

Compliance of Environmental Clearance conditions for the period 1st April, 2023 to 30th September, 2023

Project: Setting up a Grass Root 9 MMTPA Refinery cum Petrochemical Complex project at Tehsil Pachpadra, District Barmer (Rajasthan) by M/s Hindustan Petroleum Corporation Limited (HPCL)

Reference No.: F. No. J-11011/87/2013-IA-II(I) dated 13th September, 2017 and its amendment dated 31st January, 2020 by Ministry of Environment, Forests and Climate Change, Gol.

15. Compliance of terms and conditions (Specific Conditions)

(i)	Consent to Establish/Operate for the project shall be obtained from the State Pollution Control Board as required under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974.	Complied. CTE obtained on 8 th Jan 2018 from RSPCB (order no: 2017-2018/HDF/2618). Further, CTE extension obtained upto November, 2024 from RSPCB vide letter no. F5/(O&G-329)/RSPCB/OGM/584-586; dated: 10/08/2022.
(ii)	As already committed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged outside the premises. The effluent discharge, if any, shall conform to the standards prescribed under the Environment (Protection) Rules, 1986.	Zero Liquid Discharge for the refinery is ensured and no waste/treated water shall be discharged outside the premises. All effluent discharge shall conform to the standards prescribed under the Environment (Protection) Rules, 1986.
(iii)	Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid Waste Management Rules, 2016 shall be obtained and the provisions contained in the Rules shall be strictly adhered to.	Shall be complied with. Authorizations for construction related Hazardous waste taken from RSPCB dated October 10 th , 2023 vide authorization No. RPCB/HWM/2023-2024/Oil and Gas/HSW/1. Fresh Application for Operation Phase Hazardous waste shall be taken.
(iv)	Environmental Standards for Petroleum Oil Refinery dated 18 th March 2008 and Environmental Standards for Petrochemical (Basic and Intermediates) dated on 9 th November, 2012, and its amendments from time to time shall be followed.	Shall be complied with.
(v)	To control source and the fugitive emissions, suitable pollution control devices shall be installed to meet the prescribed norms and/or the NAAQS. Multi-cyclone followed by bag filter shall be provided to the DCU coke	Shall be complied with. Dust Extraction system is provided at outlet of Coke crusher within DCU and at bunker loading area of Captive Power Plant (CPP). All transfer point of

	<p>based CFBC boiler to control particulate emissions within permissible limit. The gaseous emissions shall be dispersed through stack of adequate height as per CPCB/SPCB guidelines.</p>	<p>conveyors is provided with dry fog type dust suppression system. Coke storage at coke yard is provided with Sprinkler Type dust suppression system. Adequate stack height is provided in all stacks as per CPCB/SPCB guidelines.</p>
(vi)	<p>Total water requirement shall not exceed 5300 cum/hr to be met from Indira Gandhi Canal. Necessary permission in this regard shall be obtained from the concerned regulatory authority. No ground water shall be used without prior permission from the CGWA.</p>	<p>Noted.</p> <p>Permission for withdrawal of water from Indira Gandhi Nahar Pariyojana (IGNP) is in place. No ground water shall be used without prior permission from the Central Ground Water Authority (CGWA).</p>
(vii)	<p>Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through guard pond.</p>	<p>Shall be complied with.</p>
(viii)	<p>Hazardous chemicals shall be stored in tanks, tank farms, drums, carboys etc. Flame arresters shall be provided on tank farm, and solvent transfer to be done through pumps.</p>	<p>Shall be complied with.</p>
(ix)	<p>Process organic residue and spent carbon shall be sent to cement industries. ETP sludge, process inorganic & evaporation salt shall be disposed off to the TSDF. The ash from boiler shall be sold to brick manufacturers/cement industry.</p>	<p>Shall be complied with.</p> <p>During operation of CPP, efforts will be made to sell the fly ash produced from CFBC boilers to brick manufacturers/cement industry as advised in the EC letter granted by MoEFCC. ETP sludge will be routed to Delayed Coker Unit (DCU) for processing.</p>
(x)	<p>The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 as amended time to time. All transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.</p>	<p>Shall be complied with.</p>
(xi)	<p>Fly ash should be stored separately. as per CPCB guidelines so that it should not adversely affect the air quality, becoming air borne by wind or water regime during rainy season by flowing along with the storm water. Direct exposure of workers to fly ash & dust should be avoided.</p>	<p>Noted.</p> <p>Fly ash collected from different locations of the boiler (including ESP, APH) shall be conveyed to Reinforced Cement Concrete (RCC) silo through dense phase system (closed conveying). RCC sump to collect floor wash at different location of fly ash handling shall be provided. Separate silos shall be provided for fly ash and bed ash. There shall be one common RCC silo for fly ash collection from two Circulating Fluidized Bed Combustion (CFBC) boilers in each power block with capacity of 5 days of operation of both CFBC boilers at MCR. Ash from all silos shall be directly unloaded into container trucks in</p>

	<p>The company shall undertake waste minimization measures as below: -</p> <ul style="list-style-type: none"> (a) Metering and control of quantities of active ingredients to minimize waste. (b) Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. (c) Use of automated filling to minimize spillage. (d) Use of Close Feed system into batch reactors. (e) Venting equipment through vapour recovery system. (f) Use of high pressure hoses for equipment clearing to reduce wastewater generation. 	<p>dry form through unloading spout. There shall be two such unloading spout in each silo so that unloading can be done through two trucks simultaneously. Provision shall also be made at each fly ash silo to moisture the ash and unload it in the open truck for further disposal outside the refinery complex.</p>
(xii)		<p>Noted.</p> <ul style="list-style-type: none"> (a) – (e) Shall be complied with, as applicable. (f) Shall be complied with during the operation and maintenance phase of the project.
(xiii)	<p>The green belt of at least 10 m width shall be developed in more than 33% of the total project area, mainly along the plant periphery, in downward wind direction, and along road sides etc. As many as 25000 trees to be planted per year during first five years. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.</p>	<p>HRRL has acquired 4380.71 acres land from Government of Rajasthan. Total plot area of refinery and petrochemical (including Marketing Terminal) is 4126.95 acres. Total plot area of refinery and petrochemical (excluding Marketing Terminal) is 3876.95 acres. The allocated greenbelt of refinery area is 1279.38 acres and Marketing Terminal is 82.5 acres which is 33% of the total plot area within the Boundary line.</p> <p>AFRI has completed the Green Belt Study and released Detail Project Report (DPR) to HRRL. The DPR which has been prepared with the details of Green Belt development Plan was submitted to DFO, Barmer (Rajasthan) for necessary action.</p> <p>The Forest department replied that the proposed green belt area is saline water-logged area, due to which the survival potential of plants is very less. Forest department mentioned that the advanced soil work/plantation work mentioned in DPR prepared by AFRI Jodhpur is very technical in nature and it is not practical to get the work done.</p> <p>Later on, Forest and Environment Ministry, Rajasthan has suggested that HRRL should develop the green belt area as per the guidelines given in AFRI report.</p>

22

		<p>HRRL has planned to develop tree plantation in a phased manner considering the difficulties expressed by Forest Department. In 1st phase 5000 demo tree plantation is planned in 11.25 acres. A public tender for tree plantation has been floated and the order is expected to be finalized by 1st week of Jan, 2024. Plantation works will be taken up immediately after order placement.</p> <p>In addition to above, HRRL has planned to develop a Nursery for supporting the tree plantation in green belt area where in 50000 plant saplings per year are planned. A public tender in this regard is released for development of nursery at HRRL site for development of green belt in a phased manner.</p>
(xiv)	<p>All the commitment made regarding issues raised during the Public Hearing/ consultation meeting held on 30th May, 2014 shall be satisfactorily implemented.</p>	<p>Noted and will be implemented.</p>
(xv)	<p>At least 2.5% of the total project cost shall be allocated for Enterprise Social Commitment based on Public Hearing and item-wise details along with the time bound action plan shall be prepared and submitted to the Ministry's Regional Office.</p>	<p>MoEFCC has accorded amendment in the EC vide letter no. F. No. J-11011/87/2013-IA-II(I) dated 31st January, 2020. The revised EC Condition is stated below:</p> <p>"At least Rs. 107.82 Crores (0.25% of the total project cost) shall be allocated for Corporate Environmental responsibility based on Public Hearing issues."</p> <p>CER proposals have been finalized in consultation with Government of Rajasthan (GOR):</p> <ul style="list-style-type: none"> ➤ Construction of alternate route from NH-025 km 92/800 to A/R Saijyali Km 0/0 to 12/500 – HRRL has disbursed 1st Instalment (INR 3.91 Cr) to PWD for construction of road. PWD yet to start the site works. ➤ Construction of BT road from NH-025 Km. 87/500 to A/R Sambhra Km 0/0 to 3/0. - Purchase Order for the construction of roads was placed on 24.12.2020. Sambhra -Jerla Road works completed and handed over to PWD in August 2022.

NW

- Construction of Hospital of 50 bed capacity - Topography survey and Soil Investigation are completed. Detailed Engineering works are in progress. Building completion targeted by August 2024.
- Construction of Senior Secondary School - Foundation works are completed for school building. Superstructure works are in progress. The building completion is targeted by February 2024.
- Avenue Plantation for 90 KM distance has been finalized in consultation with DC, Barmer. AFRI have conducted site survey and sample collection and released a DPR for the same. DPR handed over to Forest department for carrying out the Avenue plantation with funding by HRRL. Avenue tree plantation is being handled by Forest department as advised by DC-Balotra during recent review meeting. Forest dept to carry out the work on deposit work based on DPR.

S. No.	Name of the Road	Distance KM
1.	Highway to Sambhra	4
2.	Highway to Ashapura Mandir	1
3.	Bagundi to Malwa	10
4.	Pachpadra to Patodi	25
5.	Pachpadra to Khed	10
6.	Jerla to Sambhra	10
7.	Highway to Mungra	10
8.	Refinery to Champabery	5
9.	Lakhe ki Beri to Sajiyali	9
10.	Highway to Karni Mata Mandir	5
11.	Highway to Chirdhani Mandir	1

NM

(xvi)	For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.	Shall be complied with.
(xvii)	The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Firefighting system shall be as per the norms.	Shall be complied with.
(xviii)	Continuous online (24x7) monitoring system. Both for emissions and the effluent shall be installed within the plant site for measurement of discharge and pollutants concentration. Data shall be uploaded on the company's website and provided to the respective RO's of MoEF&CC, CPCB and SPCB.	Shall be complied with.
(xix)	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Shall be complied with during the operation phase of the project.
(xx)	Wetland habitat shall be provided for migratory bird namely, Demoiselle Crane, at the reservoir and green belt areas.	Shall be complied with. The Pachpadra lake is a rain water lake formed mostly during rainy seasons and it has created a natural wetland habitation which attracts migratory bird like demoiselle cranes. This natural habitation is not affected and no impact on migratory birds has been noticed during a site visit and survey carried out in the vicinity of the project site and in and around Pachpadra lake by Biological expert from EIA Consultant M/s EIL. This action on the natural wetland can be further enhanced or developed by taking guidance from subject matter expert agency in future as we progress. In this regard a Site survey & study was conducted by Jai Narain Vyas University (JNVU), Jodhpur & the same has been completed. Accordingly, DPR has been prepared & submitted by the agency. Tender for execution works is floated.
(xxi)	At least 10 natural surface water bodies shall be rejuvenated and developed as complete eco-system with the tree plantation development and growth using satellite imageries.	Shall be complied with. A comprehensive list of 15 more water bodies is identified and obtained concurrence from DC Barmer. The following water bodies (10 Nos) have been identified by DC Barmer for rejuvenation: Sarla Nada, Kasaiyon Ki Nadi,

NN

		Kher ka Talav, Bhaibahan Ka Nada, Gulab Sagar, Tejori Nadi, Kola Nada, Khari Nadi, Ram Ghat Talav, Navoda Talav. An amount of INR 10 lakhs paid to watershed department in July 2023. State watershed management department to develop technical details and undertake implementation of work with funding by HRRL.
(xxii)	The international boundary is reportedly at a distance of 100-150 km from the project site. In view of the security apprehensions, necessary permission required, if any, shall be obtained from the Ministry of Defense and/or Ministry of Home Affairs.	NOC has been renewed by the IAF HQ SWAC vide letter SWAC/2564/8/5949/ATS (BM) dated 16th October, 2023.
15.1	Compliance of other general conditions	
(i)	The project authorities must strictly adhere to the stipulations made by the State Government, Central Pollution Control Board, State Pollution Control Board and any other statutory authority.	Noted and shall be complied with. Stipulations of RSPCB vide CTE dated January 8, 2018 shall be complied with.
(ii)	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Noted and shall be complied with.
(iii)	The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one station each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.	The locations of ambient air quality monitoring stations have been decided in consultation with the Rajasthan State Pollution Control Board (RSPCB). Three (03) nos. of continuous ambient air quality monitoring stations will be installed. One no. station each will be installed in the upwind, downwind direction and where maximum ground level concentrations are anticipated.
(iv)	The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16 th November, 2009 shall be followed.	Shall be complied with.
(v)	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall, conform to the standards prescribed. Under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	Necessary specification details shall be included in all the Engineering, Procurement & Construction (EPC) Contracts for implementation.

MM

(vi)	The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and use the same water for the process activities of the project to conserve fresh water.	All water will be collected through storm water system in Guard Pond. Recharging the ground water is not envisaged due to High salinity of Ground water.
(vii)	Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.	Shall be complied with. During the project phase, EPC Contractors are providing training to concerned workers and engineers who are involved in chemical handling. Pre-employment medical examination is being carried out for all workers and staff.
(viii)	The company shall also comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management and risk mitigation measures relating to the project shall be implemented.	Shall be complied with.
(ix)	The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. CSR activities shall be undertaken by involving local villages and administration.	Shall be complied with.
(x)	The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.	Shall be complied with.
(xi)	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/pollution control measures shall not be diverted for any other purpose.	Fund provision has been envisaged for capital /recurring cost towards environment pollution control measures.
(xii)	A copy of clearance letter shall be sent by the project proponent to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal.	Complied. EC letter sent to following agencies: BDO - Panchayat Samiti – Balotra, CEO, Zilla Parishad – Barmer, Sarpanch - Sambhra Village, Sarpanch - SRK Village, RSPCB RO-Jodhpur, vide our letter dated October 5 and 9, 2017.
(xiii)	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-	The last compliance report for the period October 2022 to March 2023 was submitted to all statutory authorities on June 1st, 2023 and the same has been uploaded on the HRRL website with following link.

NW

	mail) to the respective Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.	https://www.hrrl.in/ec_compliance_report
(xiv)	The environmental statement for each financial year ending 31 st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of MoEF&CC by e-mail.	Shall be compiled. Form-V, Environmental statement shall be submitted to Rajasthan State Pollution Control Board after the Consent to Operate (CTO) is obtained before commissioning of the Project.
(xv)	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at http://moef.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.	Complied. Environmental Clearance has been advertised on September 27, 2017 in Times of India (English) and Rajasthan Patrika (Hindi) Newspapers. A copy of the same has been sent to MoEF&CC Regional Office at Lucknow vide HPCL letter dated October 5, 2017.
(xvi)	The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.	Final approval of the project from MoPNG has been obtained on 9th October 2017. Financial closure was completed on 28th January 2019. Detail Engineering Design has been completed & construction work is in progress.
16	The Ministry may revoke or suspend the clearance, at subsequent stages, if implementation of any of the above conditions is not satisfactory.	Noted
17	The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.	Noted
18	The above conditions will be enforced, inter alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Water Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Trans boundary	Noted

MM

Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

2016

2/2

Post Environmental Monitoring Report

For

**M/s HPCL Rajasthan Refinery Limited
(HRRL)**

At

Barmer, Rajasthan

Period : **April – June 2023**

Prepared by



Netel (India) Limited

W-408, MIDC Rabale, TTC Industrial Area

Navi Mumbai – 400 701, Maharashtra

Phone : 022 27606016

email : ems@netel-india.com

POST ENVIRONMENTAL DATA COLLECTION AT BARMER, RAJASTHAN

Name of Client M/s HPCL Rajasthan Refinery Limited (HRRL)
Tel Bhavan, Sahkar Marg Lal Kothi Vistar
Jyoti Nagar, Jaipur – 302 005
Rajasthan.

Project Management Consultant (PMC)
M/s. Engineers India Limited (EIL)
Sector-16 (on NH-8),
Gurugram, Haryana 122001

Name of Contractor NETEL (INDIA) LIMITED
Environment Management Services
W-408, Pipeline Road, MIDC Rabale
TTC Industrial Area, Navi Mumbai – 400 701

Work Order HRRL/LOA/2020/18, Dated 21.08.2020

Nature of Job Environmental Baseline Data Collection

 Prepared By Sr. Chemist	 Approved By Technical Manager	 Issued By Quality Manager
---	---	---





INDEX

SR. NO.	TITLE	PAGE NO.
1	AMBIENT AIR QUALITY	1
2	WATER QUALITY	7
3	SOIL QUALITY	14
4	NOISE LEVEL MONITORING	17

1. AMBIENT AIR QUALITY

Parameter Details:

Sr. No.	Parameters	Unit	Analysis Method	CPCB limit
1	Particulate Matter (PM ₁₀)	µg/m ³	IS 5182 (Part 23)	100
2	Particulate Matter (PM _{2.5})	µg/m ³	IS 5182 (Part 24)	60
3	Sulphur Dioxide (SO ₂)	µg/m ³	IS 5182 (Part 2)	80
4	Oxides of Nitrogen (NO _x)	µg/m ³	IS 5182 (Part 6)	80
5	Carbon Monoxide (CO)	mg/m ³	IS 5182 (Part 10)	2
6	Ozone (O ₃)	µg/m ³	IS 5182 (Part 9)	100
7	Benzene (C ₆ H ₆)	µg/m ³	IS 5182 (Part 11)	5

Results:

Sr. No.	Parameters	Unit	Richholi Village		
			03.04.2023	17.04.2023	02.05.2023
---	Date of Sampling	---	03.04.2023	17.04.2023	02.05.2023
---	Sample Code	---	NIL/OT/04/23/454	NIL/OT/04/23/460	NIL/OT/05/23/610
1	Particulate Matter (PM ₁₀)	µg/m ³	67.8	72.2	69.8
2	Particulate Matter (PM _{2.5})	µg/m ³	30.4	39.5	33.4
3	Sulphur Dioxide (SO ₂)	µg/m ³	13.9	13.9	11.5
4	Oxides of Nitrogen (NO _x)	µg/m ³	21.7	18.3	14.7
5	Carbon Monoxide (CO)	mg/m ³	1.06	0.90	0.93
6	Ozone (O ₃)	µg/m ³	11.8	8.1	8.8
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.2	<1.0

Sr. No.	Parameters	Unit	Richholi Village		
			16.05.2023	01.06.2023	15.06.2023
---	Date of Sampling	---	16.05.2023	01.06.2023	15.06.2023
---	Sample Code	---	NIL/OT/05/23/616	NIL/OT/06/23/307	NIL/OT/06/23/313
1	Particulate Matter (PM ₁₀)	µg/m ³	72.5	75.7	69.4
2	Particulate Matter (PM _{2.5})	µg/m ³	26.9	39.5	25.6
3	Sulphur Dioxide (SO ₂)	µg/m ³	13.9	12.9	12.2
4	Oxides of Nitrogen (NO _x)	µg/m ³	19.2	16.4	16.8
5	Carbon Monoxide (CO)	mg/m ³	0.91	1.00	0.88
6	Ozone (O ₃)	µg/m ³	10.8	7.6	12.1
7	Benzene (C ₆ H ₆)	µg/m ³	1.4	<1.0	<1.0



Results:

Sr. No.	Parameters	Unit	Kiyar Village		
			05.04.2023	19.04.2023	04.05.2023
---	Date of Sampling	---	05.04.2023	19.04.2023	04.05.2023
---	Sample Code	---	NIL/OT/04/23/455	NIL/OT/04/23/461	NIL/OT/05/23/611
1	Particulate Matter (PM ₁₀)	µg/m ³	57.7	62.2	58.7
2	Particulate Matter (PM _{2.5})	µg/m ³	26.5	33.4	24.7
3	Sulphur Dioxide (SO ₂)	µg/m ³	10.1	12.4	11.2
4	Oxides of Nitrogen (NO _x)	µg/m ³	15.9	16.1	14.0
5	Carbon Monoxide (CO)	mg/m ³	0.67	0.81	0.78
6	Ozone (O ₃)	µg/m ³	8.0	8.8	12.2
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	<1.0

Sr. No.	Parameters	Unit	Kiyar Village		
			18.05.2023	03.06.2023	20.06.2023
---	Date of Sampling	---	18.05.2023	03.06.2023	20.06.2023
---	Sample Code	---	NIL/OT/05/23/617	NIL/OT/06/23/308	NIL/OT/06/23/314
1	Particulate Matter (PM ₁₀)	µg/m ³	59.9	60.4	63.5
2	Particulate Matter (PM _{2.5})	µg/m ³	30.4	23.0	28.6
3	Sulphur Dioxide (SO ₂)	µg/m ³	9.8	10.5	10.2
4	Oxides of Nitrogen (NO _x)	µg/m ³	13.1	13.7	13.6
5	Carbon Monoxide (CO)	mg/m ³	0.89	0.70	0.69
6	Ozone (O ₃)	µg/m ³	11.3	7.6	6.1
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.3	<1.0



Results:

Sr. No.	Parameters	Unit	Sajiyali Village		
			05.04.2023	19.04.2023	04.05.2023
---	Date of Sampling	---	05.04.2023	19.04.2023	04.05.2023
---	Sample Code	---	NIL/OT/04/23/456	NIL/OT/04/23/462	NIL/OT/05/23/612
1	Particulate Matter (PM ₁₀)	µg/m ³	70.9	71.6	78.6
2	Particulate Matter (PM _{2.5})	µg/m ³	39.1	32.1	30.8
3	Sulphur Dioxide (SO ₂)	µg/m ³	11.3	12.3	13.3
4	Oxides of Nitrogen (NO _x)	µg/m ³	19.1	16.0	17.7
5	Carbon Monoxide (CO)	mg/m ³	0.89	0.91	1.09
6	Ozone (O ₃)	µg/m ³	10.1	11.7	11.4
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	1.1

Sr. No.	Parameters	Unit	Sajiyali Village		
			18.05.2023	03.06.2023	20.06.2023
---	Date of Sampling	---	18.05.2023	03.06.2023	20.06.2023
---	Sample Code	---	NIL/OT/05/23/618	NIL/OT/06/23/309	NIL/OT/06/23/315
1	Particulate Matter (PM ₁₀)	µg/m ³	69.9	67.6	69.5
2	Particulate Matter (PM _{2.5})	µg/m ³	35.6	34.3	26.9
3	Sulphur Dioxide (SO ₂)	µg/m ³	15.6	12.0	15.7
4	Oxides of Nitrogen (NO _x)	µg/m ³	21.5	15.0	21.2
5	Carbon Monoxide (CO)	mg/m ³	1.05	0.96	1.11
6	Ozone (O ₃)	µg/m ³	13.9	9.8	15.1
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	1.2	<1.0

Results:

Sr. No.	Parameters	Unit	Samra ki Dhani		
			07.04.2023	21.04.2023	06.05.2023
---	Date of Sampling	---	07.04.2023	21.04.2023	06.05.2023
---	Sample Code	---	NIL/OT/04/23/457	NIL/OT/04/23/463	NIL/OT/05/23/613
1	Particulate Matter (PM ₁₀)	µg/m ³	72.5	75.1	75.8
2	Particulate Matter (PM _{2.5})	µg/m ³	39.1	38.2	32.6
3	Sulphur Dioxide (SO ₂)	µg/m ³	12.6	14.3	13.4
4	Oxides of Nitrogen (NO _x)	µg/m ³	19.1	18.2	16.9
5	Carbon Monoxide (CO)	mg/m ³	0.94	1.02	0.96
6	Ozone (O ₃)	µg/m ³	11.6	10.2	10.6
7	Benzene (C ₆ H ₆)	µg/m ³	1.2	<1.0	<1.0

Sr. No.	Parameters	Unit	Samra ki Dhani		
			20.05.2023	05.06.2023	19.06.2023
---	Date of Sampling	---	20.05.2023	05.06.2023	19.06.2023
---	Sample Code	---	NIL/OT/05/23/619	NIL/OT/06/23/310	NIL/OT/06/23/316
1	Particulate Matter (PM ₁₀)	µg/m ³	75.0	78.6	74.4
2	Particulate Matter (PM _{2.5})	µg/m ³	29.9	33.9	40.8
3	Sulphur Dioxide (SO ₂)	µg/m ³	14.8	12.6	11.2
4	Oxides of Nitrogen (NO _x)	µg/m ³	20.3	16.3	14.6
5	Carbon Monoxide (CO)	mg/m ³	1.01	0.95	0.92
6	Ozone (O ₃)	µg/m ³	11.8	15.4	12.4
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	<1.0

Results:

Sr. No.	Parameters	Unit	Kasajiyon Ki Dhani		
			07.04.2023	21.04.2023	06.05.2023
---	Date of Sampling	---	07.04.2023	21.04.2023	06.05.2023
---	Sample Code	---	NIL/OT/04/23/458	NIL/OT/04/23/464	NIL/OT/05/23/614
1	Particulate Matter (PM ₁₀)	µg/m ³	56.4	64.0	61.9
2	Particulate Matter (PM _{2.5})	µg/m ³	19.5	30.8	22.1
3	Sulphur Dioxide (SO ₂)	µg/m ³	11.6	12.4	12.9
4	Oxides of Nitrogen (NO _x)	µg/m ³	19.1	15.6	16.3
5	Carbon Monoxide (CO)	mg/m ³	0.85	0.91	0.87
6	Ozone (O ₃)	µg/m ³	13.8	8.0	12.1
7	Benzene (C ₆ H ₆)	µg/m ³	1.1	<1.0	1.3

Sr. No.	Parameters	Unit	Kasajiyon Ki Dhani		
			20.05.2023	05.06.2023	19.06.2023
---	Date of Sampling	---	20.05.2023	05.06.2023	19.06.2023
---	Sample Code	---	NIL/OT/05/23/620	NIL/OT/06/23/311	NIL/OT/06/23/317
1	Particulate Matter (PM ₁₀)	µg/m ³	59.2	58.9	63.0
2	Particulate Matter (PM _{2.5})	µg/m ³	23.9	26.5	33.4
3	Sulphur Dioxide (SO ₂)	µg/m ³	11.3	9.7	12.6
4	Oxides of Nitrogen (NO _x)	µg/m ³	15.6	13.6	16.5
5	Carbon Monoxide (CO)	mg/m ³	0.85	0.85	0.89
6	Ozone (O ₃)	µg/m ³	9.9	10.8	9.9
7	Benzene (C ₆ H ₆)	µg/m ³	1.2	1.1	<1.0



Results:

Sr. No.	Parameters	Unit	Pachpadra		
			03.04.2023	17.04.2023	02.05.2023
---	Date of Sampling	---	03.04.2023	17.04.2023	02.05.2023
---	Sample Code	---	NIL/OT/04/23/453	NIL/OT/04/23/459	NIL/OT/05/23/609
1	Particulate Matter (PM ₁₀)	µg/m ³	68.7	61.5	66.6
2	Particulate Matter (PM _{2.5})	µg/m ³	22.6	29.9	29.5
3	Sulphur Dioxide (SO ₂)	µg/m ³	11.5	12.7	9.9
4	Oxides of Nitrogen (NO _x)	µg/m ³	18.5	17.7	13.3
5	Carbon Monoxide (CO)	mg/m ³	0.72	0.82	1.02
6	Ozone (O ₃)	µg/m ³	10.4	8.8	9.2
7	Benzene (C ₆ H ₆)	µg/m ³	<1.0	<1.0	1.3

Sr. No.	Parameters	Unit	Pachpadra		
			16.05.2023	01.06.2023	15.06.2023
---	Date of Sampling	---	16.05.2023	01.06.2023	15.06.2023
---	Sample Code	---	NIL/OT/05/23/615	NIL/OT/06/23/306	NIL/OT/06/23/312
1	Particulate Matter (PM ₁₀)	µg/m ³	62.5	61.4	60.8
2	Particulate Matter (PM _{2.5})	µg/m ³	27.3	26.5	31.7
3	Sulphur Dioxide (SO ₂)	µg/m ³	14.0	13.0	14.1
4	Oxides of Nitrogen (NO _x)	µg/m ³	17.8	17.6	18.8
5	Carbon Monoxide (CO)	mg/m ³	0.84	0.88	0.85
6	Ozone (O ₃)	µg/m ³	12.1	13.1	11.8
7	Benzene (C ₆ H ₆)	µg/m ³	1.1	<1.0	<1.0

2. WATER QUALITY

Parameter Details:

Sr. No.	Parameters	Unit	IS 10500 Limits (Desirable / Permissible)	Analysis Method
1	Temperature	°C	---	IS 3025 (Part 9)
2	Colour	Hazen	5 / 15	IS 3025 (Part 4)
3	Odour	–	Agreeable	IS 3025 (Part 5)
4	Taste	–	Agreeable	IS 3025 (Part 7 & 8)
5	pH	–	6.5 – 8.5	IS 3025 (Part 11)
6	Turbidity	NTU*	1 / 5	IS 3025 (Part 10)
7	Total Dissolved Solids	mg/lit	500 / 2000	IS 3025 (Part 16)
8	Total Suspended Solids	mg/lit	---	IS 3025 (Part 17)
9	Total Alkalinity	mg/lit	200 / 600	IS 3025 (Part 23)
10	Total Hardness	mg/lit	200 / 600	IS 3025 (Part 21)
11	Calcium Hardness	mg/lit	---	IS 3025 (Part 40)
12	Magnesium Hardness	mg/lit	---	IS 3025 (Part 21 & 40)
13	COD	mg/lit	---	IS 3025 (Part 58)
14	BOD	mg/lit	---	IS 3025 (Part 44)
15	Chloride	mg/lit	250 / 1000	APHA 4500-Cl
16	Salinity	ppt	---	IS 3025 (Part 32)
17	Sulphate	mg/lit	200 / 400	IS 3025 (Part 24)
18	Fluoride	mg/lit	1 / 1.5	IS 3025 (Part 60)
19	Nitrate	mg/lit	45	IS 3025 (Part 34)
20	Total Phosphorus	mg/lit	---	APHA 4500-P-C
21	Total Nitrogen	mg/lit	---	IS 3025 (Part 34)
22	Sodium	mg/lit	---	IS 3025 (Part 45)
23	Potassium	mg/lit	---	IS 3025 (Part 45)
24	Iron	mg/lit	0.3	APHA 3111-B
25	Manganese	mg/lit	0.1 / 0.3	APHA 3111-B
26	Cadmium	mg/lit	0.003	APHA 3111-B
27	Lead	mg/lit	0.01	APHA 3111-B
28	Zinc	mg/lit	5 / 15	APHA 3111-B
29	Nickel	mg/lit	0.02	APHA 3111-B
30	Copper	mg/lit	0.05 / 1.5	APHA 3111-B
31	Total Coliform	MPN/100ml	Absent	IS 1622 : 1981
32	Faecal Coliform	–	Absent	IS 1622 : 1981

Note: * Nephelometric Turbidity Unit



Results: Surface Water

Sr. No.	Parameters	Unit	Gulab Sagar Lake (S/W)		
			04.04.2023	03.05.2023	02.06.2023
---	Date of Sampling	---	04.04.2023	03.05.2023	02.06.2023
---	Sample Code	---	NIL/OT/04/23/447	NIL/OT/05/23/603	NIL/OT/06/23/300
1	Temperature	°C	27.8	27.6	29.8
2	Colour	Hazen	53	48	43
3	Odour	–	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable
5	pH	–	7.48	7.80	8.20
6	Turbidity	NTU	20.5	23.7	29.6
7	Total Dissolved Solids	mg/lit	128	150	137
8	Total Suspended Solids	mg/lit	16	17	22
9	Total Alkalinity	mg/lit	96.8	88.0	92.4
10	Total Hardness	mg/lit	44.4	44.4	48.5
11	Calcium Hardness	mg/lit	28.3	32.3	28.3
12	Magnesium Hardness	mg/lit	16.2	12.1	20.2
13	COD	mg/lit	10	12	8
14	BOD	mg/lit	<5	<5	<5
15	Chloride	mg/lit	16.0	13.6	19.7
16	Salinity	ppt	0.07	0.05	0.06
17	Sulphate	mg/lit	2.8	3.6	3.3
18	Fluoride	mg/lit	0.27	0.31	0.29
19	Nitrate	mg/lit	<0.5	<0.5	<0.5
20	Total Phosphorus	mg/lit	0.85	0.76	1.23
21	Total Nitrogen	mg/lit	2.11	1.69	2.53
22	Sodium	mg/lit	12.6	11.5	12.7
23	Potassium	mg/lit	<0.05	<0.05	<0.05
24	Iron	mg/lit	0.69	0.50	0.52
25	Manganese	mg/lit	<0.1	<0.1	<0.1
26	Cadmium	mg/lit	<0.003	<0.003	<0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01
28	Zinc	mg/lit	<0.05	<0.05	<0.05
29	Nickel	mg/lit	<0.01	<0.01	<0.01
30	Copper	mg/lit	<0.04	<0.04	<0.04
31	Total Coliform	MPN/100ml	8	6	9
32	Faecal Coliform	–	Absent	Absent	Absent

Results: Surface Water

Sr. No.	Parameters	Unit	Kumbhariya Ka Talav (S/W)		
			04.04.2023	03.05.2023	02.06.2023
---	Date of Sampling	---	04.04.2023	03.05.2023	02.06.2023
---	Sample Code	---	NIL/OT/04/23/448	NIL/OT/05/23/604	NIL/OT/06/23/301
1	Temperature	°C	28.5	28.4	29.3
2	Colour	Hazen	17	19	13
3	Odour	–	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable
5	pH	–	7.32	8.17	7.93
6	Turbidity	NTU	7.7	5.4	8.0
7	Total Dissolved Solids	mg/lit	642	628	675
8	Total Suspended Solids	mg/lit	4	6	4
9	Total Alkalinity	mg/lit	66.0	74.8	70.4
10	Total Hardness	mg/lit	210.1	230.3	238.4
11	Calcium Hardness	mg/lit	137.4	145.4	145.9
12	Magnesium Hardness	mg/lit	72.7	84.8	88.9
13	COD	mg/lit	26	32	24
14	BOD	mg/lit	7.0	7.0	8.0
15	Chloride	mg/lit	169.5	191.5	203.9
16	Salinity	ppt	0.30	0.24	0.39
17	Sulphate	mg/lit	36.1	28.4	27.7
18	Fluoride	mg/lit	0.51	0.52	0.71
19	Nitrate	mg/lit	<0.5	<0.5	<0.5
20	Total Phosphorus	mg/lit	<1	<1	<1
21	Total Nitrogen	mg/lit	2.02	1.62	1.56
22	Sodium	mg/lit	5706.6	5681.7	5476.4
23	Potassium	mg/lit	1516.0	1583.0	1782.0
24	Iron	mg/lit	<0.1	<0.1	<0.1
25	Manganese	mg/lit	<0.1	<0.1	<0.1
26	Cadmium	mg/lit	<0.003	<0.003	<0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01
28	Zinc	mg/lit	<0.05	<0.05	<0.05
29	Nickel	mg/lit	<0.01	<0.01	<0.01
30	Copper	mg/lit	<0.04	<0.04	<0.04
31	Total Coliform	MPN/100ml	7	9	7
32	Faecal Coliform	–	Absent	Absent	Absent



Results: Ground Water

Sr. No.	Parameters	Unit	Akarli Village (G/W)			Limits*
			04.04.2023	03.05.2023	02.06.2023	
---	Date of Sampling	---	04.04.2023	03.05.2023	02.06.2023	---
---	Sample Code	---	NIL/OT/04/23/443	NIL/OT/05/23/599	NIL/OT/06/23/296	---
1	Temperature	°C	27.8	29.5	27.3	---
2	Colour	Hazen	47	58	66	5 / 15
3	Odour	–	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	–	8.27	7.61	8.16	6.5 – 8.5
6	Turbidity	NTU	<1	<1	<1	1 / 5
7	Total Dissolved Solids	mg/lit	8848	8758	10513	500 / 2000
8	Total Suspended Solids	mg/lit	18	20	19	---
9	Total Alkalinity	mg/lit	404.8	418.0	409.2	200 / 600
10	Total Hardness	mg/lit	355.5	363.6	379.8	200 / 600
11	Calcium Hardness	mg/lit	210.1	202.0	222.2	---
12	Magnesium Hardness	mg/lit	145.4	161.6	157.6	---
13	COD	mg/lit	90	84	100	---
14	BOD	mg/lit	21	24	25.0	---
15	Chloride	mg/lit	4343.4	3549.7	5154.5	250 / 1000
16	Salinity	ppt	7.22	6.35	6.11	---
17	Sulphate	mg/lit	685.1	759.3	632.5	200 / 400
18	Fluoride	mg/lit	0.88	0.99	0.82	1 / 1.5
19	Nitrate	mg/lit	30.0	30.0	26.0	45
20	Total Phosphorus	mg/lit	<1	<1	<1	---
21	Total Nitrogen	mg/lit	2807.42	2484.29	2069.32	---
22	Sodium	mg/lit	6767.1	5690.9	5261.8	---
23	Potassium	mg/lit	1475.0	1778.0	1322.0	---
24	Iron	mg/lit	<0.1	<0.1	<0.1	0.3
25	Manganese	mg/lit	<0.1	<0.1	<0.1	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	<0.05	<0.05	<0.05	5 / 15
29	Nickel	mg/lit	<0.01	<0.01	<0.01	0.02
30	Copper	mg/lit	<0.04	<0.04	<0.04	0.05 / 1.5
31	Total Coliform	MPN/100ml	21	25	17	Absent
32	Faecal Coliform	–	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)

Post Environmental Monitoring Report for HRRL, Rajasthan



Results: Ground Water

Sr. No.	Parameters	Unit	Meghwali Ki Dhani (G/W)			Limits*
			04.04.2023	03.05.2023	02.06.2023	
---	Date of Sampling	---	04.04.2023	03.05.2023	02.06.2023	---
---	Sample Code	---	NIL/OT/04/23/444	NIL/OT/05/23/600	NIL/OT/06/23/297	---
1	Temperature	°C	27.3	27.8	28.9	---
2	Colour	Hazen	37	30	45	5 / 15
3	Odour	–	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	–	8.12	8.21	7.83	6.5 – 8.5
6	Turbidity	NTU	588.9	420.1	583.5	1 / 5
7	Total Dissolved Solids	mg/lit	15848	12409	12516	500 / 2000
8	Total Suspended Solids	mg/lit	1103	1267	1132	---
9	Total Alkalinity	mg/lit	202.4	211.2	224.4	200 / 600
10	Total Hardness	mg/lit	242.4	250.5	258.6	200 / 600
11	Calcium Hardness	mg/lit	125.2	129.3	137.4	---
12	Magnesium Hardness	mg/lit	117.2	121.2	121.2	---
13	COD	mg/lit	150	144	180	---
14	BOD	mg/lit	46.0	52.0	49.0	---
15	Chloride	mg/lit	4728.5	4591.3	4353.8	250 / 1000
16	Salinity	ppt	10.27	8.39	9.71	---
17	Sulphate	mg/lit	347.3	282.5	364.2	200 / 400
18	Fluoride	mg/lit	5.43	4.62	4.35	1 / 1.5
19	Nitrate	mg/lit	<0.5	<0.5	<0.5	45
20	Total Phosphorus	mg/lit	2.59	2.54	2.30	---
21	Total Nitrogen	mg/lit	1.83	2.91	2.15	---
22	Sodium	mg/lit	6226.1	6376.0	10596.1	---
23	Potassium	mg/lit	51.0	39.0	49.0	---
24	Iron	mg/lit	7.78	6.65	6.78	0.3
25	Manganese	mg/lit	0.00	0.00	0.00	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	0.67	0.29	0.48	5 / 15
29	Nickel	mg/lit	0.00	0.00	0.00	0.02
30	Copper	mg/lit	<0.04	<0.04	<0.04	0.05 / 1.5
31	Total Coliform	MPN/100ml	13	10	21	Absent
32	Faecal Coliform	–	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)

Post Environmental Monitoring Report for HRRL, Rajasthan



Results: Ground Water

Sr. No.	Parameters	Unit	Kiyar Village (G/W)			Limits*
			04.04.2023	03.05.2023	02.06.2023	
---	Date of Sampling	---	04.04.2023	03.05.2023	02.06.2023	---
---	Sample Code	---	NIL/OT/04/23/445	NIL/OT/05/23/601	NIL/OT/06/23/298	---
1	Temperature	°C	29.4	28.0	30.0	---
2	Colour	Hazen	14	11	10	5 / 15
3	Odour	–	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	–	8.02	8.35	8.39	6.5 – 8.5
6	Turbidity	NTU	30.0	26.6	36.8	1 / 5
7	Total Dissolved Solids	mg/lit	9385	6552	6480	500 / 2000
8	Total Suspended Solids	mg/lit	18	20	15	---
9	Total Alkalinity	mg/lit	206.8	198.0	202.4	200 / 600
10	Total Hardness	mg/lit	387.8	395.9	391.9	200 / 600
11	Calcium Hardness	mg/lit	145.4	133.3	137.4	---
12	Magnesium Hardness	mg/lit	242.4	262.6	254.5	---
13	COD	mg/lit	120	102	140	---
14	BOD	mg/lit	32.0	30	42.0	---
15	Chloride	mg/lit	2510.8	3253.9	2569.2	250 / 1000
16	Salinity	ppt	5.36	4.92	5.53	---
17	Sulphate	mg/lit	664.3	982.4	776.3	200 / 400
18	Fluoride	mg/lit	0.23	0.21	0.23	1 / 1.5
19	Nitrate	mg/lit	<0.5	<0.5	<0.5	45
20	Total Phosphorus	mg/lit	<1	<1	<1	---
21	Total Nitrogen	mg/lit	2.07	2.02	2.32	---
22	Sodium	mg/lit	4915.7	5065.1	5918.5	---
23	Potassium	mg/lit	32.0	41.0	47.0	---
24	Iron	mg/lit	1.89	2.59	2.37	0.3
25	Manganese	mg/lit	<0.1	<0.1	<0.1	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	<0.05	<0.05	<0.05	5 / 15
29	Nickel	mg/lit	<0.01	<0.01	<0.01	0.02
30	Copper	mg/lit	<0.04	<0.04	<0.04	0.05 / 1.5
31	Total Coliform	MPN/100ml	Absent	Absent	Absent	Absent
32	Faecal Coliform	–	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)



Results: Ground Water

Sr. No.	Parameters	Unit	Sajiyali Village (G/W)			Limits*
			04.04.2023	03.05.2023	02.06.2023	
---	Date of Sampling	---	04.04.2023	03.05.2023	02.06.2023	---
---	Sample Code	---	NIL/OT/04/23/446	NIL/OT/05/23/602	NIL/OT/06/23/299	---
1	Temperature	°C	27.6	28.0	27.3	---
2	Colour	Hazen	59	63	78	5 / 15
3	Odour	–	Agreeable	Agreeable	Agreeable	Agreeable
4	Taste	–	Agreeable	Agreeable	Agreeable	Agreeable
5	pH	–	8.14	7.85	7.32	6.5 – 8.5
6	Turbidity	NTU	<1	<1	<1	1 / 5
7	Total Dissolved Solids	mg/lit	15682	12357	11709	500 / 2000
8	Total Suspended Solids	mg/lit	14	12	11	---
9	Total Alkalinity	mg/lit	264.0	272.8	286.0	200 / 600
10	Total Hardness	mg/lit	153.5	161.6	169.7	200 / 600
11	Calcium Hardness	mg/lit	52.5	56.6	60.6	---
12	Magnesium Hardness	mg/lit	101.0	105.0	109.1	---
13	COD	mg/lit	94	94	108	---
14	BOD	mg/lit	35.0	25.0	28.0	---
15	Chloride	mg/lit	1769.9	2350.7	2354.2	250 / 1000
16	Salinity	ppt	7.42	11.56	9.27	---
17	Sulphate	mg/lit	779.3	835.3	759.7	200 / 400
18	Fluoride	mg/lit	5.21	3.88	5.25	1 / 1.5
19	Nitrate	mg/lit	1.0	1.0	1.0	45
20	Total Phosphorus	mg/lit	<1	<1	<1	---
21	Total Nitrogen	mg/lit	3.14	2.74	2.79	---
22	Sodium	mg/lit	5738.0	7994.9	7251.8	---
23	Potassium	mg/lit	61.0	44.0	51.0	---
24	Iron	mg/lit	<0.1	<0.1	<0.1	0.3
25	Manganese	mg/lit	<0.1	<0.1	<0.1	0.1 / 0.3
26	Cadmium	mg/lit	<0.001	<0.001	<0.001	0.003
27	Lead	mg/lit	<0.01	<0.01	<0.01	0.01
28	Zinc	mg/lit	<0.05	<0.05	<0.05	5 / 15
29	Nickel	mg/lit	0.00	0.00	0.00	0.02
30	Copper	mg/lit	0.00	0.00	0.00	0.05 / 1.5
31	Total Coliform	MPN/100ml	Absent	Absent	Absent	Absent
32	Faecal Coliform	–	Absent	Absent	Absent	Absent

Note: *As per IS10500:2012 (Desirable/Permissible)

3. SOIL QUALITY

Parameter Details:

Sr. No.	Parameters	Unit	Analysis Method
1	Particle Size Distribution		
	i. Sand	%	International Pipette Method
	ii. Silt	%	International Pipette Method
	iii Clay	%	International Pipette Method
2	Texture	–	International Pipette Method
3	pH Value	–	IS 2720 (Part 26)
4	Electrical Conductivity	mS/cm	IS 14767
5	Specific Gravity	mg/kg	ASTM D854
6	Bulk Density	g/cm ³	Note 1*
7	Organic Matter	%	Lab SOP No. NIL/SOP/05***
8	Sodium Absorption Ratio (SAR)	–	IS 11624
9	Porosity	%	Note 2**
10	NPK Value	mg/kg	APHA 4500-N-C and Lab SOP No. NIL/SOP/10***

Note :

1. * Environmental Analysis – Water, Soil and Air, by M.M. Saxena
2. ** Soil Sampling, Preparation and Analysis (2nd Edition) by Kim H. Tan
3. *** Based on Manual of Soil testing in India, Ministry of Agriculture, GOI, 2011



Results:

Sr. No.	Parameters	Unit	Near Project Site (Dewal Ki Dhani)		
			04.04.2023	03.05.2023	02.06.2023
---	Date of Sampling	---	04.04.2023	03.05.2023	02.06.2023
---	Sample Code	---	NIL/OT/04/23/449	NIL/OT/05/23/605	NIL/OT/06/23/302
1	Particle Size Distribution				
	i. Sand	%	99.3	99.1	99.4
	ii. Silt	%	0.4	0.4	0.3
	iii Clay	%	0.3	0.5	0.3
2	Texture	–	Sand	Sand	Sand
3	pH Value	–	7.27	6.35	8.19
4	Electrical Conductivity	mS/cm	2.346	2.070	2.745
5	Specific Gravity	mg/kg	2.63	2.82	2.50
6	Bulk Density	g/cm ³	1.80	2.28	2.08
7	Organic Matter	%	1.87	2.25	2.51
8	Sodium Absorption Ratio (SAR)	–	1.19	0.96	1.33
9	Porosity	%	18.5	18.7	23.0
10	NPK Value	mg/kg	335.1	360.8	326.8

Sr. No.	Parameters	Unit	Kasajiyon ki Dhani		
			04.04.2023	03.05.2023	02.06.2023
---	Date of Sampling	---	04.04.2023	03.05.2023	02.06.2023
---	Sample Code	---	NIL/OT/04/23/450	NIL/OT/05/23/606	NIL/OT/06/23/303
1	Particle Size Distribution				
	i. Sand	%	98.9	99.1	98.8
	ii. Silt	%	0.5	0.4	0.3
	iii Clay	%	0.6	0.5	0.9
2	Texture	–	Sand	Sand	Sand
3	pH Value	–	8.10	10.47	8.86
4	Electrical Conductivity	mS/cm	0.183	0.204	0.203
5	Specific Gravity	mg/kg	2.38	2.46	2.03
6	Bulk Density	g/cm ³	1.86	1.64	1.72
7	Organic Matter	%	1.56	1.17	1.65
8	Sodium Absorption Ratio (SAR)	–	2.56	3.02	2.17
9	Porosity	%	22.8	21.9	25.1
10	NPK Value	mg/kg	862.1	744.0	801.7



Results:

Sr. No.	Parameters	Unit	Sajiyali Village		
---	Date of Sampling	---	04.04.2023	03.05.2023	02.06.2023
---	Sample Code	---	NIL/OT/04/23/451	NIL/OT/05/23/607	NIL/OT/06/23/304
1	Particle Size Distribution				
	i. Sand	%	99.2	98.8	99.1
	ii. Silt	%	0.6	0.6	0.5
	iii Clay	%	0.2	0.6	0.4
2	Texture	—	Sand	Sand	Sand
3	pH Value	—	8.70	9.21	7.96
4	Electrical Conductivity	mS/cm	0.125	0.117	0.128
5	Specific Gravity	mg/kg	2.33	2.07	2.40
6	Bulk Density	g/cm ³	1.87	2.10	1.64
7	Organic Matter	%	0.87	0.68	1.01
8	Sodium Absorption Ratio (SAR)	—	6.87	5.44	7.52
9	Porosity	%	18.2	17.1	18.6
10	NPK Value	mg/kg	312.9	347.0	328.1

Sr. No.	Parameters	Unit	Godaro Ki Dhani		
---	Date of Sampling	---	04.04.2023	03.05.2023	02.06.2023
---	Sample Code	---	NIL/OT/04/23/452	NIL/OT/05/23/608	NIL/OT/06/23/305
1	Particle Size Distribution				
	i. Sand	%	99.2	98.8	99.2
	ii. Silt	%	0.4	0.4	0.3
	iii Clay	%	0.4	0.8	0.5
2	Texture	—	Sand	Sand	Sand
3	pH Value	—	7.71	8.81	8.26
4	Electrical Conductivity	mS/cm	0.109	0.105	0.112
5	Specific Gravity	mg/kg	2.83	3.21	2.84
6	Bulk Density	g/cm ³	2.08	2.47	1.90
7	Organic Matter	%	0.59	0.72	0.56
8	Sodium Absorption Ratio (SAR)	—	5.70	5.43	6.10
9	Porosity	%	22.6	27.1	22.5
10	NPK Value	mg/kg	3470.5	3289.2	3722.8



4. NOISE LEVEL MONITORING

Standard:

As per the Noise Pollution (Regulation and Control) Rules, 2000 the Ambient Air Quality Standards in respect of Noise are as below:

Area Code	Category of Area / Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence Zone	50	40

- Note:-**
1. Day time mean from 6.00 a.m. to 10.00 p.m.
 2. Night time mean from 10.00 p.m. to 6.00 a.m.
 3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority
 4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.



Result:

LOCATION		Kiyar					
DATE		07.04.2023	21.04.2023	06.05.2023	20.05.2023	05.06.2023	22.06.2023
Hourly L _{eq}	06:00 - 07:00	50.2	48.7	51.6	51.9	49.7	49.1
	07:00 - 08:00	52.2	50.8	52.8	50.2	47.7	49.4
	08:00 - 09:00	51.6	51.9	54.3	49.2	48.0	53.6
	09:00 - 10:00	49.6	52.8	54.6	53.5	56.5	51.5
	10:00 - 11:00	50.3	48.0	50.2	50.8	52.6	53.1
	11:00 - 12:00	52.5	51.4	53.3	53.8	52.7	54.7
	12:00 - 13:00	51.7	47.7	51.8	53.1	46.8	54.5
	13:00 - 14:00	51.1	55.5	50.6	51	48.4	42.7
	14:00 - 15:00	48.5	53.2	48.8	54.4	49.2	54.2
	15:00 - 16:00	44.5	51.7	46.4	48.8	51.2	51.2
	16:00 - 17:00	52.2	52.7	50.2	49.6	49.1	51.4
	17:00 - 18:00	51.6	48.9	51.8	52.2	51.7	54.0
	18:00 - 19:00	53.3	48.2	46.5	52.5	52.6	53.8
	19:00 - 20:00	52.7	49.2	47.2	47.6	53.5	52.9
	20:00 - 21:00	53.8	51.4	47.2	49.9	48.6	48.0
	21:00 - 22:00	50.8	48.6	40.5	54.5	42.1	48.8
	22:00 - 23:00	40.2	43.3	43.3	47.4	40.5	45.5
	23:00 - 00:00	48.6	40.5	44.2	44.4	39.5	40.2
	00:00 - 01:00	42.3	41.8	42.8	45.4	42.8	42.2
	01:00 - 02:00	41.8	45.1	42.7	42.3	41.5	40.1
02:00 - 03:00	38.6	39.9	40.5	40.7	42.2	38.8	
03:00 - 04:00	39.3	40.9	41.8	36.8	40.8	43.7	
04:00 - 05:00	37.5	42.1	39.5	42.6	43.8	41.9	
05:00 - 06:00	40.2	41.1	41.4	39.4	40.2	37.5	
L _{eq} Day		51.5	51.3	51.0	51.9	51.2	52.3
L _{eq} Night		42.6	42.2	42.3	43.5	41.6	41.9
L _{DN}		51.9	51.6	51.5	52.5	51.3	52.2

Note: All Values in dB(A)



Result

LOCATION		Akarli					
DATE		06.04.2023	20.04.2023	05.05.2023	19.05.2023	05.06.2023	19.06.2023
Hourly L _{eq}	06:00 - 07:00	54.0	52.0	52.8	53.2	51.1	50.1
	07:00 - 08:00	54.4	55.4	57.7	47.5	48.4	47.2
	08:00 - 09:00	54.6	53.6	51.5	47.0	47.1	49.5
	09:00 - 10:00	56.3	52.8	52.6	58.3	49.5	54.8
	10:00 - 11:00	52.8	54.2	53.8	52.8	49.8	50.5
	11:00 - 12:00	48.8	51.8	54.7	47.6	49.1	51.0
	12:00 - 13:00	48.9	54.6	54.2	53.6	50.4	55.5
	13:00 - 14:00	52.0	53.6	48.4	50.8	45.9	49.2
	14:00 - 15:00	50.5	52.4	53.6	54.9	46.6	54.0
	15:00 - 16:00	54.2	54.4	53.6	54.2	50.6	53.9
	16:00 - 17:00	51.8	51.8	54.4	54.5	46.4	53.1
	17:00 - 18:00	53.3	52.4	52.9	54.9	47.7	53.3
	18:00 - 19:00	52.6	50.6	55.3	51.8	50.7	50.4
	19:00 - 20:00	54.3	52.7	51.4	53.3	50.2	52.1
	20:00 - 21:00	52.7	54.6	53.6	48.5	44.3	52.6
	21:00 - 22:00	49.8	52.5	50.5	46.2	49.3	48.5
	22:00 - 23:00	42.5	45.6	45.5	42.2	42.7	45.6
	23:00 - 00:00	41.8	40.2	42.2	40.7	44.6	42.6
	00:00 - 01:00	43.7	42.3	41.8	45.6	43.6	39.0
	01:00 - 02:00	40.8	41.6	43.6	39.7	40.0	41.4
02:00 - 03:00	38.8	41.8	40.8	41.8	39.6	40.7	
03:00 - 04:00	39.5	37.5	38.8	41.2	41.0	38.5	
04:00 - 05:00	41.1	41.5	40.2	40.4	42.2	39.6	
05:00 - 06:00	42.5	40.8	39.6	43.4	42.5	40.8	
L _{eq} Day		53.0	53.3	53.7	53.0	49.0	52.2
L _{eq} Night		41.6	41.9	42.1	42.3	42.3	41.6
L _{DN}		52.6	52.9	53.2	52.8	50.4	52.0

Note: All Values in dB(A)



Result

LOCATION		Dewal ki Dhani					
DATE		10.04.2023	24.04.2023	09.05.2023	23.05.2023	08.06.2023	22.06.2023
Hourly L_{eq}	06:00 - 07:00	53.2	52.8	54.6	44.7	48.5	51.6
	07:00 - 08:00	58.5	52.9	52.8	52.6	45.2	46.2
	08:00 - 09:00	57.9	53.6	56.2	38.3	41.5	42.2
	09:00 - 10:00	50.2	55.8	52.7	45.3	43.9	46.0
	10:00 - 11:00	52.6	52.6	55.5	41.0	52.8	49.6
	11:00 - 12:00	51.8	54.7	52.4	47.5	54.6	49.4
	12:00 - 13:00	55.2	52.8	51.6	46.2	58.2	48.0
	13:00 - 14:00	53.6	55.0	48.5	60.4	51.6	38.1
	14:00 - 15:00	53.6	55.7	52.4	37.8	58.2	46.5
	15:00 - 16:00	54.2	52.7	53.3	41.1	52.4	50.1
	16:00 - 17:00	52.5	56.2	52.6	43.2	48.3	48.6
	17:00 - 18:00	50.7	52.8	54.2	42.4	46.3	47.9
	18:00 - 19:00	53.7	51.2	55.8	42.2	45.2	47.8
	19:00 - 20:00	48.8	52.7	54.2	36.6	52.3	45.1
	20:00 - 21:00	51.2	48.6	51.8	37.3	48.6	42.2
	21:00 - 22:00	43.6	42.5	52.2	42.7	47.7	41.9
	22:00 - 23:00	42.5	41.6	43.0	44.5	49.7	42.7
	23:00 - 00:00	41.1	40.8	42.8	40.2	44.2	44.1
	00:00 - 01:00	40.8	43.2	40.4	45.8	41.6	49.0
	01:00 - 02:00	38.6	44.6	40.0	45.3	37.7	47.8
02:00 - 03:00	40.2	39.6	38.6	33.9	40.6	43.7	
03:00 - 04:00	38.5	39.3	42.5	41.8	37.6	48.7	
04:00 - 05:00	41.2	41.4	40.5	43.1	38.4	45.6	
05:00 - 06:00	40.8	45.4	39.6	43.4	41.2	46.0	
L_{eq} Day		53.7	53.5	53.5	49.9	52.3	47.5
L_{eq} Night		40.6	42.5	41.2	43.3	43.5	46.5
L_{DN}		52.9	53.2	52.9	51.3	52.7	52.7

Note: All Values in dB(A)



Result

LOCATION		Panch Padra					
DATE		05.04.2023	19.04.2023	04.05.2023	18.05.2023	03.06.2023	17.06.2023
Hourly L _{eq}	06:00 - 07:00	56.4	53.6	53.8	52.3	50.3	55.9
	07:00 - 08:00	54.2	51.2	52.2	52.1	48.6	51.6
	08:00 - 09:00	52.8	54.7	54.3	54.2	54.2	58.2
	09:00 - 10:00	57.1	58.6	48.5	57.5	51.6	52.4
	10:00 - 11:00	50.2	49.1	48.5	52.4	54.3	50.8
	11:00 - 12:00	58.2	50.8	52.6	50.3	53.2	51.2
	12:00 - 13:00	50.6	54.6	49.6	56.2	52.4	52.2
	13:00 - 14:00	55.6	52.2	52.2	58.8	52.4	53.3
	14:00 - 15:00	54.2	52.7	50.7	51.1	52.6	52.7
	15:00 - 16:00	48.2	54.6	51.8	50.8	55.2	52.5
	16:00 - 17:00	52.2	53.6	52.0	52.6	54.6	50.8
	17:00 - 18:00	53.6	52.7	53.8	54.8	54.6	50.6
	18:00 - 19:00	54.4	53.5	59.7	52.2	58.2	51.9
	19:00 - 20:00	55.1	54.2	55.4	52.4	48.5	54.2
	20:00 - 21:00	52.8	52.4	52.2	51.6	52.6	52.7
	21:00 - 22:00	53.2	51.6	48.4	52.8	50.5	52.2
	22:00 - 23:00	41.7	42.8	44.0	43.0	41.8	40.2
	23:00 - 00:00	42.5	40.0	41.9	40.5	40.9	40.2
	00:00 - 01:00	44.4	42.0	44.5	42.2	40.2	41.7
	01:00 - 02:00	40.8	38.6	41.7	43.4	42.2	40.6
02:00 - 03:00	43.3	41.1	38.0	42.4	41.3	41.1	
03:00 - 04:00	42.8	40.0	42.3	41.6	40.2	48.2	
04:00 - 05:00	40.7	39.9	39.5	40.8	43.2	43.5	
05:00 - 06:00	42.2	41.8	40.4	38.6	40.7	42.1	
L _{eq} Day		54.4	53.7	53.3	54.0	53.4	53.2
L _{eq} Night		42.5	41.0	42.0	41.8	41.4	43.1
L _{DN}		53.9	53.0	52.9	53.4	52.8	53.2

Note: All Values in dB(A)