



हिन्दुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड

(भारत सरकार का उपक्रम) रजिस्टर्ड ऑफिस : 17, जमशेदजी टाटा रोड, मुंबई - 400 020

HINDUSTAN PETROLEUM CORPORATION LIMITED

(A GOVERNMENT OF INDIA ENTERPRISE) REGISTERED OFFICE : 17, JAMSHEDJI TATA ROAD, MUMBAI-400020

2 जी इथेनॉल बायो-रिफाइनरी प्रोजेक्ट : बठिण्डा रिटेल क्षेत्रीय कार्यालय : अर्बन एस्टेट, फेस - II, पार्ट -II, बठिण्डा-151 001,
2G Ethanol Bio-Refinery Project : BATHINDA RETAIL REGIONAL OFFICE : URBAN ESTATE, PHASE-II, PART-II, BATHINDA - 151001
website : www.hindustanpetroleum.com

To,

The Deputy Director / Scientist 'C'

Ministry of Environment, Forests & Climate Change,

Northern Regional Office

Bays No. 24-25, Sector-31A,

Dakshin Marg, Chandigarh-160030

(Email: chdmofenv@gmail.com)

Sub: Submission of six-monthly compliance report of stipulated conditions of Environmental Clearance for setting up 2G Ethanol Bio-refinery plant of capacity 100KLPD at Village- Nasibpura, Tehsil Talwandi Sabo, Bathinda (Punjab) for the period of December 2023.

Ref: F.No. J-11011/221/2017-IA II (I) Dated- 23.09.2020

Sir/ Madam

This has reference to the EC vide letter no. **J-11011/221/2017-IA II (I) Dated- 23.09.2020**. In this regard, we are submitting hereby status report of compliance with the specific and general conditions for period December 2023. Documents enclosed along with report are mentioned below as

1. Point- wise compliance of stipulated environmental conditions & safeguards
2. Analysis Reports
3. Supporting Documents

Thanking You

For M/s Hindustan Petroleum Corporation Limited

(Authorized Signatory)

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Copy to:

1. The Director, Ministry of Environment, Forest & Climate Change, Govt of India, Sector 31, Chandigarh.
2. The Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar Delhi-32
3. The Member Secretary, Punjab Pollution Control Board, Vataran Bhawan, Nabha Road, Patiala, 147001 (Punjab)

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PURPOSE OF THE REPORT

1.0 Introduction

1.1 About Project: M/s Hindustan petroleum Corporation Limited has proposed to set up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bathinda (Punjab).

This Project has obtained Environmental Clearance vide letter dated 14th August, 2018 for setting up 2G Bio-refinery Plant of capacity 100 KLD and now has granted amended Environmental Clearance from Ministry of Environment, Forests and Climate Change Delhi, with certain conditions.

1.2 Purpose of the Report

As per the "Sub Para (i)" of "Para 10" of EIA Notification 2006, it is stated that *"It shall be mandatory for the project proponent to submit half-yearly compliance report in respect of the stipulated prior environmental clearance terms and conditions in hard and soft copies to the concerned regulatory authority, on 1st June and 1st December of each calendar year"* and as per compliance condition mentioned in Environment Clearance Letter.

The regulatory authorities in this case are MoEF& CC Delhi, MoEF& CC, Chandigarh and SPCB, Punjab. Various scheduled Site Visits were conducted by a team of Experts to Monitor Pollution related parameters as defined by CPCB / HSPCB. Samples for water and soil were also collected by NABL/ MoEF approved laboratory for analysis.

Based on the Specific and General Conditions mentioned in the EC Letter, a Compliance Report has been prepared and submitted regularly to the authority.

The Environmental assessment has been carried out to verify:

- 1) The proposed project does not have any adverse effect on the project site as well as its surrounding.
- 2) There is compliance with the conditions stipulated in the Environmental Clearance Letter.
- 3) The Project proponent is implementing the environmental safeguards in true spirit.
- 4) The project proponent is implementing the environmental pollution mitigative measures as suggested in approved EIA report.

1.3 Methodology for Preparation of Report is as follows:

- 1) Study of EC Letter & Related Documents,
- 2) Monitoring of Environment Parameters, viz. Ambient Air, Water, Noise & Soil by the NABL/MoEF labs.
- 3) Interpretation of Monitoring Results.
- 4) Preparation of half yearly Environmental Compliance Report.

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1.4 Generic Structure of Report:

- 1) Purpose of the Report, explaining the need of a Compliance Report and Methodology Adopted for preparation of Report.
- 2) Compliance Report, explaining the entire General & specific conditions in the EC Letter and providing details w.r.t. each condition/ guideline.
- 3) Monitoring Reports & Analysis, showing the level of emission within the project site for various Environment Parameters.
- 4) Photographs showing sample collection for environmental monitoring.
- 5) Supporting Documents which are mandatory for the project.

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ADHERENCE TO SPECIFIC AND GENERAL CONDITIONS

PART A- SPECIFIC CONDITION

S. No.	Conditions of Environmental Clearance	Status of Compliance
[A]	The final product (Ethanol) shall be used exclusively for fuel blending only.	<i>Noted.</i>
[B]	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.	<i>Consent to Establish (CTE) was obtained from PPCB valid till 31.12.2021 as per the amended EC.</i>
[C]	As already committed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged outside the premises	<i>As proposed zero discharge of waste water will be met during operational phase.</i>
[D]	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.	<i>Authorization required for hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid waste Management Rules, 2016 will be obtained as per the requirement.</i>
[E]	To control source and the fugitive emissions, suitable pollution control devices shall be installed to meet the prescribed norms and/or the NAAQS. The gaseous emissions shall be dispersed through stack of adequate height as per CPCB/SPCB guidelines	<i>Measures will be taken to control fugitive emission, pollution control devices will be installed as per the requirement. Stack of adequate height as per the guidelines will be installed for the gaseous emission dispersion.</i>
[F]	Total fresh water requirement shall not exceed 2280 cum/day, proposed to be met from canal supply.	<i>Prescribed water requirement will not be exceeded.</i>
[G]	Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through a separate conveyance system.	<i>We will ensure that process water is not mixed with storm water.</i>
[H]	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.	<i>Noted.</i>

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[I]	<p>The company shall undertake waste minimization measures as below:-</p> <ol style="list-style-type: none"> i. Metering and control of quantities of active ingredients to minimize waste. ii. Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. iii. Use of automated filling to minimize spillage. iv. Use of Close Feed system into batch reactors. v. Venting equipment through vapour recovery system vi. Use of high pressure hoses for equipment clearing to reduce wastewater generation. 	<p><i>We will comply with the condition as per the requirement to minimize waste generation in the plant-</i></p> <ol style="list-style-type: none"> <i>i. Metering and control of quantities of active ingredients will be done regularly.</i> <i>ii. By products will be reused as raw material as much as possible according to requirement.</i> <i>iii. Automated filling will be carried out to minimize spillage</i> <i>iv. Close feed system will be used into batch reactors.</i> <i>v. Water scrubber, vent bottle & flame arrestors will be provided as per requirement.</i> <i>vi. High pressure hoses for equipment clearing will be used to reduce waste water generation.</i>
[J]	<p>The green belt of 5-10 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. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.</p>	<p><i>We have submitted Green belt development plan to the MoEF&CC in the EIA report and same will be developed as per the EC requirement.</i></p>
[K]	<p>All the commitments made regarding issues raised during the public hearing/ consultation meeting shall be satisfactorily implemented.</p>	<p><i>Noted.</i></p>
[L]	<p>At least 1% of the total project cost shall be allocated for Corporate Environment Responsibility (CER) and the details along with time bound action plan shall be submitted to the Ministry's Regional Office.</p>	<p><i>The project is in initial stage and construction is yet to be commenced. CER details will be submitted to the authority in due course of time. .</i></p>
[M]	<p>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.</p>	<p><i>Acoustically enclosed DG sets will be installed and Stack height will be kept as per the CPCB guidelines.</i></p>
[N]	<p>The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire fighting system shall be as per the norms.</p>	<p><i>Fire Fighting system will be installed as per the condition.</i></p>
[O]	<p>Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.</p>	<p><i>Regular Health Check-up arrangement will be provided for the workers A qualified doctor will be appointed.</i></p>
[P]	<p>There shall be adequate space inside the plant premises earmarked for parking of vehicles for raw materials and finished products, and no parking to be allowed outside on public places.</p>	<p><i>No parking will be done outside on public places. Plan in this regard has already been submitted to authority.</i></p>
[Q]	<p>Storage of raw materials shall be either stored in silos or in covered areas to prevent dust pollution and other fugitive emissions.</p>	<p><i>During operation phase, raw materials will be stored properly in covered areas</i></p>
[R]	<p>Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel/drain carrying effluent within the</p>	<p><i>We will comply.</i></p>

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	premises.	
[S]	CO ₂ generated from the process shall be bottled/made solid ice/value added products and sold to authorize vendors.	<i>Noted.</i>

11.1 OtherGenericConditions:-

S. No.	Conditions of Environmental Clearance	Status of Compliance
i.	The project authorities must strictly adhere to the stipulations made by the state Pollution Control Board (SPCB), State Government and/ or any other statutory authority.	<i>We ensure to follow the guidelines strictly.</i>
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.	<i>Noted.</i>
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 stations each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated	<i>Noted and same will be complied.</i>
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 Complied with.	<i>Noted.</i>
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).	<i>We will ensure to keep the noise levels within the standards.</i>
vi.	The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial operations within the plant.	<i>Noted.</i>
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.	<i>Regular training of health & safety will be provided to the employees for chemical handling.</i>

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viii.	The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, risk mitigation measures and public hearing shall be implemented.	<i>Noted and will be complied as per the requirement.</i>
ix.	The company shall undertake all measures for improving socio-economic conditions of the surrounding area. CSR activities shall be undertaken by involving local villagers, administration and other stake holders. Also eco-developmental measures shall be undertaken for overall improvement of the environment.	<i>CSR activities will be undertaken as per the proposed plan.</i>
x.	A separate Environmental Management Cell equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.	<i>Noted.</i>
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 Changes 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.	<i>Separate funds will be kept for the implementation of the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government.</i>
xii.	A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.	<i>Noted.</i>
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-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 reports shall be posted on the website of the company.	<i>Noted. We are complying with the condition.</i>
xiv.	The environmental statement for each financial year ending 31 st March in Form-Vas 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.	<i>Noted.</i>
xv.	The project proponent shall inform the public that the project has been accorded environmental clearance by	<i>Copy of advertisements attached.</i>

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	<p>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.</p>	
xvi.	<p>The Ministry reserves the right to stipulate additional conditions, if found necessary at subsequent stages and the project proponent shall implement all the said conditions in a time bound manner. The Ministry may revoke or suspend the environmental clearance, if implementation of any of the above conditions is not found satisfactory.</p>	<i>Noted.</i>
xvii.	<p>The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 read with subsequent amendments therein.</p>	<i>Noted.</i>

3

DETAILS OF ENVIRONMENTAL MONITORING

3.1 AMBIENT AIR QUALITY MONITORING

3.1.1 Ambient Air Quality Monitoring Stations

Ambient air quality monitoring has been carried out at twelve locations on quarterly bases, to assess the ambient air quality of the project site. This will enable to have a comparative analytical understanding about air quality and the changes in the air environment in the study area with respect to the condition prevailing. The locations of the ambient air quality monitoring stations are given in **Table 3.1**.

Table 3.1 Details of Ambient Air Quality Monitoring Stations

S. No.	Location	Location Name/ Description	
		June 2023	September 2023
1.	AAQ1	Near Project site	Near Project site
2.	AAQ2	Nasibpura	Nasibpura
3.	AAQ3	Kot Kashmir	Kot Kashmir
4.	AAQ4	Jiwan Singh Wala	Jiwan Singh Wala
5.	AAQ5	Leleana	Leleana
6.	AAQ6	Mahi Nangal	Mahi Nangal
7.	AAQ7	Baghi Bandar	Baghi Bandar
8.	AAQ8	KotFatta	KotFatta
9.	AAQ9	Chathewala	Chathewala
10.	AAQ10	Manwala	Manwala
11.	AAQ11	Kothbhara	Kothbhara
12.	AAQ12	Gehri Boghi	Gehri Boghi

3.1.2 Ambient Air Quality Monitoring Methodology

Monitoring was conducted in respect of the following parameters:

- Particulate Matter 2.5 (PM 2.5)
- Particulate Matter 10 (PM 10)
- Sulphur Dioxide (SO₂)
- Oxides of Nitrogen (NO₂)
- Carbon Monoxide (CO)
- Ammonia (NH₃)
- Lead (Pb)
- Benzene (C₆H₆)
- Benzo(a)pyrene
- Ozone (O₃)
- Arsenic (As)

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- Nickel (Ni)
- Volatile Organic Carbon (VOCs)
- Hydrocarbon (as Methane)

Installation of Respirable Dust sampler (RDS) & Fine Particulate Sampler (FPS) was done with the attachment for the 24 hourly ambient air qualities monitoring as per Gazette Notification 16th November 2009.

The air samples were analyzed as per standard methods specified by Central Pollution Control Board (CPCB) and IS: 5182. The techniques used for ambient air quality monitoring and minimum detectable levels are given in **Table 3.2**.

Fine Particulate Sampler instruments have been used for monitoring Particulate Matter 2.5 (PM_{2.5} i.e. <2.5 microns), and Respirable Dust Sampler was used for sampling Repairable fraction (<10 microns), gaseous pollutants like SO₂, and NO₂. Bladder and Aspirator bags were used for collection Carbon monoxide samples. Gas Chromatography techniques have been used for the estimation of CO.

Table 3.2 Techniques used for Ambient Air Quality Monitoring

S. No.	Parameter	Technique	Technical Protocol
1	Particulate Matter 2.5	Fine Particulate Sampler, Gravimetric Method	SOP No. VEL/SOP/01, Section No. S 63
2	Particulate Matter 10	Respirable Dust Sampler, with cyclone separator, Gravimetric Method	IS: 5182 (P-23), 2006
3	Sulphur dioxide	Modified West and Gaeke	IS: 5182 (P-6)
4	Oxides of Nitrogen	Jacob & Hochheiser	IS: 5182 (P-2)
5	Carbon Monoxide	Gas Chromatography	IS:11255(P-6)
6	Ammonia	Distillation Method	IS: 5182 (P-22)
7	Lead	Atomic Absorption Spectro-photometer	IS: 5182 (P-10)
8	Benzene	Gas Chromatography	IS: 5182 (P-11)
9	Benzo(a)pyrene	Gas Chromatography	IS: 5182 (P-12)
10	Ozone	Colorimetry	IS: 5182 (P-9)
11	Arsenic	Atomic Absorption Spectro-photometer	IS: 5182 (P-22)
12	Nickel	Atomic Absorption Spectro-photometer	IS: 5182 (P-22)
13	Volatile Organic Carbon (VOCs)	IS:5182 (P-11)	IS:5182 (P-11)
14	Hydrocarbon (as Methane)	IS:5182 (P-17), 1979	IS:5182 (P-17), 1979

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3.1.3 Ambient Air Quality Monitoring Results (June-2023)

Table 3.6 Ambient Air Quality Monitoring Results (1-4 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ1	AAQ2	AAQ3	AAQ4	
1	Particulate Matter (PM _{2.5}), µg/m ³	50.48	46.89	51.61	53.32	60
2	Particulate Matter (PM ₁₀), µg/m ³	89.10	72.66	77.87	83.68	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	24.66	21.89	21.02	16.22	80
4	Sulphur Dioxide (SO ₂), µg/m ³	9.33	7.44	8.24	8.43	80
5	Carbon Monoxide (CO) mg/m ³	0.70	0.64	0.69	0.81	4
6	Ammonia (NH ₃), µg/m ³	23.55	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	400
7	Lead (Pb), µg/m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	1
8	Benzene(C ₆ H ₆),µg/m ³	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	05
9	Benzo(a)pyrene, ng/m ³	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	01
10	Ozone (O ₃),µg/m ³	17.02	15.78	24.55	21.48	180
11	Arsenic As, ng/ m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	6
12	Nickel Ni, ng/ m ³	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	20
13	Volatile Organic Carbon (VOCs)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	--
14	Hydrocarbon (as Methane)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	--

*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

Table 3.7 Ambient Air Quality Monitoring Results (5-8 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ5	AAQ6	AAQ7	AAQ8	
1	Particulate Matter (PM _{2.5}), µg/m ³	52.26	44.18	39.89	42.33	60
2	Particulate Matter (PM ₁₀), µg/m ³	90.59	79.72	83.46	76.14	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	26.33	26.14	24.21	20.55	80
4	Sulphur Dioxide (SO ₂), µg/m ³	7.24	7.68	9.18	10.26	80
5	Carbon Monoxide (CO) mg/m ³	0.78	0.72	0.70	0.67	4

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6	Ammonia (NH ₃), µg/m ³	22.57	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	400
7	Lead (Pb), µg/m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	1
8	Benzene(C ₆ H ₆),µg/m ³	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	05
9	Benzo(a)pyrene, ng/m ³	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	01
10	Ozone (O ₃),µg/m ³	18.15	24.55	25.65	24.00	180
11	Arsenic As, ng/ m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	6
12	Nickel Ni, ng/ m ³	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	20
13	Volatile Organic Carbon (VOCs)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	--
14	Hydrocarbon (as Methane)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	--

*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

Table 3.8 Ambient Air Quality Monitoring Results (9-12 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ9	AAQ10	AAQ11	AAQ12	
1	Particulate Matter (PM _{2.5}), µg/m ³	43.88	57.68	37.14	47.55	60
2	Particulate Matter (PM ₁₀), µg/m ³	72.44	88.14	73.55	67.12	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	27.12	22.36	24.35	19.55	80
4	Sulphur Dioxide (SO ₂), µg/m ³	9.47	8.21	6.87	7.54	80
5	Carbon Monoxide (CO) mg/m ³	0.66	0.71	0.72	0.71	4
6	Ammonia (NH ₃), µg/m ³	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	400
7	Lead (Pb), µg/m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	1
8	Benzene(C ₆ H ₆),µg/m ³	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	05
9	Benzo(a)pyrene,	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	01
10	Ozone (O ₃),µg/m ³	18.14	18.69	25.47	16.92	180
11	Arsenic As, ng/ m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	6
12	Nickel Ni, ng/ m ³	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	20
13	Volatile Organic	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	--
14	Hydrocarbon (as Methane)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	--

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*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

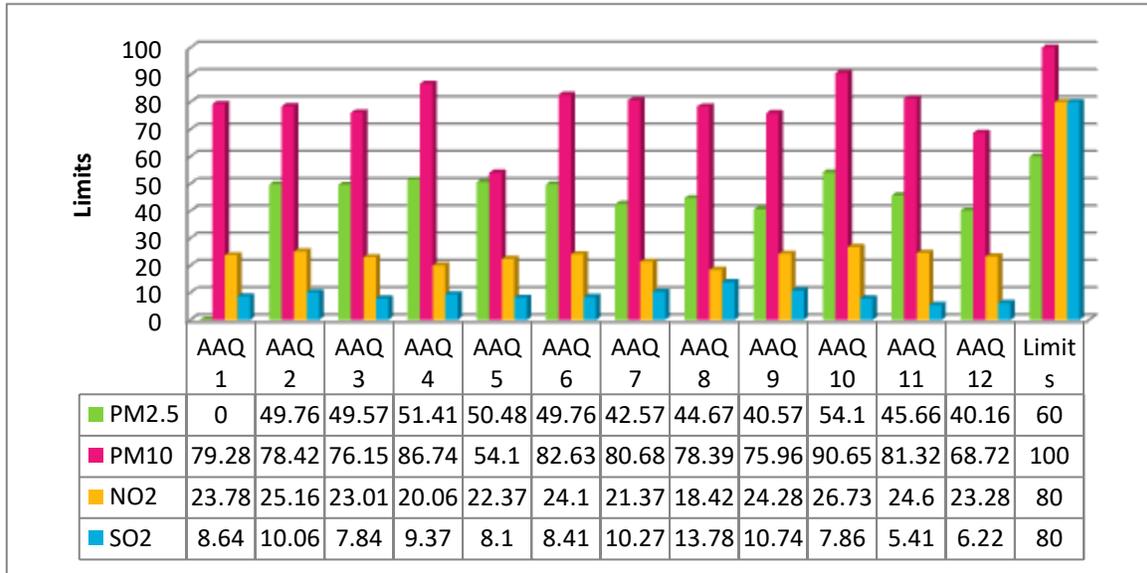


Figure 3.3 Location-wise Variation of Ambient Air Quality (June 2023)

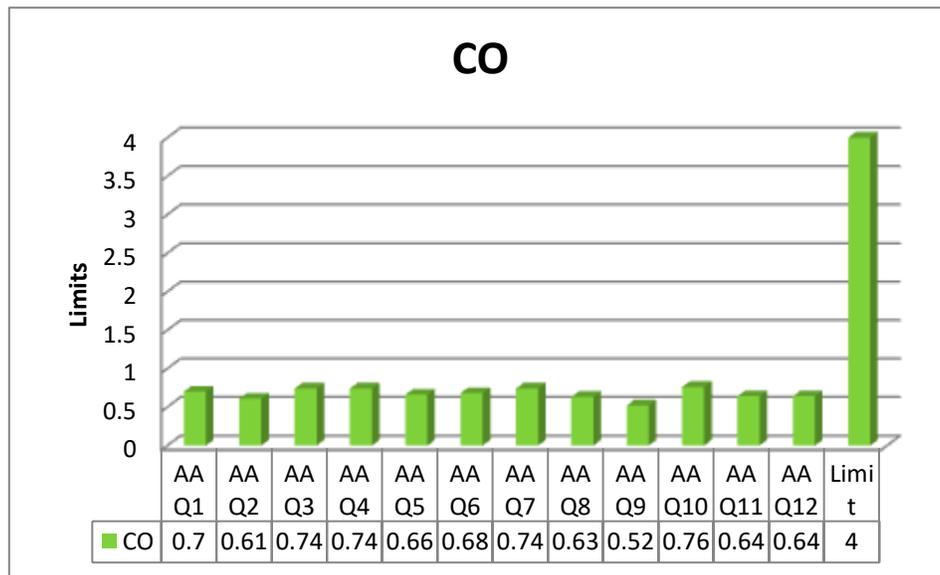


Figure 3.4 Location-wise Variation of CO in Ambient Air Quality (June 2023)

3.1.4 Discussion on Ambient Air Quality in the Study Area

PM₁₀ and PM_{2.5} levels at the project site are within the permissible limit of 100µg/m³ and 60 µg/m³ respectively (for residential, rural and other areas as stipulated in the National Ambient Air Quality Standards). SO₂, NO_x and CO was observed within the corresponding stipulated limits (Limit for SO₂ and NO_x: 80 µg/m³ and limit for CO: 4.0 mg/m³) at all monitoring locations. Station wise variation of ambient air quality parameters has been pictorially shown in **Figure 3.1, 3.2, 3.3 & 3.4**.

3.1.5 Ambient Air Quality Monitoring Results (September -2023)

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Table 3.3 Ambient Air Quality Monitoring Results (1-4 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ1	AAQ2	AAQ3	AAQ4	
1	Particulate Matter (PM _{2.5}), µg/m ³	51.39	49.76	49.57	51.41	60
2	Particulate Matter (PM ₁₀), µg/m ³	79.28	78.42	76.15	86.74	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	23.78	25.16	23.01	20.06	80
4	Sulphur Dioxide (SO ₂), µg/m ³	8.64	10.06	7.84	9.37	80
5	Carbon Monoxide (CO) mg/m ³	0.7	0.61	0.74	0.74	4
6	Ammonia (NH ₃), µg/m ³	21.49	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	400
7	Lead (Pb), µg/m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	1
8	Benzene(C ₆ H ₆),µg/m ³	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	05
9	Benzo(a)pyrene, ng/m ³	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	01
10	Ozone (O ₃),µg/m ³	24.06	21.73	26.39	23.11	180
11	Arsenic As, ng/ m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	6
12	Nickel Ni, ng/ m ³	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	20
13	Volatile Organic	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	--
14	Hydrocarbon (as Methane)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	--

*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

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Table 3.4 Ambient Air Quality Monitoring Results (5-8 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ5	AAQ6	AAQ7	AAQ8	
1	Particulate Matter (PM _{2.5}), µg/m ³	50.48	49.76	42.57	44.67	60
2	Particulate Matter (PM ₁₀), µg/m ³	54.10	82.63	80.68	78.39	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	22.37	24.10	21.37	18.42	80
4	Sulphur Dioxide (SO ₂), µg/m ³	8.10	8.41	10.27	13.78	80
5	Carbon Monoxide (CO) mg/m ³	0.66	0.68	0.74	0.63	4
6	Ammonia (NH ₃), µg/m ³	21.30	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	400
7	Lead (Pb), µg/m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	1
8	Benzene(C ₆ H ₆),µg/m ³	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	05
9	Benzo(a)pyrene, ng/m ³	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	01
10	Ozone (O ₃),µg/m ³	14.27	21.49	21.59	21.00	180
11	Arsenic As, ng/ m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	6
12	Nickel Ni, ng/ m ³	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	20
13	Volatile Organic Carbon (VOCs)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	--
14	Hydrocarbon (as Methane)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	--

*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

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Table 3.5 Ambient Air Quality Monitoring Results (9-12 Location)

S. No.	Parameter	Test Result				NAAQS*
		AAQ9	AAQ10	AAQ11	AAQ12	
1	Particulate Matter (PM _{2.5}), µg/m ³	40.57	54.10	45.66	40.16	60
2	Particulate Matter (PM ₁₀), µg/m ³	75.96	90.65	81.32	68.72	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	24.28	26.73	24.60	23.28	80
4	Sulphur Dioxide (SO ₂), µg/m ³	10.74	7.86	5.41	6.22	80
5	Carbon Monoxide (CO) mg/m ³	0.52	0.76	0.64	0.64	4
6	Ammonia (NH ₃), µg/m ³	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	400
7	Lead (Pb), µg/m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	1
8	Benzene(C ₆ H ₆),µg/m ³	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	05
9	Benzo(a)pyrene,	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	BLQ(LOQ 0.5)	01
10	Ozone (O ₃),µg/m ³	17.30	24.09	22.96	14.37	180
11	Arsenic As, ng/ m ³	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	6
12	Nickel Ni, ng/ m ³	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	BLQ(LOQ 5.0)	20
13	Volatile Organic	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	BLQ(LOQ 0.05)	--
14	Hydrocarbon (as Methane)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	--

*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009

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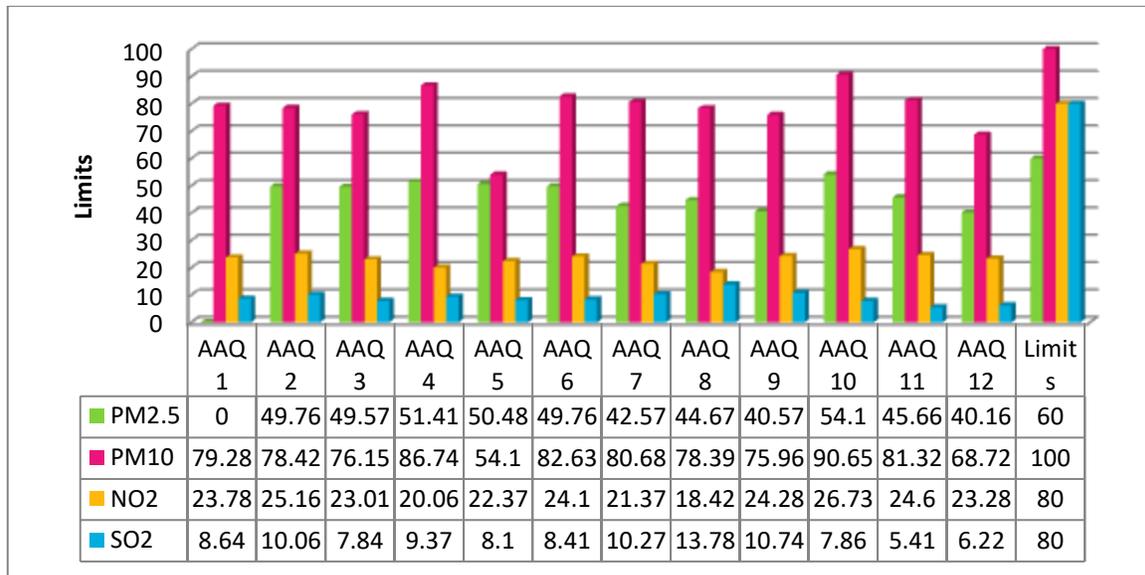


Figure 3.1 Location-wise Variation of Ambient Air Quality (September 2023)

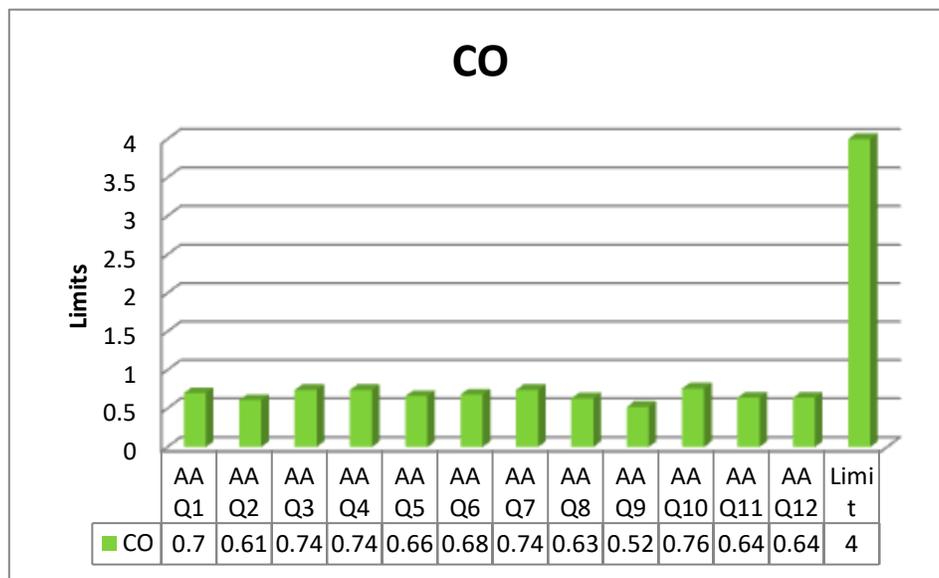


Figure 3.2 Location-wise Variation of CO in Ambient Air Quality (September 2023)

3.1.6 Discussion on Ambient Air Quality in the Study Area

PM₁₀ and PM_{2.5} levels at the project site are within the permissible limit of 100µg/m³ and 60 µg/m³ respectively (for residential, rural and other areas as stipulated in the National Ambient Air Quality Standards). SO₂, NO_x and CO was observed within the corresponding stipulated limits (Limit for SO₂ and NO_x: 80 µg/m³ and limit for CO: 4.0 mg/m³) at all monitoring locations. Station wise variation of ambient air quality parameters has been pictorially shown in **Figure 3.1, 3.2, 3.3 & 3.4**.

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3.2 AMBIENT NOISE MONITORING

3.2.1 Ambient Noise Monitoring Locations

The main objective of noise monitoring in the study area is to assess the present ambient noise levels in near front gate due to various construction allied activities and increased vehicular movement. A preliminary reconnaissance survey has been undertaken to identify the major noise generating sources in the area. Ambient noise monitoring was conducted at 12 locations in and around the project site on quarterly bases as given in Table 3.9.

Table 3.9 Details of Ambient Noise Monitoring Stations

S. No.	Location Code	Location Name/ Description		Present Land use
		June 2023	September 2023	
1.	N1	Near Project site	Near Project site	Industrial
2.	N2	Nasibpura	NasibPura	Residential
3.	N3	Kot Kashmir	Kot Kashmir	Residential
4.	N4	Jiwan Singh Wala	Jiwan Singh Wala	Residential
5.	N5	KotFatta	KotFatta	Residential
6.	N6	Baghi Bandar	Baghi Bandar	Residential
7.	N7	Mahi Nangal	Mahi Nangal	Residential
8.	N8	Leleana	Leleana	Residential
9.	N9	Kothbhara	Kothbhara	Residential
10.	N10	Chathewala	Chathewala	Residential
11.	N11	Maawala	Maanwala	Residential
12.	N12	GehriBoghi	GehriBoghi	Residential

3.2.2 Methodology of Noise Monitoring

Noise levels were measured using sound level meter. Noise level monitoring was carried out continuously for 24-hours with one hour interval starting at 06:00hrs to 06:00hrs next day. The noise levels were monitored on working days only. During each hour Leq were directly computed by the instrument based on the sound pressure levels. Monitoring was carried out at 'A' response and fast mode.

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3.2.3 Ambient Noise Monitoring Results (June 2023)

The location wise ambient noise monitoring results is summarized in **Table 3.13, 3.14& 3.15**. The location-wise variation of noise levels are graphically presented in **Figure**

Table 3.13 Ambient Noise Monitoring Results (1-4 Location)

Parameter	N1		N2		N3		N4	
	Day Time	Night Time						
Lmax	76.1	67.7	58.1	47.5	53.5	47.8	54.6	43.9
Lmin	51.2	44.4	43.8	35.8	39.7	34.2	36.4	32.4
Leq	57.87	46.68	52.44	44.76	46.59	41.57	44.58	38.59
CPCB Limit (Leq in dB(A) Industrial Limit& Residential Limit)	75.00	70.00	55.00	45.00	55.00	45.00	55.00	45.00

Note: *A “decibel” is a unit in which noise is measured.

Table 3.14 Ambient Noise Monitoring Results (5-8 Location)

Parameter	N5		N6		N7		N8	
	Day Time	Night Time						
Lmax	53.2	45.5	57.3	50.4	51.9	40.8	59.1	46.3
Lmin	35.7	31.8	37.2	34.8	36.2	33.5	39.5	32.6
Leq	45.01	40.04	51.73	42.84	47.25	37.59	53.86	40.55
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

Note: *A “decibel” is a unit in which noise is measured.

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Table 3.15 Ambient Noise Monitoring Results (9-12 Location)

Parameter	N9		N10		N11		N12	
	Day Time	Night Time						
Lmax	56.6	40.9	57.8	45.3	50.8	46.2	54.8	47.2
Lmin	37.8	32.3	37.2	33.7	38.1	35.3	40.9	38.3
Leq	48.21	37.01	48.02	37.55	48.68	41.36	50.88	43.69
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

Note: *A “decibel” is a unit in which noise is measured

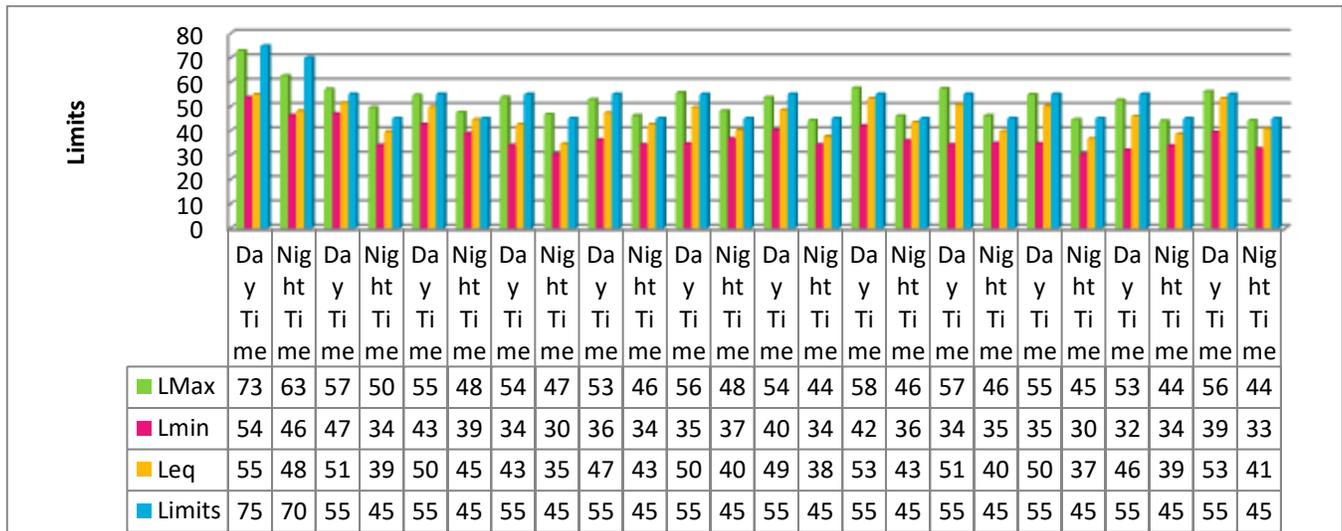


Figure 3.6 Location-wise Variation of Ambient Noise Levels (June 2023)

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3.2.4 Ambient Noise Monitoring Results (September-2023)

The location wise ambient noise monitoring results is summarized in **Table 3.10, 3.11 & 3.12**. The location-wise variation of noise levels are graphically presented in **Figure**

Table 3.10 Ambient Noise Monitoring Results (1-4 Location)

Parameter	N1		N2		N3		N4	
	Day Time	Night Time						
Lmax	72.9	62.6	57.1	49.6	54.7	47.6	53.9	46.7
Lmin	53.6	46.3	46.9	34.1	42.6	38.9	34.1	30.1
Leq	54.87	48.18	51.47	39.48	49.76	44.66	42.61	34.63
CPCB Limit (Leq in dB(A) Industrial Limit& Residential Limit)	75.00	70.00	55.00	45.00	55.00	45.00	55.00	45.00

Note *A “decibel” is a unit in which noise is measured.

Table 3.11 Ambient Noise Monitoring Results (5-8 Location)

Parameter	N5		N6		N7		N8	
	Day Time	Night Time						
Lmax	52.9	46.2	55.6	48.2	53.7	44.2	57.6	46.1
Lmin	36.3	34.2	34.7	36.7	40.2	34.3	41.9	35.8
Leq	47.29	42.69	49.66	40.27	48.62	37.61	53.26	43.47
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

Note *A “decibel” is a unit in which noise is measured.

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Table 3.12 Ambient Noise Monitoring Results (9-12 Location)

Parameter	N9		N10		N11		N12	
	Day Time	Night Time						
Lmax	57.4	46.2	54.9	44.7	52.6	44.1	56.1	44.2
Lmin	34.2	34.8	34.7	30.2	32.0	33.9	39.4	32.6
Leq	50.69	39.76	50.28	36.76	45.96	38.66	53.24	40.73
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

Note: *A “decibel” is a unit in which noise is measured

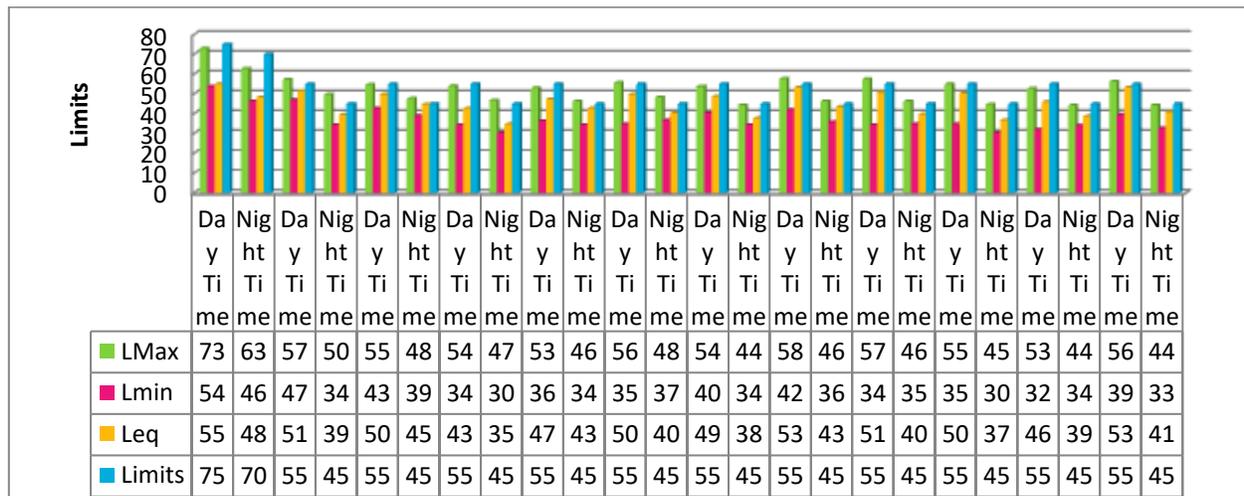


Figure 3.6 Location-wise Variation of Ambient Noise Levels (September 2023)

3.2.4 Discussion on Ambient Noise Levels in the Study Area

Day Time Noise Levels (L_{day}):

The day time noise level at all the locations were found to within limits prescribed for Industrial area i.e. 75 dB (A) and for residential are 55 dB (A).

Night Time Noise Levels (L_{night}):

The night time noise level at all the locations were found to within limit prescribed for Industrial area i.e. 70 dB (A) and for residential are 45

3.3 WATER QUALITY MONITORING

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3.3.1 Ground Water Quality Monitoring Locations

Keeping in view the importance of Ground water & Surface water as an important source of water to the local population, sample of ground water & surface water was collected from the project site for the assessment of impacts of the project on the ground water quality & surface water quality.

Water sample was collected from the project site and nearby villages. The sample was analyzed for various parameters to compare with the standards for water as per IS: 10500 for water sources. The details of water sampling locations are given in **Table 3.16**

Table 3.16 Details of Water Quality Monitoring Station

S. No.	Location Code	Location Name/ Description	
		June 2023	September 2023
1.	W 1	Ground Water (Near Project Site)	Ground Water (Near Project Site)
2.	W 2	Ground Water (NasibPura)	Ground Water (Jiwan Singh Wala)
3.	W 3	Ground Water (Kot Kashmir)	Ground Water (Maanwala)
4.	W 4	Ground Water (Baghi Bandar)	Ground Water (Mahi Nangal)
5.	W 5	Ground Water (Maanwala)	Ground Water (Kot Kashmir)
6.	W 6	Ground Water (Jiwan Singh Wala)	Ground Water (NasibPura)
7.	W 7	Ground Water (Mahi Nangal)	Ground Water (Baghi Bandar)
8.	W 8	Surface Water (Chathewala)	Surface Water (KotFatta)
9.	W 9	Surface Water (KotFatta)	Surface Water (Chathewala)

3.3.2 Methodology of Groundwater & Surface water Quality Monitoring

Sampling of water was carried out on **June 2023 & September 2023**. Samples were collected as grab sample and sampling forms are filled in as per the sampling plan. The preservative sample were properly added to preserve as per standard operating procedures (SOP) and stored immediately in ice boxes, which were ensured for appropriate temperatures. Sample for chemical analysis was collected in polyethylene carboys. Sample collected for metal content were acidified to <2 pH with 1 ml HNO₃. A sample for bacteriological analysis was collected in sterilized glass bottles.

Soon after the completion of sampling, chain of custody sheets for the samples are filled in and then they were transported to laboratory for further analysis. Proper care was taken during packing and transportation of samples. All the samples reached the central laboratory within the holding times for different parameters. After ensuring the same the samples were forwarded immediately for analysis.

The samples were analyzed as per the standard procedures specified in 'Standard Methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA) and CPCB. The analytical techniques and the test methods adopted for testing of water are given in **Table 3.17-3.34**.

3.3.3 Ground Water & Surface Water Quality Monitoring Results (December 2022)

The detailed ground water & surface water quality monitoring results are presented in **Table 3.26-3.34**

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Table 3.26 Ground water Quality Monitoring Result (Near Project Site)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.35	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (P-21)	254.63	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	64.84	mg/L	75	200
8.	Alkalinity as	IS 3025 (P-23)	241.02	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	57.42	mg/L	250	1000
10.	Cyanide as CN	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No
11.	Magnesium as Mg	APHA 3500 Mg B	22.56	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	534.00	mg/L	500	2000
13.	Sulphate as SO ₄	IS 3025 (P-24)	18.08	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.52	mg/L	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (Part -34)	4.01	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.12	mg/L	1.0	No Relaxation
17.	Aluminium as Al	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium as Cr	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No
22.	Anionic Detergents	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc as Zn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.24	mg/L	5.0	15.0
24.	Copper as Cu	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese as Mn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium as Cd	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation

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27.	Lead as Pb	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium as Se	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic as As	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury as Hg	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	860	μS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	24.2	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.5	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	---	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	--

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.27 Ground water Quality Monitoring Result (Nasibpura)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.62	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (P-21)	226.01	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	65.32	mg/L	75	200
8.	Alkalinity as	IS 3025 (P-23)	228.21	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	47.26	mg/L	250	1000
10.	Cyanide as CN	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No

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11.	Magnesium as Mg	APHA 3500 Mg B	15.32	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	502.00	mg/L	500	2000
13.	Sulphate as SO ₄	IS 3025 (P-24)	30.06	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.60	mg/L	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (Part -34)	3.31	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.12	mg/L	1.0	No Relaxation
17.	Aluminium as Al	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium as Cr	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No
22.	Anionic	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc as Zn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.24	mg/L	5.0	15.0
24.	Copper as Cu	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese as Mn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium as Cd	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead as Pb	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium as Se	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic as As	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury as Hg	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	7.98	μS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	31.8	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.8	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	---	

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36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample
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*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

@Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total

Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

Table 3.28 Ground water Quality Monitoring Result (Kot Kashmir)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.66	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (P-21)	251.26	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	69.24	mg/L	75	200
8.	Alkalinity as	IS 3025 (P-23)	211.14	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	84.89	mg/L	250	1000
10.	Cyanide as CN	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No
11.	Magnesium as Mg	APHA 3500 Mg B	19.08	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	560.00	mg/L	500	2000
13.	Sulphate as SO ₄	IS 3025 (P-24)	37.59	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.52	mg/L	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (Part -34)	5.02	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.15	mg/L	1.0	No Relaxation
17.	Aluminium as Al	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium as Cr	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No
22.	Anionic	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0

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23.	Zinc as Zn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.42	mg/L	5.0	15.0
24.	Copper as Cu	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese as Mn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium as Cd	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead as Pb	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium as Se	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic as As	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury as Hg	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	8.93	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	40.8	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.8	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	---	--
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	----

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

@Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

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Table 3.29 Ground water Quality Monitoring Result (Baghi Bandar)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.66	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (P-21)	298.42	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	91.23	mg/L	75	200
8.	Alkalinity as	IS 3025 (P-23)	242.00	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	77.04	mg/L	250	1000
10.	Cyanide as CN	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No
11.	Magnesium as Mg	APHA 3500 Mg B	16.90	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	594.00	mg/L	500	2000
13.	Sulphate as SO ₄	IS 3025 (P-24)	49.58	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.76	mg/L	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (Part -34)	7.44	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.13	mg/L	1.0	No Relaxation
17.	Aluminium as Al	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium as Cr	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No

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22.	Anionic	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc as Zn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.39	mg/L	5.0	15.0
24.	Copper as Cu	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese as Mn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium as Cd	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead as Pb	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium as Se	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic as As	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury as Hg	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	9.40	μS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	23.1	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.6	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	---	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

©Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

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Table 3.30 Ground water Quality Monitoring Result (Maanwala)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	77.58	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (P-21)	215.89	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	67.36	mg/L	75	200
8.	Alkalinity as	IS 3025 (P-23)	164.42	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	70.86	mg/L	250	1000
10.	Cyanide as CN	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No
11.	Magnesium as Mg	APHA 3500 Mg B	11.62	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	510.00	mg/L	500	2000
13.	Sulphate as SO ₄	IS 3025 (P-24)	52.14	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.80	mg/L	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (Part -34)	4.69	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.20	mg/L	1.0	No Relaxation
17.	Aluminium as Al	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium as Cr	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No
22.	Anionic	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0

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23.	Zinc as Zn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.26	mg/L	5.0	15.0
24.	Copper as Cu	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese as Mn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium as Cd	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead as Pb	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium as Se	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic as As	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury as Hg	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	798	μS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	37.0	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.3	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	---	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

©Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

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Table 3.31 Ground water Quality Monitoring Result (Jiwan Singh Wala)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.74	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (P-21)	181.26	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	46.87	mg/L	75	200
8.	Alkalinity as	IS 3025 (P-23)	158.11	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	43.57	mg/L	250	1000
10.	Cyanide as CN	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No
11.	Magnesium as Mg	APHA 3500 Mg B	15.63	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	346.00	mg/L	500	2000
13.	Sulphate as SO ₄	IS 3025 (P-24)	14.59	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.56	mg/L	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (Part -34)	4.20	mg/L	45	No Relaxation
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.13	mg/L	1.0	No Relaxation
17.	Aluminium as Al	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium as Cr	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation

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20.	Phenolic	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No
22.	Anionic	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc as Zn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.24	mg/L	5.0	15.0
24.	Copper as Cu	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese as Mn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium as Cd	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead as Pb	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium as Se	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic as As	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury as Hg	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	570	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	10.4	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.0	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	---	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

@Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

Table 3.32 Ground water Quality Monitoring Result (Mahi Namgal)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source

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1.	pH (at 25°C)	IS 3025 (P-11)	7.47	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	IS 3025 (P-21)	205.24	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	46.03	mg/L	75	200
8.	Alkalinity as	IS 3025 (P-23)	183.40	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	54.76	mg/L	250	1000
10.	Cyanide as CN	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No
11.	Magnesium as Mg	APHA 3500 Mg B	21.96	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	404.00	mg/L	500	2000
13.	Sulphate as SO ₄	IS 3025 (P-24)	19.55	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.50	mg/L	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (Part -34)	8.2	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.18	mg/L	1.0	No Relaxation
17.	Aluminium as Al	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium as Cr	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No
22.	Anionic	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc as Zn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.23	mg/L	5.0	15.0
24.	Copper as Cu	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese as Mn	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium as Cd	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead as Pb	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium as Se	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic as As	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury as Hg	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation

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31.	Conductivity	IS 3025 (P-14)	648	μS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	20.1	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.5	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	---	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml	

Note: - *BDL-Below Detection Limit, **DL- Detection Limit

Table 3.33 Surface water Quality Monitoring Result (Chathewala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.33	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	15.2	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Taste	IS 3025 (P-8)	NR	--
6.	Chloride as Cl	IS 3025 (P-32)	66.49	mg/L
7.	Conductivity	IS 3025 (P-14)	598	μS/cm
8.	Nitrate as NO ₃	IS 3025 (P-34)	10.55	mg/L
9.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.30	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	37100	mg/L
11.	Lead as Pb	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
12.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	0.29	mg/L
13.	Sulphate as SO ₄	IS 3025 (P-24)	10.57	mg/L
14.	Fluoride as F	APHA 4500 FD	0.60	mg/L
15.	BOD (3 Days at	IS 3025 (P-44)	3.92	mg/L
16.	COD	IS 3025 (P-58)	25.02	mg/L
17.	Free Ammonia as	IS 3025 (P-34)	8.689	mg/L
18.	Total Coliform	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	Per 100ml
19.	Arsenic as As	IS 3025 (P-21)	BLQ(LOQ 0.002)	mg/L
20.	Total Hardness as CaCO ₃	IS 3025 (P-40)	133.00	mg/L

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21.	Calcium as Ca	IS 3025 (P-23)	42.58	mg/L
22.	Alkalinity as	APHA 3500 Mg B Calculation Method	152.39	mg/L
23.	Magnesium as Mg	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	6.50	mg/L
24.	Copper as Cu	IS 3025 (P-45)	2.76	mg/L
25.	Sodium	IS 3025 (P-45)	45.24	mg/L
26.	Potassium	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	3.8	mg/L
27.	Total Chromium as Cr	IS 15185:2016	Absent	mg/L

Note:- BLQ-Below Limit of Quantification, *LOQ-Limit of Quantification, **NR- Not Reported.

Table 3.34 Surface water Quality Monitoring Result (Kot Fatta)

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25°C)	IS 3025 (P-11)	7.21	--
2	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3	Turbidity	IS 3025 (P-10)	17.0	NTU
4	Odour	IS 3025 (P-5)	Agreeable	--
5	Taste	IS 3025 (P-8)	NR	--
6	Chloride as Cl	IS 3025 (P-32)	49.02	mg/L
7	Conductivity	IS 3025 (P-14)	801	µS/cm
8	Nitrate as NO ₃	IS 3025 (P-34)	4.55	mg/L
9	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.39	mg/L
10	Total Dissolved Solids	IS 3025 (P-16)	486.00	mg/L
11	Lead as Pb	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
12	Boron	VEL/STP/ICP/W-01, Issue No.-01,	0.27	mg/L
13	Sulphate as SO ₄	IS 3025 (P-24)	22.95	mg/L
14	Fluoride as F	APHA 4500 FD	0.32	mg/L
15	BOD (3 Days at	IS 3025 (P-44)	2.66	mg/L
16	COD	IS 3025 (P-58)	14.89	mg/L
17	Free Ammonia as	IS 3025 (P-34)	5.24	mg/L
18	Total Coliform	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	Per 100ml
19	Arsenic as As	IS 3025 (P-21)	BLQ(LOQ 0.002)	mg/L
20	Total Hardness as CaCO ₃	IS 3025 (P-40)	112.21	mg/L
21	Calcium as Ca	IS 3025 (P-23)	48.11	mg/L
22	Alkalinity as	APHA 3500 Mg B Calculation Method	155.09	mg/L
23	Magnesium as Mg	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	1.90	mg/L

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24	Copper as Cu	IS 3025 (P-45)	2.87	mg/L
25	Sodium	IS 3025 (P-45)	44.1	mg/L
26	Potassium	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	1.9	mg/L
27	Total Chromium as Cr	IS 15185:2016	Absent	mg/L

Note:- BLQ-Below Limit of Quantification, *LOQ-Limit of Quantification, **NR- Not Reported.

3.3.4 Ground Water & Surface Water Quality Monitoring Results (September 2023)

The detailed ground water & surface water quality monitoring results are presented in **Table 3.17-3.25**

Table 3.17 Ground water Quality Monitoring Result (Near Project Site)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.62	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	232.14	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	60.28	mg/L	75	200
8.	Alkalinity (as	IS 3025 (P-23)	232.14	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	54.69	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No
11.	Magnesium (as Mg)	APHA 3500 Mg B	19.86	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	523.00	mg/L	500	2000
13.	Sulphate(as SO ₄)	IS 3025 (P-24)	14.04	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.47	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	3.87	mg/L	45	No
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.10	mg/L	1.0	No Relaxation

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17.	Aluminium(as Al)	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No
22.	Anionic Detergents	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.21	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	835	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	21.9	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.3	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	--	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	'Shall not be detectable in any 100 ml	

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

©Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

Table 3.18 Ground water Quality Monitoring Result (Nasibpura)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source

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1.	pH (at 25°C)	IS 3025 (P-11)	7.34	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	214.87	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	61.69	mg/L	75	200
8.	Alkalinity (as	IS 3025 (P-23)	215.63	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	44.78	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No
11.	Magnesium (as Mg)	APHA 3500 Mg B	14.81	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	478.20	mg/L	500	2000
13.	Sulphate(as SO ₄)	IS 3025 (P-24)	32.57	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.66	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	3.69	mg/L	45	No
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.10	mg/L	1.0	No Relaxation
17.	Aluminium(as Al)	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No
22.	Anionic Detergents	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.21	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation

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31.	Conductivity	IS 3025 (P-14)	746	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	29.87	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.1	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any	

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

©Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

Table 3.19 Ground water Quality Monitoring Result (Kot Kashmir)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.41	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	243.69	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	64.28	mg/L	75	200
8.	Alkalinity (as	IS 3025 (P-23)	204.55	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	86.89	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No
11.	Magnesium (as Mg)	APHA 3500 Mg B	20.24	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	534.00	mg/L	500	2000
13.	Sulphate(as SO ₄)	IS 3025 (P-24)	34.28	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.47	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	4.89	mg/L	45	No

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16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.12	mg/L	1.0	No Relaxation
17.	Aluminium(as Al)	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No
22.	Anionic Detergents	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.27	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	874	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	38.45	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.4	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any	

Note: - *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

©Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

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Table 3.20 Ground water Quality Monitoring Result (Baghi Bandar)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.21	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	241.65	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	84.65	mg/L	75	200
8.	Alkalinity (as	IS 3025 (P-23)	237.00	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	71.09	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	7.39	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	544.00	mg/L	500	2000
13.	Sulphate(as SO ₄)	IS 3025 (P-24)	52.58	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.62	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	8.14	mg/L	45	No Relaxation

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16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.10	mg/L	1.0	No Relaxation
17.	Aluminium(as Al)	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.46	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	921	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	22.7	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.9	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	

Note: - *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

@Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

Table 3.21 Ground water Quality Monitoring Result (Maanwal)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source

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1.	pH (at 25°C)	IS 3025 (P-11)	7.27	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	232.49	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	64.28	mg/L	75	200
8.	Alkalinity (as	IS 3025 (P-23)	149.39	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	68.75	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No
11.	Magnesium (as Mg)	APHA 3500 Mg B	17.52	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	521.00	mg/L	500	2000
13.	Sulphate(as SO ₄)	IS 3025 (P-24)	50.58	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.74	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	3.89	mg/L	45	No
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.26	mg/L	1.0	No Relaxation
17.	Aluminium(as Al)	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No
22.	Anionic Detergents	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.21	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation

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31.	Conductivity	IS 3025 (P-14)	747	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	34.0	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.9	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any	

Note: *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

©Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

Table 3.22 Ground water Quality Monitoring Result (Jiwan Singh Wala)

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.52	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	159.24	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	44.67	mg/L	75	200
8.	Alkalinity (as	IS 3025 (P-23)	163.47	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	42.98	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	11.61	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	365.00	mg/L	500	2000
13.	Sulphate(as SO ₄)	IS 3025 (P-24)	16.65	mg/L	200	400

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14.	Fluoride (as F)	APHA 4500 F D	0.48	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	5.62	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.19	mg/L	1.0	No Relaxation
17.	Aluminium(as Al)	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01,	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.21	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	552	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	12.8	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.2	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	

Note: - *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

©Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

Table 3.23 Ground water Quality Monitoring Result (Mahi Nangal)

S.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012
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No.					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.62	--	6.5 to 8.5	No
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	214.78	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	44.02	mg/L	75	200
8.	Alkalinity (as	IS 3025 (P-23)	195.63	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	51.78	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No
11.	Magnesium (as Mg)	APHA 3500 Mg B	25.50	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	420.00	mg/L	500	2000
13.	Sulphate(as SO ₄)	IS 3025 (P-24)	16.69	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.58	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	6.2	mg/L	45	No
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.23	mg/L	1.0	No Relaxation
17.	Aluminium(as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No
22.	Anionic Detergents	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.29	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation

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28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	623	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	23.8	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.1	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any	

Note: - *BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

@Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).

Table 3.24 Surface water Quality Monitoring Result (Chathewala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.62	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	13.8	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Taste	IS 3025 (P-8)	NR	--
6.	Chloride (as Cl)	IS 3025 (P-32)	64.21	mg/L
7.	Conductivity	IS 3025 (P-14)	551	µS/cm
8.	Nitrate (as NO ₃)	IS 3025 (P-34)	13.78	mg/L
9.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.36	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	361.25	mg/L
11.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
12.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.36	mg/L
13.	Sulphate(as SO ₄)	IS 3025 (P-24)	12.47	mg/L
14.	Fluoride (as F)	APHA 4500 F D	0.66	mg/L

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15.	BOD (5 Days at 20°C)	IS 3025 (P-44)	3.21	mg/L
16.	COD	IS 3025 (P-58)	26.01	mg/L
17.	Free Ammonia (as N)	IS 3025 (P-34)	7.89	mg/L
18.	Total Coliform	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	Per 100ml
19.	Arsenic (as As)	IS 3025 (P-21)	112.00	mg/L
20.	Total Hardness (as CaCO ₃)	IS 3025 (P-40)	45.85	mg/L
21.	Calcium (as Ca)	IS 3025 (P-23)	145.67	mg/L
22.	Alkalinity (as CaCO ₃)	APHA 3500 Mg B Calculation Method	5.96	mg/L
23.	Magnesium (as Mg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	3.65	mg/L
24.	Copper (as Cu)	IS 3025 (P-45)	43.85	mg/L
25.	Sodium (as Na)	IS 3025 (P-45)	4.6	mg/L
26.	Potassium (as K)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
27.	Total Chromium (as Cr)	IS 15185:2016	Absent	mg/L

Note:- BLQ-Below Limit of Quantification, *LOQ-Limit of Quantification, **NR- Not Reported.

Table 3.25 Surface water Quality Monitoring Result (Kot Fatta)

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25°C)	IS 3025 (P-11)	7.46	--
2	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3	Turbidity	IS 3025 (P-10)	15.0	NTU
4	Odour	IS 3025 (P-5)	Agreeable	--
5	Taste	IS 3025 (P-8)	NR	--
6	Chloride (as Cl)	IS 3025 (P-32)	42.02	mg/L
7	Conductivity	IS 3025 (P-14)	836	μS/cm
8	Nitrate (as NO ₃)	IS 3025 (P-34)	4.87	mg/L
9	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.46	mg/L
10	Total Dissolved Solids	IS 3025 (P-16)	428.00	mg/L
11	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
12	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.24	mg/L
13	Sulphate(as SO ₄)	IS 3025 (P-24)	26.95	mg/L

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14	Fluoride (as F)	APHA 4500 F D	0.38	mg/L
15	BOD (5 Days at	IS 3025 (P-44)	3.56	mg/L
16	COD	IS 3025 (P-58)	13.18	mg/L
17	Free Ammonia (as	IS 3025 (P-34)	6.32	mg/L
18	Total Coliform	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	Per 100ml
19	Arsenic (as As)	IS 3025 (P-21)	123.47	mg/L
20	Total Hardness (as CaCO ₃)	IS 3025 (P-40)	52.69	mg/L
21	Calcium (as Ca)	IS 3025 (P-23)	141.57	mg/L
22	Alkalinity (as	APHA 3500 Mg B Calculation Method	2.10	mg/L
23	Magnesium (as Mg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	2.62	mg/L
24	Copper (as Cu)	IS 3025 (P-45)	45.6	mg/L
25	Sodium (as Na)	IS 3025 (P-45)	2.3	mg/L
26	Potassium (as K)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
27	Total Chromium (as Cr)	IS 15185:2016	Absent	mg/L

Note:- BLQ-Below Limit of Quantification, *LOQ-Limit of Quantification, **NR- Not Reported.

3.4 SOIL MONITORING

3.4.1 Soil Monitoring Locations

The objective of the soil monitoring is to identify the impacts of ongoing project activities on soil quality and also predict impacts, which have arisen due to execution of various constructions allied activities. Accordingly, a study of assessment of the soil quality has been carried out.

To assess impacts of ongoing project activities on the soil in the area, the physico-chemical characteristics of soils were examined by obtaining soil samples from selected points and analysis of the same. Single sample of soil was collected from the project site for studying soil characteristics, the location of which is listed in **Table 3.35**.

Table 3.35 Details of Soil Quality Monitoring Location

S. No.	Location Code	Location Name/ Description	
		June 2023	September 2023
1.	S1	Near Project Site	Near Project Site
2.	S2	NasibPura	Jiwan Singh wala
3.	S3	Kot Kashmir	MaanWala
4.	S4	Kotbhara	Mahi Nangal
5.	S5	Chathewala	Leleana
6.	S6	KotFatta	Baghi Bandar
7.	S7	Baghi Bandar	NasibPura
8.	S8	MaanWala	Kotbhara
9.	S9	Jiwan Singh wala	Kot Kashmir

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10.	S10	GehriBoghi	GehriBoghi
11.	S11	Mahi Nangal	Chathewala
12.	S12	Leleana	KotFatta

3.4.2 Methodology of Soil Monitoring

The sampling has been done in line with IS: 2720 & Methods of Soil Analysis, Part-1, 2nd edition, 1986 of American Society for Agronomy and Soil Science Society of America. The homogenized samples were analyzed for physical and chemical characteristics (physical, chemical and heavy metal concentrations). The soil samples were collected in the month of **June 2023 & September 2023**.

The samples have been analyzed as per the established scientific methods for physic-chemical parameters. The heavy metals have been analyzed by using Atomic Absorption Spectrophotometer.

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3.4.3 Soil Monitoring Results (June 2023)

Single sample of soil is collected from the site to check the quality of soil of the study area .The physio-chemical characteristics of the soil, as obtained from the analysis of the soil sample, are presented in **Table 3.48-3.59**.

Table 3.48 Physico-Chemical Characteristics of Soil in the Study Area (Near Project Site)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.32	--
2.	Conductivity	IS 14767	0.315	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	32.56	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.24	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	38.59	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	21.12	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	30.58	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	114.24	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.15	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.68	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	17.68	%
14.	Available Nitrogen as N	IS:14684	151.56	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	12.48	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	22.20	%
17.	Organic Carbon	IS 2720 (P-22)	0.40	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.71	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.49	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.68	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	9.58	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.45	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	20.55	%

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Table 3.49 Physico-Chemical Characteristics of Soil in the Study Area (Nasibpura)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.83	--
2.	Conductivity	IS 14767	0.356	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	45.21	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.28	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	39.12	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	50.69	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	47.12	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	124.36	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.89	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.75	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	25.36	%
14.	Available Nitrogen as N	IS:14684	274.55	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	21.32	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	27.24	%
17.	Organic Carbon	IS 2720 (P-22)	0.44	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.55	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.77	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.44	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.79	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.45	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	14.89	%

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Table 3.50 Physico-Chemical Characteristics of Soil in the Study Area (Kot Kashmir)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.65	--
2.	Conductivity	IS 14767	0.232	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	23.48	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.30	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	42.87	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	35.59	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	47.24	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	128.33	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.11	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.52	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	14.24	%
14.	Available Nitrogen as N	IS:14684	238.11	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	27.02	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	16.06	%
17.	Organic Carbon	IS 2720 (P-22)	0.30	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.75	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.50	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.74	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.00	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.41	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	18.55	%

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Table 3.51 Physico-Chemical Characteristics of Soil in the Study Area (Kot Bhara)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.92	--
2.	Conductivity	IS 14767	0.346	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	33.67	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.46	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	39.23	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	48.32	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	56.15	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	136.58	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.88	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.67	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	25.56	%
14.	Available Nitrogen as N	IS:14684	220.24	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	13.48	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	10.02	%
17.	Organic Carbon	IS 2720 (P-22)	0.39	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.60	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.63	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.23	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.13	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.08	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	20.06	%

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Table 3.52 Physico-Chemical Characteristics of Soil in the Study Area (Leleana)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	8.12	--
2.	Conductivity	IS 14767	0.312	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty Loam	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	17.59	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.24	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	38.14	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	33.24	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	44.02	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	75.14	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.87	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.58	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	15.25	%
14.	Available Nitrogen as N	IS:14684	201.47	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	16.79	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	14.06	%
17.	Organic Carbon	IS 2720 (P-22)	0.34	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.64	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.57	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.78	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.42	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	19.06	%

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Table 3.53 Physico-Chemical Characteristics of Soil in the Study Area (Kot Fatta)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.55	--
2.	Conductivity	IS 14767	0.308	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	28.01	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.16	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	39.24	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	43.40	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	37.15	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	119.55	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.46	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.62	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	23.48	%
14.	Available Nitrogen as N	IS:14684	208.44	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	8.47	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.24	%
17.	Organic Carbon	IS 2720 (P-22)	0.36	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.57	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.68	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.55	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.36	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.30	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 0.5)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	15.69	%

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Table 3.54 Physico-Chemical Characteristics of Soil in the Study Area (Baghi Bandar)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.44	--
2.	Conductivity	IS 14767	0.232	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Brown	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	27.14	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.26	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	49.59	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	41.36	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	79.48	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	135.44	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.21	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.68	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	34.23	%
14.	Available Nitrogen as N	IS:14684	251.69	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	27.14	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	24.40	%
17.	Organic Carbon	IS 2720 (P-22)	0.40	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.31	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.78	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.44	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.06	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.39	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	22.54	%

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Table 3.55 Physico-Chemical Characteristics of Soil in the Study Area (Maanwala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.31	--
2.	Conductivity	IS 14767	0.368	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	32.59	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.30	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	38.26	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	47.14	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	32.68	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	147.21	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.69	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.72	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	22.44	%
14.	Available Nitrogen as N	IS:14684	251.48	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	12.44	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	14.06	%
17.	Organic Carbon	IS 2720 (P-22)	0.42	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.51	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.78	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.66	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.33	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.50	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	17.06	%

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Table 3.56 Physico-Chemical Characteristics of Soil in the Study Area (Kot Kashmir)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.42	--
2.	Conductivity	IS 14767	0.318	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Brown	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	27.15	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.22	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	47.14	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	30.68	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	40.47	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	133.06	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.01	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.62	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	16.55	%
14.	Available Nitrogen as N	IS:14684	224.36	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	10.59	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	17.14	%
17.	Organic Carbon	IS 2720 (P-22)	0.36	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.47	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.30	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.55	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.58	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	17.05	%

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Table 3.57 Physico-Chemical Characteristics of Soil in the Study Area (Gehri Boghi)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.55	--
2.	Conductivity	IS 14767	0.342	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty Loam	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	32.57	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.44	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	59.23	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	36.48	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	54.23	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	123.14	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.05	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.79	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	22.48	%
14.	Available Nitrogen as N	IS:14684	247.13	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	16.58	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	21.22	%
17.	Organic Carbon	IS 2720 (P-22)	0.46	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.68	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.71	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.54	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.56	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.22	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	17.46	%

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Table 3.58 Physico-Chemical Characteristics of Soil in the Study Area (Mahi Mangal)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.69	--
2.	Conductivity	IS 14767	0.348	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Brownish	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	23.87	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.32	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	42.82	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	35.66	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	68.14	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	120.48	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.01	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.67	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	28.44	%
14.	Available Nitrogen as N	IS:14684	246.20	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	15.48	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.23	%
17.	Organic Carbon	IS 2720 (P-22)	0.39	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.12	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.23	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.69	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.73	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg

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24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	19.40	%
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Table 3.59 Physico-Chemical Characteristics of Soil in the Study Area (Laleana)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.48	--
2.	Conductivity	IS 14767	0.351	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Brown	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	29.01	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.33	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	70.21	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	47.15	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	32.48	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	154.76	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.44	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.60	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	31.58	%
14.	Available Nitrogen as N	IS:14684	276.40	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	21.33	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	17.80	%
17.	Organic Carbon	IS 2720 (P-22)	0.35	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.87	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.70	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.59	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.89	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.49	mg/kg

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23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	17.40	%

3.4.3 Soil Monitoring Results (September 2023)

Single sample of soil is collected from the site to check the quality of soil of the study area. The physio-chemical characteristics of the soil, as obtained from the analysis of the soil sample, are presented in **Table 3.36-3.47**.

Table 3.36 Physico-Chemical Characteristics of Soil in the Study Area (Near Project Site)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	8.15	--
2.	Conductivity	IS 14767	0.369	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	35.78	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	2.10	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	34.27	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	23.69	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	33.18	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	124.18	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.54	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.72	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	18.36	%
14.	Available Nitrogen (as N)	IS:14684	142.49	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	14.10	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	25.67	%
17.	Organic Carbon	IS 2720 (P-22)	0.49	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.68	mg/kg

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19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.53	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.71	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	10.34	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.49	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	18.74	%

Table 3.37 Physico-Chemical Characteristics of Soil in the Study Area (Nasibpura)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.21	--
2.	Conductivity	IS 14767	0.410	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	43.69	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.10	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	36.74	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	47.96	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	49.35	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	132.45	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.85	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.81	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	3.96	%
14.	Available Nitrogen (as N)	IS:14684	284.27	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	23.65	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	28.96	%
17.	Organic Carbon	IS 2720 (P-22)	0.47	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.52	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.73	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.10	mg/kg

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21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.89	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.41	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	13.14	%

Table 3.38 Physico-Chemical Characteristics of Soil in the Study Area (Kot Kashmir)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.10	--
2.	Conductivity	IS 14767	0.310	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	21.48	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.10	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	40.74	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	36.38	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	45.27	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	132.96	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.25	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.50	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	11.78	%
14.	Available Nitrogen (as N)	IS:14684	256.78	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	25.01	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	18.90	%
17.	Organic Carbon	IS 2720 (P-22)	0.27	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.79	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.55	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.71	mg/kg

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21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.00	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.48	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	16.28	%

Table 3.39 Physico-Chemical Characteristics of Soil in the Study Area (Kot Bhara)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.10	--
2.	Conductivity	IS 14767	0.332	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	31.45	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	2.32	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	34.18	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	50.79	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	62.33	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	124.57	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.49	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.59	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	23.15	%
14.	Available Nitrogen (as N)	IS:14684	235.96	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	11.78	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	9.57	%

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17.	Organic Carbon	IS 2720 (P-22)	0.42	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.68	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.45	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.10	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.48	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	22.04	%

Table 3.40 Physico-Chemical Characteristics of Soil in the Study Area (Chathwala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.99	--
2.	Conductivity	IS 14767	0.341	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty Loam	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	15.26	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.39	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	34.27	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	30.68	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	41.47	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	71.65	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.48	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.62	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	12.66	%
14.	Available Nitrogen (as N)	IS:14684	195.74	kg/hect.

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15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	18.29	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	13.01	%
17.	Organic Carbon	IS 2720 (P-22)	0.39	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.50	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.74	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.29	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.60	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	21.48	%

Table 3.41 Physico-Chemical Characteristics of Soil in the Study Area (Kot Fatta)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.32	--
2.	Conductivity	IS 14767	0.321	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	29.78	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.29	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	42.63	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	41.89	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	34.20	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	110.85	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.85	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.54	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	20.78	%

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14.	Available Nitrogen (as N)	IS:14684	196.36	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	7.69	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.98	%
17.	Organic Carbon	IS 2720 (P-22)	0.41	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.63	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.96	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.23	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.34	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 0.5)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	14.78	%

Table 3.42 Physico-Chemical Characteristics of Soil in the Study Area (Baghi Bandar)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.64	--
2.	Conductivity	IS 14767	0.348	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Brownish	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	24.59	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.39	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	52.48	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	43.66	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	75.10	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	130.89	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.68	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.60	%

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13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	31.33	%
14.	Available Nitrogen (as N)	IS:14684	241.34	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	29.57	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	22.98	%
17.	Organic Carbon	IS 2720 (P-22)	0.43	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.37	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.82	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.41	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.52	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.46	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	25.63	%

Table 3.43 Physico-Chemical Characteristics of Soil in the Study Area (Maanwala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.62	--
2.	Conductivity	IS 14767	0.341	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	34.68	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.65	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	36.12	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	46.74	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	30.36	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	152.49	%

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11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.54	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.70	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	20.34	%
14.	Available Nitrogen (as N)	IS:14684	241.35	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	13.96	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	11.02	%
17.	Organic Carbon	IS 2720 (P-22)	0.49	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.50	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.85	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.96	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.45	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.57	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	18.10	%

Table 3.44 Physico-Chemical Characteristics of Soil in the Study Area (Jiwan Singh Wala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.30	--
2.	Conductivity	IS 14767	0.332	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	25.24	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.12	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	44.69	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	27.65	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	43.40	%

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10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	123.10	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.54	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.60	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	15.41	%
14.	Available Nitrogen (as N)	IS:14684	213.78	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	9.69	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	15.18	%
17.	Organic Carbon	IS 2720 (P-22)	0.31	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.60	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.51	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.29	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.41	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.62	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	18.07	%

Table 3.45 Physico-Chemical Characteristics of Soil in the Study Area (Gehri Boghi)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.31	--
2.	Conductivity	IS 14767	0.323	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty Loam	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	30.85	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.20	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	46.39	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	32.81	%

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9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	51.96	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	114.65	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.01	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.82	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	26.37	%
14.	Available Nitrogen (as N)	IS:14684	235.26	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	18.17	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	18.33	%
17.	Organic Carbon	IS 2720 (P-22)	0.41	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.63	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.75	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.59	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.21	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.26	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	14.58	%

Table 3.46 Physico-Chemical Characteristics of Soil in the Study Area (Mahi Nangal)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.31	--
2.	Conductivity	IS 14767	0.323	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Brownish	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	20.46	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.10	gm/cc

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7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	38.65	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	34.11	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	65.74	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	114.78	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.21	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.61	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	24.35	%
14.	Available Nitrogen (as N)	IS:14684	232.47	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	16.38	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.10	%
17.	Organic Carbon	IS 2720 (P-22)	0.42	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.57	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.8	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.32	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.79	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.70	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	20.62	%

Table 3.47 Physico-Chemical Characteristics of Soil in the Study Area (Laleana)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.68	--
2.	Conductivity	IS 14767	0.324	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Brown	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	32.69	%

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6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.41	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	68.54	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	44.36	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	30.78	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	141.28	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.21	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.51	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	30.84	%
14.	Available Nitrogen (as N)	IS:14684	263.18	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	20.28	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	19.64	%
17.	Organic Carbon	IS 2720 (P-22)	0.31	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.92	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.65	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.63	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.56	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.41	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	19.65	%

3.4.5 Discussion on Soil Characteristics in the Study Area

The soil in study area is characterized by moderate organic content. The soil quality in the project area has not been affected by the project activities.

3.5 Site Photographs

**Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab
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Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab

(F.No. J-11011/221/2017-IA II (I) Dated-23/11/2020)



Ambient Noise Monitoring

**Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab
(F.No. J-11011/221/2017-IA II (I) Dated-23/11/2020)**



Ambient Air Monitoring



Soil Sampling

**Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab
(F.No. J-11011/221/2017-IA II (I) Dated-23/11/2020)**



Water Sampling



Test Report

Sample Number:	VEL/HPCLA/A/01	Report No.:	VEL/A/2306160007
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
Latitude:	30°05'46.90" N	Party Reference No.:	NIL
Longitude:	75°01'00.75" E	Reporting Date:	20/06/2023
		Period of Analysis:	16/06/2023 to 20/06/2023
		Receipt Date:	16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan Envirolab Representative
Sampling Location	: Near Project Site
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/FPS/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 10/06/2023 to 11/06/2023
Time of Monitoring	: 09:30 AM to 09:30 AM
Ambient Temperature (°C)	: Min. 31.0°C, Max. 46.0°C
Surrounding Activity	: Human, Vehicular, & Other Plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182 & CPCB Guideline
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ²⁰ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	50.48	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	89.10	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	24.66	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	9.33	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.70	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	23.55	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	17.02	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- (i) NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

*BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number:	VEL/HPCL/A/02	Report No.:	VEL/A/2306160008
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
Latitude:	30°07'94.18" N	Party Reference No.:	NIL
Longitude:	75°00'18.46" E	Reporting Date:	20/06/2023
		Period of Analysis:	16/06/2023 to 20/06/2023
		Receipt Date:	16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan Envirolab Representative
Sampling Location	: Nasibpura
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/FPS/08
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 10/06/2023 to 11/06/2023
Time of Monitoring	: 10:00 AM to 10:00 AM
Ambient Temperature (°C)	: Min. 31.0°C, Max. 46.0°C
Surrounding Activity	: Human & Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182 & CPCB Guideline
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ¹ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	46.86	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	72.66	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	21.89	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	7.44	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.64	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	15.78	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :-¹ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

*BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number:	VEL/HPCL/A03	Report No.:	VEL/A/2306160009
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
Latitude:	30°10'20.00" N	Party Reference No.:	NIL
Longitude:	75°00'70.00" E	Reporting Date:	20/06/2023
		Period of Analysis:	16/06/2023 to 20/06/2023
		Receipt Date:	16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan Envirolab Representative
Sampling Location	: Kot Shamir
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/FPS/07
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 10/06/2023 to 11/06/2023
Time of Monitoring	: 10:30 AM to 10:30 AM
Ambient Temperature (°C)	: Min. 31.0°C, Max. 46.0°C
Surrounding Activity	: Human & Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182 & CPCB Guideline
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ² Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	51.61	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	77.87	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	21.02	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	8.24	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.69	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	24.55	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
*BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number:	VEL/HPCL/A/04	Report No.:	VEL/A/2306160010
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
Latitude:	30°04'18.29" N	Party Reference No.:	NIL
Longitude:	75°01'40.48" E	Reporting Date:	20/06/2023
		Period of Analysis:	16/06/2023 to 20/06/2023
		Receipt Date:	16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Jivan Singh Wala
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/FPS/12
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 10/06/2023 to 11/06/2023
Time of Monitoring	: 11:00 AM to 11:00 AM
Ambient Temperature (°C)	: Min. 31.0°C, Max. 46.0°C
Surrounding Activity	: Human & Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182 & CPCB Guideline
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS st Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	53.32	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	83.68	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	16.22	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	8.43	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.81	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	21.48	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	-
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	-

Note :- (i) NAAQS - National Ambient Air Quality Standards, Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

*BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number:	VEL/HPCL/A/05	Report No.:	VEL/A/2306160011
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasihpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
Latitude:	29°59'49.83" N	Party Reference No.:	NIL
Longitude:	75°01'15.53" E	Reporting Date:	20/06/2023
		Period of Analysis:	16/06/2023 to 20/06/2023
		Receipt Date:	16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Leleana
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/FPS/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 11/06/2023 to 12/06/2023
Time of Monitoring	: 10:00 AM to 10:00 AM
Ambient Temperature (°C)	: Min. 32.0°C, Max. 47.0°C
Surrounding Activity	: Human & Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182 & CPCB Guideline
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ¹ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	52.26	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	90.59	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	26.33	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	7.24	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.78	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	22.57	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	18.15	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- ① NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

*BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number: VEL/HPCL/A/06
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
 Latitude: 30°02'31.98" N
 Longitude: 75°01'62.80" E

Report No.: VEL/A/2306160012
 Format No.: 7.8 F-03
 Party Reference No.: NIL
 Reporting Date: 20/06/2023
 Period of Analysis: 16/06/2023 to 20/06/2023
 Receipt Date: 16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan Envirolab Representative
 Sampling Location : Mahi Nangal
 Instrument Used : RDS & FPS Sampler with all Accessories
 Instrument Code : VEL/RDS/FPS/12
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 11/06/2023 to 12/06/2023
 Time of Monitoring : 10:45 AM to 10:45 AM
 Ambient Temperature (°C) : Min. 32.0°C, Max. 47.0°C
 Surrounding Activity : Human & Vehicular, & Other Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ¹ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	44.18	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	79.72	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	26.14	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	7.68	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.72	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	24.55	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :-¹ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009.
 *BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number:	VEL/HPCL/A/07	Report No.:	VEL/A/2306160013
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
Latitude:	30°02'56.92" N	Party Reference No.:	NIL
Longitude:	75°06'43.06" E	Reporting Date:	20/06/2023
		Period of Analysis:	16/06/2023 to 20/06/2023
		Receipt Date:	16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan Envirolab Representative
Sampling Location	: Baghi Bandar
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/FPS/08
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 11/06/2023 to 12/06/2023
Time of Monitoring	: 11:15 AM to 11:15 AM
Ambient Temperature (°C)	: Min. 32.0°C, Max. 47.0°C
Surrounding Activity	: Human & Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182 & CPCB Guideline
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ¹ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	39.89	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	83.46	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	24.21	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	9.18	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.70	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	25.65	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	—
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	—

Note :-¹ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

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Test Report

Sample Number:	VEL/HPCL/A/08	Report No.:	VEL/A/2306160014
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
Latitude:	30°06'48.46" N	Party Reference No.:	NIL
Longitude:	75°04'40.18" E	Reporting Date:	20/06/2023
		Period of Analysis:	16/06/2023 to 20/06/2023
		Receipt Date:	16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Fatta
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/FPS/07
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 11/06/2023 to 12/06/2023
Time of Monitoring	: 12:00 PM to 12:00 PM
Ambient Temperature (°C)	: Min. 32.0°C, Max. 47.0°C
Surrounding Activity	: Human & Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182 & CPCB Guideline
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^{II} Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	42.33	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	76.14	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	20.55	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	10.26	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.67	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	24.00	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- @ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

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Test Report

Sample Number: VEL/HPCUA/09
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
 Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
 Latitude: 30°03'57.98" N
 Longitude: 75°03'55.26" E

Report No.: VEL/A/2306160015
 Format No.: 7.8 F-93
 Party Reference No.: NIL
 Reporting Date: 20/06/2023
 Period of Analysis: 16/06/2023 to 20/06/2023
 Receipt Date: 16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan Envirolab Representative
 Sampling Location : Chathewala
 Instrument Used : RDS & FPS Sampler with all Accessories
 Instrument Code : VEL/RDS/FPS/12
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 12/06/2023 to 13/06/2023
 Time of Monitoring : 11:00 AM to 11:00 AM
 Ambient Temperature (°C) : Min. 35.0°C, Max. 48.0°C
 Surrounding Activity : Human & Vehicular, & Other Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ²⁰ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	43.88	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	72.44	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	27.12	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	9.47	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.66	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	18.14	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards, Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
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Test Report

Sample Number:	VEL/HPCL/A/10	Report No.:	VEL/A/2306160016
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
Latitude:	30°20'45.12" N	Party Reference No.:	NIL
Longitude:	75°53'07.00" E	Reporting Date:	20/06/2023
		Period of Analysis:	16/06/2023 to 20/06/2023
		Receipt Date:	16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Manwala
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/FPS/7
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 12/06/2023 to 13/06/2023
Time of Monitoring	: 11:30 AM to 11:30 AM
Ambient Temperature (°C)	: Min. 35.0°C, Max. 48.0°C
Surrounding Activity	: Human & Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182 & CPCB Guideline
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS [*] Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	57.68	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	88.14	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	22.36	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	8.21	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.71	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	18.69	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note 1:-@ NAAQS – National Ambient Air Quality Standards: Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

*BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number:	VEL/HPCL/A/11	Report No.:	VEL/A/2306160017
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
Latitude:	30°05'49.86" N	Party Reference No.:	NIL
Longitude:	75°04'11.98" E	Reporting Date:	20/06/2023
		Period of Analysis:	16/06/2023 to 20/06/2023
		Receipt Date:	16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan Envirolab Representative
Sampling Location	: Kot Bhara
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/FPS/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 12/06/2023 to 13/06/2023
Time of Monitoring	: 12:00 PM to 12:00 PM
Ambient Temperature (°C)	: Min. 35.0°C, Max. 48.0°C
Surrounding Activity	: Human & Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182 & CPCB Guideline
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ¹ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	37.14	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	73.55	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	24.35	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	6.87	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.72	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	25.47	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- (i) NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

*BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number: VEL/HPCLA/12
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd., Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
Latitude: 30°08'21.78" N
Longitude: 75°57'44.11" E

Report No.: VEL/A/2306160018
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 20/06/2023
Period of Analysis: 16/06/2023 to 20/06/2023
Receipt Date: 16/06/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan Envirolab Representative
Sampling Location : Gehri Bhagi
Instrument Used : RDS & FPS Sampler with all Accessories
Instrument Code : VEL/RDS/FPS/08
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 12/06/2023 to 13/06/2023
Time of Monitoring : 12:30 PM to 12:30 PM
Ambient Temperature (°C) : Min. 35.0°C, Max. 48.0°C
Surrounding Activity : Human & Vehicular, & Other Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ¹ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	47.55	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	67.12	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	19.55	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	7.54	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.71	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	16.92	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- (i) NAAQS - National Ambient Air Quality Standards, Schedule-VII, [Rule 3 (3B)], [Part-II-ser.-3(i)]18.11.2009.
*BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number: VEL/N/01
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/N/2306160007
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 20/06/2023
Receipt Date: 16/06/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Near Project Site
Latitude:	30°05'46.90" N
Longitude:	75°01'00.75" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 10/06/2023 to 11/06/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 31.0°C, Max. 46.0°C
Surrounding Activity	: Human, Vehicular, & Other Plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	76.1	67.7	dB(A)
2.	L _{min}	IS 9989	51.2	44.4	dB(A)
3.	L _{eq}	IS 9989	57.87	46.68	dB(A)
4.	CPCB Limits in dB(A) Leq (Industrial Area)	-	75.00	70.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Sample Number: VEL/N/02
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Test Report

Report No.: VEL/N/2306160008
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 20/06/2023
Receipt Date: 16/06/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Nasibpura
Latitude:	: 30°07'94.18" N
Longitude:	: 75°00'18.46" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/07
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 10/06/2023 to 11/06/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 31.0°C, Max. 46.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	58.1	47.5	dB(A)
2.	L_{min}	IS 9989	43.8	35.8	dB(A)
3.	L_{eq}	IS 9989	52.44	44.76	dB(A)
4.	CPCB Limits in dB(A) [*] Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Vardan Envirolab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number: VEL/N/03
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/N/2306160009
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 20/06/2023
Receipt Date: 16/06/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by

Sampling Location

Latitude:

Longitude:

Instrument Used

Instrument Code

Instrument Calibration Status

Meteorological condition during monitoring

Date of Monitoring

Time of Monitoring

Ambient Temperature (°C)

Surrounding Activity

Scope of Monitoring

Control measure if Any

Sampling & Analysis Protocol

Sampling Duration

Parameter Required

: Vardan EnviroLab Representative
: **Kot Shamir**
: 30°10'20.00" N
: 75°00'70.00" E
: Sound Level Meter
: VEL/S/SLM/08
: Calibrated
: Cloudy Sky
: 10/06/2023 to 11/06/2023
: 06:00 AM to 06:00 AM
: Min. 31.0°C, Max. 46.0°C
: Human, Vehicular, & Other Activities
: Regulatory Requirement
: No any
: IS-9989 R-2014 & CPCB Guideline
: 24 Hours
: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	53.5	47.8	dB(A)
2.	L_{min}	IS 9989	39.7	34.2	dB(A)
3.	L_{eq}	IS 9989	46.59	41.57	dB(A)
4.	CPCB Limits in dB(A) L_{eq} (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number: VEL/N/04
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd, Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/N/2306160010
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/06/2023
Receipt Date: 16/06/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Jivan Singh Wala
Latitude:	30°04'18.29" N
Longitude:	75°01'40.48" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/12
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 10/06/2023 to 11/06/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 31.0°C, Max. 46.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	54.6	43.9	dB(A)
2.	L _{min}	IS 9989	36.4	32.4	dB(A)
3.	L _{eq}	IS 9989	44.58	38.59	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Sample Number: Name & Address of the Project:	VEL/N/05	Test Report	Report No.:	VEL/N/2306160011
	M/s Hindustan Petroleum Corporation Ltd.		Format No.:	7.8 F-03
	Bio Refinery, Village-Nasibpura, Tehsil-		Party Reference No.:	NIL
	Talwandi Sabo, Bathinda, Punjab		Reporting Date:	20/06/2023
			Receipt Date:	16/06/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Fatta
Latitude:	30°06'48.46" N
Longitude:	75°04'40.18" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 11/06/2023 to 12/06/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 32.0°C, Max. 47.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	53.2	45.5	dB(A)
2.	L _{min}	IS 9989	35.7	31.8	dB(A)
3.	L _{eq}	IS 9989	45.01	40.04	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number:	VEL/N/06	Report No.:	VEL/N/2306160012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Tahwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	20/06/2023
		Receipt Date:	16/06/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Baghi Bandar
Latitude:	: 30°02'56.92" N
Longitude:	: 75°06'43.06" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/08
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 11/06/2023 to 12/06/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 32.0°C, Max. 47.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	57.3	50.4	dB(A)
2.	L _{min}	IS 9989	37.2	34.8	dB(A)
3.	L _{eq}	IS 9989	51.73	42.84	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number: VEL/N/07
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpara, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/N/2306160013
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 20/06/2023
Receipt Date: 16/06/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Mahi Nangal
Latitude:	: 30°02'31.98" N
Longitude:	: 75°01'62.80" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/07
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 11/06/2023 to 12/06/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 32.0°C, Max. 47.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	51.9	40.8	dB(A)
2.	L _{min}	IS 9989	36.2	33.5	dB(A)
3.	L _{eq}	IS 9989	47.25	37.59	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Sample Number: Name & Address of the Project:	VEL/N/09	Test Report	Report No.:	VEL/N/2306160015
	M/s Hindustan Petroleum Corporation Ltd.		Format No.:	7.8 F-03
	Bio Refinery, Village-Nasibpura, Tehsil-		Party Reference No.:	NIL
	Talwandi Sabo, Bathinda, Punjab		Reporting Date:	20/06/2023
			Receipt Date:	16/06/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Bhara
Latitude:	30°05'49.86" N
Longitude:	75°04'11.98" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/09
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 12/06/2023 to 13/06/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 35.0°C, Max. 48.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	56.6	40.9	dB(A)
2.	L_{min}	IS 9989	37.8	32.3	dB(A)
3.	L_{eq}	IS 9989	48.21	37.01	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Sample Number: Name & Address of the Project:	VEL/N/10	Test Report	Report No.:	VEL/N/2306160016
	M/s Hindustan Petroleum Corporation Ltd.		Format No.:	7.8 F-03
	Bio Refinery, Village-Nasibpura, Tehsil-		Party Reference No.:	NIL
	Talwandi Sabo, Bathinda, Punjab		Reporting Date:	20/06/2023
			Receipt Date:	16/06/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Chathewala
Latitude:	: 30°03'57.98" N
Longitude:	: 75°03'55.26" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/10
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 12/06/2023 to 13/06/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 35.0°C, Max. 48.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	57.8	45.3	dB(A)
2.	L_{min}	IS 9989	37.2	33.7	dB(A)
3.	L_{eq}	IS 9989	48.02	37.55	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Sample Number: Name & Address of the Project:	VEL/N/11	Test Report	Report No.:	VEL/N/2306160017
	M/s Hindustan Petroleum Corporation Ltd.		Format No.:	7.8 F-03
	Bio Refinery, Village-Nasibpura, Tehsil-		Party Reference No.:	NIL
	Talwandi Sabo, Bathinda, Punjab		Reporting Date:	20/06/2023
			Receipt Date:	16/06/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Manwala
Latitude:	: 30°20'45.12" N
Longitude:	: 75°53'07.00" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/07
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 12/06/2023 to 13/06/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 35.0°C, Max. 48.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	50.8	46.2	dB(A)
2.	L_{min}	IS 9989	38.1	35.3	dB(A)
3.	L_{eq}	IS 9989	48.68	41.36	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number: VEL/N/12
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/N/2306160018
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 20/06/2023
Receipt Date: 16/06/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Gehri Bhagi
Latitude:	30°08'21.78" N
Longitude:	75°57'44.11" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/12
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 12/06/2023 to 13/06/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 35.0°C, Max. 48.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	54.8	47.2	dB(A)
2.	L _{min}	IS 9989	40.9	38.3	dB(A)
3.	L _{eq}	IS 9989	50.88	43.69	dB(A)
4.	CPCB Limits in dB(A) ¹ Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number:	VEL/GW/01	Report No.:	VEL/W/2306150006
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil- Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	19/06/2023
		Period of Analysis:	15/06/2023 to 19/06/2023
		Receipt Date:	15/06/2023
Sample Description:	Ground Water Sample	Sampling Date:	10/06/2023
Sample Location:	Near Project Site	Sample Quantity:	2.0 Ltr. + 250 ml
Sample Collected By:	Vardan EnviroLab Representative	Sampling Type:	Grab
Parameter Required:	As per Work Order	Preservation:	Refrigerated
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025		

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.35	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	254.63	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	64.84	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	241.02	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	57.42	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	22.56	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	534.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	18.08	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.52	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	4.01	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.12	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Test Report

Sample No.: VEL/GW/01			Report No.: VEL/W/2306150006			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.24	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	860	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	24.2	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.5	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	--
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification

^a Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliforms & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



SATYA DEV
Dr. T. S. ...
19/06/2023



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Vardan Envirolab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number: VEL/GW/02
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-
Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/W/2306150007
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 19/06/2023
Period of Analysis: 15/06/2023 to 19/06/2023
Receipt Date: 15/06/2023
Sampling Date: 10/06/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

Sample Description: Ground Water Sample
Sample Location: Nasibpura
Sample Collected By: Vardan Envirolab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.62	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	226.01	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	65.32	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	228.21	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	47.26	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	15.32	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	502.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	30.06	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.60	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	3.31	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.12	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Test Report

Sample No.: VEL/GW/02			Report No.: VEL/W/2306150007			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.24	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	798	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	31.8	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.8	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	--
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification

**Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



Dy. T. S. P. 19/10/2023



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number:	VEL/GW/03	Report No.:	VEL/W/2306150008
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil- Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	19/06/2023
		Period of Analysis:	15/06/2023 to 19/06/2023
		Receipt Date:	15/06/2023
Sample Description:	Ground Water Sample	Sampling Date:	16/06/2023
Sample Location:	Kot Shamir	Sample Quantity:	2.0 Ltr. + 250 ml
Sample Collected By:	Vardan EnviroLab Representative	Sampling Type:	Grab
Parameter Required:	As per Work Order	Preservation:	Refrigerated
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025		

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.66	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	251.26	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	69.24	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	211.14	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	84.89	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	19.08	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	560.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	37.59	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.52	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	5.02	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.15	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Test Report

Sample No.: VEL/GW/03			Report No.: VEL/W/2306150008			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.42	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	893	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	40.8	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.8	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	--
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification

[†] Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil)



Dy. Technical Manager
[Signature]



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number: VEL/GW/04
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/W/2306150009
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 19/06/2023
Period of Analysis: 15/06/2023 to 19/06/2023
Receipt Date: 15/06/2023
Sampling Date: 10/06/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

Sample Description: Ground Water Sample
Sample Location: Baghi Bandar
Sample Collected By: Vardan EnviroLab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.66	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	298.42	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	91.73	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	242.00	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	77.04	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	16.90	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	594.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	49.58	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.76	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	7.44	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.13	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Test Report

Sample No.: VEL/GW/04			Report No.: VEL/W/2306150009			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.39	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	940	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	23.1	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.6	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	--	

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

[†] Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliforms & E.coli)-& Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001

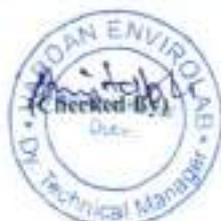


Test Report

Sample Number:	VEL/GW/05	Report No.:	VEL/W/2306150010
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil- Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	19/06/2023
		Period of Analysis:	15/06/2023 to 19/06/2023
		Receipt Date:	15/06/2023
Sample Description:	Ground Water Sample	Sampling Date:	10/06/2023
Sample Location:	Maanwala	Sample Quantity:	2.0 Ltr. + 250 ml
Sample Collected By:	Vardan EnviroLab Representative	Sampling Type:	Grab
Parameter Required:	As per Work Order	Preservation:	Refrigerated
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025		

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.58	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	215.89	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	67.36	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	164.42	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	70.86	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	11.62	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	510.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	52.14	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.80	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	4.69	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.20	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Test Report

Sample No.: VEL/GW/05			Report No.: VEL/W/2306150010			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.26	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	798	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	37.0	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.3	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	
36.	E. coli	IS 15185:2016	Absent	Per 100ml	--	

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

*Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



Sd/-
19/06/2023
Dy. Technical Manager-Micro



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Vardan EnviroLab

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ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number:	VEL/GW/06	Report No.:	VEL/W/2306150011
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	19/06/2023
		Period of Analysis:	15/06/2023 to 19/06/2023
		Receipt Date:	15/06/2023
Sample Description:	Ground Water Sample	Sampling Date:	10/06/2023
Sample Location:	Jiwan Singh Wala	Sample Quantity:	2.0 Ltr. + 250 ml
Sample Collected By:	Vardan EnviroLab Representative	Sampling Type:	Grab
Parameter Required:	As per Work Order	Preservation:	Refrigerated
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:5025		

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.74	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	181.26	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	46.87	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	158.11	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	43.57	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	15.63	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	346.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	14.59	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.56	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	4.20	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.13	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Vardan Envirolab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample No.: VEL/GW/06				Report No.: VEL/W/2306150011		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.24	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	570	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	10.4	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.0	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	--
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



Dy. Technical Manager
19/06/2023



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Vardan Envirolab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number:	VEL/GW/07	Report No.:	VEL/W/2306150012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	19/06/2023
		Period of Analysis:	15/06/2023 to 19/06/2023
		Receipt Date:	15/06/2023
Sample Description:	Ground Water Sample	Sampling Date:	11/06/2023
Sample Location:	Mahi Nangal	Sample Quantity:	2.0 Ltr. + 250 ml
Sample Collected By:	Vardan Envirolab Representative	Sampling Type:	Grab
Parameter Required:	As per Work Order	Preservation:	Refrigerated
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025		

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.47	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	205.24	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	46.03	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	183.40	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	54.76	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	21.96	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	404.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	19.55	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.50	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	8.2	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.18	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Test Report

Sample No.: VEL/GW/07			Report No.: VEL/W/2306150012			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.23	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	648	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	20.1	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.5	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	--
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

¹ Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Bore & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



S. J. Jaiswal
19/06/23
Dy. Technical Manager-Micro



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Test Report

Sample Number: VEL/SW/01
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/SW/2306150001
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 19/06/2023
Period of Analysis: 15/06/2023 to 19/06/2023
Receipt Date: 15/06/2023
Sampling Date: 11/06/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

Sample Description: Surface Water Sample
Sample Location: Chathewala
Sample Collected By: Vardan Envirolab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

TEST RESULTS

S. No.	Parameter	Test Method	Results	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.33	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	15.2	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Taste	IS 3025 (P-8)	NR	--
6.	Chloride (as Cl)	IS 3025 (P-32)	66.49	mg/L
7.	Conductivity	IS 3025 (P-14)	598	µS/cm
8.	Nitrate (as NO ₃)	IS 3025 (P-34)	10.55	mg/L
9.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.30	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	372.00	mg/L
11.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
12.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.29	mg/L
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	10.57	mg/L
14.	Fluoride (as F)	APHA 4500 F D	0.60	mg/L
15.	BOD (3 Days at 27°C)	IS 3025 (P-44)	3.92	mg/L
16.	COD	IS 3025 (P-58)	25.02	mg/L
17.	Free Ammonia (as NH ₃)	IS 3025 (P-34)	8.68	mg/L
18.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
19.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	133.00	mg/L
20.	Calcium (as Ca)	IS 3025 (P-40)	42.58	mg/L
21.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	152.39	mg/L
22.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	6.50	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	2.76	mg/L
24.	Sodium (as Na)	IS 3025 (P-45)	45.24	mg/L
25.	Potassium (as K)	IS 3025 (P-45)	3.8	mg/L
26.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
27.	Total Coliform	IS 15185:2016	Absent	Per 100ml

Note: BLQ-Below Limit of Quantification, *LOQ-Limit of Quantification, **NR- Not Reported.



Signature: S. K. Jaiswal, Date: 19/06/2023



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Test Report

Sample Number:	VEL/SW/02	Report No.:	VEL/SW/2306150002
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	19/06/2023
		Period of Analysis:	15/06/2023 to 19/06/2023
		Receipt Date:	15/06/2023
Sample Description:	Surface Water Sample	Sampling Date:	11/06/2023
Sample Location:	Kot Fatta	Sample Quantity:	2.0 Ltr. + 250 ml
Sample Collected By:	Vardan EnviroLab Representative	Sampling Type:	Grab
Parameter Required:	As per Work Order	Preservation:	Refrigerated
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025		

TEST RESULTS

S. No.	Parameter	Test Method	Results	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.21	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	17.0	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Taste	IS 3025 (P-8)	NR	--
6.	Chloride (as Cl)	IS 3025 (P-32)	49.02	mg/L
7.	Conductivity	IS 3025 (P-14)	801	µS/cm
8.	Nitrate (as NO ₃)	IS 3025 (P-34)	4.55	mg/L
9.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.39	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	486.00	mg/L
11.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
12.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.27	mg/L
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	22.95	mg/L
14.	Fluoride (as F)	APHA 4500 F D	0.32	mg/L
15.	BOD (3 Days at 27°C)	IS 3025 (P-44)	2.66	mg/L
16.	COD	IS 3025 (P-58)	14.89	mg/L
17.	Free Ammonia (as NH ₃)	IS 3025 (P-34)	5.24	mg/L
18.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
19.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	112.21	mg/L
20.	Calcium (as Ca)	IS 3025 (P-40)	48.11	mg/L
21.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	155.69	mg/L
22.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	1.90	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	2.87	mg/L
24.	Sodium (as Na)	IS 3025 (P-45)	44.1	mg/L
25.	Potassium (as K)	IS 3025 (P-45)	1.9	mg/L
26.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
27.	Total Coliform	IS 15185:2016	Absent	Per 100ml

Note: BLQ-Below Limit of Quantification, *LOQ-Limit of Quantification, **NR- Not Reported.



Dy. Tech. *[Signature]* 19/06/2023



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Test Report

Sample Number:
Name & Address of the Project:

VEL/S0/01
M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nashipura, Tehsil-Talwandi
Sabu, Bathinda, Punjab

Report No.: VEL/S0/2306150001
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 19/06/2023
Period of Analysis: 15/06/2023 to 19/06/2023
Receipt Date: 15/06/2023
Sampling Date: 10/06/2023
Sampling Type: Composite
Sample Quantity: 2.0 Kg
Packing Status: Temp Sealed

Sample Description:
Sample Location:
Sample Collected By:
Sampling & Analysis Protocol:

Soil Sample
Near Project Site
Vardan EnviroLab Representative
IS 2720, USEPA 3050B & USDA

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.32	-
2.	Conductivity	IS 14767	0.315	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	32.56	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.24	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	38.59	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	21.12	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	30.58	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	114.24	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.15	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.68	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	17.68	%
14.	Available Nitrogen (as N)	IS:14684	151.56	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	12.48	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	22.20	%
17.	Organic Carbon	IS 2720 (P-22)	0.40	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.71	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.49	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.68	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	9.58	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.45	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	20.55	%

Note- STP- Standard Testing Procedure.

Terms & Conditions

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- The report is valid only for the intended purpose.
- This test report will not be used for advertising or media purpose without prior written permission of the laboratory.
- Giving opinions does not make the laboratory liable for the sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





Test Report

Sample Number:
Name & Address of the Project:

VEL/S0/02
M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi
Sabu, Bathinda, Punjab

Report No.: VEL/S0/2306150002
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 19/06/2023
Period of Analysis: 15/06/2023 to 19/06/2023
Receipt Date: 15/06/2023
Sampling Date: 10/06/2023
Sampling Type: Composite
Sample Quantity: 2.0 Kg
Packing Status: Temp Sealed

Sample Description:
Sample Location:
Sample Collected By:
Sampling & Analysis Protocol:

Soil Sample
Nasibpura
Vardan EnviroLab Representative
IS 2720, USEPA 3050B & USDA

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.83	—
2.	Conductivity	IS 14767	0.356	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	—
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	—
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	45.21	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.28	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	39.12	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	50.69	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	47.12	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	124.36	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.89	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.75	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	25.36	%
14.	Available Nitrogen (as N)	IS:14684	174.55	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	21.32	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	27.24	%
17.	Organic Carbon	IS 2720 (P-22)	0.44	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.55	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.77	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.44	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.79	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.45	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	14.89	%

Note- STP- Standard Testing Procedure.

Terms & Conditions

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- The report will be valid only for the period mentioned in the report.
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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number:
Name & Address of the Project:

VEL/S0/03
M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi
Sabu, Bathinda, Punjab

Report No.: VEL/S0/2306150003
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 19/06/2023
Period of Analysis: 15/06/2023 to 19/06/2023
Receipt Date: 15/06/2023
Sampling Date: 10/06/2023
Sampling Type: Composite
Sample Quantity: 2.0 Kg
Packing Status: Temp Sealed

Sample Description:
Sample Location:
Sample Collected By:
Sampling & Analysis Protocol:

Soil Sample
Kot Shamir
Vardan EnviroLab Representative
IS 2720, USEPA 3050B & USDA

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.65	--
2.	Conductivity	IS 14767	0.323	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	23.48	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.30	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	42.87	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	35.59	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	47.24	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	128.33	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.11	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.52	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	14.24	%
14.	Available Nitrogen (as N)	IS:14684	238.11	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	27.02	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	16.06	%
17.	Organic Carbon	IS 2720 (P-22)	0.30	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.75	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.30	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.74	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.00	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.41	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	18.55	%

Note- STP- Standard Testing Procedure.

Terms & Conditions

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- The report no. with full analytical report.
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- Shipping options does not imply responsibility of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number:	VEL/S0/04	Report No.:	VEL/S0/2306150004
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd, Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	19/06/2023
		Period of Analysis:	15/06/2023 to 19/06/2023
		Receipt Date:	15/06/2023
Sample Description:	Soil Sample	Sampling Date:	12/06/2023
Sample Location:	Kot Bhara	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.92	--
2.	Conductivity	IS 14767	0.346	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	33.67	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.46	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	39.23	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	48.32	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	59.15	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	136.58	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.88	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.67	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	25.56	%
14.	Available Nitrogen (as N)	IS-14684	220.24	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	13.48	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	10.02	%
17.	Organic Carbon	IS 2720 (P-22)	0.39	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.60	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.63	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.23	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.13	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.08	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	20.06	%

Note- STP- Standard Testing Procedure,

Terms & Conditions

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Test Report

Sample Number:	VEL/S0/05	Report No.:	VEL/S0/2306150006
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	19/06/2023
		Period of Analysis:	15/06/2023 to 19/06/2023
		Receipt Date:	15/06/2023
Sample Description:	Soil Sample	Sampling Date:	12/06/2023
Sample Location:	Chathewala	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	8.12	—
2.	Conductivity	IS 14767	0.312	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty Loam	—
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	—
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	17.59	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.24	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	38.14	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	33.24	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	44.02	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	75.14	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.87	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.58	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	15.25	%
14.	Available Nitrogen (as N)	IS:14684	201.47	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	16.79	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	14.06	%
17.	Organic Carbon	IS 2720 (P-22)	0.34	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.64	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.57	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.78	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.42	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	19.06	%

Note- STP- Standard Testing Procedure.

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Test Report

Sample Number:
Name & Address of the Project:

VEL/S0/06
M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi
Sabo, Bathinda, Punjab

Report No.: VEL/S0/2306150006
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 19/06/2023
Period of Analysis: 15/06/2023 to 19/06/2023
Receipt Date: 15/06/2023
Sampling Date: 11/06/2023
Sampling Type: Composite
Sample Quantity: 2.0 Kg
Packing Status: Temp Sealed

Sample Description:
Sample Location:
Sample Collected By:
Sampling & Analysis Protocol:

Soil Sample
Kot Fatta
Vardan Envirolab Representative
IS 2720, USEPA 3050B & USDA

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.55	—
2.	Conductivity	IS 14767	0.308	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	—
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	—
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	28.01	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.16	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	39.24	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	43.40	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	37.15	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	119.55	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.46	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.62	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	23.48	%
14.	Available Nitrogen (as N)	IS:14684	208.44	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	8.47	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.24	%
17.	Organic Carbon	IS 2720 (P-22)	0.36	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.57	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.68	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.55	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.26	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.30	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 0.5)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	15.69	%

Note- STP- Standard Testing Procedure.

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Vardan Envirolab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number:
Name & Address of the Project:

VEL/ S0/07
M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasihpura, Tehsil-Talwandi
Sabu, Bathinda, Punjab

Report No.:
Format No.:
Party Reference No.:
Reporting Date:
Period of Analysis:
Receipt Date:
Sampling Date:
Sampling Type:
Sample Quantity:
Packing Status:

VEL/S0/2306150007
7.8 F-03
NIL
19/06/2023
15/06/2023 to 19/06/2023
15/06/2023
11/06/2023
Composite
2.0 Kg
Temp Sealed

Sample Description:
Sample Location:
Sample Collected By:
Sampling & Analysis Protocol:

Soil Sample
Baghi Bandar
Vardan EnviroLab Representative
IS 2720, USEPA 3050B & USDA

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.44	—
2.	Conductivity	IS 14767	0.323	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	—
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Brownish	—
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	27.14	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.26	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	49.99	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	41.36	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	79.48	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	135.44	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.21	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.68	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	34.23	%
14.	Available Nitrogen (as N)	IS:14684	251.69	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	27.14	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	24.40	%
17.	Organic Carbon	IS 2720 (P-22)	0.40	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.31	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.78	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.44	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.06	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.39	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	22.54	%

Note- STP- Standard Testing Procedure.

Terms & Conditions

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- This test report will not be used for any other purpose without prior written permission of the laboratory.
- Going online does not imply the ownership of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





Test Report

Sample Number:
Name & Address of the Project:

VEL/S0/08
M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi
Sabu, Bathinda, Punjab

Report No.: VEL/S0/2306150008
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 19/06/2023
Period of Analysis: 15/06/2023 to 19/06/2023
Receipt Date: 15/06/2023
Sampling Date: 12/06/2023
Sampling Type: Composite
Sample Quantity: 2.0 Kg
Packing Status: Temp Sealed

Sample Description:
Sample Location:
Sample Collected By:
Sampling & Analysis Protocol:

Soil Sample
Manwala
Vardan EnviroLab Representative
IS 2720, USEPA 3050B & USDA

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.31	--
2.	Conductivity	IS 14767	0.368	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	32.50	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.30	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	38.26	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	47.14	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	32.68	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	147.21	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.69	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.72	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	22.44	%
14.	Available Nitrogen (as N)	IS:14684	251.48	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	12.44	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	14.06	%
17.	Organic Carbon	IS 2720 (P-22)	0.42	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.51	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.78	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.66	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.33	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.50	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	17.06	%

Note- STP- Standard Testing Procedure.

Terms & Conditions

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Vardan Envirolab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number:
Name & Address of the Project:

VEL/ S0/09
M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi
Sabu, Bathinda, Punjab

Report No.: VEL/S0/2306150009
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 19/06/2023
Period of Analysis: 15/06/2023 to 19/06/2023
Receipt Date: 15/06/2023
Sampling Date: 10/06/2023
Sampling Type: Composite
Sample Quantity: 2.0 Kg
Packing Status: Temp Sealed

Sample Description:
Sample Location:
Sample Collected By:
Sampling & Analysis Protocol:

Soil Sample
Jiwan Singh Wala
Vardan Envirolab Representative
IS 2720, USEPA 3050B & USDA

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.42	--
2.	Conductivity	IS 14767	0.318	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	27.15	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.22	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	47.14	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	30.68	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	40.47	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	133.06	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.01	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.62	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	16.55	%
14.	Available Nitrogen (as N)	IS:14684	224.36	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	10.59	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	17.14	%
17.	Organic Carbon	IS 2720 (P-22)	0.36	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.47	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.30	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.55	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.58	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	17.05	%

Note- STP- Standard Testing Procedure.

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Test Report

Sample Number:	VEL/S0/10	Report No.:	VEL/S0/2306150010
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd, Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	19/06/2023
		Period of Analysis:	15/06/2023 to 19/06/2023
		Receipt Date:	15/06/2023
Sample Description:	Soil Sample	Sampling Date:	12/06/2023
Sample Location:	Gehri Bhagi	Sampling Type:	Composite
Sample Collected By:	Vardan Envirolab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.55	--
2.	Conductivity	IS 14767	0.342	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty Loam	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	32.57	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.44	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	49.23	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	36.48	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	54.23	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	123.14	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.05	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.79	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	22.48	%
14.	Available Nitrogen (as N)	IS: 14684	247.13	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	16.58	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	21.22	%
17.	Organic Carbon	IS 2720 (P-22)	0.46	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.68	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.71	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.54	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.56	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.22	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	17.46	%

Note- STP- Standard Testing Procedure.

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Hr)
ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number:
Name & Address of the Project:

VEL/ S0/11
M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi
Sabu, Bathinda, Punjab

Report No.: VEL/S0/2306150011
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 19/06/2023
Period of Analysis: 15/06/2023 to 19/06/2023
Receipt Date: 15/06/2023
Sampling Date: 11/06/2023
Sampling Type: Composite
Sample Quantity: 2.0 Kg
Packing Status: Temp Sealed

Sample Description:
Sample Location:
Sample Collected By:
Sampling & Analysis Protocol:

Soil Sample
Mahi Nangal
Vardan EnviroLab Representative
IS 2720, USEPA 3050B & USDA

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.69	—
2.	Conductivity	IS 14767	0.348	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	—
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Brown	—
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	23.87	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.32	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	42.82	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	35.66	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	68.14	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	120.48	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.01	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.67	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	28.44	%
14.	Available Nitrogen (as N)	IS:14684	246.20	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	15.48	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.23	%
17.	Organic Carbon	IS 2720 (P-22)	0.39	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.12	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.23	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.69	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.73	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	19.40	%

Note- STP- Standard Testing Procedure.

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Test Report

Sample Number:	VEL/S0/12	Report No.:	VEL/S0/2306150012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	19/06/2023
		Period of Analysis:	15/06/2023 to 19/06/2023
		Receipt Date:	15/06/2023
Sample Description:	Soil Sample	Sampling Date:	11/06/2023
Sample Location:	Laleana	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.48	--
2.	Conductivity	IS 14767	0.351	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Brown	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	29.01	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.33	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	70.21	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	47.15	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	32.48	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	154.76	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.44	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.60	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	31.58	%
14.	Available Nitrogen (as N)	IS:14684	276.40	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	21.33	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	17.80	%
17.	Organic Carbon	IS 2720 (P-22)	0.35	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.87	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.70	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.59	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.89	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.49	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	17.40	%

Note: STP- Standard Testing Procedure.

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Test Report

Sample Number: VEL/SW/01
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
 Bio Refinery, Village-Nasibpura, Tehsil-
 Talwandi Sabo, Bathinda, Punjab

Sample Description: Surface Water Sample
Sample Location: Chathewala
Sample Collected By: Vardan EnviroLab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

Report No.: VEL/W/209250001
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Period of Analysis: 25/09/2023 to 29/09/2023
Receipt Date: 25/09/2023
Sampling Date: 21/09/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

TEST RESULTS

S. No.	Parameter	Test Method	Results	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.62	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	13.8	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Taste	IS 3025 (P-8)	NR	--
6.	Chloride (as Cl)	IS 3025 (P-32)	64.21	mg/L
7.	Conductivity	IS 3025 (P-14)	551	µS/cm
8.	Nitrate (as NO ₃)	IS 3025 (P-34)	13.78	mg/L
9.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.36	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	361.25	mg/L
11.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
12.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.36	mg/L
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	12.47	mg/L
14.	Fluoride (as F)	APHA 4500 F D	0.66	mg/L
15.	BOD (3 Days at 27°C)	IS 3025 (P-44)	3.21	mg/L
16.	COD	IS 3025 (P-58)	26.01	mg/L
17.	Free Ammonia (as NH ₃)	IS 3025 (P-34)	7.89	mg/L
18.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
19.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	112.00	mg/L
20.	Calcium (as Ca)	IS 3025 (P-40)	45.85	mg/L
21.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	145.67	mg/L
22.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	5.96	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	3.65	mg/L
24.	Sodium (as Na)	IS 3025 (P-45)	43.85	mg/L
25.	Potassium (as K)	IS 3025 (P-45)	4.6	mg/L
26.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
27.	Total Coliform	IS 15185:2016	Absent	Per 100ml

Note:- BLQ-Below Limit of Quantification, *LOQ-Limit of Quantification, **NR- Not Reported.



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Test Report

Sample Number: VEL/SW/02
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/W/2309250002
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Period of Analysis: 25/09/2023 to 29/09/2023
Receipt Date: 25/09/2023
Sampling Date: 22/09/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

Sample Description: Surface Water Sample
Sample Location: Kot Fatta
Sample Collected By: Vardan EnviroLab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

TEST RESULTS

S. No.	Parameter	Test Method	Results	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.46	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	15.0	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Taste	IS 3025 (P-8)	NR	--
6.	Chloride (as Cl)	IS 3025 (P-32)	42.02	mg/L
7.	Conductivity	IS 3025 (P-14)	836	µS/cm
8.	Nitrate (as NO ₃)	IS 3025 (P-34)	4.87	mg/L
9.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.46	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	428.00	mg/L
11.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
12.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.24	mg/L
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	26.95	mg/L
14.	Fluoride (as F)	APHA 4500 F D	0.38	mg/L
15.	BOD (3 Days at 27°C)	IS 3025 (P-44)	3.56	mg/L
16.	COD	IS 3025 (P-58)	13.18	mg/L
17.	Free Ammonia (as NH ₃)	IS 3025 (P-34)	6.32	mg/L
18.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
19.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	123.47	mg/L
20.	Calcium (as Ca)	IS 3025 (P-40)	52.69	mg/L
21.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	141.57	mg/L
22.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	2.10	mg/L
23.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	2.62	mg/L
24.	Sodium (as Na)	IS 3025 (P-45)	45.6	mg/L
25.	Potassium (as K)	IS 3025 (P-45)	2.3	mg/L
26.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L
27.	Total Coliform	IS 15185:2016	Absent	Per 100ml

Note: BLQ-Below Limit of Quantification, *LOQ-Limit of Quantification, **NR- Not Reported



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Test Report

Sample Number:	VEL/S0/01	Report No.:	VEL/PE/2309250001
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023
		Sampling Date:	20/09/2023
		Sampling Type:	Composite
		Sample Quantity:	2.0 Kg
		Packing Status:	Temp Sealed

Sample Description:	Soil Sample
Sample Location:	Near Project Site
Sample Collected By:	Vardan EnviroLab Representative
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	8.15	--
2.	Conductivity	IS 14767	0.369	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	35.78	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	2.10	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	34.27	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	23.69	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	33.18	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	124.18	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.54	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.72	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	18.36	%
14.	Available Nitrogen (as N)	IS:14684	142.49	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	14.10	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	25.67	%
17.	Organic Carbon	IS 2720 (P-22)	0.49	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.68	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.53	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.71	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	10.34	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.49	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	18.74	%

Note- STP- Standard Testing Procedure.



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Test Report

Sample Number:	VEL/ S0/02	Report No.:	VEL/PE/2309250002
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7-8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023
		Sampling Date:	20/09/2023
		Sampling Type:	Composite
		Sample Quantity:	2.0 Kg
		Packing Status:	Temp Sealed

Sample Description:	Soil Sample
Sample Location:	Nasibpura
Sample Collected By:	Vardan EnviroLab Representative
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.21	--
2.	Conductivity	IS 14767	0.410	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	43.69	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.10	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	36.74	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	47.96	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	49.35	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	132.45	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.85	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.81	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	3.96	%
14.	Available Nitrogen (as N)	IS:14684	284.27	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	23.65	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	28.96	%
17.	Organic Carbon	IS 2720 (P-22)	0.47	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.52	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.73	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.10	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.89	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.41	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	13.14	%

Note: STP- Standard Testing Procedure.



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Test Report

Sample Number:	VEL/ 50/03	Report No.:	VEL/PE/2309250003
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023
Sample Description:	Soil Sample	Sampling Date:	20/09/2023
Sample Location:	Kot Shamir	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.10	--
2.	Conductivity	IS 14767	0.310	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	21.48	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.10	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	40.74	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	36.38	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	45.27	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	132.96	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.25	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.50	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	11.78	%
14.	Available Nitrogen (as N)	IS:14684	256.78	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	25.01	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	18.90	%
17.	Organic Carbon	IS 2720 (P-22)	0.27	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.79	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.55	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.71	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.00	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.48	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	16.28	%

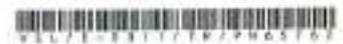
Note- STP- Standard Testing Procedure.



Page 1 of 1

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Test Report

Sample Number:	VEL/S0/04	Report No.:	VEL/PE/2309250004
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023
Sample Description:	Soil Sample	Sampling Date:	20/09/2023
Sample Location:	Kot Bhara	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.10	--
2.	Conductivity	IS 14767	0.332	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	31.45	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	2.32	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	34.18	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	50.79	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	62.33	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	124.57	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.49	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.59	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	23.15	%
14.	Available Nitrogen (as N)	IS:14684	235.96	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	11.78	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	9.57	%
17.	Organic Carbon	IS 2720 (P-22)	0.42	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.68	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.45	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.10	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.48	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	22.04	%

Note- STP- Standard Testing Procedure.



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Test Report

Sample Number:	VEL/S0/05	Report No.:	VEL/PE/2309250006
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabn, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023
Sample Description:	Soil Sample	Sampling Date:	21/09/2023
Sample Location:	Chathewala	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.99	--
2.	Conductivity	IS 14767	0.341	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty Loam	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	15.26	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.39	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	34.27	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	30.68	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	41.47	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	71.65	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.48	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.62	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	12.66	%
14.	Available Nitrogen (as N)	IS:14684	195.74	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	18.29	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	13.01	%
17.	Organic Carbon	IS 2720 (P-22)	0.39	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.50	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.74	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.29	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.60	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	21.48	%

Note- STP- Standard Testing Procedure.



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Test Report

Sample Number:	VEL/S0/06	Report No.:	VEL/PE/2309250006
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023
Sample Description:	Soil Sample	Sampling Date:	21/09/2023
Sample Location:	Kot Fatta	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.32	--
2.	Conductivity	IS 14767	0.321	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	29.78	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.29	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	42.63	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	41.89	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	34.20	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	110.85	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.85	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.54	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	20.78	%
14.	Available Nitrogen (as N)	IS:14684	196.36	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	7.69	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.98	%
17.	Organic Carbon	IS 2720 (P-22)	0.41	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.63	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.61	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.96	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.23	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.34	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 0.5)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	14.78	%

Note- STP- Standard Testing Procedure.



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Test Report

Sample Number:	VEL/S0/08	Report No.:	VEL/PE/2309250008
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpara, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023
Sample Description:	Soil Sample	Sampling Date:	21/09/2023
Sample Location:	Manwala	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.62	--
2.	Conductivity	IS 14767	0.341	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	34.68	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.65	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	36.12	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	46.74	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	30.36	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	152.49	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.54	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.70	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	20.34	%
14.	Available Nitrogen (as N)	IS:14684	241.25	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	13.96	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	11.02	%
17.	Organic Carbon	IS 2720 (P-22)	0.49	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.50	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.85	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.96	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.45	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.57	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	18.10	%

Note- STP- Standard Test Procedure.



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Test Report

Sample Number:	VEL/ S0/09	Report No.:	VEL/PE/2309250009
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd, Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023
Sample Description:	Soil Sample	Sampling Date:	22/09/2023
Sample Location:	Jhwan Singh Wala	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.30	--
2.	Conductivity	IS 14767	0.332	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	25.24	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.12	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	44.69	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	27.65	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	43.40	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	123.10	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.54	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.60	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	15.41	%
14.	Available Nitrogen (as N)	IS:14684	213.78	kg/ha.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	9.69	kg/ha.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	15.18	%
17.	Organic Carbon	IS 2720 (P-22)	0.31	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.60	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.51	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.29	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.41	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.62	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	18.07	%

Note: STP- Standard Testing Procedure.



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Test Report

Sample Number:	VEL/S0/10	Report No.:	VEL/PE/2309250010
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023
Sample Description:	Soil Sample	Sampling Date:	22/09/2023
Sample Location:	Gehri Bhagi	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.31	--
2.	Conductivity	IS 14767	0.323	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty Loam	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Red	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	30.85	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.20	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	46.39	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	32.81	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	51.96	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	114.65	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.01	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.82	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	26.37	%
14.	Available Nitrogen (as N)	IS:14684	235.26	kg/hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	18.17	kg/hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	18.33	%
17.	Organic Carbon	IS 2720 (P-22)	0.41	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.63	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.75	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.59	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.21	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.26	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	14.58	%

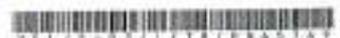
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Test Report

Sample Number:	VEL/ S0/11	Report No.:	VEL/PE/2309250011
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023
Sample Description:	Soil Sample	Sampling Date:	22/09/2023
Sample Location:	Mahi Nangal	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.23	--
2.	Conductivity	IS 14767	0.323	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Brown	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	20.46	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.10	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	38.65	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	34.11	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	65.74	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	114.78	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.21	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.61	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	24.35	%
14.	Available Nitrogen (as N)	IS:14684	232.47	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	16.38	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.10	%
17.	Organic Carbon	IS 2720 (P-22)	0.42	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.57	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.8	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	2.32	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.79	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.70	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	20.62	%

Note- STP- Standard Testing Procedure.



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Test Report

Sample Number:	VEL /S0/12	Report No.:	VEL/PE/2309250012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023
Sample Description:	Soil Sample	Sampling Date:	22/09/2023
Sample Location:	Lalcaana	Sampling Type:	Composite
Sample Collected By:	Vardan EnviroLab Representative	Sample Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Packing Status:	Temp Sealed

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.68	--
2.	Conductivity	IS 14767	0.324	mS/cm
3.	Soil Texture	VEL/STP/EN/64, Issue No.- 01, 01/11/2021	Silty	--
4.	Color	VEL/STP/EN/67, Issue No.- 01, 01/11/2021	Yellowish Brown	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	32.69	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	1.41	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	68.54	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	44.36	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	30.78	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	141.28	%
11.	Iron as (Fe)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.21	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.51	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	30.84	%
14.	Available Nitrogen (as N)	IS:14684	263.18	kg/hect.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	20.28	kg/hect.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	19.64	%
17.	Organic Carbon	IS 2720 (P-22)	0.31	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.92	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.65	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.63	mg/kg
21.	Copper (as Cu)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	1.56	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.41	mg/kg
23.	Nickel (as Ni)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	19.65	%

Note: STP - Standard Testing Procedure.



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Test Report

Sample Number: VEL/GW/01
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/W/2309250006
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Period of Analysis: 25/09/2023 to 29/09/2023
Receipt Date: 25/09/2023
Sampling Date: 26/09/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

Sample Description: Ground Water Sample
Sample Location: Near Project Site
Sample Collected By: Vardan EnviroLab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.62	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	232.14	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	60.28	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	232.14	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	54.69	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	19.86	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	523.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	14.04	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.47	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	3.87	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.10	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Test Report

Sample No.: VEL/GW/01				Report No.: VEL/W/2309250006		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.21	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	835	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	21.9	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.3	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	--
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

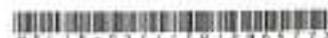
*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

* Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



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Test Report

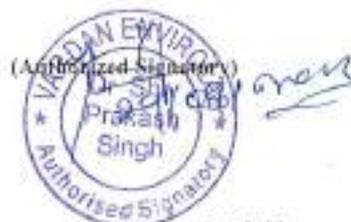
Sample Number: VEL/GW/02
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-
Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/W/2309250007
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Period of Analysis: 25/09/2023 to 29/09/2023
Receipt Date: 25/09/2023
Sampling Date: 20/09/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

Sample Description: Ground Water Sample
Sample Location: Nasibpura
Sample Collected By: Vardan EnviroLab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.34	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	214.87	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	61.69	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	215.63	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	44.78	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	14.81	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	478.20	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	32.57	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.66	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	3.69	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.10	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Test Report

Sample No.: VEL/GW/02			Report No.: VEL/W/2309250007			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.21	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	746	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	29.87	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.1	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	--
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

**Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boreon & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



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Test Report

Sample Number: VEL/GW/03
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd,
Bio Refinery, Village-Nasibpura, Tehsil-
Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/W/2309250008
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Period of Analysis: 25/09/2023 to 29/09/2023
Receipt Date: 25/09/2023
Sampling Date: 20/09/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

Sample Description: Ground Water Sample
Sample Location: Kot Shamir
Sample Collected By: Vardan EnviroLab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

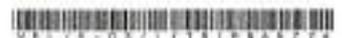
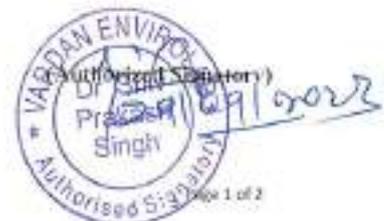
TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.41	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	243.69	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	64.28	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	204.55	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	86.89	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	20.24	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	534.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	34.28	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.47	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	4.89	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.12	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as-Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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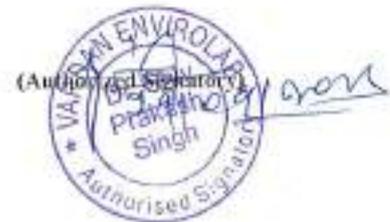


Test Report

Sample No.: VEL/GW/03			Report No.: VEL/W/2309250008			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.37	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	874	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	38.45	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.4	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	--
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

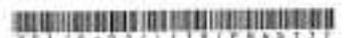
*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

*Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Barium & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



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Test Report

Sample Number: VEL/GW/04
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/W/2309250009
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Period of Analysis: 25/09/2023 to 29/09/2023
Receipt Date: 25/09/2023
Sampling Date: 20/09/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

Sample Description: Ground Water Sample
Sample Location: Baghi Bandar
Sample Collected By: Vardan EnviroLab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.21	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	241.65	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	84.65	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	237.00	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	71.09	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	7.39	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	544.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	52.58	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.62	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	8.14	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.10	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Test Report

Sample No.: VEL/GW/04			Report No.: VEL/W/2309250009			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.46	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	921	µS/cm	—	—
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	22.7	mg/L	—	—
34.	Potassium	IS 3025 (P-45)	1.9	mg/L	—	—
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	—
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

* Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



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Test Report

Sample Number: VEL/GW/05
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/W/2309250010
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Period of Analysis: 25/09/2023 to 29/09/2023
Receipt Date: 25/09/2023
Sampling Date: 21/09/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

Sample Description: Ground Water Sample
Sample Location: Maanwala
Sample Collected By: Vardan EnviroLab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.27	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	232.49	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	64.28	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	149.39	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	68.75	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	17.52	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	521.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	50.85	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.74	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	3.89	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.26	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Test Report

Sample No.: VEL/GW/05			Report No.: VEL/W/2309250010			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.21	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	747	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	34.0	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.9	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	--
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

® Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



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Test Report

Sample Number: VEL/GW/06
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/W/2309250011
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Period of Analysis: 25/09/2023 to 29/09/2023
Receipt Date: 25/09/2023
Sampling Date: 21/09/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

Sample Description: Ground Water Sample
Sample Location: Jivan Singh Wala
Sample Collected By: Vardan EnviroLab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.52	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	159.24	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	44.67	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	163.47	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	42.98	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	11.61	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	363.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	16.65	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.48	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	5.62	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.19	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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Test Report

Sample No.: VEL/GW/06				Report No.: VEL/W/2309250011		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.21	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	552	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	12.8	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.2	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	--
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

©Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



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Test Report

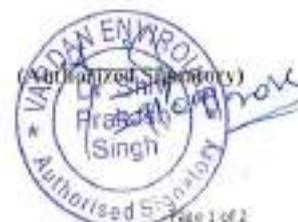
Sample Number: VEL/GW/07
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-
Tabwandi Sabo, Bathinda, Punjab

Report No.: VEL/W/2309250012
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Period of Analysis: 25/09/2023 to 29/09/2023
Receipt Date: 25/09/2023
Sampling Date: 21/09/2023
Sample Quantity: 2.0 Ltr. + 250 ml
Sampling Type: Grab
Preservation: Refrigerated

Sample Description: Ground Water Sample
Sample Location: Mahi Nangal
Sample Collected By: Vardan EnviroLab Representative
Parameter Required: As per Work Order
Sampling & Analysis Protocol: APHA 23rd Edition 2017 & IS:3025

TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25°C)	IS 3025 (P-11)	7.62	--	6.5 to 8.5	No Relaxation
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen	5	15
3.	Turbidity	IS 3025 (P-10)	BLQ(LOQ 1.0)	NTU	1	5
4.	Odour	IS 3025 (P-5)	Agreeable	--	Agreeable	Agreeable
5.	Taste	IS 3025 (P-8)	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21)	214.78	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	44.02	mg/L	75	200
8.	Alkalinity (as CaCO ₃)	IS 3025 (P-23)	195.63	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	51.78	mg/L	250	1000
10.	Cyanide (as CN)	IS 3025 (P-27)	BLQ(LOQ 0.02)	mg/L	0.05	No Relaxation
11.	Magnesium (as Mg)	APHA 3500 Mg B	25.50	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	420.00	mg/L	500	2000
13.	Sulphate (as SO ₄)	IS 3025 (P-24)	16.69	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.58	mg/L	1.0	1.5
15.	Nitrate (as NO ₃)	IS 3025 (Part -34)	6.2	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.23	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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- This report is valid for 30 days from the date of issue.
- This test report will not be used for publicity or advertising or media purpose without prior written permission of the laboratory.
- Giving opinion does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.



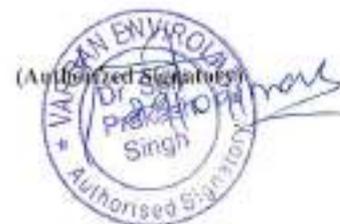


Test Report

Sample No.: VEL/GW/07				Report No.: VEL/W/2309250012		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 3025 (P-39) Clause 6	BLQ(LOQ 0.05)	mg/L	1.0	No Relaxation
22.	Anionic Detergents (as MBAS)	IS 3025 (P-68)	BLQ(LOQ 0.05)	mg/L	0.2	1.0
23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.29	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.005	No Relaxation
27.	Lead (as Pb)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	BLQ(LOQ 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	623	µS/cm	--	--
32.	Ammonia (as NH ₃)	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	23.8	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.1	mg/L	--	--
35.	Total Coliform	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any 100 ml sample	
36.	E. coli	IS 15185:2016	Absent	Per 100ml		

*BLQ-Below Limit of Quantification, **LOQ- Limit of Quantification.

**Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018 (Limit of Boron & IS method of Total Coliform & E.coli) & Amendment No.3 in Feb. 2021 (Limit of Mineral Oil).



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- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





Test Report

Sample Number:	VEL/N/01	Report No.:	VEL/AP/2309250007
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Receipt Date:	25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Near Project Site
Latitude:	30°05'46.90" N
Longitude:	75°01'00.75" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 20/09/2023 to 21/09/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 37.0°C
Surrounding Activity	: Human, Vehicular, & Other Plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	72.9	62.6	dB(A)
2.	L _{min}	IS 9989	53.6	46.3	dB(A)
3.	L _{eq}	IS 9989	54.87	48.18	dB(A)
4.	CPCB Limits in dB(A) ⁵ Leq (Industrial Area)	-	75.00	70.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





Test Report

Sample Number: VEL/N/02
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AP/2309250008
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Receipt Date: 25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

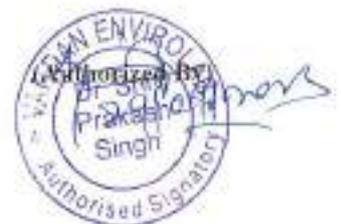
General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Nasibpura
Latitude:	30°07'94.18" N
Longitude:	75°00'18.46" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/07
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 20/09/2023 to 21/09/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 37.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	57.1	49.6	dB(A)
2.	L _{min}	IS 9989	46.9	34.1	dB(A)
3.	L _{eq}	IS 9989	51.47	39.48	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number: VEL/N/03
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AP/2309250009
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Receipt Date: 25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Shamir
Latitude:	30°10'20.00" N
Longitude:	75°00'70.00" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/08
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 20/09/2023 to 21/09/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 37.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	54.7	47.6	dB(A)
2.	L_{min}	IS 9989	42.6	38.9	dB(A)
3.	L_{eq}	IS 9989	49.76	44.66	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number: VEL/N/04
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AP/2309250010
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Receipt Date: 25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
Sampling Location : Jiwan Singh Wala
Latitude: 30°04'18.29" N
Longitude: 75°01'40.48" E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/12
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Cloudy Sky
Date of Monitoring : 22/09/2023 to 23/09/2023
Time of Monitoring : 06:00 AM to 06:00 AM
Ambient Temperature (°C) : Min. 25.0°C, Max. 37.0°C
Surrounding Activity : Human, Vehicular, & Other Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2014 & CPCB Guideline
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	53.9	46.7	dB(A)
2.	L_{min}	IS 9989	34.1	30.1	dB(A)
3.	L_{eq}	IS 9989	42.61	34.63	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number: VEL/N/05
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AP/2309250011
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Receipt Date: 25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

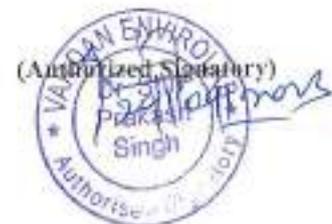
General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Fatta
Latitude:	: 30°06'48.46" N
Longitude:	: 75°04'40.18" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 21/09/2023 to 22/09/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 37.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	52.9	46.2	dB(A)
2.	L_{min}	IS 9989	36.3	34.2	dB(A)
3.	L_{eq}	IS 9989	47.29	42.69	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number:	VEL/N/06	Report No.:	VEL/AP/2309250012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Receipt Date:	25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Baghi Bandar
Latitude:	30°02'56.92" N
Longitude:	75°06'43.06" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/08
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 21/09/2023 to 22/09/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 37.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	55.6	48.2	dB(A)
2.	L_{min}	IS 9989	34.7	36.7	dB(A)
3.	L_{eq}	IS 9989	49.66	40.27	dB(A)
4.	CPCB Limits in dB(A) L_{eq} (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number: VEL/N/07
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AP/2309250013
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Receipt Date: 25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
Sampling Location : Mahi Nangal
Latitude: 30°02'31.98" N
Longitude: 75°01'62.80" E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/07
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 22/09/2023 to 23/09/2023
Time of Monitoring : 06:00 AM to 06:00 AM
Ambient Temperature (°C) : Min. 25.0°C, Max. 37.0°C
Surrounding Activity : Human, Vehicular, & Other Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2014 & CPCB Guideline
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	53.7	44.2	dB(A)
2.	L_{min}	IS 9989	40.2	34.3	dB(A)
3.	L_{eq}	IS 9989	48.62	37.61	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number: VEL/N/08
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nashpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AP/2309250014
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Receipt Date: 25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
Sampling Location : Leleana
Latitude: 29°59'49.83" N
Longitude: 75°01'15.53" E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/12
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 22/09/2023 to 23/09/2023
Time of Monitoring : 06:00 AM to 06:00 AM
Ambient Temperature (°C) : Min. 25.0°C, Max. 37.0°C
Surrounding Activity : Human, Vehicular, & Other Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2014 & CPCB Guideline
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	57.6	46.1	dB(A)
2.	L _{min}	IS 9989	41.9	35.8	dB(A)
3.	L _{eq}	IS 9989	53.26	43.47	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number: VEL/N/09
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AP/2309250015
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Receipt Date: 25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Bhara
Latitude:	: 30°05'49.86" N
Longitude:	: 75°04'11.98" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/09
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 20/09/2023 to 21/09/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 37.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	57.4	46.2	dB(A)
2.	L_{min}	IS 9989	34.2	34.8	dB(A)
3.	L_{eq}	IS 9989	50.69	39.76	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number: VEL/N/10
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AP/2309250016
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Receipt Date: 25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Chathewala
Latitude:	30°03'57.98" N
Longitude:	75°03'55.26" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/10
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 21/09/2023 to 22/09/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 37.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	54.9	44.7	dB(A)
2.	L_{min}	IS 9989	34.7	30.2	dB(A)
3.	L_{eq}	IS 9989	50.28	36.79	dB(A)
4.	CPCB Limits in dB(A) L_{eq} (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number: VEL/N/11
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AP/2309250017
Format No.: 7.8 F-03
Party Reference No.: NIL
Reporting Date: 29/09/2023
Receipt Date: 25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Manwala
Latitude:	30°20'45.12" N
Longitude:	75°53'07.00" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/07
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 21/09/2023 to 22/09/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 37.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	52.6	44.1	dB(A)
2.	L _{min}	IS 9989	32.0	33.9	dB(A)
3.	L _{eq}	IS 9989	45.96	38.66	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Note: * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number:	VEL/N/12	Report No.:	VEL/AP/2309250018
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	29/09/2023
		Receipt Date:	25/09/2023

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Gehri Bhagi
Latitude:	30°08'21.78" N
Longitude:	75°57'44.11" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/12
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 22/09/2023 to 23/09/2023
Time of Monitoring	: 06:00 AM to 06:00 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 37.0°C
Surrounding Activity	: Human, Vehicular, & Other Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	IS 9989	56.1	44.2	dB(A)
2.	L_{min}	IS 9989	39.4	32.6	dB(A)
3.	L_{eq}	IS 9989	53.24	40.73	dB(A)
4.	CPCB Limits in dB(A) ¹ Leq (Residential Area)	-	55.00	45.00	dB(A)

Note * A "decibel" is a unit in which noise is measured.



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Test Report

Sample Number:	VEL/HPCL/A/01	Report No.:	VEL/AP/2309250007
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nashpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	Format No.:	7.8 F-03
Latitude:	30°05'46.90" N	Party Reference No.:	NIL
Longitude:	75°01'00.75" E	Reporting Date:	29/09/2023
		Period of Analysis:	25/09/2023 to 29/09/2023
		Receipt Date:	25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Near Project Site
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/FPS/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Cloudy Sky
Date of Monitoring	: 20/09/2023 to 21/09/2023
Time of Monitoring	: 09:30 AM to 09:30 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 37.0°C
Surrounding Activity	: Human, Vehicular, & Other Plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182 & CPCB Guideline
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ⁰¹ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	51.39	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	79.28	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	23.78	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	8.64	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.78	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	21.49	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	24.06	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :-@ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

*BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number: VEL/HPCL/A02
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
 Bio Refinery, Village-Nasibpura, Tehsil-Talwandi
 Sabo, Bathinda, Punjab
 Latitude: 30°07'94.18" N
 Longitude: 75°00'18.46" E

Report No.: VEL/AP/2309250008
 Format No.: 7.8 F-03
 Party Reference No.: NIL
 Reporting Date: 29/09/2023
 Period of Analysis: 25/09/2023 to 29/09/2023
 Receipt Date: 25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
 Sampling Location : Nasibpura
 Instrument Used : RDS & FPS Sampler with all Accessories
 Instrument Code : VEL/RDS/FPS/08
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Cloudy Sky
 Date of Monitoring : 20/09/2023 to 21/09/2023
 Time of Monitoring : 10:00 AM to 10:00 AM
 Ambient Temperature (°C) : Min. 25.0°C, Max. 37.0°C
 Surrounding Activity : Human & Vehicular, & Other Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ¹ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	49.76	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	78.42	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	25.16	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	10.06	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.61	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	21.73	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- (i) NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-B-sec.-3(i)]18.11.2009.

*BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number: VEL/HPCL/A/03
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
 Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
 Latitude: 30°10'20.00" N
 Longitude: 75°00'70.00" E

Report No.: VEL/AP/2309250009
 Format No.: 7.8 F-03
 Party Reference No.: NIL
 Reporting Date: 29/09/2023
 Period of Analysis: 25/09/2023 to 29/09/2023
 Receipt Date: 25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
 Sampling Location : Kot Shamir
 Instrument Used : RDS & FPS Sampler with all Accessories
 Instrument Code : VEL/RDS/FPS/07
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Cloudy Sky
 Date of Monitoring : 20/09/2023 to 21/09/2023
 Time of Monitoring : 10:30 AM to 10:30 AM
 Ambient Temperature (°C) : Min. 25.0°C, Max. 37.0°C
 Surrounding Activity : Human & Vehicular, & Other Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ⁰¹ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	49.57	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	76.18	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	23.01	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	7.84	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.74	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benz(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	26.39	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- 01 NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
 *BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number: VEL/HPCL/A/04
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd, Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
 Latitude: 30°04'18.29" N
 Longitude: 75°01'40.48" E

Report No.: VEL/AP/2309250010
 Format No.: 7.8 F-05
 Party Reference No.: NIL
 Reporting Date: 29/09/2023
 Period of Analysis: 25/09/2023 to 29/09/2023
 Receipt Date: 25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
 Sampling Location : Jiwan Singh Wala
 Instrument Used : RDS & FPS Sampler with all Accessories
 Instrument Code : VEL/RDS/FPS/12
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Cloudy Sky
 Date of Monitoring : 21/09/2023 to 22/09/2023
 Time of Monitoring : 11:00 AM to 11:00 AM
 Ambient Temperature (°C) : Min. 28.0°C, Max. 37.0°C
 Surrounding Activity : Human & Vehicular, & Other Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	51.41	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	86.74	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	20.06	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	9.37	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.74	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	23.11	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec-3(i)]18.11.2009.
 *BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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- Laboratory is not responsible for the authenticity of pre-accepted test report. The test samples will be retained only for specific period.
- This report is, with SoRo A-Amendment Report.
- This test report shall not be used for publicity or advertising or media purpose without prior written permission of the laboratory.
- Giving samples does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





Test Report

Sample Number: VEL/HPCL/A/05
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
 Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
 Latitude: 29°59'49.83" N
 Longitude: 75°01'15.53" E

Report No.: VEL/AP/2309250011
 Format No.: 7.8 F-03
 Party Reference No.: NIL
 Reporting Date: 29/09/2023
 Period of Analysis: 25/09/2023 to 29/09/2023
 Receipt Date: 25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
 Sampling Location : Leicena
 Instrument Used : RDS & FPS Sampler with all Accessories
 Instrument Code : VEL/RDS/FPS/06
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 22/09/2023 to 23/09/2023
 Time of Monitoring : 10:00 AM to 10:00 AM
 Ambient Temperature (°C) : Min. 25.0°C, Max. 38.0°C
 Surrounding Activity : Human & Vehicular, & Other Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^{III} Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	50.48	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	84.10	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	22.37	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	8.10	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.66	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	21.30	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	14.27	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
 *BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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- The report no. with Suffix A- Amended Report.
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- Giving opinion does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability caused by the use or misuse of the test report.





Test Report

Sample Number: VEL/HPCL/A/06
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
 Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
 Latitude: 30°02'31.98" N
 Longitude: 75°01'62.80" E

Report No.: VEL/AP/2309250012
 Format No.: 7.8 F-03
 Party Reference No.: NIL
 Reporting Date: 29/09/2023
 Period of Analysis: 25/09/2023 to 29/09/2023
 Receipt Date: 25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

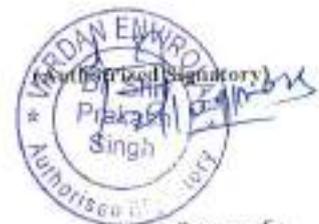
General Information:-

Sample Collected by : Vardan EnviroLab Representative
 Sampling Location : Mahi Nangal
 Instrument Used : RDS & FPS Sampler with all Accessories
 Instrument Code : VEL/RDS/FPS/12
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 22/09/2023 to 23/10/2023
 Time of Monitoring : 10:45 AM to 10:45 AM
 Ambient Temperature (°C) : Min. 26.0°C, Max. 37.0°C
 Surrounding Activity : Human & Vehicular, & Other Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

TEST RESULTS

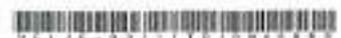
S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	49.76	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	82.63	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	24.10	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	8.41	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.68	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	21.49	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	-
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	-

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
 *BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number: VEL/HPCL/A/07
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
 Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
 Latitude: 30°02'56.92" N
 Longitude: 75°06'43.06" E

Report No.: VEL/AP/2309250013
 Format No.: 7.8 F-03
 Party Reference No.: NIL
 Reporting Date: 29/09/2023
 Period of Analysis: 25/09/2023 to 29/09/2023
 Receipt Date: 25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

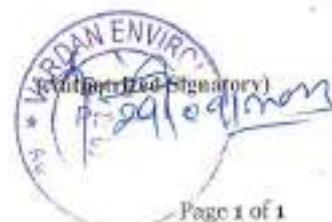
Sample Collected by
 Sampling Location
 Instrument Used
 Instrument Code
 Instrument Calibration Status
 Meteorological condition during monitoring
 Date of Monitoring
 Time of Monitoring
 Ambient Temperature (°C)
 Surrounding Activity
 Scope of Monitoring
 Control measure if Any
 Sampling & Analysis Protocol
 Parameter Required

: Vardan EnviroLab Representative
 : Baghi Bandar
 : RDS & FPS Sampler with all Accessories
 : VEL/RDS-FPS/08
 : Calibrated
 : Clear Sky
 : 22/09/2023 to 23/09/2023
 : 11:15 AM to 11:15 AM
 : Min. 25.0°C, Max. 38.0°C
 : Human & Vehicular, & Other Activities
 : Regulatory Requirement
 : No
 : IS-5182 & CPCB Guideline
 : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ¹ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	42.57	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	80.68	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	21.37	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	10.28	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.74	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	21.59	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :-¹NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
²BLQ- Below Limit of Quantification, ³LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number: VEL/HPCL/A/08
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
 Bio Refinery, Village-Nashpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
 Latitude: 30°06'48.46" N
 Longitude: 75°04'40.18" E

Report No.: VEL/AP/2309250014
 Format No.: 7.8 F-03
 Party Reference No.: NIL
 Reporting Date: 29/09/2023
 Period of Analysis: 25/09/2023 to 29/09/2023
 Receipt Date: 25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
 Sampling Location : Kot Fatta
 Instrument Used : RDS & FPS Sampler with all Accessories
 Instrument Code : VEL/RDS/FPS/07
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 21/09/2023 to 22/09/2023
 Time of Monitoring : 12:00 PM to 12:00 PM
 Ambient Temperature (°C) : Min. 28.0°C, Max. 37.0°C
 Surrounding Activity : Human & Vehicular, & Other Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^{NS} Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	44.67	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	78.39	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	18.42	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	13.78	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.63	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	21.00	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- (a) NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
 *BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number: VEL/HPCL/A/09
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
 Latitude: 30°03'57.98" N
 Longitude: 75°03'55.26" E

Report No.: VEL/AP/2309250015
 Format No.: 7.8 F-03
 Party Reference No.: NIL
 Reporting Date: 29/09/2023
 Period of Analysis: 25/09/2023 to 29/09/2023
 Receipt Date: 25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
 Sampling Location : Chathewala
 Instrument Used : RDS & FPS Sampler with all Accessories
 Instrument Code : VEL/RDS/FPS/12
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 20/09/2023 to 21/09/2023
 Time of Monitoring : 11:00 AM to 11:00 AM
 Ambient Temperature (°C) : Min. 26.0°C, Max. 38.0°C
 Surrounding Activity : Human & Vehicular, & Other Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS* Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	40.87	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	75.96	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	24.28	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	10.74	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.52	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	17.30	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- *NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
 **BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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Test Report

Sample Number: VEL/HPCL/A/10
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
 Bio Refinery, Village-Nasibpura, Tehsil-Talwandi
 Sabo, Bathinda, Punjab
 Latitude: 30°20'45.12" N
 Longitude: 75°53'07.00" E

Report No.: VEL/AP/2309250016
 Format No.: 7.8 F-03
 Party Reference No.: NIL
 Reporting Date: 29/09/2023
 Period of Analysis: 25/09/2023 to 29/09/2023
 Receipt Date: 25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
 Sampling Location : Manwala
 Instrument Used : RDS & FPS Sampler with all Accessories
 Instrument Code : VEL/RDS/FPS/7
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 21/09/2023 to 22/09/2023
 Time of Monitoring : 11:30 AM to 11:30 AM
 Ambient Temperature (°C) : Min. 29.0°C, Max. 38.0°C
 Surrounding Activity : Human & Vehicular, & Other Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	54.10	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	90.65	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	26.73	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	7.86	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.76	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	24.09	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

*BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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- This report is valid only for the purpose of the test.
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- Giving opinions does not imply endorsement of the tested sample by the lab. Under no circumstances, the lab accepts any liability covered by the use or misuse of the test report.





Test Report

Sample Number: VEL/HPCL/A/11
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
 Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
 Latitude: 30°05'49.86" N
 Longitude: 75°04'11.98" E

Report No.: VEL/A/P/2392560017
 Format No.: 7.8 F-03
 Party Reference No.: NIL
 Reporting Date: 29/09/2023
 Period of Analysis: 25/09/2023 to 29/09/2023
 Receipt Date: 25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by
 Sampling Location
 Instrument Used
 Instrument Code
 Instrument Calibration Status
 Meteorological condition during monitoring
 Date of Monitoring
 Time of Monitoring
 Ambient Temperature (°C)
 Surrounding Activity
 Scope of Monitoring
 Control measure if Any
 Sampling & Analysis Protocol
 Parameter Required

: Vardan EnviroLab Representative
 : Kot Bhura
 : RDS & FPS Sampler with all Accessories
 : VEL/RDS/FPS/06
 : Calibrated
 : Clear Sky
 : 21/09/2023 to 22/09/2023
 : 12:00 PM to 12:00 PM
 : Min. 28.0°C, Max. 37.0°C
 : Human & Vehicular, & Other Activities
 : Regulatory Requirement
 : No
 : IS-5182 & CPCB Guideline
 : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ST Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	45.66	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	81.32	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	24.60	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	5.41	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.67	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	22.96	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	-
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	-

Note :-@ NAAQS - National Ambient Air Quality Standards, Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
 *BLQ- Below Limit of Quantification, **LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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- The report no. will follow A-Annexes Report.
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Test Report

Sample Number: VEL/HPCL/A/12
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
 Latitude: 30°08'21.78" N
 Longitude: 75°57'44.11" E

Report No.: VEL/AP/2309250018
 Format No.: 7.8 F-03
 Party Reference No.: NIL
 Reporting Date: 29/09/2023
 Period of Analysis: 25/09/2023 to 29/09/2023
 Receipt Date: 25/09/2023

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
 Sampling Location : Gehri Bhagi
 Instrument Used : RDS & FPS Sampler with all Accessories
 Instrument Code : VEL/RDS/FPS/08
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 22/09/2023 to 23/10/2023
 Time of Monitoring : 12:30 PM to 12:30 PM
 Ambient Temperature (°C) : Min. 26.0°C, Max. 37.0°C
 Surrounding Activity : Human & Vehicular, & Other Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameter	Protocol	Result	Unit	NAAQS ¹ Limit
1.	Particulate Matter (as PM _{2.5})	IS 5182 (P-24)	40.16	µg/m ³	60
2.	Particulate Matter (as PM ₁₀)	IS 5182 (P-23)	68.72	µg/m ³	100
3.	Nitrogen Dioxide (as NO ₂)	IS 5182 (P-6)	23.28	µg/m ³	80
4.	Sulphur Dioxide (as SO ₂)	IS 5182 (P-2)	6.22	µg/m ³	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.64	mg/m ³	4
6.	Ammonia (as NH ₃)	VEL/ENV/STP/155, Issue No.-01, 20/06/2022	BLQ(LOQ 20.0)	µg/m ³	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m ³	1
8.	Benzene (as C ₆ H ₆)	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m ³	05
9.	Benzo(a)pyrene	VEL/ENV/STP/157, Issue No.-01, 01/11/2021	BLQ(LOQ 0.5)	ng/m ³	01
10.	Ozone (as O ₃)	IS 5182 (P-9)	14.37	µg/m ³	180
11.	Arsenic (as As)	VEL/ENV/STP/110, Issue No.-01, 01/11/2021	BLQ(LOQ 0.1)	ng/m ³	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS 5182 (P-17)	BLQ(LOQ 0.1)	ppm(v/v)	--

Note :-¹ NAAQS - National Ambient Air Quality Standards, Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.

²BLQ- Below Limit of Quantification, ³LOQ- Limit of Quantification, STP-Standard Testing Procedure.



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