing, and coastal developmental activity, mainly the economic activities may degrade the dune stability and its ecosystem quality. Though, the major parts of the dune are covered

by the *P. juliflora* and minimum anthropogenic activities noticed during the survey, however, the rapid pace of developmental activities are undergoing in the entire coastal areas of Kachchh including the Mandvi coast, may degrade the ecosystem in future. Therefore, minimum human interference to be allowed in the dune and its sandy coast and focus to be given for awareness among various stakeholders about importance of dune ecosystem and conservation of sand dune.

8. Removal of Beach Debris

Removal of beach debris/waste from such area is an appropriate management practice to promote dunes in the project area. Accumulation of beach debris and other waste by wave action or by dumping leads to damage of dune vegetation and in course of time may affect further dune formations. Beach cleaning occurs in those locations with high levels of recreational use, especially near urbanizations. In addition to its adverse impact on the foreshore flora and fauna, it can exacerbate erosion. The only requirement in most cases is to cease the activity and allow dune vegetation to re-establish.

9. Conservation Education and Awareness Programme

It is normally observed that people have lack of knowledge and awareness about the importance of sand dune ecosystem for the environment and for the human being. Therefore, focus should be given in organizing activities, sign board and other awareness programme on the conservation of sand dune and its dependent fauna.

10. Monitoring and Evaluation

Regular monitoring and evaluation of the sand dune ecosystem and its floral and faunal composition is pre-requisite to manage the sand dune in future and in the event of establishing Greenfield complex by the M/S GHCL Ltd. through expert agencies.

Fund Allocation for Implementation of Conservation Plan

The successful conservation and protection of natural ecosystem/habitats is the prime duty of all stakeholders using the natural resources of such areas for their livelihood and economic development activity. The conservation measure suggested for the conservation sand dune present in the buffer area of the proposed project area of the GHCL is given in the previous section. Since, sand dune is a crucial ecosystem for some threatened wildlife species, special focus is required to ensure effective conservation measures to be implemented in future for conservation and restoration of the sand dune.

To implement the above-mentioned conservation measure for the sand dune, budget has been proposed (breakup given in table 4) for each activity to meet the goal of successful conservation of sand dune and its threatened biodiversity. The proposed estimated budget of Rs. 30,00,000/- (Rupees Thirty lakhs only) has been allocated for the upcoming 10 years from the date of inception of the project to implement various conservation actions as suggested in the previous section of the report.

In addition to the fund allocation made for conservation of sand dune in the buffer areas of the GHCL proposed project, environmental/ habitat improvement programmes could be undertaken as part of CSR activities focussing on the conservation of sand dune environment.

Table 4: Proposed budget for implementation for conservation measure

Sl. No.	Specific Conservation and Management Objective	Proposed Expenditure
		Long term (10 years)
1	Sand dune Conservation and Protection	6,00,000.00
2	Habitat Improvement & Plantation	7,00,000.00
3	Research and Monitoring	6,00,000.00
4	Conservation education & Awareness generation	4,00,000.00
	Total	**23,00,000.00**

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ANNEXURE R/28

Results in Engineering 23 (2024) 102399

Contents lists available at ScienceDirect

Results in Engineering

journal homepage: www.sciencedirect.com/journal/results-in-engineering

Review article

Toward sustainable soda ash production: A critical review on eco-impacts, modifications, and innovative approaches

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ARTICLE INFO

Keywords:
Soda ash
Solvay process
Modified solvay
Environmental impacts
Cleaner production

ABSTRACT

This article explores the evolution of soda ash production methods, highlighting the shift towards more sustainable practices. It analyzes the environmental and economic challenges of traditional methods, including high energy consumption, pollution, and waste generation. The discussion progresses chronologically, examining obsolete natural methods and their gradual replacement by more efficient techniques like the Solvay Process. However, the production of calcium chloride ($CaCl_2$) as a byproduct in the Solvay Process necessitates further advancements. The article explores promising alternatives such as modified Solvay methods utilizing external CO_2 sources and exciting new frontiers like microbial-assisted production. Additionally, it delves into methods utilizing wastes like CaO (calcium oxide) and the potential of layered double hydroxides (LDHs) and cyclic CO_2, even though these may generate hydrochloric acid (HCl) as a byproduct. The primary focus remains on the potential of innovative methods based on physical and biological processes to achieve enhanced efficiency, decreased environmental impact, and reduced energy and resource demands.

1. Introduction

Soda ash is a brand name for sodium carbonate (Na_2CO_3) [1–6] that is widely used around the world. Today, natural resources (Trona Reserves) and industrial methods are extensively used to produce sodium carbonate, with the difference that production through industrial methods is about two-thirds more than that using natural sources [7–9].

Considering that sodium carbonate was first produced using ash from plants and seaweed or natural mineral resources, it was utilized as a necessary raw material in the manufacturing of glass (as a flux to reduce the melting point of glass compounds), detergents (soap production), and textiles (as an alkaline cleaning agent in white and cotton fabrics). The need for sodium carbonate surged as a result of population growth and technological advancements; its production from natural sources could no longer meet industrial demands, and difficulties arose in its manufacture [10–15].

The invention and development of synthetic processes to produce sodium carbonate can be considered the catalyst for a revolution in the chemical industry [10,16–18]. Sodium carbonate is now produced synthetically by the cost-effective Solvay process using raw materials, including salt (sodium chloride) and limestone (calcium carbonate). Using this process to produce sodium carbonate has serious environmental impacts due to the production of alkaline effluents containing numerous particles and impurities [19–25]. The challenges associated with the management of toxic effluents and large amounts of carbon dioxide emissions from Solvay plants into the environment and atmosphere [26–31] have prompted scientists to look for alternatives or modifications to this method. In 1980, a process called dual Solvay, also known as the modified Solvay process, was first proposed in Japan. The dual process was an environmentally friendly method for the production of sodium carbonate with minimal pollution; however, for the reasons that will be mentioned in the following sections, it lost its economic viability, and the use of this process for the production of soda ash decreased [32–37].

Numerous modified and innovative methods with reduced environmental impacts have been proposed by researchers to produce soda ash [6,38–44]; however, due to economic reasons, modified methods were not favored by manufacturers. In other words, any reduction in environmental impacts requires more financial resources. Unfortunately, for economic reasons, the production of sodium carbonate still follows the

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https://doi.org/10.1016/j.rineng.2024.102399
Received 10 April 2024; Received in revised form 22 May 2024; Accepted 10 June 2024
Available online 11 June 2024
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original Solvay process [26,38,45–49], in which the toxic effluents are discharged into rivers and seas only after an initial filtration in sedimentary basins, causing several environmental problems.

The Solvay process's dependence on the calcination of limestone is one of its main disadvantages [50–55]. Due to the enormous volumes of CO_2 that industrial facilities like power plants, cement factories, and lime kilns produce each year, this process has a major impact on greenhouse gas emissions [56–65].

Efforts are currently underway to address and mitigate these emissions. Regulatory measures such as the Carbon Sequestration Legislation and Climate Change Laws are being enforced to promote clean production practices and mandate CO_2 storage within these industries [66–72]. Extensive research has been conducted to investigate carbon capture and CO_2 emissions from such facilities [73–84]. However, a significant challenge persists: the secure storage of the captured CO_2 gas.

The emergence of a potential solution is evident in the possibility of utilizing captured CO_2 for soda ash plants, which could potentially revolutionize the industry. The utilization of stored CO_2 would obviate the necessity for limestone calcination in the Solvay process, thereby significantly reducing its environmental impact. Consequently, this could render the original Solvay process more economically viable when compared to currently less feasible modified methods, despite their cleaner attributes.

Additionally, research indicates that there may be potential for financial optimization of the modified methods. This could be achieved by utilizing ammonia gas recovered from municipal and industrial wastewater treatment to enhance the cost-effectiveness of soda ash production. This review encompasses a range of soda ash production methods, including natural approaches, established industrial processes such as the Leblanc and Solvay methods, and more contemporary techniques. The examination will delve into the chemical and physical properties of sodium carbonate, assess the environmental and economic challenges associated with each production method (including natural resource depletion, greenhouse gas emissions, and wastewater generation), and introduce both conventional Solvay methods and their cleaner, albeit currently less practical, modifications.

To cope with the ecological and economic challenges of sodium carbonate production, various solutions have been presented by scientists at laboratory and industrial scales [38,85–97]. However, a comparative study of major methods of soda ash production and the associated environmental concerns has not yet been carried out.

This comprehensive review critically assesses the progress toward achieving more sustainable soda ash production. It includes a thorosugh examination of the environmental impact, reforms, and innovative approaches in soda ash production. The study's objective is to analyze and mitigate the environmental impact of traditional soda ash production methods, as well as to identify potential improvements. Additionally, it presents and evaluates promising modifications to existing processes and innovative approaches that have the potential to significantly reduce the environmental impact of soda ash production. Ultimately, this research aims to pave the way for a more sustainable future for this essential industrial material by reviewing these advancements.

2. Chemical and physical properties and types of sodium carbonate

Soda ash, historically extracted from plant ashes rich in sodium, is a white substance composed primarily of sodium carbonate (Na_2CO_3). It consists of 58 % sodium oxide (Na_2O) and 42 % carbon dioxide (CO_2) [98–104]. Soda ash gets its name from the presence of CO_2, similar to carbonated water. It is an alkaline substance with a high pH, posing potential harm to the eyes, respiratory tract, and skin. There are two types of soda ash: powder and granules, differentiated by particle size and density. Dense soda ash, with a specific gravity ranging from 960 to 1040 kg m^{-3}, is commonly used in glass production. Light soda ash, with a specific gravity of 520–600 kg m^{-3}, finds widespread use in various chemical industries and detergent companies. Both types share similar physical and chemical properties (Table 1). Besides anhydrous sodium carbonate, there are three other forms: sodium carbonate monohydrate ($Na_2CO_3.H_2O$), sodium carbonate heptahydrate ($Na_2CO_3.7H_2O$), and sodium carbonate decahydrate ($Na_2CO_3.10H_2O$) [98].

3. Applications of sodium carbonate in various industries

Sodium carbonate finds applications in various industries including glass, chemical, detergent, paper, ceramic, medicine, textile, steel, water treatment, and oil. The glass industry accounts for approximately half of the global sodium carbonate production [11,98,105]. It acts as a flux substance in glassmaking furnaces, reducing the melting point of silica sand. It is also utilized in steelmaking as a flux and separator for sulfur, phosphate, and nitrite [98,106]. Sodium carbonate plays a role in the recycling of aluminum and zinc. In the detergent industry, sodium carbonate is a key ingredient in the production of soaps, detergents, and cleaning products [98,106]. Moreover, it serves as a precursor for various chemicals like sodium phosphate, sodium silicate, sodium sulfate, sodium dichromate, sodium sesquicarbonate, sodium percarbonate, and pure sodium carbonate used in pharmaceutical, food, and cosmetic industries [98,106]. Other applications include leather, brick, and fertilizer industries, as well as plastics, paper, paints, adhesives, fire extinguishers, and oil and gas industries. Fig. 1 provides recent statistics on the usage of sodium carbonate across different industries in 2023.

4. Classification of various methods for soda ash production

According to Fig. 2, sodium carbonate can be produced by natural [10] and industrial (synthetic) processes [32,38,108,109]. Natural methods include the use of plant and mineral resources while industrial methods involve original, modified, and modern methods. The first method of producing sodium carbonate was natural, obtained from plants and seaweed. However, due to low efficiency and increasing demand, this method became obsolete. It was replaced by Leblanc's industrial process and natural production from Trona Reserves. The Leblanc Process produced highly toxic HCl and CaS gases, leading to its obsolescence. It was replaced by the Solvay process and its modified version, which is the most widely used today due to its simplicity and the abundance of raw materials. The modified Solvay process and the LDH method were introduced to address the environmental issues of the Solvay process, which will be discussed in detail in the following sections.

5. Production of sodium carbonate using natural resources

5.1. Production of sodium carbonate using plant resources and seaweed

Soda ash was historically produced from plant sources like Barilla or seaweed. The plants were burned and the ashes obtained were mixed with water to create an alkaline solution. This solution was boiled until the water evaporated, resulting in dry soda ash. It is important to note that the amount of sodium carbonate extractable from seaweed (kelp) ranges from 2 to 3 % by weight, whereas Barilla can contain up to 30 % sodium carbonate [11,110].

Table 1
Characteristics of light and dense soda ash [32,98].

	Dense	Light
Sodium carbonate (Na_2CO_3)	99.1 %	99 0.1 %
Sodium chloride (NaCl)	0.5 %	0.5 %
Sodium sulfate (Na_2SO_4)	0.04 %	0.04 %
Fe_2O_3	0.004 %	0.004 %
H_2O	0.02 %	0.02 %
Bulk density (kg.m^{-3})	960–1040	520–600

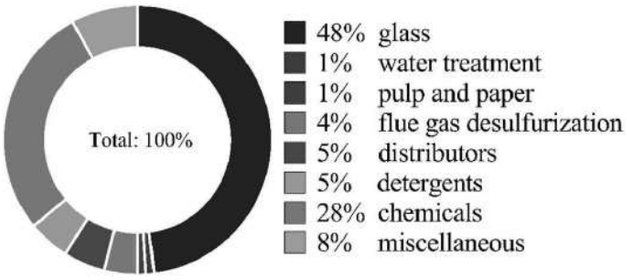


Fig. 1. Distribution of soda ash by end use in 2023 [107].

Seaweed ash is less economically feasible for sodium carbonate extraction than barilla ash because it has a substantially lower sodium carbonate concentration. Stated differently, processing a substantially greater volume of seaweed is needed to extract the same quantity of sodium carbonate as from barilla ash, which means that higher expenses for collecting, processing, and transportation are required. Furthermore, the energy consumption is directly proportional to the amount of materials processed. Hence, considering the ten times higher sodium carbonate content in barilla ash as compared to seaweed ash, it is more cost-effective to extract sodium carbonate from barilla ash.

5.2. Production of sodium carbonate using mineral resources (Trona)

Trona is the primary source of soda ash production. It is a mineral with the chemical formula $Na_2CO_3.NaHCO_3.2H_2O$, containing 70.39 % sodium carbonate [111]. The United States possesses the largest Trona reserves globally [107]. Sodium carbonate can be obtained from Trona through processes such as monohydrate, sesquicarbonate, alkali extraction, and carbonization. The monohydrate and sesquicarbonate processes are commonly employed to produce sodium carbonate monohydrate from Trona sources. The production steps for both processes are provided in Fig. 3 [11,98,112].

6. Production of sodium carbonate by the leblanc process (obsolete)

Before the industrialization of sodium carbonate production, it was sourced from natural materials such as plants and mines. However, by the late 1700s, the scarcity of sodium carbonate needed by glass and soap companies, along with the escalating demand and the unresponsiveness of natural sources of production, made it challenging to meet supply. Meanwhile, Nicolas Leblanc invented a process that utilized sodium chloride, sulfuric acid, coal, and limestone to produce soda ash. The first Leblanc soda ash plant was established in France in 1790, initially producing 300 kg per day [113]. The Leblanc process involved the reaction of sodium chloride with sulfuric acid, resulting in sodium sulfate and hydrochloric acid (Equation (1)). The sodium sulfate was

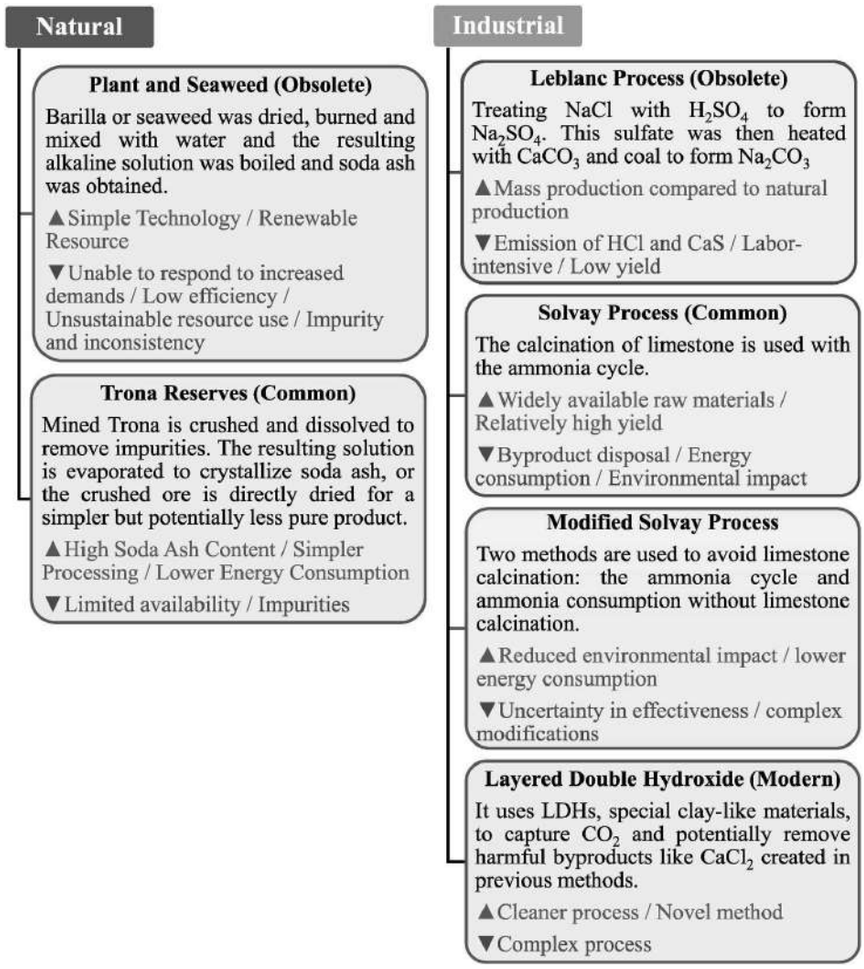


Fig. 2. Mapping, classification and characterization of different methods of sodium carbonate production.

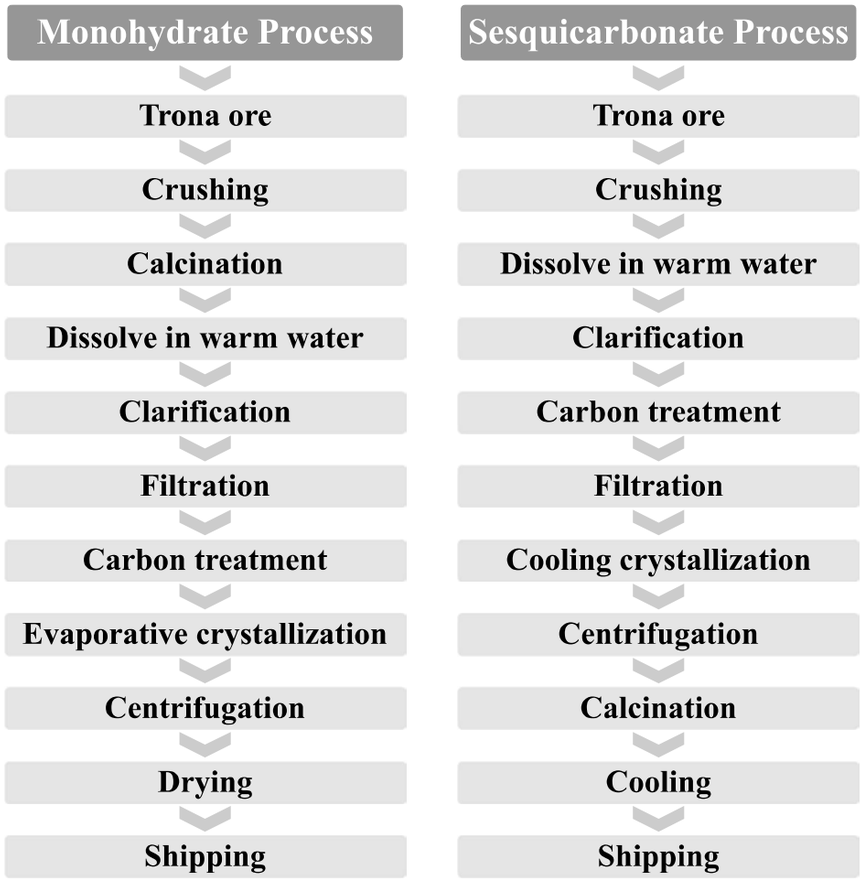


Fig. 3. Simplified steps of the of soda ash production from Trona sources [11].

then mixed with coal and limestone, and heated to produce sodium carbonate, carbon dioxide, and calcium sulfide (Equations (2) and (3)). The resulting mixture, known as black ash, was washed to extract sodium carbonate. However, this process had environmental risks due to the production of hydrogen chloride gas and solid calcium sulfide waste. As one of the primary air pollutants, HCl gas combines with atmospheric moisture to produce hydrochloric acid ($HCl_{(aq)}$), which causes acid rain and harms human health, buildings, and ecosystems. Furthermore, improper disposal of CaS can cause it to leak into water sources and react with the water to form the poisonous and malodorous hydrogen sulfide gas (H_2S). At high amounts, H_2S can be fatal and cause respiratory issues in both terrestrial and aquatic life [114,115]. Eventually, the Solvay process replaced the Leblanc process due to these concerns.

$$2NaCl + H_2SO_4 \rightarrow Na_2SO_4 + 2HCl \quad (1)$$

$$N\,a_2SO_4 + 2C \rightarrow Na_2\,S + 2C\,O_2 \quad (2)$$

$$N\,a_2S + CaCO_3 \rightarrow Na_2CO_3 + CaS \quad (3)$$

7. Production of soda ash using the solvay process

The production of soda ash based on the Solvay process can be carried out using the classic and modified Solvay processes as follows [11,32,38,109].

- Method 1: Common Solvay process (with limestone calcination - with ammonia cycle)
- Method 2: Modified Solvay process (without limestone calcination - with ammonia cycle)
- Method 3: Dual-modified Solvay process (without limestone calcination - with ammonia consumption)

The CO_2 in sodium carbonate can be supplied in various ways. In the first method, $CaCO_3$ (limestone) is calcined to provide CO_2. Some of the unused CO_2 gas from the limestone calcination is recycled within the soda ash production process. The aforementioned process presents a significant drawback due to the substantial release of CO_2 into the atmosphere from the lime kiln [11]. Approximately 0.2–0.4 tons of CO_2 are emitted into the atmosphere for every ton of soda ash produced [32,38].

On the other hand, the second and third processes, known as Modified Solvay, do not rely on limestone calcination to provide CO_2. Instead, they use stored CO_2 from other sources, by capturing CO_2 from exhaust gases produced by plants and factories that use fossil fuels, such as power plants and cement plants. These modified processes contribute to carbon sequestration efforts and help mitigate global warming. The modified processes not only recover CO_2 from stored exhaust gases but also eliminate the issue of CO_2 emissions from lime kilns since soda ash plants using these processes do not have lime kilns [11,32,38,109].

In the production of soda ash by these three processes, in addition to supplying the consumed CO_2 gas, some unused CO_2 gas is also required to be cycled. The first and second methods also require cyclic NH_3 gas (ammonia) as a raw material, while the third method, known as the dual process, does not use NH_3 gas. Additionally, besides soda ash, a byproduct in the form of calcium chloride solution is produced in the first and second methods. Similarly, in the third method, ammonium chloride solution is generated as a byproduct, which can be utilized as a fertilizer and is not considered waste [11].

7.1. Solvay process (with limestone calcination - with ammonia cycle)

The production of soda ash in the Solvay process involves using sodium chloride and calcium carbonate (limestone) as raw materials. The availability of these raw materials is a significant advantage of this method. According to Equation (4), the chemical process produces sodium carbonate along with a byproduct of calcium chloride. However, in reality, it is not possible to directly produce sodium carbonate as per Equation (4), and sodium chloride and calcium carbonate do not react under normal conditions [11,32,38,109].

$$2NaCl_{(aq)} + Ca\,CO_{3(s)} \rightarrow CaCl_{2(aq)} + Na_2CO_{3(s)} \quad (4)$$

The industrial production of soda ash using the Solvay process involves several steps. First, limestone is calcined at a temperature between 950 and 1100 °C, resulting in the production of CO_2 gas and CaO. This CO_2 gas is essential for the subsequent production of sodium carbonate [26,106,116]. The calcination of limestone in lime kilns represents around 30 % of the total cost of soda ash production using the Solvay process [91,117,118].

Sodium chloride dissolves in water, producing a brine solution. This process requires 2 mol of NH_3 gas, 1 mol of CO_2 gas, and 2 mol of H_2O, which are cyclic materials (Equations (5)–(2)). According to Equations 5-3 and 5-4, by conducting CO_2 gas from limestone calcination, cyclic materials and sodium chloride solution in industrial reactors produce sodium bicarbonate and ammonium chloride solution [106]. The solid sodium bicarbonate is separated from the ammonium chloride solution using special filters. The sodium bicarbonate is calcined at 160–230 °C to produce sodium carbonate (Equations (5)–(5)). For each mole of Na_2CO_3, the first part of the cyclic material, including 1 mol of CO_2 and 1 mol of H_2O, is released and returned to the production process. Then, according to Equations (5) and (6), from the reaction of ammonium chloride solution with the residual lime from the calcium carbonate calcination (in the form of lime slurry), while producing calcium chloride solution, the second part of the cyclic materials, including NH_3 and H_2O gas (2 mol of ammonia gas and 1 mol of water), is released and returned to the production process conditions [11,32,38,109].

$$2NaCl_{(aq)} + Ca\,CO_{3(s)} \rightarrow CaCl_{2(aq)} + Na_2CO_{3(s)} \quad (5)$$

$$CaC\,O_{3(s)} \rightarrow CaO_{(s)} + CO_2 \quad (5\text{-}1)$$

$$[(2NH_3 + H_2O) + (CO_2 + H_2O)] : \text{Recycling materials} \quad (5\text{-}2)$$

$$[(2NH_3 + H_2O) + (CO_2 + H_2O)] + CO_2 \rightarrow 2NH_4\,HCO_3 \quad (5\text{-}3)$$

$$2NaCl_{(aq)} + 2NH_4\,HCO_3 \rightarrow 2NH_4Cl_{(aq)} + 2NaHCO_{3(s)} \quad (5\text{-}4)$$

$$2NaHC\,O_3 \rightarrow Na_2CO_3 + [CO_2 + H_2O]\uparrow \quad (5\text{-}5)$$

$$2NH_4Cl_{(aq)} + CaO \rightarrow CaCl_{2(aq)} + [2NH_3 + H_2O]\uparrow \quad (5\text{–}6)$$

The process of producing sodium carbonate and calcium chloride solution as a waste by-product using the raw materials of sodium chloride salt and limestone by the Solvay process according to Equations 5-1 to 5-6, is shown in Fig. 4-A. To avoid the clutters, H_2O used in sodium chloride solution and H_2O needed to convert CaO into Ca $(OH)_2$, and H_2O in $CaCl_2$ and NH_4Cl solutions are not shown.

When stoichiometric analysis of Equation (5) is performed, this reaction can be understood as a double displacement reaction where the anions (Cl^- and CO_3^{2-}) and cations (Na^+ and Ca^{2+}) swap places. The stoichiometric analysis and the quantity of Na_2CO_3 generated for every 10 g of NaCl are provided below.

1 converting grams of NaCl into moles:

moles of NaCl = 10.0 g/58.44 g/mol = 0.171 mol.

2 Finding moles of Na_2CO_3:

moles of Na_2CO_3 = 0.171 mol NaCl * (1 mol Na_2CO_3/2 mol NaCl) = 0.0855 mol Na_2CO_3

3 Converting moles of Na_2CO_3 to grams:

grams of Na_2CO_3 = 0.0855 mol * 106.00 g/mol = 9.03 g.

Thus, 9.03 g of Na_2CO_3 may potentially be created using 10.0 g of NaCl. This calculation assumes a complete reaction and no losses. The actual yield of Na_2CO_3 may be lower in practice for a variety of reasons.

7.2. Modified Solvay process using lime in fly ash or slag from other plants and factories to recover ammonia (without calcination of limestone - with ammonia cycle)

In the modified Solvay process for soda ash production, sources other than limestone can be used to provide the required CO_2, eliminating 30 % of soda ash production's cost associated with limestone calcination [91]. However, the presence of CaO, which is produced through limestone calcination, is necessary for the recovery of NH_3 in the process. CaO can be obtained from CaO-containing slag or fly ash from other plants, offering environmental benefits. The CaO content in slag and fly ash varies depending on the industry and technology used [119]. For example, blast furnace slag (BFS) and basic oxygen furnace slag (BOF)

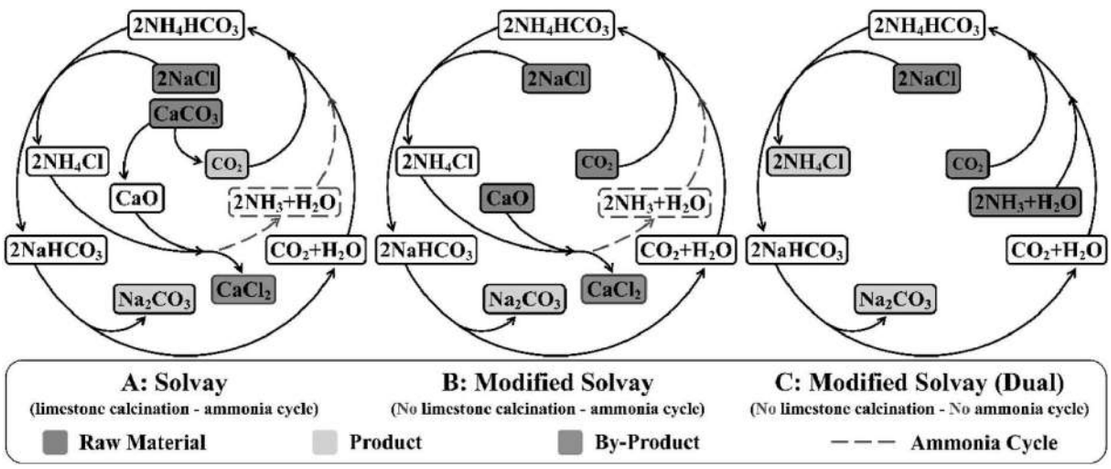


Fig. 4. Comparison of the classic Solvay process, modified and dual processes for the production of soda ash.

contain 38 to 42 wt% and 46.3 to 55.9 wt% CaO, respectively [120]. In addition, fly ash from power plant furnaces contains 3.2 to 25.8 wt% CaO [121]. The use of CaO from these sources for NH_3 recovery involves complexities that have been studied in previous research [91,119, 122–124]. Therefore, the higher the amount of CaO, the more calcium ions are extracted from it and the more ammonia is recovered. Nevertheless, this is a complicated procedure, because temperature and crystal lattice geometry affect calcium extraction [91]. Fly ash and slag contain additional materials like silica, iron oxide, and aluminum oxide, which do not interfere with ammonia recovery but impact the efficiency and quality of plant waste. These materials can form complexes with ammonia, reducing its recovery efficiency [124–128]. In several investigations, the specifics of the extraction and purification procedures have been covered [122–124,129].

In general, the process of the production of sodium carbonate using the modified Solvay process (without limestone calcination - with ammonia cycle) is similar to Equations 5-1 to 5-6 of the original Solvay process. The difference is that due to the removal of limestone calcination, Equations (5)–(1) is excluded, and lime in fly ash or slag is used to provide the CaO required for NH3 recovery according to Equations (5) and (6) [91]. A schematic representation of this method (without calcination of limestone - with ammonia cycle) is shown in Fig. 4-B.

7.3. Dual modified solvay process (without calcination of limestone - with ammonia consumption)

The modified Solvay process differs from the original process by not using limestone and its calcination to provide CO_2. Instead, the dual process utilizes saline water along with CO_2 and NH_3 gases, and H_2O as the main raw materials [32]. One mole of CO_2 gas and 1 mol of H_2O are used as cyclic materials in the production process, as described in Equations (6)–(1). Unlike the original process, the dual process does not require an NH_3 gas circuit, resulting in the production of ammonium chloride as a byproduct in addition to sodium carbonate. This is why it is referred to as the dual process [11]. The overall process is represented by Equations 6-2 to 6-4, as shown in Fig. 4-C. The dual process, also known as the Japanese method, was invented in Japan in 1980 [32].

$$[(CO_2+H_2O)] : \text{Recycling materials} \quad (6\text{-}1)$$

$$2NH_3 + CO_2 + H_2O + [(CO_2+H_2O)] \rightarrow 2NH_4HCO_3 \quad (6\text{-}2)$$

$$2NaCl_{(aq)} + 2NH_4HCO_3 \rightarrow 2NH_4Cl_{(aq)} + 2NaHCO_{3(s)} \quad (6\text{-}3)$$

$$2NaHCO_3 \rightarrow Na_2CO_3 + [CO_2+H_2O] \uparrow \quad (6\text{-}4)$$

$$2NaCl_{(aq)} + 2NH_3 + CO_2 + H_2O \rightarrow 2NH_4Cl_{(aq)} + Na_2CO_{3(s)} \quad (6)$$

7.4. Regulations

In the US, due to the presence of large deposits of trona, the closure of all synthetic soda ash plants was enforced a few years ago [130]. In many industrialized countries, soda ash production is limited by environmental regulations. In modern soda plants, the use of limestone as a raw material in the Solvay process requires a purity of 95–99 % $CaCO_3$. Since the compounds dissolved in distillation effluent (mainly $CaCl_2$ and NaCl) lose most of their ecological significance when discharged at the sea, increasing environmental regulations could force European soda ash producers to relocate their factories to the coast to dispose of their waste into the sea. With environmental regulations being tightened every year, the establishment of new soda ash plants using the classic Solvay process becomes difficult [11,130].

7.5. Environmental challenges of soda ash production using the solvay process

Environmental challenges associated with soda ash production using the Solvay process (including classic Solvay process and modified processes) involve different aspects, including natural resource degradation and greenhouse gas emissions, saline water refining, limestone calcination, ammonia recovery wastes in effluents and their impact on environmental pollution.

Para No. N

7.5.1. Degradation of natural resources and emission of greenhouse gases

The production of soda ash using traditional methods such as the Solvay process can have negative environmental impacts. Large quantities of limestone and rock salt resources are required, leading to the depletion of natural resources and the emission of dust and fine particles during their extraction from quarries, which can cause respiratory diseases and affect agricultural land and gardens in the surrounding areas. Additionally, the classic Solvay process generates 10 m^3 of waste, consisting of liquid and inorganic solid particles, for every ton of soda ash produced [131]. These waste materials are produced during various stages of the process, including brine treatment, limestone calcination, and ammonia recovery [11,32,38,109]. Furthermore, in the classic Solvay process with lime calcination and the ammonia cycle, the exhaust gases from the lime kiln and a portion of the ammonia gas used in the cycles are gradually released into the atmosphere.

Para No. O

7.5.2. Effect of saline water purification on effluent pollution

Fly ash plants typically use local rock salt sources located near these plants to provide the sodium chloride solution. The saline water resulting from the dissolution of salt in water is purified before entering the reactors to separate calcium and magnesium ions from the saline water and avoid disturbance in the process of sodium bicarbonate production in the reactors. During the purification of saline water to prepare a pure sodium chloride solution, solid particles, including calcium carbonate and magnesium hydroxide, are produced. These are discharged to the plant effluent after separation (although these solid particles contain some sodium chloride) [11]. Since sodium chloride solution is one of the main raw materials in the production of soda ash using the Solvay process, this type of waste is generated by all three processes, including the classic Solvay process as well as both modified processes (as introduced in the previous sections) [131].

Para No. P

7.5.3. Effect of limestone calcination on effluent pollution

In the production of soda ash using the classic Solvay process, part of the solid particles in the effluent results from the calcination stage of limestone. Carbon-based fuels (such as coal and coke) are commonly used to calcine limestone for further CO_2 production. Lime kiln exhaust gases contain 37–42 % carbon dioxide, rock dust, ash particles, and other gaseous impurities, which are first diluted with nitrogen gas; then their temperature is reduced by passing them through the water. CO2 is supplied by condensers and transported to reactors. The lime in the lime kiln is directed into water previously used to cool the exhaust gases to form large suspensions of calcium hydroxide (lime slurry). Thus, the lime slurry produced contains several impurities, including calcined limestone particles and ash particles, which are added to the plant effluent in the ammonia recovery stage [11].

In the first modified Solvay process (without limestone calcination - with ammonia cycle), using lime in fly ash or slag from other plants and factories to recover ammonia, although no lime kiln is used, due to the use of lime sources (fly ash or slag) for ammonia recovery, metal oxides in the fly ash or slag enter the plant effluent. Also, in the (dual process) second modified Solvay process (without limestone calcination - with ammonia consumption), no ammonia is recycled, and lime is not required; thus, no solid particles associated with limestone and lime are added to the effluent [11,91].

Para No. Q

7.5.4. Effect of the waste from ammonia recovery on effluent pollution

In the production of soda ash using the classic Solvay process, in addition to precipitated sodium bicarbonate, ammonium chloride is produced as a by-product. According to Equations (5) and (6), it is mixed with CaO in the lime slurry to recover ammonia for reuse throughout the production cycle. Calcium chloride solution is also produced as waste. However, during the recovery of ammonia, part of the lime slurry does not react. This produces waste including a solution of calcium chloride and calcium hydroxide particles [11].

Para No. R

7.5.5. Impact of effluent on environmental pollution

In a soda ash plant, the effluent consists mainly of a calcium chloride solution containing particles of calcium hydroxide. This solution mixes with impurities from the refining of saline water and the calcination of limestone resulting in an alkaline liquid with pH > 11.5, containing solutions of calcium chloride, sodium chloride, and suspended particles such as calcium carbonate, sulfates, magnesium hydroxide, and calcium hydroxide. This effluent of the Solvay process is directed to sedimentation ponds (lagoons), where solid particles settle and the liquid is discharged into rivers and lakes. Unfortunately, this discharge causes significant environmental damage, including contamination of groundwater, riverbeds, and agricultural land [26,38,130,132–134]. Improper sealing of the sedimentation ponds can lead to their destruction during floods, resulting in the release of alkaline compounds into the environment. This renders nearby agricultural land infertile and poses serious risks to the residents and animals in the area.

7.5.6. Comparison of methods from the perspective of environmental challenges

To summarize the environmental challenges in the production of soda ash using the Solvay process (including classic Solvay and its modified processes), a comparison is made between the three methods in terms of the production cycle (Fig. 4) and the relevant environmental problems (Table 2). As shown, by using the modified methods, environmental problems are reduced, with the dual process method entailing the lowest environmental problems. On the other hand, by eliminating lime calcination and using CO_2 from other sources, the modified processes take an important step towards carbon sequestration and reducing greenhouse gas emissions into the atmosphere, thereby protecting the environment.

Table 2
Comparison of the environmental problems of soda ash production using Solvay-based methods

	Solvay process	Modified Solvay (fly ash or slag)	Dual modified Solvay	Degree of impact
Degradation of rock salt resources	×	×	×;	High
Degradation of limestone resources	×			High
Emission of greenhouse gases (except CO_2) from lime kilns	×			High
Use of carbon-based fuels for the calcination of lime	×			High
Gradual and continuous discharge of some of the cyclic ammonia gas	×	×		Low
Effect of saline water treatment on effluent pollution	×	×	×	Moderate
Effect of lime calcination on effluent pollution	×			Moderate
Effect of ammonia recovery with lime slurry on effluent pollution	×	×		Moderate
Ammonium chloride entering the effluent (if not in demand)			×	Low

7.6. Solutions to reduce environmental problems and related economic challenges

This section, in addition to introducing various solutions to reduce environmental problems caused by the production of soda ash using Solvay-based processes, examines the relevant economic challenges including increased production costs.

7.6.1. Removal or replacement of limestone

Limestone is an essential raw material for the production of soda ash using the Solvay process. However, in modified Solvay processes, the need for lime calcination is eliminated, which requires access to CO_2 and CaO resources, incurring additional costs. Utilizing stored CO_2 from the exhaust gases of other factories not only eliminates greenhouse gas emissions from the soda plant's lime kiln but also reduces emissions from those factories, while also reducing effluent from the soda ash plant. Also, ammonia recovery can be achieved through waste fly ash and slag from other factories, providing the necessary lime. Additionally, solid particles and impurities present in the fly ash and slag tailings, along with some lime, are directed to the plant effluent during the ammonia recovery process. By eliminating the need for ammonia recovery, the environmental issues caused by entrained solid particles and impurities from fly ash and slag, along with lime, in the plant effluent can be avoided. Therefore, if there is a demand for ammonium chloride as a by-product, the waste from the soda ash plant would be limited to particles and solid impurities generated during brine treatment. Utilizing CO_2 and CaO resources from other factories for soda ash production not only provides numerous environmental benefits but also helps overcome challenges associated with CO_2 storage and procurement, purchasing fly ash and CaO-containing slag from other plants, and transportation and maintenance costs.

According to Fig. 5, global lime production has increased significantly compared to soda ash production since 2001. Storing a portion of the CO_2 gas obtained from lime kilns can meet the demand for soda ash kilns. The cement industry is responsible for 5–9 % of global greenhouse gas production [135–139]. Capturing CO_2 from cement plant flue gases and using it for sodium carbonate production can reduce the environmental impact of this chemical. The stored CO_2 can be used in the production of soda ash using sustainable clean methods. However, storing and maintaining CO_2 from cement plants and other industries pose additional challenges. There are constraints associated with various carbon capture systems. Post-combustion absorption lowers plant efficiency, although pre-combustion absorption might be energy-intensive. Additionally, oxyfuel technology is still in its infancy. Furthermore, CO_2 leaks from storage tanks may result in issues that need to be verified and monitored over time [140–142]. Overcoming these challenges will require collaboration between governments, industries, and research institutions. If these issues are resolved, carbon capture has the potential to emerge as a competitive and workable soda ash manufacturing method.

Once the dual-modified Solvay process is used solely for carbon sequestration (CO_2 storage) in a solid, if sodium bicarbonate is not calcined after production, the total CO_2 is stored in the sodium bicarbonate solid. In other words, the cyclic CO_2 is replaced by the consumed CO_2, and rather than producing 1 M ratio of Na_2CO_3, 2 M ratios of $NaHCO_3$ are produced, doubling CO_2 precipitation. As a consequence, a reduction in CO_2 emissions is achieved, and CO_2 previously stored from other plants is utilized. Additionally, there is a decrease in the generation of waste materials, and the occurrence of calcination is eliminated.

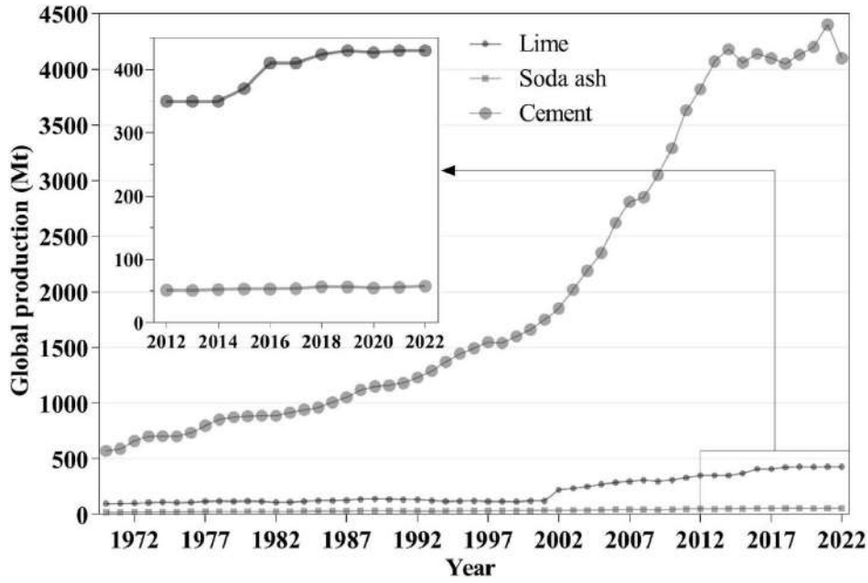


Fig. 5. Portland cement, lime, and soda ash production from 1970 to 2022 [143].

7.6.2. Use of natural gas rather than carbon-based fuels when lime calcination is required

In the production of soda ash using the classic Solvay process, part of the solid particles in the plant effluent is related to the limestone calcination stage. To produce more CO_2, carbon-based fuels (such as coal and coke) are commonly used for limestone calcination. If modern furnaces and natural gas are used instead of carbon-based fuels, the entry of solid particles into the plant effluent is reduced, yielding less CO_2. To compensate, more limestone is calcined, which increases the cost of soda ash production. From an ecological point of view, natural gas is less polluting than carbon-based fuels. It is recommended to construct and build limestone and soda ash plants side-by-side whenever possible. In this way, while producing high-quality lime demanded by the market with modern furnaces and natural gas, the carbon dioxide released is fed into the reactors of the soda ash plant (adjacent to the limestone plant). The co-production of these products, limestone and soda ash, in two adjacent factories, reduces pollution from the soda ash plant's effluent by eliminating the need for carbon-based fuels. This prevents the emission of CO_2 gas into the atmosphere (due to precipitation in soda ash). Excess CO_2 produced in the limestone plant can also be used to store carbon in the soda ash plant effluent.

7.6.3. Proper mining or replacement of rock salt

Another raw material required for the production of soda ash using the Solvay process is rock salt. In the case of extracting rock salt from the seabed or salt mines, the measures to prevent the formation of salt are not usually taken due to economic reasons. The release of salt dust causes irreparable damage to the environment. If an ash production plant is built next to seawater treatment plants (desalination plants), the salt mines can be replaced with the salt water derived from these plants. By preventing salt water from entering the sea from these factories, an effective step can be taken to protect the environment [119,144].

7.6.4. Added value of by-products and economy

In soda ash production using classic and modified Solvay processes, saline water is obtained from rock salt dissolution or desalination plant effluent. This water needs purification to remove impurities like calcium and magnesium ions, resulting in sodium chloride particles that can be used as agricultural fertilizers without harming plant growth. This not only reduces effluent pollution but also provides an opportunity to generate revenue by marketing the waste as a fertilizer.

The dual-modified Solvay process reduces pollution but has higher production costs compared to other methods because it eliminates limestone calcination and ammonia recovery. However, if there is a market demand for ammonium chloride as a by-product, the cost of ammonia supply decreases as soda ash production constantly requires ammonia. In Japan, there has been a demand for ammonium chloride as a by-product for rice cultivation [98]. Moreover, ammonium chloride is considered part of the plant effluent, which is undesirable from an environmental and economic perspective. Therefore, the use of the dual process for soda ash production has become obsolete in Japan, and the country imports soda ash from the US, which is available at a lower price and with fewer environmental concerns [145].

7.6.5. Effluent treatment

As mentioned in the previous sections, the effluent from the Solvay process is discharged into the sedimentation ponds (lagoons) where the liquid and solid phases are separated by the deposition of solid particles, and the liquid part is discharged into rivers and lakes, resulting in irreparable damage to the environment in the long term. Due to the presence of chemicals such as calcium hydroxide, the pH of this effluent is high and completely alkaline. By injecting CO_2 from the exhaust gases of other factories into the effluent according to Equation (7), Ca $(OH)_2$ in the effluent can be carbonized by CO_2 and converted into calcium carbonate precipitate. The removal of calcium hydroxide from the wastewater lowers its pH, diminishing its environmental impact. If further purification is possible, the wastewater residue, which mainly contains calcium chloride, can be used as a solution or solid in various industries.

$$Ca(OH)_{2(S)} + H_2O + CO_2 \rightarrow CaCO_{3(S)} + 2H_2O \quad (7)$$

8. New methods

8.1. Layered double hydroxide (LDH)

Layered double hydroxides (hydrotalcite) can be used to treat water and remove contaminants such as iodine [146], silicate [147], chloride [148], heavy metals [149] and other materials [150]. Clay materials that have layers of metal hydroxides and interlayer anions are used for this purpose [108]. When LDHs are dissolved in a solvent, they can easily replace the ions between their bilayers with other ions in the solvent, which can make hydrotalcite the best anion adsorbent [119].

Hydrotalcites can be used to produce soda ash. The raw materials used in this method are sodium chloride solution and CO_2 gas. By using cyclic materials including hydrotalcite and cyclic CO_2, it is possible to produce sodium carbonate and hydrochloric acid as the main product and by-product, respectively. According to Equations (8)–(1), MgAl(OH)2Cl is solidly precipitated by mixing hydrotalcite with saline solution to form caustic soda.

$$Mg_{0.8}AL_{0.2}0_{1.1} + 0.2NaCL + 1.1H_2O \rightarrow Mg_{0.8}AL_{0.2}(OH)_2CL_{0.2} + 0.2NaOH \quad (8\text{-}1)$$

$$0.2NaOH_{(aq)} + 0.2\ CO_2 \rightarrow 0.2NaHCO_{3(aq)} \quad (8\text{-}2)$$

$$0.2NaHC\ O_3 \rightarrow 0.1Na_2CO_3 + [0.1\ CO_2 + 0.1H_2O]\uparrow \quad (8\text{-}3)$$

$$Mg_{0.8}AL_{0.2}(OH)_2CL_{0.2} \rightarrow Mg_{0.8}AL_{0.2}0_{1.1} + 0.2HCl + 0.9H_2O \quad (8\text{-}4)$$

$$0.2NaCl + 0.2\ CO_2 \rightarrow 0.1Na_2CO_3 + 0.2HCl \quad (8)$$

Sodium hydroxide is then fed into special reactors. Injecting stored CO_2 from the exhaust gases of other factories results in sodium bicarbonate precipitation (Equations (8)–(2)). Due to the calcination of sodium bicarbonate during the production of sodium carbonate, the released CO_2 gas is fed back into the production cycle (Equations (8)–(3)). The precipitated MgAl $(OH)_2Cl$ is also calcined at a temperature above 450 °C to produce MgAlO and HCl (Equations (8)–(4)). MgAlO then returns to the production cycle as a cyclic hydrotalcite, and HCl is marketed as a by-product. Among the uses of HCl include its ability to produce chlorine gas (Cl_2) via electrolysis [151], which is then used to disinfect and purify water. Moreover, HCl is utilized in the manufacturing of plastics [152], metals [153–155], the oil and gas industry [156], and construction industries [157].

The summary of Equations 1-8 to 8-4 is shown in Equation (8), illustrating the production of Na_2CO_3 and HCl using NaCl and CO_2 as the raw materials. Apart from being used as a new method for the production of soda ash, hydrotalcite can also be used in the classic Solvay process to treat effluent and reduce its environmental impact.

8.2. Replacing ammonia gas with alcohol amines

As mentioned in the previous sections, in contrast to the classic Solvay process, the use of limestone and its calcination to provide CO_2 can be dispensed with in modified Solvay processes. In addition, salt water with CO_2 and NH_3 gases as well as H_2O are used as the main raw materials. Another new process for the production of soda ash is introduced by replacing alcohol amines with volatile ammonia [119].

8.3. Microbial-assisted method

Fahmi et al. [37] presented a novel enzymatically modified (microbial-assisted) Solvay method. In this method, urea ($(NH_2)_2CO$) was exposed to the biocatalyzed urease enzyme from *Sporosarcina pasteurii* (formerly known as *Bacillus pasturii*). After the hydrolysis of urea, the outgassing of CO_2 led to the production of sodium bicarbonate ($NaHCO_3$). In addition to the removal of harmful materials (raw materials and residues) before and after the process, this method highlights the potential to convert CO_2 from the environment or released gases of various industries into $NaHCO_3$, which is a highly applicable material for pharmaceuticals, food, and other industries. This article can inspire the use of urea in human and animal urine to produce sodium bicarbonate and sodium carbonate. If urea is derived from factory-produced resources, purification may not be necessary. However, when derived from animal or human sources, purification becomes crucial. Further research on this topic is essential due to its potential implications.

8.4. Benefits

Due to the use of hydrotalcite, CO_2 is practically used cyclically in the production of soda ash. It is not released into the environment. Also, its cyclical nature obviates the need for storing carbon dioxide obtained from other factories. Additionally, since CO_2 is derived from other factories, the production of hydrochloric acid as a product of this process justifies this method from environmental and economic aspects. Finally, replacing ammonia with alcohol amines is economical and more efficient than NH_3 in the soda ash production process.

9. Suggested ideas

9.1. Clean production by supplying CO_2 from nearby factories

According to Fig. 6, the Kaveh Soda plant, Azarshahr Lime, Soufian Cement plants, and Urmia Lake are located in a region with abundant salt and limestone sources. The Kaveh Soda plant produces soda ash using the classic Solvay process, while Azarshahr Lime and Soufian cement plants release CO_2 into the atmosphere for Portland cement and lime production. By capturing CO_2 from the exhaust gases of these two plants and transferring it to the Kaveh Soda plant, the limestone calcination stage is eliminated and the entry of pollutant solid particles into the plant effluent is eliminated. The modified Solvay process can also be used with the ammonia cycle, allowing lime for ammonia recovery from fly ash from various factories. The dual-modified Solvay process allows for sustainable and cleaner soda ash production, with part of the required ammonia gas supplied from municipal wastewater treatment plants. Ammonia production from municipal waste has been investigated in several studies [158–160].

In addition to the solutions presented for the production of clean soda ash at the Kaveh Soda plant, the extraction of rock salt from the bed of Lake Urmia (a huge source of salt) requires some measures to prevent the formation of salt dust and its emission in the villages and cities around Lake Urmia and achieve clean production of soda ash with minimal environmental hazards.

There are currently existing pipeline networks for CO_2 transport, but they are limited in extent and capacity compared to what might be needed for widespread deployment of carbon capture and storage. Despite limitations, existing pipelines could be integrated into future carbon capture and storage projects. Existing pipelines could be expanded or upgraded to increase their capacity for CO_2 transport. For large-scale carbon capture and storage adoption, significant new CO_2 pipeline infrastructure will likely be required. Government incentives and policies can play a significant role in encouraging investment in new CO_2 pipeline infrastructure. Collaboration between governments, industries, and research institutions will be necessary for developing and deploying efficient carbon capture and storage solutions, including pipeline networks [161,162].

9.2. A combination of electrolysis processes of saline water and dual-modified solvay

The dual process for soda ash production involves calcinating $NaHCO_3$, which releases CO_2 gas and H_2O, which are then fed back into the production cycle. After calcination, the 2 M ratios of $NaHCO_3$ are converted into 1 M ratio of Na_2CO_3. According to Equations 6-1 to 6-4, in the production cycle, 1 M ratio of CO_2 is used as a consumable, and another molar ratio is used as a cyclic material for soda ash production. The Solvay process produces a sodium bicarbonate solution (Equation (9)), which can be converted to solid sodium carbonate after crystallization. This process increases production efficiency by yielding 2 M ratios of sodium carbonate after reaction with sodium hydroxide, replacing cyclic CO_2 with consumable CO_2, and doubling CO_2. However, eliminating the sodium bicarbonate calcination step is economical.

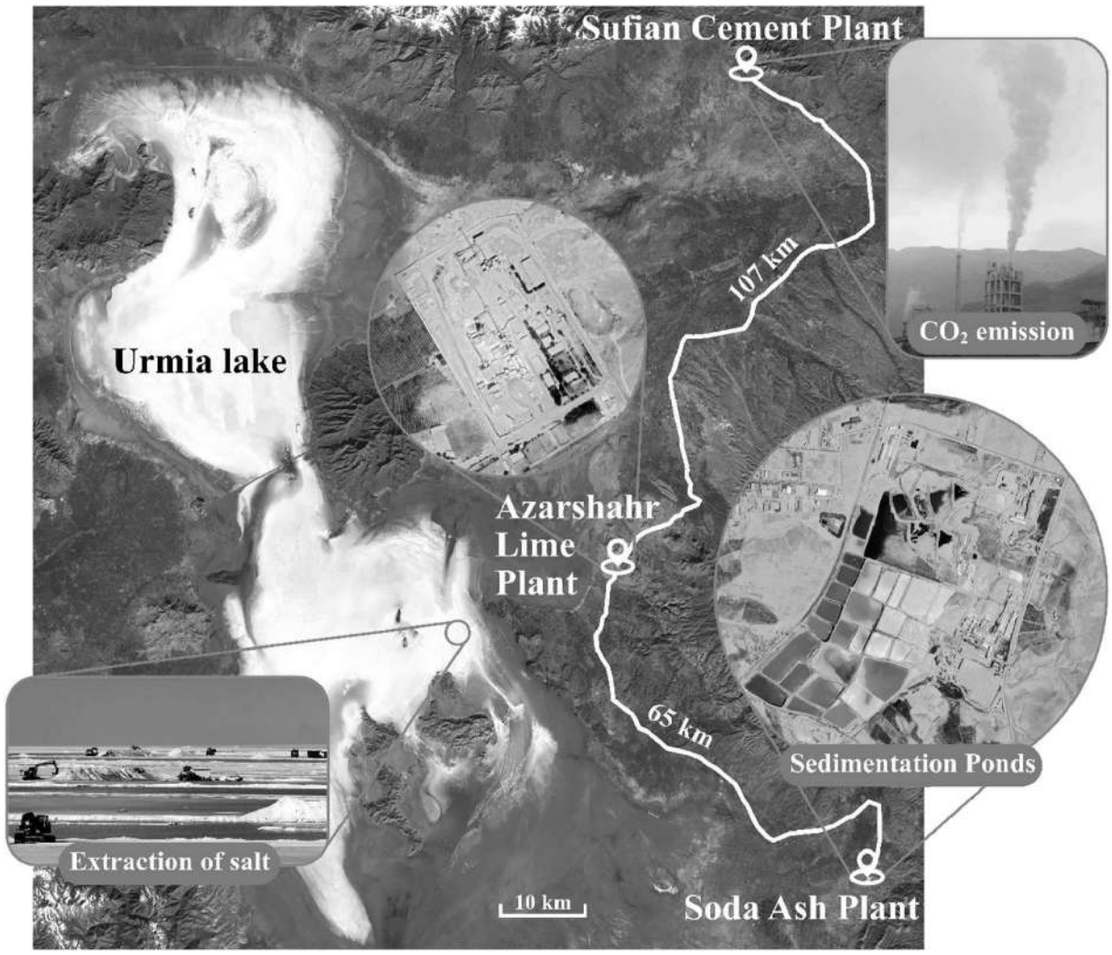


Fig. 6. Location of Kaveh Soda (producer of soda ash), Azarshahr Lime, Soufian Cement *plants*, and Urmia Lake (a huge source of salt) (aerial map taken from sentinel-hub.com, January 9, 2024).

$$2NaHCO_{3(aq)} + 2NaOH_{(aq)} \rightarrow 2Na_2CO_{3(aq)} + 2H_2O \quad (9)$$

At first, it seems unreasonable to use sodium hydroxide as a widely used chemical to increase the production efficiency of sodium carbonate. However, once the salt water electrolysis process and the Solvay process are combined, it seems logical and feasible. In the electrolysis process, chlorine gas and hydrogen gas can be produced in addition to caustic soda (Equation (10)–(1)). By combining the saltwater electrolysis process (Equation (10)–(1)) with the dual modified Solvay (Equation (10)–(2)), since sodium chloride is used as the initial material in both processes, the chemical reaction between sodium bicarbonate of the dual Solvay process takes place with sodium hydroxide of the electrolysis process, according to Equation (10)–(3), and sodium carbonate, hydrogen gas, chlorine gas and ammonium chloride solution are produced with higher efficiency (2 M ratios). A summary of Equations 10-1 to 10-3 is provided in Equation (10). The production of hydrogen gas and chlorine gas as two high-demand chemicals may justify the use of this process.

$$2NaCl + 2H_2O \pm 2e^- \rightarrow 2NaOH + H_{2(g)} + Cl_{2(g)} \quad (10\text{-}1)$$

$$2NaCl + 2NH_3 + 2CO_2 + 2H_2O \rightarrow 2NH_4Cl + 2NaHCO_3 \quad (10\text{-}2)$$

$$2NaHCO_{3(aq)} + 2NaOH_{(aq)} \rightarrow 2Na_2CO_{3(aq)} + 2H_2O \quad (10\text{-}3)$$

$$4NaCl + 2NH_3 + 2CO_2 + 4H_2O \pm 2e^- \rightarrow 2NH_4Cl_{(aq)} + 2Na_2CO_{3(aq)} + H_{2(g)} + Cl_{2(g)} + 2H_2O \quad (10)$$

In coastal areas, such as the southern parts of Iran and some other countries, saline water (salt), the waste water from desalination plants as a source of salt, industrial greenhouse gases as a source of CO_2, and municipal and industrial wastewater (MIW) as a source of ammonia are used According to Fig. 7-A, using CO_2 gas stored from industries and MIW into the system (a combination of the dual modified Solvay process and electrolysis) enables the production of fresh water, chlorine gas, hydrogen gas, sodium carbonate, and ammonium chloride. The environmental and economic benefits of this approach are.

- Enabling carbon sequestration by eliminating the emission of CO_2 into the atmosphere to prevent global warming
- Using stored ammonia gas in municipal wastewater treatment plants and preventing its emission into the atmosphere
- Preventing environmental damage caused by the salt water from desalination plants entering the sea and helping to develop more plants for the production of fresh water (as a material in high demand)
- Sustainable production of sodium carbonate, ammonium chloride, and chlorine and hydrogen gases with high added value

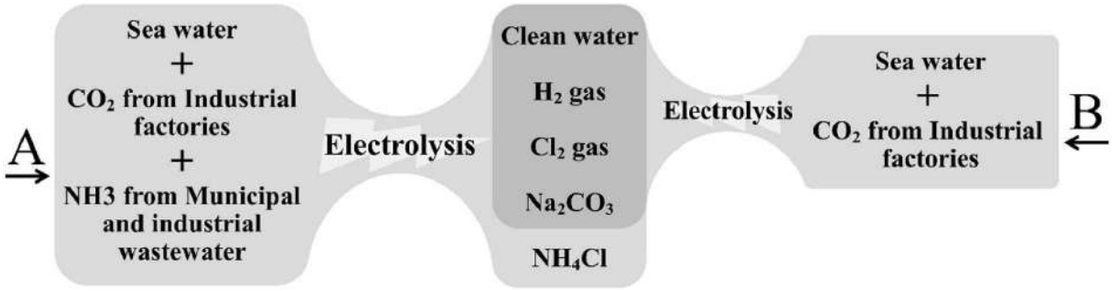


Fig. 7. The use of salt water electrolysis processes in sodium carbonate production.

9.3. The use of salt water electrolysis process along with sodium hydroxide carbonation

As mentioned in the previous sections, the electrolysis of salt water can produce not only caustic soda but also chlorine and hydrogen gases (Equations (10)–(1)). The produced sodium hydroxide is divided into two parts. By blowing the CO_2 derived from the plant exhaust gases to half of the sodium hydroxide solution, sodium bicarbonate is produced (Equation (10)–(2)). From the reaction of sodium bicarbonate with the remaining sodium hydroxide, sodium carbonate is produced (Equation (10)–(3)). According to the summary represented in Equation (10), in this method, the raw material contains only salt water (sodium chloride solution), and the output product includes sodium carbonate, chlorine, and hydrogen gases. If the saline water is obtained from the effluent of desalination plants, as shown in Fig. 7-B, by using seawater and stored CO_2 gas from the exhaust gases of the plants with the electrolysis process, it is possible to produce fresh water, chlorine, and hydrogen gases and sodium carbonate.

10. Conclusion and outlook

Considering the ecological and financial drawbacks of the Solvay process, including the high cost of lime calcination, $CaCl_2$ production, and effluent, scientists proposed the modified methods: Dual Solvay in which ammonia is consumed, and dual modified Solvay that uses ammonia in the circuit. As quicklime was not used for either process, soda ash manufacturing costs were decreased by 30 %. Moreover, both processes reduced air pollution by storing CO_2 derived from other factories to supply the amount of CO_2 required for the reaction. In addition, the use of CaO-containing wastes from other industries, such as fly ash and slag, minimizes the amount of waste from steel mills and other industries entering the environment while maintaining the cycle's capability of feeding the reaction with the necessary Ca. The sole drawback of this procedure is that $CaCl_2$ waste is generated, which is identical to the Solvay process. The manufacture of $CaCl_2$ using the Solvay process has been fully abolished in the dual Solvay process with a one-step upgrade; in the dual process, Ca was not required, but ammonia was utilized as a raw material that could not be recycled or reused. The Solvay process and its modified methods represent a new and sustainable approach that uses LDHs as a breakthrough. LDHs are highly soluble in water and can exchange ions in the interlayer with ease. As a result, Na_2CO_3 and HCl can be produced as the main product and byproduct, respectively. Moreover, the microbial-assisted method and the replacement of alcohol amines with ammonia gas can be employed to minimize CO_2.

CRediT authorship contribution statement

Hamed Rahimpour: Writing – original draft, Visualization, Validation, Software, Resources, Methodology, Investigation, Data curation, Conceptualization. **Ahmad Fahmi:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Sahar Zinatloo-Ajabshir:** Writing – review & editing, Visualization, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal

relationships that could have appeared to influence the work reported in this paper.

considered as potential competing interests.

Data availability

No data was used for the research described in the article.

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No.J-11013/41/2006-IA-II(I)(Part)
Government of India
Ministry of Environment, Forests and Climate Change
Impact Assessment Division
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Indira Paryavaran Bhawan,
Jor Bagh Raod, Aliganj
New Delhi-110 003

Dated the 7th November, 2014

OFFICE MEMORANDUM

Subject: Issues on Appraisal- clarification regarding.

The Ministry of Environment, Forests and Climate Change, vide Office Memoranda of even No. dated 22.03.2010, 22.08.2014 and 08.10.2014 prescribed a time limit for validity of Terms of Reference (TORs) for a period of three years for submission of EIA and EMP reports after public consultation and also that this period would be extendable to fourth year, based on proper justification and recommendation of the EAC/SEAC, as the case may be. Thus an outer limit of four years for the validity of TORs has been prescribed for any developmental project, except River Valley and HEP Projects, where the outer limit validity of TOR is five years. The aforesaid Office Memoranda also clarified that the date of public hearing and the primary data used in preparation of EIA / EMP report submitted after public consultation should not be more than three years old and in case these conditions are not met, the proponent will have to start the process *de novo* after obtaining fresh TORs.

2. The matter has been further examined in the Ministry in the light of decision taken as part of clearance reform and it is felt that it would not be logical to start the process of environment clearance *de novo* including taking fresh Terms of Reference(TORs), if the base line data collected for preparation of EIA / EMP report and/or public consultation are more than three years old.

3. Thus it has been decided to substitute para 2(v) of the above referred Office Memorandum No. J-11013/41/2006-IA.II(I) (part) dated 22.08.2014 with the following:

"(v)

(a) All the projects which have been recommended by the Expert Appraisal Committee(EAC) shall be considered by the Competent Authority even if the data collected has become more than three years old as the ToRs itself used to have three years validity and extendable by one more year.

...2/-

(b) All the projects where the project proponent have already submitted their EIA/EMP Report for consideration by the EAC though the cases have still not been placed before the EAC and meanwhile the data had become more than three years old, shall be considered for the same reason as given in the para (a) above.

(c) In case of project proponent seeking Environment Clearance for expansion of the existing unit but had committed certain violation and the project proponent has submitted all the information and details but the State has not filed case under Section 15/19 of Environment (Protection) Act, 1986, such cases shall also be considered by the Authority, as the project proponent is not at fault."

4. The earlier Office Memorandum dated 22.08.2014 may be treated as amended to this an extent. The other stipulations stated in the Office Memorandum dated 22.08.2014 will continue to apply.

3. This issues with the approval of the Competent Authority.

07.11.2014

(Dr. Satish C. Garkoti)
Scientist 'F'

Copy to:

1. All the officers of IA Division
2. Chairperson/ Member Secretaries of all the SEIAAs/SEACs
3. Chairman of all the Expert Appraisal Committees
4. Chairman, CPCB
5. Chairpersons/ Member Secretaries of all SPCBs/ UTPCCs

Copy for information:

1. PS to MOS(Independent Charge)
2. PPS to Secretary(EF&CC)
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4. PS to JS(MKS)
5. Website, MoEF&CC
6. Guard File

F. No. IA3-22/10/2022-IA.III [E 177258]
Government of India
Ministry of Environment, Forest and Climate Change
(IA Division)

Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi - 110003

Dated: 8th June, 2022

OFFICE MEMORANDUM

Subject: Standardizing the validity of baseline data and public consultation reports for submission of proposal within the validity period of Terms of Reference (ToR) under the provisions of EIA Notification, 2006 - regarding.

As per the provisions of EIA Notification, 2006, Terms of References (ToR) are being accorded to the various developmental projects listed in the schedule to the EIA Notification, 2006 except schedule 8(a) for undertaking EIA/EMP study. In this regard, Ministry issued Office Memorandum No. J-11013/41/2006-IA-II (I) (Part) dated 29th August 2017 stating that the validity period of ToR as three years for all the projects/activities and four years for River Valley and HEP Projects. This validity period could be further extended by a maximum period of one year, thereby making the outer limit for validity of ToR as four years for all projects/activities and five years for River Valley and HEP projects.

2. Further, in the above-mentioned O.M, it is also stated that the baseline data used for preparation of EIA/EMP reports may be collected at any stage, irrespective of the request for ToR or the issue thereof. However, such baseline data and the public consultation should not be older than three years, at the time of submission of the proposal, for grant of Environmental Clearance (EC), as per ToRs prescribed.

3. Thereafter, MoEF&CC also issued a gazette notification vide S.O.751 (E) dated 17/02/2020 stating that the Terms of Reference for the projects or activities except for River valley and Hydro-electric projects, issued by the concerned regulatory authority, shall have the validity of four years from the date of issue. In case of the River valley and Hydro-electric projects, the validity of ToR will be for five years.

4. Instances have been brought to the notice of this Ministry wherein the application for Environment Clearance are being submitted by the project proponent well within the validity period of the ToR but the baseline data is older than three years. In such situation, project proponent is required to start the entire process of baseline data collection *de novo*. Many a times, it is also observed that the delay in submission of EC proposal happens due to delay in rescheduling and conduct of public hearing for reasons beyond the control of project proponent.

5. In many such cases where proposals are submitted with baseline data older than three years, the EAC prescribes for revalidation of data with fresh baseline data of 15 days/1 month/ 1 season on a case to case basis.

6. The aforesaid matter has been examined in the Ministry. In order to address this issue in a practical manner and to bring uniformity in handling such proposals, the following standard procedures shall be followed with immediate effect:

i. Baseline data used for preparation of EIA/EMP reports may be collected at any stage of the EC process or even before the grant of ToR.
ii. Public consultation shall be conducted after the grant of ToR. The Public consultation conducted after the expiry of ToR shall not be accepted by the Regulatory Authority.
iii. The baseline data and Public Hearing shall not be more than three years old at the time of submission of application for consideration of EC.
iv. At the time of application for EC, in case baseline data is older than three years, but less than five years old in the case of River valley and HEP Projects, or less than four years old in the case of other projects, the same shall be considered, subject to the condition that it is revalidated with one season fresh non-monsoon data collected after three years of the initial baseline data.
v. In case the proposal for EC along with EIA/EMP reports based on the ToRs prescribed is not submitted within the validity period of ToRs, and/or not complying with the above-mentioned criteria, the concerned Member Secretary shall not accept the proposal and process shall be initiated *de novo* by the PP.

7. This O.M. is issued in supersession of OM no. J-11013/41/2006-IA-II (I) (Part) dated 29th August 2017 and with the approval of the Competent Authority.

3/5/22

(Sundar Ramanathan)
Scientist E

To

1. Chairman, Central Pollution Control Board (CPCB).
2. Chairman of all the Expert Appraisal Committees
3. Chairperson/Member Secretaries of all the SEIAAs/SEACs
4. Chairpersons/Member Secretaries of all SPCBs/UTPCCs
5. All the Officers of I.A. Division

Copy for information to:

1. PS to Hon'ble Minister for Environment, Forest and Climate Change
2. PS to Hon'ble MoS (EF&CC)
3. PPS to Secretary (EF&CC)
4. PPS to DGF&SS (EF&CC)
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Gmail ENVIRO LEGAL DEFENCE FIRM <eldflegal@gmail.com>

Service in Go Green Foundation Trust Vs. Union of India & Ors. [Appeal No. 26 of 2025/WZ]

1 message

ELDF <eldflegal@gmail.com> Tue, Nov 4, 2025 at 6:24 PM
To: nitinlonkar@gmail.com, GUJARAT POLLUTION CONTROL BOARD <Ms-gpcb@gujarat.gov.in>, STATE OF GUJARAT <Chiefsecretary@gujarat.gov.in>, Pushkal Mishra <pushkalm6@gmail.com>, Neelkanth Mehta <mehtaneelkanth@gmail.com>
Cc: Mansi Bachani <mansi@eldfindia.com>, Gitanjali Sanyal <gitanjali@eldfindia.com>, Satvika Krishnan <satvika@eldfindia.com>

Dear Sir/Ma'am

Please find attached copy of the **Reply Affidavit** on behalf of Respondent No. 13, Greenfield Chemical Complex, GHCL Ltd., in the abovementioned case.

Thanks & Regards
--
Sameer Manher
Clerk
Enviro Legal Defence Firm
29, Presidential Estate LGF,
Nizamuddin East New Delhi – 110013
Ph. No. 011-40573181

Reply.pdf