



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- 400 020

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

To,
The Deputy Director / Scientist 'C'
Ministry of Environment, Forests & Climate Change,
Northern Regional Office
Bays No. 24-25, Sector-31A,
Dakshin Marg, Chandigarh-160030
(Email: chdmoefenv@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 June 2022.

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 June 2022. 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 - AKHLAQUE AHMAD.
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Copy to:

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

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PURPOSE OF THE REPORT

1.0 Introduction

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

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

1.2 Purpose of the Report

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

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

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

The Environmental assessment has been carried out to verify:

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

1.3 Methodology for Preparation of Report is as follows:

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

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

1.4 Generic Structure of Report:

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

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ADHERENCE TO SPECIFIC AND GENERAL CONDITIONS

PART A- SPECIFIC CONDITION

S. No.	Conditions of Environmental Clearance	Status of Compliance
[A]	The final product (Ethanol) shall be used exclusively for fuel blending only.	<i>Noted.</i>
[B]	Consent to Establish/Operate for the project shall be obtained from the State Pollution Control Board as required under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974.	<i>Consent to Establish (CTE) was obtained from PPCB valid till 31.12.2021 as per the amended EC.</i>
[C]	As already committed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged outside the premises	<i>As proposed zero discharge of waste water will be met during operational phase.</i>
[D]	Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid Waste Management Rules, 2016 shall be obtained and the provisions contained in the Rules shall be strictly adhered to.	<i>Authorization required for hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid waste Management Rules, 2016 will be obtained as per the requirement.</i>
[E]	To control source and the fugitive emissions, suitable pollution control devices shall be installed to meet the prescribed norms and/or the NAAQS. The gaseous emissions shall be dispersed through stack of adequate height as per CPCB/SPCB guidelines	<i>Measures will be taken to control fugitive emission, pollution control devices will be installed as per the requirement. Stack of adequate height as per the guidelines will be installed for the gaseous emission dispersion.</i>
[F]	Total fresh water requirement shall not exceed 2280 cum/day, proposed to be met from canal supply.	<i>Prescribed water requirement will not be exceeded.</i>
[G]	Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through a separate conveyance system.	<i>We will ensure that process water is not mixed with storm water.</i>
[H]	The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 as amended time to time. All transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.	<i>Noted.</i>

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[I]	<p>The company shall undertake waste minimization measures as below:-</p> <ol style="list-style-type: none"> i. Metering and control of quantities of active ingredients to minimize waste. ii. Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. iii. Use of automated filling to minimize spillage. iv. Use of Close Feed system into batch reactors. v. Venting equipment through vapour recovery system vi. Use of high pressure hoses for equipment clearing to reduce wastewater generation. 	<p><i>We will comply with the condition as per the requirement to minimize waste generation in the plant-</i></p> <ol style="list-style-type: none"> <i>i. Metering and control of quantities of active ingredients will be done regularly.</i> <i>ii. By products will be reused as raw material as much as possible according to requirement.</i> <i>iii. Automated filling will be carried out to minimize spillage</i> <i>iv. Close feed system will be used into batch reactors.</i> <i>v. Water scrubber, vent bottle & flame arrestors will be provided as per requirement.</i> <i>vi. High pressure hoses for equipment clearing will be used to reduce waste water generation.</i>
[J]	<p>The green belt of 5-10 m width shall be developed in more than 33% of the total project area, mainly along the plant periphery, in downward wind direction, and along road sides etc. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.</p>	<p><i>We have submitted Green belt development plan to the MoEF&CC in the EIA report and same will be developed as per the EC requirement.</i></p>
[K]	<p>All the commitments made regarding issues raised during the public hearing/ consultation meeting shall be satisfactorily implemented.</p>	<p><i>Noted.</i></p>
[L]	<p>At least 1% of the total project cost shall be allocated for Corporate Environment Responsibility (CER) and the details along with time bound action plan shall be submitted to the Ministry's Regional Office.</p>	<p><i>The project is in initial stage and construction is yet to be commenced. CER details will be submitted to the authority in due course of time. .</i></p>
[M]	<p>For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.</p>	<p><i>Acoustically enclosed DG sets will be installed and Stack height will be kept as per the CPCB guidelines.</i></p>
[N]	<p>The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire fighting system shall be as per the norms.</p>	<p><i>Fire Fighting system will be installed as per the condition.</i></p>
[O]	<p>Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.</p>	<p><i>Regular Health Check-up arrangement will be provided for the workers A qualified doctor will be appointed.</i></p>
[P]	<p>There shall be adequate space inside the plant premises earmarked for parking of vehicles for raw materials and finished products, and no parking to be allowed outside on public places.</p>	<p><i>No parking will be done outside on public places. Plan in this regard has already been submitted to authority.</i></p>
[Q]	<p>Storage of raw materials shall be either stored in silos or in covered areas to prevent dust pollution and other fugitive emissions.</p>	<p><i>During operation phase, raw materials will be stored properly in covered areas</i></p>
[R]	<p>Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow</p>	<p><i>We will comply.</i></p>

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

11.1 Other Generic Conditions:-

S. No.	Conditions of Environmental Clearance	Status of Compliance
i.	The project authorities must strictly adhere to the stipulations made by the state Pollution Control Board (SPCB), State Government and/ or any other statutory authority.	<i>We ensure to follow the guidelines strictly.</i>
ii.	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	<i>Noted.</i>
iii.	The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated	<i>Noted and same will be complied.</i>
iv.	The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R No. 826(E) dated 16 th November, 2009 Shall be Complied with.	<i>Noted.</i>
v.	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	<i>We will ensure to keep the noise levels within the standards.</i>
vi.	The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial operations within the plant.	<i>Noted.</i>
vii.	Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.	<i>Regular training of health & safety will be provided to the employees for chemical handling.</i>

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viii.	The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, risk mitigation measures and public hearing shall be implemented.	<i>Noted and will be complied as per the requirement.</i>
ix.	The company shall undertake all measures for improving socio-economic conditions of the surrounding area. CSR activities shall be undertaken by involving local villagers, administration and other stake holders. Also eco-developmental measures shall be undertaken for overall improvement of the environment.	<i>CSR activities will be undertaken as per the proposed plan.</i>
x.	A separate Environmental Management Cell equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.	<i>Noted.</i>
xi.	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Changes well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/Pollution control measures shall not be diverted for any other purpose.	<i>Separate funds will be kept for the implementation of the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government.</i>
xii.	A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, ZilaParisad/ Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.	<i>Noted.</i>
xiii.	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status reports shall be posted on the website of the company.	<i>Noted. We are complying with the condition.</i>
xiv.	The environmental statement for each financial year ending 31 st March in Form-Vas is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional offices of MoEF&CC by e-mail.	<i>Noted.</i>
xv.	The project proponent shall inform the public that the	<i>Copy of advertisements attached.</i>

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	<p>project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at http://moef.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional office of the Ministry.</p>	
xvi.	<p>The Ministry reserves the right to stipulate additional conditions, if found necessary at subsequent stages and the project proponent shall implement all the said conditions in a time bound manner. The Ministry may revoke or suspend the environmental clearance, if implementation of any of the above conditions is not found satisfactory.</p>	<i>Noted.</i>
xvii.	<p>The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Waste (Management, Handling and Trans boundary 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	
		December 2021	March 2022
1.	AAQ1	Near Project site	Near Project site
2.	AAQ2	Jiwan Singh Wala	Nasib Pura
3.	AAQ3	Maawala	Kot Kashmir
4.	AAQ4	Mahi Nangal	Chathewala
5.	AAQ5	Leleana	Kot Fatta
6.	AAQ6	Baghi Bandar	Baghi Bandar
7.	AAQ7	Nasibpura	Kothbhara
8.	AAQ8	Kothbhara	Jiwan Singh Wala
9.	AAQ9	Kot Kashmir	Gehri Boghi
10.	AAQ10	Gehri Boghi	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 (SO₂)
- Oxides of Nitrogen (NO₂)
- Carbon Monoxide (CO)
- Ammonia (NH₃)
- Lead (Pb)
- Benzene (C₆H₆)
- Benzo(a)pyrene
- Ozone (O₃)

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

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

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

Fine Particulate Sampler instruments have been used for monitoring Particulate Matter 2.5 (PM2.5 i.e. <2.5 microns), and Respirable Dust Sampler was used for sampling Repairable fraction (<10 microns), gaseous pollutants like SO₂, and NO₂. Bladder and Aspirator bags were used for collection Carbon monoxide samples. Gas Chromatography techniques have been used for the estimation of CO.

Table 3.2 Techniques used for Ambient Air Quality Monitoring

S. No.	Parameter	Technique	Technical Protocol
1	Particulate Matter 2.5	Fine Particulate Sampler, Gravimetric Method	#SOP No. VEL/SOP/01, Section No. SP 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 (December-2021)

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

S. No.	Parameter	Test Result				NAAQS*
		AAQ1	AAQ2	AAQ3	AAQ4	
1	Particulate Matter (PM _{2.5}), µg/m ³	54.67	50.25	51.62	47.54	60
2	Particulate Matter (PM ₁₀), µg/m ³	95.74	89.64	92.02	88.73	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	25.86	21.76	23.55	21.45	80
4	Sulphur Dioxide (SO ₂), µg/m ³	9.42	7.83	8.72	9.76	80
5	Carbon Monoxide (CO) mg/m ³	0.79	0.78	0.83	0.80	4
6	Ammonia (NH ₃), µg/m ³	8.97	6.75	9.10	8.92	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m ³)	**BDL (*DL 0.05 µg/m ³)	**BDL (*DL 0.05 µg/m ³)	**BDL (*DL 0.05 µg/m ³)	1
8	Benzene(C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m ³)	**BDL (*DL 0.1 µg/m ³)	**BDL (*DL 0.1 µg/m ³)	**BDL (*DL 0.1 µg/m ³)	05
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m ³)	**BDL (*DL 1.0 ng/m ³)	**BDL (*DL 1.0 ng/m ³)	**BDL (*DL 1.0 ng/m ³)	01
10	Ozone (O ₃),µg/m ³	22.54	19.32	20.51	18.46	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	**BDL (*DL 5.0ng/ m ³)	**BDL (*DL 5.0ng/ m ³)	**BDL (*DL 5.0ng/ m ³)	6
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	**BDL (*DL 5.0ng/ m ³)	**BDL (*DL 5.0ng/ m ³)	**BDL (*DL 5.0ng/ m ³)	20
13	Volatile Organic Carbon (VOCs)	**BDL (*DL 5.0 µg/m ³)	**BDL (*DL 5.0 µg/m ³)	**BDL (*DL 5.0 µg/m ³)	**BDL (*DL 5.0 µg/m ³)	--
14	Hydrocarbon (as Methane)	**BDL(*DL 0.2 ppm(v/v))	**BDL(*DL 0.2 ppm(v/v))	**BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	--

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

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

S. No.	Parameter	Test Result				NAAQS*
		AAQ5	AAQ6	AAQ7	AAQ8	
1	Particulate Matter (PM _{2.5}), µg/m ³	49.27	46.62	48.65	51.23	60
2	Particulate Matter (PM ₁₀), µg/m ³	90.53	87.31	87.16	90.59	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	24.38	18.48	19.85	24.61	80
4	Sulphur Dioxide (SO ₂), µg/m ³	8.86	8.50	9.12	8.26	80
5	Carbon Monoxide (CO) mg/m ³	0.91	0.86	0.74	0.87	4

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6	Ammonia (NH ₃), µg/m ³	8.64	7.95	9.83	7.35	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m ³)	1			
8	Benzene(C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m ³)	05			
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m ³)	01			
10	Ozone (O ₃),µg/m ³	21.97	19.37	21.38	20.48	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	6			
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	20			
13	Volatile Organic Carbon (VOCs)	**BDL (*DL 5.0 µg/m ³)	--			
14	Hydrocarbon (as Methane)	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	--

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

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

S. No.	Parameter	Test Result				NAAQS*
		AAQ9	AAQ10	AAQ11	AAQ12	
1	Particulate Matter (PM _{2.5}) µg/m ³	47.23	49.11	46.98	48.56	60
2	Particulate Matter (PM ₁₀) µg/m ³	88.16	89.75	87.26	87.23	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	17.82	18.06	16.88	19.17	80
4	Sulphur Dioxide (SO ₂), µg/m ³	9.73	8.42	7.29	8.34	80
5	Carbon Monoxide (CO) mg/m ³	0.78	0.73	0.79	0.82	4
6	Ammonia (NH ₃), µg/m ³	9.27	9.75	6.68	7.06	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m ³)	1			
8	Benzene(C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m ³)	05			
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m ³)	01			
10	Ozone (O ₃),µg/m ³	19.74	19.34	17.84	17.89	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	6			
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	20			
13	Volatile Organic	**BDL (*DL 5.0 µg/m ³)	--			
14	Hydrocarbon (as Methane)	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	--

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

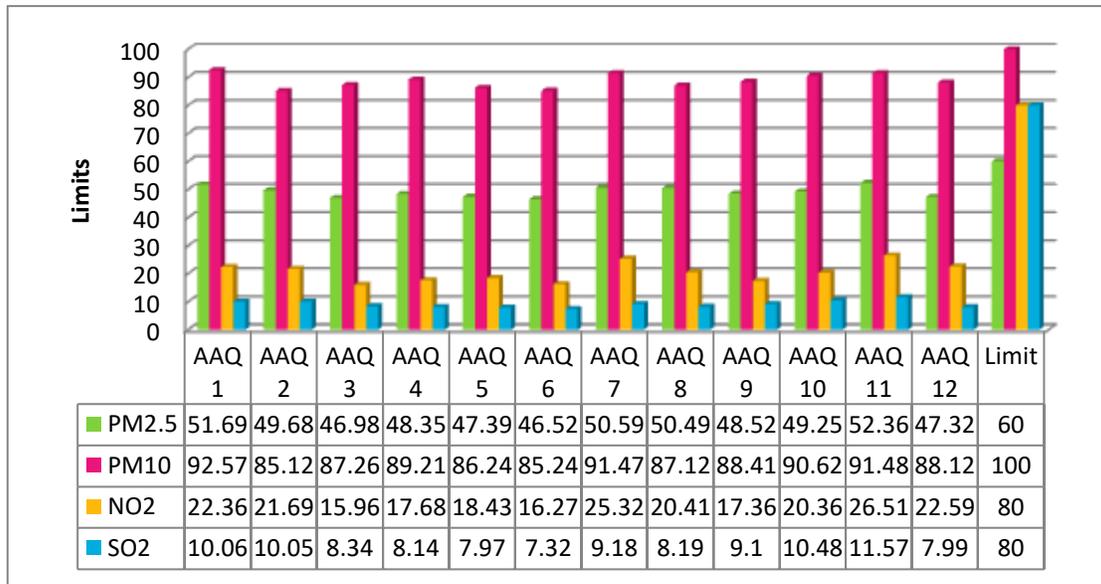


Figure 3.3 Location-wise Variation of Ambient Air Quality (December 2021)

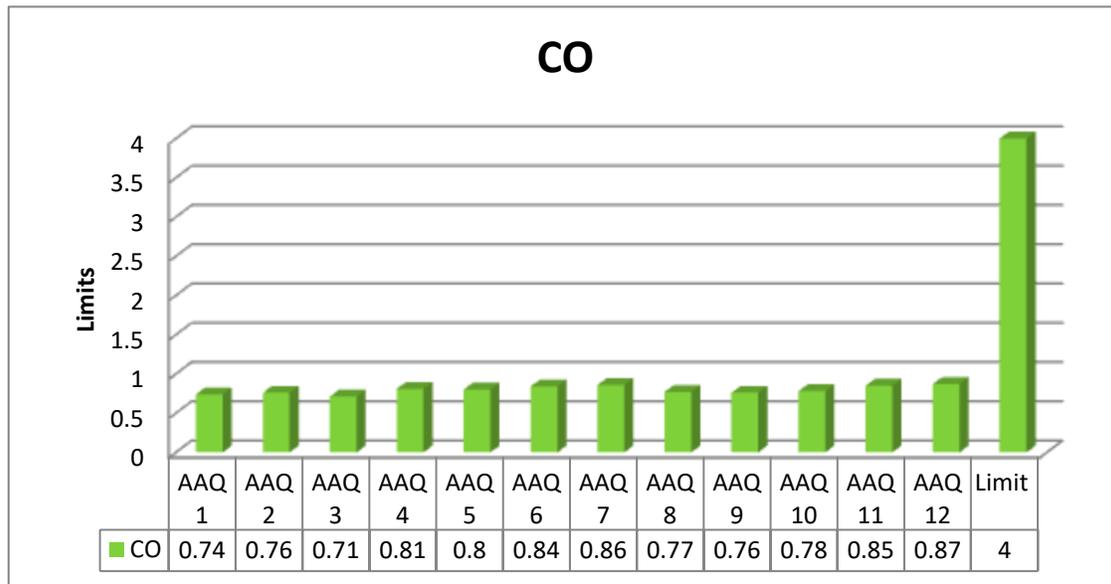


Figure 3.4 Location-wise Variation of CO in Ambient Air Quality (December 2021)

3.1.4 Discussion on Ambient Air Quality in the Study Area

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

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3.1.5 Ambient Air Quality Monitoring Results (March-2022)

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

S. No.	Parameter	Test Result				NAAQS*
		AAQ1	AAQ2	AAQ3	AAQ4	
1	Particulate Matter (PM _{2.5}), µg/m ³	51.69	49.68	46.98	48.35	60
2	Particulate Matter (PM ₁₀), µg/m ³	92.57	85.12	87.26	89.21	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	22.36	21.69	15.96	17.68	80
4	Sulphur Dioxide (SO ₂), µg/m ³	10.06	10.05	8.34	8.14	80
5	Carbon Monoxide (CO) mg/m ³	0.74	0.76	0.71	0.81	4
6	Ammonia (NH ₃), µg/m ³	9.41	8.97	7.69	7.09	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m ³)	1			
8	Benzene(C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m ³)	05			
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m ³)	01			
10	Ozone (O ₃),µg/m ³	21.64	19.85	22.65	20.58	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	6			
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	20			
13	Volatile Organic Carbon	**BDL (*DL 5.0 µg/m ³)	--			
14	Hydrocarbon (as Methane)	**BDL(*DL 0.2 ppm(v/v))	**BDL(*DL 0.2 ppm(v/v))	**BDL(*DL 0.2 ppm(v/v))	**BDL(*DL 0.2 ppm(v/v))	--

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

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

S. No.	Parameter	Test Result				NAAQS*
		AAQ5	AAQ6	AAQ7	AAQ8	
1	Particulate Matter (PM _{2.5}), µg/m ³	47.39	46.52	50.59	50.49	60
2	Particulate Matter (PM ₁₀), µg/m ³	86.24	85.24	91.47	87.12	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	18.43	16.27	25.32	20.41	80
4	Sulphur Dioxide (SO ₂), µg/m ³	7.97	7.32	9.18	8.19	80
5	Carbon Monoxide (CO) mg/m ³	0.80	0.84	0.86	0.77	4
6	Ammonia (NH ₃), µg/m ³	6.98	8.04	8.08	7.06	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m ³)	1			
8	Benzene(C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m ³)	05			
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m ³)	01			
10	Ozone (O ₃),µg/m ³	16.54	18.47	23.10	18.69	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	6			
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	20			
13	Volatile Organic Carbon (VOCs)	**BDL (*DL 5.0 µg/m ³)	--			
14	Hydrocarbon (as Methane)	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	**BDL(*DL 0.2 ppm(v/v))	--

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

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

S. No.	Parameter	Test Result				NAAQS*
		AAQ9	AAQ10	AAQ11	AAQ12	
1	Particulate Matter (PM _{2.5}), µg/m ³	48.52	49.25	52.36	47.32	60
2	Particulate Matter (PM ₁₀), µg/m ³	88.41	90.62	91.48	88.12	100
3	Nitrogen Dioxide (NO ₂), µg/m ³	17.36	20.36	26.51	22.59	80
4	Sulphur Dioxide (SO ₂), µg/m ³	9.10	10.48	11.57	7.99	80
5	Carbon Monoxide (CO) mg/m ³	0.76	0.78	0.85	0.87	4
6	Ammonia (NH ₃), µg/m ³	8.72	9.13	10.06	8.14	400
7	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m ³)	1			
8	Benzene (C ₆ H ₆), µg/m ³	**BDL (*DL 0.1 µg/m ³)	05			
9	Benzo(a)pyrene, ng/m ³	**BDL (*DL 1.0 ng/m ³)	01			
10	Ozone (O ₃), µg/m ³	18.24	17.64	19.87	20.62	180
11	Arsenic As, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	6			
12	Nickel Ni, ng/ m ³	**BDL (*DL 5.0ng/ m ³)	20			
13	Volatile Organic	**BDL (*DL 5.0 µg/m ³)	--			
14	Hydrocarbon (as Methane)	*BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	**BDL(*DL 0.2 ppm(v/v))	*BDL(*DL 0.2 ppm(v/v))	--

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



Figure 3.1 Location-wise Variation of Ambient Air Quality (March 2022)

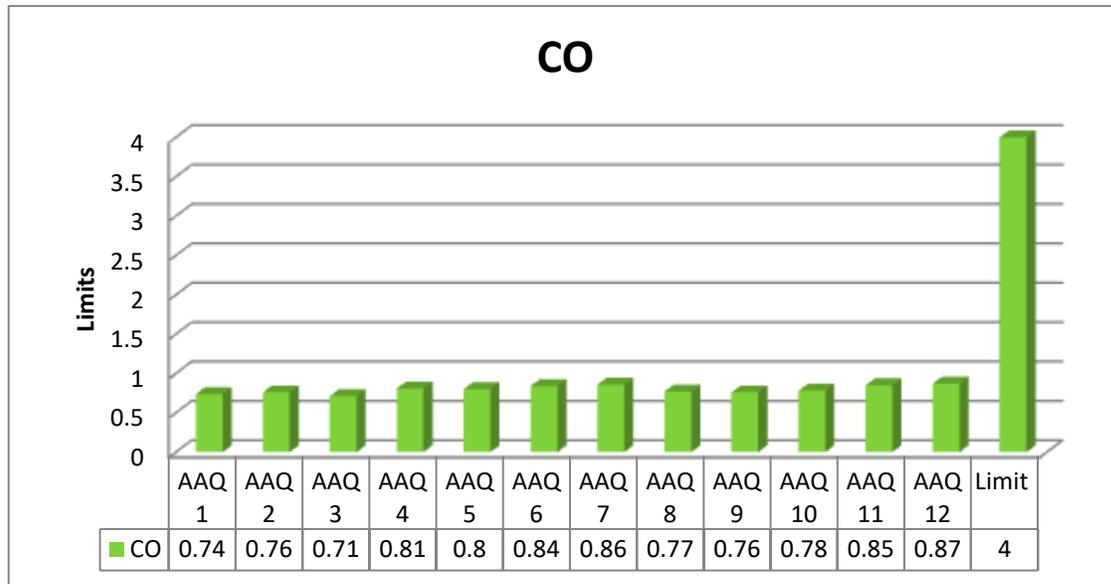


Figure 3.2 Location-wise Variation of CO in Ambient Air Quality (March 2022)

3.1.6 Discussion on Ambient Air Quality in the Study Area

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

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3.2 AMBIENT NOISE MONITORING

3.2.1 Ambient Noise Monitoring Locations

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

Table 3.9 Details of Ambient Noise Monitoring Stations

S. No.	Location Code	Location Name/ Description		Present Land use
		December 2021	March 2022	
1.	N1	Near Project site	Near Project site	Industrial
2.	N2	Jiwan Singh Wala	Nasib Pura	Residential
3.	N3	Maawala	Kot Kashmir	Residential
4.	N4	Mahi Nangal	Chathewala	Residential
5.	N5	Leleana	Kot Fatta	Residential
6.	N6	Baghi Bandar	Baghi Bandar	Residential
7.	N7	Nasibpura	Kothbhara	Residential
8.	N8	Kothbhara	Jiwan Singh Wala	Residential
9.	N9	Kot Kashmir	Gehri Boghi	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 (December-2021)

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

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

Parameter	N1		N2		N3		N4	
	Day Time	Night Time						
Lmax	73.4	64.7	58.4	49.3	60.8	53.5	59.5	53.1
Lmin	52.8	43.5	38.7	32.5	37.1	31.4	35.9	31.6
Leq	63.70	55.80	47.10	40.30	48.70	38.12	46.80	39.60
CPCB Limit (Leq in dB(A) Industrial Limit & Residential Limit)	75.00	70.00	55.00	45.00	55.00	45.00	55.00	45.00

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

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

Parameter	N5		N6		N7		N8	
	Day Time	Night Time						
Lmax	62.5	47.9	55.6	48.6	59.7	46.3	54.1	44.9
Lmin	38.7	30.6	34.9	31.9	37.1	29.4	35.3	28.2
Leq	49.36	38.51	45.15	39.25	46.50	36.40	45.10	37.60
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

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

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

Parameter	N9		N10		N11		N12	
	Day Time	Night Time						
Lmax	56.3	47.2	53.7	44.5	57.3	45.7	54.2	44.9
Lmin	35.7	30.6	34.2	26.9	36.3	27.6	33.8	30.1
Leq	46.20	37.30	43.90	35.10	47.16	36.81	46.37	36.17
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

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

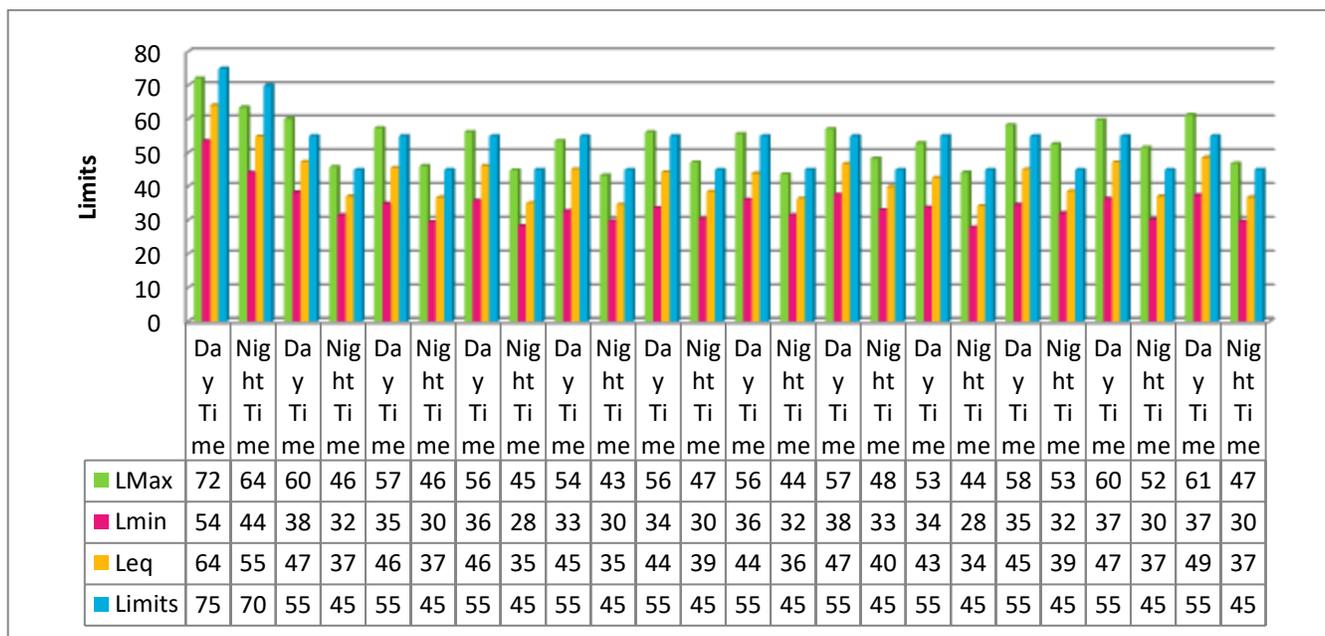


Figure 3.6 Location-wise Variation of Ambient Noise Levels (December 2021)

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3.2.4 Ambient Noise Monitoring Results (March-2022)

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

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

Parameter	N1		N2		N3		N4	
	Day Time	Night Time						
Lmax	72.1	63.5	60.1	45.9	57.4	46.1	56.2	44.8
Lmin	53.6	44.1	38.3	31.5	34.9	29.5	35.9	28.3
Leq	64.10	54.90	47.40	37.10	45.60	36.80	46.20	35.10
CPCB Limit (Leq in dB(A) Industrial Limit & Residential Limit)	75.00	70.00	55.00	45.00	55.00	45.00	55.00	45.00

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

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

Parameter	N5		N6		N7		N8	
	Day Time	Night Time						
Lmax	53.6	43.3	56.2	47.2	55.6	43.7	57.1	48.3
Lmin	32.8	29.8	33.7	30.4	36.2	31.6	37.6	33.1
Leq	45.20	34.70	44.30	38.50	43.90	36.40	46.80	39.90
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

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

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

Parameter	N9		N10		N11		N12	
	Day Time	Night Time						
Lmax	52.9	44.2	58.3	52.6	59.7	51.6	61.3	46.9
Lmin	33.8	27.9	34.6	32.1	36.5	30.2	37.4	29.7
Leq	42.60	34.20	45.10	38.70	47.20	37.10	48.60	36.80
CPCB Limit (Leq in dB(A) Residential Limit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

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

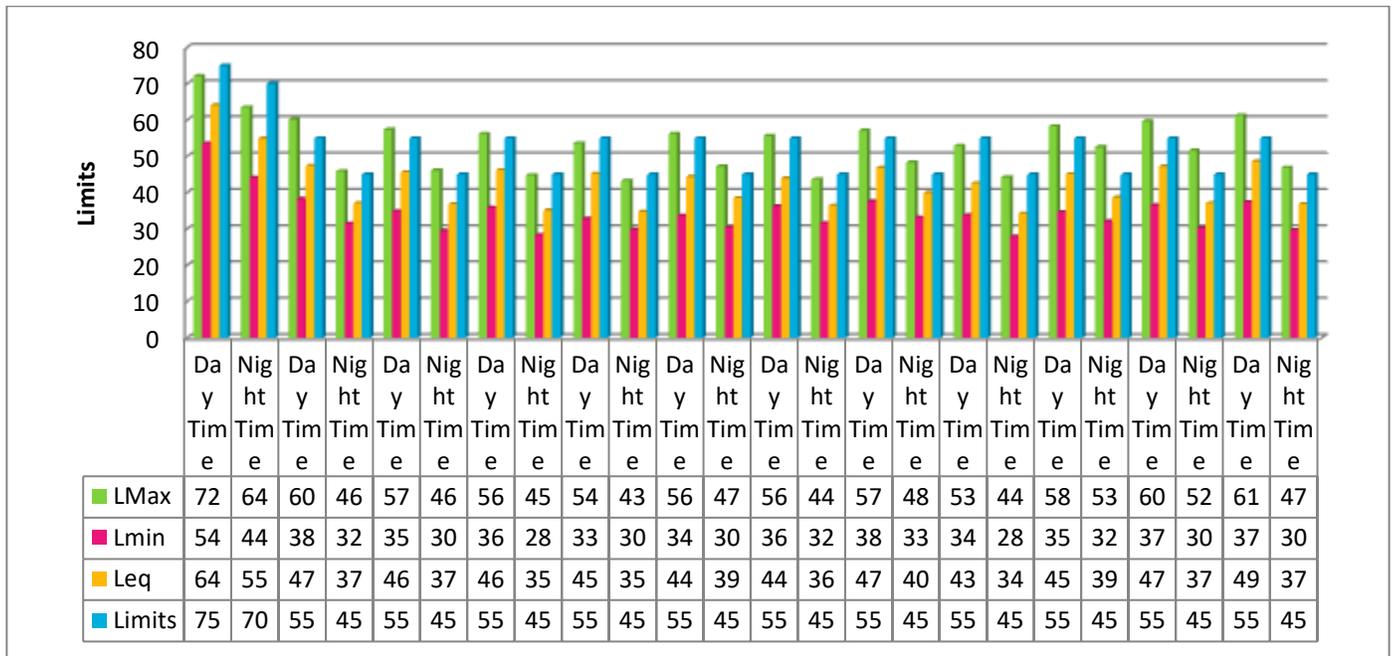


Figure 3.6 Location-wise Variation of Ambient Noise Levels (March 2022)

3.2.4 Discussion on Ambient Noise Levels in the Study Area

Day Time Noise Levels (L_{day}):

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

Night Time Noise Levels (L_{night}):

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

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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	
		December 2021	March 2022
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 **December 2021 & March 2022**. Samples were collected as grab sample and sampling forms are filled in as per the sampling plan. The preservative sample were properly added to preserve as per standard operating procedures (SOP) and stored immediately in ice boxes, which were ensured for appropriate temperatures. Sample for chemical analysis was collected in polyethylene carboys. Sample collected for metal content were acidified to <2 pH with 1 ml HNO₃. A sample for bacteriological analysis was collected in sterilized glass bottles.

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

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

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3.3.3 Ground Water & Surface Water Quality Monitoring Results (December-2021)

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)	APHA ,4500-H ⁺ B Electrometric	7.53	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	285.30	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	81.79	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	236.83	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	53.96	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	19.74	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	663.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	29.76	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F ⁻ D, SPADNS Method	0.79	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) , Chromotropic Method	7.38	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [®]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [®]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.31	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3

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26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation [@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1105	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	23.14	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.6	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/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)	APHA ,4500-H ⁺ B Electrometric	7.43	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	178.40	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	49.37	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	162.89	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	35.48	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation

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11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	13.42	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	416.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	16.84	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.79	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	9.12	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [®]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [®]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No
22.	Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.43	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation [®]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	693	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	19.7	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	4.8	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

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

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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)	APHA ,4500-H ⁺ B Electrometric	7.38	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	219.80	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	81.57	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	201.26	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	64.58	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	3.95	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	546.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	63.47	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.87	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) , Chromotropic Method	8.26	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [®]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [®]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.37	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation

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27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation [@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	910	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	20.5	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	3.9	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

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

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)	APHA ,4500-H ⁺ B Electrometric	7.73	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	197.10	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	56.89	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	186.14	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	45.23	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	13.40	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	489.00	mg/l	500	2000

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13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	32.47	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.63	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	7.28	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [@]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [@]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No
22.	Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.33	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation [@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	815	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	25.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.6	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

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

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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)	APHA ,4500-H ⁺ B Electrometric	7.66	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	252.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	78.61	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	238.56	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	65.49	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	13.57	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	626.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	59.31	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F ⁻ D, SPADNS Method	0.82	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	8.65	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [®]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [®]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.45	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation

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27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation [@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1043	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	23.7	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.2	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

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

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)	APHA ,4500-H ⁺ B Electrometric	7.35	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	204.80	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	68.45	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	217.68	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	61.27	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	8.26	mg/l	30	100

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12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	567.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	45.23	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.65	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	8.03	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [®]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [®]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.46	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation [®]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	945	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	26.8	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.9	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

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

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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)	APHA ,4500-H ⁺ B Electrometric	7.44	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	293.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	96.34	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	319.51	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	82.73	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	12.79	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	715.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	64.59	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.83	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) , Chromotropic Method	8.71	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [®]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [®]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.51	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation

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27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation [@]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1192	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	31.4	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	8.6	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

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)	APHA ,4500-H ⁺ B Electrometric Method	7.67	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	25	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Taste	APHA , 2160 B, Threshold Test Method	None	--
6.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	64.18	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	708	µS/cm
8.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	12.44	mg/l
9.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.21	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	425.00	mg/l
11.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12.	Boron	APHA, 4500B C, Carmine Method	0.16	mg/l
13.	Sulphate as SO ⁴	APHA , 4500 E, Turbidimetric Method	14.25	mg/l
14.	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.51	mg/l
15.	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025,P-44	6.70	mg/l
16.	COD	APHA, 5220 B, Open Reflux Method	25.00	mg/l

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17.	Free Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	10.23	mg/l
18.	Total Coliform	IS 1622	26	MPN/100ml
19.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l
20.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	161.00	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	57.62	mg/l
22.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	174.16	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	4.19	mg/l
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	2.8	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	72.16	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	27.38	mg/l
27.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l

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

Table 3.34 Surface water Quality Monitoring Result (Chathewala)

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.82	--
2	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0Hazen)	Hazen
3	Turbidity	APHA, 2130 B, Nephelometric Method	21	NTU
4	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5	Taste	APHA , 2160 B, Threshold Test Method	None	--
6	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	55.19	mg/l
7	Conductivity	APHA, 2510 B, Conductivity Meter Method	872	μS/cm
8	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	7.15	mg/l
9	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.25	mg/l
10	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	523.00	mg/l
11	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12	Boron	APHA, 4500B C, Carmine Method	0.13	mg/l
13	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	24.72	mg/l
14	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.41	mg/l
15	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025,P-44	5.80	mg/l
16	COD	APHA, 5220 B, Open Reflux Method	27.00	mg/l
17	Free Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	8.75	mg/l
18	Total Coliform	IS 1622	25	MPN/100ml

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19	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l
20	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	167.00	mg/l
21	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	56.43	mg/l
22	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	189.15	mg/l
23	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	6.37	mg/l
24	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	3.15	mg/l
25	Sodium	APHA, 3500 Na B Flame Photometric Method	76.32	mg/l
26	Potassium	APHA, 3500 Na B Flame Photometric Method	22.57	mg/l
27	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l

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

3.3.4 Ground Water & Surface Water Quality Monitoring Results (March 2022)

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 OC)	APHA ,4500-H+ B Electrometric	7.48	--	6.5 to 8.5	No
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	276.85	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	78.24	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	241.62	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	51.40	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	19.84	mg/l	30	100
12.	Total Dissolved	APHA , 2540 C, Gravimetric Method	648.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric	24.62	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.71	mg/l	1.0	1.5

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15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic	6.98	mg/l	45	No
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.14	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.004)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05)	mg/l	1.0	No
22.	Anionic Detergents	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.28	mg/l	5.0	15.0
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.05)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(** DL 0.002)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.005)	mg/l	0.01	No Relaxation
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1089	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	21.54	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.2	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit. #These parameter are not covered in our NABL scope.

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)

Table 3.18 Ground water Quality Monitoring Result (Jiwan Singh Wala)

S.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012
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No.					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 OC)	APHA ,4500-H+ B Electrometric	7.51	--	6.5 to 8.5	No
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	176.48	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	47.32	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	160.54	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	33.25	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	14.19	mg/l	30	100
12.	Total Dissolved	APHA , 2540 C, Gravimetric Method	409.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric	14.62	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.77	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	7.62	mg/l	45	No
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.09	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.004)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05)	mg/l	1.0	No
22.	Anionic Detergents	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.39	mg/l	5.0	15.0
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.05)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(** DL 0.002)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001)	mg/l	0.01	No Relaxation

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29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.005)	mg/l	0.01	No Relaxation
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	690	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	17.2	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	4.1	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit. #These parameter are not covered in our NABL scope.

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)

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 0C)	APHA ,4500-H+ B Electrometric	7.34	--	6.5 to 8.5	No
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	205.47	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	74.63	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	198.71	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	62.58	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	4.68	mg/l	30	100
12.	Total Dissolved	APHA , 2540 C, Gravimetric Method	539.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric	58.42	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.78	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	7.66	mg/l	45	No

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16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.10	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.004)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05)	mg/l	1.0	No
22.	Anionic Detergents	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.32	mg/l	5.0	15.0
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.05)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.005)	mg/l	0.01	No Relaxation
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	904	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	21.5	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	4.2	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit. #These parameter are not covered in our NABL scope.

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)

Table 3.20 Ground water Quality Monitoring Result (Mahi Nangal)

S.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012
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Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandi Sabo, Bhatinda, Punjab

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No.					Requirement (Acceptable Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 OC)	APHA ,4500-H+ B Electrometric	7.69	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	196.47	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	51.35	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	183.57	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	42.51	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	16.61	mg/l	30	100
12.	Total Dissolved	APHA , 2540 C, Gravimetric Method	475.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric	26.41	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.62	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	5.67	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.08	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.004)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05)	mg/l	1.0	No Relaxation
22.	Anionic Detergents	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.24	mg/l	5.0	15.0
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.05)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(** DL 0.002)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001)	mg/l	0.01	No Relaxation

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29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.005)	mg/l	0.01	No Relaxation
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	795	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	24.9	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.2	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit. #These parameter are not covered in our NABL scope.

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)

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 0C)	APHA ,4500-H+ B Electrometric	7.69	--	6.5 to 8.5	No
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	251.43	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	76.25	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	236.41	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	63.59	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	14.87	mg/l	30	100
12.	Total Dissolved	APHA , 2540 C, Gravimetric Method	624.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric	57.29	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.79	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	8.13	mg/l	45	No

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16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.07	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.004)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05)	mg/l	1.0	No
22.	Anionic Detergents	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.42	mg/l	5.0	15.0
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.05)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.005)	mg/l	0.01	No Relaxation
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1045	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	22.6	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.7	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit. #These parameter are not covered in our NABL scope.

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

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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 0C)	APHA ,4500-H+ B Electrometric	7.29	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	198.26	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	66.15	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	213.07	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	59.87	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	8.07	mg/l	30	100
12.	Total Dissolved	APHA , 2540 C, Gravimetric Method	554.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric	41.26	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.62	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic	6.87	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.06	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.004)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05)	mg/l	1.0	No Relaxation
22.	Anionic Detergents	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.40	mg/l	5.0	15.0
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.05)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.003	No Relaxation

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27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(** DL 0.002)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.005)	mg/l	0.01	No Relaxation
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	926	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	24.3	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.4	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit. #These parameter are not covered in our NABL scope.

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

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 OC)	APHA ,4500-H+ B Electrometric	7.45	--	6.5 to 8.5	No
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	286.48	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	91.57	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	305.24	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	86.95	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	14.10	mg/l	30	100

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12.	Total Dissolved	APHA , 2540 C, Gravimetric Method	719.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric	62.54	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.85	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic	8.41	mg/l	45	No
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.14	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.004)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05)	mg/l	1.0	No
22.	Anionic Detergents	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.47	mg/l	5.0	15.0
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.05)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(** DL 0.002)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.005)	mg/l	0.01	No Relaxation
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1206	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	30.8	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	8.4	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit. #These parameter are not covered in our NABL scope.

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)

Table 3.24 Surface water Quality Monitoring Result (KotFatta)

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S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25°C)	APHA ,4500-H+ B Electrometric Method	7.79	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0)	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	18	NTU
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--
5.	Taste	APHA , 2160 B, Threshold Test Method	None	--
6.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	53.24	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	869	µS/cm
8.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	6.99	mg/l
9.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.21	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	519.00	mg/l
11.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l
12.	Boron	IS 3025 (P-65):2014(RA:2019)	0.11	mg/l
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	21.69	mg/l
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.38	mg/l
15.	BOD (3 Days at 20°C)	APHA, 5210 C/ IS 3025 (Part 44)	4.57	mg/l
16.	COD	APHA 5220 B Open Reflux Method	25.69	mg/l
17.	Free Ammonia as N	IS 3025 (P-34) , Titrimetric Method	7.88	mg/l
18.	Total Coloform	IS 15185:2016	23	/100ml
19.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l
20.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	169.24	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	58.36	mg/l
22.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	182.41	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	5.74	mg/l
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	3.26	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	75.1	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	25.6	mg/l
27.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.03)	mg/l

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

Table 3.25 Surface water Quality Monitoring Result (Chathewala)

S. No.	Parameter	Test-Method	Result	Unit
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1	pH (at 25°C)	APHA ,4500-H+ B Electrometric Method	7.51	--
2	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0)	Hazen
3	Turbidity	APHA, 2130 B, Nephelometric Method	22	NTU
4	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--
5	Taste	APHA , 2160 B, Threshold Test Method	None	--
6	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	62.41	mg/l
7	Conductivity	APHA, 2510 B, Conductivity Meter Method	704	µS/cm
8	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	10.69	mg/l
9	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.19	mg/l
10	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	418.00	mg/l
11	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l
12	Boron	IS 3025 (P-65):2014(RA:2019)	0.14	mg/l
13	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	12.35	mg/l
14	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.48	mg/l
15	BOD (3 Days at	APHA, 5210 C/ IS 3025 (Part 44)	5.98	mg/l
16	COD	APHA 5220 B Open Reflux Method	24.60	mg/l
17	Free Ammonia as	IS 3025 (P-34) , Titrimetric Method	9.87	mg/l
18	Total Coloform	IS 15185:2016	21	/100ml
19	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l
20	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	158.47	mg/l
21	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	55.13	mg/l
22	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	171.29	mg/l
23	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	5.08	mg/l
24	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	2.4	mg/l
25	Sodium	APHA, 3500 Na B Flame Photometric Method	71.9	mg/l
26	Potassium	APHA, 3500 Na B Flame Photometric Method	25.4	mg/l
27	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.03)	mg/l

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

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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	
		December 2021	March 2022
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 **December 2021 & March 2022**.

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 (December 2021)

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 0C)	IS : 2720 (P-26) by pH Meter	7.81	--
2.	Conductivity	IS:14767 by Conductivity meter	0.322	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	33.15	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.24	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	54.61	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	34.53	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	37.13	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	131.46	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.95	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.87	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	16.22	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	192.15	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	15.87	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.64	mg/kg
17.	Organic Carbon	USEPA 3050B	0.48	%
18.	Lead (as Pb)	USEPA 3050B	0.76	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.63	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.78	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.04	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.32	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	13.7	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.62	--
2.	Conductivity	IS:14767 by Conductivity meter	0.321	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	30.26	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.18	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	43.21	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	35.13	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	46.71	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	142.05	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.39	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.85	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	23.15	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	221.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	16.34	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.86	mg/kg
17.	Organic Carbon	USEPA 3050B	0.55	%
18.	Lead (as Pb)	USEPA 3050B	0.74	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.39	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.57	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.34	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	10.9	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.72	--
2.	Conductivity	IS:14767 by Conductivity meter	0.317	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	30.65	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.34	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	41.62	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	62.18	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	55.37	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	136.76	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.31	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.65	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	20.16	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	219.74	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	24.02	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	12.48	mg/kg
17.	Organic Carbon	USEPA 3050B	0.35	%
18.	Lead (as Pb)	USEPA 3050B	0.57	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.73	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.45	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.08	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.44	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	15.8	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.65	--
2.	Conductivity	IS:14767 by Conductivity meter	0.336	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	31.28	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.25	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	51.76	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	41.24	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	61.58	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	140.16	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.85	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	31.87	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	212.00	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	20.43	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	7.35	mg/kg
17.	Organic Carbon	USEPA 3050B	0.44	%
18.	Lead (as Pb)	USEPA 3050B	0.63	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.40	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.47	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.81	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	17.3	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.72	--
2.	Conductivity	IS:14767 by Conductivity meter	0.345	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	25.16	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.20	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	61.54	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	43.21	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	51.74	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	156.86	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.64	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.84	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	27.53	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	241.00	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	24.53	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.51	mg/kg
17.	Organic Carbon	USEPA 3050B	0.45	%
18.	Lead (as Pb)	USEPA 3050B	0.88	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.81	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.75	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.13	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.44	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	15.3	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.61	--
2.	Conductivity	IS:14767 by Conductivity meter	0.322	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	40.56	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.18	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	51.26	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	46.78	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	52.15	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	163.72	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.27	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.78	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	37.02	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	243.00	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	24.67	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.58	mg/kg
17.	Organic Carbon	USEPA 3050B	0.46	%
18.	Lead (as Pb)	USEPA 3050B	0.69	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.47	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.45	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.38	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	18.4	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.66	--
2.	Conductivity	IS:14767 by Conductivity meter	0.342	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	49.51	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.26	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	47.84	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	70.29	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	56.37	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	125.73	kg/hect.
11.	Iron as Fe	USEPA 3050B	3.76	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.89	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	27.15	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	250.00	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	29.13	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	18.21	mg/kg
17.	Organic Carbon	USEPA 3050B	0.51	%
18.	Lead (as Pb)	USEPA 3050B	0.60	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.74	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.75	mg/kg
21.	Copper (as Cu)	USEPA 3050B	1.98	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.56	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	17.9	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.79	--
2.	Conductivity	IS:14767 by Conductivity meter	0.358	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	38.24	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.49	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	42.35	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	48.74	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	57.28	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	131.52	kg/hect.
11.	Iron as Fe	USEPA 3050B	1.83	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.56	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	33.15	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	210.68	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	17.83	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.49	mg/kg
17.	Organic Carbon	USEPA 3050B	0.35	%
18.	Lead (as Pb)	USEPA 3050B	0.57	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.69	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.50	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.30	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.84	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	14.9	%

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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 0C)	IS : 2720 (P-26) by pH Meter	7.71	--
2.	Conductivity	IS:14767 by Conductivity meter	0.368	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	29.12	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.69	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	57.02	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	38.21	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	44.26	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	147.12	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.47	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.49	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	23.50	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	214.87	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	25.31	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.58	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.88	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.79	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.90	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.84	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.38	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	16.5	%

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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 0C)	IS : 2720 (P-26) by pH Meter	7.68	--
2.	Conductivity	IS:14767 by Conductivity meter	0.318	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	35.26	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.91	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	49.67	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	42.01	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	50.16	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	148.56	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.29	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.77	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	28.05	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	249.08	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	27.11	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	13.58	mg/kg
17.	Organic Carbon	USEPA 3050B	0.52	%
18.	Lead (as Pb)	USEPA 3050B	0.74	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.79	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.54	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.25	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.24	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	14.5	%

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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 0C)	IS : 2720 (P-26) by pH Meter	7.81	--
2.	Conductivity	IS:14767 by Conductivity meter	0.295	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	21.06	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.12	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	59.31	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	42.14	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	45.87	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	105.23	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.82	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.65	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	18.23	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	190.15	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	28.06	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.84	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.92	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.76	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.06	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.34	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	12.6	%

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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 0C)	IS : 2720 (P-26) by pH Meter	7.60	--
2.	Conductivity	IS:14767 by Conductivity meter	0.321	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	29.34	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.20	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	45.12	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	59.21	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	48.37	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	106.15	kg/hect.
11.	Iron as Fe	USEPA 3050B	3.28	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	21.87	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	197.55	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	17.16	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	12.34	mg/kg
17.	Organic Carbon	USEPA 3050B	0.47	%
18.	Lead (as Pb)	USEPA 3050B	0.56	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.74	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.68	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.18	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.39	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	14.7	%

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3.4.3 Soil Monitoring Results (March 2022)

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 0C)	IS : 2720 (P-26) by pH Meter	7.76	--
2.	Conductivity	IS:14767 by Conductivity meter	0.317	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	31.45	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.18	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	51.32	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	30.58	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	35.91	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	127.25	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.84	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.86	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	15.24	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	186.77	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	14.39	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.57	mg/kg
17.	Organic Carbon	USEPA 3050B	0.46	%
18.	Lead (as Pb)	USEPA 3050B	0.72	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.60	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.75	mg/kg
21.	Copper (as Cu)	USEPA 3050B	5.87	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.30	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	12.6	%

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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 0C)	IS : 2720 (P-26) by pH Meter	7.54	--
2.	Conductivity	IS:14767 by Conductivity meter	0.317	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	29.54	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.16	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	42.65	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	34.21	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	45.67	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	141.20	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.35	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.83	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	22.36	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	220.14	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	15.67	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	9.75	mg/kg
17.	Organic Carbon	USEPA 3050B	0.52	%
18.	Lead (as Pb)	USEPA 3050B	0.71	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.73	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.36	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.49	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.31	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	9.7	%

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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 0C)	IS : 2720 (P-26) by pH Meter	7.67	--
2.	Conductivity	IS:14767 by Conductivity meter	0.310	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	28.41	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.30	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	40.25	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	61.59	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	53.48	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	134.26	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.28	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.63	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	18.97	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	217.06	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	22.20	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	10.36	mg/kg
17.	Organic Carbon	USEPA 3050B	0.32	%
18.	Lead (as Pb)	USEPA 3050B	0.54	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.41	mg/kg
21.	Copper (as Cu)	USEPA 3050B	1.99	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.40	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	14.3	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.42	--
2.	Conductivity	IS:14767 by Conductivity meter	0.331	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	29.84	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.21	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	49.26	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	38.10	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	59.46	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	138.28	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.81	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.69	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	30.67	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	210.41	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	18.97	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	6.59	mg/kg
17.	Organic Carbon	USEPA 3050B	0.40	%
18.	Lead (as Pb)	USEPA 3050B	0.61	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.67	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.39	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.42	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.78	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	16.8	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.76	--
2.	Conductivity	IS:14767 by Conductivity meter	0.349	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	27.54	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.25	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	63.59	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	45.71	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	53.64	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	158.20	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.69	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.88	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	29.41	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	243.58	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.51	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.64	mg/kg
17.	Organic Carbon	USEPA 3050B	0.48	%
18.	Lead (as Pb)	USEPA 3050B	0.91	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.84	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.77	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.19	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.47	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	17.8	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.59	--
2.	Conductivity	IS:14767 by Conductivity meter	0.316	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	38.51	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.16	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	49.69	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	44.24	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	50.23	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	161.42	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.24	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.75	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	35.69	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	241.08	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	22.61	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.65	mg/kg
17.	Organic Carbon	USEPA 3050B	0.42	%
18.	Lead (as Pb)	USEPA 3050B	0.64	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.75	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.43	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.40	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.36	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	16.9	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.61	--
2.	Conductivity	IS:14767 by Conductivity meter	0.337	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	47.25	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.24	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	45.39	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	68.41	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	54.28	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	123.69	kg/hect.
11.	Iron as Fe	USEPA 3050B	3.72	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.85	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	25.16	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	248.62	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	27.31	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	16.54	mg/kg
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.58	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.73	mg/kg
21.	Copper (as Cu)	USEPA 3050B	1.94	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.53	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	15.4	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.71	--
2.	Conductivity	IS:14767 by Conductivity meter	0.352	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	36.15	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.47	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	40.36	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	46.25	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	55.49	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	129.61	kg/hect.
11.	Iron as Fe	USEPA 3050B	1.81	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.52	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	31.29	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	208.41	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	15.32	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.32	mg/kg
17.	Organic Carbon	USEPA 3050B	0.31	%
18.	Lead (as Pb)	USEPA 3050B	0.54	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.65	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.47	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.28	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.86	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	13.5	%

*SOP-Laboratory Standard Operating Procedure.

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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 0C)	IS : 2720 (P-26) by pH Meter	7.67	--
2.	Conductivity	IS:14767 by Conductivity meter	0.362	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	27.16	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.64	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	55.13	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	36.45	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	42.19	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	145.63	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.43	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.46	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	21.67	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	212.58	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	23.41	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	8.16	mg/kg
17.	Organic Carbon	USEPA 3050B	0.34	%
18.	Lead (as Pb)	USEPA 3050B	0.84	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.87	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.57	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.35	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	14.3	%

*SOP-Laboratory Standard Operating Procedure.

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

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.70	--
2.	Conductivity	IS:14767 by Conductivity meter	0.314	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	33.62	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.87	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	47.25	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	40.68	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	48.46	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	146.20	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.25	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	26.95	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	247.63	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	25.13	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	11.53	mg/kg
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.70	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.51	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.18	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.20	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	13.7	%

*SOP-Laboratory Standard Operating Procedure.

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

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.75	--
2.	Conductivity	IS:14767 by Conductivity meter	0.291	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	19.84	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.08	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	57.19	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	40.58	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	43.69	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	103.54	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.75	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.61	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	16.29	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	188.47	kg/hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.53	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	7.92	mg/kg
17.	Organic Carbon	USEPA 3050B	0.34	%
18.	Lead (as Pb)	USEPA 3050B	0.86	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.69	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.74	mg/kg
21.	Copper (as Cu)	USEPA 3050B	5.89	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.30	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	11.8	%

*SOP-Laboratory Standard Operating Procedure.

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

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.54	--
2.	Conductivity	IS:14767 by Conductivity meter	0.317	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	27.36	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.17	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	43.26	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	57.68	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	46.35	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	104.29	kg/hect.
11.	Iron as Fe	USEPA 3050B	3.16	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.71	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	19.85	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	195.22	kg./hect.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	15.69	kg./hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No.-01	10.54	mg/kg
17.	Organic Carbon	USEPA 3050B	0.44	%
18.	Lead (as Pb)	USEPA 3050B	0.53	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.62	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.05	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.35	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No.-01& Issue Date-14/02/2013	12.6	%

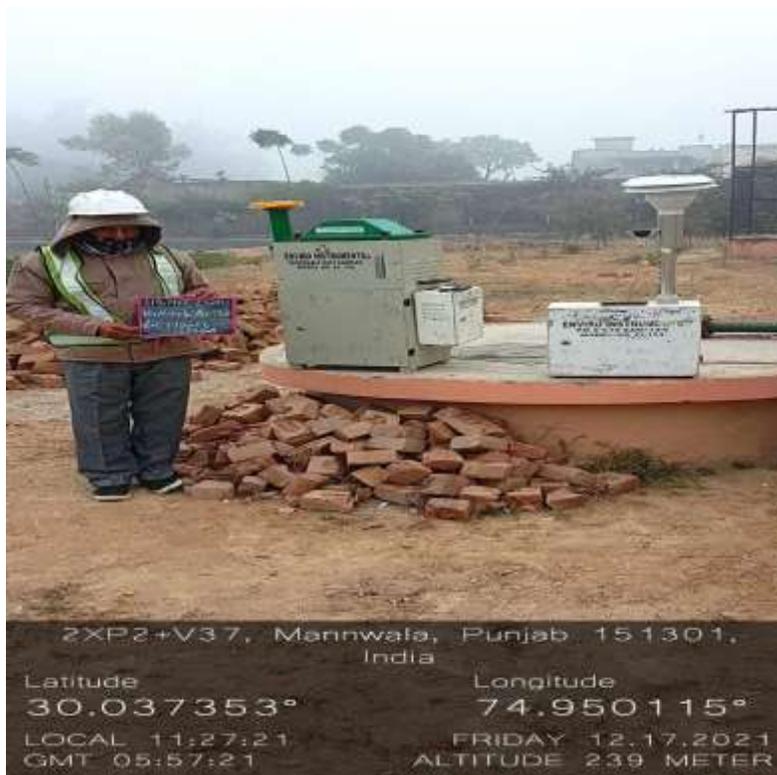
*SOP-Laboratory Standard Operating Procedure.

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.

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3.5 Site Photographs



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PUNJAB POLLUTION CONTROL BOARD

Zonal Office, Power House Road, Street No. 12, Bathinda.

Website:- www.ppcb.gov.in

Office Dispatch No :

Registered/Speed Post

Date:

Industry Registration ID: R19BTI356560

Application No : 14320137

To,

Shri Sanjay Kumar
Hindustan Petroleum Corporation Limited, 6th Floor, Core-ii North Tower, Scope Minar, Laxmi Nagar
Delhi, Delhi-110092

Subject: Grant of "Consent to Establish"(NOC) for an industrial unit u/s 25 of Water (Prevention & Control of Pollution) Act, 1974 and u/s 21 of Air (Prevention & Control of Pollution) Act, 1981.

With reference to your application for obtaining fresh 'Consent to Establish'(NOC) an industrial plant u/s 25 of Water (Prevention & Control of Pollution) Act, 1974 and u/s 21 of Air (Prevention & Control of Pollution) Act, 1981, you are, hereby, permitted to establish the industrial unit to discharge the effluent(s) & emission(s) arising out of your premises subject to the Terms and Conditions as specified in this Certificate.

1. Particulars of Consent to Establish (NOC) granted to the Industry

Certificate No.	CTE/Fresh/BTI/2021/14320137
Date of issue :	04/01/2021
Date of expiry :	31/12/2021
Certificate Type :	Fresh

2. Particulars of the Industry

Name & Designation of the Applicant	Sanjay Kumar, (Cheif Manager Bio Fuels)
Address of Industrial premises	Hindustan Petroleum Corporation Limited, Vill - Nasibpura, taluka - Talwandi Sabo, Distt - Bathinda, Talwandi Sabo, Bathinda-151001
Capital Investment of the Industry	109625.0 lakhs
Category of Industry	Red
Type of Industry	1060-Distillery (molasses / grain / yeast based)
Scale of the Industry	Large
Office District	Bathinda
Consent Fee Details	Rs. 10,80,000/- vide R.No. 362293229 dt. 14.12.2020.
Raw Materials (Name with quantity per day)	<ul style="list-style-type: none">• Bio-mass @ 500 TPD.• Yeast @ .05 TPD• Acid @ 10 TPD• Enzymes @ 3.5 TPD• Nutrients @ 4 TPD• Chemicals @ 23 TPD

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Products (Name with quantity per day)	<i>Ethanol @ 100 KLD</i>
By-Products, if any,(Name with quantity per day)	<ul style="list-style-type: none"> • <i>CO2 @ 75 TPD.</i> • <i>Fuel Oil @ 0.3 TPD.</i> • <i>Technical Alcohol @ 2.0 TPD.</i> • <i>Ash @ 125 TPD.</i>
Details of the machinery and processes	<i>2G ethanol generation from lingo-cellulosic biomass</i>
Details of the Effluent Treatment Plant	<ul style="list-style-type: none"> • <i>Stream I – Trade Effluent @ 512 KLD to be generated from boiler blow down, DM plant and cooling tower blow down will be treated through reverse osmosis followed by MEE treatment. The treated effluent will be utilized as cooling tower makeup water.</i> • <i>Stream II – Effluent generated from process condensate is proposed to be treated through anaerobic followed by aerobic biological process and thereafter the effluent will be utilized as utility makeup water.</i> • <i>Domestic Effluent @ 10 KLD to be treated in the sewage treatment plant based on MBR technology.</i>
Mode of Disposal of Effluent	<ul style="list-style-type: none"> • <i>Trade Effluent – It has been proposed to achieve Zero Liquid discharge.</i> • <i>Domestic Effluent @ 10 KLD – discharged onto land for plantation after treatment in the STP.</i>
Standards to be achieved under Water (Prevention & Control of Pollution) Act, 1974	<i>As prescribed by the PPCB/CPCB/MOEF.</i>
Sources of emissions and type of pollutants	<ul style="list-style-type: none"> • <i>Two boilers of capacity 42 TPH each has been proposed.</i> • <i>Two DG sets of capacity 2000 KVA each has been proposed.</i>
Mode of disposal of emissions with stack height	<ul style="list-style-type: none"> • <i>Separate stacks of adequate height have been proposed with boiler furnaces.</i> • <i>Separate stacks of adequate height have been proposed with DG sets.</i>
Quantity of fuel required in TPD	<ul style="list-style-type: none"> • <i>Paddy Straw / Wet Cake as fuel proposed to be used in both the boilers of capacity 42 TPH each.</i> • <i>HSD for DG sets.</i>
Type of Air Pollution Control Devices to be installed	<ul style="list-style-type: none"> • <i>Separate Electrostatic Precipitators (ESP) as APCD with both the boilers of capacity 42 TPH each.</i> • <i>Separate Canopies with both the DG sets of capacity 2000 KVA each.</i>
Standars to be achieved under Air (Prevention & Control of Pollution) Act, 1981	<i>As prescribed by the PPCB/CPCB/MOEF.</i>



04/01/2021

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(Ruby Sidhu)
Asstt Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

Endst. No.:

Dated:

A copy of the above is forwarded to the following for information and necessary action please:

Environmental Engineer, Punjab Pollution Control Board, Regional Office, Bathinda.



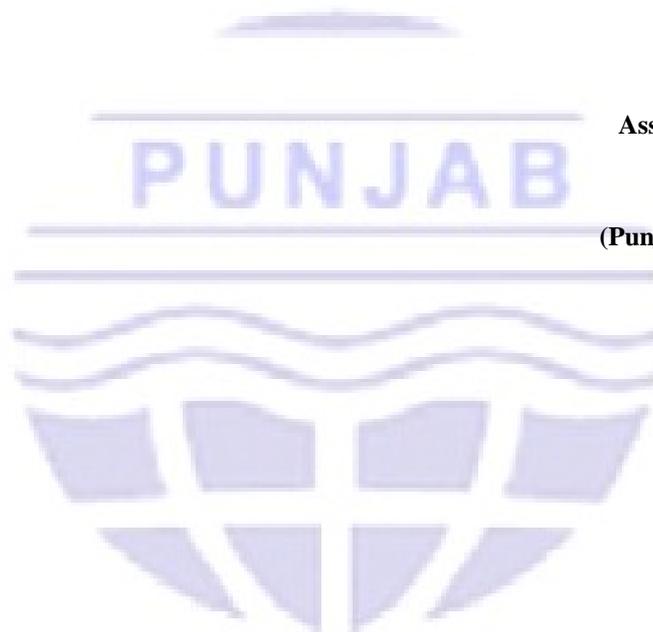
04/01/2021

(Ruby Sidhu)
Asstt Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)



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A. GENERAL CONDITIONS

1. The industry shall apply for consent of the Board as required under the provision of Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981 & Authorization under Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016, two months before the commissioning of the industry.
2. The industry shall provide adequate arrangements for fighting the accidental leakages/ discharge of any air pollutant/gas/liquids from the vessels, mechanical equipments etc. which are likely to cause environmental pollution.
3. The Industry shall apply for further extension in the validity of the CTE atleast two months before the expiry of this CTE, if applicable.
4. The industry shall comply with any other conditions laid down or directions issued by the Board under the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and the Air (Prevention & Control of Pollution) Act,1981 from time to time.
5. The project has been approved by the Board from pollution angle and the industry shall obtain the approval of site from other concerned departments, if need be.
6. The industry shall get its building plans approved under the provisions of section 3-A of Punjab Factory Rules, 1952.
7. The industry shall put up display board indicating the Environment data in the prescribed format at the main entrance gate.
8. The industry shall provide port-holes, platforms and/or other necessary facilities as may be required for collecting samples of emissions from any chimney, flue or duct or any other outlets.

Specifications of the port-holes shall be as under:-

- i) The sampling ports shall be provided atleast 8 times chimney diameter downstream and 2 times upstream from the flow disturbance. For a rectangular cross section the equivalent diameter (D_e) shall be calculated from the following equation to determine upstream, downstream distance:-
$$D_e = 2 LW / (L+W)$$

Where L= length in mts. W= Width in mts.
 - ii) The sampling port shall be 7 to 10 cm in diameter
9. The industry shall discharge all gases through a stack of minimum height as specified in the following standards laid down by the Board.

(i) Stack height for boiler plants

S.NO.	Boiler with Steam Generating Capacity	Stack heights
1.	Less than 2 ton/hr.	9 meters or 2.5 times the height of neighboring building which ever is more
2.	More than 2 ton/hr. to 5 ton/hr.	12 meters
3.	More than 5 ton/hr. to 10 ton/hr	15 meters
4.	More than 10 ton/hr. to 15 ton/hr	18 meters
5.	More than 15 ton/hr. to 20 ton/hr	21 meters
6.	More than 20 ton/hr. to 25 ton/hr.	24 meters
7.	More than 25 ton/hr. to 30 ton/hr.	27 meters
8.	More than 30 ton/hr.	30 meters or using the formula $H = 14 Q_g^{0.3}$ or $H = 74 (Q_p)^{0.24}$ Where Q_g = Quantity of SO ₂ in Kg/hr. Q_p = Quantity of particulate matter in Ton/day.

Note : Minimum Stack height in all cases shall be 9.0 mtr. or as calculated from relevant formula whichever is more.

(ii) For industrial furnaces and kilns, the criteria for selection of stack height would be based on fuel used for the corresponding steam generation.

(iii) Stack height for diesel generating sets:

Capacity of diesel generating set	Height of the Stack	
0-50 KVA	Height of the building	+ 1.5 mt
50-100 KVA	-do-	+ 2.0 mt.
100-150 KVA	-do-	+ 2.5 mt.
150-200 KVA	-do-	+ 3.0 mt.
200-250 KVA	-do-	+ 3.5 mt.
250-300 KVA	-do-	+ 3.5 mt.

For higher KVA rating stack height H (in meter) shall be worked out according to the formula:

$$H = h + 0.2 (KVA)^{0.5}$$

where h = height of the building in meters where the generator set is installed.

10. The industry shall put up canopy on its DG sets and also provide stack of adequate height as per norms prescribed by the Board and shall ensure the compliance of instructions issued by the Board vide office order no. Admin./SA-2/F.No.783/2011/448 dated 8/6/2010.
11. The industry shall put up canopy on its DG sets and also provide stack of adequate height as per norms prescribed by the Board and shall ensure the compliance of instructions issued by the Board vide office order no. Admin./SA-2/F.No.783/2011/448 dated 8/6/2010.
 - (i) Once in Year for Small Scale Industries.
 - (ii) Four in a Year for Large/Medium Scale Industries.
 - (iii) The industry will submit monthly reading/ data of the separate energy meter installed for running of effluent treatment plant/re-circulation system to the concerned Regional Office of the Board by the 5th of the following month.
12. The industry shall provide flow meters at the source of water supply, at the outlet of effluent treatment plant and shall maintain the record of the daily reading and submit the same to the concerned Regional Office by the 5th day of the following month.
13. The industry shall make necessary arrangements for the monitoring of stack emissions and shall get its emissions analyzed from lab approved / authorized by the Board:-
 - (i) Once in Year for Small Scale Industries.
 - (ii) Twice/thrice/four time in a Year for Large/Medium Scale Industries.
14. The pollution control devices shall be interlocked with the manufacturing process of the industry.
15. The Board reserves the right to revoke this "consent to establish" (NOC) at any time, in case the industry is found violating any of the conditions of this "consent to establish" and/or the provisions of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 as amended from time to time.
16. The industry shall plant minimum of three suitable varieties of trees at the density of not less than 1000 trees per acre along the boundary of the industrial premises.
17. The issuance of this consent does not convey any property right in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State or Local Laws or Regulations.
18. The consent does not authorize or approve the construction of any physical structures or facilities for undertaking of any work in any natural watercourse.
19. Nothing in this NOC shall be deemed to neither preclude the institution of any legal action nor relieve the applicant from any responsibilities, liabilities or penalties to which the applicant is or may be subjected under this or any other Act.
20. The diversion or bye pass of any discharge from facilities utilized by the applicant to maintain compliance with the terms and conditions of this consent is prohibited except.
 - (i) Where unavoidable to prevent loss of life or some property damage or
 - (ii) Where excessive storm drainage or run off would damage facilities necessary for compliance with terms and conditions of this consent. The applicant shall immediately notify the consent issuing authority in writing of each such diversion or bye-pass.
21. The industry shall ensure that no water pollution problem is created in the area due to discharge of effluents from its industrial premises.

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22. The industry shall comply with the conditions imposed if any by the SEIAA/MOEF in the Environmental Clearance granted to it as required under EIA notification dated 14/9/06, if applicable.
23. The industry shall earmark a land within their premises for disposal of boiler ash in an environmentally sound manner, and / or the industry shall make necessary arrangements for proper disposal of fuel ash in a scientific manner and shall maintain proper record for the same, if applicable.
24. The industry shall obtain and submit Insurance cover as required under the Public Liability Insurance Act, 1991.
25. The industry shall submit a site emergency plan approved by the Chief Inspector of Factories, Punjab as applicable.
26. The industry shall provide proper and adequate air pollution control arrangements for control emission from its coal/fuel handling area, if applicable.
27. The Industry shall comply with the code of practice as notified by the Government / Board for the type of Industries where the siting guidelines / code of practice have been notified
28. Solids, sludge, filter backwash or other pollutant removed from or resulting from treatment or control of waste waters shall be disposed off in such a manner so as to prevent any pollutants from such materials from entering into natural water.
29. The industry shall submit a detailed plan showing therein, the distribution system for conveying waste-waters for application on land for irrigation along with the crop pattern to be adopted throughout the year.
30. The industry shall not irrigate the vegetable crops with the treated effluents which are used/ consumed as raw.
31. The industry shall ensure that its production capacity & quantity of trade effluent do not exceed the quantity mentioned in the NOC and shall not carry out any expansion without the prior permission/NOC of the Board.
32. All amendments/revisions made by the Board in the emission/stack height standards shall be applicable to the industry from the date of such amendments/revisions.
33. The industry shall not cause any nuisance/traffic hazard in vicinity of the area.
34. The industry shall maintain the following record to the satisfaction of the Board :-
 - (i) Log books for running of air pollution control devices or pumps/motors used for it.
 - (ii) Register showing the result of various tests conducted by the industry for monitoring of stack emissions and ambient air.
 - (iii) Register showing the stock of absorbents and other chemicals to be used for scrubbers.
35. The industry shall ensure that there will not be significant visible dust emissions beyond the property line.
36. The industry shall establish sufficient number of piezometer wells in consultation with the concerned Regional Office, of the Board to monitor the impact on the Ground Water Quantity due to the industrial operations, if applicable.
37. The industry shall provide adequate and appropriate air pollution control devices to contain emissions from handling, transportation and processing of raw material & product of the industry



04/01/2021

(Ruby Sidhu)
Asstt Environmental Engineer
For & on behalf
of
(Punjab Pollution Control Board)

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B. SPECIAL CONDITIONS

1. The industry shall comply with the conditions of the Environmental Clearance granted to it from MoEF vide F.No. J-11011/221/2017-IA II (I) dated 14.08.2018 & further amendment issued vide letter dated 23.09.2020.
2. The industry will ensure to achieve zero liquid discharge and it shall be further ensured that no waste / treated water is discharged, without prior permission of the Board.
3. The industry shall develop thick green belt all along the boundary wall covering 33% of the total project area as per the karnal technology in compliance to the conditions of the Environmental Clearance.
4. The industry shall manage and transport the fuel ash to be generated from its boilers in a scientific manner.
5. The industry will install pollution control devices as proposed simultaneously with the commissioning of the main project.



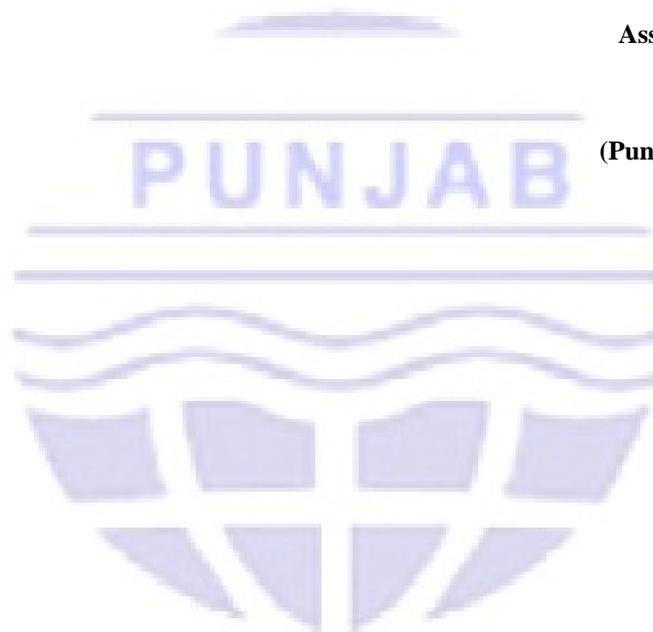
04/01/2021

(Ruby Sidhu)
Asstt Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)





Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/HPCL/AA/01 Report No.: VEL/AA/2112/20/001
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
 Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
 Reporting Date: 24/12/2021
 Latitude: 30° 3' 13.34"N Period of Analysis: 20/12/2021 - 24/12/2021
 Longitude: 75° 0' 41.57"E Receipt Date: 20/12/2021

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/03 & VEL/FPS/03
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 15/12/2021 to 16/12/2021
 Time of Monitoring : 10:25 AM – 10:25 AM
 Ambient Temperature (°C) : Min. 10°C Max. 23°C
 Surrounding Activity : Human & Vehicular Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per client requirement.

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^(a) Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	54.67	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	95.74	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	25.86	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.42	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.79	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	8.97	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	22.54	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-[@] NAAQS – National Ambient Air Quality Standards: Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
 SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit. *DL- Detection Limit

ARJUN RAWAT
(Checked By)



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Ph: 0124-4343750/752/753, 9810355569, 9953147268 E-mail: lab@vardanenvirolab.com, bd@vardanenvirolab.com



Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/HPCL/AA/02
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab
Report No.: VEL/AA/2112/20/002
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 24/12/2021
Period of Analysis: 20/12/2021 - 24/12/2021
Latitude: 30° 3' 37.63"N
Longitude: 75° 2' 75.30"E
Receipt Date: 20/12/2021

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/05 & VEL/FPS/05
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 15/12/2021 to 16/12/2021
Time of Monitoring : 10:50 AM – 10:50 AM
Ambient Temperature (°C) : Min. 10°C Max. 23°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
Parameter Required : As per client requirement.

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	"SOP No. VEL/SOP/01, Section No. SP 63	50.25	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	89.64	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	21.76	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	7.83	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.78	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	6.75	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	19.32	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3(3B)], [Part-II-sec.-3(i)]18.11.2009.
SOP- Laboratory Standard Operating Procedure. **BDL- Below Detection Limit, *DL- Detection Limit

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/HPCL/AA/03 Report No.: VEL/AA/2112/20/003
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Latitude: 30° 2' 33.23"N Reporting Date: 24/12/2021
Longitude: 75° 58' 6.88"E Period of Analysis: 20/12/2021 - 24/12/2021
Receipt Date: 20/12/2021

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Maanwala
Instrument Used : RDS & FPS sampler with all Accessories
Instrument Code : VEL/RDS/06 & VEL/FPS/06
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 15/12/2021 to 16/12/2021
Time of Monitoring : 11:30 AM – 11:30 AM
Ambient Temperature (°C) : Min. 10°C Max. 23°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^(a) Limit
1.	Particulate Matter (PM _{2.5})	"SOP No. VEL/SOP/01, Section No. SP 63	51.62	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	92.02	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	23.55	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	8.72	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.83	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	9.10	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	20.51	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @NAAQS - National Ambient Air Quality Standards: Schedule-VII, [Rule 3 (3B)], [Part-II-sec -3(i)]18.11.2009
SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

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

Sample Number: VEL/HPCL/AA/04
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab
Report No.: VEL/AA/2112/20/004
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 24/12/2021
Period of Analysis: 20/12/2021 - 24/12/2021
Latitude: 30° 1' 13.05"N
Longitude: 75° 1' 3.89"E
Receipt Date: 20/12/2021

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/04 & VEL/FPS/04
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 15/12/2021 to 16/12/2021
Time of Monitoring : 11:50 AM – 11:50 AM
Ambient Temperature (°C) : Min. 10°C Max. 23°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^(a) Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	47.54	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	88.73	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	21.45	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.76	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.80	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	8.92	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	18.46	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- (a) NAAQS – National Ambient Air Quality Standards: Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009
SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

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Test Report

Sample Number: VEL/HPCL/AA/05 Report No.: VEL/AA/2112/20/005
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Latitude: 29° 59' 40.64"N Reporting Date: 24/12/2021
Longitude: 75° 1' 17.61"E Period of Analysis: 20/12/2021 - 24/12/2021
Receipt Date: 20/12/2021

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/03 & VEL/FPS/03
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 16/12/2021 to 17/12/2021
Time of Monitoring : 09:20 AM – 09:20 AM
Ambient Temperature (°C) : Min. 09°C Max. 23°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	49.27	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	90.53	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	24.38	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	8.86	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.91	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	8.64	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	21.97	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-@ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

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Test Report

Sample Number: VEL/HPCL/AA/06 Report No.: VEL/AA/2112/20/006
 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
 Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
 Reporting Date: 24/12/2021
 Latitude: 30° 1' 27.46"N Period of Analysis: 20/12/2021 - 24/12/2021
 Longitude: 75° 4' 8.62"E Receipt Date: 20/12/2021

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/05 & VEL/FPS/05
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : **16/12/2021 to 17/12/2021**
 Time of Monitoring : 10:21 AM – 10:21 AM
 Ambient Temperature (°C) : Min. 09°C Max. 23°C
 Surrounding Activity : Human & Vehicular Activities
 Scope of Monitoring : Regulatory Requirement
 Control measure if Any : No
 Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
 Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [@] Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	46.62	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	87.31	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	18.48	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	8.50	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.86	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	7.95	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	19.37	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-[@] NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule-3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
 SOP- Laboratory Standard Operating Procedure.. **BDL- Below Detection Limit, *DL- Detection Limit

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Test Report

Sample Number: VEL/HPCL/AA/07
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab
Latitude: 30° 4' 34.79"N
Longitude: 74° 59' 57.45"E
Report No.: VEL/AA/2112/20/007
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 24/12/2021
Period of Analysis: 20/12/2021 - 24/12/2021
Receipt Date: 20/12/2021

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/06 & VEL/FPS/06
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 16/12/2021 to 17/12/2021
Time of Monitoring : 10:47AM – 10:47 AM
Ambient Temperature (°C) : Min. 09°C Max. 23°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	48.65	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	87.16	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	19.85	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.12	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.74	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	9.83	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	21.38	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-@ NAAQS - National Ambient Air Quality Standards: Schedule-VII. [Rule 3 (3B)], [Part-II-sec -3(i)]18.11.2009.
SOP- Laboratory Standard Operating Procedure. **BDL- Below Detection Limit. *DL- Detection Limit

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Test Report

Sample Number: VEL/HPCL/AA/08 Report No.: VEL/AA/2112/20/008
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 24/12/2021
Period of Analysis: 20/12/2021 - 24/12/2021
Receipt Date: 20/12/2021
Latitude: 30° 5' 40.22"N
Longitude: 75° 4' 5.30"E

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by : Vardan Enviro Lab Representative
Sampling Location : Kotbhara
Instrument Used : RDS & FPS sampler with all Accessories
Instrument Code : VEL/RDS/04 & VEL/FPS/04
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 16/12/2021 to 17/12/2021
Time of Monitoring : 11:03 AM – 11:03 AM
Ambient Temperature (°C) : Min. 09°C Max. 23°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	51.23	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	90.59	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	24.61	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	8.26	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.87	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	7.35	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	20.48	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :-@ NAAQS – National Ambient Air Quality Standards; Schedule-VII. [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

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Test Report

Sample Number: VEL/HPCL/AA/09
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd,
Village Nasibpura, Bhatinda Punjab
Latitude: 30° 6' 34.53"N
Longitude: 75° 0' 23.67"E
Report No.: VEL/AA/2112/20/009
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 24/12/2021
Period of Analysis: 20/12/2021 - 24/12/2021
Receipt Date: 20/12/2021

Sample Description: AMBIENT AIR QUALITY MONITORING

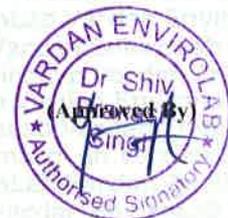
General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Kot Kashmir
Instrument Used : RDS & FPS sampler with all Accessories
Instrument Code : VEL/RDS/03 & VEL/FPS/03
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 17/12/2021 to 18/12/2021
Time of Monitoring : 10:04 AM – 10:04 AM
Ambient Temperature (°C) : Min. 08°C Max. 23°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS ^(a) Limit
1.	Particulate Matter (PM _{2.5})	^(b) SOP No. VEL/SOP/01, Section No. SP 63	47.23	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	88.16	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	17.82	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.73	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.78	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	9.27	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	19.74	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- (a) NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec -3(i)]18.11.2009
(b) SOP- Laboratory Standard Operating Procedure, **BDL- Below Detection Limit, *DL- Detection Limit

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/HPCL/AA/10	Report No.:	VEL/AA/2112/20/010
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 6' 44.02"N	Party Reference No.:	NIL
Longitude:	74° 57' 21.06"E	Reporting Date:	24/12/2021
		Period of Analysis:	20/12/2021 - 24/12/2021
		Receipt Date:	20/12/2021

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Gehri Boghi
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	: VEL/RDS/05 & VEL/FPS/05
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 17/12/2021 to 18/12/2021
Time of Monitoring	: 10:33 AM – 10:33 AM
Ambient Temperature (°C)	: Min. 08°C Max. 23°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182 & CPCB Guideline
Parameter Required	: As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [@] Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	49.11	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	89.75	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	18.06	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	8.42	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.73	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	9.75	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	19.34	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards: Schedule-VII. [Rule 3 (3B)], [Part-II-sec.-3(i)]18,11,2009
SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

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Test Report

Sample Number: VEL/HPCL/AA/11 **Report No.:** VEL/AA/2112/20/011
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. **Format No.:** 7.8 F-01
Village Nasibpura, Bhatinda Punjab **Party Reference No.:** NIL
Latitude: 30° 3' 45.41"N **Reporting Date:** 24/12/2021
Longitude: 75° 4' 6.08"E **Period of Analysis:** 20/12/2021 - 24/12/2021
Receipt Date: 20/12/2021

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/06 & VEL/FPS/06
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 17/12/2021 to 18/12/2021
Time of Monitoring : 10:45 AM – 10:45 AM
Ambient Temperature (°C) : Min. 08°C Max. 23°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	46.98	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	87.26	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	16.88	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	7.29	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.79	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	6.68	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	17.84	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec -3(i)]18,11 2009
SOP- Laboratory Standard Operating Procedure. **BDL- Below Detection Limit, *DL- Detection Limit

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Test Report

Sample Number: VEL/HPCL/AA/12
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab
Report No.: VEL/AA/2112/20/012
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 24/12/2021
Period of Analysis: 20/12/2021 - 24/12/2021
Receipt Date: 20/12/2021
Latitude: 30° 6' 48.99"N
Longitude: 75° 4' 54.51"E

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/04 & VEL/FPS/04
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 17/12/2021 to 18/12/2021
Time of Monitoring : 10:58 AM – 10:58 AM
Ambient Temperature (°C) : Min. 08°C Max. 23°C
Surrounding Activity : Human & Vehicular Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No
Sampling & Analysis Protocol : IS-5182 & CPCB Guideline
Parameter Required : As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2.5})	"SOP No. VEL/SOP/01, Section No. SP 63	48.56	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	87.23	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	19.17	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	8.34	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.82	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS: 11255(P-6) Indo Phenol Blue Method	7.06	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	17.89	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 18.11.2009
SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

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Test Report

Sample Number: VEL/HPCL/AN/01 **Report No.:** VEL/AN/2112/20/001
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab **Format No.:** 7.8 F-01
Party Reference No.: NIL
Reporting Date: 24/12/2021
Receipt Date: 20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Near Project Site
Latitude : 30° 3' 13.34"N
Longitude : 75° 0' 41.57"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/01
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 15/12/2021 to 16/12/2021
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement 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

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.	Lmax	IS 9989 R-2014	73.4	64.7	dB(A)
2.	Lmin	IS 9989 R-2014	52.8	43.5	dB(A)
3.	Leq	IS 9989 R-2014	63.70	55.80	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/HPCL/AN/02 Report No.: VEL/AN/2112/20/002
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 24/12/2021
Receipt Date: 20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Jiwan Singh Wala
Latitude : 30° 3' 37.63"N
Longitude : 75° 2' 75.30"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/02
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 15/12/2021 to 16/12/2021
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement 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

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.	Lmax	IS 9989 R-2014	58.4	49.3	dB(A)
2.	Lmin	IS 9989 R-2014	38.7	32.5	dB(A)
3.	Leq	IS 9989 R-2014	47.10	40.30	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/HPCL/AN/03	Report No.:	VEL/AN/2112/20/003
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	24/12/2021
		Receipt Date:	20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Maanwala
Latitude	: 30° 2' 33.23"N
Longitude	: 75° 58' 6.88"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/04
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 15/12/2021 to 16/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Cement 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

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.	Lmax	IS 9989 R-2014	60.8	53.5	dB(A)
2.	Lmin	IS 9989 R-2014	37.1	31.4	dB(A)
3.	Leq	IS 9989 R-2014	48.70	38.12	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/HPCL/AN/04 Report No.: VEL/AN/2112/20/004
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 24/12/2021
Receipt Date: 20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Mahi Nangal
Latitude : 30° 1' 13.05"N
Longitude : 75° 1' 3.89"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/03
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 15/12/2021 to 16/12/2021
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement 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

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.	Lmax	IS 9989 R-2014	59.5	53.1	dB(A)
2.	Lmin	IS 9989 R-2014	35.9	31.6	dB(A)
3.	Leq	IS 9989 R-2014	46.80	39.60	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/HPCL/AN/05	Report No.:	VEL/AN/2112/20/005
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	24/12/2021
		Receipt Date:	20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Leleana
Latitude	: 29° 59' 40.64"N
Longitude	: 75° 1' 17.61"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/02
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 16/12/2021 to 17/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Rail 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

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.	Lmax	IS 9989 R-2014	62.5	47.9	dB(A)
2.	Lmin	IS 9989 R-2014	38.7	30.6	dB(A)
3.	Leq	IS 9989 R-2014	49.36	38.51	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/HPCL/AN/06 Report No.: VEL/AN/2112/20/006
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 24/12/2021
Receipt Date: 20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Baghi Bandar
Latitude : 30° 1' 27.46"N
Longitude : 75° 4' 8.62"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/03
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 16/12/2021 to 17/12/2021
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Rail 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

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.	Lmax	IS 9989 R-2014	55.6	48.6	dB(A)
2.	Lmin	IS 9989 R-2014	34.9	31.9	dB(A)
3.	Leq	IS 9989 R-2014	45.15	39.25	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/HPCL/AN/07 Report No.: VEL/AN/2112/20/007
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 24/12/2021
Receipt Date: 20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Nasibpura
Latitude : 30° 4' 34.79"N
Longitude : 74° 59' 57.45"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/01
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 16/12/2021 to 17/12/2021
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement 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

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.	Lmax	IS 9989 R-2014	59.7	46.3	dB(A)
2.	Lmin	IS 9989 R-2014	37.1	29.4	dB(A)
3.	Leq	IS 9989 R-2014	46.50	36.40	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/HPCL/AN/08	Report No.:	VEL/AN/2112/20/008
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	24/12/2021
		Receipt Date:	20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Kotbhara
Latitude	: 30° 5' 40.22"N
Longitude	: 75° 4' 5.30"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/04
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 16/12/2021 to 17/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Cement 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

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.	Lmax	IS 9989 R-2014	54.1	44.9	dB(A)
2.	Lmin	IS 9989 R-2014	35.3	28.2	dB(A)
3.	Leq	IS 9989 R-2014	45.10	37.60	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	--	55.00	45.00	dB(A)

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

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Vardan EnviroLab

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

Sample Number: VEL/HPCL/AN/09 Report No.: VEL/AN/2112/20/009
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Village Nasibpura, Bhatinda Punjab Party Reference No.: NIL
Reporting Date: 24/12/2021
Receipt Date: 20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Kot Kashmir
Latitude : 30° 6' 34.53"N
Longitude : 75° 0' 23.67"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/02
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 17/12/2021 to 18/12/2021
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement 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

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.	Lmax	IS 9989 R-2014	56.3	47.2	dB(A)
2.	Lmin	IS 9989 R-2014	35.7	30.6	dB(A)
3.	Leq	IS 9989 R-2014	46.20	37.30	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/HPCL/AN/10 **Report No.:** VEL/AN/2112/20/010
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. **Format No.:** 7.8 F-01
Village Nasibpura, Bhatinda Punjab **Party Reference No.:** NIL
Reporting Date: 24/12/2021
Receipt Date: 20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by : Vardan EnviroLab Representative
Sampling Location : Gehri Boghi
Latitude : 30° 6' 44.02"N
Longitude : 74° 57' 21.06"E
Instrument Used : Sound Level Meter
Instrument Code : VEL/S/SLM/01
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 17/12/2021 to 18/12/2021
Time of Monitoring : 06:00 AM to 06:00AM
Surrounding Activity : Human, Vehicular and Cement 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

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.	Lmax	IS 9989 R-2014	53.7	44.5	dB(A)
2.	Lmin	IS 9989 R-2014	34.2	26.9	dB(A)
3.	Leq	IS 9989 R-2014	43.90	35.10	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/HPCL/AN/11	Report No.:	VEL/AN/2112/20/011
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	24/12/2021
		Receipt Date:	20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Chathewala
Latitude	: 30° 3' 45.41"N
Longitude	: 75° 4' 6.08"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/04
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 17/12/2021 to 18/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Cement 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

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.	Lmax	IS 9989 R-2014	57.3	45.7	dB(A)
2.	Lmin	IS 9989 R-2014	36.3	27.6	dB(A)
3.	Leq	IS 9989 R-2014	47.16	36.81	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/HPCL/AN/12	Report No.:	VEL/AN/2112/20/012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
		Reporting Date:	24/12/2021
		Receipt Date:	20/12/2021

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Fatta
Latitude	: 30° 6' 48.99"N
Longitude	: 75° 4' 54.51"E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/03
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 17/12/2021 to 18/12/2021
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Cement 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

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.	Lmax	IS 9989 R-2014	54.2	44.9	dB(A)
2.	Lmin	IS 9989 R-2014	33.8	30.1	dB(A)
3.	Leq	IS 9989 R-2014	46.37	36.17	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/HPCL/W/01	Report No.:	VEL/W/2112/20/001
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 3' 13.34" N	Party Reference No.:	NIL
Longitude:	75° 0' 41.57" E	Reporting Date:	24/12/2021
Sample Description:	Ground Water Sample	Period of Analysis:	20/12/2021 – 24/12/2021
Sample Location:	Near Project Site	Receipt Date:	20/12/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	15/12/2021
Parameter Required	As per work order	Sampling Quantity:	2.0 Ltr + 200 ml
Sampling & Analysis Protocol:	IS-3025, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

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)	APHA .4500-H ⁺ B Electrometric Method	7.53	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	285.30	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	81.79	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	236.83	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B. Argentometric Method	53.96	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	19.74	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C. Gravimetric Method	663.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E. Turbidimetric Method	29.76	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F D. SPADNS Method	0.79	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) Chromotropic Method	7.38	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [@]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [@]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample No.: VEL/HPCL/W/01				Report No.: VEL/W/2112/20/001		
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	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.3 l	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation ^①
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1105	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	23.14	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.6	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

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

^①Amendment 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)

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Test Report

Sample Number:	VEL/HPCL/W/02	Report No.:	VEL/W/2112/20/002
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 3' 37.63" N	Party Reference No.:	NIL
Longitude:	75° 2' 75.30" E	Reporting Date:	24/12/2021
Sample Description:	Ground Water Sample	Period of Analysis:	20/12/2021 – 24/12/2021
Sample Location:	Jiwan Singh Wala	Receipt Date:	20/12/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	15/12/2021
Parameter Required	As per work order	Sampling Quantity:	2.0 Ltr + 200 ml
Sampling & Analysis Protocol:	IS-3025, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated VEL/W/2107/02/001

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)	APHA .4500-H ⁺ B Electrometric Method	7.43	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B, Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B, Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B . Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C, EDTA Titrimetric Method	178.40	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B, EDTA Titrimetric Method	49.37	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	162.89	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl ⁻ B, Argentometric Method	35.48	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B, Calculation Method	13.42	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C, Gravimetric Method	416.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E, Turbidimetric Method	16.84	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F ⁻ D, SPADNS Method	0.79	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	9.12	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.01 mg/l)	mg/l	1.0 [@]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.01 mg/l)	mg/l	0.5	2.4 [@]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample No.: VEL/HPCL/W/02

Report No.: VEL/W/2112/20/002

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	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	Annex K. IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.43	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation ^(a)
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	693	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	19.7	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	4.8	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

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

^(a)Amendment No.1 in June .2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

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Test Report

Sample Number:	VEL/HIPCL/W/03	Report No.:	VEL/W/2112/20/003
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 2' 33.23" N	Party Reference No.:	NIL
Longitude:	75° 58' 6.88" E	Reporting Date:	24/12/2021
Sample Description:	Ground Water Sample	Period of Analysis:	20/12/2021 – 24/12/2021
Sample Location:	Maanwala	Receipt Date:	20/12/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	15/12/2021
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr + 200 ml
Sampling & Analysis Protocol:	IS-3025, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

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)	APHA .4500-H ⁺ B Electrometric Method	7.38	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	219.80	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	81.57	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	201.26	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	64.58	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	3.95	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	546.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	63.47	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F ⁻ D. SPADNS Method	0.87	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	8.26	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [@]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [@]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample No.: VEL/HPCL/W/03					Report No.: VEL/W/2112/20/003	
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	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.37	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation ^(a)
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	910	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	20.5	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	3.9	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

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

^(a)Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No.2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

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Test Report

Sample Number:	VEL/HPCL/W/04	Report No.:	VEL/W/2112/20/004
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 1' 13.05" N	Party Reference No.:	NIL
Longitude:	75° 1' 3.89" E	Reporting Date:	24/12/2021
Sample Description:	Ground Water Sample	Period of Analysis:	20/12/2021 – 24/12/2021
Sample Location:	Mahi Nangal	Receipt Date:	20/12/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	15/12 /2021
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr + 200 ml
Sampling & Analysis Protocol:	IS-3025, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

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)	APHA .4500-H' B Electrometric Method	7.73	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	197.10	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	56.89	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA , 2320 B. Titrimetric Method	186.14	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl' B. Argentometric Method	45.23	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	13.40	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	489.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E. Turbidimetric Method	32.47	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F' D. SPADNS Method	0.63	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	7.28	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [@]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [@]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample No.: VEL/HPCL/W/04

Report No.: VEL/W/2112/20/004

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	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	Annex K. IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.33	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation ^(a)
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	815	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA. 3500 Na B Flame Photometric Method	25.1	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.6	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

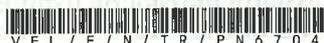
Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit.

^(a)Amendment No.1 in June 2015 (Limits of Iron & Arsenic) and Amendment No 2 in Sept. 2018(Limit of Boron & IS method of Total Coliform & E.Coli)

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Test Report

Sample Number:	VEL/HPCL/W/05	Report No.:	VEL/W/2112/20/005
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 6' 34.53" N	Party Reference No.:	NIL
Longitude:	75° 0' 23.67" E	Reporting Date:	24/12/2021
Sample Description:	Ground Water Sample	Period of Analysis:	20/12/2021 – 24/12/2021
Sample Location:	Kot Kashmir	Receipt Date:	20/12/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	16/12/2021
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr + 200 ml
Sampling & Analysis Protocol:	IS-3025, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

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)	APHA .4500-H ⁺ B Electrometric Method	7.66	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	252.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	78.61	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	238.56	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	65.49	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	13.57	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	626.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA . 4500 E. Turbidimetric Method	59.31	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F ⁻ D. SPADNS Method	0.82	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	8.65	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [@]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [@]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample No.: **VEL/HPCL/W/05**

Report No.: **VEL/W/2112/20/005**

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	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	Annex K. IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.45	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation ^(a)
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1043	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	23.7	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.2	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

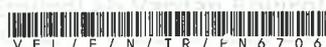
Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit.

^aAmendment 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)

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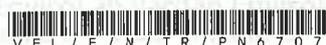
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Test Report

Sample Number:	VEL/HPCL/W/06	Report No.:	VEL/W/2112/20/006
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 4' 34.79" N	Party Reference No.:	NIL
Longitude:	74° 59' 57.45" E	Reporting Date:	24/12/2021
Sample Description:	Ground Water Sample	Period of Analysis:	20/12/2021 – 24/12/2021
Sample Location:	Nasibpura	Receipt Date:	20/12/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	16/12/2021
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr + 200 ml
Sampling & Analysis Protocol:	IS-3025, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

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)	APHA ,4500-H ⁺ B Electrometric Method	7.35	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B . Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	204.80	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	68.45	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	217.68	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	61.27	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	8.26	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	567.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E. Turbidimetric Method	45.23	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F- D. SPADNS Method	0.65	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) .Chromotropic Method	8.03	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [@]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [@]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample No.: VEL/HPCL/W/06

Report No.: VEL/W/2112/20/006

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	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	Annex K. IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.46	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation [®]
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	945	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	26.8	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.9	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

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

[®]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)

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Vardan EnviroLab

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

Sample Number:	VEL/HPCL/W/07	Report No.:	VEL/W/2112/20/007
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 1' 27.46" N	Party Reference No.:	NIL
Longitude:	75° 4' 8.62" E	Reporting Date:	24/12/2021
Sample Description:	Ground Water Sample	Period of Analysis:	20/12/2021 – 24/12/2021
Sample Location:	Baghi Bandar	Receipt Date:	20/12/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	16/12/2021
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr + 200 ml
Sampling & Analysis Protocol:	IS-3025, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

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)	APHA .4500-H ⁺ B Electrometric Method	7.44	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0 Hazen)	Hazen	5	15
3.	Turbidity	APHA. 2130 B. Nephelometric Method	*BDL (**DL 1.0 NTU)	NTU	1	5
4.	Odour	APHA. 2150 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA . 2160 B. Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA . 2340 C. EDTA Titrimetric Method	293.00	mg/l	200	600
7.	Calcium as Ca	APHA. 3500 Ca B. EDTA Titrimetric Method	96.34	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA . 2320 B. Titrimetric Method	319.51	mg/l	200	600
9.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	82.73	mg/l	250	1000
10.	Cyanide as CN	IS:3025 (P-27)	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B. Calculation Method	12.79	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	715.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA , 4500 E. Turbidimetric Method	64.59	mg/l	200	400
14.	Fluoride as F	APHA . 4500-F ⁻ D. SPADNS Method	0.83	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	8.71	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	1.0 [@]	No relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.5	2.4 [@]
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample No.: **VEL/HPCL/W/07**

Report No.: **VEL/W/2112/20/007**

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	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.0004 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	Annex K. IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.51	mg/l	5	15
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002 mg/l)	mg/l	0.01	No Relaxation ^(*)
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005 mg/l)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1192	µS/cm	--	--
32.	Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	31.4	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	8.6	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note: - This Report Complies as per IS 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit.

^(*)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)

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

Sample Number:	VEL/HPCL/W/08	Report No.:	VEL/W/2112/20/008
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 6' 48.99" N	Party Reference No.:	NIL
Longitude:	75° 4' 54.51" E	Reporting Date:	24/12/2021
Sample Description:	Surface Water Sample	Period of Analysis:	20/12/2021 – 24/12/2021
Sample Location:	Kot Fatta	Receipt Date:	20/12/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	17/12/2021
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr + 200 ml
Sampling & Analysis Protocol:	IS 3025, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA .4500-H ⁺ B Electrometric Method	7.67	--
2.	Colour	APHA .2120 B. Visual Comparison Method	*BDL (**DL 1.0Hazen)	Hazen
3.	Turbidity	APHA. 2130 B. Nephelometric Method	25	NTU
4.	Odour	APHA. 2150 B . Threshold Test Method	Agreeable	--
5.	Taste	APHA . 2160 B. Threshold Test Method	None	--
6.	Chloride as Cl	APHA. 4500-Cl ⁻ B. Argentometric Method	64.18	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	708	µS/cm
8.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	12.44	mg/l
9.	Iron as Fe	APHA , 3500-Fe B 1.10 Phenanthroline Method	0.21	mg/l
10.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	425.00	mg/l
11.	Lead as Pb	APHA , 3111 B. Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12.	Boron	APHA. 4500B C, Carmine Method	0.16	mg/l
13.	Sulphate as SO ⁴	APHA . 4500 E. Turbidimetric Method	14.25	mg/l
14.	Fluoride as F	APHA . 4500-F ⁻ D. SPADNS Method	0.51	mg/l
15.	BOD (3 Days at 27°C)	APHA. 5210 C / IS 3025.P-44	6.70	mg/l
16.	COD	APHA. 5220 B. Open Reflux Method	25.00	mg/l
17.	Free Ammonia as NH ₃	IS 3025 (P-34) . Titrimetric Method	10.23	mg/l
18.	Total Coliform	IS 1622	26	MPN/100ml
19.	Arsenic as As	APHA . 3114 B. Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

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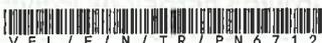
Test Report

Sample No.: VEL/HPCL/W/08			Report No.: VEL/W/2112/20/008	
S. No.	Parameter	Test-Method	Result	Unit
20.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	161.00	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	57.62	mg/l
22.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	174.16	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	4.19	mg/l
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	2.8	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	72.16	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	27.38	mg/l
27.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l

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

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Test Report

Sample Number:	VEL/HPCL/W/09	Report No.:	VEL/W/2112/20/009
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
Latitude:	30° 3' 45.41" N	Party Reference No.:	NIL
Longitude:	75° 4' 6.08" E	Reporting Date:	24/12/2021
Sample Description:	Surface Water Sample	Period of Analysis:	20/12/2021 – 24/12/2021
Sample Location:	Chathewala	Receipt Date:	20/12/2021
Sample Collected by:	Vardan EnviroLab Representative	Sampling Date:	17/12/2021
Parameter Required	As per Client Requirement	Sampling Quantity:	2.0 Ltr + 200 ml
Sampling & Analysis Protocol:	IS 3025, APHA	Sampling Type:	Garb
		Preservation:	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.82	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	21	NTU
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--
5.	Taste	APHA , 2160 B, Threshold Test Method	None	--
6.	Chloride as Cl ⁻	APHA, 4500-Cl ⁻ B, Argentometric Method	55.19	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	872	µS/cm
8.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	7.15	mg/l
9.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.25	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	523.00	mg/l
11.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
12.	Boron	APHA, 4500B C, Carmine Method	0.13	mg/l
13.	Sulphate as SO ⁴	APHA , 4500 E, Turbidimetric Method	24.72	mg/l
14.	Fluoride as F ⁻	APHA , 4500-F ⁻ D, SPADNS Method	0.41	mg/l
15.	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025,P-44	5.80	mg/l
16.	COD	APHA, 5220 B, Open Reflux Method	27.00	mg/l
17.	Free Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	8.75	mg/l
18.	Total Coliform	IS 1622	25	MPN/100ml
19.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

ARJUN BAWAT
(Checked By)

VARDAN ENVIROLAB
Dr Shiv
Approved By
Singh
Authorized Signatory

VARDAN ENVIRO
Mohamed Shafi
Technical Manager
Authorized Signatory



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Vardan EnviroLab

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Test Report

Sample No.: VEL/HPCL/W/09			Report No.: VEL/W/2112/20/009	
S. No.	Parameter	Test-Method	Result	Unit
20.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	167.00	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	56.43	mg/l
22.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	189.15	mg/l
23.	Magnesium as Mg	APHA . 3500 Mg B, Calculation Method	6.37	mg/l
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	3.15	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	76.32	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	22.57	mg/l
27.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l

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

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

Sample Number: VEL/HPCL/S/01
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab

Latitude: 30° 3' 13.34"N
Longitude: 75° 0' 41.57"E

Sample Description: Soil Sample
Sampling Location: Near Project Site
Sample Collected by: Vardan Enviro Lab Team
Sampling & Analysis Protocol: IS 2720, USEPA & SOP

Report No.: VEL/S/2112/20/001
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 24/12/2021
Period of Analysis: 20/12/2021 - 24/12/2021
Receipt Date: 20/12/2021
Sampling Date: 15/12/2021
Type of Sampling: Composite
Sampling Quantity: 2.0 Kg
Packing Status: Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.81	--
2.	Conductivity	IS:14767 by Conductivity meter	0.322	mS/cm
3.	Soil Texture	SOP, SP-87, Issue No -01 & Issue Date-14/02/2013	Silty	--
4.	Color	SOP, SP-78, Issue No -01 & Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP, SP-81, Issue No -01 & Issue Date-14/02/2013	33.15	%
6.	Bulk density	SOP, SP-80, Issue No -01 & Issue Date-14/02/2013	1.24	gm/cc
7.	Chloride as Cl	SOP, SP-85, Issue No -01 & Issue Date-14/02/2013	54.61	mg/100g
8.	Calcium as Ca	SOP, SP-82, Issue No -01 & Issue Date-14/02/2013	34.53	mg/100g
9.	Sodium as Na	SOP, SP-84, Issue No -01 & Issue Date-14/02/2013	37.13	mg/kg
10.	Potassium as K	SOP, SP-84, Issue No -01 & Issue Date-14/02/2013	131.46	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.95	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.87	%
13.	Magnesium as Mg	SOP, SP-83, Issue No -01 & Issue Date-14/02/2013	16.22	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	192.15	kg/hect.
15.	Available Phosphorus	SOP, SP-86, Issue No -01 & Issue Date-14/02/2013	15.87	kg/hect.
16.	Zinc (as Zn)	SOP, SP-86, Issue No -01	9.64	mg/kg
17.	Organic Carbon	USEPA 3050B	0.48	%
18.	Lead (as Pb)	USEPA 3050B	0.76	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.63	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.78	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.04	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.32	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP, SP-79, Issue No -01 & Issue Date-14/02/2013	13.7	%

Note: SOP-Standard Operating Procedure.

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Test Report

Sample Number:	VEL/HPCL/S/02	Report No.:	VEL/S/2112/20/002
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30° 3' 37.63"N	Reporting Date:	24/12/2021
Longitude:	75° 2' 75.30"E	Period of Analysis :	20/12/2021 - 24/12/2021
Sample Description:	Soil Sample	Receipt Date:	20/12/2021
Sampling Location:	Jiwan Singh Wala	Sampling Date:	15/12/2021
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.62	--
2.	Conductivity	IS:14767 by Conductivity meter	0.321	mS/cm
3.	Soil Texture	SOP , SP-87.Issue No -01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81.Issue No -01& Issue Date-14/02/2013	30.26	%
6.	Bulk density	SOP , SP-80.Issue No -01& Issue Date-14/02/2013	1.18	gm/cc
7.	Chloride as Cl	SOP , SP-85.Issue No -01& Issue Date-14/02/2013	43.21	mg/100g
8.	Calcium as Ca	SOP , SP-82.Issue No -01& Issue Date-14/02/2013	35.13	mg/100g
9.	Sodium as Na	SOP , SP-84.Issue No -01& Issue Date-14/02/2013	46.71	mg/kg
10.	Potassium as K	SOP , SP-84.Issue No -01& Issue Date-14/02/2013	142.05	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.39	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.85	%
13.	Magnesium as Mg	SOP , SP-83.Issue No -01& Issue Date-14/02/2013	23.15	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	221.00	kg/hect.
15.	Available Phosphorus	SOP , SP-86.Issue No -01& Issue Date-14/02/2013	16.34	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86.Issue No -01	9.86	mg/kg
17.	Organic Carbon	USEPA 3050B	0.55	%
18.	Lead (as Pb)	USEPA 3050B	0.74	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.39	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.57	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.34	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79.Issue No -01& Issue Date-14/02/2013	10.9	%

Note: SOP-Standard Operating Procedure, ^Due to Additional Parameter.

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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: VEL/HIPCL/S/03
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab

Latitude: 30° 2' 33.23"N
Longitude: 75° 58' 6.88"E

Sample Description: Soil Sample
Sampling Location: Maanwala
Sample Collected by: Vardan Enviro Lab Team
Sampling & Analysis Protocol: IS 2720, USEPA & SOP
Packing Status: Temp Sealed

Report No.: VEL/S/2112/20/003
Format No.: 7.8 F-01
Party Reference No.: NIL

Reporting Date: 24/12/2021
Period of Analysis: 20/12/2021 - 24/12/2021
Receipt Date: 20/12/2021
Sampling Date: 15/12/2021
Type of Sampling: Composite
Sampling Quantity: 2.0 Kg
Depth of Sampling: Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.72	--
2.	Conductivity	IS.14767 by Conductivity meter	0.317	mS/cm
3.	Soil Texture	SOP . SP-87,Issue No -01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP . SP-78,Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP . SP-81,Issue No -01& Issue Date-14/02/2013	30.65	%
6.	Bulk density	SOP . SP-80,Issue No -01& Issue Date-14/02/2013	1.34	gm/cc
7.	Chloride as Cl	SOP . SP-85,Issue No -01& Issue Date-14/02/2013	41.62	mg/100g
8.	Calcium as Ca	SOP . SP-82,Issue No -01& Issue Date-14/02/2013	62.18	mg/100g
9.	Sodium as Na	SOP . SP-84,Issue No -01& Issue Date-14/02/2013	55.37	mg/kg
10.	Potassium as K	SOP . SP-84,Issue No -01& Issue Date-14/02/2013	136.76	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.31	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.65	%
13.	Magnesium as Mg	SOP . SP-83,Issue No -01& Issue Date-14/02/2013	20.16	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	219.74	kg/hect.
15.	Available Phosphorus	SOP . SP-86,Issue No -01& Issue Date-14/02/2013	24.02	kg/hect.
16.	Zinc (as Zn)	SOP . SP-86,Issue No -01	12.48	mg/kg
17.	Organic Carbon	USEPA 3050B	0.35	%
18.	Lead (as Pb)	USEPA 3050B	0.57	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.73	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.45	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.08	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.44	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP . SP-79,Issue No -01& Issue Date-14/02/2013	15.8	%

Note: SOP-Standard Operating Procedure

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Vardan EnviroLab

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Test Report

Sample Number:	VEL/HPCL/S/04	Report No.:	VEL/S/2112/20/004
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30° 1' 13.05"N	Reporting Date:	24/12/2021
Longitude:	75° 1' 3.89"E	Period of Analysis :	20/12/2021 - 24/12/2021
Sample Description:	Soil Sample	Receipt Date:	20/12/2021
Sampling Location:	Mahi Nangal	Sampling Date:	15/12/2021
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	Temp Sealed VEL/S/2107/02/001

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.65	--
2.	Conductivity	IS:14767 by Conductivity meter	0.336	mS/cm
3.	Soil Texture	SOP , SP-87.Issue No -01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81.Issue No -01& Issue Date-14/02/2013	31.28	%
6.	Bulk density	SOP , SP-80.Issue No -01& Issue Date-14/02/2013	1.25	gm/cc
7.	Chloride as Cl	SOP , SP-85.Issue No -01& Issue Date-14/02/2013	51.76	mg/100g
8.	Calcium as Ca	SOP , SP-82.Issue No -01& Issue Date-14/02/2013	41.24	mg/100g
9.	Sodium as Na	SOP , SP-84.Issue No -01& Issue Date-14/02/2013	61.58	mg/kg
10.	Potassium as K	SOP , SP-84.Issue No -01& Issue Date-14/02/2013	140.16	kg/hect
11.	Iron as Fe	USEPA 3050B	2.85	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13.	Magnesium as Mg	SOP , SP-83.Issue No -01& Issue Date-14/02/2013	31.87	mg/100g
14.	Available Nitrogen as N	IS 14684 Distillation Method	212.00	kg/hect
15.	Available Phosphorus	SOP , SP-86.Issue No -01& Issue Date-14/02/2013	20.43	kg/hect
16.	Zinc (as Zn)	SOP , SP-86.Issue No -01	7.35	mg/kg
17.	Organic Carbon	USEPA 3050B	0.44	%
18.	Lead (as Pb)	USEPA 3050B	0.63	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.40	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.47	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.81	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79.Issue No -01& Issue Date-14/02/2013	17.3	%

Note: SOP-Standard Operating Procedure

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Test Report

Sample Number:	VEL/HPCL/S/05	Report No.:	VEL/S/2112/20/005
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	29° 59' 40.64"N	Reporting Date:	24/12/2021
Longitude:	75° 1' 17.61"E	Period of Analysis :	20/12/2021 - 24/12/2021
Sample Description:	Soil Sample	Receipt Date:	20/12/2021
Sampling Location:	Leleana	Sampling Date:	16/12/2021
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	Temp Sealed VEL/S/2107/02/001

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.72	--
2.	Conductivity	IS: 14767 by Conductivity meter	0.345	mS/cm
3.	Soil Texture	SOP , SP-87.Issue No -01 & Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78.Issue No -01 & Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81.Issue No -01 & Issue Date-14/02/2013	25.16	%
6.	Bulk density	SOP , SP-80.Issue No -01 & Issue Date-14/02/2013	1.20	gm/cc
7.	Chloride as Cl	SOP , SP-85.Issue No -01 & Issue Date-14/02/2013	61.54	mg/100g
8.	Calcium as Ca	SOP , SP-82.Issue No -01 & Issue Date-14/02/2013	43.21	mg/100g
9.	Sodium as Na	SOP , SP-84.Issue No -01 & Issue Date-14/02/2013	51.74	mg/kg
10.	Potassium as K	SOP , SP-84.Issue No -01 & Issue Date-14/02/2013	156.86	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.64	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.84	%
13.	Magnesium as Mg	SOP , SP-83.Issue No -01 & Issue Date-14/02/2013	27.53	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	241.00	kg /hect.
15.	Available Phosphorus	SOP , SP-86.Issue No -01 & Issue Date-14/02/2013	24.53	kg /hect.
16.	Zinc (as Zn)	SOP , SP-86.Issue No -01	8.51	mg/kg
17.	Organic Carbon	USEPA 3050B	0.45	%
18.	Lead (as Pb)	USEPA 3050B	0.88	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.81	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.75	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.13	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.44	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79.Issue No -01 & Issue Date-14/02/2013	15.3	%

Note: SOP-Standard Operating Procedure.

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Test Report

Sample Number:	VEL/HPCL/S/06	Report No.:	VEL/S/2112/20/006
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30° 1' 27.46"N	Reporting Date:	24/12/2021
Longitude:	75° 4' 8.62"E	Period of Analysis :	20/12/2021 - 24/12/2021
Sample Description:	Soil Sample	Receipt Date:	20/12/2021
Sampling Location:	Baghi Bandar	Sampling Date:	16/12/2021
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.61	--
2.	Conductivity	IS:14767 by Conductivity meter	0.322	mS/cm
3.	Soil Texture	SOP , SP-87.Issue No -01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81.Issue No -01& Issue Date-14/02/2013	40.56	%
6.	Bulk density	SOP , SP-80.Issue No -01& Issue Date-14/02/2013	1.18	gm/cc
7.	Chloride as Cl	SOP , SP-85.Issue No -01& Issue Date-14/02/2013	51.26	mg/100g
8.	Calcium as Ca	SOP , SP-82.Issue No -01& Issue Date-14/02/2013	46.78	mg/100g
9.	Sodium as Na	SOP , SP-84.Issue No -01& Issue Date-14/02/2013	52.15	mg/kg
10.	Potassium as K	SOP , SP-84.Issue No -01& Issue Date-14/02/2013	163.72	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.27	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.78	%
13.	Magnesium as Mg	SOP , SP-83.Issue No -01& Issue Date-14/02/2013	37.02	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	243.00	kg/hect.
15.	Available Phosphorus	SOP , SP-86.Issue No -01& Issue Date-14/02/2013	24.67	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86.Issue No -01	9.58	mg/kg
17.	Organic Carbon	USEPA 3050B	0.46	%
18.	Lead (as Pb)	USEPA 3050B	0.69	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.47	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.45	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.38	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79.Issue No -01& Issue Date-14/02/2013	18.4	%

Note: SOP-Standard Operating Procedure

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Test Report

Sample Number: VEL/HPCL/S/07
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab

Latitude: 30° 4' 34.79"N
Longitude: 74° 59' 57.45"E

Sample Description: Soil Sample
Sampling Location: Nasibpura
Sample Collected by: Vardan Enviro Lab Team
Sampling & Analysis Protocol: IS 2720, USEPA & SOP
Packing Status: Temp Sealed

Report No.: VEL/S/2112/20/007
Format No.: 7.8 F-01
Party Reference No.: NIL

Reporting Date: 24/12/2021
Period of Analysis : 20/12/2021 - 24/12/2021
Receipt Date: 20/12/2021
Sampling Date: 16/12/2021
Type of Sampling: Composite
Sampling Quantity: 2.0 Kg
Depth of Sampling: 30 cm

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.66	--
2.	Conductivity	IS:14767 by Conductivity meter	0.342	mS/cm
3.	Soil Texture	SOP . SP-87,Issue No -01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP . SP-78,Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP . SP-81,Issue No -01& Issue Date-14/02/2013	49.51	%
6.	Bulk density	SOP . SP-80,Issue No -01& Issue Date-14/02/2013	1.26	gm/cc
7.	Chloride as Cl	SOP . SP-85,Issue No -01& Issue Date-14/02/2013	47.84	mg/100g
8.	Calcium as Ca	SOP . SP-82,Issue No -01& Issue Date-14/02/2013	70.29	mg/100g
9.	Sodium as Na	SOP . SP-84,Issue No -01& Issue Date-14/02/2013	56.37	mg/kg
10.	Potassium as K	SOP . SP-84,Issue No -01& Issue Date-14/02/2013	125.73	kg/hect.
11.	Iron as Fe	USEPA 3050B	3.76	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.89	%
13.	Magnesium as Mg	SOP . SP-83,Issue No -01& Issue Date-14/02/2013	27.15	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	250.00	kg/hect.
15.	Available Phosphorus	SOP . SP-86,Issue No -01& Issue Date-14/02/2013	29.13	kg/hect.
16.	Zinc (as Zn)	SOP . SP-86,Issue No -01	18.21	mg/kg
17.	Organic Carbon	USEPA 3050B	0.51	%
18.	Lead (as Pb)	USEPA 3050B	0.60	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.74	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.75	mg/kg
21.	Copper (as Cu)	USEPA 3050B	1.98	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.56	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP . SP-79,Issue No -01& Issue Date-14/02/2013	17.9	%

Note: SOP-Standard Operating Procedure.

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Vardan EnviroLab

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Test Report

Sample Number: VEL/IOCL/S/08
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab

Latitude: 30° 5' 40.22"N
Longitude: 75° 4' 5.30"E

Sample Description: Soil Sample
Sampling Location: Kotbhara
Sample Collected by: Vardan Enviro Lab Team
Sampling & Analysis Protocol: IS 2720, USEPA & SOP
Packing Status: Temp Sealed

Report No.: VEL/S/2112/20/008
Format No.: 7.8 F-01
Party Reference No.: NIL

Reporting Date: 24/12/2021
Period of Analysis: 20/12/2021 - 24/12/2021
Receipt Date: 20/12/2021
Sampling Date: 16/12/2021
Type of Sampling: Composite
Sampling Quantity: 2.0 Kg
Depth of Sampling: 30 cm

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 OC)	IS - 2720 (P-26) by pH Meter	7.79	--
2.	Conductivity	IS:14767 by Conductivity meter	0.358	mS/cm
3.	Soil Texture	SOP , SP-87.Issue No -01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81.Issue No -01& Issue Date-14/02/2013	38.24	%
6.	Bulk density	SOP , SP-80.Issue No -01& Issue Date-14/02/2013	1.49	gm/cc
7.	Chloride as Cl	SOP , SP-85.Issue No -01& Issue Date-14/02/2013	42.35	mg/100g
8.	Calcium as Ca	SOP , SP-82.Issue No -01& Issue Date-14/02/2013	48.74	mg/100g
9.	Sodium as Na	SOP , SP-84.Issue No -01& Issue Date-14/02/2013	57.28	mg/kg
10.	Potassium as K	SOP , SP-84.Issue No -01& Issue Date-14/02/2013	131.52	kg/hect
11.	Iron as Fe	USEPA 3050B	1.83	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.56	%
13.	Magnesium as Mg	SOP , SP-83.Issue No -01& Issue Date-14/02/2013	33.15	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	210.68	kg./hect
15.	Available Phosphorus	SOP , SP-86.Issue No -01& Issue Date-14/02/2013	17.83	kg./hect
16.	Zinc (as Zn)	SOP , SP-86.Issue No -01	8.49	mg/kg
17.	Organic Carbon	USEPA 3050B	0.35	%
18.	Lead (as Pb)	USEPA 3050B	0.57	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.69	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.50	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.30	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.84	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79.Issue No -01& Issue Date-14/02/2013	14.9	%

Note: SOP-Standard Operating Procedure

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Test Report

Sample Number:	VEL/IIPCL/S/09	Report No.:	VEL/S/2112/20/009
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30° 6' 34.53"N	Reporting Date:	24/12/2021
Longitude:	75° 0' 23.67"E	Period of Analysis :	20/12/2021 - 24/12/2021
Sample Description:	Soil Sample	Receipt Date:	20/12/2021
Sampling Location:	Kot Kashmir	Sampling Date:	17/12/2021
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.71	--
2.	Conductivity	IS:14767 by Conductivity meter	0.368	mS/cm
3.	Soil Texture	SOP , SP-87.Issue No -01 & Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78.Issue No -01 & Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81.Issue No -01 & Issue Date-14/02/2013	29.12	%
6.	Bulk density	SOP , SP-80.Issue No -01 & Issue Date-14/02/2013	1.69	gm/cc
7.	Chloride as Cl	SOP , SP-85.Issue No -01 & Issue Date-14/02/2013	57.02	mg/100g
8.	Calcium as Ca	SOP , SP-82.Issue No -01 & Issue Date-14/02/2013	38.21	mg/100g
9.	Sodium as Na	SOP , SP-84.Issue No -01 & Issue Date-14/02/2013	44.26	mg/kg
10.	Potassium as K	SOP , SP-84.Issue No -01 & Issue Date-14/02/2013	147.12	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.47	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.49	%
13.	Magnesium as Mg	SOP , SP-83.Issue No -01 & Issue Date-14/02/2013	23.50	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	214.87	kg/hect.
15.	Available Phosphorus	SOP , SP-86.Issue No -01 & Issue Date-14/02/2013	25.31	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86.Issue No -01	8.58	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.88	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.79	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.90	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.84	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.38	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79.Issue No -01 & Issue Date-14/02/2013	16.5	%

Note: SOP-Standard Operating Procedure.

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Vardan EnviroLab

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

Sample Number:	VEL/HPCL/S/10	Report No.:	VEL/S/2112/20/010
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30° 6' 44.02"N	Reporting Date:	24/12/2021
Longitude:	74° 57' 21.06"E	Period of Analysis :	20/12/2021 - 24/12/2021
Sample Description:	Soil Sample	Receipt Date:	20/12/2021
Sampling Location:	Gehri Boghi	Sampling Date:	17/12/2021
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS 2720 (P-26) by pH Meter	7.68	--
2.	Conductivity	IS:14767 by Conductivity meter	0.318	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No -01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP , SP-78,Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No -01& Issue Date-14/02/2013	35.26	%
6.	Bulk density	SOP , SP-80,Issue No -01& Issue Date-14/02/2013	1.91	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No -01& Issue Date-14/02/2013	49.67	mg/100g
8.	Calcium as Ca	SOP , SP-82,Issue No -01& Issue Date-14/02/2013	42.01	mg/100g
9.	Sodium as Na	SOP , SP-84,Issue No -01& Issue Date-14/02/2013	50.16	mg/kg
10.	Potassium as K	SOP , SP-84,Issue No -01& Issue Date-14/02/2013	148.56	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.29	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.77	%
13.	Magnesium as Mg	SOP , SP-83,Issue No -01& Issue Date-14/02/2013	28.05	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	249.08	kg /hect.
15.	Available Phosphorus	SOP , SP-86,Issue No -01& Issue Date-14/02/2013	27.11	kg /hect.
16.	Zinc (as Zn)	SOP , SP-86,Issue No -01	13.58	mg/kg
17.	Organic Carbon	USEPA 3050B	0.52	%
18.	Lead (as Pb)	USEPA 3050B	0.74	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.79	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.54	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.25	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.24	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79,Issue No -01& Issue Date-14/02/2013	14.5	%

Note: SOP-Standard Operating Procedure.

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Vardan EnviroLab

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Test Report

Sample Number: VEL/HPCL/S/11
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Village Nasibpura, Bhatinda Punjab
Report No.: VEL/S/2112/20/011
Format No.: 7.8 F-01
Party Reference No.: NIL
Latitude: 30° 3' 45.41"N
Longitude: 75° 4' 6.08"E
Reporting Date: 24/12/2021
Sample Description: Soil Sample
Period of Analysis : 20/12/2021 - 24/12/2021
Sampling Location: Chathewala
Receipt Date: 20/12/2021
Sample Collected by: Vardan Enviro Lab Team
Sampling Date: 17/12/2021
Sampling & Analysis Protocol: IS 2720 , USEPA & SOP
Type of Sampling: Composite
Packing Status: Temp Sealed
Sampling Quantity: 2.0 Kg
Depth of Sampling: 30 cm

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.81	--
2.	Conductivity	IS:14767 by Conductivity meter	0.295	mS/cm
3.	Soil Texture	SOP . SP-87.Issue No -01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP . SP-78.Issue No -01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP . SP-81.Issue No -01& Issue Date-14/02/2013	21.06	%
6.	Bulk density	SOP . SP-80.Issue No -01& Issue Date-14/02/2013	1.12	gm/cc
7.	Chloride as Cl	SOP . SP-85.Issue No -01& Issue Date-14/02/2013	59.31	mg/100g
8.	Calcium as Ca	SOP . SP-82.Issue No -01& Issue Date-14/02/2013	42.14	mg/100g
9.	Sodium as Na	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	45.87	mg/kg
10.	Potassium as K	SOP . SP-84.Issue No -01& Issue Date-14/02/2013	105.23	kg/hect.
11.	Iron as Fe	USEPA 3050B	2.82	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.65	%
13.	Magnesium as Mg	SOP . SP-83.Issue No -01& Issue Date-14/02/2013	18.23	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	190.15	kg/hect.
15.	Available Phosphorus	SOP . SP-86.Issue No -01& Issue Date-14/02/2013	28.06	kg/hect.
16.	Zinc (as Zn)	SOP . SP-86.Issue No -01	9.84	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.92	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.76	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.06	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.34	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP . SP-79.Issue No -01& Issue Date-14/02/2013	12.6	%

Note: SOP-Standard Operating Procedure

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Vardan EnviroLab

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Test Report

Sample Number:	VEL/HPCL/S/12	Report No.:	VEL/S/2112/20/012
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Format No.:	7.8 F-01
		Party Reference No.:	NIL
Latitude:	30° 6' 48.99"N	Reporting Date:	24/12/2021
Longitude:	75° 4' 54.51"E	Period of Analysis :	20/12/2021 - 24/12/2021
Sample Description:	Soil Sample	Receipt Date:	20/12/2021
Sampling Location:	Kot Fatta	Sampling Date:	17/12/2021
Sample Collected by:	Vardan Enviro Lab Team	Type of Sampling:	Composite
Sampling & Analysis Protocol:	IS 2720 , USEPA & SOP	Sampling Quantity:	2.0 Kg
Packing Status:	Temp Sealed	Depth of Sampling:	30 cm

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 OC)	IS : 2720 (P-26) by pH Meter	7.60	--
2.	Conductivity	IS:14767 by Conductivity meter	0.321	mS/cm
3.	Soil Texture	SOP , SP-87.Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78.Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81.Issue No.-01& Issue Date-14/02/2013	29.34	%
6.	Bulk density	SOP , SP-80.Issue No.-01& Issue Date-14/02/2013	1.20	gm/cc
7.	Chloride as Cl	SOP , SP-85.Issue No.-01& Issue Date-14/02/2013	45.12	mg/100g
8.	Calcium as Ca	SOP , SP-82.Issue No.-01& Issue Date-14/02/2013	59.21	mg/100g
9.	Sodium as Na	SOP , SP-84.Issue No.-01& Issue Date-14/02/2013	48.37	mg/kg
10.	Potassium as K	SOP , SP-84.Issue No.-01& Issue Date-14/02/2013	106.15	kg/hect.
11.	Iron as Fe	USEPA 3050B	3.28	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13.	Magnesium as Mg	SOP , SP-83.Issue No.-01& Issue Date-14/02/2013	21.87	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	197.55	kg/hect.
15.	Available Phosphorus	SOP , SP-86.Issue No.-01& Issue Date-14/02/2013	17.16	kg/hect.
16.	Zinc (as Zn)	SOP , SP-86.Issue No.-01	12.34	mg/kg
17.	Organic Carbon	USEPA 3050B	0.47	%
18.	Lead (as Pb)	USEPA 3050B	0.56	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.74	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.68	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.18	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.39	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g
24.	Moisture Content	SOP , SP-79.Issue No.-01& Issue Date-14/02/2013	14.7	%

Note: SOP-Standard Operating Procedure

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Test Report

Sample Number:	VEL/HPCL/AA/01	Report No.:	VEL/AA/2203/12/001
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-01
Latitude:	30°05'45.69" N	Party Reference No.:	NIL
Longitude:	75°01'00.81" E	Reporting Date:	16/03/2022
		Period of Analysis:	12/03/2022 to 16/03/2022
		Receipt Date:	12/03/2022

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/07 & VEL/FPS/07
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 08/03/2022 to 09/03/2022
Time of Monitoring	: 9:00 AM to 9:00 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°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 [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	51.69	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	92.57	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	22.36	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	10.06	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.74	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	9.41	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	21.64	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

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

SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

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Vardan EnviroLab

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

Sample Number:	VEL/HPCL/AA/02	Report No.:	VEL/AA/2203/12/002
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-01
Latitude:	30°07'91.97" N	Party Reference No.:	NIL
Longitude:	75°00'20.12" E	Reporting Date:	16/03/2022
		Period of Analysis:	12/03/2022 to 16/03/2022
		Receipt Date:	12/03/2022

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/08 & VEL/FPS/08
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 08/03/2022 to 09/03/2022
Time of Monitoring	: 9:30 AM to 9:30 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°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 [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	49.68	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	85.12	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	21.69	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	10.05	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.76	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	8.97	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	19.85	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
* SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit. *DL- Detection Limit

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16/03/22



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

Sample Number: VEL/HPCL/AA/03
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
Latitude: 30°10'19.14" N
Longitude: 75°00'71.02" E

Report No.: VEL/AA/2203/12/003
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 16/03/2022
Period of Analysis: 12/03/2022 to 16/03/2022
Receipt Date: 12/03/2022

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
Sampling Location : Kot Kashmir
Instrument Used : RDS & FPS Sampler with all Accessories
Instrument Code : VEL/RDS/09 & VEL/FPS/09
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 08/03/2022 to 09/03/2022
Time of Monitoring : 10:00 AM to 10:00 AM
Ambient Temperature (°C) : Min. 21.0°C, Max. 39.0°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 [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	46.98	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	87.26	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	15.96	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	8.34	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.71	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	7.69	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	22.65	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

Note :- @ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009.
* SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

ANJU INDOLIA
(Chemist/Analyst)
16/03/22



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Test Report

Sample Number: VEL/HPCL/AA/04 Report No.: VEL/AA/2203/12/004
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-01
Party Reference No.: NIL
Reporting Date: 16/03/2022
Latitude: 30°05'29.86" N Period of Analysis: 12/03/2022 to 16/03/2022
Longitude: 75°06'60.43" E Receipt Date: 12/03/2022

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/10 & VEL/FPS/10
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 08/03/2022 to 09/03/2022
Time of Monitoring : 10:30 AM to 10:30 AM
Ambient Temperature (°C) : Min. 21.0°C, Max. 39.0°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 [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	48.35	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	89.21	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	17.68	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	8.14	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.81	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	7.09	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	20.58	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

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

* SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

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16/03/2022



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Vardan EnviroLab

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

Sample Number: VEL/HPCL/AA/05
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
Latitude: 30°11'08.66" N
Longitude: 75°08'46.58" E

Report No.: VEL/AA/2203/12/005
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 16/03/2022
Period of Analysis: 12/03/2022 to 16/03/2022
Receipt Date: 12/03/2022

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/11 & VEL/FPS/11
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 09/03/2022 to 10/03/2022
Time of Monitoring : 9:00 AM to 9:00 AM
Ambient Temperature (°C) : Min. 21.0°C, Max. 39.0°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 [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	47.39	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	86.24	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	18.43	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	7.97	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.80	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	6.98	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	16.54	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

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

SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

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Test Report

Sample Number:	VEL/HPCL/AA/06	Report No.:	VEL/AA/2203/12/006
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-01
Latitude:	30°02'56.54" N	Party Reference No.:	NIL
Longitude:	75°06'43.21" E	Reporting Date:	16/03/2022
		Period of Analysis:	12/03/2022 to 16/03/2022
		Receipt Date:	12/03/2022

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/12 & VEL/FPS/12
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 09/03/2022 to 10/03/2022
Time of Monitoring	: 9:30 AM to 9:30 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°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 [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	46.52	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	85.24	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	16.27	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	7.32	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.84	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	8.04	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	18.47	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	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

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

Sample Number:	VEL/HPCL/AA/07	Report No.:	VEL/AA/2203/12/007
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-01
Latitude:	30°09'85.19" N	Party Reference No.:	NIL
Longitude:	75°07'07.17" E	Reporting Date:	16/03/2022
		Period of Analysis:	12/03/2022 to 16/03/2022
		Receipt Date:	12/03/2022

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Kotbhara
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/07 & VEL/FPS/07
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 09/03/2022 to 10/03/2022
Time of Monitoring	: 10:00 AM to 10:00 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°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 [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	50.59	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	91.47	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	25.32	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.18	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.86	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	8.08	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	23.10	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	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

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Test Report

Sample Number:	VEL/HPCL/AA/08	Report No.:	VEL/AA/2203/12/008
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-01
Latitude:	30°05'67.90" N	Party Reference No.:	NIL
Longitude:	75°03'50.95" E	Reporting Date:	16/03/2022
		Period of Analysis:	12/03/2022 to 16/03/2022
		Receipt Date:	12/03/2022

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/08 & VEL/FPS/08
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 09/03/2022 to 10/03/2022
Time of Monitoring	: 10:30 AM to 10:30 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°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 [®] Limit
1.	Particulate Matter (PM _{2.5})	*SOP No. VEL/SOP/01, Section No. SP 63	50.49	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	87.12	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	20.41	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	8.19	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.77	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	7.06	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	18.69	µg/m ³	180
11.	Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	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 (Haryana)
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Test Report

Sample Number:	VEL/HPCL/AA/09	Report No.:	VEL/AA/2203/12/009
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-01
Latitude:	30°11'09.27" N	Party Reference No.:	NIL
Longitude:	74°96'10.78" E	Reporting Date:	16/03/2022
		Period of Analysis:	12/03/2022 to 16/03/2022
		Receipt Date:	12/03/2022

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Gehri Boghi
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/09 & VEL/FPS/09
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 10/03/2022 to 11/03/2022
Time of Monitoring	: 9:00 AM to 9:00 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°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 [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	48.52	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	88.41	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	17.36	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.10	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.76	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	8.72	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	18.24	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	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 (Haryana)
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Test Report

Sample Number: VEL/HPCL/AA/10
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab
Latitude: 30°02'11.32" N
Longitude: 75°01'53.33" E

Report No.: VEL/AA/2203/12/010
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 16/03/2022
Period of Analysis: 12/03/2022 to 16/03/2022
Receipt Date: 12/03/2022

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/10 & VEL/FPS/10
Instrument Calibration Status : Calibrated
Meteorological condition during monitoring : Clear Sky
Date of Monitoring : 10/03/2022 to 11/03/2022
Time of Monitoring : 9:30 AM to 9:30 AM
Ambient Temperature (°C) : Min. 21.0°C; Max. 39.0°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 [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	49.25	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	90.62	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	20.36	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	10.48	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.78	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	9.13	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	17.64	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

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

* SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

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Test Report

Sample Number:	VEL/HPCL/AA/11	Report No.:	VEL/AA/2203/12/011
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-01
Latitude:	30°03'74.49" N	Party Reference No.:	NIL
Longitude:	74°95'03.56" E	Reporting Date:	16/03/2022
		Period of Analysis:	12/03/2022 to 16/03/2022
		Receipt Date:	12/03/2022

Sample Description: AMBIENT AIR QUALITY MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Maanwala
Instrument Used	: RDS & FPS Sampler with all Accessories
Instrument Code	: VEL/RDS/11 & VEL/FPS/11
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 10/03/2022 to 11/03/2022
Time of Monitoring	: 10:00 AM to 10:00 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°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 [®] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	52.36	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	91.48	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	26.51	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	11.57	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.85	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	10.06	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	19.87	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	6
12.	Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/ m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

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

* SOP- Laboratory Standard Operating Procedure., **BDL- Below Detection Limit, *DL- Detection Limit

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Test Report

Sample Number:	VEL/HPCL/AA/12	Report No.:	VEL/AA/2203/12/012
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-01
Latitude:	29°99'04.45" N	Party Reference No.:	NIL
Longitude:	75°01'90.13" E	Reporting Date:	16/03/2022
		Period of Analysis:	12/03/2022 to 16/03/2022
		Receipt Date:	12/03/2022

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/12 & VEL/FPS/12
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 10/03/2022 to 11/03/2022
Time of Monitoring	: 10:30 AM to 10:30 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°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 [@] Limit
1.	Particulate Matter (PM _{2.5})	#SOP No. VEL/SOP/01, Section No. SP 63	47.32	µg/m ³	60
2.	Particulate Matter (PM ₁₀)	IS: 5182 (P-23) Gravimetric Method	88.12	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	22.59	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	7.99	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.87	mg/m ³	4
6.	Ammonia (NH ₃), µg/m ³	IS:5182(P-25) Indo Phenol Blue Method	8.14	µg/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	µg/m ³	1
8.	Benzene (C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
9.	Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
10.	Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	20.62	µg/m ³	180
11.	Arsenic As, ng/m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/m ³)	ng/m ³	6
12.	Nickel Ni, ng/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m ³	20
13.	Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	--
14.	Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	--

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

* SOP- Laboratory Standard Operating Procedure, **BDL- Below Detection Limit, *DL- Detection Limit

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Test Report

Sample Number: VEL/HPCL/AN/01 Report No.: VEL/AN/2203/12/001
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL
Reporting Date: 16/03/2022
Receipt Date: 12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
Sampling Location : Near Project Site
Latitude: 30°05'45.69" N
Longitude: 75°01'00.81" 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 : 08/03/2022 to 09/03/2022
Time of Monitoring : 9:05 AM to 9:05 AM
Ambient Temperature (°C) : Min. 21.0°C, Max. 39.0°C
Surrounding Activity : Human, Vehicular, & Other Plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2014 & CPCB Guideline
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	72.1	63.5	dB(A)
2.	L _{min}	IS 9989	53.6	44.1	dB(A)
3.	L _{eq}	IS 9989	64.10	54.90	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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16/03/22 Analyst

(Approved By)
Dr Shiv Prakash Singh
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Test Report

Sample Number: VEL/HPCL/AN/02 Report No.: VEL/AN/2203/12/002
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL
Reporting Date: 16/03/2022
Receipt Date: 12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
Sampling Location : Nasibpura
Latitude: 30°07'91.97" N
Longitude: 75°00'20.12" 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 : 08/03/2022 to 09/03/2022
Time of Monitoring : 9:35 AM to 9:35 AM
Ambient Temperature (°C) : Min. 21.0°C, Max. 39.0°C
Surrounding Activity : Human, Vehicular, & Other Plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2014 & CPCB Guideline
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	60.1	45.9	dB(A)
2.	L _{min}	IS 9989	38.3	31.5	dB(A)
3.	L _{eq}	IS 9989	47.40	37.10	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/HPCL/AN/03 Report No.: VEL/AN/2203/12/003
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL
Reporting Date: 16/03/2022
Receipt Date: 12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
Sampling Location : Kot Kashmir
Latitude: 30°10'19.14" N
Longitude: 75°00'71.02" 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 : 08/03/2022 to 09/03/2022
Time of Monitoring : 10:05 AM to 10:05 AM
Ambient Temperature (°C) : Min. 21.0°C, Max. 39.0°C
Surrounding Activity : Human, Vehicular, & Other Plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2014 & CPCB Guideline
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	57.4	46.1	dB(A)
2.	L _{min}	IS 9989	34.9	29.5	dB(A)
3.	L _{eq}	IS 9989	45.60	36.80	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/HPCL/AN/04 Report No.: VEL/AN/2203/12/004
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Format No.: 7.8 F-01
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab Party Reference No.: NIL
Reporting Date: 16/03/2022
Receipt Date: 12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
Sampling Location : Chathewala
Latitude: 30°05'29.86" N
Longitude: 75°06'60.43" 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 : 08/03/2022 to 09/03/2022
Time of Monitoring : 10:35 AM to 10:35 AM
Ambient Temperature (°C) : Min. 21.0°C, Max. 39.0°C
Surrounding Activity : Human, Vehicular, & Other Plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2014 & CPCB Guideline
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	56.2	44.8	dB(A)
2.	L _{min}	IS 9989	35.9	28.3	dB(A)
3.	L _{eq}	IS 9989	46.20	35.10	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/HPCL/AN/05	Report No.:	VEL/AN/2203/12/005
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-01
		Party Reference No.:	NIL
		Reporting Date:	16/03/2022
		Receipt Date:	12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Kot Fatta
Latitude:	: 30°11'08.66" N
Longitude:	: 75°08'46.58" 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	: 09/03/2022 to 10/03/2022
Time of Monitoring	: 9:05 AM to 9:05 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°C
Surrounding Activity	: Human, Vehicular, & Other Plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	53.6	43.3	dB(A)
2.	L _{min}	IS 9989	32.8	29.8	dB(A)
3.	L _{eq}	IS 9989	45.20	34.70	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/HPCL/AN/06	Report No.:	VEL/AN/2203/12/006
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-01
		Party Reference No.:	NIL
		Reporting Date:	16/03/2022
		Receipt Date:	12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

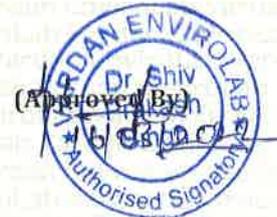
Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Baghi Bandar
Latitude:	: 30°02'56.54" N
Longitude:	: 75°06'43.21" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/07
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 09/03/2022 to 10/03/2022
Time of Monitoring	: 9:35 AM to 9:35 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°C
Surrounding Activity	: Human, Vehicular, & Other Plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	56.2	47.2	dB(A)
2.	L _{min}	IS 9989	33.7	30.4	dB(A)
3.	L _{eq}	IS 9989	44.30	38.50	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/HPCL/AN/07 Report No.: VEL/AN/2203/12/007
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-01
Party Reference No.: NIL
Reporting Date: 16/03/2022
Receipt Date: 12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
Sampling Location : Kotbhara
Latitude: 30°09'85.19" N
Longitude: 75°07'07.17" 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 : 09/03/2022 to 10/03/2022
Time of Monitoring : 10:05 AM to 10:05 AM
Ambient Temperature (°C) : Min. 21.0°C, Max. 39.0°C
Surrounding Activity : Human, Vehicular, & Other Plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2014 & CPCB Guideline
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	55.6	43.7	dB(A)
2.	L _{min}	IS 9989	36.2	31.6	dB(A)
3.	L _{eq}	IS 9989	43.90	36.40	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/HPCL/AN/08	Report No.:	VEL/AN/2203/12/008
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-01
		Party Reference No.:	NIL
		Reporting Date:	16/03/2022
		Receipt Date:	12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Jiwan Singh Wala
Latitude:	30°05'67.90" N
Longitude:	75°03'50.95" 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	: 09/03/2022 to 10/03/2022
Time of Monitoring	: 10:35 AM to 10:35 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°C
Surrounding Activity	: Human, Vehicular, & Other Plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	57.1	48.3	dB(A)
2.	L _{min}	IS 9989	37.6	33.1	dB(A)
3.	L _{eq}	IS 9989	46.80	39.90	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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(Checked By)
Analyst
16/03/2022



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Vardan EnviroLab

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

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

Report No.: VEL/AN/2203/12/009
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 16/03/2022
Receipt Date: 12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
Sampling Location : Gehri Boghi
Latitude: 30°11'09.27" N
Longitude: 74°96'10.78" 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 : 10/03/2022 to 11/03/2022
Time of Monitoring : 9:05 AM to 9:05 AM
Ambient Temperature (°C) : Min. 21.0°C, Max. 39.0°C
Surrounding Activity : Human, Vehicular, & Other Plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2014 & CPCB Guideline
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	52.9	44.2	dB(A)
2.	L _{min}	IS 9989	33.8	27.9	dB(A)
3.	L _{eq}	IS 9989	42.60	34.20	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/HPCL/AN/10
Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd.
Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab

Report No.: VEL/AN/2203/12/010
Format No.: 7.8 F-01
Party Reference No.: NIL
Reporting Date: 16/03/2022
Receipt Date: 12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by : Vardan EnviroLab Representative
Sampling Location : Mahi Nangal
Latitude: 30°02'11.32" N
Longitude: 75°01'53.33" 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 : 10/03/2022 to 11/03/2022
Time of Monitoring : 9:35 AM to 9:35 AM
Ambient Temperature (°C) : Min. 21.0°C, Max. 39.0°C
Surrounding Activity : Human, Vehicular, & Other Plant Activities
Scope of Monitoring : Regulatory Requirement
Control measure if Any : No any
Sampling & Analysis Protocol : IS-9989 R-2014 & CPCB Guideline
Sampling Duration : 24 Hours
Parameter Required : As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	58.3	52.6	dB(A)
2.	L _{min}	IS 9989	34.6	32.1	dB(A)
3.	L _{eq}	IS 9989	45.10	38.70	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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(Checked By)
Analyst
6/3/22



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Test Report

Sample Number:	VEL/HPCL/AN/11	Report No.:	VEL/AN/2203/12/011
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-01
		Party Reference No.:	NIL
		Reporting Date:	16/03/2022
		Receipt Date:	12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Maanwala
Latitude:	: 30°03'74.49" N
Longitude:	: 74°95'03.56" 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	: 10/03/2022 to 11/03/2022
Time of Monitoring	: 10:05 AM to 10:05 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°C
Surrounding Activity	: Human, Vehicular, & Other Plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	59.7	51.6	dB(A)
2.	L _{min}	IS 9989	36.5	30.2	dB(A)
3.	L _{eq}	IS 9989	47.20	37.10	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.

(Checked By)
ANJU INDOLIA
16/03/22
Analyst

(Approved By)
Dr Shiv Ansh Singh
16/03/22
Authorised Signatory



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Test Report

Sample Number:	VEL/HPCL/AN/12	Report No.:	VEL/AN/2203/12/012
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-01
		Party Reference No.:	NIL
		Reporting Date:	16/03/2022
		Receipt Date:	12/03/2022

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

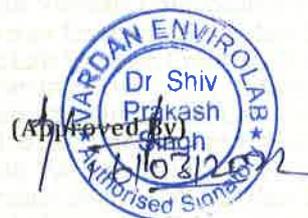
Sample Collected by	: Vardan EnviroLab Representative
Sampling Location	: Leleana
Latitude:	: 29°99'04.45" N
Longitude:	: 75°01'90.13" E
Instrument Used	: Sound Level Meter
Instrument Code	: VEL/S/SLM/09
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 10/03/2022 to 11/03/2022
Time of Monitoring	: 10:35 AM to 10:35 AM
Ambient Temperature (°C)	: Min. 21.0°C, Max. 39.0°C
Surrounding Activity	: Human, Vehicular, & Other Plant Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No any
Sampling & Analysis Protocol	: IS-9989 R-2014 & CPCB Guideline
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

TEST RESULTS

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	IS 9989	61.3	46.9	dB(A)
2.	L _{min}	IS 9989	37.4	29.7	dB(A)
3.	L _{eq}	IS 9989	48.60	36.80	dB(A)
4.	CPCB Limits in dB(A) [*] L _{eq} (Residential Area)		55.00	45.00	dB(A)

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

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Test Report

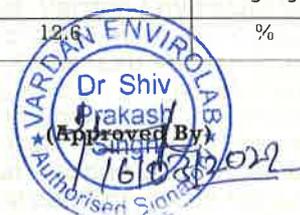
Sample Number:	VEL/HPCL/S/01	Report No.:	VEL/S/2203/12/001
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-01
Latitude:	30°05'45.69" N	Party Reference No.:	NIL
Longitude:	75°01'00.81" E	Reporting Date:	16/03/2022
Sample Description:	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Near Project Site	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	08/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	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) by pH Meter	7.76	--
2.	Conductivity	IS:14767 by Conductivity meter	0.317	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	31.45	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.18	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	51.32	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	30.58	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	35.91	%
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	127.25	%
11.	Iron as (Fe)	USEPA 3050B	2.84	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.86	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	15.24	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	186.77	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	14.39	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	8.57	%
17.	Organic Carbon	USEPA 3050B	0.46	%
18.	Lead (as Pb)	USEPA 3050B	0.72	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.60	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.75	mg/kg
21.	Copper (as Cu)	USEPA 3050B	5.87	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.30	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/03/2013	12.6	%

Note- SOP- Standard operating procedure.

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Test Report

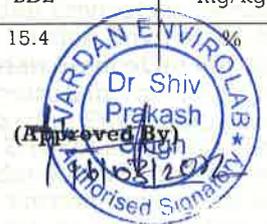
Sample Number:	VEL/HPCL/S/02	Report No.:	VEL/S/2203/12/002
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasibpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-01
Latitude:	30°07'91.97" N	Party Reference No.:	NIL
Longitude:	75°00'20.12" E	Reporting Date:	16/03/2022
Sample Description:	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Nasibpura	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	08/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	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) by pH Meter	7.61	--
2.	Conductivity	IS:14767 by Conductivity meter	0.337	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	47.25	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.24	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	45.39	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	68.41	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	54.28	%
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	123.69	%
11.	Iron as (Fe)	USEPA 3050B	3.72	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.85	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	25.16	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	248.62	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	27.31	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	16.54	%
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.58	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.73	mg/kg
21.	Copper (as Cu)	USEPA 3050B	1.94	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.53	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/02/2013	15.4	

Note- SOP- Standard operating procedure.

Checked By:
ANJAN DOLIA
Sr Analyst



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Test Report

Sample Number:	VEL/HPCL/S/03	Report No.:	VEL/S/2203/12/003
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-01
Latitude:	30°10'19.14" N	Party Reference No.:	NIL
Longitude:	75°00'71.02" E	Reporting Date:	16/03/2022
Sample Description;	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Kot Kashmir	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	08/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	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) by pH Meter	7.67	--
2.	Conductivity	IS:14767 by Conductivity meter	0.362	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	27.16	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.64	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	55.13	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	36.45	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	42.19	%
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	145.63	%
11.	Iron as (Fe)	USEPA 3050B	2.43	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.46	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	21.67	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	212.58	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	23.41	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	8.16	%
17.	Organic Carbon	USEPA 3050B	0.34	%
18.	Lead (as Pb)	USEPA 3050B	0.84	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.87	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.57	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.35	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/02/2013	14.3	%

Note- SOP- Standard operating procedure

ANISHA HINDOLIA
Analyst



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Test Report

Sample Number:	VEL/HPCL/S/04	Report No.:	VEL/S/2203/12/004
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-01
Latitude:	30°05'29.86" N	Party Reference No.:	NIL
Longitude:	75°06'60.43" E	Reporting Date:	16/03/2022
Sample Description:	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Chathewala	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	08/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	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) by pH Meter	7.75	--
2.	Conductivity	IS:14767 by Conductivity meter	0.291	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	19.84	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.08	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	57.19	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	40.58	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	43.69	%
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	103.54	%
11.	Iron as (Fe)	USEPA 3050B	2.75	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.61	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	16.29	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	188.47	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.53	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	7.92	%
17.	Organic Carbon	USEPA 3050B	0.34	%
18.	Lead (as Pb)	USEPA 3050B	0.86	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.69	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.74	mg/kg
21.	Copper (as Cu)	USEPA 3050B	5.89	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.30	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/02/2013	11.8	%

Note- SOP- Standard operating procedure

ANANDHOLIA
(Checked By)
S. Anandholia
Analyst



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Test Report

Sample Number:	VEL/HPCL/S/05	Report No.:	VEL/S/2203/12/005
Name & Address of the Project:	M/s Hindustan Petroleum Corporation Ltd. Bio Refinery, Village-Nasihpura, Tehsil-Talwandi Sabo, Bathinda, Punjab	Format No.:	7.8 F-01
Latitude:	30°11'08.66" N	Party Reference No.:	NIL
Longitude:	75°08'46.58" E	Reporting Date:	16/03/2022
Sample Description;	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Kot Fatta	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	09/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	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) by pH Meter	7.54	--
2.	Conductivity	IS:14767 by Conductivity meter	0.317	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01 & Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01 & Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01 & Issue Date-14/02/2013	27.36	%
6.	Bulk density	SOP , SP-80,Issue No.-01 & Issue Date-14/02/2013	1.17	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01 & Issue Date-14/02/2013	43.26	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01 & Issue Date-14/02/2013	57.68	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01 & Issue Date-14/02/2013	46.35	%
10.	Potassium as K	SOP , SP-84,Issue No.-01 & Issue Date-14/02/2013	104.29	%
11.	Iron as (Fe)	USEPA 3050B	3.16	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.71	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01 & Issue Date-14/02/2013	19.85	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	195.22	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01 & Issue Date-14/02/2013	15.69	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	10.54	%
17.	Organic Carbon	USEPA 3050B	0.44	%
18.	Lead (as Pb)	USEPA 3050B	0.53	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.62	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.05	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.35	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/02/2013	12.6	%

Note- SOP- Standard operating procedure.

APRIL INDOLIA
Analyst



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Test Report

Sample Number:	VEL/HPCL/S/06	Report No.:	VEL/S/2203/12/006
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-01
Latitude:	30°02'56.54" N	Party Reference No.:	NIL
Longitude:	75°06'43.21" E	Reporting Date:	16/03/2022
Sample Description;	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Baghi Bandar	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	09/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	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) by pH Meter	7.59	--
2.	Conductivity	IS:14767 by Conductivity meter	0.316	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	38.51	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.16	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	49.69	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	44.24	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	50.23	%
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	161.42	%
11.	Iron as (Fe)	USEPA 3050B	2.24	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.75	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	35.69	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	241.08	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	22.61	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	8.65	%
17.	Organic Carbon	USEPA 3050B	0.42	%
18.	Lead (as Pb)	USEPA 3050B	0.64	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.75	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.43	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.40	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.36	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/02/2013	16.9	%

Note- SOP- Standard operating procedure.

(Checked By)
Anil
16/03/22



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Test Report

Sample Number:	VEL/HPCL/S/07	Report No.:	VEL/S/2203/12/007
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-01
Latitude:	30°09'85.19" N	Party Reference No.:	NIL
Longitude:	75°07'07.17" E	Reporting Date:	16/03/2022
Sample Description;	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Kotbhara	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	09/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	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) by pH Meter	7.71	--
2.	Conductivity	IS:14767 by Conductivity meter	0.352	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	36.15	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.47	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	40.36	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	46.25	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	55.49	%
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	129.61	%
11.	Iron as (Fe)	USEPA 3050B	1.81	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.52	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	31.29	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	208.41	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	15.32	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	8.32	%
17.	Organic Carbon	USEPA 3050B	0.31	%
18.	Lead (as Pb)	USEPA 3050B	0.54	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.65	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.47	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.28	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.86	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/02/2013	13.5	%

Note- SOP- Standard operating procedure.

ANINDOLIA
(Checked by)
16/03/2022 Analyst



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Test Report

Sample Number:	VEL/HPCL/S/08	Report No.:	VEL/S/2203/12/008
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-01
Latitude:	30°05'67.90" N	Party Reference No.:	NIL
Longitude:	75°03'50.95" E	Reporting Date:	16/03/2022
Sample Description;	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Jiwan Singh Wala	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	09/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	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) by pH Meter	7.54	--
2.	Conductivity	IS:14767 by Conductivity meter	0.317	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	29.54	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.16	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	42.65	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	34.21	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	45.67	%
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	141.20	%
11.	Iron as (Fe)	USEPA 3050B	2.35	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.83	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	22.36	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	220.14	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	15.67	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	9.75	%
17.	Organic Carbon	USEPA 3050B	0.52	%
18.	Lead (as Pb)	USEPA 3050B	0.71	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.73	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.36	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.49	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.31	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/02/2013	9.7	%

Note- SOP- Standard operating procedure.

ANNU INDOLIA
(Checked By)
16/03/2022 Analyst



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Test Report

Sample Number:	VEL/HPCL/S/09	Report No.:	VEL/S/2203/12/009
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-01
Latitude:	30°11'09.27" N	Party Reference No.:	NIL
Longitude:	74°96'10.78" E	Reporting Date:	16/03/2022
Sample Description:	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Gehri Boghi	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	10/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	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) by pH Meter	7.70	--
2.	Conductivity	IS:14767 by Conductivity meter	0.314	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty Loam	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	33.62	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.87	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	47.25	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	40.68	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	48.46	%
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	146.20	%
11.	Iron as (Fe)	USEPA 3050B	2.25	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.74	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	26.95	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	247.63	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	25.13	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	11.53	%
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.70	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.76	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.51	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.18	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.20	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/02/2013	13.7	%

Note- SOP- Standard operating procedure.

ANJU INDOLIA
(Checked By)
Analyst
16/3/22



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Test Report

Sample Number:	VEL/HPCL/S/10	Report No.:	VEL/S/2203/12/010
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-01
Latitude:	30°02'11.32" N	Party Reference No.:	NIL
Longitude:	75°01'53.33" E	Reporting Date:	16/03/2022
Sample Description:	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Mahi Nangal	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	10/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	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) by pH Meter	7.42	--
2.	Conductivity	IS:14767 by Conductivity meter	0.331	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	29.84	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.21	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	49.26	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	38.10	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	59.46	%
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	138.28	%
11.	Iron as (Fe)	USEPA 3050B	2.81	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.69	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	30.67	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	210.41	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	18.97	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	6.59	%
17.	Organic Carbon	USEPA 3050B	0.40	%
18.	Lead (as Pb)	USEPA 3050B	0.61	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.67	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.39	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.42	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.78	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/02/2013	16.8	%

Note- SOP-Standard operating procedure.

ANJU INDOLIA
 (Checked By)
 16/03/22

Dr. Shiv Prakash Singh
 16/03/2022
 Authorised Signatory



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Test Report

Sample Number:	VEL/HPCL/S/11	Report No.:	VEL/S/2203/12/011
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-01
Latitude:	30°03'74.49" N	Party Reference No.:	NIL
Longitude:	74°95'03.56" E	Reporting Date:	16/03/2022
Sample Description:	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Maanwala	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	10/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	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) by pH Meter	7.67	--
2.	Conductivity	IS:14767 by Conductivity meter	0.310	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish Red	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	28.41	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.30	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	40.25	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	61.59	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	53.48	%
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	134.26	%
11.	Iron as (Fe)	USEPA 3050B	2.28	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.63	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	18.97	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	217.06	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	22.20	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	10.36	%
17.	Organic Carbon	USEPA 3050B	0.32	%
18.	Lead (as Pb)	USEPA 3050B	0.54	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.71	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.41	mg/kg
21.	Copper (as Cu)	USEPA 3050B	1.99	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.40	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/02/2013	14.3	%

Note- SOP- Standard operating procedure.

ANJANINDOLIA
ISO Analyst



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Vardan EnviroLab

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

Sample Number:	VEL/HPCL/S/12	Report No.:	VEL/S/2203/12/012
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-01
Latitude:	29°99'04.45" N	Party Reference No.:	NIL
Longitude:	75°01'90.13" E	Reporting Date:	16/03/2022
Sample Description:	Soil Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Leleena	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	10/03/2022
Sampling & Analysis Protocol:	IS 2720, USEPA 3050B & USDA	Sampling Type:	Composite
		Sample Quantity:	2.0 Kg
		Packing Status:	Temp Sealed

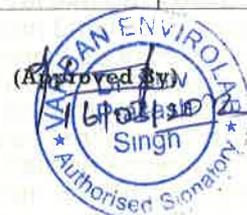
TEST RESULTS

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26) by pH Meter	7.76	--
2.	Conductivity	IS:14767 by Conductivity meter	0.349	mS/cm
3.	Soil Texture	SOP , SP-87,Issue No.-01& Issue Date-14/02/2013	Silty	--
4.	Color	SOP , SP-78,Issue No.-01& Issue Date-14/02/2013	Yellowish	--
5.	Water holding capacity	SOP , SP-81,Issue No.-01& Issue Date-14/02/2013	27.54	%
6.	Bulk density	SOP , SP-80,Issue No.-01& Issue Date-14/02/2013	1.25	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No.-01& Issue Date-14/02/2013	63.59	%
8.	Calcium as Ca	SOP , SP-82,Issue No.-01& Issue Date-14/02/2013	45.71	%
9.	Sodium as Na	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	53.64	%
10.	Potassium as K	SOP , SP-84,Issue No.-01& Issue Date-14/02/2013	158.20	%
11.	Iron as (Fe)	USEPA 3050B	2.69	mg/kg
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.88	%
13.	Magnesium as Mg	SOP , SP-83,Issue No.-01& Issue Date-14/02/2013	29.41	%
14.	Available Nitrogen as N	IS:14684 Distillation Method	243.58	kg./hec.
15.	Available Phosphorus	SOP , SP-86,Issue No.-01& Issue Date-14/02/2013	26.51	kg./hec.
16.	Zinc (as Zn)	USEPA 3050B	8.64	%
17.	Organic Carbon	USEPA 3050B	0.48	%
18.	Lead (as Pb)	USEPA 3050B	0.91	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.84	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.77	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.19	mg/kg
22.	Molybdenum (as MO)	USEPA 3050B	0.47	mg/kg
23.	Nickel (as Ni)	USEPA 3050B	*BDL	mg/kg
24.	Moisture Content	SOP, SP-79, Issue No.-01 & Issue Date-14/02/2013	17.8	%

Note- SOP- Standard operating procedure.

(Checked By)

ANJU INDOLIA
Sr. Analyst



VEL/E/N/TR/PN10726

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Test Report

Sample Number:	VEL/HPCL/W/01	Report No.:	VEL/W/2203/12/001
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-01
Latitude:	30°05'45.69" N	Party Reference No.:	NIL
Longitude:	75°01'00.81" E	Reporting Date:	16/03/2022
Sample Description:	Ground Water Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Near Project Site	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	08/03/2022
Parameter Required:	As per Work Order	Sample Quantity:	2.0 Ltr. + 250 ml
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025	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 OC)	APHA ,4500-H+ B Electrometric Method	7.48	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric Method	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B , Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	276.85	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	78.24	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	241.62	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	51.40	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	19.84	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	648.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	24.62	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.71	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	6.98	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.14	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation

Anil
ANIL KUMAR
16/03/22
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Vardan EnviroLab

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

Sample No.: VEL/HPCL/W/01			Report No.: VEL/W/2203/12/001			
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	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.004)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05)	mg/l	1.0	No Relaxation
22.	Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.28	mg/l	5.0	15.0
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.05)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.005)	mg/l	0.01	No Relaxation
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1089	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	21.54	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.2	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note:- This Report Complies as per IS: 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit.

@@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).

Aniy
(Checked By)
ANIS INDOLIA
Sr. Analyst

Approved By
Dr. Shiv Prakash
16/03/2022
Authorized Signatory

Mohammad Shafi
Technical Manager
Authorized Signatory
16/03/2022



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Vardan EnviroLab

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

Sample Number:	VEL/HPCL/W/02	Report No.:	VEL/W/2203/12/002
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-01
Latitude:	30°2'11.32" N	Party Reference No.:	NIL
Longitude:	75°1'53.33" E	Reporting Date:	16/03/2022
Sample Description:	Ground Water Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Mahi Nangal	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	08/03/2022
Parameter Required:	As per Work Order	Sample Quantity:	2.0 Ltr. + 250 ml
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025	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 OC)	APHA ,4500-H+ B Electrometric Method	7.69	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric Method	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA, 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA, 2340 C, EDTA Titrimetric Method	196.47	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	51.35	mg/l	75	200
8.	Alkalinity as CaCO3	APHA, 2320 B, Titrimetric Method	183.57	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	42.51	mg/l	250	1000
10.	#Cyanide as CN	APHA, 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	16.61	mg/l	30	100
12.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	475.00	mg/l	500	2000
13.	Sulphate as SO4	APHA, 4500 E, Turbidimetric Method	26.41	mg/l	200	400
14.	Fluoride as F	APHA, 4500-F- D, SPADNS Method	0.62	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34), Chromotropic Method	5.67	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.08	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation

ANJALI INDOLIA
Sr. Analyst

Dr. Shiv
Approved
16/03/2022
Authorised Signatory



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Vardan EnviroLab

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

Sample No.: VEL/HPCL/W/02			Report No.: VEL/W/2203/12/002			
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	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.004)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05)	mg/l	1.0	No Relaxation
22.	Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.24	mg/l	5.0	15.0
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.05)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.005)	mg/l	0.01	No Relaxation
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	795	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	24.9	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	6.2	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note:- This Report Complies as per IS: 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit.

@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).

ANINDOLIA
(Checked By)
S Analyst
6/03/22



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Vardan EnviroLab

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

Sample Number:	VEL/HPCL/W/03	Report No.:	VEL/W/2203/12/003
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-01
Latitude:	30°02'56.54" N	Party Reference No.:	NIL
Longitude:	75°06'43.21" E	Reporting Date:	16/03/2022
Sample Description:	Ground Water Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Baghi Bandar	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	09/03/2022
Parameter Required:	As per Work Order	Sample Quantity:	2.0 Ltr. + 250 ml
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025	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 OC)	APHA ,4500-H+ B Electrometric Method	7.45	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric Method	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA, 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA, 2340 C, EDTA Titrimetric Method	286.48	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	91.57	mg/l	75	200
8.	Alkalinity as CaCO3	APHA, 2320 B, Titrimetric Method	305.24	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	86.95	mg/l	250	1000
10.	#Cyanide as CN	APHA, 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	14.10	mg/l	30	100
12.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	719.00	mg/l	500	2000
13.	Sulphate as SO4	APHA, 4500 E, Turbidimetric Method	62.54	mg/l	200	400
14.	Fluoride as F	APHA, 4500-F- D, SPADNS Method	0.85	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	8.41	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.14	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation

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Vardan EnviroLab

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

Sample No.: VEL/HPCL/W/03				Report No.: VEL/W/2203/12/003		
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	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.004)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05)	mg/l	1.0	No Relaxation
22.	Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.47	mg/l	5.0	15.0
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.05)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.005)	mg/l	0.01	No Relaxation
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1206	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	30.8	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	8.4	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note:- This Report Complies as per IS: 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit.

@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).

ANJU INDOLIA
(Checked By) Analyst
16/03/22

VARDAN ENVIROLAB
Dr Shiv
Approved By
16/03/22
Authorise

VARDAN ENVIROLAB
Mohammad Shafi
Technical Manager
Authorized Signatory
16/03/2022



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Vardan EnviroLab

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (Haryana)
NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/HPCL/W/04	Report No.:	VEL/W/2203/12/004
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-01
Latitude:	30°05'67.90" N	Party Reference No.:	NIL
Longitude:	75°03'50.95" E	Reporting Date:	16/03/2022
Sample Description:	Ground Water Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Jiwan Singh Wala	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	09/03/2022
Parameter Required:	As per Work Order	Sample Quantity:	2.0 Ltr. + 250 ml
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025	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 0C)	APHA ,4500-H+ B Electrometric Method	7.51	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric Method	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	176.48	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	47.32	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	160.54	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	33.25	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	14.19	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	409.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	14.62	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.77	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	7.62	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.09	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation

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Test Report

Sample Number:	VEL/HPCL/W/05	Report No.:	VEL/W/2203/12/005
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-01
Latitude:	30°07'91.97" N	Party Reference No.:	NIL
Longitude:	75°00'20.12" E	Reporting Date:	16/03/2022
Sample Description:	Ground Water Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Nasibpura	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	09/03/2022
Parameter Required:	As per Work Order	Sample Quantity:	2.0 Ltr. + 250 ml
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025	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 OC)	APHA ,4500-H+ B Electrometric Method	7.29	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric Method	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	198.26	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	66.15	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	213.07	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	59.87	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	8.07	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	554.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	41.26	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.62	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	6.87	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.06	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation

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Test Report

Sample No.: VEL/HPCL/W/05				Report No.: VEL/W/2203/12/005		
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	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.004)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.05)	mg/l	1.0	No Relaxation
22.	Anionic Detergents as MBAS	Annex K, IS 13428/IS 3025 (P-68)	*BDL(**DL 0.05)	mg/l	0.2	1.0
23.	Zinc as Zn	IS 3025 (P-65):2014(RA:2019)	0.40	mg/l	5.0	15.0
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.05)	mg/l	0.05	1.5
25.	Manganese as Mn	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.1	0.3
26.	Cadmium as Cd	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.003	No Relaxation
27.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(** DL 0.002)	mg/l	0.01	No Relaxation
28.	Selenium as Se	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.001)	mg/l	0.01	No Relaxation
29.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.005)	mg/l	0.01	No Relaxation
30.	Mercury as Hg	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.0005)	mg/l	0.001	No Relaxation
31.	Conductivity	APHA, 2510 B, Conductivity Meter Method	926	µS/cm	--	--
32.	Ammonia as NH3	IS 3025 (P-34) , Titrimetric Method	*BDL	mg/l	0.5	No Relaxation
33.	Sodium	APHA, 3500 Na B Flame Photometric Method	24.3	mg/l	--	--
34.	Potassium	APHA, 3500 Na B Flame Photometric Method	5.4	mg/l	--	--
35.	Total Coliform	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	
36.	E. Coli	IS 15185:2016	Absent	/100ml	Shall not be detectable in any 100 ml sample	

Note:- This Report Complies as per IS: 10500:2012 (RA: 2018)

*BDL-Below Detection Limit, **DL- Detection Limit.

@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).

Checked By
ANJAN DOLIA
Analyst
16/03/22

Approved By
Mohammad Sherif
16/03/2022

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Test Report

Sample Number:	VEL/HPCL/W/06	Report No.:	VEL/W/2203/12/006
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-01
Latitude:	30°10'19.14" N	Party Reference No.:	NIL
Longitude:	75°00'71.02" E	Reporting Date:	16/03/2022
Sample Description:	Ground Water Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Kot Kashmir	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	09/03/2022
Parameter Required:	As per Work Order	Sample Quantity:	2.0 Ltr. + 250 ml
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025	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 0C)	APHA ,4500-H+ B Electrometric Method	7.69	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephelometric Method	*BDL (**DL 1.0)	NTU	1	5
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA , 2160 B, Threshold Test Method	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	251.43	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	76.25	mg/l	75	200
8.	Alkalinity as CaCO3	APHA , 2320 B, Titrimetric Method	236.41	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	63.59	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN- D	*BDL(**DL 0.02)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	14.87	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	624.00	mg/l	500	2000
13.	Sulphate as SO4	APHA , 4500 E, Turbidimetric Method	57.29	mg/l	200	400
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.79	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	8.13	mg/l	45	No Relaxation
16.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.07	mg/l	1.0	No Relaxation
17.	Aluminium as Al	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.03	0.2
18.	Boron	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l	0.5	2.4
19.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.002)	mg/l	0.05	No Relaxation

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Test Report

Sample Number:	VEL/HPCL/W/08	Report No.:	VEL/W/2203/12/008
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-01
Latitude:	30°05'29.86" N	Party Reference No.:	NIL
Longitude:	75°06'60.43" E	Reporting Date:	16/03/2022
Sample Description:	Surface Water Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Chathewala	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	08/03/2022
Parameter Required:	As per Work Order	Sample Quantity:	2.0 Ltr. + 250 ml
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025	Sampling Type:	Grab
		Preservation:	Refrigerated

TEST RESULTS

S. No.	Parameter	Test Method	Results	Unit
1.	pH (at 25°C)	APHA ,4500-H+ B Electrometric Method	7.51	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0)	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	22	NTU
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--
5.	Taste	APHA, 2160 B, Threshold Test Method	None	--
6.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	62.41	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	704	µS/cm
8.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	10.69	mg/l
9.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.19	mg/l
10.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	418.00	mg/l
11.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l
12.	Boron	IS 3025 (P-65):2014(RA:2019)	0.14	mg/l
13.	Sulphate as SO ₄ ⁻	APHA, 4500 E, Turbidimetric Method	12.35	mg/l
14.	Fluoride as F	APHA, 4500-F- D, SPADNS Method	0.48	mg/l
15.	BOD (3 Days at 27°C)	APHA, 5210 C/ IS 3025 (Part 44)	5.98	mg/l
16.	COD	APHA 5220 B Open Reflux Method	24.60	mg/l
17.	Free Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	9.87	mg/l
18.	Total Coloform	IS 15185:2016	21	/100ml
19.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l
20.	Total Hardness as CaCO ₃	APHA, 2340 C, EDTA Titrimetric Method	158.47	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	55.13	mg/l
22.	Alkalinity as CaCO ₃	APHA, 2320 B, Titrimetric Method	171.29	mg/l
23.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	5.08	mg/l
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	2.4	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	71.9	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	25.4	mg/l
27.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.03)	mg/l

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

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Test Report

Sample Number:	VEL/HPCL/W/09	Report No.:	VEL/W/2203/12/009
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-01
Latitude:	30°11'08.66" N	Party Reference No.:	NIL
Longitude:	75°08'46.58" E	Reporting Date:	16/03/2022
Sample Description:	Surface Water Sample	Period of Analysis:	12/03/2022 to 16/03/2022
Sample Location:	Kot Fatta	Receipt Date:	12/03/2022
Sample Collected By:	Vardan EnviroLab Representative	Sampling Date:	08/03/2022
Parameter Required:	As per Work Order	Sample Quantity:	2.0 Ltr. + 250 ml
Sampling & Analysis Protocol:	APHA 23 rd Edition 2017 & IS:3025	Sampling Type:	Grab
		Preservation:	Refrigerated

TEST RESULTS

S. No.	Parameter	Test Method	Results	Unit
1.	pH (at 25°C)	APHA ,4500-H+ B Electrometric Method	7.79	--
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 1.0)	Hazen
3.	Turbidity	APHA, 2130 B, Nephelometric Method	18	NTU
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	--
5.	Taste	APHA, 2160 B, Threshold Test Method	None	--
6.	Chloride as Cl	APHA, 4500-Cl- B, Argentometric Method	53.24	mg/l
7.	Conductivity	APHA, 2510 B, Conductivity Meter Method	869	µS/cm
8.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	6.99	mg/l
9.	Iron as Fe	IS 3025 (P-65):2014(RA:2019)	0.21	mg/l
10.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	519.00	mg/l
11.	Lead as Pb	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l
12.	Boron	IS 3025 (P-65):2014(RA:2019)	0.11	mg/l
13.	Sulphate as SO ₄	APHA , 4500 E, Turbidimetric Method	21.69	mg/l
14.	Fluoride as F	APHA , 4500-F- D, SPADNS Method	0.38	mg/l
15.	BOD (3 Days at 27°C)	APHA, 5210 C/ IS 3025 (Part 44)	4.57	mg/l
16.	COD	APHA 5220 B Open Reflux Method	25.69	mg/l
17.	Free Ammonia as NH ₃	IS 3025 (P-34) , Titrimetric Method	7.88	mg/l
18.	Total Coliform	IS 15185:2016	23	/100ml
19.	Arsenic as As	IS 3025 (P-65):2014(RA:2019)	*BDL(**DL 0.01)	mg/l
20.	Total Hardness as CaCO ₃	APHA , 2340 C, EDTA Titrimetric Method	169.24	mg/l
21.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	58.36	mg/l
22.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	182.41	mg/l
23.	Magnesium as Mg	APHA , 3500 Mg B, Calculation Method	5.74	mg/l
24.	Copper as Cu	IS 3025 (P-65):2014(RA:2019)	3.26	mg/l
25.	Sodium	APHA, 3500 Na B Flame Photometric Method	75.1	mg/l
26.	Potassium	APHA, 3500 Na B Flame Photometric Method	25.6	mg/l
27.	Total Chromium as Cr	IS 3025 (P-65):2014(RA:2019)	*BDL (**DL 0.03)	mg/l

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

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