



# 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 क्षेत्रीया 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](http://www.hindustanpetroleum.com)

Date: 14 Nov 2025

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: [chdmoeenv@gmail.com](mailto:chdmoeenv@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 2025**

**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 2025. 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)

Name - M S Janardhana Rao  
Designation - DGM Projects  
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Contact No. - 9849639198

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)

# 1

## **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 14<sup>th</sup> 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.

# 2

## 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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<b>[I]</b>	<p>The company shall undertake waste minimization measures as below:-</p> <ol style="list-style-type: none"> <li>i. Metering and control of quantities of active ingredients to minimize waste.</li> <li>ii. Reuse of by-products from the process as raw materials or as raw material substitutes in other processes.</li> <li>iii. Use of automated filling to minimize spillage.</li> <li>iv. Use of Close Feed system into batch reactors.</li> <li>v. Venting equipment through vapour recovery system</li> <li>vi. Use of high pressure hoses for equipment clearing to reduce wastewater generation.</li> </ol>	<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"> <li><i>i. Metering and control of quantities of active ingredients will be done regularly.</i></li> <li><i>ii. By products will be reused as raw material as much as possible according to requirement.</i></li> <li><i>iii. Automated filling will be carried out to minimize spillage</i></li> <li><i>iv. Close feed system will be used into batch reactors.</i></li> <li><i>v. Water scrubber, vent bottle &amp; flame arrestors will be provided as per requirement.</i></li> <li><i>vi. High pressure hoses for equipment clearing will be used to reduce waste water generation.</i></li> </ol>
<b>[J]</b>	<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&amp;CC in the EIA report and same will be developed as per the EC requirement.</i></p>
<b>[K]</b>	<p>All the commitments made regarding issues raised during the public hearing/ consultation meeting shall be satisfactorily implemented.</p>	<p><i>Noted.</i></p>
<b>[L]</b>	<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>
<b>[M]</b>	<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>
<b>[N]</b>	<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>
<b>[O]</b>	<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>
<b>[P]</b>	<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>
<b>[Q]</b>	<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>
<b>[R]</b>	<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 <sub>2</sub> generated from the process shall be bottled/made solid ice/value added products and sold to authorize vendors.	<i>Noted.</i>

**11.1 OtherGenericConditions:-**

<b>S. No.</b>	<b>Conditions of Environmental Clearance</b>	<b>Status of Compliance</b>
<b>i.</b>	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>
<b>ii.</b>	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>
<b>iii.</b>	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>
<b>iv.</b>	The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R No. 826(E) dated 16 <sup>th</sup> November, 2009 Shall be Complied with.	<i>Noted.</i>
<b>v.</b>	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>
<b>vi.</b>	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>
<b>vii.</b>	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 &amp; 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 <sup>st</sup> 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 <a href="http://moef.nic.in">http://moef.nic.in</a>. 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 &amp; Control of Pollution) Act, 1974, the Air (Prevention &amp; 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 2025	September 2025
1.	AAQ1	Near Project site	Near Project site
2.	AAQ2	Jiwan Singh Wala	NasibPura
3.	AAQ3	Maawala	Kot Kashmir
4.	AAQ4	Mahi Nangal	Chathewala
5.	AAQ5	Leleana	KotFatta
6.	AAQ6	Baghi Bandar	Baghi Bandar
7.	AAQ7	Nasibpura	Kothbhara
8.	AAQ8	Kothbhara	Jiwan Singh Wala
9.	AAQ9	Kot Kashmir	GehriBoghi
10.	AAQ10	GehriBoghi	Mahi Nangal
11.	AAQ11	Chathewala	Maanwala
12.	AAQ12	KotFatta	Leleana

#### 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 (SO<sub>2</sub>)
- Oxides of Nitrogen (NO<sub>2</sub>)
- Carbon Monoxide (CO)
- Ammonia (NH<sub>3</sub>)
- Lead (Pb)
- Benzene (C<sub>6</sub>H<sub>6</sub>)
- Benzo(a)pyrene
- Ozone (O<sub>3</sub>)
- 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 16<sup>th</sup> 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<sub>2.5</sub> i.e. <2.5 microns), and Respirable Dust Sampler was used for sampling Repairable fraction (<10 microns), gaseous pollutants like SO<sub>2</sub>, and NO<sub>2</sub>. 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 2025)**

**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 <sub>2.5</sub> ), µg/m <sup>3</sup>	34.97	36.14	31.49	35.40	60
2	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	54.36	54.10	52.98	57.68	100
3	Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	16.41	13.17	21.30	16.24	80
4	Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	9.52	10.52	8.41	10.59	80
5	Carbon Monoxide (CO) mg/m <sup>3</sup>	0.60	0.69	0.77	0.61	4
6	Ammonia (NH <sub>3</sub> ), µg/m <sup>3</sup>	18.43	BLQ(LOQ-20.0)	BLQ(LOQ-20.0)	BLQ(LOQ-20.0)	400
7	Lead (Pb), µg/m <sup>3</sup>	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	1
8	Benzene(C <sub>6</sub> H <sub>6</sub> ),µg/m <sup>3</sup>	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	05
9	Benzo(a)pyrene, ng/m <sup>3</sup>	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	01
10	Ozone (O <sub>3</sub> ),µg/m <sup>3</sup>	14.89	15.88	23.52	17.23	180
11	Arsenic As, ng/ m <sup>3</sup>	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	6
12	Nickel Ni, ng/ m <sup>3</sup>	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 3.7 Ambient Air Quality Monitoring Results (5-8 Location)**

S. No.	Parameter	Test Result				NAAQS*
		AAQ5	AAQ6	AAQ7	AAQ8	
1	Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup>	30.27	34.69	35.76	29.34	60
2	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	46.50	56.07	40.22	52.16	100
3	Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	14.68	12.33	14.39	17.29	80
4	Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	8.51	10.18	10.81	9.07	80
5	Carbon Monoxide (CO) mg/m <sup>3</sup>	0.72	0.52	0.63	0.51	4
6	Ammonia (NH <sub>3</sub> ), µg/m <sup>3</sup>	BLQ(LOQ-20.0)	BLQ(LOQ-20.0)	BLQ(LOQ-20.0)	BLQ(LOQ 20.0)	400
7	Lead (Pb), µg/m <sup>3</sup>	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ 0.1)	1
8	Benzene(C <sub>6</sub> H <sub>6</sub> ),µg/m <sup>3</sup>	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ 0.5)	05
9	Benzo(a)pyrene, ng/m <sup>3</sup>	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ 0.5)	01
10	Ozone (O <sub>3</sub> ),µg/m <sup>3</sup>	14.99	13.25	16.15	16.58	180
11	Arsenic As, ng/ m <sup>3</sup>	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ 0.1)	6
12	Nickel Ni, ng/ m <sup>3</sup>	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 3.8 Ambient Air Quality Monitoring Results (9-12 Location)**

S. No.	Parameter	Test Result				NAAQS*
		AAQ9	AAQ10	AAQ11	AAQ12	
1	Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup>	33.01	34.55	34.23	36.13	60
2	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	50.64	48.17	54.18	43.50	100
3	Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	14.73	16.20	25.79	11.49	80
4	Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	9.53	7.89	8.30	8.78	80
5	Carbon Monoxide (CO) mg/m <sup>3</sup>	0.58	0.66	0.58	0.66	4
6	Ammonia (NH <sub>3</sub> ), µg/m <sup>3</sup>	BLQ(LOQ 20.0)	18.23	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	400
7	Lead (Pb), µg/m <sup>3</sup>	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	1
8	Benzene(C <sub>6</sub> H <sub>6</sub> ),µg/m <sup>3</sup>	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 <sub>3</sub> ),µg/m <sup>3</sup>	13.67	16.98	12.62	13.55	180
11	Arsenic As, ng/ m <sup>3</sup>	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	6
12	Nickel Ni, ng/ m <sup>3</sup>	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

### 3.1.4 Discussion on Ambient Air Quality in the Study Area

PM<sub>10</sub> and PM<sub>2.5</sub> levels at the project site are within the permissible limit of 100µg/m<sup>3</sup> and 60 µg/m<sup>3</sup> respectively (for residential, rural and other areas as stipulated in the National Ambient Air Quality Standards). SO<sub>2</sub>, NO<sub>x</sub> and CO was observed within the corresponding stipulated limits (Limit for SO<sub>2</sub> and NO<sub>x</sub>: 80 µg/m<sup>3</sup> and limit for CO: 4.0 mg/m<sup>3</sup>) 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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**3.1.5 Ambient Air Quality Monitoring Results (September -2025)**

**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 <sub>2.5</sub> ), µg/m <sup>3</sup>	31.14	34.55	33.28	32.21	60
2	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	56.47	52.47	50.65	53.30	100
3	Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	15.10	14.52	20.11	18.25	80
4	Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	8.84	9.32	9.00	9.25	80
5	Carbon Monoxide (CO) mg/m <sup>3</sup>	0.70	0.60	0.84	0.74	4
6	Ammonia (NH <sub>3</sub> ), µg/m <sup>3</sup>	19.25	BLQ(LOQ-20.0)	BLQ(LOQ-20.0)	BLQ(LOQ-20.0)	400
7	Lead (Pb), µg/m <sup>3</sup>	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	1
8	Benzene(C <sub>6</sub> H <sub>6</sub> ),µg/m <sup>3</sup>	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	05
9	Benzo(a)pyrene, ng/m <sup>3</sup>	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	01
10	Ozone (O <sub>3</sub> ),µg/m <sup>3</sup>	15.64	14.74	22.62	16.05	180
11	Arsenic As, ng/ m <sup>3</sup>	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	6
12	Nickel Ni, ng/ m <sup>3</sup>	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 <sub>2.5</sub> ), µg/m <sup>3</sup>	34.84	32.34	33.24	32.25	60
2	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	48.24	51.32	50.50	50.85	100
3	Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	16.20	14.10	15.22	16.20	80
4	Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	9.56	08.54	08.54	8.25	80
5	Carbon Monoxide (CO) mg/m <sup>3</sup>	0.65	0.64	0.70	0.42	4
6	Ammonia (NH <sub>3</sub> ), µg/m <sup>3</sup>	BLQ(LOQ-20.0)	BLQ(LOQ-20.0)	BLQ(LOQ-20.0)	BLQ(LOQ 20.0)	400
7	Lead (Pb), µg/m <sup>3</sup>	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ 0.1)	1
8	Benzene(C <sub>6</sub> H <sub>6</sub> ),µg/m <sup>3</sup>	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ 0.5)	05
9	Benzo(a)pyrene, ng/m <sup>3</sup>	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ-0.5)	BLQ(LOQ 0.5)	01
10	Ozone (O <sub>3</sub> ),µg/m <sup>3</sup>	13.25	14.10	15.22	18.10	180
11	Arsenic As, ng/ m <sup>3</sup>	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ-0.1)	BLQ(LOQ 0.1)	6
12	Nickel Ni, ng/ m <sup>3</sup>	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 <sub>2.5</sub> ), µg/m <sup>3</sup>	30.25	32.02	33.05	34.40	60
2	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	52.15	51.98	52.22	48.21	100
3	Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	13.58	14.84	24.58	14.22	80
4	Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	8.40	9.12	9.10	9.54	80
5	Carbon Monoxide (CO) mg/m <sup>3</sup>	0.65	0.70	0.60	0.60	4
6	Ammonia (NH <sub>3</sub> ), µg/m <sup>3</sup>	BLQ(LOQ 20.0)	19.44	BLQ(LOQ 20.0)	BLQ(LOQ 20.0)	400
7	Lead (Pb), µg/m <sup>3</sup>	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	1
8	Benzene(C <sub>6</sub> H <sub>6</sub> ),µg/m <sup>3</sup>	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 <sub>3</sub> ),µg/m <sup>3</sup>	12.52	15.25	14.54	14.10	180
11	Arsenic As, ng/ m <sup>3</sup>	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	BLQ(LOQ 0.1)	6
12	Nickel Ni, ng/ m <sup>3</sup>	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

### 3.1.6 Discussion on Ambient Air Quality in the Study Area

PM<sub>10</sub> and PM<sub>2.5</sub> levels at the project site are within the permissible limit of 100µg/m<sup>3</sup> and 60 µg/m<sup>3</sup> respectively (for residential, rural and other areas as stipulated in the National Ambient Air Quality Standards). SO<sub>2</sub>, NO<sub>x</sub> and CO was observed within the corresponding stipulated limits (Limit for SO<sub>2</sub> and NO<sub>x</sub>: 80 µg/m<sup>3</sup> and limit for CO: 4.0 mg/m<sup>3</sup>) 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 2025	September 2025	
1.	N1	Near Project site	Near Project site	Industrial
2.	N2	Jiwan Singh Wala	NasibPura	Residential
3.	N3	Maawala	Kot Kashmir	Residential
4.	N4	Mahi Nangal	Chathewala	Residential
5.	N5	Leleana	KotFatta	Residential
6.	N6	Baghi Bandar	Baghi Bandar	Residential
7.	N7	Nasibpura	Kothbhara	Residential
8.	N8	Kothbhara	Jiwan Singh Wala	Residential
9.	N9	Kot Kashmir	GehriBoghi	Residential
10.	N10	GehriBoghi	Mahi Nangal	Residential
11.	N11	Chathewala	Maanwala	Residential
12.	N12	KotFatta	Leleana	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 2025)**

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						
<b>Lmax</b>	71.5	66.3	50.1	41.7	49.5	40.3	51.0	39.5
<b>Lmin</b>	52.9	45.8	43.9	33.9	40.8	32.9	35.2	29.8
<b>Leq</b>	60.72	49.56	47.83	38.52	46.72	37.24	46.7	34.91
<b>CPCB Limit (Leq in dB(A) Industrial Limit&amp; Residential Limit)</b>	<b>75.00</b>	<b>70.00</b>	<b>55.00</b>	<b>45.00</b>	<b>55.00</b>	<b>45.00</b>	<b>55.00</b>	<b>45.00</b>

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						
<b>Lmax</b>	51.8	40.9	49.3	38.1	50.1	39.2	50.2	39.3
<b>Lmin</b>	34.0	34.6	28.0	30.6	29.7	29.5	34.6	30.0
<b>Leq</b>	49.73	39.22	44.37	33.90	44.03	34.11	46.10	33.81
<b>CPCB Limit (Leq in dB(A) Residential Limit)</b>	<b>55.00</b>	<b>45.00</b>	<b>55.00</b>	<b>45.00</b>	<b>55.00</b>	<b>45.00</b>	<b>55.00</b>	<b>45.00</b>

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	49.3	41.5	49.3	38.2	51.2	42.3	50.9	41.3
Lmin	32.7	30.1	39.1	30.5	42.9	32.9	36.4	29.5
Leq	43.80	34.96	44.77	36.14	47.30	38.46	43.02	34.68
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

**3.2.4 Ambient Noise Monitoring Results (September 2025)**

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	70.8	65.2	52.5	42.5	50.7	41.8	52.5	40.8
Lmin	51.4	44.2	44.2	35.1	41.5	34.3	38.4	30.5
Leq	62.30	50.54	49.24	40.32	45.58	38.46	48.32	36.52
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)**

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Parameter	N5		N6		N7		N8	
	Day Time	Night Time						
Lmax	50.4	41.5	50.5	40.6	52.6	40.8	52.5	40.8
Lmin	36.8	31.6	35.2	30.4	33.8	28.4	35.2	31.2
Leq	48.20	37.52	45.10	35.45	44.22	36.51	45.55	35.36
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.

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

Parameter	N9		N10		N11		N12	
	Day Time	Night Time						
Lmax	51.5	42.6	48.6	37.8	53.0	41.9	51.7	42.6
Lmin	36.3	31.5	36.5	29.3	43.5	34.4	38.3	32.4
Leq	45.52	35.33	48.85	38.24	48.52	40.85	42.36	35.25
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

**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 ( $L_{night}$ ):

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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

#### 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 2025	September 2025
1.	W 1	Ground Water (Near Project Site)	Ground Water (Near Project Site)
2.	W 2	Ground Water (Jiwan Singh Wala)	Ground Water (Jiwan Singh Wala)
3.	W 3	Ground Water (Maanwala)	Ground Water (Maanwala)
4.	W 4	Ground Water (Mahi Nangal)	Ground Water (Mahi Nangal)
5.	W 5	Ground Water (Kot Kashmir)	Ground Water (Kot Kashmir)
6.	W 6	Ground Water (NasibPura)	Ground Water (NasibPura)
7.	W 7	Ground Water (Baghi Bandar)	Ground Water (Baghi Bandar)
8.	W 8	Surface Water (KotFatta)	Surface Water (KotFatta)
9.	W 9	Surface Water (Chathewala)	Surface Water (Chathewala)

#### 3.3.2 Methodology of Groundwater & Surface water Quality Monitoring

Sampling of water was carried out on **June 2025 & September 2025**. 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 HNO<sub>3</sub>. 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 (June 2025)

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

**Table 3.26 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)	7.11	--	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 <sub>3</sub>	IS 3025 (P-21)	220.93	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	68.27	mg/L	75	200
8.	Alkalinity as CaCO <sub>3</sub>	IS 3025 (P-23)	230.41	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	60.35	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	12.29	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	509.34	mg/L	500	2000
13.	Sulphate as SO <sub>4</sub>	IS 3025 (P-24)	16.78	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.69	mg/L	1.0	1.5
15.	Nitrate as NO <sub>3</sub>	IS 3025 (Part -34)	6.40	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.57	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	0.38	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

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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)	817	µS/cm	--	--
32.	Ammonia as NH <sub>3</sub>	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	25.2	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.9	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 (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)	7.22	--	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 <sub>3</sub>	IS 3025 (P-21)	220.73	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	59.64	mg/L	75	200
8.	Alkalinity as CaCO <sub>3</sub>	IS 3025 (P-23)	205.12	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	38.56	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	17.47	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	463.09	mg/L	500	2000
13.	Sulphate as SO <sub>4</sub>	IS 3025 (P-24)	30.52	mg/L	200	400
14.	Fluoride as F	APHA 4500 FD	0.61	mg/L	1.0	1.5
15.	Nitrate as NO <sub>3</sub>	IS 3025 (Part -34)	3.98	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.36	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	0.28	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)	725	µS/cm	--	--
32.	Ammonia as NH <sub>3</sub>	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	27.84	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.46	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.

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@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 (Maanwala)**

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)	7.48	--	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 <sub>3</sub>	IS 3025 (P-21)	227.38	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	59.21	mg/L	75	200
8.	Alkalinity as CaCO <sub>3</sub>	IS 3025 (P-23)	225.70	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	82.00	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	19.35	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	519.69	mg/L	500	2000
13.	Sulphate as SO <sub>4</sub>	IS 3025 (P-24)	38.77	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.51	mg/L	1.0	1.5
15.	Nitrate as NO <sub>3</sub>	IS 3025 (Part -34)	3.29	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.38	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	0.68	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

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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)	843	µS/cm	--	--
32.	Ammonia as NH <sub>3</sub>	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	34.27	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.0	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	----

\*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 3.29 Ground water Quality Monitoring Result (Mahi Nangal)**

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)	7.42	--	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 <sub>3</sub>	IS 3025 (P-21)	263.05	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	80.76	mg/L	75	200

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8.	Alkalinity as CaCO <sub>3</sub>	IS 3025 (P-23)	243.28	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	78.31	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	14.95	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	511.00	mg/L	500	2000
13.	Sulphate as SO <sub>4</sub>	IS 3025 (P-24)	58.24	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.77	mg/L	1.0	1.5
15.	Nitrate as NO <sub>3</sub>	IS 3025 (Part -34)	9.62	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.53	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	0.51	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 <sub>3</sub>	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	20.8	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.5	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 3.30 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)	7.52	--	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 <sub>3</sub>	IS 3025 (P-21)	235.21	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	58.64	mg/L	75	200
8.	Alkalinity as CaCO <sub>3</sub>	IS 3025 (P-23)	149.81	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	68.23	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	21.60	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	565.00	mg/L	500	2000
13.	Sulphate as SO <sub>4</sub>	IS 3025 (P-24)	51.48	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.89	mg/L	1.0	1.5
15.	Nitrate as NO <sub>3</sub>	IS 3025 (Part -34)	2.70	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.45	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	0.44	mg/L	5.0	15.0

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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)	755	µS/cm	--	--
32.	Ammonia as NH <sub>3</sub>	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	37.1	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).

**Table 3.31 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
1.	pH (at 25°C)	IS 3025 (P-11)	7.39	--	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

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6.	Total Hardness as CaCO <sub>3</sub>	IS 3025 (P-21)	146.25	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	36.49	mg/L	75	200
8.	Alkalinity as CaCO <sub>3</sub>	IS 3025 (P-23)	159.33	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	43.28	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	13.41	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	351.29	mg/L	500	2000
13.	Sulphate as SO <sub>4</sub>	IS 3025 (P-24)	18.08	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.65	mg/L	1.0	1.5
15.	Nitrate as NO <sub>3</sub>	IS 3025 (Part -34)	5.27	mg/L	45	No Relaxation
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.40	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	0.43	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)	592	µS/cm	--	--
32.	Ammonia as NH <sub>3</sub>	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation

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33.	Sodium	IS 3025 (P-45)	14.6	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.9	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 (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)	7.48	--	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 <sub>3</sub>	IS 3025 (P-21)	230.05	mg/L	200	600
7.	Calcium as Ca	IS 3025 (P-40)	39.68	mg/L	75	200
8.	Alkalinity as CaCO <sub>3</sub>	IS 3025 (P-23)	191.44	mg/L	200	600
9.	Chloride as Cl	IS 3025 (P-32)	60.71	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	31.84	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	419.00	mg/L	500	2000
13.	Sulphate as SO <sub>4</sub>	IS 3025 (P-24)	17.19	mg/L	200	400
14.	Fluoride as F	APHA 4500 F D	0.56	mg/L	1.0	1.5
15.	Nitrate as NO <sub>3</sub>	IS 3025 (Part -34)	6.11	mg/L	45	No
16.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.43	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

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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	0.70	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)	621	µS/cm	--	--
32.	Ammonia as NH <sub>3</sub>	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	25.3	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	

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

**Table 3.33 Surface water Quality Monitoring Result (KotFatta)**

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.23	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	16.1	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Taste	IS 3025 (P-8)	NR	--
6.	Chloride as Cl	IS 3025 (P-32)	57.13	mg/L
7.	Conductivity	IS 3025 (P-14)	5624	µS/cm

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8.	Nitrate as NO <sub>3</sub>	IS 3025 (P-34)	12.75	mg/L
9.	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.60	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	353.16	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	0.80	mg/L
13.	Sulphate as SO <sub>4</sub>	IS 3025 (P-24)	19.69	mg/L
14.	Fluoride as F	APHA 4500 F D	0.51	mg/L
15.	BOD (3 Days at	IS 3025 (P-44)	5.46	mg/L
16.	COD	IS 3025 (P-58)	28.73	mg/L
17.	Free Ammonia as	IS 3025 (P-34)	7.56	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)	125.00	mg/L
20.	Total Hardness as CaCO <sub>3</sub>	IS 3025 (P-40)	41.28	mg/L
21.	Calcium as Ca	IS 3025 (P-23)	134.59	mg/L
22.	Alkalinity as CaCO <sub>3</sub>	APHA 3500 Mg B Calculation Method	5.34	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)	42.99	mg/L
25.	Sodium	IS 3025 (P-45)	8.6	mg/L
26.	Potassium	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 3.34 Surface water Quality Monitoring Result (Chathewala)**

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25°C)	IS 3025 (P-11)	7.53	--
2	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3	Turbidity	IS 3025 (P-10)	18.9	NTU
4	Odour	IS 3025 (P-5)	Agreeable	--
5	Taste	IS 3025 (P-8)	NR	--
6	Chloride as Cl	IS 3025 (P-32)	42.19	mg/L
7	Conductivity	IS 3025 (P-14)	852	µS/cm
8	Nitrate as NO <sub>3</sub>	IS 3025 (P-34)	5.78	mg/L
9	Iron as Fe	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.65	mg/L

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10	Total Dissolved Solids	IS 3025 (P-16)	412.00	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	0.83	mg/L
13	Sulphate as SO <sub>4</sub>	IS 3025 (P-24)	26.11	mg/L
14	Fluoride as F	APHA 4500 F D	0.59	mg/L
15	BOD (3 Days at	IS 3025 (P-44)	3.62	mg/L
16	COD	IS 3025 (P-58)	14.37	mg/L
17	Free Ammonia as	IS 3025 (P-34)	6.18	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)	128.55	mg/L
20	Total Hardness as CaCO <sub>3</sub>	IS 3025 (P-40)	56.79	mg/L
21	Calcium as Ca	IS 3025 (P-23)	140.64	mg/L
22	Alkalinity as CaCO <sub>3</sub>	APHA 3500 Mg B Calculation Method	3.19	mg/L
23	Magnesium as Mg	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	4.72	mg/L
24	Copper as Cu	IS 3025 (P-45)	41.30	mg/L
25	Sodium	IS 3025 (P-45)	4.0	mg/L
26	Potassium	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.

### 3.3.4 Ground Water & Surface Water Quality Monitoring Results (September 2025)

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)	7.24	--	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 <sub>3</sub> )	IS 3025 (P-21)	216.36	mg/L	200	600

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7.	Calcium (as Ca)	IS 3025 (P-40)	70.58	mg/L	75	200
8.	Alkalinity (as	IS 3025 (P-23)	233.57	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	62.40	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	13.54	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	512.87	mg/L	500	2000
13.	Sulphate(as SO <sub>4</sub> )	IS 3025 (P-24)	17.36	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.72	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	7.21	mg/L	45	No
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.60	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	0.42	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)	810	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	24.6	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	3.2	mg/L	--	--

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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 (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)	7.40	--	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 <sub>3</sub> )	IS 3025 (P-21)	225.14	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	60.22	mg/L	75	200
8.	Alkalinity (as)	IS 3025 (P-23)	210.84	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	40.62	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	18.66	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	462.12	mg/L	500	2000
13.	Sulphate(as SO <sub>4</sub> )	IS 3025 (P-24)	32.20	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.65	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	4.33	mg/L	45	No
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.40	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

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23.	Zinc (as Zn)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.32	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)	736	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	28.32	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.01	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 (Maanwala)**

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)	7.32	--	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 <sub>3</sub> )	IS 3025 (P-21)	224.61	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	60.48	mg/L	75	200

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8.	Alkalinity (as	IS 3025 (P-23)	228.60	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	83.00	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	20.28	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	520.44	mg/L	500	2000
13.	Sulphate(as SO <sub>4</sub> )	IS 3025 (P-24)	40.84	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.62	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	4.39	mg/L	45	No
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.43	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	0.70	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)	845	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	35.87	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	

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36.	E. coli	IS 15185:2016	Absent	Per 100ml	Shall not be detectable in any
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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 3.20 Ground water Quality Monitoring Result (Mahi Nangal)**

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)	7.56	--	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 <sub>3</sub> )	IS 3025 (P-21)	260.24	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	85.12	mg/L	75	200
8.	Alkalinity (as	IS 3025 (P-23)	245.39	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	80.74	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	16.22	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	512.00	mg/L	500	2000
13.	Sulphate(as SO <sub>4</sub> )	IS 3025 (P-24)	60.48	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.80	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	8.52	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.66	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	0.60	mg/L	5.0	15.0

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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)	872	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	21.4	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.1	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	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 (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)	7.38	--	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 <sub>3</sub> )	IS 3025 (P-21)	240.45	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)	150.36	mg/L	200	600

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9.	Chloride (as Cl)	IS 3025 (P-32)	70.48	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	22.32	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	560.00	mg/L	500	2000
13.	Sulphate(as SO <sub>4</sub> )	IS 3025 (P-24)	52.10	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 FD	0.90	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	3.26	mg/L	45	No
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.50	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	0.48	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)	752	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	38.2	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.0	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	

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**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 (Nasibpura)**

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)	7.45	--	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 <sub>3</sub> )	IS 3025 (P-21)	142.48	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	38.12	mg/L	75	200
8.	Alkalinity (as	IS 3025 (P-23)	160.28	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	45.54	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	14.22	mg/L	30	100
12.	Total Dissolved	IS 3025 (P-16)	350.33	mg/L	500	2000
13.	Sulphate(as SO <sub>4</sub> )	IS 3025 (P-24)	19.21	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.66	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	6.18	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.44	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 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

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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)	536	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	15.8	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.2	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 (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)	7.32	--	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 <sub>3</sub> )	IS 3025 (P-21)	234.20	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	40.74	mg/L	75	200
8.	Alkalinity (as)	IS 3025 (P-23)	186.21	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	62.31	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	32.22	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	416.00	mg/L	500	2000
13.	Sulphate(as SO <sub>4</sub> )	IS 3025 (P-24)	18.34	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.60	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	7.00	mg/L	45	No
16.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.46	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	0.74	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)	628	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	24.6	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.0	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 3.24 Surface water Quality Monitoring Result (KotFatta)**

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.54	--
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)	56.20	mg/L
7.	Conductivity	IS 3025 (P-14)	5630	µS/cm
8.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	13.52	mg/L
9.	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.62	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	354.11	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	0.84	mg/L
13.	Sulphate(as SO <sub>4</sub> )	IS 3025 (P-24)	20.12	mg/L
14.	Fluoride (as F)	APHA 4500 F D	0.56	mg/L
15.	BOD (5 Days at	IS 3025 (P-44)	6.84	mg/L
16.	COD	IS 3025 (P-58)	29.46	mg/L
17.	Free Ammonia (as	IS 3025 (P-34)	8.22	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)	128.00	mg/L
20.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-40)	42.36	mg/L
21.	Calcium (as Ca)	IS 3025 (P-23)	132.24	mg/L
22.	Alkalinity (as	APHA 3500 Mg B Calculation Method	6.70	mg/L
23.	Magnesium (as Mg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	7.95	mg/L
24.	Copper (as Cu)	IS 3025 (P-45)	44.21	mg/L
25.	Sodium (as Na)	IS 3025 (P-45)	9.3	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.

**Table 3.25 Surface water Quality Monitoring Result (Chathewala)**

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S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25°C)	IS 3025 (P-11)	7.44	--
2	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3	Turbidity	IS 3025 (P-10)	19.2	NTU
4	Odour	IS 3025 (P-5)	Agreeable	--
5	Taste	IS 3025 (P-8)	NR	--
6	Chloride (as Cl)	IS 3025 (P-32)	43.45	mg/L
7	Conductivity	IS 3025 (P-14)	848	µS/cm
8	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	5.78	mg/L
9	Iron (as Fe)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	0.70	mg/L
10	Total Dissolved Solids	IS 3025 (P-16)	415.00	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	0.76	mg/L
13	Sulphate(as SO <sub>4</sub> )	IS 3025 (P-24)	24.48	mg/L
14	Fluoride (as F)	APHA 4500 F D	0.69	mg/L
15	BOD (5 Days at 20°C)	IS 3025 (P-44)	4.28	mg/L
16	COD	IS 3025 (P-58)	15.66	mg/L
17	Free Ammonia (as N)	IS 3025 (P-34)	7.08	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)	130.27	mg/L
20	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-40)	58.32	mg/L
21	Calcium (as Ca)	IS 3025 (P-23)	142.74	mg/L
22	Alkalinity (as CaCO <sub>3</sub> )	APHA 3500 Mg B Calculation Method	4.22	mg/L
23	Magnesium (as Mg)	VEL/STP/ICP/W-01, Issue No.-01, 01/11/21	5.95	mg/L
24	Copper (as Cu)	IS 3025 (P-45)	40.12	mg/L
25	Sodium (as Na)	IS 3025 (P-45)	5.0	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.

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**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 2025	September 2025
1.	S1	Near Project Site	Near Project Site
2.	S2	Jiwan Singh wala	Jiwan Singh wala
3.	S3	MaanWala	MaanWala
4.	S4	Mahi Nangal	Mahi Nangal
5.	S5	Leleana	Leleana
6.	S6	Baghi Bandar	Baghi Bandar
7.	S7	NasibPura	NasibPura
8.	S8	Kotbhara	Kotbhara
9.	S9	Kot Kashmir	Kot Kashmir
10.	S10	GehriBoghi	GehriBoghi
11.	S11	Chathewala	Chathewala
12.	S12	KotFatta	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 2025 & September 2025**

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

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**3.4.3 Soil Monitoring Results (June 2024)**

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)	8.05	--
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	31.49	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	4.01	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	29.75	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	26.10	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	29.34	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	124.53	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.10	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	16.34	%
14.	Available Nitrogen as N	IS:14684	137.23	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	22.07	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	24.22	%
17.	Organic Carbon	IS 2720 (P-22)	0.58	%
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	0.66	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.62	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	14.08	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	17.01	%

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**Table 3.49 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)	7.21	--
2.	Conductivity	IS 14767	0.413	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	45.92	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	4.70	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	45.60	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	51.38	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	130.52	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.98	mg/kg
12.	Organic Matter	IS 2720 (P-22)	3.10	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	4.24	%
14.	Available Nitrogen as N	IS:14684	290.20	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	26.53	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	29.71	%
17.	Organic Carbon	IS 2720 (P-22)	0.64	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.53	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.58	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.77	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.93	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.65	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	14.62	%

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**Table 3.50 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)	7.39	--
2.	Conductivity	IS 14767	0.372	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	22.68	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	4.03	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	40.75	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	35.22	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	44.32	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	128.41	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.99	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	14.32	%
14.	Available Nitrogen as N	IS:14684	258.10	kg/hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	28.14	kg/hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	20.56	%
17.	Organic Carbon	IS 2720 (P-22)	0.70	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.91	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	0.63	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	12.42	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.68	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	%

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**Table 3.51 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)	7.22	--
2.	Conductivity	IS 14767	0.401	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	31.04	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	3.26	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	35.41	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	56.90	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	60.27	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	126.32	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.95	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.69	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	24.75	%
14.	Available Nitrogen as N	IS:14684	225.18	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	18.62	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	13.43	%
17.	Organic Carbon	IS 2720 (P-22)	0.90	%
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	0.75	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.28	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	5.32	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.14	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	28.36	%

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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)	7.28	--
2.	Conductivity	IS 14767	0.401	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	18.42	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	3.05	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	36.29	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	31.64	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	44.18	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	66.27	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.96	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	19.75	%
14.	Available Nitrogen as N	IS:14684	174.23	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	21.59	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	17.42	%
17.	Organic Carbon	IS 2720 (P-22)	0.76	%
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	0.84	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.72	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.99	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.36	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	26.44	%

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**Table 3.53 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)	7.28	--
2.	Conductivity	IS 14767	0.462	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	31.53	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	3.62	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	44.09	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	41.38	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	35.91	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	119.74	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.21	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.69	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	22.78	%
14.	Available Nitrogen as N	IS:14684	191.04	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	10.37	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	9.13	%
17.	Organic Carbon	IS 2720 (P-22)	0.88	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.91	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	4.03	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.57	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 0.5)	mg/kg
24.	Moisture Content	VEL/STP/EN/108, Issue No.- 01, 01/11/2021	18.25	%

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**Table 3.54 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)	7.43	--
2.	Conductivity	IS 14767	0.465	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	21.92	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	4.05	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	59.74	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	46.30	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	79.06	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	121.28	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.99	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.57	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	33.42	%
14.	Available Nitrogen as N	IS:14684	229.58	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	31.44	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	26.17	%
17.	Organic Carbon	IS 2720 (P-22)	0.66	%
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	0.79	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.81	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.25	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	24.36	%

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

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.32	--
2.	Conductivity	IS 14767	0.415	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	35.76	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	4.32	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	39.11	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	46.85	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	32.29	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	155.61	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.23	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.80	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	27.15	%
14.	Available Nitrogen as N	IS:14684	244.23	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	18.60	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	13.72	%
17.	Organic Carbon	IS 2720 (P-22)	0.61	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.59	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	6.09	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	5.28	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.59	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	24.56	%

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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)	7.25	--
2.	Conductivity	IS 14767	0.391	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	30.10	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	6.82	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	47.34	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	28.50	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	51.02	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	131.83	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.45	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	21.02	%
14.	Available Nitrogen as N	IS:14684	219.28	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	12.43	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	17.94	%
17.	Organic Carbon	IS 2720 (P-22)	0.70	%
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	0.77	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	5.01	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.67	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	22.15	%

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**Table 3.57 Physico-Chemical Characteristics of Soil in the Study Area (GehriBoghi)**

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.49	--
2.	Conductivity	IS 14767	0.425	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	35.67	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	5.01	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	52.45	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	29.79	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	55.32	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	126.08	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	14.67	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.66	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	28.64	%
14.	Available Nitrogen as N	IS:14684	229.00	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	25.14	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	26.17	%
17.	Organic Carbon	IS 2720 (P-22)	0.88	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.72	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.59	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.67	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	5.80	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.56	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	21.95	%

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**Table 3.58 Physico-Chemical Characteristics of Soil in the Study Area (Chathewala)**

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.24	--
2.	Conductivity	IS 14767	0.385	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	27.82	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	6.4	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	43.58	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	39.45	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	62.04	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	126.53	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.61	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	30.77	%
14.	Available Nitrogen as N	IS:14684	228.89	kg/hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	16.01	kg/hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	15.27	%
17.	Organic Carbon	IS 2720 (P-22)	0.79	%
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	0.88	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.43	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.81	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.77	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	24.24	%

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**Table 3.59 Physico-Chemical Characteristics of Soil in the Study Area (KotFatta)**

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.36	--
2.	Conductivity	IS 14767	0.401	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	38.16	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	4.75	gm/cc
7.	Chloride as Cl	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	74.13	%
8.	Calcium as Ca	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	51.90	%
9.	Sodium as Na	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	39.6	%
10.	Potassium as K	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	161.28	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.54	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.80	%
13.	Magnesium as Mg	VEL/STP/EN/72, Issue No. 01, 01/11/2021	39.17	%
14.	Available Nitrogen as N	IS:14684	261.84	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	27.61	%
17.	Organic Carbon	IS 2720 (P-22)	0.72	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	5.12	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	0.70	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.19	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.78	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	26.41	%

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**3.4.3 Soil Monitoring Results (September 2025)**

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)	7.92	--
2.	Conductivity	IS 14767	0.375	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	32.55	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	5.22	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	30.45	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	25.58	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	30.40	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	126.58	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.31	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	17.56	%
14.	Available Nitrogen (as N)	IS:14684	140.22	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	25.12	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	22.54	%
17.	Organic Carbon	IS 2720 (P-22)	0.48	%
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	0.64	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.56	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	13.89	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	16.32	%

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**Table 3.37 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)	7.46	--
2.	Conductivity	IS 14767	0.386	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	44.32	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	5.25	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	40.84	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	36.08	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	48.61	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	132.57	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	3.31	mg/kg
12.	Organic Matter	IS 2720 (P-22)	4.56	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	5.25	%
14.	Available Nitrogen (as N)	IS:14684	285.64	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	25.46	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	30.45	%
17.	Organic Carbon	IS 2720 (P-22)	0.72	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.44	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.64	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.25	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.45	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	13.98	%

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**Table 3.38 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)	7.48	--
2.	Conductivity	IS 14767	0.390	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	21.45	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	4.92	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	32.41	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	41.10	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	122.36	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.42	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	15.22	%
14.	Available Nitrogen (as N)	IS:14684	260.24	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	29.54	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)	0.68	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.86	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.62	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	13.22	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	17.36	%

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**Table 3.39 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)	7.30	--
2.	Conductivity	IS 14767	0.386	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	32.46	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	4.54	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	34.22	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	54.25	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	58.47	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	130.20	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.80	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	25.12	%
14.	Available Nitrogen (as N)	IS:14684	230.10	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	20.23	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	14.10	%
17.	Organic Carbon	IS 2720 (P-22)	0.88	%
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	0.80	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	5.30	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.21	mg/kg
22.	Molybdenum (as MO)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.02	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	30.85	%

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**Table 3.40 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)	7.30	--
2.	Conductivity	IS 14767	0.382	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	19.58	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	4.15	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	34.23	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	32.12	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	45.78	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	64.36	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.48	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	20.12	%
14.	Available Nitrogen (as N)	IS:14684	175.28	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	22.40	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	18.20	%
17.	Organic Carbon	IS 2720 (P-22)	0.74	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.65	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.86	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.70	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.24	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.40	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	25.78	%

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**Table 3.41 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)	7.40	--
2.	Conductivity	IS 14767	0.448	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	32.24	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	4.33	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	45.21	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	42.48	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	36.46	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	120.22	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	5.10	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.74	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	24.36	%
14.	Available Nitrogen (as N)	IS:14684	160.25	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	12.45	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	10.84	%
17.	Organic Carbon	IS 2720 (P-22)	0.80	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.34	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.64	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	5.10	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.36	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.42	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	20.47	%

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**Table 3.42 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)	7.25	--
2.	Conductivity	IS 14767	0.452	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	22.36	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	5.12	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	60.82	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	48.12	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	80.45	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	124.30	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.12	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	34.28	%
14.	Available Nitrogen (as N)	IS:14684	232.46	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	34.22	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	30.14	%
17.	Organic Carbon	IS 2720 (P-22)	0.56	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.46	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	0.86	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.98	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.52	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	28.23	%

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

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.46	--
2.	Conductivity	IS 14767	0.392	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	34.55	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	5.10	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	41.78	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	45.12	%
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	160.24	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.24	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.84	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	29.08	%
14.	Available Nitrogen (as N)	IS:14684	246.42	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	19.47	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	14.32	%
17.	Organic Carbon	IS 2720 (P-22)	0.64	%
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	0.78	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.12	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.58	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.64	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	25.10	%

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**Table 3.44 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)	7.16	--
2.	Conductivity	IS 14767	0.398	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	32.45	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	7.10	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	44.86	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	30.24	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	49.44	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	140.84	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.15	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	22.14	%
14.	Available Nitrogen (as N)	IS:14684	224.48	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	18.42	%
17.	Organic Carbon	IS 2720 (P-22)	0.65	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.72	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.80	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.60	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	4.96	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.64	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	24.02	%

**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)**

**Table 3.45 Physico-Chemical Characteristics of Soil in the Study Area (GehriBoghi)**

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.28	--
2.	Conductivity	IS 14767	0.414	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	36.40	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	6.78	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	50.96	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	30.84	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	54.46	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	130.24	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	15.84	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	30.12	%
14.	Available Nitrogen (as N)	IS:14684	225.00	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	26.58	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	24.62	%
17.	Organic Carbon	IS 2720 (P-22)	0.94	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.70	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.62	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.64	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.34	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	23.16	%

**Table 3.46 Physico-Chemical Characteristics of Soil in the Study Area (Chathewala)**

**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)**

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.32	--
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 Brown	--
5.	Water holding capacity	VEL/STP/EN/86, Issue No.- 01, 01/11/2021	29.24	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	7.6	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	42.79	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	36.28	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	60.23	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	128.40	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	8.24	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.78	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	32.46	%
14.	Available Nitrogen (as N)	IS:14684	230.58	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	18.24	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	16.33	%
17.	Organic Carbon	IS 2720 (P-22)	0.84	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.70	mg/kg
19.	Cadmium (as Cd)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.90	mg/kg
20.	Chromium (as Cr)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.84	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	7.68	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.80	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	25.65	%

**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)**

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

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.41	--
2.	Conductivity	IS 14767	0.392	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	40.22	%
6.	Bulk density	VEL/STP/EN/59, Issue No.- 01, 01/11/2021	5.48	gm/cc
7.	Chloride (as Cl)	VEL/STP/EN/69, Issue No.- 01, 01/11/2021	75.10	%
8.	Calcium (as Ca)	VEL/STP/EN/72, Issue No.- 01, 01/11/2021	52.46	%
9.	Sodium (as Na)	VEL/STP/EN/62, Issue No.- 01, 01/11/2021	40.8	%
10.	Potassium (as K)	VEL/STP/EN/61, Issue No.- 01, 01/11/2021	158.36	%
11.	Iron as (Fe )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	5.12	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.64	%
13.	Magnesium (as Mg)	VEL/STP/EN/72, Issue No. 01, 01/11/2021	40.28	%
14.	Available Nitrogen (as N)	IS:14684	256.36	kg./hec.
15.	Available Phosphorus	VEL/STP/EN/73, Issue No.- 01, 01/11/2021	25.44	kg./hec.
16.	Zinc (as Zn)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	28.24	%
17.	Organic Carbon	IS 2720 (P-22)	0.70	%
18.	Lead (as Pb)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	6.22	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	0.72	mg/kg
21.	Copper (as Cu )	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	5.20	mg/kg
22.	Molybdenum (as Mo)	VEL/STP/HW/03, Issue No.- 01, 01/10/2021	0.81	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	28.30	%

### 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.



## Test Report

Sample Number:	VEL/HPCL/A/01	Report No.:	VEL/AP/2506170019
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°05'46.28" N	Party Reference No.:	NIL
Longitude:	75°01'03.05" E	Reporting Date:	21/06/2025
		Period of Analysis:	17/06/2025 to 21/06/2025
		Receipt Date:	17/06/2025

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/05
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 09/06/2025 to 10/06/2025
Time of Monitoring	: 10:00 AM to 10:00 AM
Ambient Temperature (°C)	: Min. 36.0°C, Max. 48.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	34.97	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	54.36	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	16.41	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	9.52	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.60	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	18.43	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	14.89	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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/02  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab  
Latitude: 30°07'91.88" N  
Longitude: 75°00'18.00" E

Report No.: VEL/AP/2506170020  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Period of Analysis: 17/06/2025 to 21/06/2025  
Receipt Date: 17/06/2025

Sample Description: AMBIENT AIR QUALITY MONITORING

### General Information:-

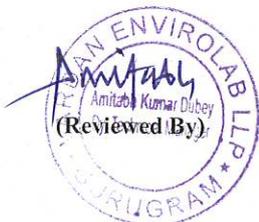
Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Nasibpura  
Instrument Used : RDS & FPS Sampler with all Accessories  
Instrument Code : VEL/RDS/FPS/06  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 09/06/2025 to 10/06/2025  
Time of Monitoring : 09:30 AM to 09:30 AM  
Ambient Temperature (°C) : Min. 36.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	36.14	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	54.10	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	13.17	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	10.52	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.69	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	15.88	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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/03  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.  
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab  
Latitude: 30°10'19.35" N  
Longitude: 75°00'70.46" E

Report No.: VEL/AP/2506170021  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Period of Analysis: 17/06/2025 to 21/06/2025  
Receipt Date: 17/06/2025

Sample Description: AMBIENT AIR QUALITY MONITORING

### General Information:-

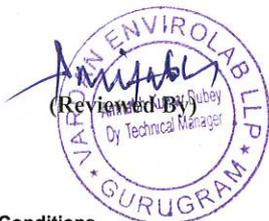
Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Kot Shamir  
Instrument Used : RDS & FPS Sampler with all Accessories  
Instrument Code : VEL/RDS/FPS/07  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 09/06/2025 to 10/06/2025  
Time of Monitoring : 10:15 AM to 10:15 AM  
Ambient Temperature (°C) : Min. 36.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	31.49	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	52.98	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	21.30	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	8.41	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.77	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	23.52	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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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# Vardan Envirolab LLP

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



## 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°06'95.18" N  
Longitude: 75°06'79.83" E

Report No.: VEL/AP/2506170022  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Period of Analysis: 17/06/2025 to 21/06/2025  
Receipt Date: 17/06/2025

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/07  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 10/06/2025 to 11/06/2025  
Time of Monitoring : 10:25 AM to 10:25 AM  
Ambient Temperature (°C) : Min. 36.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	35.40	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	57.68	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	16.24	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	10.59	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.61	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	17.23	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/HPCL/A/11	Report No.:	VEL/AP/2506170023
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°98'18.6" N	Party Reference No.:	NIL
Longitude:	75°06'45.56" E	Reporting Date:	21/06/2025
		Period of Analysis:	17/06/2025 to 21/06/2025
		Receipt Date:	17/06/2025

Sample Description: AMBIENT AIR QUALITY MONITORING

### General Information:-

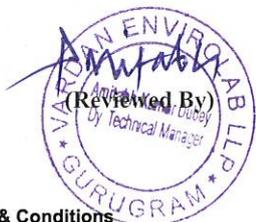
Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Bhara
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/FPS/07
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 12/06/2025 to 13/06/2025
Time of Monitoring	: 10:55 AM to 10:55 AM
Ambient Temperature (°C)	: Min. 34.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	30.27	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	46.50	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	14.68	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	8.51	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.72	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	14.99	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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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# Vardan EnviroLab LLP

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



## Test Report

Sample Number: VEL/HPCL/A/08  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab  
Latitude: 30°11'58.80" N  
Longitude: 75°06'45.56" E

Report No.: VEL/AP/2506170024  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Period of Analysis: 17/06/2025 to 21/06/2025  
Receipt Date: 17/06/2025

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/05  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 10/06/2025 to 11/06/2025  
Time of Monitoring : 10:20 AM to 10:20 AM  
Ambient Temperature (°C) : Min. 36.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	34.69	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	56.07	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	12.33	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	10.18	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.52	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	13.25	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## 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°05'74.39" N  
Longitude: 75°03'46.83" E

Report No.: VEL/AP/2506170025  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Period of Analysis: 17/06/2025 to 21/06/2025  
Receipt Date: 17/06/2025

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/06  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 10/06/2025 to 11/06/2025  
Time of Monitoring : 09:45 AM to 09:45 AM  
Ambient Temperature (°C) : Min. 36.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	35.76	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	40.22	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	14.39	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	10.81	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.63	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	16.15	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab  
Latitude: 30°03'74.66" N  
Longitude: 74°95'01.84" E

Report No.: VEL/AP/2506170026  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Period of Analysis: 17/06/2025 to 21/06/2025  
Receipt Date: 17/06/2025

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/05  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 12/06/2025 to 13/06/2025  
Time of Monitoring : 10:40 AM to 10:40 AM  
Ambient Temperature (°C) : Min. 34.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	29.34	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	52.16	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	17.29	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	9.07	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.51	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ 20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ 0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	16.58	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ 0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m <sup>3</sup>	--
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/07	Report No.:	VEL/AP/2506170027
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°02'58.78" N	Party Reference No.:	NIL
Longitude:	75°06'42.66" E	Reporting Date:	21/06/2025
		Period of Analysis:	17/06/2025 to 21/06/2025
		Receipt Date:	17/06/2025

Sample Description: AMBIENT AIR QUALITY MONITORING

### General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: <b>Baghi Bandar</b>
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	: <b>11/06/2025 to 12/06/2025</b>
Time of Monitoring	: 10:35 AM to 10:35 AM
Ambient Temperature (°C)	: Min. 35.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	33.01	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	50.64	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	14.73	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	9.53	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.58	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ 20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ 0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	13.67	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ 0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m <sup>3</sup>	--
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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# Vardan EnviroLab LLP

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



## 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°99'07.18" N  
Longitude: 75°01'09.02" E

Report No.: VEL/AP/2506170028  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Period of Analysis: 17/06/2025 to 21/06/2025  
Receipt Date: 17/06/2025

Sample Description: AMBIENT AIR QUALITY MONITORING

### General Information:-

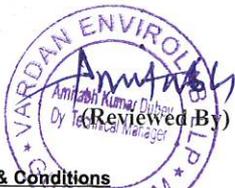
Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Leleana  
Instrument Used : RDS & FPS Sampler with all Accessories  
Instrument Code : VEL/RDS/FPS/06  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 12/06/2025 to 13/06/2025  
Time of Monitoring : 11:10 AM to 11:10 AM  
Ambient Temperature (°C) : Min. 16.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	34.55	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	48.17	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	16.20	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	7.89	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.66	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	18.23	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ 0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	16.98	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ 0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m <sup>3</sup>	--
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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ISO 9001 | ISO 14001 | ISO 45001



## 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°02'11.58" N  
Longitude: 75°01'56.76" E

Report No.: VEL/AP/2506170029  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Period of Analysis: 17/06/2025 to 21/06/2025  
Receipt Date: 17/06/2025

Sample Description: AMBIENT AIR QUALITY MONITORING

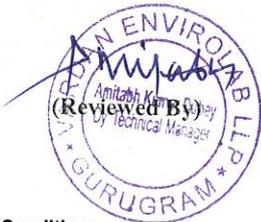
### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Mahi Nangal  
Instrument Used : RDS & FPS Sampler with all Accessories  
Instrument Code : VEL/RDS/FPS/06  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 11/06/2025 to 12/06/2025  
Time of Monitoring : 10:50 AM to 10:50 AM  
Ambient Temperature (°C) : Min. 14.0°C, Max. 35.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	34.23	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	54.18	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	25.79	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	8.30	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.58	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ 20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ 0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	12.62	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ 0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m <sup>3</sup>	--
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/12	Report No.:	VEL/AP/2506170030
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°11'10.85" N	Party Reference No.:	NIL
Longitude:	74°96'12.48" E	Reporting Date:	21/06/2025
		Period of Analysis:	17/06/2025 to 21/06/2025
		Receipt Date:	17/06/2025

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/05
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 11/06/2025 to 12/06/2025
Time of Monitoring	: 10:30 AM to 10:30 AM
Ambient Temperature (°C)	: Min. 16.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	36.13	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	43.50	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	11.49	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	8.78	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.66	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ 20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ 0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	13.55	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ 0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m <sup>3</sup>	--
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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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## 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/W/2506170024  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 25/06/2025  
Period of Analysis: 17/06/2025 to 25/06/2025  
Receipt Date: 17/06/2025  
Sampling Date: 10/06/2025  
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 23<sup>rd</sup> Edition 2017 & IS:3025

### TEST RESULTS

S. No.	Parameter	Test Method	Results	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.23	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	16.1	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Taste	IS 3025 (P-8)	NR	--
6.	Chloride (as Cl)	IS 3025 (P-32)	57.13	mg/L
7.	Conductivity	IS 3025 (P-14)	5624	µS/cm
8.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	12.75	mg/L
9.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.60	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	353.16	mg/L
11.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L
12.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.80	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	19.69	mg/L
14.	Fluoride (as F)	APHA 4500 F D	0.51	mg/L
15.	BOD (3 Days at 27°C)	IS 3025 (P-44)	5.46	mg/L
16.	COD	IS 3025 (P-58)	28.73	mg/L
17.	Free Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	7.56	mg/L
18.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L
19.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	125.00	mg/L
20.	Calcium (as Ca)	IS 3025 (P-40)	41.28	mg/L
21.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	134.59	mg/L
22.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	5.34	mg/L
23.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	6.50	mg/L
24.	Sodium (as Na)	IS 3025 (P-45)	42.99	mg/L
25.	Potassium (as K)	IS 3025 (P-45)	8.6	mg/L
26.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	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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(Authorized Signatory)

25/06/2025  
Shiv Prakash Singh

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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/2506170025  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 25/06/2025  
Period of Analysis: 17/06/2025 to 25/06/2025  
Receipt Date: 17/06/2025  
Sampling Date: 10/06/2025  
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 23<sup>rd</sup> Edition 2017 & IS:3025

### TEST RESULTS

S. No.	Parameter	Test Method	Results	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.53	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	18.9	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Taste	IS 3025 (P-8)	NR	--
6.	Chloride (as Cl)	IS 3025 (P-32)	42.19	mg/L
7.	Conductivity	IS 3025 (P-14)	852	µS/cm
8.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	5.78	mg/L
9.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	0.65	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	412.00	mg/L
11.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L
12.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	0.83	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	26.11	mg/L
14.	Fluoride (as F)	APHA 4500 F D	0.59	mg/L
15.	BOD (3 Days at 27°C)	IS 3025 (P-44)	3.62	mg/L
16.	COD	IS 3025 (P-58)	14.37	mg/L
17.	Free Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	6.18	mg/L
18.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L
19.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	128.55	mg/L
20.	Calcium (as Ca)	IS 3025 (P-40)	56.79	mg/L
21.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	140.64	mg/L
22.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	3.19	mg/L
23.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	4.72	mg/L
24.	Sodium (as Na)	IS 3025 (P-45)	41.30	mg/L
25.	Potassium (as K)	IS 3025 (P-45)	4.0	mg/L
26.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L
27.	Total Coliform	IS 15185:2016	Absent	Per 100ml

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## Test Report

<b>Sample Number:</b>	VEL/S0/01	<b>Report No.:</b>	VEL/PE/2506170013
<b>Name &amp; Address of the Project:</b>	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil- Talwandi Sabo, Bathinda, Punjab	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	NIL
		<b>Reporting Date:</b>	25/06/2025
		<b>Period of Analysis:</b>	17/06/2025 to 25/06/2025
		<b>Receipt Date:</b>	17/06/2025
<b>Sample Description:</b>	Soil Sample	<b>Sampling Date:</b>	09/06/2025
<b>Sample Location:</b>	Near Project Site	<b>Sampling Type:</b>	Composite
<b>Sample Collected By:</b>	Vardan Envirolab Representative	<b>Sample Quantity:</b>	2.0 Kg
<b>Sampling &amp; Analysis Protocol:</b>	IS 2720, USEPA 3050B & USDA	<b>Packing Status:</b>	Temp Sealed

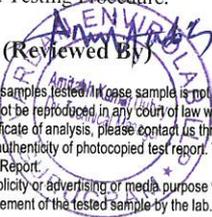
## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	8.05	--
2.	Conductivity	IS 14767	0.368	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	31.49	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	4.01	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	29.75	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	26.10	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	29.34	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	124.53	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	6.10	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.61	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	16.34	%
14.	Available Nitrogen (as N)	IS:14684	137.23	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	22.07	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	24.22	%
17.	Organic Carbon	IS 2720 (P-22)	0.58	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.52	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.66	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.62	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	14.08	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.57	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	17.01	%

Note- STP- Standard Testing Procedure.

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(Reviewed By)  
  
 ANSHU SINGH  
 Analyst  
 VARDAN ENVIROLAB LLP

(Authorized Signatory)  
  
 ANSHU SINGH  
 Analyst  
 VARDAN ENVIROLAB LLP  
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# Vardan Envirolab LLP

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



## Test Report

Sample Number:	VEL/ S0/02	Report No.:	VEL/PE/2506170014
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:	25/06/2025
		Period of Analysis:	17/06/2025 to 25/06/2025
		Receipt Date:	17/06/2025
		Sampling Date:	09/06/2025
		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	0.413	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	45.92	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	4.70	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	39.23	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	45.60	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	51.38	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	130.52	%
11.	Iron as (Fe)	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	3.98	mg/kg
12.	Organic Matter	IS 2720 (P-22)	3.10	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	4.24	%
14.	Available Nitrogen (as N)	IS:14684	290.20	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	26.53	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	29.71	%
17.	Organic Carbon	IS 2720 (P-22)	0.64	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.53	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.58	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	6.77	mg/kg
21.	Copper (as Cu)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	3.93	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.65	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	14.62	%

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# Vardan Envirolab LLP



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/PE/2506170015  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 25/06/2025  
Period of Analysis: 17/06/2025 to 25/06/2025  
Receipt Date: 17/06/2025  
Sampling Date: 09/06/2025  
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)	7.39	--
2.	Conductivity	IS 14767	0.372	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	22.68	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	4.03	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	40.75	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	35.22	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	44.32	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	128.41	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	6.99	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.67	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	14.32	%
14.	Available Nitrogen (as N)	IS:14684	258.10	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	28.14	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	20.56	%
17.	Organic Carbon	IS 2720 (P-22)	0.70	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.91	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.68	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.63	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	12.42	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.68	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	19.40	%

Note- STP- Standard Testing Procedure.

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25/06/2025  
25/06/2025

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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/PE/2506170016
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
Sample Description:	Soil Sample	Party Reference No.:	NIL
Sample Location:	Kot Bhara	Reporting Date:	25/06/2025
Sample Collected By:	Vardan Envirolab Representative	Period of Analysis:	17/06/2025 to 25/06/2025
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Receipt Date:	17/06/2025
		Sampling Date:	12/06/2025
		Sampling Type:	Composite
		Sample Quantity:	2.0 Kg
		Packing Status:	Temp Sealed

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.22	--
2.	Conductivity	IS 14767	0.401	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	31.04	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	3.26	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	35.41	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	56.90	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	60.27	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	126.32	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	3.95	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.69	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	24.75	%
14.	Available Nitrogen (as N)	IS:14684	225.18	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	18.62	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	13.43	%
17.	Organic Carbon	IS 2720 (P-22)	0.90	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.68	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.75	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	4.28	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	5.32	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	6.14	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	28.36	%

Note- STP- Standard Testing Procedure.

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25/06/2025  
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## Test Report

Sample Number:	VEL/S0/05	Report No.:	VEL/PE/2506170017
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:	25/06/2025
		Period of Analysis:	17/06/2025 to 25/06/2025
		Receipt Date:	17/06/2025
Sample Description;	Soil Sample	Sampling Date:	10/06/2025
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)	7.28	--
2.	Conductivity	IS 14767	0.401	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty Loam	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	18.42	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	3.05	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	36.29	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	31.64	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	44.18	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	66.27	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	6.96	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.81	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	19.75	%
14.	Available Nitrogen (as N)	IS:14684	174.23	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	21.59	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	17.42	%
17.	Organic Carbon	IS 2720 (P-22)	0.76	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.68	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.84	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.72	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	6.99	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.36	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	26.44	%

Note- STP- Standard Testing Procedure.

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(Authorized Signatory)

Dr. Shiv Prakash Singh  
25/06/2025  
Authorized Signatory

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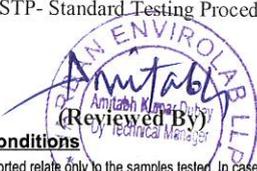
## Test Report

<b>Sample Number:</b>	VEL/ S0/06	<b>Report No.:</b>	VEL/PE/2506170018
<b>Name &amp; Address of the Project:</b>	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	NIL
		<b>Reporting Date:</b>	25/06/2025
		<b>Period of Analysis:</b>	17/06/2025 to 25/06/2025
		<b>Receipt Date:</b>	17/06/2025
<b>Sample Description;</b>	Soil Sample	<b>Sampling Date:</b>	10/06/2025
<b>Sample Location:</b>	Kot Fatta	<b>Sampling Type:</b>	Composite
<b>Sample Collected By:</b>	Vardan Envirolab Representative	<b>Sample Quantity:</b>	2.0 Kg
<b>Sampling &amp; Analysis Protocol:</b>	IS 2720, USEPA 3050B & USDA	<b>Packing Status:</b>	Temp Sealed

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.28	--
2.	Conductivity	IS 14767	0.462	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	31.53	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	3.62	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	44.09	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	41.38	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	35.91	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	119.74	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	4.21	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.69	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	22.78	%
14.	Available Nitrogen (as N)	IS:14684	191.04	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	10.37	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	9.13	%
17.	Organic Carbon	IS 2720 (P-22)	0.88	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.91	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.68	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	4.03	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	6.57	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.39	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 0.5)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	18.25	%

Note- STP- Standard Testing Procedure.



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## Test Report

Sample Number:  
Name & Address of the Project:

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

Report No.: VEL/PE/2506170019  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 25/06/2025  
Period of Analysis: 17/06/2025 to 25/06/2025  
Receipt Date: 17/06/2025  
Sampling Date: 11/06/2025  
Sampling Type: Composite  
Sample Quantity: 2.0 Kg  
Packing Status: 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)	7.43	--
2.	Conductivity	IS 14767	0.465	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Brownish	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	21.92	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	4.05	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	59.74	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	46.30	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	79.06	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	121.28	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	3.99	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.57	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	33.42	%
14.	Available Nitrogen (as N)	IS:14684	229.58	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	31.44	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	26.17	%
17.	Organic Carbon	IS 2720 (P-22)	0.66	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.50	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.79	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.81	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	7.25	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.60	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	24.36	%

Note- STP- Standard Testing Procedure.

(Reviewed By)

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(Authorized Signatory)

25/06/2025  
Prakash Singh  
Authorized Signatory

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# Vardan Envirolab LLP

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



## Test Report

Sample Number:	VEL /S0/08	Report No.:	VEL/PE/2506170020
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:	25/06/2025
		Period of Analysis:	17/06/2025 to 25/06/2025
		Receipt Date:	17/06/2025
		Sampling Date:	11/06/2025
		Sampling Type:	Composite
		Sample Quantity:	2.0 Kg
		Packing Status:	Temp Sealed

Sample Description:	Soil Sample
Sample Location:	Manwala
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)	7.32	--
2.	Conductivity	IS 14767	0.415	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	35.76	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	4.32	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	39.11	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	46.85	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	32.29	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	155.61	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	7.23	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.80	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	27.15	%
14.	A available Nitrogen (as N)	IS:14684	244.23	kg./hec.
15.	A available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	18.60	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	13.72	%
17.	Organic Carbon	IS 2720 (P-22)	0.61	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.59	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.75	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	6.09	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	5.28	mg/kg
22.	Molybdenum (as MO)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.59	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	24.56	%

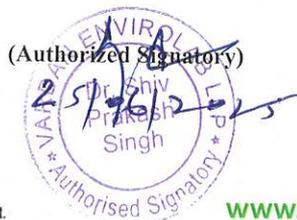
Note- STP- Standard Testing Procedure.

(Reviewed By)

(Authorized Signatory)

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# Vardan Envirolab LLP

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/PE/2506170021  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 25/06/2025  
Period of Analysis: 17/06/2025 to 25/06/2025  
Receipt Date: 17/06/2025  
Sampling Date: 10/06/2025  
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)	7.25	--
2.	Conductivity	IS 14767	0.391	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	30.10	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	6.82	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	47.34	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	28.50	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	51.02	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	131.83	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	6.45	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.82	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	21.02	%
14.	Available Nitrogen (as N)	IS:14684	219.28	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	12.43	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	17.94	%
17.	Organic Carbon	IS 2720 (P-22)	0.70	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.68	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.77	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.59	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	5.01	mg/kg
22.	Molybdenum (as MO)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.67	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	22.15	%

Note- STP- Standard Testing Procedure.

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Amitabh Kumar Dubey  
(Reviewed By)

Dr. Shiv Singh  
(Authorized Signatory)

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# Vardan Envirolab LLP

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



## Test Report

Sample Number:	VEL/S0/10	Report No.:	VEL/PE/2506170022
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:	25/06/2025
		Period of Analysis:	17/06/2025 to 25/06/2025
		Receipt Date:	17/06/2025
Sample Description;	Soil Sample	Sampling Date:	12/06/2025
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)	7.49	--
2.	Conductivity	IS 14767	0.425	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty Loam	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	35.67	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	5.01	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	52.45	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	29.79	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	55.32	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	126.08	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	14.67	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.66	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	28.64	%
14.	A available Nitrogen (as N)	IS:14684	229.00	kg./hec.
15.	A available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	25.14	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	26.17	%
17.	Organic Carbon	IS 2720 (P-22)	0.88	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.72	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.59	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.67	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	5.80	mg/kg
22.	Molybdenum (as MO)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.56	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	21.95	%

Note- STP- Standard Testing Procedure.

(Reviewed By)

(Authorized Signatory)

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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/PE/2506170023  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 25/06/2025  
Period of Analysis: 17/06/2025 to 25/06/2025  
Receipt Date: 17/06/2025  
Sampling Date: 11/06/2025  
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 Nagal  
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)	7.24	--
2.	Conductivity	IS 14767	0.385	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Brown	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	27.82	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	6.4	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	43.58	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	39.45	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	62.04	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	126.53	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	7.61	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.82	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	30.77	%
14.	Available Nitrogen (as N)	IS:14684	228.89	kg/hect.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	16.01	kg/hect.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	15.27	%
17.	Organic Carbon	IS 2720 (P-22)	0.79	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.68	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.88	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	7.43	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	8.81	mg/kg
22.	Molybdenum (as MO)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.77	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	24.24	%

Note- STP- Standard Testing Procedure.

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(Reviewed By)  
Anant Singh  
Authorized Signatory

(Authorized Signatory)  
Anant Singh  
Authorized Signatory

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# Vardan Envirolab LLP

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



## Test Report

<b>Sample Number:</b>	VEL /S0/12	<b>Report No.:</b>	VEL/PE/2506170024
<b>Name &amp; Address of the Project:</b>	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabu, Bathinda, Punjab	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	NIL
		<b>Reporting Date:</b>	25/06/2025
		<b>Period of Analysis:</b>	17/06/2025 to 25/06/2025
<b>Sample Description:</b>	Soil Sample	<b>Receipt Date:</b>	17/06/2025
<b>Sample Location:</b>	Laleana	<b>Sampling Date:</b>	12/06/2025
<b>Sample Collected By:</b>	Vardan Envirolab Representative	<b>Sampling Type:</b>	Composite
<b>Sampling &amp; Analysis Protocol:</b>	IS 2720, USEPA 3050B & USDA	<b>Sample Quantity:</b>	2.0 Kg
		<b>Packing Status:</b>	Temp Sealed

## TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.36	--
2.	Conductivity	IS 14767	0.401	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Brown	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	38.16	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	4.75	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	74.13	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	51.90	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	39.6	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	161.28	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	4.54	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.80	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	39.17	%
14.	Available Nitrogen (as N)	IS:14684	261.84	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	23.65	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	27.61	%
17.	Organic Carbon	IS 2720 (P-22)	0.72	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	5.12	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.63	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.70	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	4.19	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.78	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	26.41	%

Note- STP- Standard Testing Procedure.

(Reviewed By)



(Authorized Signatory)



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# Vardan Envirolab LLP

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/2506170017
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:	25/06/2025
		Period of Analysis:	17/06/2025 to 25/06/2025
		Receipt Date:	17/06/2025
Sample Description:	Ground Water Sample	Sampling Date:	09/06/2025
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 <sup>rd</sup> 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)	7.11	--	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 <sub>3</sub> )	IS 3025 (P-21)	220.93	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	68.27	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	230.41	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	60.35	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	12.29	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	509.34	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	16.78	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.69	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	6.40	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.57	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	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/2506170017			
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/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.38	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	817	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	25.2	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

<b>Sample Number:</b>	VEL/GW/02	<b>Report No.:</b>	VEL/W/2506170018
<b>Name &amp; Address of the Project:</b>	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	NIL
		<b>Reporting Date:</b>	25/06/2025
		<b>Period of Analysis:</b>	17/06/2025 to 25/06/2025
		<b>Receipt Date:</b>	17/06/2025
<b>Sample Description:</b>	Ground Water Sample	<b>Sampling Date:</b>	09/06/2025
<b>Sample Location:</b>	Nasibpura	<b>Sample Quantity:</b>	2.0 Ltr. + 250 ml
<b>Sample Collected By:</b>	Vardan Envirolab Representative	<b>Sampling Type:</b>	Grab
<b>Parameter Required:</b>	As per Work Order	<b>Preservation:</b>	Refrigerated
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> 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)	7.22	--	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 <sub>3</sub> )	IS 3025 (P-21)	220.73	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	59.64	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	205.12	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	38.56	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	17.47	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	463.09	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	30.52	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.61	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	3.98	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.36	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation

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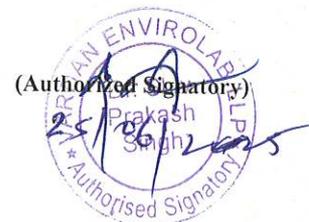


## Test Report

Sample No.: VEL/GW/02			Report No.: VEL/W/2506170018			
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/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	0.28	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	725	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	27.84	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	1.46	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

<b>Sample Number:</b>	VEL/GW/03	<b>Report No.:</b>	VEL/W/2506170019
<b>Name &amp; Address of the Project:</b>	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil- Talwandi Sabo, Bathinda, Punjab	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	NIL
		<b>Reporting Date:</b>	25/06/2025
		<b>Period of Analysis:</b>	17/06/2025 to 25/06/2025
		<b>Receipt Date:</b>	17/06/2025
<b>Sample Description:</b>	Ground Water Sample	<b>Sampling Date:</b>	09/06/2025
<b>Sample Location:</b>	Kot Shamir	<b>Sample Quantity:</b>	2.0 Ltr. + 250 ml
<b>Sample Collected By:</b>	Vardan Envirolab Representative	<b>Sampling Type:</b>	Grab
<b>Parameter Required:</b>	As per Work Order	<b>Preservation:</b>	Refrigerated
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> 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)	7.48	--	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 <sub>3</sub> )	IS 3025 (P-21)	227.38	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	59.21	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	225.70	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	82.00	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	19.35	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	519.69	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	38.77	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.51	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	3.29	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.38	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation

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(Authorized Signatory)

Prakash Singh  
25/06/2025  
Authorized Signatory

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# Vardan Envirolab LLP

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



## Test Report

Sample No.: VEL/GW/03				Report No.: VEL/W/2506170019		
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/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.68	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	843	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	34.27	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.0	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)



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## Test Report

<b>Sample Number:</b>	VEL/GW/03	<b>Report No.:</b>	VEL/W/2506170020
<b>Name &amp; Address of the Project:</b>	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil- Talwandi Sabo, Bathinda, Punjab	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	NIL
		<b>Reporting Date:</b>	25/06/2025
		<b>Period of Analysis:</b>	17/06/2025 to 25/06/2025
		<b>Receipt Date:</b>	17/06/2025
<b>Sample Description:</b>	Ground Water Sample	<b>Sampling Date:</b>	11/06/2025
<b>Sample Location:</b>	Baghi Bandar	<b>Sample Quantity:</b>	2.0 Ltr. + 250 ml
<b>Sample Collected By:</b>	Vardan EnviroLab Representative	<b>Sampling Type:</b>	Grab
<b>Parameter Required:</b>	As per Work Order	<b>Preservation:</b>	Refrigerated
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> 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)	7.42	--	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 <sub>3</sub> )	IS 3025 (P-21)	263.05	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	80.76	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	243.28	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	78.31	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	14.95	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	511.00	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	58.24	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.77	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	9.62	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.53	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation

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## Test Report

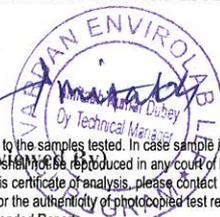
Sample No.: VEL/GW/04					Report No.: VEL/W/2506170020	
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	IS 3025 (P-43)	BLQ(LOQ 0.0004)	mg/L	0.001	0.002
21.	Mineral Oil	IS 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/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	0.51	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	874	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	20.8	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.

@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	Report No.:	VEL/W/2506170021
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
Sample Description:	Ground Water Sample	Party Reference No.:	NIL
Sample Location:	Maanwala	Reporting Date:	25/06/2025
Sample Collected By:	Vardan EnviroLab Representative	Period of Analysis:	17/06/2025 to 25/06/2025
Parameter Required:	As per Work Order	Receipt Date:	17/06/2025
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS:3025	Sampling Date:	11/06/2025
		Sample Quantity:	2.0 Ltr. + 250 ml
		Sampling Type:	Grab
		Preservation:	Refrigerated

## 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 <sub>3</sub> )	IS 3025 (P-21)	235.21	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	58.64	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	149.81	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	68.23	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	21.60	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	565.00	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	51.48	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.89	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	2.70	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.45	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation

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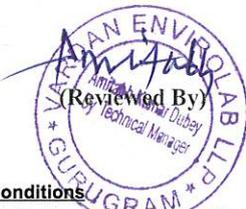


## Test Report

Sample No.: VEL/GW/05			Report No.: VEL/W/2506170021			
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/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.44	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	755	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	37.1	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).



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# Vardan Envirolab LLP

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## Test Report

Sample Number:	VEL/GW/06	Report No.:	VEL/W/2506170022
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:	25/06/2025
		Period of Analysis:	17/06/2025 to 25/06/2025
		Receipt Date:	17/06/2025
Sample Description:	Ground Water Sample	Sampling Date:	10/06/2025
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 <sup>rd</sup> 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)	7.39	--	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 <sub>3</sub> )	IS 3025 (P-21)	146.25	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	36.49	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	159.33	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	43.28	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	13.41	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	351.29	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	18.08	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.65	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	5.27	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.40	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation

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25/06/2025  
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ISO 9001 | ISO 14001 | ISO 45001

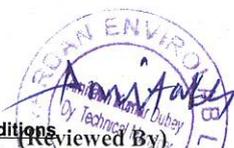


## Test Report

Sample No.: VEL/GW/06			Report No.: VEL/W/2506170022			
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/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	0.43	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	592	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	14.6	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

<b>Sample Number:</b>	VEL/GW/07	<b>Report No.:</b>	VEL/W/2506170023
<b>Name &amp; Address of the Project:</b>	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	NIL
		<b>Reporting Date:</b>	25/06/2025
		<b>Period of Analysis:</b>	17/06/2025 to 25/06/2025
		<b>Receipt Date:</b>	17/06/2025
<b>Sample Description:</b>	Ground Water Sample	<b>Sampling Date:</b>	11/06/2025
<b>Sample Location:</b>	Mahi Nangal	<b>Sample Quantity:</b>	2.0 Ltr. + 250 ml
<b>Sample Collected By:</b>	Vardan Envirolab Representative	<b>Sampling Type:</b>	Grab
<b>Parameter Required:</b>	As per Work Order	<b>Preservation:</b>	Refrigerated
<b>Sampling &amp; Analysis Protocol:</b>	APHA 23 <sup>rd</sup> 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)	7.48	--	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 <sub>3</sub> )	IS 3025 (P-21)	230.05	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	39.68	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	191.44	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	60.71	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	31.84	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	419.00	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	17.19	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.56	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	6.11	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.43	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	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/2506170023		
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/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	0.70	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	621	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	25.3	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).



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## Test Report

Sample Number:	VEL/N/01	Report No.:	VEL/AP/2506170031
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:	21/06/2025
		Receipt Date:	17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

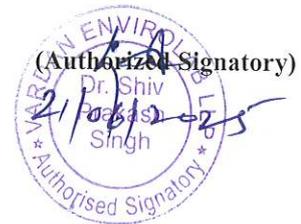
### General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Near Project Site
Latitude:	30°05'46.23" N
Longitude:	75°01'03.48" 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	: 09/06/2025 to 10/06/2025
Time of Monitoring	: 09:30 AM to 09:30 AM
Ambient Temperature (°C)	: Min. 36.0°C, Max. 48.0°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 <sub>max</sub>	IS 9989	71.5	66.3	dB(A)
2.	L <sub>min</sub>	IS 9989	52.9	45.8	dB(A)
3.	L <sub>eq</sub>	IS 9989	60.72	49.56	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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## Test Report

Sample Number:	VEL/N/02	Report No.:	VEL/AP/2506170032
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:	21/06/2025
		Receipt Date:	17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Nasibpura
Latitude:	30°07'92.05" N
Longitude:	75°00'18.31" 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	: 09/06/2025 to 10/06/2025
Time of Monitoring	: 09:40 AM to 09:40 AM
Ambient Temperature (°C)	: Min. 36.0°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 <sub>max</sub>	IS 9989	50.1	41.7	dB(A)
2.	L <sub>min</sub>	IS 9989	43.9	33.9	dB(A)
3.	L <sub>eq</sub>	IS 9989	47.83	38.52	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

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## Test Report

Sample Number: VEL/N/03 Report No.: VEL/AP/2506170033  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-03  
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Receipt Date: 17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

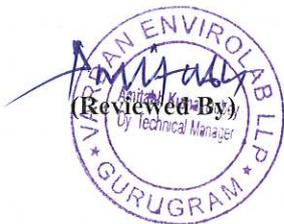
### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Kot Shamir  
Latitude: 30°10'19.53" N  
Longitude: 75°00'70.45" 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 : 09/06/2025 to 10/06/2025  
Time of Monitoring : 09:50 AM to 09:50 AM  
Ambient Temperature (°C) : Min. 36.0°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 <sub>max</sub>	IS 9989	49.5	40.3	dB(A)
2.	L <sub>min</sub>	IS 9989	40.8	32.9	dB(A)
3.	L <sub>eq</sub>	IS 9989	46.72	37.24	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 Report No.: VEL/AP/2506170034  
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: 21/06/2025  
Receipt Date: 17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

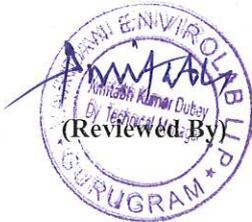
### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Kot Bhara  
Latitude: 30°09'81.73" N  
Longitude: 75°06'45.46" 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 : 12/06/2025 to 13/06/2025  
Time of Monitoring : 06:00 AM to 06:00 AM  
Ambient Temperature (°C) : Min. 34.0°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 <sub>max</sub>	IS 9989	51.0	39.5	dB(A)
2.	L <sub>min</sub>	IS 9989	35.2	29.8	dB(A)
3.	L <sub>eq</sub>	IS 9989	46.7	34.91	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

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## Test Report

Sample Number:	VEL/N/05	Report No.:	VEL/AP/2506170035
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:	21/06/2025
		Receipt Date:	17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Fatta
Latitude:	30°11'58.08" N
Longitude:	75°08'17.61" 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	: 10/06/2025 to 11/06/2025
Time of Monitoring	: 10:30 AM to 10:30 AM
Ambient Temperature (°C)	: Min. 36.0°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 <sub>max</sub>	IS 9989	51.8	40.9	dB(A)
2.	L <sub>min</sub>	IS 9989	34.0	34.6	dB(A)
3.	L <sub>eq</sub>	IS 9989	49.73	39.22	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/2506170036  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Receipt Date: 17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Chathewala  
Latitude: 30°06'95.18" N  
Longitude: 75°06'79.83" 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 : 10/06/2025 to 11/06/2025  
Time of Monitoring : 10:55 AM to 10:55 AM  
Ambient Temperature (°C) : Min. 36.0°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 <sub>max</sub>	IS 9989	49.3	38.1	dB(A)
2.	L <sub>min</sub>	IS 9989	28.0	30.6	dB(A)
3.	L <sub>eq</sub>	IS 9989	44.37	33.90	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

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## Test Report

Sample Number:	VEL/N/11	Report No.:	VEL/AP/2506170037
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:	21/06/2025
		Receipt Date:	17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Manwala
Latitude:	30°03'74.66" N
Longitude:	75°95'01.84" 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	: 11/06/2025 to 12/06/2025
Time of Monitoring	: 09:50 AM to 09:50 AM
Ambient Temperature (°C)	: Min. 35.0°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 <sub>max</sub>	IS 9989	50.1	39.2	dB(A)
2.	L <sub>min</sub>	IS 9989	29.7	29.5	dB(A)
3.	L <sub>eq</sub>	IS 9989	44.03	34.11	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/2506170038
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:	21/06/2025
		Receipt Date:	17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: <b>Baghi Bandar</b>
Latitude:	30°02'85.59" N
Longitude:	75°06'42.03" 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	: 11/06/2025 to 12/06/2025
Time of Monitoring	: 10:00 AM to 10:00 AM
Ambient Temperature (°C)	: Min. 35.0°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 <sub>max</sub>	IS 9989	50.2	39.3	dB(A)
2.	L <sub>min</sub>	IS 9989	34.6	30.0	dB(A)
3.	L <sub>eq</sub>	IS 9989	46.10	33.81	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

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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/2506170039  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Receipt Date: 17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Jiwan Singh Wala  
Latitude: 30°05'74.01" N  
Longitude: 75°03'46.48" 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 : 10/06/2025 to 11/06/2025  
Time of Monitoring : 10:15 AM to 10:15 AM  
Ambient Temperature (°C) : Min. 36.0°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 <sub>max</sub>	IS 9989	49.3	41.5	dB(A)
2.	L <sub>min</sub>	IS 9989	32.7	30.1	dB(A)
3.	L <sub>eq</sub>	IS 9989	43.80	34.96	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 LLP

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



## Test Report

Sample Number:	VEL/N/07	Report No.:	VEL/AP/2506170040
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:	21/06/2025
		Receipt Date:	17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Mahi Nangal
Latitude:	30°02'11.88" N
Longitude:	75°01'56.66" 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	: 11/06/2025 to 12/06/2025
Time of Monitoring	: 10:30 AM to 10:30 AM
Ambient Temperature (°C)	: Min. 35.0°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 <sub>max</sub>	IS 9989	49.3	38.2	dB(A)
2.	L <sub>min</sub>	IS 9989	39.1	30.5	dB(A)
3.	L <sub>eq</sub>	IS 9989	44.77	36.14	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

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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-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AP/2506170041  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Receipt Date: 17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Leleana  
Latitude: 30°01'029.99" N  
Longitude: 74°97'47.58" 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 : 12/06/2025 to 13/06/2025  
Time of Monitoring : 06:00 AM to 06:00 AM  
Ambient Temperature (°C) : Min. 34.0°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 <sub>max</sub>	IS 9989	51.2	42.3	dB(A)
2.	L <sub>min</sub>	IS 9989	42.9	32.9	dB(A)
3.	L <sub>eq</sub>	IS 9989	47.30	38.46	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

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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/AP/2506170042  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 21/06/2025  
Receipt Date: 17/06/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

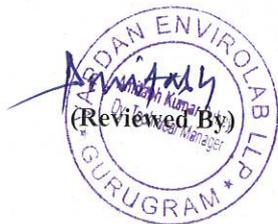
### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Gehri Bhagi  
Latitude: 30°11'10.71" N  
Longitude: 74°96'12.01" 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 : 12/06/2025 to 13/06/2025  
Time of Monitoring : 11:30 AM to 11:30 AM  
Ambient Temperature (°C) : Min. 34.0°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 <sub>max</sub>	IS 9989	50.9	41.3	dB(A)
2.	L <sub>min</sub>	IS 9989	36.4	29.5	dB(A)
3.	L <sub>eq</sub>	IS 9989	43.02	34.68	dB(A)
4.	CPCB Limits in dB(A*) Leq (Residential Area)	-	55.00	45.00	dB(A)

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## Test Report

Sample Number:	VEL/S0/01	Report No.:	VEL/PE/2509300013
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description:	Soil Sample	Sampling Date:	25/09/2025
Sample Location:	Near Project Site	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	0.375	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	32.55	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	5.22	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	30.45	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	25.58	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	30.40	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	126.58	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	7.31	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.58	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	17.56	%
14.	Available Nitrogen (as N)	IS:14684	140.22	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	25.12	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	22.54	%
17.	Organic Carbon	IS 2720 (P-22)	0.48	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.55	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.64	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.56	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	13.89	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.61	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	16.32	%

Note- STP- Standard Testing Procedure

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# Vardan EnviroLab LLP

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



## Test Report

Sample Number:	VEL/ S0/02	Report No.:	VEL/PE/2509300014
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description;	Soil Sample	Sampling Date:	25/09/2025
Sample Location:	Nasibpura	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)	7.46	--
2.	Conductivity	IS 14767	0.386	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	44.32	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	5.25	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	40.84	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	36.08	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	48.61	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	132.57	%
11.	Iron as (Fe)	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	3.31	mg/kg
12.	Organic Matter	IS 2720 (P-22)	4.56	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	5.25	%
14.	Available Nitrogen (as N)	IS:14684	285.64	kg/hect.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	25.46	kg/hect.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	30.45	%
17.	Organic Carbon	IS 2720 (P-22)	0.72	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.44	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.64	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	7.25	mg/kg
21.	Copper (as Cu)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	4.45	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.58	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	13.98	%

Note- STP- Standard-Testing Procedure.

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## Test Report

Sample Number:	VEL/ S0/03	Report No.:	VEL/PE/2509300015
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description;	Soil Sample	Sampling Date:	25/09/2025
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)	7.48	--
2.	Conductivity	IS 14767	0.390	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	21.45	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	4.92	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	38.26	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	32.41	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	41.10	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	122.36	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	7.42	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.54	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	15.22	%
14.	Available Nitrogen (as N)	IS:14684	260.24	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	29.54	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	22.20	%
17.	Organic Carbon	IS 2720 (P-22)	0.68	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.86	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.62	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.68	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	13.22	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.70	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	17.36	%

Note- STP- Standard Testing Procedure.

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## Test Report

Sample Number:	VEL/ S0/04	Report No.:	VEL/PE/2509300016
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description;	Soil Sample	Sampling Date:	27/09/2025
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)	7.30	--
2.	Conductivity	IS 14767	0.386	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	32.46	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	4.54	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	34.22	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	54.25	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	58.47	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	130.20	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	4.80	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.70	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	25.12	%
14.	Available Nitrogen (as N)	IS:14684	230.10	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	20.23	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	14.10	%
17.	Organic Carbon	IS 2720 (P-22)	0.88	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.71	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.80	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	5.30	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	6.21	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	8.02	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	30.85	%

Note- STP- Standard Testing Procedure.

(Reviewed By)

Amisha K...

Technical Manager

(Authorized Signatory)

akash Singh

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## Test Report

Sample Number:	VEL/S0/05	Report No.:	VEL/PE/2509300017
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description;	Soil Sample	Sampling Date:	26/09/2025
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)	7.30	--
2.	Conductivity	IS 14767	0.382	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty Loam	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	19.58	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	4.15	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	34.23	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	32.12	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	45.78	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	64.36	%
11.	Iron as (Fe)	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	7.48	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.75	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	20.12	%
14.	Available Nitrogen (as N)	IS:14684	175.28	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	22.40	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	18.20	%
17.	Organic Carbon	IS 2720 (P-22)	0.74	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.65	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.86	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.70	mg/kg
21.	Copper (as Cu)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	7.24	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.40	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	25.78	%

Note- STP- Standard Testing Procedure.

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## Test Report

Sample Number:	VEL/ S0/06	Report No.:	VEL/PE/2509300018
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Saboo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description;	Soil Sample	Sampling Date:	26/09/2025
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)	7.40	--
2.	Conductivity	IS 14767	0.448	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	32.24	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	4.33	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	45.21	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	42.48	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	36.46	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	120.22	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	5.10	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.74	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	24.36	%
14.	Available Nitrogen (as N)	IS:14684	160.25	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	12.45	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	10.84	%
17.	Organic Carbon	IS 2720 (P-22)	0.80	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.34	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.64	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	5.10	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	7.36	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.42	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	20.47	%

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06/10/2025

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## Test Report

Sample Number:	VEL/ S0/07	Report No.:	VEL/PE/2509300019
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description;	Soil Sample	Sampling Date:	27/09/2025
Sample Location:	Baghi Bandar	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)	7.25	--
2.	Conductivity	IS 14767	0.452	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Brownish	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	22.36	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	5.12	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	60.82	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	48.12	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	80.45	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	124.30	%
11.	Iron as (Fe)	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	4.12	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.62	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	34.28	%
14.	Available Nitrogen (as N)	IS:14684	232.46	kg/hect.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	34.22	kg/hect.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	30.14	%
17.	Organic Carbon	IS 2720 (P-22)	0.56	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.46	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.82	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.86	mg/kg
21.	Copper (as Cu)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	6.98	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.52	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	28.23	%

Note- STP- Standard Testing Procedure.

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## Test Report

Sample Number:	VEL /S0/08	Report No.:	VEL/PE/2509300020
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description;	Soil Sample	Sampling Date:	27/09/2025
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)	7.46	--
2.	Conductivity	IS 14767	0.392	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	34.55	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	5.10	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	41.78	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	45.12	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	34.20	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	160.24	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	8.24	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.84	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	29.08	%
14.	Available Nitrogen (as N)	IS:14684	246.42	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	19.47	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	14.32	%
17.	Organic Carbon	IS 2720 (P-22)	0.64	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.60	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.78	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	7.12	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	6.58	mg/kg
22.	Molybdenum (as MO)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.64	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	25.10	%

Note- STP- Standard Testing Procedure.

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
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## Test Report

Sample Number:	VEL/ S0/09	Report No.:	VEL/PE/2509300021
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description;	Soil Sample	Sampling Date:	26/09/2025
Sample Location:	Jiwan 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)	7.16	--
2.	Conductivity	IS 14767	0.398	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	32.45	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	7.10	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	44.86	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	30.24	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	49.44	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	140.84	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	8.15	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.82	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	22.14	%
14.	Available Nitrogen (as N)	IS:14684	224.48	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	14.10	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	18.42	%
17.	Organic Carbon	IS 2720 (P-22)	0.65	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.72	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.80	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.60	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	4.96	mg/kg
22.	Molybdenum (as MO)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.64	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	24.02	%

Note- STP- Standard Testing Procedure.

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ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/S0/10	Report No.:	VEL/PE/25009300022
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
Sample Description;	Soil Sample	Party Reference No.:	NIL
Sample Location:	Gehri Bhagi	Reporting Date:	06/10/2025
Sample Collected By:	Vardan Envirolab Representative	Period of Analysis:	30/09/2025 to 06/10/2025
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Receipt Date:	30/09/2025
		Sampling Date:	27/09/2025
		Sampling Type:	Composite
		Sample Quantity:	2.0 Kg
		Packing Status:	Temp Sealed

### TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.28	--
2.	Conductivity	IS 14767	0.414	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty Loam	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Red	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	36.40	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	6.78	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	50.96	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	30.84	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	54.46	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	130.24	%
11.	Iron as (Fe)	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	15.84	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.70	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	30.12	%
14.	Available Nitrogen (as N)	IS:14684	225.00	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	26.58	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	24.62	%
17.	Organic Carbon	IS 2720 (P-22)	0.94	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.70	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.62	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.64	mg/kg
21.	Copper (as Cu)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	6.34	mg/kg
22.	Molybdenum (as MO)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.58	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	23.16	%

Note- STP- Standard Testing Procedure.

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## Test Report

Sample Number:	VEL/ S0/11	Report No.:	VEL/PE/2509300023
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description;	Soil Sample	Sampling Date:	26/09/2025
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)	7.32	--
2.	Conductivity	IS 14767	0.410	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Brown	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	29.24	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	7.6	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	42.79	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	36.28	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	60.23	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	128.40	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	8.24	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.78	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	32.46	%
14.	Available Nitrogen (as N)	IS:14684	230.58	kg./hec.
15.	Available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	18.24	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	16.33	%
17.	Organic Carbon	IS 2720 (P-22)	0.84	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.70	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.90	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	6.84	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	7.68	mg/kg
22.	Molybdenum (as MO)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.80	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	25.65	%

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## Test Report

<b>Sample Number:</b>	VEL /S0/12	<b>Report No.:</b>	VEL/PE/2509300024
<b>Name &amp; Address of the Project:</b>	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	NIL
		<b>Reporting Date:</b>	06/10/2025
		<b>Period of Analysis:</b>	30/09/2025 to 06/10/2025
		<b>Receipt Date:</b>	30/09/2025
<b>Sample Description:</b>	Soil Sample	<b>Sampling Date:</b>	27/09/2025
<b>Sample Location:</b>	Laleana	<b>Sampling Type:</b>	Composite
<b>Sample Collected By:</b>	Vardan Envirolab Representative	<b>Sample Quantity:</b>	2.0 Kg
<b>Sampling &amp; Analysis Protocol:</b>	IS 2720, USEPA 3050B & USDA	<b>Packing Status:</b>	Temp Sealed

### TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS 2720 (P-26)	7.41	--
2.	Conductivity	IS 14767	0.392	mS/cm
3.	Soil Texture	VEL/EN/STP/64, Issue No.- 01, Issue date 01/11/2023	Silty	--
4.	Color	VEL/EN/STP/67, Issue No.- 01, Issue date 01/11/2023	Yellowish Brown	--
5.	Water holding capacity	VEL/EN/STP/86, Issue No.- 01, Issue date 01/11/2023	40.22	%
6.	Bulk density	VEL/EN/STP/59, Issue No.- 01, Issue date 01/11/2023	5.48	gm/cc
7.	Chloride (as Cl)	VEL/EN/STP/69, Issue No.- 01, Issue date 01/11/2023	75.10	%
8.	Calcium (as Ca)	VEL/EN/STP/72, Issue No.- 01, Issue date 01/11/2023	52.46	%
9.	Sodium (as Na)	VEL/EN/STP/71, Issue No.- 01, Issue date 01/11/2023	40.8	%
10.	Potassium (as K)	VEL/EN/STP/61, Issue No.- 01, Issue date 01/11/2023	158.36	%
11.	Iron as (Fe )	VEL/HW/STP/03, Issue No.- 01, Issue date 01/11/2023	5.12	mg/kg
12.	Organic Matter	IS 2720 (P-22)	0.64	%
13.	Magnesium (as Mg)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	40.28	%
14.	A available Nitrogen (as N)	IS:14684	256.36	kg./hec.
15.	A available Phosphorus	VEL/HW/STP/86, Issue No.- 01, Issue date 01/11/2023	25.44	kg./hec.
16.	Zinc (as Zn)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	28.24	%
17.	Organic Carbon	IS 2720 (P-22)	0.70	%
18.	Lead (as Pb)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	6.22	mg/kg
19.	Cadmium (as Cd)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.68	mg/kg
20.	Chromium (as Cr)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.72	mg/kg
21.	Copper (as Cu )	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	5.20	mg/kg
22.	Molybdenum (as Mo)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	0.81	mg/kg
23.	Nickel (as Ni)	VEL/HW/STP/ 03, Issue No.- 01, Issue date 01/11/2023	BLQ (LOQ 1.0)	mg/kg
24.	Moisture Content	VEL/EN/STP/ 108, Issue No.- 01, Issue date 01/11/2023	28.30	%

Note- STP- Standard Testing Procedure.

(Reviewed By)

Amresh Kumar

Technical Manager

(Authorized Signatory)

Prakash Singh

Authorized Signatory

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## Test Report

Sample Number:	VEL/GW/01	Report No.:	VEL/W/2509300017
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description:	Ground Water Sample	Sampling Date:	25/09/2025
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 <sup>rd</sup> 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)	7.24	--	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 <sub>3</sub> )	IS 3025 (P-21)	216.36	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	70.58	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	233.57	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	62.40	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	13.54	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	512.87	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	17.36	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.72	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	7.21	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.60	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation



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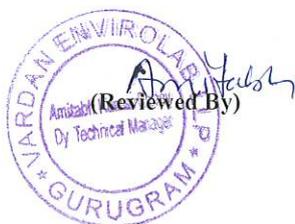


## Test Report

Sample No.: VEL/GW/01			Report No.: VEL/W/2509300017			
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/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.42	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	810	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	24.6	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	3.2	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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# Vardan Envirolab LLP

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/2509300018  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Period of Analysis: 30/09/2025 to 06/10/2025  
Receipt Date: 30/09/2025  
Sampling Date: 25/09/2025  
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 23<sup>rd</sup> 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)	7.40	--	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 <sub>3</sub> )	IS 3025 (P-21)	225.14	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	60.22	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	210.84	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	40.62	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	18.66	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	462.12	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	32.20	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.65	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	4.33	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.40	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	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/2509300018			
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/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	0.32	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	736	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	28.32	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.01	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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# Vardan EnviroLab LLP

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/2509300019
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description:	Ground Water Sample	Sampling Date:	25/09/2025
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 <sup>rd</sup> 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)	7.32	--	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 <sub>3</sub> )	IS 3025 (P-21)	224.61	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	60.48	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	228.60	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	83.00	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	20.28	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	520.44	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	40.84	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.62	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	4.39	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.43	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation

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*[Signature]*  
Singh  
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## Test Report

Sample No.: VEL/GW/03

Report No.: VEL/W/2509300019

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/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.70	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	845	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	35.87	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/03	Report No.:	VEL/W/2509300020
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description:	Ground Water Sample	Sampling Date:	26/09/2025
Sample Location:	Baghi Bandar	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 <sup>rd</sup> 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)	7.56	--	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 <sub>3</sub> )	IS 3025 (P-21)	260.24	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	85.12	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	245.39	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	80.74	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	16.22	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	512.00	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	60.48	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.80	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	8.52	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.66	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	No Relaxation

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(Authorized Signatory)

*[Signature]*  
06/10/2025  
Singh  
Authorized Signatory

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## Test Report

Sample No.: VEL/GW/04			Report No.: VEL/W/2509300020			
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/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	0.60	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	872	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	21.4	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.1	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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# Vardan EnviroLab LLP

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/2509300021
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
Sample Description:	Ground Water Sample	Party Reference No.:	NIL
Sample Location:	Maanwala	Reporting Date:	06/10/2025
Sample Collected By:	Vardan EnviroLab Representative	Period of Analysis:	30/09/2025 to 06/10/2025
Parameter Required:	As per Work Order	Receipt Date:	30/09/2025
Sampling & Analysis Protocol:	APHA 23 <sup>rd</sup> Edition 2017 & IS:3025	Sampling Date:	26/09/2025
		Sample Quantity:	2.0 Ltr. + 250 ml
		Sampling Type:	Grab
		Preservation:	Refrigerated

## 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)	7.38	--	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 <sub>3</sub> )	IS 3025 (P-21)	240.45	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	60.28	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	150.36	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	70.48	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	22.32	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	560.00	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	52.10	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.90	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	3.26	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.50	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	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/2509300021			
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/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	0.48	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	752	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	38.2	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.0	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).



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## Test Report

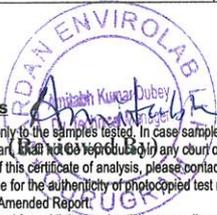
Sample Number:	VEL/GW/06	Report No.:	VEL/W/2509300022
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil- Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-03
		Party Reference No.:	NIL
		Reporting Date:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description:	Ground Water Sample	Sampling Date:	26/09/2025
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 <sup>rd</sup> 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)	7.45	--	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 <sub>3</sub> )	IS 3025 (P-21)	142.48	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	38.12	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	160.28	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	45.54	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	14.22	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	350.33	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	19.21	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.66	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	6.18	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.44	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	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/2509300022			
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/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	0.46	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.0005)	mg/L	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	536	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	15.8	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.2	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	Report No.:	VEL/W/2509300023
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description:	Ground Water Sample	Sampling Date:	26/09/2025
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 <sup>rd</sup> 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)	7.32	--	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 <sub>3</sub> )	IS 3025 (P-21)	234.20	mg/L	200	600
7.	Calcium (as Ca)	IS 3025 (P-40)	40.74	mg/L	75	200
8.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	186.21	mg/L	200	600
9.	Chloride (as Cl)	IS 3025 (P-32)	62.31	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	32.22	mg/L	30	100
12.	Total Dissolved Solids	IS 3025 (P-16)	416.00	mg/L	500	2000
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	18.34	mg/L	200	400
14.	Fluoride (as F)	APHA 4500 F D	0.60	mg/L	1.0	1.5
15.	Nitrate (as NO <sub>3</sub> )	IS 3025 (Part -34)	7.00	mg/L	45	No Relaxation
16.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.46	mg/L	1.0	No Relaxation
17.	Aluminium (as Al)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L	0.03	0.2
18.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.01)	mg/L	0.5	2.4
19.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	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/2509300023			
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/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	0.74	mg/L	5.0	15.0
24.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.05	1.5
25.	Manganese (as Mn)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.01)	mg/L	0.1	0.3
26.	Cadmium (as Cd)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.003	No Relaxation
27.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
28.	Selenium (as Se)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.001)	mg/L	0.01	No Relaxation
29.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.002)	mg/L	0.01	No Relaxation
30.	Mercury (as Hg)	VEL/W/STP/ 03, Issue No.- 01, Issue date- 01/11/2023	BLQ(LOQ 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	IS 3025 (P-14)	628	µS/cm	--	--
32.	Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	BLQ(LOQ 0.1)	mg/L	0.5	No Relaxation
33.	Sodium	IS 3025 (P-45)	24.6	mg/L	--	--
34.	Potassium	IS 3025 (P-45)	2.0	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).



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# Vardan EnviroLab LLP

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



## 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/W/2509300024  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Period of Analysis: 30/09/2025 to 06/10/2025  
Receipt Date: 30/09/2025  
Sampling Date: 26/09/2025  
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 23<sup>rd</sup> Edition 2017 & IS:3025

### TEST RESULTS

S. No.	Parameter	Test Method	Results	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.54	--
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)	56.20	mg/L
7.	Conductivity	IS 3025 (P-14)	5630	µS/cm
8.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	13.52	mg/L
9.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.62	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	354.11	mg/L
11.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L
12.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.84	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	20.12	mg/L
14.	Fluoride (as F)	APHA 4500 F D	0.56	mg/L
15.	BOD (3 Days at 27°C)	IS 3025 (P-44)	6.84	mg/L
16.	COD	IS 3025 (P-58)	29.46	mg/L
17.	Free Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	8.22	mg/L
18.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L
19.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	128.00	mg/L
20.	Calcium (as Ca)	IS 3025 (P-40)	42.36	mg/L
21.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	132.24	mg/L
22.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	6.70	mg/L
23.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	7.95	mg/L
24.	Sodium (as Na)	IS 3025 (P-45)	44.21	mg/L
25.	Potassium (as K)	IS 3025 (P-45)	9.3	mg/L
26.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	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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(Authorized Signatory)  
Singh

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# Vardan Envirolab LLP

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



## Test Report

Sample Number:	VEL/SW/02	Report No.:	VEL/W/2509300025
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:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025
Sample Description:	Surface Water Sample	Sampling Date:	26/09/2025
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 <sup>rd</sup> Edition 2017 & IS:3025		

### TEST RESULTS

S. No.	Parameter	Test Method	Results	Unit
1.	pH (at 25°C)	IS 3025 (P-11)	7.44	--
2.	Colour	IS 3025 (P-4)	BLQ(LOQ 1.0)	Hazen
3.	Turbidity	IS 3025 (P-10)	19.2	NTU
4.	Odour	IS 3025 (P-5)	Agreeable	--
5.	Taste	IS 3025 (P-8)	NR	--
6.	Chloride (as Cl)	IS 3025 (P-32)	43.45	mg/L
7.	Conductivity	IS 3025 (P-14)	848	µS/cm
8.	Nitrate (as NO <sub>3</sub> )	IS 3025 (P-34)	5.78	mg/L
9.	Iron (as Fe)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.70	mg/L
10.	Total Dissolved Solids	IS 3025 (P-16)	415.00	mg/L
11.	Lead (as Pb)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L
12.	Boron	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	0.76	mg/L
13.	Sulphate (as SO <sub>4</sub> )	IS 3025 (P-24)	24.48	mg/L
14.	Fluoride (as F)	APHA 4500 F D	0.69	mg/L
15.	BOD (3 Days at 27°C)	IS 3025 (P-44)	4.28	mg/L
16.	COD	IS 3025 (P-58)	15.66	mg/L
17.	Free Ammonia (as NH <sub>3</sub> )	IS 3025 (P-34)	7.08	mg/L
18.	Arsenic (as As)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	BLQ(LOQ 0.002)	mg/L
19.	Total Hardness (as CaCO <sub>3</sub> )	IS 3025 (P-21)	130.27	mg/L
20.	Calcium (as Ca)	IS 3025 (P-40)	58.32	mg/L
21.	Alkalinity (as CaCO <sub>3</sub> )	IS 3025 (P-23)	142.74	mg/L
22.	Magnesium (as Mg)	APHA 3500 Mg B Calculation Method	4.22	mg/L
23.	Copper (as Cu)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	5.95	mg/L
24.	Sodium (as Na)	IS 3025 (P-45)	40.12	mg/L
25.	Potassium (as K)	IS 3025 (P-45)	5.0	mg/L
26.	Total Chromium (as Cr)	VEL/W/STP/ 03, Issue No.- 01, Issue date-01/11/2023	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/N/01 Report No.: VEL/AP/2509300031  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-03  
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Near Project Site  
Latitude: 30°05'46.23" N  
Longitude: 75°01'03.48" 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 : 25/09/2025 to 26/09/2025  
Time of Monitoring : 09:30 AM to 09:30 AM  
Ambient Temperature (°C) : Min. 25.0°C, Max. 36.0°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 <sub>max</sub>	IS 9989	70.8	65.2	dB(A)
2.	L <sub>min</sub>	IS 9989	51.4	44.2	dB(A)
3.	L <sub>eq</sub>	IS 9989	62.30	50.54	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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## Test Report

Sample Number: VEL/N/02 Report No.: VEL/AP/2506170032  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-03  
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Nasibpura  
Latitude: 30°07'92.05" N  
Longitude: 75°00'18.31" 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 : 25/09/2025 to 26/09/2025  
Time of Monitoring : 09:40 AM to 09:40 AM  
Ambient Temperature (°C) : Min. 25.0°C, Max. 36.0°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	52.5	42.5	dB(A)
2.	$L_{min}$	IS 9989	44.2	35.1	dB(A)
3.	$L_{cq}$	IS 9989	49.24	40.32	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/2509300033  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Kot Shamir  
Latitude: 30°10'19.53" N  
Longitude: 75°00'70.45" 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 : 25/09/2025 to 26/09/2025  
Time of Monitoring : 09:50 AM to 09:50 AM  
Ambient Temperature (°C) : Min. 25.0°C, Max. 36.0°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 <sub>max</sub>	IS 9989	50.7	41.8	dB(A)
2.	L <sub>min</sub>	IS 9989	41.5	34.3	dB(A)
3.	L <sub>eq</sub>	IS 9989	45.58	38.46	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 Report No.: VEL/AP/2509300034  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-03  
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Kot Bhara  
Latitude : 30°09'81.73" N  
Longitude : 75°06'45.46" 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 : 26/09/2025 to 27/09/2025  
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 <sub>max</sub>	IS 9989	52.5	40.8	dB(A)
2.	L <sub>min</sub>	IS 9989	38.4	30.5	dB(A)
3.	L <sub>eq</sub>	IS 9989	48.32	36.52	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 Report No.: VEL/AP/2509300035  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-03  
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Kot Fatta  
Latitude: 30°11'58.08" N  
Longitude: 75°08'17.61" 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 : 26/09/2025 to 27/09/2025  
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 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 <sub>max</sub>	IS 9989	50.4	41.5	dB(A)
2.	L <sub>min</sub>	IS 9989	36.8	31.6	dB(A)
3.	L <sub>eq</sub>	IS 9989	48.20	37.52	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/2509300036  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Chathewala  
Latitude: 30°06'95.18" N  
Longitude: 75°06'79.83" 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 : 25/09/2025 to 26/09/2025  
Time of Monitoring : 10:55 AM to 10:55 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 <sub>max</sub>	IS 9989	50.5	40.6	dB(A)
2.	L <sub>min</sub>	IS 9989	35.2	30.4	dB(A)
3.	L <sub>eq</sub>	IS 9989	45.10	35.45	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/11 Report No.: VEL/AP/2509300037  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-03  
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Manwala  
Latitude: 30°03'74.66" N  
Longitude: 75°95'01.84" 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 : 26/09/2025 to 27/09/2025  
Time of Monitoring : 09:50 AM to 09:50 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 <sub>max</sub>	IS 9989	52.6	40.8	dB(A)
2.	L <sub>min</sub>	IS 9989	33.8	28.4	dB(A)
3.	L <sub>eq</sub>	IS 9989	44.22	36.51	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/2509300038  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-03  
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Baghi Bandar  
Latitude: 30°02'85.59" N  
Longitude: 75°06'42.03" 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 : 27/09/2025 to 28/09/2025  
Time of Monitoring : 10:00 AM to 10:00 AM  
Ambient Temperature (°C) : Min. 25.0°C, Max. 36.0°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 <sub>max</sub>	IS 9989	52.5	40.8	dB(A)
2.	L <sub>min</sub>	IS 9989	35.2	31.2	dB(A)
3.	L <sub>eq</sub>	IS 9989	45.55	35.36	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/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/2509300039  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Jiwan Singh Wala  
Latitude: 30°05'74.01" N  
Longitude: 75°03'46.48" 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 : 26/09/2025 to 27/09/2025  
Time of Monitoring : 10:15 AM to 10:15 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 <sub>max</sub>	IS 9989	51.5	42.6	dB(A)
2.	L <sub>min</sub>	IS 9989	36.3	31.5	dB(A)
3.	L <sub>eq</sub>	IS 9989	45.52	35.33	dB(A)
4.	CPCB Limits in dB(A) <sup>*</sup> 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-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AP/2509300040  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Mahi Nangal  
Latitude: 30°02'11.88" N  
Longitude: 75°01'56.66" 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 : 27/09/2025 to 28/09/2025  
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 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 <sub>max</sub>	IS 9989	48.6	37.8	dB(A)
2.	L <sub>min</sub>	IS 9989	36.5	29.3	dB(A)
3.	L <sub>eq</sub>	IS 9989	48.85	38.24	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 Report No.: VEL/AP/2509300041  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-03  
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Leleana  
Latitude: 30°01'029.99" N  
Longitude: 74°97'47.58" 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 : 27/09/2025 to 28/09/2025  
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 <sub>max</sub>	IS 9989	53.0	41.9	dB(A)
2.	L <sub>min</sub>	IS 9989	43.5	34.4	dB(A)
3.	L <sub>eq</sub>	IS 9989	48.52	40.85	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/AP/2509300042  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT NOISE LEVEL MONITORING

### General Information:-

Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Gehri Bhagi  
Latitude: 30°11'10.71" N  
Longitude: 74°96'12.01" 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 : 27/09/2025 to 28/09/2025  
Time of Monitoring : 11:30 AM to 11:30 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 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 <sub>max</sub>	IS 9989	51.7	42.6	dB(A)
2.	L <sub>min</sub>	IS 9989	38.3	32.4	dB(A)
3.	L <sub>eq</sub>	IS 9989	42.36	35.25	dB(A)
4.	CPCB Limits in dB(A)* Leq (Residential Area)	-	55.00	45.00	dB(A)

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## Test Report

Sample Number:	VEL/HPCL/A/01	Report No.:	VEL/AP/2509300019
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°05'46.28" N	Party Reference No.:	NIL
Longitude:	75°01'03.05" E	Reporting Date:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025

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/05
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 25/09/2025 to 26/09/2025
Time of Monitoring	: 10:00 AM to 10:00 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 36.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	31.14	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	56.47	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	15.10	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	8.84	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.70	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	19.25	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	15.64	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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/02  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab  
Latitude: 30°07'91.88" N  
Longitude: 75°00'18.00" E

Report No.: VEL/AP/2509300020  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Period of Analysis: 30/09/2025 to 06/10/2025  
Receipt Date: 30/09/2025

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/06  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 25/09/2025 to 26/09/2025  
Time of Monitoring : 09:30 AM to 09:30 AM  
Ambient Temperature (°C) : Min. 25.0°C, Max. 36.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	34.55	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	52.47	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	14.52	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	9.32	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.60	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	14.74	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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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# Vardan EnviroLab LLP

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



## Test Report

Sample Number:	VEL/HPCL/A/03	Report No.:	VEL/AP/2509300021
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°10'19.35" N	Party Reference No.:	NIL
Longitude:	75°00'70.46" E	Reporting Date:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025

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	: Clear Sky
Date of Monitoring	: 25/09/2025 to 26/09/2025
Time of Monitoring	: 10:15 AM to 10:15 AM
Ambient Temperature (°C)	: Min. 25.0°C, Max. 36.0°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 <sup>®</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	33.28	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	50.65	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	20.11	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	9.00	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.84	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	22.62	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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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Customer Care: 8010127843, Ph: 0124-4343750, 9810355569, 9953147268 | E-mail: environment@vardan.co.in, bd@vardan.co.in



# Vardan EnviroLab LLP

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



## 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°06'95.18" N  
Longitude: 75°06'79.83" E  
Report No.: VEL/AP/2509300022  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Period of Analysis: 30/09/2025 to 06/10/2025  
Receipt Date: 30/09/2025

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/07  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 25/09/2025 to 26/09/2025  
Time of Monitoring : 10:25 AM to 10:25 AM  
Ambient Temperature (°C) : Min. 25.0°C, Max. 36.0°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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	32.21	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	53.30	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	18.25	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	9.25	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.74	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	16.05	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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/11  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab  
Latitude: 30°98'18.6" N  
Longitude: 75°06'45.56" E

Report No.: VEL/AP/2509300023  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Period of Analysis: 30/09/2025 to 06/10/2025  
Receipt Date: 30/09/2025

Sample Description: AMBIENT AIR QUALITY MONITORING

### General Information:-

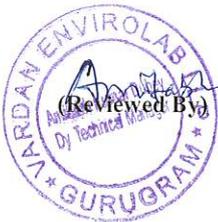
Sample Collected by : Vardan EnviroLab Representative  
Sampling Location : Kot Bhara  
Instrument Used : RDS & FPS Sampler with all Accessories  
Instrument Code : VEL/RDS/FPS/07  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 26/09/2025 to 27/09/2025  
Time of Monitoring : 10:55 AM to 10:55 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 <sup>®</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	34.84	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	48.24	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	16.20	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	9.56	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.65	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	13.25	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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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# Vardan Envirolab LLP

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



## Test Report

Sample Number:	VEL/HPCL/A/08	Report No.:	VEL/AP/2509300024
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°11'58.80" N	Party Reference No.:	NIL
Longitude:	75°06'45.56" E	Reporting Date:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025

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/05
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 26/09/2025 to 27/09/2025
Time of Monitoring	: 10:20 AM to 10:20 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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	32.34	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	51.32	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	14.10	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	08.54	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.64	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	14.10	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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/04  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab  
Latitude: 30°05'74.39" N  
Longitude: 75°03'46.83" E  
Report No.: VEL/AP/2509300025  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Period of Analysis: 30/09/2025 to 06/10/2025  
Receipt Date: 30/09/2025

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/06  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 26/09/2025 to 27/09/2025  
Time of Monitoring : 09:45 AM to 09:45 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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	33.24	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	50.50	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	15.22	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	08.54	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.70	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ-20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ-0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ-0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ-0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	15.22	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ-0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ-5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ-0.05)	µg/m <sup>3</sup>	--
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  
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab  
Latitude: 30°03'74.66" N  
Longitude: 74°95'01.84" E

Report No.: VEL/AP/2509300026  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Period of Analysis: 30/09/2025 to 06/10/2025  
Receipt Date: 30/09/2025

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/05  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 26/09/2025 to 27/09/2025  
Time of Monitoring : 10:40 AM to 10:40 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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	32.25	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	50.85	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	16.20	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	8.25	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.42	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ 20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ 0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	18.10	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ 0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m <sup>3</sup>	--
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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# Vardan EnviroLab LLP

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



## 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°02'58.78" N  
Longitude: 75°06'42.66" E

Report No.: VEL/AP/2509300027  
Format No.: 7.8 F-03  
Party Reference No.: NIL  
Reporting Date: 06/10/2025  
Period of Analysis: 30/09/2025 to 06/10/2025  
Receipt Date: 30/09/2025

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/07  
Instrument Calibration Status : Calibrated  
Meteorological condition during monitoring : Clear Sky  
Date of Monitoring : 27/09/2025 to 28/09/2025  
Time of Monitoring : 10:35 AM to 10:35 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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	30.25	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	52.15	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	13.58	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	8.40	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.65	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ 20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ 0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	12.52	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ 0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m <sup>3</sup>	--
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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# Vardan Envirolab LLP

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



## Test Report

Sample Number:	VEL/HPCL/A/05	Report No.:	VEL/AP/2509300028
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:	29°99'07.18" N	Party Reference No.:	NIL
Longitude:	75°01'09.02" E	Reporting Date:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025

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	: 27/09/2025 to 28/09/2025
Time of Monitoring	: 11:10 AM to 11:10 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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	32.02	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	51.98	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	14.84	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	9.12	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.70	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	19.44	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ 0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	15.25	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ 0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m <sup>3</sup>	--
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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# Vardan Envirolab LLP

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



## Test Report

Sample Number:	VEL/HPCL/A/06	Report No.:	VEL/AP/2509300029
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°02'11.58" N	Party Reference No.:	NIL
Longitude:	75°01'56.76" E	Reporting Date:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025

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/06
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 27/09/2025 to 28/09/2025
Time of Monitoring	: 10:50 AM to 10:50 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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	33.05	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	52.22	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	24.58	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	9.10	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.60	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ 20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ 0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	14.54	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ 0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m <sup>3</sup>	--
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/12	Report No.:	VEL/AP/25009300030
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°11'10.85" N	Party Reference No.:	NIL
Longitude:	74°96'12.48" E	Reporting Date:	06/10/2025
		Period of Analysis:	30/09/2025 to 06/10/2025
		Receipt Date:	30/09/2025

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/05
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 27/09/202 to 28/09/2025
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 <sup>@</sup> Limit
1.	Particulate Matter (as PM <sub>2.5</sub> )	IS 5182 (P-24)	34.40	µg/m <sup>3</sup>	60
2.	Particulate Matter (as PM <sub>10</sub> )	IS 5182 (P-23)	48.21	µg/m <sup>3</sup>	100
3.	Nitrogen Dioxide (as NO <sub>2</sub> )	IS 5182 (P-6)	14.22	µg/m <sup>3</sup>	80
4.	Sulphur Dioxide (as SO <sub>2</sub> )	IS 5182 (P-2)	9.54	µg/m <sup>3</sup>	80
5.	Carbon Monoxide (as CO)	IS 5182 (P-10), NDIR Method	0.60	mg/m <sup>3</sup>	4
6.	Ammonia (as NH <sub>3</sub> )	IS 5182 (P-25)	BLQ(LOQ 20.0)	µg/m <sup>3</sup>	400
7.	Lead (as Pb)	IS 5182 (P-22)	BLQ(LOQ 0.1)	µg/m <sup>3</sup>	1
8.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	IS 5182 (P-12)	BLQ(LOQ 0.5)	µg/m <sup>3</sup>	05
9.	Benzo(a)pyrene	VEL/EN/STP/157, Issue No.-01, 01/11/2023	BLQ(LOQ 0.5)	ng/m <sup>3</sup>	01
10.	Ozone (as O <sub>3</sub> )	IS 5182 (P-9)	14.10	µg/m <sup>3</sup>	180
11.	Arsenic (as As)	VEL/EN/STP/110, Issue No.-01, 01/11/2023	BLQ(LOQ 0.1)	ng/m <sup>3</sup>	6
12.	Nickel (as Ni)	IS 5182 (P-26)	BLQ(LOQ 5.0)	ng/m <sup>3</sup>	20
13.	Volatile Organic Carbon (VOCs)	IS 5182 (P-11)	BLQ(LOQ 0.05)	µg/m <sup>3</sup>	--
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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