

JOINT COMMITTEE INSPECTION REPORT

In the Matter of

Original Application No.18/2023

Dr Subhash C Pandey vs Bhopal Municipal
Corporation & Ors

w.r.to

Hon`ble National Green Tribunal Central Bench Bhopal
order dated 02 March, 2023

ACTION TAKEN REPORT

Ref: Action taken report in compliance to the orders of Hon'ble NGT order dated 02.03.2023 in the matter of OA 18/2023 (CZ) of Dr Subhash C Pandey vs Bhopal Municipal Corporation & Ors.

Hon'ble NGT issue following instructions on dated 02.03.2023 in the matter of OA 18/2023 (CZ) Dr Subhash C Pandey vs Bhopal Municipal Corporation & Ors.

1. *“Grievance of the applicant is non-compliance of Environmental Rules and violation of Solid Waste Management Rules, 2016 by the Bhopal Municipal Corporation/respondents by permitting the MSW dump at Adampur Chawani situated at outskirts of Bhopal city, which was burnt on 24.02.2023 and continue to be burnt since then without taking any necessary remedial measures in accordance with the rules and/or Guidelines issued by the CPCB. The fire extended to more than 2 acres of the legacy waste spread over the site since, last 5 years. It is further argued by the applicant that approximately 7 lakhs tonnes of legacy waste was thrown there and the impact of fire was so hazardous that its impact on the air pollution spread more than 14 kilometers distance from the place. There is no firefighting equipments, no high drains, functioning of bore well at the dump site and this dump site has been operated by Bhopal Municipal Corporation through PPP model and unauthorized MSW site is being operated without CTO/CTE and in violation of EC granted.*
6. *It will be just and proper to call a report from the Joint Committee consisting of :*
 - i. *One representative from Central Pollution Control Board*
 - ii. *One representative from Madhya Pradesh Pollution Control Board*
 - iii. *One Expert from Indore Municipal Corporation looking after waste disposal*
 - iv. *One Expert Professor from MANIT, Bhopal nominated by its Director*
 - v. *Addl. Director, Central Government Health Services, Bhopal*

In compliance of the orders received, following officers are nominated by the concerned departments of Central Pollution Control Board, MPPCB, Municipal Corporation, Bhopal, MANIT, Bhopal, Central Government Health Services, Bhopal, the details are as under:-

1. Dr. Ram Shankar Rawat, Additional Director, Central Government Health Services, Bhopal
2. Shri. Anoop Goyal, Executive Engineer, Indore Municipal Corporation
3. Dr. Krishna Kumar Dhote, Professor, Architecture and Planning, MANIT
4. Dr. Poulami C. Patil, Scientist, Central Pollution Control Board
5. Shri. Brajesh Sharma, Regional Officer, R.O. M.P.P.C.B, Bhopal.

Along with the joint committee Shri Saurabh Maheshwari, Assistant Engineer, Indore Municipal Corporation, Dr Mohammad Asif, Medical Officer, C.G.H.S, Bhopal, Shri Jainendra Chandel, Chemist, R.O., M.P.P.C.B, Bhopal were present during the inspection. A site visit was conducted on dated 10.04.2023 at Adampur Chawani, Bhopal. The Geographical location and photographs of the site are attached as **Annexure-1**. The following are the observations made by the committee:

Description of the Site:-

1. The Municipal Solid Waste Disposal Site is located at Village-Koluakhurd, Bhopal at Latitude and Longitude viz 23.2662N & 77.56111E. It is 15 km away from Bhopal on Bhopal-Raisen Road.
2. Adampur Chawani, Haripur, Arjun Nagar, Koluakhurda, Padariya Kachhi and Bilkhiriya are the villages situated nearby among which the nearest villages Koluakhurda and Padariya Kachhi are situated at a distance of Approx. 650 meters and 750 meters respectively from this site.
3. Ajnal River and Ajnal Dam are located at a distance of about 2.20 km in downstream of MSW site.

4. Rahwasi Village and Raisen Road SH 146, situated at a distance of about 1.26 kms. The google map showing the about places is as per **Annexure-1**.

Status of Environmental Clearance:-

5. A 21 MW power plant with integrated MSW facility was proposed at this site by Municipal Corporation Bhopal. Whose public hearing was completed on 04.07.2018. Thereafter, the environmental clearance of this project was received in the name of M/s Bhopal Municipal Solid Waste Private Limited on 11.01.2019, whose copy is as per **Annexure-2**.
6. Environmental clearance was obtained by M/s Bhopal Municipal Solid Waste Private Limited for 21 MW capacity Municipal Solid Waste based power plant. As per point no 16 of environmental clearance issued by MoEF a secured landfill at an area of 22.63 hact is mentioned in this point. This 21 MW capacity Municipal Solid Waste based power plant was not established.
7. Presently M/s Green Resource Solid Waste Management Pvt. Ltd. Bhopal applied for public hearing for obtaining Environmental clearance under EIA Notification 2006 for the establishment of integrated solid waste management facility consisting of processing plant of 850 TPD capacity and secure land fill site of 380000 cubic meter capacity.
8. The Public hearing of the case was held on dated 09/01/2023 and the proceedings of the public hearing are sent to MPSEIAA. The matter is under process. Copy is as per **Annexure-3**.
9. Establishment/production consent has not been obtained from the board for carrying out this activity which is in violation of environmental regulations.

The status of municipal solids waste facility:-

10. The MSW at Adampur site is currently being managed by M/s Green Resource Solid Waste Management Pvt Ltd. without any valid EC/ CTE/ CTO/ Authorization.

11. Processing units of dry and wet urban waste have been established at Adampur Chawani. Plastic and recyclable materials are separated from the dry waste by rag pickers at the initial stage. After that, RDF is separated by Mechanical Traummel screening machines depending upon size of waste.
12. Currently there are 14 Mechanical Traummel screening machines working at the site where each machine is having the capacity of 20 TPH. The working hours are 8-9 hours daily.
13. Approx 150-200 tons/day RDF is sent for co-processing in waste to energy plant, Jabalpur and A.C.C Cement, Katni.
14. An organic compost plant of 200 tonnes per day capacity has also been set up at the MSW site for processing of wet waste, in which the wet waste is mixed with compost decomposer for 30 days and kept in the wind-row for decomposing. After that the compost is packed in bags and sold directly to farmers or to various institutes through Government Agency.
15. A dump of about 1.5 lakh cubic meters of old legacy waste was found at the MSW site during inspection, which was brought from Bhanpur Khanti. According to the information provided by the representative of M/s Green Resource Solid Waste Management Pvt Ltd., bio-remediation of the old legacy waste dump is in progress. About 600-700 tonnes/day of waste is processed and the segregated RDF is provided to cement plants for co-processing.
16. A scientific sanitary landfill with a capacity of 380000 cubic meter with High density polyethylene (HDPE) geo-membrane 1.5 mm site has been developed at the MSW site for disposal of inert waste material remaining after processing of solid dry waste and wet waste. ETP plant of 50 KLD capacity has been set up for the treatment of leachate generated from the landfill site. Copy of executive summery is enclosed as **Annexure - 4**
17. During inspection, it was found that the solid waste at the MSW site has been stored up to a height of about 20-25 feet on the raw land. Accumulation of leachate/seepage was observed in the drains located in the premises. The above leachate/seepage is collected in the rain pit of the stored solid waste. The sample of leachate has been collected for

analysis and the results will be submitted as soon as received from the laboratory division.

18. Garland drains/leachate collection drains developed around the waste collection site were found broken at many places due to movement of heavy machinery and lack of proper repairs. Leachate collection pit, in which the leachate is collected, was also found damaged. Leachate/seepage flow was also observed in some pits outside the premises near MSW site.
19. Analysis of the ground water at village Padariya, at plantation site adampur chhawani, village Kolua, Chhawani Pathar Naka are being done by MPPCB. The analysis data is attached at **Annexure-5**
20. As per the analysis results of village Padariya & Chhawani Pathar Naka tubewells water samples, the values of Iron are found above prescribed limit.
21. Large amount of sheet spread was observed inside the MSW site and also outside the boundary wall to some extent. Therefore, it is necessary to install a wired-mesh/chain link mesh screen of sufficient height above the boundary wall to prevent polythene bags from spreading around in summer and in case of strong wind.

The status of fire in the municipal solids waste dump:-

22. During the inspection of the dump site joint committee observed no active fire and smoke from the MSW dump at Adampur Chawani dump site, But ash generated from the fire incident was found at several places.
23. The dump site management informed the committee that the fire was occurred on dated 24/02/2023 and on 01/04/2023 on some portions of segregated dry waste stored in the dump site premises, which was control by the deployment of fire brigades.
24. There is no active Emergency Response Plan found with the operator for fire, which is clear violation of Guidelines issued by CPCB.
25. The ambient air quality sample monitoring was conducted by RO, MPPCB, Bhopal at two stations adjacent to the MSW site during fire incident reported on 24/02/2023 and on 01/04/2023. As per analysis

report of the samples collected, the results of PM₁₀ are found 271.7 µg/m³& 366.0 µg/m³ and 383.9 µg/m³& 288.9 µg/m³.The results are found more than the prescribed standards of PM₁₀of 100 µg/m³.The analysis data is attached at **Annexure-6**.

Plantation:-

- 26. About 5000 trees have been planted by the Municipal Corporation in the north direction adjacent to the MSW site.
- 27. Plantation on south side and west side is not done.

Environmental Compensation for the legacy waste:-

As per the observation and information provided by the MSW dump site management there is a stock of 1.50 lacs tons of legacy waste accumulated at the site. In this regard the environmental compensation is calculated as per the order of Hon’ble NGT (PB) in OA No. 606/2018 dated 14.12.2020. Details are under:-

- As per point no. 4 of the order for the cities having population more than 10 lakhs may be levied a compensation of Rs. 10 lacs per month basis.
- The calculation is as under:-

Particulars	Number of months	Rate of Compensation	Compensation (in Rs.)	Remarks
Months of violation	15 months	Rs. 10 lacs per month	1.50 Cr.	The violation months are calculated from MPPCB Inspection dated 15.12.2021 upto 10.04.2023

Recommendations:-

1. The integrated municipal solid waste management facility working at village Adampur Chawani should obtain environmental clearance under EIA notification 2006 and consents (CTE/CTO) under Water (Prevention and Control of Pollution) Act 1974 and Air (Prevention and Control of Pollution) Act 1981.
2. To prevent the surface runoff generated due to rains, garland drains should be provided around the dump site and maintained regularly.
3. Pacca (RCC) platform should be provided for the storage of municipal solid waste to prevent seepage of liquid in the ground.
4. For the prevention of accidental fire, municipal solid waste should be stocked in small heaps of area 20x30 feet each and each heap should be separated by a gap of at least 1.5 meters.
5. The site should be equipped with fire hydrates at suitable places to prevent any fire misshape along with proper protective gears for the workers.
6. The site should install a wired-mesh/chain link mesh screen of sufficient height above the boundary wall to prevent polythene bags from spreading around in summer and in case of strong wind.
7. The site should be cover with a boundary wall around the site with wire mesh railing of at least 20 feet high.
8. The legacy waste stored at the site should be processed and disposed of on priority.
9. Green belt should be provided all around the premises.
10. All the important records of waste management must be kept in the Campus. Designated official be made responsible to sit in the office for supervising the work and the maintenance of records.
11. The Routine Health Check up (annually/half yearly) for the workers as well as well as the near by Residents to prevent the workers from Occupational Health Hazards and the Residents from (a). Dermatitis, (b). Respiratory Diseases right from Allergic Bronchitis to Malignancy, (c) Gastro enteritis, (d) Eye Diseases etc.
12. Proper SOP to be put at the site of the working of Installed Machine.

13. Annual Maintenance Contract to be initiated and required to be done routinely to overcome the accidents and proper prevention of Occupation Health Hazards.
14. The workers to be kept for short term because those exposed to the machine and other work for longer period will develop the Health Problems.
15. A supply of safe drinking water be made to the nearby residents.
16. Insurance for the workers must be initiated.

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**Joint Committee Inspection at Adampur Chawani Bhopal for NGT OA
18/2023 (CZ) Dr Subhash C Pandey vs Nagar Nigam &Ors.**



**Committee members at Adampur Chawani
alongwith Plant management**



Mechanical Traummel screening machines



Material Recovery Facility



Bio composting plant



Bio composting plant



Secured landfill site



Effluent Treatment Plant for leachate treatment



Plantation on North Side



Fig 1 : Google Map showing distances of Adampur Chhawni MSW Site from Ajnaal River, nearby villages and Raisen road





No. J-13012/16/2017-IA.II (T)
Government of India
Ministry of Environment, Forest and Climate Change

3rd Floor, Vayu Block,
 Indira Paryavaran Bhawan, Jor Bagh Road,
 Aliganj, New Delhi-110003

Dated: 11.01.2019

To

The Authorised Signatory
The M/s Bhopal Municipal Solid Waste Pvt. Ltd.
 513/A, 5th Floor, Kohinoor City,
 Kirol Road, Kurla (W), Mumbai- 400070.

Sub: Proposed 21 MW Municipal Solid Waste based Power Plant at Villages Kolua Khurd, Adampur Chhavani, Phanda Block, Huzur Tehsil, Bhopal District by M/s Bhopal Municipal Solid Waste Private Limited. - reg. Environmental Clearance.

Sir,

The undersigned is directed to refer your online application no. **IA/TN/THE/60765/2016** dated 10.8.2018, Ministry's letter dated 22.10.2018 and documents submitted vide your letters dated 5.11.2018 & 23.10.2018 for grant of Environment Clearance.

2. It has been noted the Terms of Reference for the setting up of 23 MW Municipal Solid Waste based Power Plant in Huzur Tehsil, Bhopal District has been issued vide Ministry's letter dated 04.05.2018.

3. It has been proposed to install Integrated MSW management facility for treating 1400 TPD of unsegregated MSW (Treating by Landfill method) and the Power generation using MSW will be 21 MW. The municipal solid waste based power plant Project will be set up in 45 acres out which Plant area is 2.68 acres, Sanitary Landfill is 22.63 acres, green belt area is 14.84 acres and remaining area will be for administration block, internal roads, utility area, storage area, parking, etc. Proposed project site is revenue land. The lease deed has already been executed in the name of project proponent. No Rehabilitation and Resettlement is involved. RoW for transmission line shall be acquired.

4. It has been noted that the project is not located within 10 km radius of any National Parks, Sanctuary, Elephant /Tiger reserves, migratory routes/wildlife corridors and other protected areas. Only Reserve Forest Samardha area is available about 5 km from project site.

5. The mass incineration technology has been proposed for the generation of power plant. Collected waste shall be transferred to the closed body stationery compactor at the Mini Transfer stations by tip kart mechanism. MSW shall be either managed in existing Bhanpura dumpsite or a piece of land in the proposed Adampur landfill site can be used to store the waste temporally. All the vehicles engaged in this project are provided with OSRT (off site Real Monitoring System) and GPS facilities. The municipal

solid waste will be brought to the project site by Garbage trucks, Garbage Compactors, Garbage Tipper from various 8 ULBs within radius of 80 km from of Bhopal. There are total 220 vehicles transport the garbage from storage point to transfer station & from transfer station to landfill site. The nominal steam temperature at super heater outlet is 410°C and steam pressure at boiler outlet is 46 Bar (a). The forward acting reciprocating grate type boiler technology will be used in the proposed project.

6. It has been informed by you that the project is expected to commission by 2020. The Bhopal city is expected to produce about 1000 Tons per Day Municipal Solid waste in 2020. Further, the waste generation from Local bodies of Mandideep, Obaidullahganj, Berasia, Sehore, Ichhawar, Kothri and Ashtawould be around 100 TPD. Further, there is a legacy waste which will be collected now till the commissioning of the project and the said waste will be stored at one place. Accordingly, around 200 TPD of legacy waste will be fed to the power plant. The total of 1400 TPD MSW is expected to be the feed for power plant. The best case scenario of waste quantity and its power generation is provided as below:

Scenario	Waste Quantity (TPD)	Reduction of inert content (10%) (TPD)	Moisture reduction from 45% to 30% (15%) (TPD)	Total waste available for boiler feed (TPD)	Design Calorific value (kcal/Kg)	Total Power Generation per hour (kWh)	Conversion Efficiency (%)	Actual Power Generation (MW)
Best case Scenario	1400	140	210	1050	1660	84.44 MW	24%	21 MW

7. Two Boilers with capacity of 750 TPD and 300 TPD will be established which will generate 75 TPH and 30 TPH. The details are as below:

Boiler No.	Waste intake capacity of the boiler	Steam production	Power Production
Boiler-1	750 TPD	75 TPH	15 MW
Boiler-2	300 TPD	30 TPH	6 MW
Total Power Generation			21 MW

8. Water requirement during Construction Phase is 50 KLD and operation Phase is 500 KLD. The ground water (4 nos. of bore wells are proposed) will be used during construction period. An application to the Central Ground Water Board (NCR) has been submitted vide letter dated 18.10.2018. Further, the water requirement during operations phase will be sourced from Ghoda Pachad Dam and an assurance letter from Municipal Corporation, Bhopal vide dated 3.11.2018 has been furnished. has been requirement during construction period will be sourced from ground water. No water body/nallah is passing through the site and no diversion of natural water body is not involved.

9. Baseline data has been collected during 03.10.2017 to 30.12.2017 for one season. The IMD data for Bhopal indicates that the overall predominant wind direction is from the North East (16%) during the winter season. However, the annual pattern shows that the predominant combined wind direction is from North West (35%).

10. The Ambient Air Quality has been collected from 8 locations. The maximum and minimum concentrations for PM₁₀ were recorded as 105 µg/m³ at Vardhaman Colony and 60 µg/m³ at Project Site respectively. Sometimes it has found to be more than standards. This may be due to Kaccha internal roads in area and road widening work along main highway. The maximum and minimum concentrations for PM_{2.5} were recorded as 47 µg/m³ at Hayatkheda & Kanasaiya and 21 µg/m³ at project site respectively. The maximum and minimum SO₂ concentrations were recorded as 11.8 µg/m³ at Hatiya Kheda and 3.0 µg/m³ at Project Site respectively. The maximum and minimum NO_x concentrations were recorded as 42 µg/m³ at Bikhiriya Kalan and 22 µg/m³ Jhiriya Keda. Carbon Monoxide, Ammonia, Ozone, Lead, Benzo Pyrene, Arsenic, Nickel were detected below limits in the study area. The Methane hydrocarbons and Non-Methane hydro carbons were below detection limits in the study area.

11. The maximum ground level concentrations are computed for 24 hr average and the incremental ground level concentrations along with baseline data is as below:

Ground Level Concentrations in µg/m ³					
Pollutant	Predicted	Baseline (Max)	Total Expected	CPCB Standard	Max Concentration (Distance in km)
PM	0.25	75.9	76.15	100	0.35
SO ₂	0.50	6.8	7.3	80	
NO _x	0.63	39.0	39.63	80	

12. Soil samples have been collected at 8 locations. Soil samples are loamy, clay and sandy in texture. Soil samples from all eight locations are Light brown and dark brown. Bulk density of soil in the study area is found to be in the range from 1.20 to 1.27 g/cm³. pH of soil in the study area is found to be slightly alkaline in the range of 7.1 to 7.9.

13. Ground water has been analysed from 11 locations. The pH value of ground water sample is 6.9 to 7.4 and always meets the drinking water desirable standard. TDS of ground water is 230.5 to 302.0 mg/l. Total hardness value ground water sample is 148.5 to 314.0 mg/L. The iron content in ground water sample is 0.17 to 0.3 mg/l and found within the permissible limit of 0.3 mg/l. Fluoride content of water sample is 0.21 to 0.36 mg/l and meets the acceptable limit of 1 mg/l for potable water. The surface water sample was collected from Baigul River and the lake analyzed for physical and chemical parameters. The pH value of surface water samples was between 7.8 - 7.9 and always meets the drinking water desirable standard. TDS of surface water samples was between 205-325 mg/l and meets permissible limit of 500 mg/l. Total alkalinity of surface water samples was in the range of 82.2-101 mg/l and within the permissible limit of 600 mg/l.

14. Stack height of is 50 m will be provided to the incineration Unit. The DG Sets will be provided stack heights as per the CPCB rules. Spraying inhibitory agents or masking agent or neutralizers, as per Guidelines on Odour Monitoring & Management in Urban Municipal Solid Waste (MSW) Landfill Site will be ensured. Advanced Flue gas treatment technology with lime dosing along with bag filters shall be used. Selective Non-Catalytic

Reaction (SNCR) System will be set up to inject Ammonia solution into the combustion chamber where the flue gas temperature is between 850-950°C and to achieve the NO_x removal up to 90%. Another advantage of SNCR process is to reduce the Dioxin formation in the fluegas significantly. Fugitive emission will take place from vehicular movement. There are total 220 vehicles transport the garbage from storage point to transfer station & from transfer station to landfill site.

15. Wastewater/leachate generation is 80 KLD which will be treated through ETP comprising of Equalisation Tank, Upflow Anaerobic Sludge Blanket Reactor, Aeration Tank, Secondary Clarifier, Tube Settler, Chlorination and filtration. The treated effluent will be re-used for secondary applications like green belt, spraying on ash.

16. Total waste quantity of about 250 tons/day will be generated, out of which 40 tons (16 %) will be bottom ash and 160 tons (64%) will be flyash. Other waste constitutes (inerts) of 50 Tons. The Solid waste will contain the processing plant residues and pre-processing plant inerts. The fly ash will be given to brick manufacturing units. Quenched bottom ash will be disposed at Sanitary Land Fill in an area of 22.63 acres. The plant will generate approx. 35 kg of solid wet waste and 15 kg of solid dry waste which will be disposed at the plant itself. About 750 Litres of spent oil will be generated from the DG Sets annually. DG sets will only be used during power failures.

17. Public Hearing for the proposed project has been conducted on 4.7.2018 at Village Koluakhurd, Arjun Nagar, Primary School, Adampur Chhavani, Bhopal, Madhya Pradesh. Major issues pertain to employment generation, arrangement of drinking water to the nearby villages, implementation of water treatment measures, odour management, transportation of solid waste through covered trucks.

18. Greenbelt development of 14.84 acres will be carried out around the project site. Greenbelt will be provided along the internal roads and plant boundary. Total manpower required during construction phase will be 300 nos. and during operation phase will be 115. The CSR activities will be practiced/implemented as per the Ministry of Corporate Affairs, Government of India. The Estimated Project cost is Rs. 293 Crores. Capital and Recurring Cost for Environmental Protection Measures is Rs.13.09 Crores and Rs.9.5 Lakhs.

19. The proposal has been considered by the Re-constituted EAC (Thermal Power) in its 20th and 23rd meetings held on 30.8.2018 and 30.11.2018. Based on the recommendations of the Re-constituted EAC (Thermal Power) in its meeting held on 30.11.2018 and the information/clarifications and documents submitted by you with regard to the above-mentioned project proposal, ***the Ministry hereby accords the Environmental Clearance to the Proposed 21 MW Municipal Solid Waste based Power Plant*** as per the Project Activity listed at Sl.No.1(d) of the Schedule under the provisions of EIA Notification dated September 14, 2006 and subsequent amendments therein subject to compliance of the following Specific and General conditions.

A. Specific Conditions:

- (i) *Any change in configuration of the project design, a fresh reference shall be made for amending the EC and stipulating adequate conditions.*
- (ii) *Zero liquid discharge shall be adopted. Leachate shall be treated and reused. No treated leachate shall be discharged in any circumstances.*

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- (iii) *Periodic monitoring of emission parameters (at least once in quarter) described in the Schedule-II of MSW Rules, 2016 shall be carried out and emission records shall be maintained.*
- (iv) *Records pertaining daily water drawl, consumption and reuse shall be maintained.*
- (v) *Characteristics of Leachate and the treated leachate shall be monitored once in quarter and records shall be maintained.*
- (vi) *The records pertaining to generation quantity of flyash and bottom ash and its disposal/reuse shall be maintained.*
- (vii) *The calorific value of the incoming waste and its proximate analysis of the representative sample shall be monitored daily and the data shall be maintained to assess the efficiency of the power plant*
- (i) *Permission for water drawl (Surface water/ground water) shall be submitted after it is firmed up.*
- (ii) *As per the commitment given in the public hearing, project proponent shall take local people to the similar plant located at Jabalpur to ensure that various facilities regarding odour and pollution control measures are in place.*
- (iii) *Pollutants in the stacks such as HCl, CO, TOC, Dioxins & Furans and Heavy Metals shall be monitored as per the guidelines.*
- (iv) *Financial Commitment for implementation of CER/CSR activities in the surrounding area in line with the Ministry's CER guidelines dated 30.05.2018 shall be ensured.*
- (v) *The emission standards as per the Ministry's Notification dated 07.12.2015 shall be complied with.*
- (vi) *As per the Revised Tariff Policy notified by Ministry of Power vide dated 28.01.2016, project proponent shall explore the use of treated sewage water from the Sewage Treatment Plant of Municipality/ local bodies/ similar organization located within 50 km radius of the proposed power project to minimize the water drawl from surface water bodies.*

Statutory compliance

- (vii) **Part C of Schedule II of Municipal Solid Wastes Rules, 2016 dated 08.04.2016 as amended from time to time shall be complied for power plants based on Municipal Solid Waste.**
- (viii) **MoEF&CC Notifications on Fly Ash Utilization S.O. 763(E) dated 14.09.1999, S.O. 979(E) dated 27.08.2003, S.O. 2804(E) dated 3.11.2009, S.O. 254(E) dated 25.01.2016 as amended from time to time shall be complied.**
- (ix) **Thermal Power Plants other than the power plants located on coast and using sea water for cooling purposes, shall achieve specific water consumption of 2.5 m³/MWh and Zero effluent discharge.**
- (x) **The recommendation from Standing Committee of NBWL under the Wildlife (Protection) Act, 1972 should be obtained, if applicable.**

- (xi) No Objection Certificate from Ministry of Civil Aviation be obtained for installation of requisite chimney height and its siting criteria for height clearance.
- (xii) Groundwater shall not be drawn during construction of the project. In case, groundwater is drawn during construction, necessary permission be obtained from CGWA.

Air quality monitoring and Management

- (xiii) Flue Gas Desulphurisation System shall be installed based on Lime/Ammonia dosing to capture Sulphur in the flue gases to meet the SO₂ emissions standard of 200 mg/Nm³.
- (xiv) Selective Catalytic Reduction (SCR) system or the Selective Non-Catalytic Reduction (SNCR) system or Low NO_x Burners with Over Fire Air (OFA) system shall be installed to achieve NO_x emission standard of 400 mg/Nm³.
- (xv) High efficiency Electrostatic Precipitators (ESPs)/Fabric Filters shall be installed in each unit to ensure that particulate matter (PM) emission to meet the stipulated standards of 50 mg/Nm³.
- (xvi) Stacks of prescribed height 50 m shall be provided with continuous online monitoring instruments for SO_x, NO_x and Particulate Matter as per extant rules.
- (xvii) Exit velocity of flue gases shall not be less than 20-25 m/s. Mercury emissions from stack shall also be monitored periodically.
- (xviii) Continuous Ambient Air Quality monitoring system shall be set up to monitor common/criteria pollutants from the flue gases such as PM₁₀, PM_{2.5}, SO₂, NO_x within the plant area at least at one location. The monitoring of other locations (at least three locations outside the plant area covering upwind and downwind directions at an angle of 120° each) shall be carried out manually.
- (xix) Adequate dust extraction/suppression system shall be installed in coal handling, ash handling areas and material transfer points to control fugitive emissions.
- (xx) Appropriate Air Pollution Control measures (DEs/DSs) be provided at all the dust generating sources including sufficient water sprinkling arrangements at various locations viz., roads, excavation sites, crusher plants, transfer points, loading and unloading areas, etc.

Noise pollution and its control measures

- (xxi) The Ambient Noise levels shall meet the standards prescribed as per the Noise Pollution (Regulation and Control) Rules, 2000.
- (xxii) Persons exposed to high noise generating equipment shall use Personal Protective Equipment (PPE) like earplugs/ear muffs, etc.
- (xxiii) Periodical medical examination on hearing loss shall be carried out for all the workers and maintain audiometric record and for treatment of any hearing loss including rotating to non-noisy/less noisy areas.

Human Health Environment

- (xxiv) Bi-annual Health check-up of all the workers is to be conducted. The study shall take into account of chronic exposure to noise which may lead to adverse effects like increase in heart rate and blood pressure, hypertension and peripheral vasoconstriction and thus increased peripheral vascular resistance. Similarly, the study shall also assess the health impacts due to air polluting agents.
- (xxv) Baseline health status within study area shall be assessed and report be prepared. Mitigation measures should be taken to address the endemic diseases.
- (xxvi) Impact of operation of power plant on agricultural crops, large water bodies (as applicable) once in two years by engaging an institute of repute. The study shall also include impact due to heavy metals associated with emission from power plant.
- (xxvii) Sewage Treatment Plant shall be provided for domestic wastewater.

Water quality monitoring and Management

- (xxviii) Induced draft closed cycle wet cooling (Air cooled condenser) system including cooling towers shall be set up with minimum Cycles of Concentration (COC) of 5.0 or above for power plants using fresh water to achieve specific water consumption of 2.5 m³/MWhr.
- (xxix) In case of the water withdrawal from river, a minimum flow 15% of the average flow of 120 consecutive leanest days should be maintained for environmental flow whichever is higher, to be released during the lean season after water withdrawal for proposed power plant.
- (xxx) Records pertaining to measurements of daily water withdrawal and river flows (obtained from Irrigation Department/Water Resources Department) immediately upstream and downstream of withdrawal site shall be maintained.
- (xxxii) Rainwater harvesting in and around the plant area be taken up to reduce drawl of fresh water. If possible, recharge of groundwater to be undertaken to improve the ground water table in the area.
- (xxxii) Regular (at least once in six months) monitoring of groundwater quality in and around the ash pond area including presence of heavy metals (Hg, Cr, As, Pb, etc.) shall be carried out as per CPCB guidelines. Surface water quality monitoring shall be undertaken for major surface water bodies as per the EMP. The data so obtained should be compared with the baseline data so as to ensure that the groundwater and surface water quality is not adversely impacted due to the project & its activities.
- (xxxiii) The treated effluents emanating from the different processes such as DM plant, boiler blow down, ash pond/dyke, sewage, etc. conforming to the prescribed standards shall be re-circulated and reused. Sludge/ rejects will be disposed in accordance with the Hazardous Waste Management Rules.



- (xxxiv) Hot water dispensed from the condenser should be adequately cooled to ensure the temperature of the released surface water is not more than 5 degrees Celsius above the temperature of the intake water.
- (xxxv) Wastewater generation of 80 KLD from various sources (viz. cooling tower blowdown, boiler blow down, wastewater from ash handling, etc) shall be treated to meet the standards of pH: 6.5-8.5; Total Suspended Solids: 100 mg/l; Oil & Grease: 20 mg/l; Copper: 1 mg/l; Iron: 1 mg/l; Free Chlorine: 0.5; Zinc: 1.0 mg/l; Total Chromium: 0.2 mg/l; Phosphate: 5.0 mg/l;
- (xxxvi) Sewage generation of 15 KLD will be treated by setting up Sewage Treatment plant to maintain the treated sewage characteristics of pH: 6.5-9.0; Bio-Chemical Oxygen Demand (BOD): 30 mg/l; Total Suspended Solids: 100 mg/l; Fecal Coliforms (Most Probable Number): <1000 per 100 ml.

Risk Mitigation and Disaster Management

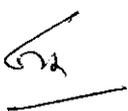
- (xxxvii) Adequate safety measures and environmental safeguards shall be provided in the plant area to control spontaneous fires in coal yard, especially during dry and humid season.
- (xxxviii) Storage facilities for auxiliary liquid fuel such as LDO and HFO/LSHS shall be made as per the extant rules in the plant area in accordance with the directives of Petroleum & Explosives Safety Organisation (PESO). Sulphur Content in the liquid fuel should not exceed 0.5%.
- (xxxix) Ergonomic working conditions with First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.
- (xl) Safety management plan based on Risk Assessment shall be prepared to limit the risk exposure to the workers within the plant boundary.
- (xli) Regular mock drills for on-site emergency management plan and Integrated Emergency Response System shall be developed for all kind of possible disaster situations.

Greenbelt and Biodiversity Conservation

- (xlii) Green belt shall be developed in an area of 33% of the total project with indigenous native tree species in accordance with CPCB guidelines. The green belt shall inter-alia cover an entire periphery of the plant.
- (xliii) *In-situ/ex-situ* Conservation Plan for the conservation of flora and fauna should be prepared and implemented.
- (xliv) Suitable screens shall be placed across the intake channel to prevent entrainment of life forms including eggs, larvae, juvenile fish, etc., during extraction of seawater.

Waste Management

- (xlv) Solid waste management should be planned in accordance with extant Solid Waste Management Rules, 2016.



- (xlvi) Toxicity Characteristic Leachate Procedure (TCLP) test shall be conducted for any substance, potential of leaching heavy metals into the surrounding areas as well as into the groundwater.
- (xlvii) Ash pond shall be lined with impervious liner as per the soil conditions. Adequate dam/dyke safety measures shall also be implemented to protect the ash dyke from getting breached.
- (xlviii) Fly ash shall be collected in dry form and ash generated shall be used in phased manner as per provisions of the Notification on Fly Ash Utilization issued by the Ministry and amendment thereto. By the end of 4th year, 100% fly ash utilization should be ensured. Unutilized ash shall be disposed off in the ash pond in the form of High Concentration Slurry. Mercury and other heavy metals (As, Hg, Cr, Pb, etc.) will be monitored in the bottom ash as also in the effluents emanating from the existing ash pond. Flyash utilization details shall be submitted to concerned Regional Office along with the six-monthly compliance reports and utilization data shall be published on company's website.
- (xlix) Unutilized ash shall be disposed off in the ash pond in the form of High Concentration Slurry/Medium Concentration Slurry/Lean Concentration Slurry method. Ash water recycling system shall be set up to recover supernatant water.
- (l) In case of waste-to-energy plant, major problems related with environment are fire smog in MSW dump site, foul smell and impacts to the surrounding populations. Therefore, the following measures are required to be taken up:
 - i. Water hydrant at all the dumpsites of MSW area to be provided so that the fire and smog could be controlled.
 - ii. Sprayer like microbial consortia may be provided for arresting the foul smell emanating from MSW area.

Monitoring of compliance

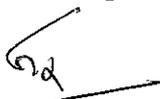
- (li) Environmental Audit of the project be taken up by the third party for preparation of Environmental Statement as per Form-V & Conditions stipulated in the EC and report be submitted to the Ministry.
- (lii) Resettlement & Rehabilitation Plan as per the extant rules of Govt. of India and respective State Govt. shall be followed, if applicable.
- (liii) Energy Conservation Plan to be implemented as envisaged in the EIA / EMP report. Renewable Energy Purchase Obligation as set by MoP/State Government shall be met either by establishing renewable energy power plant (such as solar, wind, etc.) or by purchasing Renewable Energy Certificates.
- (liv) Monitoring of Carbon Emissions from the existing power plant as well as for the proposed power project shall be carried out annually from a reputed institute and report be submitted to the Ministry's Regional Office.
- (lv) Energy and Water Audit shall be conducted at least once in two years and recommendations arising out of the Report should be followed. A report in this regard shall be submitted to Ministry's Regional Office.



- (lvi) Environment Cell (EC) shall be constituted by taking members from different divisions, headed by a qualified person on the subject, who shall be reporting directly to the Head of the Project.
- (lvii) The project proponent shall (Post-EC Monitoring):
- a. send a copy of environmental clearance letter to the heads of Local Bodies, Panchayat, Municipal bodies and relevant offices of the Government;
 - b. upload the clearance letter on the web site of the company as a part of information to the general public.
 - c. inform the public through advertisement 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 that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment, Forest and Climate Change (MoEF&CC) at <http://parviesh.nic.in>.
 - d. upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same periodically;
 - e. monitor the criteria pollutants level namely; PM (PM₁₀ & PM_{2.5} incase of ambient AAQ), SO₂, NO_x (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company;
 - f. submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MoEF&CC, the respective Zonal Office of CPCB and the SPCB;
 - g. submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company;
 - h. inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project and the date of commencement of the land development work.

Corporate Environmental Responsibility (CER) activities

- (lviii) CER activities will be carried out as per OM No. 22-65/2017-IA.II dated 01.05.2018 or as proposed by the PP in reference to Public Hearing or as earmarked in the EIA/EMP report along with the detailed schedule of implementation with appropriate budgeting.



B. General Conditions:

- (i) Storage facilities for auxiliary liquid fuel such as LDO/ HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of an accident taking place due to storage of oil.
- (ii) First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.
- (iii) Provision shall be made for the housing of construction labour (as applicable) within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.
- (iv) The progress of the project shall be submitted to CEA on six monthly basis.
- (v) Regional Office of the MoEF&CC will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment Report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use during monitoring.
- (vi) Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.
- (vii) The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of plant.
- (viii) Full cooperation shall be extended to the Scientists/Officers from the Ministry / Regional Office of the Ministry / CPCB/ SPCB who would be monitoring the compliance of environmental status.

C. An as built or as completed report on EMP to be submitted stating the scope/extent of work envisaged in the EIA along with estimated cost vis-à-vis the actual completed works and cost incurred. A certificate/completion certificate accordingly, shall have to be submitted before commissioning of the TPP.

20. The Ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction. The Ministry may also impose additional environmental conditions or modify the existing ones, if necessary.

21. The environmental clearance accorded **shall be valid for a period of 7 years** from the date of issue of this letter to start operations by the power plant.

22. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.



23. In case of any deviation or alteration in the project proposed including coal transportation system from those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required, if any.

24. The above stipulations would be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and rules there under, Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 and its amendments, the Public Liability Insurance Act, 1991 and its amendments.

25. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

This issues with the approval of the Competent Authority.

Yours faithfully,


(Dr. S. Kerketta)
Director, IA.I

Copy to:-

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi 110001.
2. The Secretary, Ministry of New and Renewable Energy, Block-14, CGO Complex, Lodhi Road, New Delhi-110 003, India.
3. The Secretary, Ministry of Housing and Urban Affairs, Nirman Bhawan, Maulana Azad Road, New Delhi-110011.
4. The Chairman, Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
5. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.
6. The Additional Principal Chief Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (WZ), E-5, Kendriya Paryavaran Bhawan, E-5 Arera Colony, Link Road-3, Ravishankar Nagar, Bhopal - 462016.
7. The Principal Secretary, Department of Housing & Environment, E- 5, Arera Colony, Bhopal, Madhya Pradesh-462016.
8. The Chairman, Madhya Pradesh Pollution Control Board E-5, Arera Colony, Paryavaran Parisar, Bhopal, Madhya Pradesh 462016.
9. The Commissioner, Bhopal Municipal Corporation, Mata Mandir Square, Harshwardhan complex, Mata Mandir, Bhopal-462026.
10. The District Collector, Collector Office Bhopal, Sultania Rd, Kohefiza, Bhopal, Madhya Pradesh-462001.
11. Guard file/Monitoring file.
12. Website of MoEF&CC.


(Dr. S. Kerketta)
Director, IA.I



State Environment Impact Assessment Authority, M.P.
(Government of India, Ministry of Environment, Forest & Climate Change)

Environmental Planning Coordination Organization
Paryavaran Parisar, E-5. Arera Colony
Bhopal-4620 16

Visit us <http://www.mpseiaa.nic.in>

Tel:0755-2466970, 2466859

Fax : 0755-2462136

No: 2796 /SEIAA/2022

Date: 12/1/22

To,

M/s Green Resources Solid Waste Management Pvt. Ltd,
Shop No. 4, Sai Park, Misrod,
Hoshangabad Road,
Dist. Bhopal, MP - 462026

Sub: Case No 8743/2021: Prior Environment Clearance for Proposed Integrated Solid Waste Management (ISWM) project processing of 850 TPD Integrated Solid Waste comprises of composing plant and secure land filling facility (380000 cum) at Adampur Chawani, Dist. Bhopal (MP) by M/s Green Resources Solid Waste Management Pvt. Ltd, Shop No. 4, Sai Park, Misrod, Hoshangabad Road, Dist. Bhopal, MP - 462026 Email – grswmpl@gmail.com, Mobile - 9399342907, 9340709592 M/s. Creative Enviro Services , Bhopal - Prescribing of TOR.

Ref:-Online Proposal No. SIA/MP/MIS/67100/2021) received in SEIAA office on 21.10.2021

This is in reference to the proposal submitted in the SEIAA office 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 and all supporting documents as per EIA Notification & its amendments.

1. The project Integrated Solid Waste Management (ISWM) is Proposed for processing of 850 TPD Integrated Solid Waste comprises of composing plant and secure land filling facility (3,80,000 cum) at Adampur Chawani, Dist. Bhopal (MP).
2. This project is designed for Bhopal Municipal Corporation only because no other ULB is in the vicinity. Government of Madhya Pradesh (GoMP), realizing the necessity of efficient waste management and system, wanted to establish an Integrated Solid Waste Management (ISWM) Project on Public Private Partnership (PPP) basis for management of MSW generated in Bhopal Town.
3. The proposed Integrated SWM Facility will be established in Adampur Chawani, Bhopal (coordinates: 23015' 59.5" N latitude and 770 33' 21.6"E longitude) over available area of 44.9 Acre for ISWM facility out of that 10 acres land is proposed for Sanitary Landfill whereas 15 acres for Composting plant.
4. The case was presented by Env. Consultant Shri Umesh Mishra from M/s. Creative Enviro Services , Bhopal and PP from M/s Green Resources Solid Waste Management Pvt. Ltd. Bhopal in 527th SEAC meeting dtd. 21.11.2021 wherein following submission made:

5. Salient Features of The Project :

Proposed project	The processing of waste will generate some amount of inert waste (Max 20%) which will have to land filled which is called disposal of inert waste. The landfill is designed to keep inert waste for 08 years. Adequate leachate sump shall be provided. The final leftover or the
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A. Any Specific Information (as required) Uploaded in XGN on 18/03/2022 10:54:39 from IP No: 27.97.16.952.

B. 144760-M/s Green Resources Solid Waste Management Pvt. Ltd. accepts the LEGAL responsibility and undertakes that the furnished information is CORRECT & ACCURATE.



State Environment Impact Assessment Authority, M.P.
(Government of India, Ministry of Environment, Forest & Climate Change)

Environmental Planning Coordination Organization
Paryavaran Parisar, E-5. Arera Colony
Bhopal-4620 16

Visit us <http://www.mpseiaa.nic.in>
Tel:0755-2466970, 2466859

Fax : 0755-2462136

No: 2796 /SEIAA/2022

Date: 12/1/22

To,

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Shop No. 4, Sai Park, Misrod,
Hoshangabad Road,
Dist. Bhopal, MP - 462026

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A. Any Specific Information (as required) Uploaded in XGN on 17/01/2022 10:51:39 from IP No: 27.57.151.12.

B. 144760-M/s Green Resources Solid Waste Management Pvt. Ltd. accepts the LEGAL responsibility and undertakes that the furnished information is CORRECT & ACCURATE.

	rejects which have no further use or value should be transferred to the landfill site. Approx 145 x 275 square meter size land fill is proposed at village Adampur Chawani to keep inert waste.
Area	25 Acre (10 acres + 15 Acres)
Project capacity	3,80,000 Cubic Meter Capacity of landfill , 850 TPD for composting plant
Operation days	365 days
Fresh water Requirement	20 KLD Source of water Municipal Corporation/Tanker
Electricity Load and Source	600 KVA
Leachate treatment System	Recirculation and RO
Man-power	25 + 35
Total project cost Rs.	35 Crore
Land acquired	44.90 Acre
Land required for proposed landfill	145 X 275 Meter (size of landfill)
Proposed area for plantation	8.25 acres (3.35 Hac)
Capital Cost for Environmental measures (proposed)	Around 150 Lacs (to be finalized during EIA study)

6. The population was 17,98,218 in 2011 as per Census. The city of Bhopal has a total of 467 Sq. Km area divided into 85 administrative wards for administration purposes and the projected population for 2024 is 2248827.
7. It is proposed to establish the ISWM facility for 850 TPD comprises of Sanitary Landfill and Compost Plant. The land fill facility for ISWM Project will be established in a land of about 10 acres located in Adampur Chawani, Bhopal whereas composting plant shall be established over 15 acres of land at Adampur Chawani, Bhopal (MP).
8. The water requirement for the proposed project is estimated to be about 20 KLD. It is expected that Bhopal Municipal Corporation would supply water to this facility. Otherwise, water requirement would be met through tankers.
9. The power requirement during construction phase is estimated to be about 600 KVA which will be fulfilled by MPTRANSCO and DG Sets of 125 KVA are proposed for power backup.
10. The approximate cost estimate for the proposed facility is about INR 35 Crore.
11. Bhopal Municipal Corporation has total administration over 421910 houses to which it supplies basic amenities like water. It is also authorize to build roads within Municipal Corporation limits and impose taxes on properties coming under its jurisdiction. However, considering the population projection and the waste generation forecast, it is proposed to establish the Integrated Waste Management Facility with 3,80,000 Cubic Meter Capacity of landfill 850 TPD capacity for composting plant.

Year	2019	2024
City Population	2077780	2248827
Waste Generation Per capita in grams per day	400	417.16
Total MSW Qty, TPD	831.11	938.12

After presentation, committee decided to recommend standard TOR prescribed by MoEF&CC with additional TOR. After the recommendation of SEAC the case was considered in 696th SEIAA meeting dtd. 10.12.21 and decided to approve the ToR as recommended by SEAC in 527th meeting held on 12.11.21 and standard TOR prescribed by the MoEF&CC for conducting the EIA along with following additional TOR's and general conditions:-

1. Ghoda- Pachhad dam is approximately 1.0 KM in the NW side hence protection plan from migration of leachate shall be discussed in the EIA report.
2. Complete drainage & design of SLF & ISW shall be discussed in the EIA report with specification of liners and other materials.
3. The proposed project location is sanctioned on existing landfill site thus the status of EC and CET/CTO of old facility (along with documentary support) with compliance status shall be discussed in the EIA report.
4. Detailed layout (A-3 size) of various proposed facilities with their capacities and design criteria shall be discussed in the EIA report.
5. Heavy metal analysis shall be carried out in all soil samples and in any one sample pesticide analysis shall also be carryout.
6. How the leachates will be handled shall be discussed in the EIA.
7. Considering the lactates generation, geo-hydrological studies should be conducted and reported with the EIA report.
8. Arrangements for management of odour nuisance shall be discussed in the EIA report.
9. Current scenario of air, surface and ground water quality shall be presented in the EIA report.
10. All the sensitive features and activities within 05 kms of site which will have the impact of this facility should be studied and discussed in the EIA report.
11. MSW handling technology should be freeze for all the wastes and worst case scenario shall be studied and discussed in the EIA.
12. Preventive measures that will be taken to avoid occurrence of fire due to methane generation be discussed in the EIA.
13. Comprehensive plantation scheme with proposal for planting evergreen broad leaf plant species & shrubs etc (Mehandi, Kadam, Pipal, Putranjiva, kanak Champa) and along the fencing Bamboo, subabool, Neem etc to be planted.

The authority approve the ToR as recommended by SEAC and decided to issue additional TOR by incorporating following conditions for preparation of EIA report:

- a) Global warming potential and carbon foot print of the industrial activities should discussed in EIA report
- b) A buffer zone of no-development should be propped & maintained around landfill site.
- c) Diversion of storm water drains to minimize lechate generation & prevent pollution of surface water & also for avoiding flooding and creation of marshy conditions.
- d) Prevention of run - off from landfill area entering any stream, river, lake or pond. Specifications for land filling given in the Municipal Solid Wastes (Management & handling) Rule, 2000 shall be followed.

General Conditions

1. The date and duration of carrying out the baseline data collection and monitoring shall be informed to the concerned Regional Officer of the M.P Pollution Control Board.
2. During monitoring, photographs shall be taken as a proof of the activity with latitude & longitude, date, time & place and same shall be attached with the EIA report. A drone video showing various sensitivities of the lease and nearby area shall also be shown during EIA presentation.

3. An inventory of various features such as sensitive area, fragile areas, mining / industrial areas, habitation, water-bodies, major roads, etc. shall be prepared and furnished with EIA.
4. An inventory of flora & fauna based on actual ground survey shall be presented.
5. Risk factors with their management plan should be discussed in the EIA report.
6. The EIA report should be prepared by the accredited consultant having no conflict of interest with any committee processing the case.
7. The EIA document shall be printed on both sides, as far as possible.
8. All documents should be properly indexed, page numbered.
9. Period/date of data collection should be clearly indicated.
10. The letter /application for EC should quote the SEIAA case No./year and also attach a copy of the letter prescribing the TOR.
11. The copy of the letter received from the SEAC prescribing TOR for the project should be attached as an annexure to the final EIA/EMP report.
12. The final EIA/EMP report submitted to the SEIAA must incorporate all issues mentioned in TOR and that raised in Public Hearing with the generic structure as detailed out in the EIA report.
13. Grant of TOR does not mean grant of EC.
14. The status of accreditation of the EIA consultant with NABET/QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared. If consultant has engaged other laboratory for carrying out the task of monitoring and analysis of pollutants, a representative from laboratory shall also be present to answer the site specific queries.
15. On the front page of EIA/EMP reports, the name of the consultant/consultancy firm along with their complete details including their accreditation, if any shall be indicated. The consultant while submitting the EIA/EMP report shall give an undertaking to the effect that the prescribed TORs (TOR proposed by the project proponent and additional TOR given by the MOEF & CC) have been complied with and the data submitted is factually correct.
16. While submitting the EIA/EMP reports, the name of the experts associated with involved in the preparation of these reports and the laboratories through which the samples have been got analyzed should be stated in the report. It shall be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and also have NABL accreditation.
17. All the necessary NOC's duly verified by the competent authority should be annexed.
18. PP has to submit the copy of earlier Consent condition /EC compliance report, whatever applicable along with EIA report.
19. The EIA report should clearly mention activity wise EMP and CER cost details and should depict clear breakup of the capital and recurring costs along with the timeline for incurring the capital cost. The basis of allocation of EMP and CER cost should be detailed in the EIA report to enable the comparison of compliance with the commitment by the monitoring agencies.
20. A time bound action plan should be provided in the EIA report for fulfillment of the EMP commitments mentioned in the EIA report.
21. The name and number of posts to be engaged by the PP for implementation and monitoring of environmental parameters should be specified in the EIA report.
22. EIA report should be strictly as per the TOR, comply with the generic structure as detailed out in the EIA notification, 2006, baseline data is accurate and concerns raised during the public hearing are adequately addressed.
23. The EIA report should be prepared by the accredited consultant having no conflict of interest with any committee processing the case.
24. Public Hearing has to be carried out as per the provisions of the EIA Notification, 2006. The issues raised in public hearing shall be properly addressed in the EMP and suitable budgetary allocations shall be made in the EMP and CER based on their nature.

25. Actual measurement of top soil shall be carried out in the lease area at minimum 05 locations and additionally N, P, K and Heavy Metals shall be analyzed in all soil samples. Additionally in one soil sample, pesticides shall also be analyzed.
26. A separate budget in EMP & CER shall be maintained for development and maintenance of grazing land as per the latest O.M, of MoEF&CC issued vide letter F.No. 22-34/2018-IA. III, dated 16/01/2020.
27. PP shall submit biological diversity report stating that there is no adverse impact in-situ and on surrounding area by this project on local flora and fauna's habitat, breeding ground, corridor/ route etc. This report shall be filed annually with six-monthly compliance report.
28. The project proponent shall provide the mitigation measures as per MoEFCCs Office Memorandum No. Z-11013/57/2014-IA. II (M) dated 29th October 2014, titled "Impact of mining activities on Habitations-issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area" with EIA report.
29. LPG gas shall be provided for camping labour under "Ujjwala Yojna .
30. In the project where ground water is proposed as water source, the project proponent shall apply to the competent authority such as Central Ground Water Authority (CGWA) as the case may be for obtaining, No Objection Certificate (NOC).
31. Consideration of mining proposals involving violation of the EIA Notification, 2006, the project proponent shall give an undertaking by way of affidavit to comply with all the statutory requirements and judgment of Hon'ble Supreme Court of India dated 02/08/2017 in WP © No. 114 of 2014 in the matter of Common Cause V/s Union of India & others before grant of TOR/EC. The under taking interalia includes commitment of the PP not to repeat any such violation in future as per MoEF&CC OM No. F.NO. 3-50/2017-IA.III (Pt.) dated 30/05/2018.
32. The mining project proponents involving violations of the EIA Notification, 2006 under the provisions of S.O. 804 (E) dated 14/03/2017 and subsequent amendments for TOR/EC shall give an undertaking by way of affidavit to comply with all the statutory requirements and judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors. Before grant of TOR/EC the undertaking inter-alia include commitment of the PP not to repeat any such violation of future. In case of violation of above undertaking, the TOR/Environmental Clearance shall be liable to be terminated forthwith.
33. Under CER scheme commitments with physical targets shall be included in EIA report for:
- ✓ Proposal for CER activities based upon commitment made during public hearing and COVID-19 pandemic.
 - ✓ Activities such as solar panels in school, awareness camps for Oral Hygiene, Diabetes and Blood Pressure, works related to plantation (distribution of fruit & fodder bearing trees) vaccination, cattle's health checkup etc. in concerned village shall be proposed.
 - ✓ No fuel wood shall be used as a source of energy by mine workers. Thus proposal for providing solar cookers / LPG gas cylinders under "Ujjwala Yojna" to them who are residing in the nearby villages, shall be considered.
 - ✓ PP's commitment that activities proposed in the CER scheme will be completed within initial 03 years of the project and in the remaining years shall be maintained shall be submitted with EIA report.
34. Under Plantation Scheme commitments with budgetary allocations shall be included in EIA report for :

- ✓ Comprehensive green belt plan with commitment that entire plantation shall be carried out in the initial three years and will be maintained thereafter with causality replacement. Proposal for distribution of fruit bearing species for nearby villagers shall also be incorporated in the plantation scheme and for which a primary survey for need assessment in concerned village shall be carried out.
- ✓ Commitment that plantation shall be carried out preferably through Govt. agency (such as Van Vikas Nigam / Van Samiti under monitoring and guidance of Forest Range officer with work permission from DFO concerned / Gram Panchayat / Agricultural department or any other suitable agency having adequate expertise as per the budgetary allocations made in the EMP.
- ✓ Commitment that high density plantation (preferably using "Miyawaki Technique or WALMI technique) shall be developed in 7.5m barrier zone left for plantation through concern CCF (social forestry) or concerned DFO or any other suitable agency.
- ✓ Commitment that local palatable mixture of annual and perennial grass and fodder tree species shall be planted for grassland/fodder development on degraded forest land suitable for the purpose through Gram Panchayat on suitable community land in the concerned village area and handed over to Gram Panchayat after lease period.
- ✓ PP shall explore the possibility for plantation in adjoining forest land in consultation with concerned DFO and commensurate budget shall be transferred for plantation to DFO.
- ✓ Where ever Aushadhi Vatika (Medicinal Garden) is proposed by PP, minimum 50 saplings be planted considering 80% survival.

FOR PROJECTS LOCATED IN SCHEDULED (V) TRIBAL AREA , following should be studied and discussed in EIA Report before Public Hearing as per the instruction of SEIAA vide letter No. 1241 dated 30/07/2018.

35. Detailed analysis by a National Institute of repute of all aspects of the health of the residents of the Schedule Tribal block.
36. Detailed analysis of availability and quality of the drinking water resources available in the block.
37. A study by CPCB of the methodology of disposal of industrial waste from the existing industries in the block, whether it is being done in a manner that mitigate all health and environmental risks.
38. The consent of Gram Sabha of the villages in the area where project is proposed shall be obtained.

Documents to be submitted:

Environmental Consultant / PP

- I. A certificate from the Consultant shall be submitted that they have been accredited by MoEF (GoI), as per their OM.
- II. Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the project should be provided.
- III. Location of National Parks, Sanctuaries, biosphere Reserves, Wildlife corridors, Tiger reserves (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated. A location map duly authenticated by Chief Wild life Warden and recommendation/ comments of Chief Wildlife Warden of concerned district should also be provided in this regard. DFO letter indicating the distances of nearest forest boundary from the boundary of the proposed site.
- IV. Land documents of the proposed site with clarity of landownership.
- V. NOC from Gram Sabha if located in scheduled notified area.

Validity –

- I. The TORs prescribed for the project will be valid for a period of four years for submission of EIA and EMP report accordingly, the TORs will lapse after 09/12/2025.

(Shriman Shukla)
Member Secretary

Copy to:-

2797

- (1). Principal Secretary, Department of Environment., Government of MP, Mantralaya Vallabh Bhawan, Bhopal.
- (2). Member Secretary, SEAC, Research and Development Wing Madhya Pradesh Pollution Control Board, Paryavaran Parisar, E-5, Arera Colony Bhopal-462016.
- (3). Member Secretary, Madhya Pradesh Pollution Control Board, Paryavaran Parisar, E-5, Arera Colony, Bhopal-462016.
- (4). The Collector, Distt- Bhopal (M.P.).
- (5). Regional Officer, Regional Office (WZ), Ministry of Environment & Forests, Kendriya Paryavaran Bhawan, Link Road No.-3, E-5, Arera Colony, Bhopal (M.P.) - 462016
- (6). Guard file.

(Alok Nayak)
Officer-in-Charge



कार्यालय कलेक्टर, जिला दण्डाधिकारी भोपाल म0प्र0
क्रमांक 771 /अजदि/2022
प्रति,

भोपाल,दिनांक 02/12/2022

क्षेत्रीय अधिकारी,
म0प्र0 प्रदूषण नियंत्रण बोर्ड,
भोपाल म0प्र0



विषय:- मेसर्स ग्रीन रिसोर्स सॉलिड वेस्ट मैनेजमेंट प्रा0लि0 भोपाल द्वारा ग्राम आदमपुर छावनी तहसील हुजूर जिला भोपाल में प्रस्तावित ठोस अपशिष्ट एकीकृत प्रसस्करण प्लॉट अनुमानित क्षमता 850 टन प्रतिदिन कम्पोस्ट प्लॉट एवं सिक्थोर लैंडफिलिंग फैसिलिटी की क्षमता 380000 क्यूबिक मीटर की स्थापना हेतु पर्यावरण स्वीकृति के संबंध में लोक सुनवाई आयोजन बावत्।

सन्दर्भ :- आपका पत्र क्रमांक 3228/क्षेका/प्रनिवो/2022 भोपाल दिनांक 29.11.2022

00

उपरोक्त विषयांतर्गत संदर्भित पत्र के द्वारा मेसर्स ग्रीन रिसोर्स सॉलिड वेस्ट मैनेजमेंट प्रा0लि0 भोपाल द्वारा ग्राम आदमपुर छावनी तहसील हुजूर जिला भोपाल में प्रस्तावित ठोस अपशिष्ट एकीकृत प्रसस्करण प्लॉट अनुमानित क्षमता 850 टन प्रतिदिन कम्पोस्ट प्लॉट एवं सिक्थोर लैंडफिलिंग फैसिलिटी की क्षमता 380000 क्यूबिक मीटर की स्थापना हेतु पर्यावरण स्वीकृति के संबंध में लोक सुनवाई का आयोजन हेतु स्थल,दिनांक व समय निर्धारित करने एवं प्राधिकृत अधिकारी नियुक्त किये का अनुरोध किया गया है।

अतएव उक्त के संबंध में पर्यावरण स्वीकृति के पूर्व लोक सुनवाई हेतु दिनांक 09.01.2023 दिन सोमवार समय 2.00 बजे स्थल शासकीय प्राथमिक शाला अर्जुननगर (आदमपुर छावनीके समीप) तहसील हुजूर जिला भोपाल निर्धारित किया जाता है। लोक सुनवाई हेतु श्री संदीप केरकेट्टा, अपर कलेक्टर भोपाल को प्राधिकृत अधिकारी नियुक्त किया जाता है।

केलेक्टर,
जिला-भोपाल



MADHYA PRADESH POLLUTION CONTROL BOARD

Paryawaran Parisar, E-5, Arera Colony, BHOPAL - 462 016

(0755) 2464428, 2466191, Website: www.mppcb.nic.in, E-mail: it_mppcb@rediffmail.com



No. 3978 /TS/MPPCB/2022

Bhopal, date: 24-11-2022

To, ✓
Regional Officer,
Regional Office
M. P. Pollution Control Board
BHOPAL (M.P.)



Sub: Order to conduct public hearing under EIA Notification No. 1533 dated: 14/09/06 for the proposed Integrated Solid Waste Management (ISWM) Project processing of 850 TPD Integrated Solid Waste comprises of composing plant and secure land filling facility (380000 cum) at Adampur Chawni, Dist. Bhopal (M.P.) by M/s. Green Resources Solid Waste Management Pvt. Ltd., Bhopal

- Ref: 1. TOR issued by SEAC, Bhopal vide letter No. 2796/SEIAA/2022, dated: 12/01/2022. (Case No. 8743/2021).
2. Project Authority letter No. Nil, dated: 17/11/2022.

-:-:-:-:-:-:-

M/s. Green Resources Solid Waste Management Pvt. Ltd. submitted an application under reference for conducting public hearing as per the provisions of EIA Notification No. 1533 dated: 14/09/06 with draft EIA report for Public Consultation in respect of Environmental Clearance for the proposed Integrated Solid Waste Management (ISWM) Project processing of 850 TPD Integrated Solid Waste comprises of composing plant and secure land filling facility (380000 cum) at Adampur Chawni, Dist. Bhopal (M.P.)

A copy of letter of request is enclosed herewith for further necessary action. Copies of the draft EIA Report (hard & soft) and summary of the draft EIA report in English & Hindi (hard & soft) shall be submitted by the project proponent directly to your office.

Now, you are hereby directed to finalize the date, time and exact venue for the public hearing as per the provisions of the notification, in consultation with the district Collector. The administrative expenses Rs. 01.00 Lakh (One Lakh only) through Demand Draft is received in Head Office. The same shall be advertised in one major National Daily and one regional vernacular daily. A minimum notice period of 30 (thirty) days shall be provided to the public for furnishing their responses. The information for the public about the places or offices where the public could access the draft Environmental Impact Assessment Report and the summary of Environmental Impact Assessment report before the public hearing shall also be mentioned in the advertisement. You are directed to follow the procedure as per the provisions given in of EIA notification dated: 14/09/06 and to ensure the compliance of the orders issued by MoEF&CC from time to time in this regards.

Encls: As above

A. Prasad
EK

25/11/2022
Public Hearing

Sub Encl
R. Prasad
25/11/2022

(Chandra Mohan Thakur)
Member Secretary



MADHYA PRADESH POLLUTION CONTROL BOARD

Paryawaran Parisar, E-5, Arera Colony, BHOPAL - 462 016

(0755) 2464428, 2466191, Website: www.mppcb.nic.in, E-mail: it_mppcb@rediffmail.com



Endt. No.

/TS/MPPCB/2022

Bhopal, dated:

Copy to:

1. Collector, District Bhopal for information and request to carry out the public hearing for the project as per the provisions of the EIA Notification, 2006
2. M/s. Green Resources Solid Waste Management Pvt. Ltd., Shop No. 4, Sai Park, Misrod, Hoshangabad Road, Bhopal-462 026 (M.P.) for information. You are requested to contact the Regional Officer, M.P. Pollution Control Board, Bhopal along with sufficient hard and soft copies of documents for conduction of public hearing. It is also requested to forward one hard and one soft copy of the above draft EIA report along with the summary EIA report to the SEIAA Bhopal and to the following authorities or offices within whose jurisdiction the project is being located:
 - a) District Magistrate/s
 - b) Zila Parishad or Municipal Corporation
 - c) District Industries Centre
3. Shri Arvind Pare, Public Hearing Work, Technical Section, M.P. Pollution Control Board, Bhopal. One soft copy of the executive summary in English & Hindi is enclosed for uploading the same on the official web site of the Board for display, as per the provisions of the notification.

Encl: As above.

(Chandra Mohan Thakur)
Member Secretary

Typical Landfill Cross- Section



Landfill Design

The landfill design is based on geological and hydrogeological conditions, projected waste generation volumes along with procedures to reduce potential impacts to the existing natural and social environment of the site.

- The most important design feature of a landfill apart from other constructional aspects is its volume, which depends on the area available, and other environmental aspects which limit the depth and height of the landfill. The design further deals with the prevention of infiltration of the leachate into the ground water by under drainage system to collect the leachate and pump the same to the leachate storage ponds. Main aspects covering the landfill Design & Construction are To minimize the possibility of contaminating surface and groundwater.
- To have control over gaseous emissions.

Landfill design involves development of concept, adoption of suitable procedure and safety considerations. Landfill is a typical combination of different component and each of these components has to be designed separately. For this process standard design procedure by CPHEEO Manual on Municipal Solid Waste Management, United States Environmental Protection Agency's Manual on Solid Waste Management (Subpart – D, Design Criteria) and Municipal Solid Waste (Management & Handling) Rules have been followed. Landfill design involves understanding the following points

- Design life
- Assessment of landfill volume and area required.
- Evaluation of concept development plan – Foot Print of Landfill Site.
- Design of liner system.

- Assessment of leachate quantity.
- Design of leachate collection system
- Assessment of landfill gas generation.
- Design of final cover system.

Design Life

A landfill design life will comprise of an 'active' period and a 'closure and post-closure' period.

Waste Volume and Landfill Capacity

The volume of waste to be placed in a landfill will be computed for the 'active' period of the landfill taking into account the waste received per annum at site. The actual capacity of the landfill will depend upon the volume occupied by the liner system and the cover material (daily, intermediate and final cover) as well as the compacted density of the waste. In addition, the amount of settlement of waste will undergo due to overburden stress and due to biodegradation and is also taken into account.

The density of waste varies on account of large variations in waste composition, degree of compaction and state of decomposition. Densities may range as low as 0.70 t/cum to 1.25 t/cum. Since the waste is processed and only rejects are planned to be sent to Landfill for planning purposes, a density of 0.9 to 1.1 t/cum is adopted.

Evaluation of Concept Development Plan – Foot Print of Land Fill Site.

Based on the topography and shape of the site identified for landfill development a broad concept for development of landfill is evaluated.

Design of Liner system

Leachate control by liner system within a landfill involves prevention of percolation of leachate from waste in landfill to the subsoil by a suitable protective system (liner system). The liner system is a combination of drainage layer and barrier layers. As per CPHEEO manual a competent liner system should have low permeability, should be robust and durable and should be resistant to chemical attack, puncture and rupture. A liner system comprises of combination of barrier materials such as natural clay, amended soils and flexible geo- membrane.

As suggested by MoEF guidelines a composite liner of two barriers made of different materials, placed in immediate contact with each other provides a beneficial combined effect of both the barriers. The liner system suggested by MOEF is a geo-membrane layer over clay or amended soil barrier. A drainage layer and leachate collection system placed over the composite liner system.

The effectiveness of barrier layer basically depends on the hydraulic conductivity of the clay/amended soil liner and density of the geo-membrane against puncture. The clay/amended soil liner is effective only if it is compacted properly and geo-membrane liner is effective only if it has the density or mass per unit area (minimum thickness is specified) is sufficient enough against punctures.

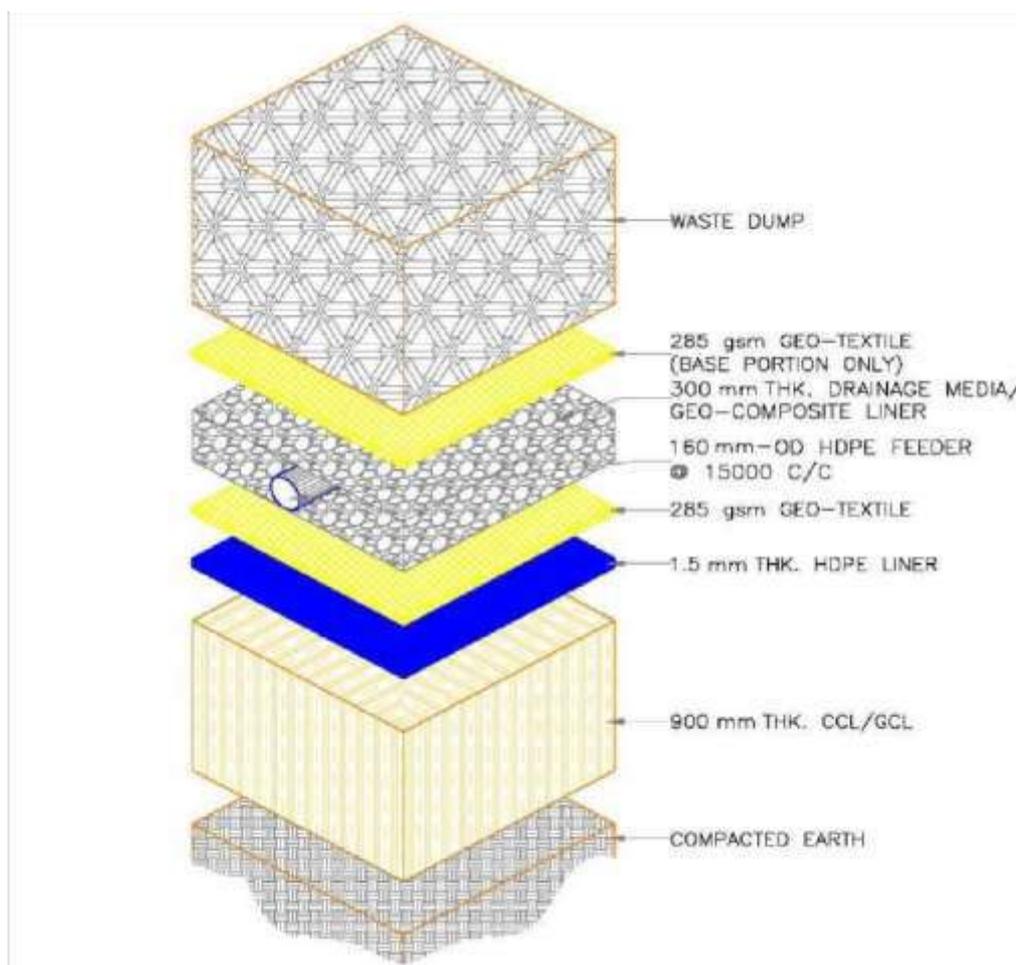
Proposed Configuration:

Starting from the bottom of the natural ground level, the proposed configuration for landfill shown below in Table.

Proposed Configuration for Landfill

Layer No.	Material Description	Thickness
Layer 1	Barrier soil layer comprising of clay or amended soil with permeability coefficient less than 1×10^{-7} cm/sec	900 mm
Layer 2	High density polyethylene (HDPE) geo-membrane	1.5 mm
Layer 3	Geo Textile	285 gsm
Layer 4	Drainage layer	300 mm
Layer 5	Geotextile	285 gsm

Cross-section of the bottom liner system



Liner Thickness Calculation: Formula:

$$\text{Thickness, } t = \frac{\rho}{\sigma_{\text{allow}}} \times \frac{x}{(\tan \delta_u + \tan \delta_L) \cos \beta}$$

- Thickness, t** =Thickness in mm
- ρ** =Load
- β** =Angle of Deformation
- x** =Anchorage distance
- σ allow** =Allowable stress
- δu** =Angle of friction above geo membrane
- δL** =Angle of friction below geo membrane

Values for Geo membrane Measure in Performance Tests			
Property		Std Value	Given Value
1	Thickness	1.5mm	1.5 mm
2	Density	0.94 gm/cc	0.94gm/cc
3	Roll Width X Length	6.5 X 171mm	6.9m X 130m
4	Tensile Strength		
	A Tensile Strength at Yield	23 N/mm	30N/m
	B Tensile Strength at Break	43 N/mm	57N/m
	C Elongation at Yield	13%	13%
	D Elongation at Break	700%	700%
	E Secant Modulus (1%)		500MPa
5	Toughness		
	A Tear Resistance (initiation)	187 N	249N
	B Puncture Resistance	530 N	703N
6	Durability		
	A Carbon Black	± 2%	± 2%
	B Oxidation induction time in Mins	> 100	> 100
	C Accelerated Heat Ageing	Negligible Strength Changes after 1 month at 110°C	Negligible Strength Changes after 1 month at 110°C
7	Chemical Resistance		
	A Resistance to Chemical Waste Mixture	10% Strength Change Over 120 days	10% Strength Change Over 120 days
	B Resistance to Chemical Reagents	10% Strength Change Over 7 days	10% Strength Change Over 7 days
8	Environmental Stress Crack	1500hrs	1500hrs

	Resistance		
9	Dimensional Stability	2%	2%
10	Seam Strength	80% or more (of Tensile Strength)	80% or more (of Tensile Strength)

DESIGN OF LEACHATE COLLECTION SYSTEM

The primary function of Leachate Collection System is to collect and convey leachate out of the landfill unit and to control the depth of the leachate above the liner. The leachate collection system should be designed to meet the hydraulic performance standard of maintaining less than 30cm depth of leachate or head above liner, as suggested by USEPA Manual. Flow of leachate through imperfections in the liner system increases with an increase in leachate head above the liner. Maintaining a low leachate level above the liner helps to improve the performance of the composite liners. The main components of leachate collection system are,

- Feeder Pipes
- Header Pipes

Leachate collection system is a network of pipes by which the leachate is collected through feeder pipes and conveyed to header pipes. The design of pipes should consider the following factors,

- The required flow using known percolation impingement rates and pipe spacing
- Pipe size using required flow and maximum slope
- Structural strength of the pipes

Spacing of Feeder Pipes

Spacing of the pipes is calculated as per the standard procedures

Structural Strength of Pipes

Perforated HDPE drainage pipes can provide long-term performance and these pipes transmit fluids rapidly and maintain good service lives. The depth of the drainage layer around the pipe should be deeper than the diameter of the pipe. The pipes can be placed in trenches to provide the extra depth. In addition, the trench serves as a sump (low point) for leachate collection. Pipes shall not be susceptible to particulate and biological clogging and to deflection.

Summary of Leachate collection network

A leachate collection system is a network consisting, 160mm diameter feeder pipe at lateral spacing of 20m connected to 200mm diameter header pipe. The pipes should be HDPE perforated pipes with sufficient strength and should be safe from particulate and biological clogging and deflections.

Leachate Collection Sump

The purpose of leachate collection sump is to collect the leachate from header pipes and active landfill area. The leachate collection sump would be supported by the pumps.

ASSESSMENT OF LANDFILL GAS GENERATION

Central Laboratory


M.P. Pollution Control Board, Bhopal [M.P.]

E/5, Arera Colony, Paryawaran Parisar, Bhopal – 462016
Ph. NO. 0755-2466191, email: cl_mppcb@rediffmail.com

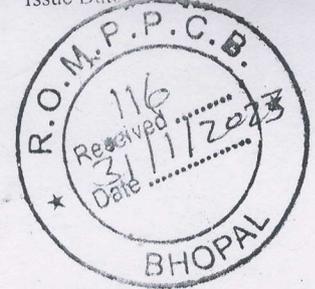


TC-8568

Test Report

Issue No. 428
Issue Date 27/01/2023

Report No. 244
Sample from: Regional Office, M.P. Pollution Control Board, Bhopal.
Reference No: Letter No.62, Dated 13/01/2023
Sample Description: 1.H/P Water Sample Near Water Tank at Village Padariya Bhopal.
Sample Container: Polyethylene Bottle
Sample Volume: 1 x 1 ltr
Sampling by CL/ Customer: Regional Office, M.P. Pollution Control Board, Bhopal
Sampling date: 12/01/2023
Received on: 16/01/2023
Date of Analysis: 16/01/2023
Sampling Method/Plan: APHA, 23rd Edition, 2017 Method 1060
Environmental Condition: Not Mentioned
Preservation status: Preserved as per Protocol
Visual Observations
1 Colour Colourless
2 Appearance Turbid
3 Odour No Odour Observed



S. No.	Analyte Tested	Unit	Method No:- APHA, 23 rd Edition, 2017	Results
1.	pH	pH Unit	4500 pH ⁺ B	7.02
2.	Total Dissolved Solid	mg/l	2540-C	852
3.	Chloride	mg/l	4500-Cl ⁻ B	166.55
4.	Total Hardness	mg/l	2340 C	386
5.	Nitrate	mg/l	4500-NO ₃ B	6.72
6.	Sulphate	mg/l	4500 - SO ₄ ⁻² E	26.58

Remark : 1. No statutory liability accepted for samples not collected by M.P.P.C.B. -
2. The results relate only to the items tested
3. The report shall not be reproduced except in full without permission of Incharge Central Laboratory, MP, Pollution Control Board, Bhopal.
4. Any other: NA

(Dr. Alok Saxena)
Authorized Signatory
Chief Chemist

Central Laboratory MPPCB Bhopal
Page 1 of 2

Chemist
30/1/2023



Central Laboratory
M.P. Pollution Control Board, Bhopal [M.P.]
E/5, Arera Colony, Paryawaran Parisar, Bhopal – 462016
Ph. NO. 0755-2466191, email: cl_mppcb@rediffmail.com

Test Report

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Received on: 17/11/2022
Date of Analysis: 17/11/2022
Sampling Method/Plan: *APHA, 23rd Edition, 2017 Method 1060*
Environmental Condition: Not Mentioned
Preservation status: Preserved as per Protocol

S. No	Analyte Tested	Unit	Method No.	Results
1.	Copper	mg/l	3111 B, APHA, 23 rd Edition, 2017	0.028
2.	Iron	mg/l		0.41
3.	Zinc	mg/l		5.02
4.	Lead	mg/l		0.04
5.	Nickel	mg/l		BDL
6.	Chromium	mg/l		BDL
7.	Cadmium	mg/l		BDL
8.	Arsenic	µg/l	3113 B APHA, 23 rd Edition, 2017	BDL
9.	Mercury	ppb	-	#
10.	Cyanide	mg/l	4500 -CNE	ND

Remark: 1. No statutory liability accepted for samples not collected by M.P.P.C.B
2. The results relate only to the items tested
3. The report shall not be reproduced except in full without permission of Incharge Central Laboratory, MP, Pollution Control Board, Bhopal.
4. BDL- Below detection limit. Cu- Detection Limit 0.006 mg/l, Zn- Detection Limit 0.004 mg/l,
Fe- Detection Limit 0.075 mg/l, Co- Detection Limit 0.004 mg/l, Pb- Detection Limit 0.021 mg/l,
Cd- Detection Limit 0.0004 mg/l, Cr- Detection Limit 0.013 mg/l, Ni- Detection Limit 0.175 mg/l,
As- Detection Limit 0.05 ppb #- Instrument out of order ND- Not Detectable.


(Dr. Alok Saxena)
Authorized Signatory
Chief Chemist

Central Laboratory MPPCB Bhopal

End – of – Report

Page 2 of 2



ANALYSIS REPORT FOR
WATER / WASTE WATER SAMPLE

M.P. Pollution Control Board, Bhopal
E - 5, Arera Colony
Bhopal 16
Bhopal
Tel:0755- 2466392, 4278342

Sample ID:292757 - Analysis Completion:22/04/2022

Project/Action Plans / LAB Inward : 5844

TEST REPORT

Test Report No. : 5844

Date: 22/04/2022

1. Name of the Customer : MSW Site, Aadapur Chhawani, District - Bhopal - 129580
2. Address : -,Aadapur Chhawani Raisen road, Bhopal,Bhopal
Bhopal-, Taluka : Hujur, District : Bhopal, GIDC : Not In SIDC
3. Nature of Sample : WAR-Water Act (Routine), (Insp Type : ROU-Routine Visit)
4. Sample Collected By & Analysed By : Mr. Shailendra Kahshap & VINITA GAUTAM,JR.SCT.
5. Quantity of Sample Received : 2.5 LITRE
6. Code No. of the Sample : 292757
7. Date & Time of Collection & Inwarding : 28/03/2022 , (0900 to 0900) & 29/03/2022
8. Date of Start & Completion of Analysis : 29/03/2022 & 22/04/2022
9. Sampling Point : MSW Site, Aadapur Chhawani, District - Bhopal
10. Flow Details (Remarks) : Plantation and garden
11. Mode of Disposal : Plantation
12. Ultimate Receiving Body :
13. Temperature on Collection : 28 & pH Range on pH Strip :7-8
14. Carboys Nos for : AC & Color & Appearance :Clear
15. Water Consumption & W.W.G (KLPD) : Ind :0.000 , Dom :0.000 & Ind :0.000 , Dom :0.000

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	Temperature	Centigrade	(2550-B, APHA Std. Methods, 23rd Edn.)	2°C-99 °C	28
2	pH	pH Units	4500-H+B APHA std. methods 23 rd Edn.	0.5-13.5	7.71
3	Total Solids	mg/l	(2540 B, APHA std. methods 23rd Edn.)	10-100000mg/l	806
4	Total Dissolved Solids	mg/l	(2540 B, APHA std. methods 23rd Edn.)	10-10000mg/l	784
5	Suspended Solids	mg/l	(2540 B, APHA std. methods 23rd Edn.)	5-10000mg/l	22
6	Total Kjeldahl Nitrogen	mg/l	(4500-Norg-B, APHA Std. Methods, 23rd Edn.)	0.28-100 mg/l	1.4
7	Nitrate	mg/l	(4500-NO3 B, APHA Std. Methods, 23rd Edn.)	0.01-100.0 mg/l	10.28
8	Total Hardness as CaCO3	mg/l	(2340 C, APHA Std. Methods, 23rd Edn.)	2-1000mg/l	320
9	Chloride	mg/l	4500-Cl- B, APHA Std. Methods, 23rd Edn.	5-100mg/l	77.85
10	Sulphate	mg/l	(4500 E, APHA Std. Methods, 23rd Edn.)	1-400mg/l	1.69
11	Phosphate	mg/l	(4500 P D, APHA Std. Methods, 23rd Edn.)	0.01-20mg/l	0.58
12	Chemical Oxygen Demand	mg/l	(5220 B, APHA Std. Methods, 23rd Edn.)	5.0-10000 mg/l	9.8
13	Fluoride	mg/l	(4500-F-D, APHA Std. Methods, 23rd Edn.)	0.1-10 mg/l	BDL
14	Iron	mg/l	(3111 B APHA Standard methods, 23rd Edn.)	0.02-150mg/l	0.12
15	Mangenesese	mg/l	(3500-mn B APHA Standard methods , 23rd Edn.)	0.0258-5.927mg/l	0.01
16	Zinc	mg/l	(3111 B APHA Standard methods, 23rd Edn.)	0.005-100mg/l	0.08
17	Total Chromium	mg/l	3111 B APHA Standard methods , 23rd Edn.)	0.02-150mg/l	BDL
18	Copper	mg/l	3111 B APHA Standard methods 23rd Edn.)	0.01-150 mg/l	0.008
19	Nickel	mg/l	(3111 B APHA Standard methods 23rd Edn.)	0.02-150 mg/l	BDL
20	Lead	mg/l	(3111 B APHA Standard methods 23rd Edn.)	0.05-150 mg/l	BDL
21	Cadmium	mg/l	(3111 B APHA Standard methods 23rd Edn.)	0.002-100 mg/l	BDL
22	B.O.D (3 Days 27oC)	mg/l	IS 3025,1993	1-10000 mg/l	0.5
23	Arsenic	mg/l	(3111 B APHA Standard methods 23rd Edn.)	-	BDL
24	Conductivity	micromho/cm	2510 B, APHA std. methods 23rd Edn.	0.1µS-100 mS/m	1176
25	MERCURY	mg/l	(3111 B APHA Standard methods 23rd Edn.)		ND
26	Calcium Hardness as CaCO3	Mg/Lts	(3500- Ca B, APHA Std. Methods, 23rd Edn)	5-10000mg/l	176
27	Magnesium Hardness as CACO3	Mg/Lts	(3500- Mg B, APHA Std. Methods, 23rd Edn)	5-10000mg/l	144

Laboratory Remarks : AdequaTE By:1152-lab_1152 Dt.: 22/04/2022

**ALOK SAXENA,Chief
Chemist**

Field Observation :

Note :

1. * - These parameters are covered under the scope of NABL.
2. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
3. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
4. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Board in writing.
5. The Board is not responsible for the authenticity for the samples not collected by the Board's officials.
6. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Madhya Pradesh Jurisdiction only.
7. Permissible Limits: as per Schedule VI of EPA Rules, 1986 as ammended by Second and Third ammendment 1993 for Effluents
8. Physicochemical and microbiological parameters, Std.Methods for Water and Waste Water- 22nd Edition by APHA.
9. Bioassay test (for toxicity) -IS:6582:Part-2:2001; Reaffirmed 2007.

Central laboratory, M.P. Pollution Control Board, Bhopal

Report no 250/2

Sample description :- 2. Bore well water at MSW site Adampur Chawni, at plantation site.

Date of collection:- 15/12/2021

Date of receipt:- 15/12/2021

Date of analysis- 15/12/2021

S.No	Parameter	units	Method number APHA, 23 rd Edition, 2017	Result	IS10500:2012
1	Arsenic	mg/l	3113 B	BDL	0.01 mg/l
2	Cadmium	mg/l	3111 B	BDL	0.01 mg/l
3	Chromium	mg/l	3111 B	BDL	0.05 mg/l
4	Copper	mg/l	3111 B	BDL	0.05 mg/l
5	Cyanide	mg/l	4500 -CNE	ND	0.05 mg/l
6	Lead	mg/l	3111 B	BDL	0.05 mg/l
7	Mercury	ppb	3112 B	BDL	0.001 mg/l
8	Nickel	mg/l	3111 B	BDL	Not given
9	Nitrate	mg/l	4500-NO ₃ B	6.55	45.0 mg/l
10	pH	pH units	4500 pH ⁺ B	5.66	6.5- 8.5
11	Iron	mg/l	3111 B	BDL	0.3 mg/l
12	Total hardness	mg/l	2340 C	62	300.0 mg/l
13	Chlorides	mg/l	4500-Cl ⁻ B	17.73	250.0 mg/l
14	Dissolved solids	mg/l	2540-C	138	500.0 mg/l
15	Zinc	mg/l	3111 B	0.31	5.0 mg/l
16	Sulphates	mg/l	4500 - SO ₄ ⁻² E	17.96	200.0 mg/l

Chief Chemist

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Central laboratory, M.P. Pollution Control Board, Bhopal

Sample description :- 1. Hand Pump water Chawni Pathar Naka
 2. Tube well of Sh Kanta Prasad , village Kolua
 3. Tube well water of Sh kasha ram H. No. 89, Village Padariya Kachhi
 4. Bore well water at MSW site Adampur Chawni (Near gate No.1)

Date of collection:- 10/12/2021

Date of receipt:- 13/12/2021

Date of analysis- 13/12/2021

S.No	Parameter	Method No APHA, 23 rd Edition, 2017	units	Results				IS 10500:2012
				1	2	3	4	
1	Arsenic	3113 B	mg/l	Not detected	Not detected	Not detected	Not detected	0.01 mg/l
2	Cadmium	3111 B	mg/l	Not detected	Not detected	Not detected	Not detected	0.01 mg/l
3	Chromium	3111 B	mg/l	Not detected	Not detected	Not detected	Not detected	0.05 mg/l
4	Copper	3111 B	mg/l	0.01	0.006	0.006	0.007	0.05 mg/l
5	Cyanide	4500 - CNE	mg/l	Not detected	Not detected	Not detected	Not detected	0.05 mg/l
6	Lead	3111 B	mg/l	Not detected	Not detected	Not detected	Not detected	0.05 mg/l
7	Mercury	3112 B	ppb	Not detected	Not detected	Not detected	Not detected	0.001 mg/l
8	Nickel	3111-B	mg/l	Not detected	Not detected	Not detected	Not detected	Not given
9	Nitrate	4500- NO ₃ B	mg/l	15.14	10.62	9.44	10.25	45.0 mg/l
10	pH	4500 pH ⁺ B	pH units	6.79	6.30	6.59	5.60	6.5- 8.5
11	Iron	3111 B	mg/l	0.63	0.03	9.16	0.09	0.3 mg/l
12	Total hardness	2340 C	mg/l	438.0	80.0	206.0	52.0	300.0 mg/l
13	Chlorides	4500-Cl ⁻ B	mg/l	96.0	17.99	269.91	29.99	250.0 mg/l
14	Dissolved solids	2540-C	mg/l	518	102	112	108	500.0 mg/l
15	Zinc	3111 B	mg/l	0.12	0.07	Not detected	Not detected	5.0 mg/l
16	Sulphates	4500 - SO ₄ ⁻² E	mg/l	133.28	8.14	17.48	17.98	200.0 mg/l
17	Fluoride	4500 - FD	mg/l	0.83	0.11	0.65	1.82	Not given

Chief Chemist

**REGIONAL OFFICE,
M.P POLLUTION CONTROL BOARD,
Paryawaran Parisar, E-5 , Arera Colony, Bhopal (M.P)**

ANALYSIS REPORT

Report No. **2153/April/2023**
Sample from:- **MSW Site, Vill- Adampur Khanti Bhopal**

S. No.	Description of sample	Date of collection	Collected by	Date of analysis
1.	Ambient Air Monitoring Near Scientific Land fill MSW Site Vill- Adampur Khanti Bhopal	04/04/2023	Mr. S. Kashyap (Sampler) & Mr. Arjun Parte (F.A.) RO Staff Regional Office, M. P. Pollution Control Board, Bhopal	05/04/2023
2	Ambient Air Monitoring Near Admin Block MSW Site Vill- Adampur Khanti Bhopal			

AMBIENT AIR MONITORING

S. No.	Analyte Tested	Unit	Result 1	Result 2
1.	Respirable Suspended Particulate Matter PM 10	$\mu\text{g}/\text{M}^3$	383.9	288.9
2.	SO ₂	$\mu\text{g}/\text{M}^3$	59.5	49.1
3.	NOX	$\mu\text{g}/\text{M}^3$	68.0	61.2

Remark Show that the parameter exceeds the prescribed limit.

Report Prepared by

Chemist

Scientist

**REGIONAL OFFICE,
M.P POLLUTION CONTROL BOARD,
Paryawaran Parisar, E-5 , Arera Colony, Bhopal (M.P)**

ANALYSIS REPORT

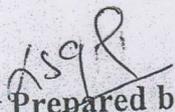
Report No. 2140/Feb/2023
Sample from:- BMC Solid Waste Disposal Site Vill- Adampur Chhawani Bhopal

S. No.	Description of sample	Date of collection	Collected by	Date of analysis
1.	Ambient Air Monitoring Near Admin Block, BMC Solid Waste Disposal Site Vill- Adampur Chhawani Bhopal	26.02.2023	Mr. Arjun Parte (F.A.) & RO Staff Regional Office, M. P. Pollution Control Board, Bhopal	27.02.2023
2	Ambient Air Monitoring Near Leachate Treatment Plant, BMC Solid Waste Disposal Site Vill- Adampur Chhawani Bhopal			

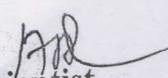
AMBIENT AIR MONITORING

S. No.	Analyte Tested	Unit	Result 1	Result 2
1.	Respirable Suspended Particulate Matter PM 10	$\mu\text{g}/\text{M}^3$	271.7	366.0
2.	SO ₂	$\mu\text{g}/\text{M}^3$	21.9	23.4
3.	NOX	$\mu\text{g}/\text{M}^3$	61.4	70.2

Remark Show that the parameter exceeds the prescribed limit.

Report Prepared by 


Chemist


Scientist