

पेट्रोलियम कॉर्पोरेशन लिमिटेड

(भारत सरकार 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.

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Date: 28th May 2020

SK/2G/Env Compliance/2

То

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 100 KLPD at Village-Nasibpura, Tehsil Talwandi Sabo, Bathinda (Punjab) for the period of June 2020

Ref: F.No. J-11011/221/2017-IA II (I) Dated- 14.08.2018

Sir/ Madam

This has reference to the EC vide letter no. J-11011/221/2017-IA II (I) Dated 14.08.2018 In this regard, we are submitting hereby status report of compliance with the specific and general conditions for period June 2020. Documents enclosed along with report are mentioned below as

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

Due to ongoing lockdown, we are submitting the compliance report via email only and uploading the report on Parivesh portal of MoEF & CC.

Thanking You



For M/s- Hindustan Petroleum Corporation Limited

(Authorized Signatory)

-Sanjay Kumar Name Designation- Chief Manager – Biofuels (Punjab) E-mail - sanjoykr@hpcl.in Contact No.- +919540933499

Copy to:

- 1. Member Secretary, Central Pollution Control Board, Parivesh Bhawan East Arjun Nagar, Delhi- 32 (mscb.cpcb@nic.in)
- 2. Member Secretary, Punjab Pollution Control Board, Vataran Bhawan, Nabha Road Patiyala, 147001 (Punjab) (msppcb@punjab.gov.in)
- 3. Director (Industry-2), MoEF & CC, Jor Bagh Road, New Delhi 03 (rb.lal@nic.in)

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

(F.No. J-11011/221/2017-IA II (I) Dated-14/08/2018)



1.0 Introduction

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

This Project has obtained Environmental Clearance from Ministry of Environment, Forests and Climate Change Delhi,withcertain 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 it's 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.

(F.No. J-11011/221/2017-IA II (I) Dated-14/08/2018)

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.

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

(F.No. J-11011/221/2017-IA II (I) Dated-14/08/2018)



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	Noted.
	fuel blending only.	
[B]	Consent to Establish/Operate for the project shall be	Consent to Establish (CTE) has been received from PPCB,
	obtained from the State Pollution Control Board as	Bathinda on 27 th Nov'19 (Copy enclosed).
	required under the Air (Prevention and Control of	
	Pollution) Act, 1981 and the Water (Prevention and	
	Control of Pollution) Act, 1974.	
[C]	As already committed by the project proponent, Zero	As proposed zero discharge of waste water will be met
Liquid Discharge shall be ensured and no waste/treated		during operational phase.
	water shall be discharged outside the premises	
[D]	Necessary authorization required under the Hazardous	Authorization required for hazardous and Other Wastes
	and Other Wastes (Management and Trans-Boundary	(Management and Trans-Boundary Movement) Rules,
	Movement) Rules, 2016, Solid Waste Management Rules,	2016, Solid waste Management Rules, 2016 will be
	2016 shall be obtained and the provisions contained in	obtained as per the requirement.
	the Rules shall be strictly adhered to.	
[E]	To control source and the fugitive emissions, suitable	Measures will be taken to control fugitive emission,
	pollution control devices shall be installed to meet the	pollution control devices will be installed as per the
	prescribed norms and/or the NAAQS. The gaseous	requirement. Stack of adequate height as per the
	emissions shall be dispersed through stack of adequate	guidelines will be installed for the gaseous emission
	neight as per CPCB/SPCB guidelines	dispersion.
		•
[F]	Total fresh water requirement shall not exceed 1800	Prescribed water requirement will not be exceeded.
	cum/day, proposed to be met from canal supply.	
[G]	Process effluent/any wastewater shall not be allowed to	We will ensure that process water is not mixed with
	mix with storm water. Storm water drain shall be passed	storm water.
	through a separate conveyance system.	
[H]	The Company shall strictly comply with the rules and	Noted.
	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.	

	(1.10.) 11011/221/2017 Mill	J Datta 11/00/2010J
[1]	 The company shall undertake waste minimization measures as below:- Metering and control of quantities of active ingredients to minimize waste. Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. Use of automated filling to minimize spillage. Use of Close Feed system into batch reactors. Venting equipment through vapour recovery system Use of high pressure hoses for equipment clearing to reduce wastewater generation. 	 We will comply with the condition as per the requirement to minimise waste generation in the plant- i. Metering and control of quantities of active ingredients will be done regularly. ii. By products will be reused as raw material as much as possible according to requirement. iii. Automated filling will be carried out to minimize spillage iv. Close feed system will be used into batch reactors. v. Water scrubber, vent bottle & flame arrestors will be provided as per requirement. vi. High pressure hoses for equipment clearing will be used to reduce waste water generation.
נע	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.	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.
[K]	All the commitments made regarding issues raised during the public hearing/ consultation meeting shall be satisfactorily implemented.	Noted.
[L]	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.	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
[M]	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.	Acoustically enclosed DG sets will be installed and Stack height will be kept as per the CPCB guidelines.
[N]	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.	Fire Fighting system will be installed as per the condition.
[0]	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Regular Health Check-up arrangement_will be provided for the workers A qualified doctor will be appointed. -
[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.	No parking will be done outside on public places. Plan in this regard has already been submitted to authority.
[Q]	Storage of raw materials shall be either stored in silos or in covered areas to prevent dust pollution and other fugitive emissions.	During operation phase, raw materials will be stored properly in covered areas
[R]	Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel/drain carrying effluent within the	We will comply.

	premises.	
[S]	CO_2 generated from the process shall be bottled/made solid ice/value added products and sold to authorize vendors.	Noted.

11.1 Other Conoria Conditions

11.1 (
S. No.	Conditions of Environmental Clearance	Status of Compliance
i.	The project authorities must strictly adhere to the stipulations made by the state PollutionControl Board	We ensure to follow the guidelines strictly.
	(SPCB), State Government and/ or any other statutory	
	authority.	
ii.	No further expansion or modifications in the plant	Noted.
	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,	
iii	The locations of ambient air quality monitoring stations	Noted and same will be complied
	shall be decided in consultation with the State Pollution	noted and same will be complica.
	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	
iv.	The National Ambient Air Quality Emission Standards	Noted.
	issued by the Ministry vide G.S.R No. 826(E) dated 16 th	
	November, 2009 Shall be Complied with.	
		It's will many to have the main loads within the
v.	The overall noise levels in and around the plant area	we will ensure to keep the noise levels within the
	shall be kept well within the standards by providing	stunuurus.
	noise control measures including acoustic noous,	
	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).	
vi.	The Company shall harvest rainwater from the roof tops	Noted.
	of the buildings and storm water drains to recharge the	
	ground water and utilize the same for different industrial	
	operations within the plant.	
vii.	Training shall be imparted to all employees on safety and	Regular training of health & safety will be provided to
	health aspects of chemicals handling. Pre-employment	the employees for chemical handling.
	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.	
V111.	The company shall comply with all the environmental	Noted and will be complied as per the requirement.
	protection measures and safeguards proposed in the	
	accuments 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.	
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.	CSR activities will be undertaken as per the proposed plan.
x.	A separateEnvironmental Management Cell equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.	Noted.
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 Changeas 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.	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.
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.	Noted.
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.	Noted. We are complying with the condition.
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.	Noted.
xv.	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at http://moef.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be	Copy of advertisements attached <u>.</u>
	C	

forwarded to the concerned Regional office of the Ministry. The Ministry reserves the right to stipulate additional xvi. Noted. 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. The above conditions will be enforced, inter-alia xvii. Noted. 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.



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, 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**.

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

Table 3.1 Details of Ambient Air Quality Monitoring Stations

3.1.2

Ambient Air Quality Monitoring Methodology

Monitoring was conducted in respect of the following parameters:

- 1. Particulate Matter 2.5 (PM 2.5)
- 2. Particulate Matter 10 (PM 10)
- 3. Sulphur Dioxide (SO₂)
- 4. Oxides of Nitrogen (NO₂)
- 5. Carbon Monoxide (CO)
- 6. Ammonia (NH₃)
- 7. Lead (Pb)
- 8. Benzene (C_6H_6)
- 9. Benzo(a)pyrene
- 10.0zone (0₃)
- 11. Arsenic (As)
- 12. Nickel (Ni)
- 13. Volatile Organic Carbon (VOCs)
- 14. 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.

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)

Table 3.2 Techniques used for Ambient Air Quality Monitoring

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

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

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

S. No.	Parameter			Test Result			
		AAQ1	AAQ2	AAQ3	AAQ4		
1.	Particulate Matter (PM _{2.5}), $\mu g/m^3$	50.21	48.15	49.64	47.40	60	
2.	Particulate Matter (PM ₁₀), $\mu g/m^3$	89.76	87.91	90.26	84.69	100	
3.	Nitrogen Dioxide (NO2), μg/m ³	22.54	20.63	21.07	22.60	80	
4.	Sulphur Dioxide (SO2),	11.02	12.01	13.01	9.96	80	
5.	Ammonia (NH3), μg/m ³	9.37	13.84	10.16	9.45	400	
6.	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m ³)	1				
7.	Carbon Monoxide (CO) mg/m ³	0.92	0.83	0.97	0.89	4	
8.	Benzene(C ₆ H ₆) ,µg/m ³	**BDL (*DL 0.05 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 0.1 µg/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	22.14	21.50	19.87	17.90	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 0.2ppm(v/v))		
	*NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec3(i)] 18.11.2009						

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	46.98	4482	48.55	51.32	60
2.	Particulate Matter (PM ₁₀), µg/m ³	81.45	81.66	85.70	92.54	100
3.	Nitrogen Dioxide (NO2), µg/m ³	17.58	21.07	24.61	20.33	80
4.	Sulphur Dioxide (SO ₂),	17.98	12.06	18.36	11.52	80
5.	Ammonia (NH₃), μg/m³	8.98	13.47	10.36	10.35	400
6.	Lead (Pb), µg/m ³	**BDL (*DL 0.05 µg/m ³)	1			
7.	Carbon Monoxide (CO) mg/m ³	0.82	0.98	0.92	1.03	4
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 (O3) ,µg/m ³	20.54	19.86	22.45	18.79	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 0.2ppm(v/v))	

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

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

S. No.	Parameter			Test Result N		
		AAQ9	AAQ10	AAQ11	AAQ12	
1.	Particulate Matter (PM _{2.5}), μg/m ³	47.32	52.86	49.31	48.93	60
2.	Particulate Matter (PM ₁₀), µg/m ³	78.61	93.61	87.66	89.31	100
3.	Nitrogen Dioxide (NO ₂), µg/m ³	21.53	26.12	21.44	23.54	80
4.	Sulphur Dioxide (SO ₂),	9.14	13.64	8.01	11.88	80
5.	Ammonia (NH₃), μg/m³	15.34	10.46	9.89	16.92	400
6.	Lead (Pb), µg/m³	**BDL (*DL 0.05 µg/m ³)	1			
7.	Carbon Monoxide (CO) mg/m ³	0.95	1.12	0.93	0.91	4
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	17.45	18.66	16.78	19.55	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)	**BDL (*DL 5.0 µg/m ³)	**BDL (*DL 5.0 µg/m ³)	**BDL (*DL 5.0µg/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 0.2ppm(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



Figure 3.2 Location-wise Variation of CO in Ambient Air Quality

3.1.4 Discussion on Ambient Air Quality in the Study Area

 PM_{10} and $PM_{2.5}$ levels at the project site are within the permissible limit of $100\mu g/m^3$ and $60 \mu g/m^3$ respectively (for residential, rural and other areas as stipulated in the National Ambient Air Quality Standards). SO₂, NOx and CO was observed within the corresponding stipulated limits (Limit for SO₂ and NOx: $80 \mu g/m^3$ and limit for CO: $4.0 mg/m^3$) at all monitoring locations. Station wise variation of ambient air quality parameters has been pictorially shown in **Figure 3.1 & 3.2**

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 3 locations at the boundary of the project site as given in **Table 3.6**.

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

Table 3.6 Details of Ambient Noise Monitoring Stations

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.

3.2.3 Ambient Noise Monitoring Results

The location wise ambient noise monitoring results is summarized in **Table 3.7**. The locationwise variation of noise levels are graphically presented in **Figure**

Parameter	N1		N2		N3		N4	
	Day Time	Night Time						
Lmax	79.8	66.3	67.5	59.8	61.9	52.7	59.4	55.6
Lmin	55.7	40.1	45,2	33.6	43.2	33.5	41.3	32.2
Leq	67.49	49.18	51.40	41.20	52.40	42.80	50.30	42.60
CPCB Limit (Leq in dB(A) Industrial Limit & Residential Limit)	75.00	70.00	55.00	45.00	55.00	45.00	55.0	45.0

Table 3.7 Ambient Noise Monitoring Results (1-4 Location)

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

Table 3.8 Ambient Noise Monitoring Results (5-8 Location)

Parameter	N	15	N	16]	N7	I	8
	Day Time	Night Time						
Lmax	64.5	54.3	58.4	49.1	55.1	46.5	55.8	44.2
Lmin	44.7	34.8	38.5	33.8	36.3	31.7	31.2	26.5
Leq	52.65	41.90	48.54	40.50	47.60	37.20	45.20	33.50
CPCB Limit (Leq in dB(A) ResidentiaLimit)	55.00	45.00	55.00	45.00	55.00	45.00	55.00	45.00

Note^{-*}A "decibel" is a unit in which noise is measured.

Table 3.9 Ambient Noise Monitoring Results (9-12 Location)								
Parameter	N9		N10		N11		N12	
	Day Time	Night Time						
Lmax	57.9	51.2	58.5	45.4	56.7	46.9	63.5	51.6
Lmin	38.6	34.4	38.2	33.8	35.3	30.2	41.2	37.2
Leq	48.50	40.20	49.50	39.60	47.60	37.49	51.64	42.15
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 3.3 Location-wise Variation of Ambient Noise Levels

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).

Night Time Noise Levels (Lnight):

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

3.3 WATER QUALITY MONITORING

3.3.1 Ground Water Quality Monitoring Locations

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

Water sample was collected from the project site. The sample was analyzed for various parameters to compare with the standards for ground water as per IS: 10500 for ground water sources. The details of water sampling locations are given in **Table 3.10**

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

Tahla 2 10	Dotails of	fWator	Auality	Monitoring	Station
1 able 5.10	Detalls U	I WALEI	Quanty	MONITOLINE	Station

3.3.2 Methodology of Groundwater Quality Monitoring

Sampling of ground water was carried out on **March 2020** 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 Drinking water are given in **Table 3.11**.

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3.3.3 Ground Water Quality Monitoring Results

The detailed ground water quality monitoring results are presented in **Table**

Table 3.11 Ground water Quality Monitoring Result(Near Project Site)

					Limits of IS:10500 -	
S. No.	Parameter Test-Method		Result	Unit	Require ment (Accept able Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 ºC)	APHA ,4500-H ⁺ B Electrometric Method	7.58		6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1 NTU)	NTU	1 A gwaeachl	5
4.	Udour	APHA, 2150 B, Threshold Test Method	Agreeable		Agreeabl	Agreeable
5.	Taste	APHA, 2160 B, Threshold Test Method	Agreeable		Agreeabl	Agreeable
6.	Total Hardness as	APHA, 2340 C, EDTA Titrimetric Method	314.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric	79,96	mg/l	75	200
8.	Alkalinity as CaCO3	APHA, 2320 B, Titrimetric Method	218.37	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	86,51	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	27.82	mg/l	30	100
12.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	952.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA, 4500 E, Turbidimetric Method	51.34	mg/l	200	400
14.	Fluoride as F	APHA, 4500-F ⁻ D, SPADNS Method	0.95	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,ChromotropicMethod	12.05	mg/l	45	No Relaxation
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.23	mg/l	0.3	No relaxation
17.	#Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.32	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	#Seleniumas Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
29.	#Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05

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30.	#Mercury as Hg	APHA, 3112 B, Cold Vapour AAS Method	*BDL (**DL 0.001 mg/l)	mg/l	0.001	No Relaxation		
31.	Total Coliform	IS 1622	< 2	MPN/100	Shall not l any 10	oe detectable in 0 ml sample		
32.	E. Coli	IS 1622	Absent	MPN/100m	Shall not l any 10	oe detectable in 0 ml sample		
No	ote: - *BDL-Below Dete	ection Limit, **DL- Detection Limit						
		Table 3.12 Ground water Ouality M	onitoring Result (Iiwa	an Singh Wa	ala)			
				0	Limits	of IS:10500 -		
S. No.	Parameter	Test-Method	Result	Unit	Require ment (Accept able Limits)	Permissible limit in the Absence of Alternate Source		
1.	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.78		6.5 to 8.5	No Relaxation		
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**(DL 5Hazen)	Hazen	5	15 5		
з. 4	Odour	APHA, 2150 B, Nephielonieuro Method	Agreeshie		Agreeabl	Agreeable		
4. r	Taste	APHA, 2150 B, Threshold Test Method	Agreeable		Agreeahl	Agreeable		
5.	Total Hardnoss as	APHA, 2100 B, Inresnold Test Method	Agreeable	mg/l	200	600		
6.	fotal maruness as	APHA, 2340 C, EDTA Titrimetric Method	288.00	ilig/1	200	300		
7.	Alleslisites es CaCo	APHA, 5500 Ca B, EDTA Thuineuric	65.21	mg/1	75	200		
8.	Alkalinity as CaCO ₃	APHA, 2320 B, Titrimetric Method	176.13	mg/l	200	600		
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	82.69	mg/l	250	1000		
10.	#Cyanide as CN	APHA , 4500 CN ⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation		
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	30.45	mg/l	30	100		
12.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	919.00	mg/l	500	2000		
13.	Sulphate as SO ₄	APHA, 4500 E, Turbidimetric Method	35.69	mg/l	200	400		
14.	Fluoride as F	APHA, 4500-F-D, SPADNS Method	0.89	mg/l	1.0	1.5		
15.	Nitrate as NO ₃	IS 3025 (P-34) ,ChromotropicMethod	9,98	mg/l	45	No Relaxation		
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.21	mg/l	0.3	No relaxation		
17.	#Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2		
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1		
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation		
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002		
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation		
22.	Anionic Detergents as	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0		
23.	Zinc as Zn	APHA, 3111 B, Direct Air, Acetylene Flame Method	0.56	mg/l	5	15		
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5		
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3		
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation		
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation		

28.	#Seleniumas Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	#Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	#Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Total Coliform	IS 1622	< 2	MPN/100 ml	Shall not be detectable in any 100 ml sample	
32.	E. Coli	IS 1622	Absent	MPN/100m	Shall not be detectable in any 100 ml sample	

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

Table 3.13 Ground water Quality Monitoring Result (Maanwala)

					Limits	of IS:10500 -
S. No.	Parameter	Test-Method	Result	Unit	Require ment (Accept able Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.83		6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable		Agreeabl	Agreeable
5.	Taste	APHA, 2160 B, Threshold Test Method	Agreeable		Agreeabl	Agreeable
6.	Total Hardness as	APHA , 2340 C, EDTA Titrimetric Method	467.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric	89.67	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA, 2320 B, Titrimetric Method	311.54	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	215.93	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN ⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	59.11	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	995.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA, 4500 E, Turbidimetric Method	129.54	mg/l	200	400
14.	Fluoride as F	APHA, 4500-F D, SPADNS Method	1.38	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) ,ChromotropicMethod	15.43	mg/l	45	No Relaxation
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.38	mg/l	0.3	No relaxation
17.	#Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.49	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
	-	т <u> </u>		<u></u>		

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26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	#Seleniumas Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	#Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	#Mercury as Hg	APHA, 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Total Coliform	IS 1622	< 2	MPN/100 ml	Shall not b any 10	be detectable in 0 ml sample
32.	E. Coli	IS 1622	Absent	MPN/100m	Shall not b any 10	be detectable in 0 ml sample
No	te : - *BDL-Below Dete	ection Limit, **DL- Detection Limit				
		Table 3.14 Ground water Quality	v Monitoring Result (N	lahi Nangal	า	
					Limits	of IS:10500 -
S. No.	Parameter	Test-Method	Result	Unit	Require ment (Accept able Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 ºC)	APHA ,4500-H ⁺ B Electrometric Method	7.68		6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable		Agreeabl	Agreeable
5.	Taste	APHA, 2160 B, Threshold Test Method	Agreeable		Agreeabl	Agreeable
6.	Total Hardness as CaCO3	APHA , 2340 C, EDTA Titrimetric Method	396.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric	96.35	mg/l	75	200
8.	Alkalinity as CaCO3	APHA, 2320 B, Titrimetric Method	296.32	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	91.05	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN ⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA . 3500 Mg B, Calculation Method	37.81	mg/l	30	100
12.	Total Dissolved Solids	APHA . 2540 C. Gravimetric Method	979.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA 4500 F. Turbidimetric Method	86.75	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) ,ChromotropicMethod	12.06	mg/l	45	No Relaxation
16.	Iron as Fe	APHA , 3500-Fe B 1,10 Phenanthroline Method	0.28	mg/l	0.3	No relaxation
17.	#Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Tptal Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.0 <u>x</u> 3 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0

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s Zn	APHA, 3111 B. Direct Air, Acetylene		mg/l	5	15		
	Flame Method	0.68	8/ -	0.05	1 5		
a as cu	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	IIIg/1	0.05	1.5		
anese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3		
ium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation		
ıs Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation		
niumas Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation		
nic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05		
cury as Hg	APHA, 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation		
Coliform	IS 1622	< 2	MPN/100 ml	Shall not l any 10	oe detectable in 0 ml sample		
	IS 1622	Absent	MPN/100m	Shall not l any 10	oe detectable in 0 ml sample		
<mark>o</mark> BDL-Below Det	ection Limit, **DL- Detection Limit						
	Table 3.15Ground water Quality	Monitoring Result (K	ot Kashmir])			
Limits of IS:10500 -							
				Limits	of IS:10500 -		
Parameter	Test-Method	Result	Unit	Limits Require ment (Accept able Limits)	of IS:10500 - Permissible limit in the Absence of Alternate Source		
Parameter : 25 ºC)	Test-Method APHA ,4500-H ⁺ B Electrometric Method	Result 7.89	Unit	Limits Require ment (Accept able Limits) 6.5 to 8.5	of IS:10500 - Permissible limit in the Absence of Alternate Source No Relaxation		
Parameter : 25 ºC)	Test-Method APHA ,4500-H ⁺ B Electrometric Method APHA ,2120 B, Visual Comparison	Result 7.89 *BDL (**DL 5Hazen)	Unit Hazen	Limits Require ment (Accept able Limits) 6.5 to 8.5 5	Permissible limit in the Absence of Alternate Source No Relaxation 15		
Parameter : 25 °C) r lity	Test-Method APHA ,4500-H ⁺ B Electrometric Method APHA ,2120 B, Visual Comparison APHA, 2130 B, Nephlelometric Method	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU)	Unit Hazen NTU	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1	Permissible limit in the Absence of Alternate Source No Relaxation 15 5		
Parameter : 25 °C) r dity	Test-Method APHA ,4500-H ⁺ B Electrometric Method APHA ,2120 B, Visual Comparison APHA, 2130 B, Nephlelometric Method APHA, 2150 B , Threshold Test Method	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable	Unit Hazen NTU 	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl	Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable		
Parameter : 25 °C) r dity	Test-Method APHA ,4500-H ⁺ B Electrometric Method APHA ,2120 B, Visual Comparison APHA, 2130 B, Nephlelometric Method APHA, 2150 B , Threshold Test Method APHA , 2160 B, Threshold Test Method	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable	Unit Hazen NTU 	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl	of IS:10500 - Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable Agreeable		
Parameter 25 °C) r dity Hardness as	Test-MethodAPHA ,4500-H ⁺ B Electrometric MethodAPHA ,2120 B, Visual ComparisonAPHA, 2130 B, Nephlelometric MethodAPHA, 2150 B , Threshold Test MethodAPHA , 2160 B, Threshold Test MethodAPHA , 2340 C, EDTA Titrimetric Method	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00	Unit Hazen NTU mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl 200	of IS:10500 - Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable Agreeable 600		
Parameter 25 °C) r dity Hardness as m as Ca	Test-Method APHA ,4500-H ⁺ B Electrometric Method APHA ,2120 B, Visual Comparison APHA, 2130 B, Nephlelometric Method APHA, 2150 B , Threshold Test Method APHA , 2160 B, Threshold Test Method APHA , 2340 C, EDTA Titrimetric Method APHA, 3500 Ca B, EDTA Titrimetric	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00 102.86	Unit Hazen NTU mg/l mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl 200 75	Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable Agreeable 600 200		
Parameter : 25 °C) r dity Hardness as m as Ca nity as CaCO ₃	Test-Method APHA ,4500-H ⁺ B Electrometric Method APHA ,2120 B, Visual Comparison APHA, 2130 B, Nephlelometric Method APHA, 2150 B , Threshold Test Method APHA , 2160 B, Threshold Test Method APHA , 2340 C, EDTA Titrimetric Method APHA, 3500 Ca B, EDTA Titrimetric APHA , 2320 B, Titrimetric Method	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00 102.86 334.02	Unit Hazen NTU mg/l mg/l mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl 200 75 200	of IS:10500 - Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable Agreeable 600 200 600		
Parameter 25 °C) r dity Hardness as m as Ca nity as CaCO ₃ de as Cl	Test-Method APHA ,4500-H ⁺ B Electrometric Method APHA ,2120 B, Visual Comparison APHA, 2130 B, Nephlelometric Method APHA, 2150 B , Threshold Test Method APHA , 2160 B, Threshold Test Method APHA , 2340 C, EDTA Titrimetric Method APHA , 3500 Ca B, EDTA Titrimetric APHA , 2320 B, Titrimetric Method APHA , 4500-Cl ⁻ B, Argentometric Method	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00 102.86 334.02 124.85	Unit Hazen NTU mg/l mg/l mg/l mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl 200 75 200 250	Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable Agreeable 600 200 600 1000		
Parameter 25 °C) r dity Hardness as m as Ca nity as CaCO ₃ de as Cl ide as CN	Test-Method APHA ,4500-H ⁺ B Electrometric Method APHA ,2120 B, Visual Comparison APHA, 2130 B, Nephlelometric Method APHA, 2130 B, Nephlelometric Method APHA, 2150 B , Threshold Test Method APHA , 2160 B, Threshold Test Method APHA , 2340 C, EDTA Titrimetric Method APHA , 2320 C, EDTA Titrimetric Method APHA , 2320 B, Titrimetric Method APHA , 4500-Cl ⁻ B, Argentometric Method APHA , 4500 CN ⁻ D	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00 102.86 334.02 124.85 *BDL (**DL 0.02 mg/l)	Unit Hazen NTU mg/l mg/l mg/l mg/l mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl 200 75 200 250 0.05	of IS:10500 - Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable Agreeable 600 200 600 1000 No Relaxation		
Parameter 25 °C) r dity Hardness as m as Ca nity as CaCO ₃ de as Cl ide as CN esium as Mg	Test-MethodAPHA ,4500-H ⁺ B Electrometric MethodAPHA ,2120 B, Visual ComparisonAPHA, 2130 B, Nephlelometric MethodAPHA, 2150 B , Threshold Test MethodAPHA , 2160 B, Threshold Test MethodAPHA , 2340 C, EDTA Titrimetric MethodAPHA , 3500 Ca B, EDTA TitrimetricAPHA , 2320 B, Titrimetric MethodAPHA , 4500 Ch ⁻ DAPHA , 3500 Mg B, Calculation Method	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00 102.86 334.02 124.85 *BDL (**DL 0.02 mg/l) 47.71	Unit Hazen NTU mg/l mg/l mg/l mg/l mg/l mg/l mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl 200 75 200 250 0.05 30	Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable Agreeable 600 200 600 1000 No Relaxation 100		
Parameter 25 °C) r dity Hardness as m as Ca nity as CaCO ₃ de as Cl dide as CN esium as Mg Dissolved Solids	Test-MethodAPHA ,4500-H ⁺ B Electrometric MethodAPHA ,2120 B, Visual ComparisonAPHA, 2130 B, Nephlelometric MethodAPHA, 2150 B , Threshold Test MethodAPHA , 2160 B, Threshold Test MethodAPHA , 2340 C, EDTA Titrimetric MethodAPHA , 2340 C, EDTA Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 4500 Ca B, EDTA TitrimetricAPHA , 3500 Ca B, EDTA TitrimetricAPHA , 3500 Cg B, Calculation MethodAPHA , 4500 Ch ⁻ DAPHA , 3500 Mg B, Calculation MethodAPHA , 2540 C, Gravimetric Method	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00 102.86 334.02 124.85 *BDL (**DL 0.02 mg/l) 47.71 1086.00	Unit Hazen NTU mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl 200 75 200 250 0.05 30 500	Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable Agreeable 600 200 600 1000 No Relaxation 100 2000		
Parameter 25 °C) r dity Hardness as m as Ca nity as CaCO ₃ de as Cl de as Cl de as CN esium as Mg Dissolved Solids ate as SO4	Test-MethodAPHA ,4500-H ⁺ B Electrometric MethodAPHA ,2120 B, Visual ComparisonAPHA, 2130 B, Nephlelometric MethodAPHA, 2150 B , Threshold Test MethodAPHA , 2160 B, Threshold Test MethodAPHA , 2340 C, EDTA Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 4500 CN ⁻ DAPHA , 3500 Mg B, Calculation MethodAPHA , 2540 C, Gravimetric MethodAPHA , 4500 E, Turbidimetric Method	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00 102.86 334.02 124.85 *BDL (**DL 0.02 mg/l) 47.71 1086.00 98.66	Unit Hazen NTU mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl 200 75 200 250 0.05 30 500 200	Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable 600 200 600 1000 No Relaxation 100 2000 400		
Parameter 2 25 °C) r dity Hardness as m as Ca nity as CaCO ₃ de as Cl de as Cl dide as CN esium as Mg Dissolved Solids ate as SO ₄ de as F	Test-MethodAPHA ,4500-H ⁺ B Electrometric MethodAPHA ,2120 B, Visual ComparisonAPHA, 2130 B, Nephlelometric MethodAPHA, 2130 B, Nephlelometric MethodAPHA, 2150 B , Threshold Test MethodAPHA , 2160 B, Threshold Test MethodAPHA , 2340 C, EDTA Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 4500 Ca B, EDTA TitrimetricAPHA , 2320 B, Titrimetric MethodAPHA , 4500 CI ⁻ B, Argentometric MethodAPHA , 3500 Mg B, Calculation MethodAPHA , 2540 C, Gravimetric MethodAPHA , 4500 F, D, SPADNS Method	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00 102.86 334.02 124.85 *BDL (**DL 0.02 mg/l) 47.71 1086.00 98.66 0.97	Unit Hazen NTU mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl 200 75 200 250 0.05 30 500 200 1.0	Of IS:10500 -Permissible limit in the Absence of Alternate SourceNo Relaxation155AgreeableAgreeable6002006001000No Relaxation10020004001.5		
Parameter 2 25 °C) r dity Hardness as m as Ca nity as CaCO3 de as Cl nide as CN esium as Mg Dissolved Solids ate as SO4 de as F e as NO3	Test-MethodAPHA ,4500-H ⁺ B Electrometric MethodAPHA ,2120 B, Visual ComparisonAPHA, 2130 B, Nephlelometric MethodAPHA, 2150 B , Threshold Test MethodAPHA , 2160 B, Threshold Test MethodAPHA , 2340 C, EDTA Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 4500 Ca B, EDTA Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 4500 CN ⁻ DAPHA , 4500 CN ⁻ DAPHA , 3500 Mg B, Calculation MethodAPHA , 4500 E, Turbidimetric MethodAPHA , 4500 F, D, SPADNS MethodIS 3025 (P-34) ,ChromotropicMethod	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00 102.86 334.02 124.85 *BDL (**DL 0.02 mg/l) 47.71 1086.00 98.66 0.97 14.33	Unit Hazen NTU mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl 200 75 200 250 0.05 30 500 200 1.0 45	of IS:10500 -Permissiblelimit in theAbsence ofAlternateSourceNo Relaxation155Agreeable6002006001000No Relaxation10020004001.5No Relaxation		
Parameter 2 25 °C) r dity Hardness as m as Ca nity as CaCO ₃ de as Cl nide as CN esium as Mg Dissolved Solids ate as SO ₄ de as F e as NO ₃ s Fe	Test-MethodAPHA ,4500-H ⁺ B Electrometric MethodAPHA ,2120 B, Visual ComparisonAPHA, 2130 B, Nephlelometric MethodAPHA, 2130 B, Threshold Test MethodAPHA, 2150 B, Threshold Test MethodAPHA , 2160 B, Threshold Test MethodAPHA , 2340 C, EDTA Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 4500 Ca B, EDTA TitrimetricAPHA , 2320 B, Titrimetric MethodAPHA , 4500 Cl ⁻ B, Argentometric MethodAPHA , 4500 Cl ⁻ B, Argentometric MethodAPHA , 3500 Mg B, Calculation MethodAPHA , 4500 E, Turbidimetric MethodAPHA , 4500 F, D, SPADNS MethodIS 3025 (P-34) ,ChromotropicMethodAPHA , 3500-Fe B 1,10 Phenanthroline Method	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00 102.86 334.02 124.85 *BDL (**DL 0.02 mg/l) 47.71 1086.00 98.66 0.97 14.33 0.32	Unit Hazen NTU mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl 200 75 200 250 0.05 30 500 200 1.0 45 0.3	Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable Agreeable 600 200 600 1000 No Relaxation 100 2000 400 1.5 No Relaxation No relaxation		
Parameter 2 25 °C) r dity Hardness as m as Ca nity as CaCO ₃ de as Cl nide as CN esium as Mg Dissolved Solids ate as SO4 de as F e as NO3 s Fe ninium as Al	Test-MethodAPHA ,4500-H ⁺ B Electrometric MethodAPHA ,2120 B, Visual ComparisonAPHA, 2130 B, Nephlelometric MethodAPHA, 2150 B , Threshold Test MethodAPHA , 2160 B, Threshold Test MethodAPHA , 2340 C, EDTA Titrimetric MethodAPHA , 2340 C, EDTA Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 2320 B, Titrimetric MethodAPHA , 4500 CN ⁻ DAPHA , 3500 Mg B, Calculation MethodAPHA , 4500 E, Turbidimetric MethodAPHA , 4500 F, D, SPADNS MethodIS 3025 (P-34) ,ChromotropicMethodAPHA , 3500-Fe B 1,10 Phenanthroline MethodAPHA , 3111 D Nitrous Oxide Acetylene	Result 7.89 *BDL (**DL 5Hazen) *BDL (**DL 1 NTU) Agreeable Agreeable 453.00 102.86 334.02 124.85 *BDL (**DL 0.02 mg/l) 47.71 1086.00 98.66 0.97 14.33 0.32 *BDL(**DL 0.03 mg/l)	Unit Hazen NTU mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	Limits Require ment (Accept able Limits) 6.5 to 8.5 5 1 Agreeabl Agreeabl 200 250 0.05 30 500 200 1.0 45 0.3 0.03	Permissible limit in the Absence of Alternate Source No Relaxation 15 5 Agreeable 600 200 600 1000 No Relaxation 100 2000 400 1.5 No Relaxation No relaxation No relaxation		
	z Zn r as Cu nese as Mn um as Cd s Pb iumas Se nic as As ury as Hg Coliform	Zn APHA , 3111 B, Direct Air, Acetylene Flame Method r as Cu APHA , 3111 B, Direct Air, Acetylene Flame Method nese as Mn APHA , 3111 B, Direct Air, Acetylene Flame Method um as Cd APHA , 3111 B, Direct Air, Acetylene Flame Method s Pb APHA , 3111 B, Direct Air, Acetylene Flame Method iumas Se APHA , 3111 B, Direct Air, Acetylene Flame Method nic as As APHA , 3114 B, Manual Hydride Generation nic as As APHA , 3112 B, Cold Vapour AAS Method Coliform IS 1622 BDL-Below Detection Limit, **DL- Detection Limit Table 3.15Ground water Quality	ZnAPHA , 3111 B, Direct Air, Acetylene Flame Method0.68r as CuAPHA , 3111 B, Direct Air, Acetylene Flame Method*BDL(**DL 0.03 mg/l)nese as MnAPHA , 3111 B, Direct Air, Acetylene Flame Method*BDL(**DL 0.06 mg/l)um as CdAPHA , 3111 B, Direct Air, Acetylene Flame Method*BDL(**DL 0.03 mg/l)s PbAPHA , 3111 B, Direct Air, Acetylene Flame Method*BDL(**DL 0.03 mg/l)iumas SeAPHA , 3111 B, Direct Air, Acetylene Flame Method*BDL(**DL 0.01 mg/l)iumas SeAPHA , 3114 B, Manual Hydride Generation*BDL(**DL 0.13 mg/l)nic as AsAPHA , 3112 B, Cold Vapour AAS Method*BDL(**DL 0.01 mg/l)coliformIS 1622<2	Zn APHA, 3111 B, Direct Air, Acetylene Flame Method 0.68 mg/l r as Cu APHA, 3111 B, Direct Air, Acetylene Flame Method *BDL(**DL 0.03 mg/l) mg/l nese as Mn APHA, 3111 B, Direct Air, Acetylene Flame Method *BDL(**DL 0.06 mg/l) mg/l um as Cd APHA, 3111 B, Direct Air, Acetylene Flame Method *BDL(**DL 0.03 mg/l) mg/l s Pb APHA, 3111 B, Direct Air, Acetylene Flame Method *BDL(**DL 0.03 mg/l) mg/l iumas Se APHA, 3111 B, Direct Air, Acetylene Flame Method *BDL(**DL 0.01 mg/l) mg/l iumas Se APHA, 3114 B, Manual Hydride Generation *BDL(**DL 0.13 mg/l) mg/l nic as As APHA, 3112 B, Cold Vapour AAS Method *BDL(**DL 0.01 mg/l) mg/l coliform IS 1622 <2	Zn APHA, 3111 B, Direct Air, Acetylene Flame Method 0.68 mg/l 5 r as Cu APHA, 3111 B, Direct Air, Acetylene Flame Method *BDL(**DL 0.03 mg/l) mg/l 0.05 nese as Mn APHA, 3111 B, Direct Air, Acetylene Flame Method *BDL(**DL 0.06 mg/l) mg/l 0.1 um as Cd APHA, 3111 B, Direct Air, Acetylene Flame Method *BDL(**DL 0.03 mg/l) mg/l 0.003 s Pb APHA, 3111 B, Direct Air, Acetylene Flame Method *BDL(**DL 0.01 mg/l) mg/l 0.01 iumas Se APHA, 3114 B, Manual Hydride Generation *BDL(**DL 0.01 mg/l) mg/l 0.01 nic as As APHA, 3112 B, Cold Vapour AAS Method *BDL(**DL 0.01 mg/l) mg/l 0.001 coliform IS 1622 <2		

19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.76	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	#Seleniumas Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	#Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	#Mercury as Hg	APHA , 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Total Coliform	IS 1622	< 2	MPN/100 ml	Shall not l any 10	be detectable in 0 ml sample
32.	E. Coli	IS 1622	Absent	MPN/100m	Shall not l any 10	be detectable in 0 ml sample

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

Table 3.16 Ground water Quality Monitoring Result (Nasibpura)

					Limits	of IS:10500 -
S.	Donomotor	Toot Mothed	Decult	II	Require	Permissible
No.	Parameter	l'est-method	Result	Unit	f Accept	Absence of
					able	Alternate
4	H (+ 25 + 20				Limits)	Source
1.	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.93		6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15 Г
3.	Iurbiaity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL I NTU)	NIU	I Agroophi	5 Agroophlo
4.	Tasta	APHA, 2150 B, Threshold Test Method	Agreeable		Agreeabl	Agreeable
5.	Taste	APHA, 2160 B, Threshold Test Method	Agreeable		Agreeabl	Agreeable
6.	Total Hardness as	APHA, 2340 C, EDTA Titrimetric Method	421.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric	115.63	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA, 2320 B, Titrimetric Method	285.32	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	108.12	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	32.20	mg/l	30	100
12.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	1010.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA, 4500 E, Turbidimetric Method	109.50	mg/l	200	400
14.	Fluoride as F	APHA, 4500-F ⁻ D, SPADNS Method	0.90	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,ChromotropicMethod	11.32	mg/l	45	No Relaxation
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.38	mg/l	0.3	No relaxation
17.	#Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA, 3111 B, Direct Air, Acetylene Flame Method	0.84	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	#Seleniumas Se	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	#Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	#Mercury as Hg	APHA, 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Total Coliform	IS 1622	< 2	MPN/100 ml	Shall not l any 10	pe detectable in 0 ml sample

Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandisabo, Bhatinda Punjab (F.No. J-11011/221/2017-IA II (I) Dated-14/08/2018) \$ ۰. MPN/100m Shall not be detectable in E. Coli 32. IS 1622 Absent any 100 ml sample **Note**: - *BDL-Below Detection Limit, **DL- Detection Limit Table 2 17 C On alter Manitania - Da lt (Deels' D . . .

		Table 3.17 Ground water Quality	Monitoring Result (Ba	gni Banda	r)	
					Limits	of IS:10500 -
S. No.	Parameter	Test-Method	Result	Unit	Require ment (Accept able Limits)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.75		6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable		Agreeabl	Agreeable
5.	Taste	APHA, 2160 B, Threshold Test Method	Agreeable		Agreeabl	Agreeable
6.	Total Hardness as	APHA, 2340 C, EDTA Titrimetric Method	454.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric	104.47	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA , 2320 B, Titrimetric Method	269.54	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl B, Argentometric Method	93.44	mg/l	250	1000
10.	#Cyanide as CN	APHA , 4500 CN D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	46.98	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	1132.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA, 4500 E, Turbidimetric Method	98.75	mg/l	200	400
14.	Fluoride as F	APHA, 4500-F D, SPADNS Method	0.88	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,ChromotropicMethod	12.98	mg/l	45	No Relaxation
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.32	mg/l	0.3	No relaxation
17.	#Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	#Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA , 3111 B, Direct Air, Acetylene Flame Method	0.71	mg/l	5	15
24.	Copper as Cu	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	#Seleniumas Se	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	#Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05

	Project: Setting up 2G Ethanol Bio-Refinery plant of capacity 100 KLPD at village Nasibpura, Tehsil Talwandisabo, Bhatinda Punjab (F.No. J-11011/221/2017-IA II (I) Dated-14/08/2018)							
30.	#Mercury as Hg	АРНА	, 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01	mg/l)	mg/l	0.001	No Relaxation
31.	Total Coliform		IS 1622	< 2		MPN/100 ml	Shall not any 10	be detectable in 00 ml sample
32.	E. Coli		IS 1622	Absent		MPN/100m	Shall not any 10	be detectable in 00 ml sample
Nc	te: - *BDL-Below Dete	ection I	Limit, **DL- Detection Limit			<u></u>	<u></u>	
			Table 3.18Surface water Quali	ity Monitoring R	lesult ((KotFatta)		
S. No). Parameter		Test-Method			Result		Unit
1.	pH (at 25 ⁰ C)		APHA ,4500-H ⁺ B Electrome	etric Method		7.91		
2.	Colour		APHA ,2120 B, Visual Compa	arison Method	*B	DL (**DL 5H	azen)	Hazen
3.	Turbidity		APHA, 2130 B, Nephlelomet	tric Method		23		NTU
4.	Odour	i	APHA, 2150 B, Threshold T	lest Method		Agreeable		
5.	Chloride as Cl	i	APHA, 4500-Cl ⁻ B, Argentom	etric Method		121.05		mg/l
6.	Conductivity	i	APHA, 2510 B, Conductivity M	Meter Method		1315		µS/cm
7.	Nitrate as NO ₃	i	IS 3025 (P-34) ,Chromotrop	picMethod		20.16		mg/l
8.	Iron as Fe	i	APHA, 3500-Fe B 1,10 Phenant	hroline Method		0.39		mg/l
9.	Total DissolvedSolids		APHA , 2540 C, Gravimetri	ic Method		789.00		mg/l
10.	Lead as Pb		APHA, 3111 B, Direct Air, Acetyle	ene Flame Method	*B	DL(**DL 0.01 r	mg/l)	mg/l
11.	Boron		APHA, 4500B C, Carmine	e Method		0.22		mg/l
12.	Sulphate as SO ⁴		APHA , 4500 E, Turbidimet	ric Method		16.78		mg/l
13.	Fluoride as F		APHA , 4500-F ⁻ D, SPADN	IS Method		0.61		mg/l
14.	BOD (3 Daysat 27 ⁰ C)		APHA, 5210 C / IS 302	5,P-44		3.56		mg/l
15.	COD		APHA, 5220 B, Open Reflu	IX Method		32.58		mg/l
16.	Free Ammonia as NH	3	IS 3025 (P-34), Titrimetrie	c Method		14.95		mg/l
17.	Total Coliform		IS 1622			32		MPN/100ml
18.	#Arsenic as As		APHA, 3114 B, Manual Hydri	de Generation	*B	3DL(**DL 0.01	mg/l)	mg/l

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

Table 3.19Surface water Quality Monitoring Result (Chathewala)

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ⁰ C)	APHA ,4500-H ⁺ B Electrometric Method	7.69	
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	17	NTU
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	
5.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	117.62	mg/l
6.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1270	µS/cm
7.	Nitrate as NO ₃	IS 3025 (P-34) ,ChromotropicMethod	9.92	mg/l
8.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.47	mg/l
9.	Total Dissolved_Solids	APHA , 2540 C, Gravimetric Method	762.00	mg/l
10.	Lead as Pb	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
11.	Boron	APHA, 4500B C, Carmine Method	0.19	mg/l
12.	Sulphate as SO ⁴	APHA, 4500 E, Turbidimetric Method	32.54	mg/l
13.	Fluoride as F	APHA , 4500-F D, SPADNS Method	0.52	mg/l
14.	BOD (3 Daysat 27 ⁰ C)	APHA, 5210 C / IS 3025,P-44	9.00	mg/l
15.	COD	APHA, 5220 B, Open Reflux Method	26.70	mg/l
16.	Free Ammonia as NH ₃	IS 3025 (P-34), Titrimetric Method	12.63	mg/l
17.	Total Coliform	IS 1622	38	MPN/100ml
18.	#Arsenic as As	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

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

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 3.20**.

S. No.	Location Code	Location Name/ Description
1.	S1	Near Project Site
2.	S2	Jiwan Singh wala
3.	S3	MaanWala
4.	S4	Mahi Nangal
5.	S5	Leleana
6.	S6	Baghi Bandar
7.	S7	NasibPura
8.	S8	Kotbhara
9.	S9	Kot Kashmir
10.	S10	GehriBoghi
11.	\$11	Chathewala
12.	S12	KotFatta

Table 3.20 Details of Soil Quality Monitoring Location

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 **March 2020**.

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

3.4.3 Soil Monitoring Results

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**.

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.82	
2.	Conductivity	IS:14767 by Conductivity meter	0.336	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78,Issue No01& Issue Date-14/02/2013	Yellowish Red	
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/201	27.64	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.66	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	57.52	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	42.37	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No01& Issue Date-14/02/2013	51.06	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No01& Issue Date-14/02/2013	142.84	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0,73	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.61	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	20.61	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	219.34	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	19.45	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	11.51	mg/kg
17.	Organic Carbon	USEPA 3050B	0.42	%
18.	Lead (as Pb)	USEPA 3050B	0.86	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.75	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.97	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.76	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.41	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Table 3.21Physico-Chemical Characteristics of Soil in the Study Area (Near Project Site)

Table 3.22Physico-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	7.57	
2.	Conductivity	IS:14767 by Conductivity meter	0.329	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish	
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	31.05	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.53	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	51.03	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	42.65	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No01& Issue Date-14/02/2013	53.12	mg/kg
10.	Potassium as K	SOP, SP-84, Issue No01& Issue Date-14/02/2013	156.84	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.53	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.57	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	31.33	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	249.52	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	22.16	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	11.65	mg/kg
17.	Organic Carbon	USEPA 3050B	0.35	%
18.	Lead (as Pb)	USEPA 3050B	0.76	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.86	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.54	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.87	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.43	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Table 3.23Physico-Chemical Characteristics of Soil in the Study Area (Maanwala)

	1		1	
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	0.331	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish Red	
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	33.51	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.83	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	45.12	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	65.47	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No01& Issue Date-14/02/2013	60.72	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No01& Issue Date-14/02/2013	135.04	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.35	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.75	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	24.33	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	234.12	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	33.85	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	14.59	mg/kg
17.	Organic Carbon	USEPA 3050B	0.27	%
18.	Lead (as Pb)	USEPA 3050B	0.63	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.69	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.21	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.49	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Table 3.24Physico-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	7.55	
2.	Conductivity	IS:14767 by Conductivity meter	0.341	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78,Issue No01& Issue Date-14/02/2013	Yellowish Red	
5.	Water holding capacity	SOP, SP-81,Issue No01& Issue Date-14/02/2013	26.38	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.24	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	51.21	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	45.98	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No01& Issue Date-14/02/2013	61.42	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No01& Issue Date-14/02/2013	146.35	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.71	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.79	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	33.15	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	236.12	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	19.87	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	8.96	mg/kg
17.	Organic Carbon	USEPA 3050B	0.25	%
18.	Lead (as Pb)	USEPA 3050B	0.67	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.45	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.45	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.86	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Table 3.26Physico-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	7.78	
2.	Conductivity	IS:14767 by Conductivity meter	0.349	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish	
5.	Water holding capacity	SOP, SP-81,Issue No01& Issue Date-14/02/2013	37.54	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.89	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	67.21	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	54.88	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No01& Issue Date-14/02/2013	61.67	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No01& Issue Date-14/02/2013	163.15	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.84	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.79	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	28.00	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	240.26	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	28.32	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	8.94	mg/kg
17.	Organic Carbon	USEPA 3050B	0.27	%
18.	Lead (as Pb)	USEPA 3050B	0.97	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0,86	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0,98	mg/kg
21.	Copper (as Cu)	USEPA 3050B	7.32	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.51	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Table 3.27Physico-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	7.54	
2.	Conductivity	IS:14767 by Conductivity meter	0.353	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish	
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	41.02	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.71	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	56.87	mg/100g
8.	Calcium as Ca	SOP, SP-82, Issue No01& Issue Date-14/02/2013	45.23	mg/100g
9.	Sodium as Na	SOP, SP-84, Issue No01& Issue Date-14/02/2013	57.49	mg/kg
10.	Potassium as K	SOP, SP-84, Issue No01& Issue Date-14/02/2013	167.52	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.69	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.78	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	37.12	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	257.89	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	22.15	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	9.98	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.78	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.86	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.57	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.92	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.41	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Table 3.28Physico-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	7.82	
2.	Conductivity	IS:14767 by Conductivity meter	0.361	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	
4.	Color	SOP, SP-78,Issue No01& Issue Date-14/02/2013	Yellowish Red	
5.	Water holding capacity	SOP, SP-81,Issue No01& Issue Date-14/02/2013	42.53	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.87	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	56.49	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	73.21	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No01& Issue Date-14/02/2013	60.54	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No01& Issue Date-14/02/2013	135.62	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.59	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.78	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	27.12	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	249.80	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	39.32	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	20.12	mg/kg
17.	Organic Carbon	USEPA 3050B	0.46	%
18.	Lead (as Pb)	USEPA 3050B	0.68	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.81	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.88	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.31	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.62	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

*SOP-Laboratory Standard Operating Procedure.

#Chromium- This parameter is not covered our NABL scope.
Table 3.29Physico-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	7.37	
2.	Conductivity	IS:14767 by Conductivity meter	0.337	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78,Issue No01& Issue Date-14/02/2013	Yellowish	
5.	Water holding capacity	SOP, SP-81,Issue No01& Issue Date-14/02/2013	25.86	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.20	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	1.20	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	40.31	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No01& Issue Date-14/02/2013	46.00	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No01& Issue Date-14/02/2013	143.25	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.58	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.65	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	36.12	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	218.00	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	16.25	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	78.12	mg/kg
17.	Organic Carbon	USEPA 3050B	0.49	%
18.	Lead (as Pb)	USEPA 3050B	0.57	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.68	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.41	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.28	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.87	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

*SOP-Laboratory Standard Operating Procedure.

#Chromium- This parameter is not covered our NABL scope.

Table 3.30Physico-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	7.75	
2.	Conductivity	IS:14767 by Conductivity meter	0.324	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish Red	
5.	Water holding capacity	SOP, SP-81,Issue No01& Issue Date-14/02/2013	26.12	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.61	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	57.36	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	42.15	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No01& Issue Date-14/02/2013	50.01	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No01& Issue Date-14/02/2013	153.00	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.78	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.65	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	23.00	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	219.00	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	22.68	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	8.23	mg/kg
17.	Organic Carbon	USEPA 3050B	0.45	%
18.	Lead (as Pb)	USEPA 3050B	0.84	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.74	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.89	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.41	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.37	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

*SOP-Laboratory Standard Operating Procedure.

#Chromium- This parameter is not covered our NABL scope.

Table 3.31Physico-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	7.53	
2.	Conductivity	IS:14767 by Conductivity meter	0.327	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish Red	
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	35.42	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.57	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	58.66	mg/100g
8.	Calcium as Ca	SOP, SP-82, Issue No01& Issue Date-14/02/2013	48.13	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No01& Issue Date-14/02/2013	59.74	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No01& Issue Date-14/02/2013	167.65	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.77	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.85	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	36.21	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	260.10	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	23.65	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	12.37	mg/kg
17.	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.76	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.86	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.64	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.98	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.35	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

*SOP-Laboratory Standard Operating Procedure.

#Chromium- This parameter is not covered our NABL scope.

Table 3.32Physico-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	0.322	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	
4.	Color	SOP, SP-78,Issue No01& Issue Date-14/02/2013	Yellowish Red	
5.	Water holding capacity	SOP, SP-81,Issue No01& Issue Date-14/02/2013	32.64	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.84	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	65.21	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	49.33	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No01& Issue Date-14/02/2013	50.74	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No01& Issue Date-14/02/2013	144.55	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.78	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.67	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	25.36	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	216.12	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	27.61	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	8.93	mg/kg
17.	Organic Carbon	USEPA 3050B	0.55	%
18.	Lead (as Pb)	USEPA 3050B	1.02	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.89	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.99	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.58	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.47	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

*SOP-Laboratory Standard Operating Procedure.

Table 3.33Physico-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	7.89	
2.	Conductivity	IS:14767 by Conductivity meter	0.351	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish Red	
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	35.76	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.98	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	60.45	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	71.24	mg/100g
9.	Sodium as Na	SOP, SP-84, Issue No01& Issue Date-14/02/2013	53.22	mg/kg
10.	Potassium as K	SOP, SP-84, Issue No01& Issue Date-14/02/2013	116.00	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.37	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.89	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	26.19	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	216.86	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	55.26	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	15.91	mg/kg
17.	Organic Carbon	USEPA 3050B	0.48	%
18.	Lead (as Pb)	USEPA 3050B	0.69	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.81	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.78	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.73	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.48	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

*SOP-Laboratory Standard Operating Procedure.

3.4.4 Discussion on Soil Characteristics in the Study Area

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

3.5 SITE PHOTOGRAPH



Ambient Air Quality Monitoring



Ambient Air Quality Monitoring



Ambient Noise Level Monitoring



Ambient Noise Level Monitoring



Water Sampling



Water Sampling



Soil Sampling



Soil Sampling

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan 'NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number: Name & Address of the Project: Latitude: Longitude:	VEL/HPCL/AA/01 M/s Hindustan Petroleum Corpo Village Nasibpura, Bhatinda Pur 30 ⁰ 3'13.34"N 75 ⁰ 0'41.57"E	rati njal	on Ltd. 9	Report No.: Format No.: Party Reference No.: Reporting Date: Period of Analysis: Receipt Date:	VEL/AA/2002/24/001 7.8 F-01 NIL 29/02/2020 24/02/2020 - 29/02/2020 24/02/2020	
Sample Description: AM	BIENT AIR QUALITY MONITO	RI	NG			
General Information:-						
Sample collected by		3	Vardan E	nviro Lab Representativ	e	
Sampling Location		6	Near Pro	roject Site		
Instrument Used Instrument Code Instrument Calibration Status Meteorological condition during monitoring		 RDS & FPS sampler with all Accessories VEL/RDS/01 & VEL/FPS/01 Calibrated Clear Sky 			essories	
Date of Monitoring			19/02/202	20 to 20/02/2020		
Ambient Temperature (°C)			10:15 AN Min. 12°	1 – 10:15 AM C Max. 22°C		
Surrounding Activity		3	Human &	ک Vehicular Activities		
Scope of Monitoring		:	Regulator	y Requirement		
Control measure if Any		3	No			
Sampling & Analysis Protocol		:	IS-5182			
Parameter Required		1	As per cli	ent requirement.		

S. No.	Parameter	Protocol	Result	Unit	NAAQS [@] Limit
1,	Particulate Matter (PM _{2.5})	"SOP No. VEL/SOP/01, Section No. SP 63	50.21	µg/m ³	60
2.	Particulate Matter (PM10)	IS: 5182 (P-23) Gravimetric Method	89.76	µg/m ³	100
3.	Nitrogen Dioxide (NO2)	IS: 5182 (P-6) Jacob & Hochheiser	22.54	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	11.02	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.92	mg/m ³	4
6.	Ammonia (NH3), µg/m3	IS:11255(P-6) Indo Phenol Blue Method	9.37	ug/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	22.14	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)	це/m ³	
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	DDIN(V/V)	

SOP- Laboratory Standard Operating Procedure, ^- This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DI/ Detection Lim

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NOTE: a)The results listed refer only to the tested samples & applicable parameters a) ne tablid inset retail inset retail in the tasket samples an approache parameters
 b) Total flabilities of our lab will be restricted to the involce amount only
 c) The sample will be destroyed after retention time unless otherwise specified
 d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/HPCL/AA/02		Report No.:	VEL/AA/2002/24/002	
Name & Address of the Project:	M/s Hindustan Petroleum (Village Nasibpura, Bhatin	Corporation Ltd. da Punjab	Format No.: Party Reference No.:	7.8 F-01 NIL	
Latitude: Longitude:	30 ⁰ 3'37.63"N 75 ⁰ 2'75.30"E		Reporting Date: Period of Analysis: Receipt Date:	29/02/2020 24/02/2020 - 29/02/2020 24/02/2020	
Sample Description: AM	BIENT AIR QUALITY MO	NITORING			
General Information:-					
Sample collected by		: Vardan E	nviro Lab Representative		
Sampling Location		: Jiwan S	ingh Wala		
Instrument Used		: RDS & F	SPS sampler with all Accessories		
Instrument Code		: VEL/RD	S/03& VEL/FPS/03		
Instrument Calibration Status		: Calibrate	d		
Meteorological condition during	monitoring	: Clear Sky	/		
Date of Monitoring		: 19/02/20	20 to 20/02/2020		
Time of Monitoring		: 10:30 AN	M – 10:30 AM		
Ambient Temperature (°C)		; Min. 12°	C Max. 22°C		
Surrounding Activity		; Human d	& Vehicular Activities		
Scope of Monitoring		: Regulato	ry Requirement		
Control measure if Any		: No			
Sampling & Analysis Protocol		: IS-5182			
Parameter Required		: As per cl	ient requirement.		

S. No.	Parameter	Protocol	Result	Unit	NAAQS [@] Limit
1.	Particulate Matter (PM2.5)	[#] SOP No. VEL/SOP/01, Section No. SP 63	48.15	µg/m³	60
2.	Particulate Matter (PM10)	IS: 5182 (P-23) Gravimetric Method	87.91	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	20.63	$\mu g/m^3$	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	12.01	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.83	mg/m ³	4
6.	Ammonia (NH3), µg/m3	IS:11255(P-6) Indo Phenol Blue Method	13.84	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)	ug/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	21.50	ug/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)	

SOP- Laboratory Standard Operating Procedure., ^- This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection Limit (Cheeked By)

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Test Report

Sample Number: Name & Address of the Project: Latitude: Longitude:	VEL/HPCL/AA/03 M/s Hindustan Petroleum Corp Village Nasibpura, Bhatinda Pu 30°2'33.23"N 75°58'6 88"F	orat Inja	tion Ltd. 1b	Report No.: Format No.: Party Reference No.: Reporting Date: Period of Analysis:	VEL/AA/2002/24/003 7.8 F-01 NIL 29/02/2020 24/02/2020 - 29/02/2020
Soughtatt	75 50 0.00 E			Receipt Date:	24/02/2020
Sample Description: AMI	BIENT AIR QUALITY MONITO	RI	NG		
General Information:-					
Sample collected by			Vardan Ei	viro Lab Representative	
Sampling Location		Maanwala			
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		1	19/02/2020) to 20/02/2020	
Time of Monitoring		:	: 09:15 AM – 09:15 AM		
Ambient Temperature (°C)			Min. 12°C Max. 22°C		
Surrounding Activity		1	Human & Vehicular Activities		
Scope of Monitoring			: Regulatory Requirement		
Control measure if Any			No		
Sampling & Analysis Protocol		3	IS-5182		
Parameter Required		3	As per Wo	ork Order	

S. No.	Parameter	Protocol	Result	Unit	NAAQS [@] Limit
1.	Particulate Matter (PM2.5)	*SOP No. VEL/SOP/01, Section No. SP 63	49.64	µg/m ³	60
2,	Particulate Matter (PM10)	IS: 5182 (P-23) Gravimetric Method	90.26	µg/m ³	100
3.	Nitrogen Dioxide (NO2)	IS: 5182 (P-6) Jacob & Hochheiser	21.07	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	13.01	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.97	mg/m ³	4
6.	Ammonia (NH3), µg/m3	IS:11255(P-6) Indo Phenol Blue Method	10.16	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	ug/m ³	180
11_{\odot}	[^] 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)	ug/m ³	
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	**BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	

Nete :-@ NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec -3(i)]18.11.2009. # SOP- Laboratory Standard Operating Procedure , ^ This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection

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NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the invoice amount only c) The sample will be destroyed after retention time unless otherwise specified

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/HPCL/AA/04	Report No.:	VEL/AA/2002/24/004
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
	0.2	Reporting Date:	29/02/2020
Latitude:	30°1 13.05"N	Period of Analysis:	24/02/2020 - 29/02/2020
Longitude:	75 [°] 1'3.89"E	Receipt Date:	24/02/2020
Sample Description: AM	BIENT AIR QUALITY MONITORING		
General Information:-			

Sample collected by	Vardan Enviro Lab Representative
Sampling Location	: Mahi Nangal
Instrument Used	: RDS & FPS sampler with all Accessories
Instrument Code	VEL/RDS/02& VEL/FPS/02
Instrument Calibration Status	; Calibrated
Meteorological condition during monitoring	Clear Sky
Date of Monitoring	: 19/02/2020 to 20/02/2020
Time of Monitoring	: 09:30 AM - 09:30 AM
Ambient Temperature (°C)	Min. 12°C Max. 22°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182
Parameter Required	As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [@] Limit
1_{e}	Particulate Matter (PM2.5)	#SOP No. VEL/SOP/01, Section No. SP 63	47.40	µg/m³	60
2.	Particulate Matter (PM10)	IS: 5182 (P-23) Gravimetric Method	84.69	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	22.60	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.96	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.89	mg/m ³	4
6.	Ammonia (NH3), µg/m3	IS:11255(P-6) Indo Phenol Blue Method	9.45	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_6H_6), $\mu g/m^3$	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	$\mu g/m^3$	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	17.90	ug/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)	ug/m ³	
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	

@ NAAQS – National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)]18.11.2009. # SOP- Laboratory Standard Operating Procedure., ^- This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection

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NOTE: a)The results listed refer only to the tested samples & applicable parameters

e a) (in testing instead elefer long to the execut annues a expination parameters b) Total liabilities of our lab will be restricted to the involce amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number: Name & Address of the Project: Latitude: Longitude:	VEL/NMDCL/AA/05 M/s Hindustan Petroleum Corpor Village Nasibpura, Bhatinda Pun 29 ⁰ 59 ³ 40.64"N 75 ⁰ 1'17.61"E	ati jab	on Ltd.	Report No.: Format No.: Party Reference No.: Reporting Date: Period of Analysis: Receipt Date:	VEL/AA/2002/24/005 7.8 F-01 NIL 29/02/2020 24/02/2020 - 29/02/2020 24/02/2020
Sample Description: AM	BIENT AIR QUALITY MONITO	RI	NG		
Sample collected by		:	Vardan E	viro Lab Representative	
Sampling Location		:	Leleana		
Instrument Used		3	RDS & FF	S sampler with all Acces	ssories
Instrument Code		:	VEL/RDS	/06 & VEL/FPS/06	
Instrument Calibration Status		:	Calibrated		
Meteorological condition during	monitoring		Clear Sky		
Date of Monitoring			19/02/202) to 20/02/2020	
Time of Monitoring		1	10:45 AM	- 10:45 AM	
Ambient Temperature (°C)		3	Min. 12 C	Max. 22 [°] C	
Surrounding Activity		6	Human &	Vehicular Activities	
Scope of Monitoring		3	Regulator	Requirement	
Control measure if Any			No		
Sampling & Analysis Protocol		З.	IS-5182		
Parameter Required		3	As per Wo	ork Order	

S. No.	Parameter	Protocol	Result	Unit	NAAQS® Limit
1.	Particulate Matter (PM2.5)	"SOP No. VEL/SOP/01, Section No. SP 63	46.98	μg/m ³	60
2,	Particulate Matter (PM10)	IS: 5182 (P-23) Gravimetric Method	81.45	µg/m ³	100
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	17.58	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	11.96	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.88	mg/m ³	4
6.	Ammonia (NH3), µg/m3	IS:11255(P-6) Indo Phenol Blue Method	9.22	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	20.96	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(y/y)	

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NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the invoice amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:	VEL/HPCL/AA/06			Report No.:	VEL/AA/2002/24/006
Name & Address of the Project:	M/s Hindustan Petroleum C	orporati	on Ltd.	Format No.:	7.8 F-01
	Village Nasibpura, Bhatinda	Punjab		Party Reference No.:	NIL
Latitude: Longitude:	30 [°] 1 ['] 27.46"N 75 [°] 4'8.62"E			Reporting Date: Period of Analysis: Receipt Date:	29/02/2020 24/02/2020 - 29/02/2020 24/02/2020
Sample Description: AM	BIENT AIR QUALITY MON	ITORI	NG		
General Information:-					
Sample collected by			Vardan E	nviro Lab Representative	
Sampling Location		2	Baghi Ba	ndar	
Instrument Used		3	RDS & FF	S sampler with all Acces	sories
Instrument Code		2	VEL/RDS	/05& VEL/FPS/05	
Instrument Calibration Status		2	Calibrated		
Meteorological condition during	monitoring	:	Clear Sky		
Date of Monitoring		4	19/02/202	0 to 20/02/2020	
Time of Monitoring		8	11:15 AM	– 11:15 AM	
Ambient Temperature (°C)		3	Min. 12°C	Max. 22°C	
Surrounding Activity		3	Human &	Vehicular Activities	
Scope of Monitoring		1	Regulator	Requirement	
Control measure if Any		3	No		
Sampling & Analysis Protocol		à.	IS-5182		
Parameter Required		3.	As per Wo	ork Order	

S. No,	Parameter	Protocol	Result	Unit	NAAQS [®] Limit
1.	Particulate Matter (PM _{2,5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	44.82	μg/m ³	60
2.	Particulate Matter (PM10)	IS: 5182 (P-23) Gravimetric Method	81.66	µg/m ³	100
3.	Nitrogen Dioxide (NO2)	IS: 5182 (P-6) Jacob & Hochheiser	21.52	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	12.06	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.98	mg/m ³	4
6.	Ammonia (NH3), µg/m3	IS:11255(P-6) Indo Phenol Blue Method	13.47	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)	$\mu g/m^3$	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	19.86	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)	ug/m ³	
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	

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NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the invoice amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Test Report

Sample Number: Name & Address of the Project:	VEL/HPCL/AA/07 M/s Hindustan Petroleum Cogy Village Nasibpura, Bhatinda P	oorat unja	ion Ltd. b	Report No.: Format No.: Party Reference No.: Reporting Date:	VEL/AA/2002/24/007 7.8 F-01 NIL 29/02/2020
Latitude:	30°4 34.79"N			Period of Analysis:	24/02/2020 - 29/02/2020
Longitude:	/4 59'5/.45"E			Receipt Date:	24/02/2020
Sample Description: AM	BIENT AIR QUALITY MONIT	ORI	٩G		
General Information:-					
Sample collected by		3	Vardan Ei	nviro Lab Representative	
Sampling Location		1	Nasibpur	a	
Instrument Used		3	RDS & FP	S sampler with all Acces	ssories
Instrument Code		:	VEL/RDS	/03& VEL/FPS/03	
Instrument Calibration Status		1	Calibrated		
Meteorological condition during	monitoring	8	Clear Sky		
Date of Monitoring		:	20/02/202	0 to 21/02/2020	
Time of Monitoring		:	09:15 AM	- 09:15 AM	
Ambient Temperature (°C)		1	Min. 12°C	Max. 22°C	
Surrounding Activity		1	Human &	Vehicular Activities	
Scope of Monitoring		4	Regulatory	Requirement	
Control measure if Any		:	No		
Sampling & Analysis Protocol		3	IS-5182		
Parameter Required		1	As per Wo	ork Order	

S. No.	Parameter	Protocol	Result	Unit	NAAQS ⁴ Limit
1.	Particulate Matter (PM2.5)	[#] SOP No. VEL/SOP/01, Section No. SP 63	48.55	µg/m³	60
2.	Particulate Matter (PM10)	IS: 5182 (P-23) Gravimetric Method	85.70	μg/m ³	100
3.	Nitrogen Dioxide (NO2)	IS: 5182 (P-6) Jacob & Hochheiser	24.61	µg/m ³	80
4.	Sulphur Dioxide (SO2)	IS: 5182 (P-2) Modified West and Gaeke	18.36	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.92	mg/m ³	4
6.	Ammonia (NH3), µg/m3	IS:11255(P-6) Indo Phenol Blue Method	10.36	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	22.45	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)	

SOP- Laboratory Standard Operating Procedure, ^- This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Petection Limit

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NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the invoice amount only c) The sample will be destroyed after retention time unless otherwise coertified

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/HPCL/AA/08		Report No.:	VEL/AA/2002/24/008
Name & Address of the Project:	: M/s Hindustan Petroleum C	orporation Lt	d. Format No.:	7.8 F-01
	Village Nasibpura, Bhatinda	Punjab	Party Reference No.:	NIL
Latitude:	30°5'40.22"N		Reporting Date: Period of Analysis:	29/02/2020 24/02/2020 - 29/02/2020
Longitudo	750415 2011		I ci iou of Analysis.	24/02/2020 - 29/02/2020
Longitude:	75 4 5.30 E		Receipt Date:	24/02/2020
Sample Description: Al	MBIENT AIR QUALITY MONI	ITORING		
General Information:-				
Sample collected by		: Varda	n Enviro Lab Representative	
Sampling Location		; Kotb	hara	
Instrument Used		: RDS a	& FPS sampler with all Acce	ssories
Instrument Code		: VEL/	RDS/02& VEL/FPS/02	

: Calibrated

: Clear Sky

: No

: IS-5182

: 20/02/2020 to 21/02/2020

: Min. 12°C Max. 22°C

Regulatory Requirement

As per Work Order

Human & Vehicular Activities

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: 10:00 AM - 10:00 AM

te Matter (PM _{2.5}) te Matter (PM ₁₀) Dioxide (NO ₂) Dioxide (SO ₂) fonoxide (CO) (NH3), µg/m3	⁴ SOP No. VEL/SOP/01, Section No. SP 63 IS: 5182 (P-23) Gravimetric Method IS: 5182 (P-6) Jacob & Hochheiser IS: 5182 (P-2) Modified West and Gacke IS: 5182 (P-10) Gas Chromatography IS: 1125(P-6) Indo Phenol Blue Method	51.32 92.54 20.33 11.52 1.03	μg/m ³ μg/m ³ μg/m ³ μg/m ³ mg/m ³	60 100 80 80
te Matter (PM ₁₀) Dioxide (NO ₂) Dioxide (SO ₂) Aonoxide (CO) (NH3), µg/m3	IS: 5182 (P-23) Gravimetric Method IS: 5182 (P-6) Jacob & Hochheiser IS: 5182 (P-2) Modified West and Gaeke IS: 5182 (P-10) Gas Chromatography IS: 1125(P-6) Indo Phenol Blue Method	92.54 20.33 11.52 1.03	μg/m ³ μg/m ³ μg/m ³ mg/m ³	100 80 80
Dioxide (NO ₂) Dioxide (SO ₂) Aonoxide (CO) (NH3), µg/m3	IS: 5182 (P-6) Jacob & Hochheiser IS: 5182 (P-2) Modified West and Gaeke IS: 5182 (P-10) Gas Chromatography IS: 11255(P-6) Indo Phenol Blue Method	20.33 11.52 1.03	μg/m ³ μg/m ³ mg/m ³	80 80
Dioxide (SO ₂) Ionoxide (CO) (NH3), µg/m3	IS: 5182 (P-2) Modified West and Gaeke IS: 5182 (P-10) Gas Chromatography IS:11255(P-6) Indo Phenol Blue Method	11.52 1.03	$\mu g/m^3$ mg/m ³	80
1onoxide (CO) (NH3), μg/m3	IS: 5182 (P-10) Gas Chromatography IS:11255(P-6) Indo Phenol Blue Method	1.03	mg/m ³	
(NH3), μg/m3	IS:11255(P-6) Indo Phenol Blue Method		1 1111/111	4
	ion i boli (i o) mao i menor brac memor	10.35	$\mu g/m^3$	400
), μg/m ⁻²	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	$\mu g/m^3$	1
C_6H_6 , $\mu g/m^3$	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	ug/m ³	05
oyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
3), μg/m ³	IS: 5182 (P-9) Colorimetric Method	18.79	ug/m ³	180
As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	$n\varrho/m^3$	6
, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/m ³)	ng/m^3	20
Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	ug/m ³	
rbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 pnm(v/v))	ppm(y/y)	
	C ₆ H ₆), µg/m ³ byrene, ng/m ³ 3), µg/m ³ As, ng/ m ³ Organic Carbon (VOCs) trbon (as Methane) solution in Vocality Standar for USE operating Procedure Device Operating Procedure	C ₆ H ₆), µg/m ³ IS: 5182 (P-11) pyrene, ng/m ³ IS: 5182 (P-2) ₃), µg/m ³ IS: 5182 (P-9) Colorimetric Method As, ng/m ³ IS: 5182 (P-9) Colorimetric Method organic Carbon (VOCs) IS: 5182 (P-22) Air Acetylene Method Organic Carbon (VOCs) IS: 5182 (P-11) urbon (as Methane) IS: 5182 (P-17), 1979 of Victor of the quality Standards; Schedule-VII, Rule 3 (3B), [PartI-sec3(j)]18.11.2 of Victor of Operating Procedure, ^- This parameter is not Covered in our NABL scope. **	C ₆ H ₆), µg/m ³ IS: 5182 (P-11) **BDL (*DL 0.1 µg/m ³) pyrene, ng/m ³ IS: 5182 (P-12) **BDL (*DL 1.0 ng/m ³) ₃), µg/m ³ IS: 5182 (P-2) **BDL (*DL 1.0 ng/m ³) ₃), µg/m ³ IS: 5182 (P-2) Colorimetric Method 18.79 As, ng/m ³ IS: 5182 (P-22) **BDL (*DL 5.0 ng/m ³) _n g/m ³ IS: 5182 (P-22) Air Acetylene Method **BDL (*DL 5.0 ng/m ³) Organic Carbon (VOCs) IS: 5182 (P-11) **BDL (*DL 5.0 µg/m ³) urbon (as Methane) IS: 5182 (P-17), 1979 *BDL (*DL 0.2 ppm(v/y)) Stabilition (Standards; Schedule-VII, [Rule 3 (3B)], [PartI-I-sec3(i)]18.11.2009. **BDL (*DL 0.2 ppm(v/y)) Stabilition (Procedure, ^~ This parameter is no reverted in our MABL scope, **BDL- Below Detection Limit, *DL- Detection Limit, *DL- Detection Limit, *DL- Detection Limit, *DL- Detection RAWAT	C ₆ H ₆), μg/m ³ IS: 5182 (P-11) **BDL (*DL 0.1 μg/m ³) μg/m ³ pyrene, ng/m ³ IS: 5182 (P-12) **BDL (*DL 1.0 ng/m ³) ng/m ³ a), µg/m ³ IS: 5182 (P-9) Colorimetric Method 18.79 µg/m ³ a), µg/m ³ IS: 5182 (P-9) Colorimetric Method 18.79 µg/m ³ a, ng/m ³ IS: 5182 (P-22) **BDL (*DL 5.0ng/m ³) ng/m ³ ng/m ³ IS: 5182 (P-22) Air Acetylene Method **BDL (*DL 5.0ng/m ³) ng/m ³ Organic Carbon (VOCs) IS: 5182 (P-11) **BDL (*DL 5.0 µg/m ³) µg/m ³ urbon (as Methane) IS: 5182 (P-17), 1979 *BDL(*DL 0.2 ppm(v/v)) ppm(v/v) active Howality Standards; Schedule-VIII, Rule 3 (3B), PartI-tsec-3(i)[18.11.2009. active Howality Standards; Schedule-VIII, Rule 3 (3B), PartI-tsec-3(i)[18.11.2009. active Howality Standards; Schedule-VIII, Rule 3 (AB), PartI-tsec-3(i)[18.11.2009. active Howality Operating Procedure, ^- This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- D

NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the Invoice amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

Instrument Calibration Status

Ambient Temperature (°C)

Sampling & Analysis Protocol

Date of Monitoring

Time of Monitoring

Surrounding Activity

Scope of Monitoring

Parameter Required

Control measure if Any

Meteorological condition during monitoring

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number: Name & Address of the Project: Latitude: Longitude:	VEL/HPCL/AA/09 M/s Hindustan Petroleum Village Nasibpura, Bhatino 30%'34.53"N 75%0'23.67"E	Co _z poration Ltd. da Punjab	Report No.: Format No.: Party Reference No.: Reporting Date: Period of Analysis: Receipt Date:	VEL/AA/2002/24/009 7.8 F-01 NIL 29/02/2020 24/02/2020 - 29/02/2020 24/02/2020
Sample Description: AM	BIENT AIR QUALITY MC	DNITORING		
General Information:-				
Sample collected by		: Vardan En	viro Lab Representative	
Sampling Location		: Kot Kash	mir	
Instrument Used		: RDS & FF	S sampler with all Access	sories
Instrument Code		: VEL/RDS	/01 & VEL/FPS/01	
Instrument Calibration Status		: Calibrated		
Meteorological condition during	monitoring	: Clear Sky		
Date of Monitoring		: 20/02/202	0 to 21/02/2020	
Time of Monitoring		: 10:30 AM	- 10:30 AM	
Ambient Temperature (°C)		1 Min. 12 C	Max. 22 C	
Surrounding Activity		: Human &	Vehicular Activities	
Scope of Monitoring		: Regulator	Requirement	
Control measure if Any		: No		
Sampling & Analysis Protocol		; IS-5182		
Parameter Required		As per Wo	ork Order	

S. No.	. Parameter Protocol		Result	Unit	NAAQS [@] Limit	
1.0	Particulate Matter (PM _{2.5})	[#] SOP No. VEL/SOP/01, Section No. SP 63	47.32	μg/m ³	60	
2.	Particulate Matter (PM10)	IS: 5182 (P-23) Gravimetric Method	78.61	µg/m ³	100	
3.	Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	21.53	μg/m³	80	
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	9.14	µg/m ³	80	
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.95	mg/m ³	4	
6.	Ammonia (NH3), µg/m3	IS:11255(P-6) Indo Phenol Blue Method	15.34	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	17.45	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))	ppin(v/v).		
Note :-@ M	RAAOS - National Ambient Air Quality Standar EPINUT KAUGHTHHing Procedure SRes RANGY YST (NY)	ds, Schedule-VII, (Rule 3 (3B)), [Part-Fisec-3(0)]18.1126 ^ This parameter is not Covered in our NABL scope, ** CICREDINN RAWAT	109. BDL- Below Detection Limit, *DL- Det	pproved By	POL BOX	

b) Total liabilities of our lab will be restricted to the invoice amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/HPCL/AA/10			Report No.:	VEL/AA/2002/24/010
Name & Address of the Project:	M/s Hindustan Petroleum Corp	orat	ion Ltd.	Format No.:	7.8 F-01
Latitude: Longitude:	Village Nasibpura, Bhatinda Pu 30 ⁰ 6'44.02"N 74 ⁰ 57'21.06"E	ınjal	b	Party Reference No.: Reporting Date: Period of Analysis: Receipt Date:	NIL 29/02/2020 24/02/2020 - 29/02/2020 24/02/2020
Sample Description: Al	BIENT AIR QUALITY MONITO	DRI	NG		
General Information:-					
Sample collected by		3	Vardan Env	viro Lab Representative	
Sampling Location		4	Gehri Bogh	i	
Instrument Used			RDS & FPS	sampler with all Access	sories
Instrument Code		:	VEL/RDS/0	4& VEL/FPS/04	
Instrument Calibration Status			Calibrated		

Instrument Code	: VEL/RDS/04& VEL/FPS/04
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 20/02/2020 to 21/02/2020
Time of Monitoring	: 10:45 AM – 10:45 AM
Ambient Temperature (°C)	: Min. 12°C Max. 22°C
Surrounding Activity	Human & Vehicular Activities
Scope of Monitoring	Regulatory Requirement
Control measure if Any	: No
Sampling & Analysis Protocol	: IS-5182

Parameter Required # As per Work Order Parameter Protocol Result Unit

S. No.

NAAQS[®]

to a b war data priviled ab ware	Frotocol	Result	Unit	Limit
Particulate Matter (PM2,5)	*SOP No. VEL/SOP/01, Section No. SP 63	52.86	µg/m ³	60
Particulate Matter (PM10)	IS: 5182 (P-23) Gravimetric Method	93.61	µg/m ³	100
Nitrogen Dioxide (NO ₂)	IS: 5182 (P-6) Jacob & Hochheiser	26.12	µg/m ³	80
Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	13.64	µg/m ³	80
Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	1.12	mg/m ³	4
Ammonia (NH3), µg/m3	IS:11255(P-6) Indo Phenol Blue Method	10.46	μg/m ³	400
Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 μg/m ³)	μg/m ³	1
Benzene(C ₆ H ₆), µg/m ³	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	µg/m ³	05
Benzo(a)pyrene, ng/m ³	IS: 5182 (P-12)	**BDL (*DL 1.0 ng/m ³)	ng/m ³	01
Ozone (O ₃), µg/m ³	IS: 5182 (P-9) Colorimetric Method	18.66	µg/m ³	180
[^] Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	ng/m^3	6
Nickel Ni, ng/ m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 5.0ng/ m ³)	ng/m ³	20
#Volatile Organic Carbon (VOCs)	IS: 5182 (P-11)	**BDL (*DL 5.0 µg/m ³)	µg/m ³	
#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	
Anithal Young An Angel An Quality Standar SR I ANAL YOT OPerating Procedure. (Fetted By) (Fet	Is; Schedule-VII, (Rule 3 (BI), (Par-II-sec-3(0))18.11.2 ^ This parameter is not Covered in our NABL scope, ** Circulation of the scope of the sco	009. BDL- Below Detection Limit, *DL- Den (A	sction Limit ppp of ca 15	OL PR + LOIR
	Particulate Matter (PM _{2.5}) Particulate Matter (PM ₁₀) Nitrogen Dioxide (NO ₂) Sulphur Dioxide (SO ₂) Carbon Monoxide (CO) Ammonia (NH3), µg/m3 Lead (Pb), µg/m ³ Benzene(C ₆ H ₆), µg/m ³ Benzene(C ₆ H ₆), µg/m ³ Ozone (O ₃), µg/m ³ ^Arsenic As, ng/m ³ Nickel Ni, ng/m ³ #Volatile Organic Carbon (VOCs) #Volatile Organic Carbon (VOCs) #V	Particulate Matter (PM _{2.8}) #SOP No. VEL/SOP/01, Section No. SP 63 Particulate Matter (PM ₁₀) IS: 5182 (P-23) Gravimetric Method Nitrogen Dioxide (NO ₂) IS: 5182 (P-2) Modified West and Gaeke Sulphur Dioxide (SO ₂) IS: 5182 (P-2) Modified West and Gaeke Carbon Monoxide (CO) IS: 5182 (P-10) Gas Chromatography Ammonia (NH3), µg/m3 IS: 11255(P-6) Indo Phenol Blue Method Lead (Pb), µg/m³ IS: 5182 (P-2) Air Acetylene Method Benzene(C ₆ H ₆), µg/m³ IS: 5182 (P-9) Colorimetric Method Benzene(C ₆ H ₆), µg/m³ IS: 5182 (P-2) Air Acetylene Method Carbon (O ₃), µg/m³ IS: 5182 (P-2) Colorimetric Method ^Arsenic As, ng/m³ IS: 5182 (P-2) Air Acetylene Method Yolatile Organic Carbon (YOCs) IS: 5182 (P-11) Htvirocarbon (arbon (YOCs) IS: 5182 (P-17), 1979 Will be restricted to the invoice amount only Standards, Schedule-VII, [Rule 3 (B3)], [Part-H.sec3(0)]18.1120 * SPL-ANAL Schedul Operating Procedure, ^ This parameters and Isolation of our NABL scope, ** This parameter is not Covered in our NABL scope, **	Particulate Matter (PM _{2.5}) ⁴ SOP No. VEL/SOP/01, Section No. SP 63 52.86 Particulate Matter (PM _{1.6}) IS: 5182 (P-23) Gravimetric Method 93.61 Nitrogen Dioxide (NO ₂) IS: 5182 (P-2) Modified West and Gacke 13.64 Carbon Monoxide (CO) IS: 5182 (P-2) Modified West and Gacke 13.64 Carbon Monoxide (CO) IS: 5182 (P-2) Modified West and Gacke 13.64 Lead (Pb), µg/m ³ IS: 11255(P-6) Indo Phenol Blue Method 10.46 Lead (Pb), µg/m ³ IS: 5182 (P-22) Air Acetylene Method **BDL (*DL 0.05 µg/m ³) Benzenet(Call ₆), µg/m ³ IS: 5182 (P-11) **BDL (*DL 0.1 µg/m ³) Benzenet(Call ₆), µg/m ³ IS: 5182 (P-22) Air Acetylene Method 18.66 ^Arsenic As, ng/m ³ IS: 5182 (P-22) **BDL (*DL 1.0 ng/m ³) Nickel Ni, ng/m ³ IS: 5182 (P-22) Air Acetylene Method 18.66 ^Arsenic As, ng/m ³ IS: 5182 (P-22) Air Acetylene Method **BDL (*DL 5.0ng/m ³) Nickel Ni, ng/m ³ IS: 5182 (P-22) Air Acetylene Method **BDL (*DL 5.0ng/m ³) Nickel Ni, ng/m ³ IS: 5182 (P-17), 1979 *BDL (*DL 5.0 µg/m ³) Wolatile Organic Carbon (VOCs) IS: 5182 (P-17), 1979 *BDL (*DL 0.2 ppm(v/v)) M	Particulate Matter (PM _{2.5}) #SOP No. VEL/SOP/01, Section No. SP 63 52.86 µg/m³ Particulate Matter (PM ₁₀) IS: 5182 (P-23) Gravimetric Method 93.61 µg/m³ Nitrogen Dioxide (NO ₂) IS: 5182 (P-2) Gravimetric Method 93.61 µg/m³ Sulphur Dioxide (SO ₂) IS: 5182 (P-2) Modified West and Gaeke 13.64 µg/m³ Carbon Monoxide (CO) IS: 5182 (P-2) Modified West and Gaeke 13.64 µg/m³ Ammonia (NH3), µg/m3 IS: 11255(P-6) Indo Phenol Blue Method 10.46 µg/m³ Lead (Pb), µg/m³ IS: 5182 (P-2) Air Acetylene Method 10.46 µg/m³ Benzenet(CeH ₆), µg/m³ IS: 5182 (P-2) Air Acetylene Method **BDL (*DL 0.1 µg/m³) µg/m³ Benzenet(CeH ₆), µg/m³ IS: 5182 (P-2) **BDL (*DL 1.0 ng/m³) µg/m³ Benzenet(CeH ₆), µg/m³ IS: 5182 (P-2) **BDL (*DL 1.0 ng/m³) ng/m³ Ozone (O ₃), µg/m³ IS: 5182 (P-2) Air Acetylene Method **BDL (*DL 5.0ng/m³) ng/m³ Nickel Ni, ng/m³ IS: 5182 (P-2) Air Acetylene Method **BDL (*DL 5.0ng/m³) ng/m³ Nickel Ni, ng/m³ IS: 5182 (P-2) Air Acetylene Method **BDL (*DL 5.0 µg/m³) ng/m³ Nickel Ni, n



Test Report

Sample Number: Name & Address of the Project: Latitude: Longitude:	VEL/HPCL/AA/11 M/s Hindustan Petroleum Co _z p Village Nasibpura, Bhatinda Pu 30 ⁰ 3 [°] 45.41"N 75 [°] 4'6.08"E	oration Ltd. Injab	Report No.: Format No.: Party Reference No.: Reporting Date: Period of Analysis: Receipt Date:	VEL/AA/2002/24/011 7.8 F-01 NIL 29/02/2020 24/02/2020 - 29/02/2020 24/02/2020
Sample Description: AMB General Information:-	ENT AIR QUALITY MONITOR	ING		
Sample collected by		: Vardan En	viro Lab Representative	
Sampling Location		: Chathewa	la	
Instrument Used		: RDS & FF	S sampler with all Acces	sories
Instrument Code		: VEL/RDS	/05& VEL/FPS/05	
Instrument Calibration Status		: Calibrated		
Meteorological condition during m	onitoring	: Clear Sky		
Date of Monitoring		: 20/02/202	0 to 21/02/2020	
Time of Monitoring		: 11:15 AM	-11:15 AM	
Ambient Temperature (°C)		: Min. 12°C	Max. 22°C	
Surrounding Activity		: Human &	Vehicular Activities	
Scope of Monitoring		: Regulatory	Requirement	
Control measure if Any		: No		
Sampling & Analysis Protocol		: IS-5182		
Parameter Required		As per Wo	ork Order	
				NALOCØ

S. No.	Parameter	Protocol	Result	Unit	NAAQS [@] Limit
1.	Particulate Matter (PM2.5)	#SOP No. VEL/SOP/01, Section No. SP 63	49.31	µg/m³	60
2.	Particulate Matter (PM10)	IS: 5182 (P-23) Gravimetric Method	87.66	µg/m ³	100
3.	Nitrogen Dioxide (NO2)	IS: 5182 (P-6) Jacob & Hochheiser	21.44	µg/m ³	80
4.	Sulphur Dioxide (SO ₂)	IS: 5182 (P-2) Modified West and Gaeke	8.01	µg/m ³	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.93	mg/m ³	4
6-	Ammonia (NH3), µg/m3	IS:11255(P-6) Indo Phenol Blue Method	9.89	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
8.0	Benzene(C_6H_6), $\mu g/m^3$	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	$\mu g/m^3$	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	16.78	$\mu g/m^3$	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)	

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NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the invoice amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Test Report

Sample Number:	VEL/HPDCL/AA/12	Report No.:	VEL/AA/2002/24/012
Name & Address of the Proj	ect: M/s Hindustan Petroleum Corporation Ltd.	Format No.:	7.8 F-01
in neuronale constant	Village Nasibpura, Bhatinda Punjab	Party Reference No.: Reporting Date:	NIL 29/02/2020
Latitude:	30 ⁰ 6'48.99"N	Period of Analysis:	24/02/2020 - 29/02/2020
Longitude:	75°4'54.51"E	Receipt Date:	24/02/2020
Sample Description:	AMBIENT AIR QUALITY MONITORING		
General Information:-			

Sample collected by	Vardan Enviro Lab Representative
Sampling Location	: Kot Fatta
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	20/02/2020 to 21/02/2020
Time of Monitoring	: 11:40 AM – 11:40 AM
Ambient Temperature (°C)	: Min. 12°C Max. 22°C
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	Regulatory Requirement
Control measure if Any	No
Sampling & Analysis Protocol	IS-5182
Parameter Required	As per Work Order

S. No.	Parameter	Protocol	Result	Unit	NAAQS [@] Limit
1.	Particulate Matter (PM2,5)	*SOP No. VEL/SOP/01, Section No. SP 63	48.93	µg/m ³	60
2.	Particulate Matter (PM10)	IS: 5182 (P-23) Gravimetric Method	89.31	μg/m ³	100
3.	Nitrogen Dioxide (NO2)	IS: 5182 (P-6) Jacob & Hochheiser	23.54	μg/m ³	80
4.	Sulphur Dioxide (SO2)	IS: 5182 (P-2) Modified West and Gaeke	11.88	$\mu g/m^3$	80
5.	Carbon Monoxide (CO)	IS: 5182 (P-10) Gas Chromatography	0.91	mg/m ³	4
6.	Ammonia (NH3), µg/m3	IS:11255(P-6) Indo Phenol Blue Method	16.92	ug/m ³	400
7.	Lead (Pb), µg/m ³	IS: 5182 (P-22) Air Acetylene Method	**BDL (*DL 0.05 µg/m ³)	ug/m ³	1
8.	Benzene(C_6H_6), $\mu g/m^3$	IS: 5182 (P-11)	**BDL (*DL 0.1 µg/m ³)	ug/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	19.55	ug/m ³	180
11.	[^] Arsenic As, ng/ m ³	IS: 5182 (P-22)	**BDL (*DL 5.0ng/ m ³)	$n\varrho/m^3$	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)	ug/m ³	
14.	#Hydrocarbon (as Methane)	IS: 5182 (P-17), 1979	*BDL(*DL 0.2 ppm(v/v))	ppm(v/v)	

antory Standard Operating Procedure., ^- This parameter is not Covered in our NABL scope, **BDL- Below Detection Limit, *DL- Detection Limit

MEENVRAUSHIK SR. ANALYST

Wheeked By) O ARJUN RAWAT

NOTE: a) The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the invoice amount only c) The sample will be destroyed after retention time unless otherwise specified
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Test Report

Sample Number:	VEL/HPCL/AN/01	Report No.:	VEL/AN/2002/24/001
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:	29/02/2020
		Receipt Date:	24/02/2020
Sample Description:	AMBIENT NOISE LEVEL MONITORING	3	
General Information:-			
Sample collected by	: Vardan E	nviroLab Representative	
Sampling Location	: Near Pro	ject Site	

Sampling Location	Near Project Site
Latitude	30°3'13.34"N
Longitude	: 75 ⁰ 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	: 19/02/2020 to 20/02/2020
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-2003
Sampling Duration	: 24 Hours
Parameter Required	As per Work Order

S. No.	andan Envirot ab Vardan fra		Test Re	lan Envirol	
	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	Unit
1.	Lmax	IS 9989 R-2003	79.8	66.3	dB(A)
2.	Lmin	IS 9989 R-2003	55.7	40.1	dB(A)
3.	Leq	IS 9989 R-2003	67.49	49.18	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.







NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the invoice amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Test Report

Sample Number: Name & Address of the Project:	VEL/HPCL/AN/02 M/s Hindustan Petroleum (Village Nasibpura, Bhating	Corpor la Pun	ation Ltd. jab	Report No.: Format No.: Party Reference No.: Reporting Date: Receipt Date:	VEL/AN/2002/24/002 7.8 F-01 NIL 29/02/2020 24/02/2020
Sample Description:	AMBIENT NOISE LEVE	L MON	ITORING		
General Information:-					
Sample collected by			Vardan En	viral ab Penrecentativa	
Sampling Location			Jiwan Sing	h Wala	
Latitude			30°3'37.63"	'N	
Longitude			75°2'75.30'	'E	
Instrument Used		:	Sound Leve	el Meter	
Instrument Code			VEL/S/SLN	4/03	
Instrument Calibration Statu	\$	120	Calibrated		
Meteorological condition duri	ng monitoring	5	Clear Sky		
Date of Monitoring	0	:	19/02/2020	to 20/02/2020	
Time of Monitoring		E	06:00 AM	to 06:00AM	
Surrounding Activity		6	Human, Ve	hicular and Cement plant	Activities
Scope of Monitoring		:	Regulatory	Requirement	
Control measure if Any			No anv		
Sampling & Analysis Protoco	1		IS-9989 R-	2003	
Sampling Duration		:	24 Hours		
Parameter Required		1	As per Wo	rk Order	
·			1.00		

	il gilaje Vardan Envirotule v	ardan Envirol.atr.va	Test Re	esult dB (A)	Unit dB(A) dB(A) dB(A) dB(A)
S. No.	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1,	Lmax	IS 9989 R-2003	67.5	59.8	dB(A)
2.	Lmin	IS 9989 R-2003	45.2	33.6	dB(A)
3.	Leq	IS 9989 R-2003	51.40	41.20	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.

MEENU KAUSHIK SR ANALYST

ARJUN BAWAT



NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the invoice amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number:

VEL/HPCL/AN/03 Name & Address of the Project: M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab

Report No.: VEL/AN/2002/24/003 Format No.: 7.8 F-01 Party Reference No.: NIL **Reporting Date:** 29/02/2020 **Receipt Date:** 24/02/2020

Sample Description:

General Information:-

AMBIENT NOISE LEVEL MONITORING

Sample collected by	Vardan Envirol ab Depresentativa
Sampling Location	Maanwala
Sampling Location	
Latitude	30°2 33.23"N
Longitude	: 75 ⁰ 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	: 19/02/2020 to 20/02/2020
Time of Monitoring	66:00 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-2003
Sampling Duration	24 Hours
Parameter Required	As per Work Order

S. No.	Vardar Jalviro Lat. Vardar	LawingLab Vandam E	Test Re	esult dB (A)	Unit dB(A) dB(A) dB(A) dB(A) dB(A)
	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	Lmax	IS 9989 R-2003	61.9	52.7	dB(A)
2.	Lmin	IS 9989 R-2003	43.2	33.5	dB(A)
3.	Leq	IS 9989 R-2003	52.40	42.80	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.

MEENU KAUSHIK SR. ANALYST rested By)

ARJUN RAWAT (Checked By)

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Test Report

Sample Number: Name & Address of the Project:	VEL/HPCL/AN/04 M/s Hindustan Petroleum Village Nasibpura, Bhating	Cogpor da Punj	ation Ltd. ab	Report No.: Format No.: Party Reference No.: Reporting Date: Receipt Date:	VEL/AN/2002/24/004 7.8 F-01 NIL 29/02/2020 24/02/2020
Sample Description:	AMBIENT NOISE LEVE	L MON	ITORING		
General Information:-					
Sample collected by			Vardan En	viroLab Representative	
Sampling Location		:	Mahi Nan	gal	
Latitude			30°1'13.05	"N	
Longitude		:	75°1'3.89"	E	
Instrument Used		:	Sound Lev	el Meter	
Instrument Code		:	VEL/S/SLI	M/02	
Instrument Calibration Status		:	Calibrated		
Meteorological condition duri	ng monitoring	1	Clear Sky		
Date of Monitoring	-		19/02/2020) to 20/02/2020	
Time of Monitoring		:	06:00 AM	to 06:00AM	
Surrounding Activity		1	Human, V	ehicular and Cement plan	nt Activities
Scope of Monitoring		5	Regulatory	Requirement	
Control measure if Any		1	No any		
Sampling & Analysis Protocol		5	IS-9989 R-	-2003	
Sampling Duration		1	24 Hours		
Parameter Required		1	As per Wo	ork Order	

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S. No.	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	Unit
I.	Lmax	IS 9989 R-2003	59.4	55.6	dB(A)
2,	Lmin	IS 9989 R-2003	41.3	32.2	dB(A)
3.	Leq	IS 9989 R-2003	50.30	42.60	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.

MEENU KAUSHIK SR. ANALYST

ARJUN RAWAT



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Test Report

Sample Number: Name & Address of the Project:	VEL/HPCL/AN/05 M/s Hindustan Petrol Village Nasibpura, Bł	eum Co _r poration Ltd. atinda Punjab	Report No.: Format No.: Party Reference No.: Reporting Date: Receipt Date:	VEL/AN/2002/24/005 7.8 F-01 NIL 29/02/2020 24/02/2020
Sample Description:	AMBIENT NOISE LI	EVEL MONITORING		
General Information:-				
Sample collected by		: Vardan En	viroLab Representative	
Latitude		29°59'40.6	4"N	
Longitude Instrument Used		: 75 ⁰ 1'17.61	"E el Meter	
Instrument Code		VEL/S/SL	M/06	
Meteorological condition duri	ng monitoring	Calibrated		
Date of Monitoring Time of Monitoring		= 19/02/2020 = 06:00 AM	0 to 20/02/2020 to 06:00AM	
Surrounding Activity		: Human, V	ehicular and Rail Activitie	es
Control measure if Any		 Regulatory No any 	/ Requirement	
Sampling & Analysis Protocol Sampling Duration		: IS-9989 R : 24 Hours	-2003	
Parameter Required		As ner We	ork Order	

	Varian EnviroLab Varian EnviroLab	and an Envirot of Varo	Test Re	esult dB (A)	Lau Verdan
S. No.	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	Unit
1,	Lmax	IS 9989 R-2003	64.5	54.3	dB(A)
2.	Lmin	IS 9989 R-2003	44.7	34.8	dB(A)
3.	Leq	IS 9989 R-2003	52.65	41.90	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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Test Report

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Sample Number:	VEL/HPCL/AN/06			Report No.:	VEL/AN/2002/24/006
Name & Address of the Project:	M/s Hindustan Petroleur Village Nasibpura, Bhati	n Co _r por inda Punj	ation Ltd. ab	Format No.: Party Reference No.: Reporting Date: Receipt Date:	7.8 F-01 NIL 29/02/2020 24/02/2020
Sample Description:	AMBIENT NOISE LEV	EL MON	ITORING		
General Information:-					
Sample collected by		:	Vardan Envi	roLab Representative	
Sampling Location		1	Baghi Banda	ar	
Latitude		(1)	30°1'27.46"N	V.	
Longitude		1	75°4'8.62"E		
Instrument Used		15	Sound Level	Meter	
Instrument Code		1	VEL/S/SLM	/05	
Instrument Calibration Status	6	1	Calibrated		
Meteorological condition duri	ng monitoring	1	Clear Sky		
Date of Monitoring		1	19/02/2020 (o 20/02/2020	
Time of Monitoring		1	06:00 AM to	06:00AM	
Surrounding Activity		3	Human, Veh	icular and Rail Activities	
Scope of Monitoring		1	Regulatory I	Requirement	
Control measure if Any		1	No any		
Sampling & Analysis Protocol		1	IS-9989 R-2	003	
Sampling Duration		1	24 Hours		
Parameter Required		:	As per Worl	k Order	

	Ardan Envirol ab Vardan I		Test Re	esult dB (A)	Han Erwicol
S. No.	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	Unit
1.	Lmax	IS 9989 R-2003	58.4	49.1	dB(A)
2.	Lmin	IS 9989 R-2003	38.5	33.8	dB(A)
3.	Leq	IS 9989 R-2003	48.54	40.50	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/2002/24/007
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:	29/02/2020
		Receipt Date:	24/02/2020

Sample Description:

AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	Vardan EnviroLab Representative
Sampling Location :	Nasibpura
Latitude	30 ⁰ 4'34.79"N
Longitude	74 ⁰ 59'57.45"E
Instrument Used	Sound Level Meter
Instrument Code :	VEL/S/SLM/05
Instrument Calibration Status	Calibrated
Meteorological condition during monitoring	Clear Sky
Date of Monitoring	20/02/2020 to 21/02/2020
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-2003
Sampling Duration :	24 Hours
Parameter Required	As per Work Order

S. No.	olah Vakim Envirolah	ardan Envirolizb Val	Test Re	esult dB (A)	zh Karda
	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	Unit dB(A) dB(A) dB(A)
1.	Lmax	IS 9989 R-2003	55.1	46.5	dB(A)
2.	Lmin	IS 9989 R-2003	36.3	31.7	dB(A)
3.	Leq	IS 9989 R-2003	47.60	37.20	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: Name & Address of the Project:	VEL/HPCL/AN/08 M/s Hindustan Petroleum Co _r p Village Nasibpura, Bhatinda Pu	ər: nj	ation Ltd. ab	Report No.: Format No.: Party Reference No.: Reporting Date: Receipt Date:	VEL/AN/2002/24/008 7.8 F-01 NIL 29/02/2020 24/02/2020
Sample Description:	AMBIENT NOISE LEVEL MO	N	ITORING		
General Information:-					
Sample collected by			Vardan Env	iroLab Representative	
Sampling Location			Kotbhara		
Latitude		;	30°5'40.22"	N	
Longitude			75°4'5.30"E		
Instrument Used		:	Sound Level	Meter	
Instrument Code		1	VEL/S/SLM	/06	
Instrument Calibration Status		:	Calibrated		
Meteorological condition durin	ng monitoring	٤.	Clear Sky		
Date of Monitoring		:	20/02/2020	to 21/02/2020	
Time of Monitoring		•	06:00 AM t	o 06:00AM	
Surrounding Activity			Human, Vel	nicular and Cement plant	Activities
Scope of Monitoring			Regulatory	Requirement	
Control measure if Any		ž.	No any		
Sampling & Analysis Protocol		2	IS-9989 R-2	.003	
Sampling Duration		•	24 Hours		
Parameter Required		1	As per Wor	k Order	

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S. No.	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	Unit
1.	Lmax	IS 9989 R-2003	55.8	44.2	dB(A)
2.	Lmin	IS 9989 R-2003	31.2	26.5	dB(A)
3.	Leq	IS 9989 R-2003	45.20	35.50	dB(A)
4.	CPCB Limits in dB(A [*]) Leq (Residential Area)	211	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/09		Report No.:	VEL/AN/2002/24/009
Name & Address of the Project:	M/s Hindustan Petrolea Village Nasibpura, Bha	ım Corporation Ltd tinda Punjab	Format No.: Party Reference No.: Reporting Date: Receipt Date:	7.8 F-01 NIL 29/02/2020 24/02/2020
Sample Description:	AMBIENT NOISE LE	VEL MONITORIN	3	
General Information:-				
Sample collected by Sampling Location		: Vardan I : Kot Kas	EnviroLab Representative hmir	
Latitude Longitude		: 30°6 34. : 75 ⁰ 0'23.	53"N 57"E Watar	
Instrument Code Instrument Calibration Status		: Sound E : VEL/S/S : Calibrate	LM/02	
Meteorological condition duri	ng monitoring	: Clear SI	29 20 to 21/02/2020	
Time of Monitoring Surrounding Activity		: 06:00 A	W to 06:00AM Vehicular and Cement play	nt Activities
Scope of Monitoring Control measure if Any		Regulato	ory Requirement	

IS-9989 R-2003 24 Hours

As per Work Order

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S. No.	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	Unit
1.	Lmax	IS 9989 R-2003	57.9	51.2	dB(A)
2.	Lmin	IS 9989 R-2003	38.6	34.4	dB(A)
3.	Leq	IS 9989 R-2003	48.50	40.20	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.



Sampling & Analysis Protocol

Sampling Duration

Parameter Required





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Test Report

Sample Number: Name & Address of the Project:	VEL/HPCL/AN/10 M/s Hindustan Petroleum Village Nasibpura, Bhatin	ı Co _r pora nda Punj	ation Ltd. ab	Report No.: Format No.: Party Reference No.: Reporting Date:	VEL/AN/2002/24/010 7.8 F-01 NIL 29/02/2020
				Receipt Date:	24/02/2020
Sample Description:	AMBIENT NOISE LEVI	EL MON	ITORING		
General Information:-					
Sample collected by Sampling Location Latitude Longitude Instrument Used Instrument Code Instrument Calibration Status Meteorological condition duri	ag monitoring		Vardan Env Gehri Bogh 30°6'44.02" 74°57'21.06 Sound Leve VEL/S/SLM Calibrated	iroLab Representative i N "E l Meter I/01	

20/02/2020 to 21/02/2020

Human, Vehicular and Cement plant Activities

06:00 AM to 06:00AM

: Regulatory Requirement

No any

: 24 Hours

IS-9989 R-2003

Para	Parameter Required		As per Work Order		
dan Env	rol in Verden Engrictabl	ardamEurineLab Ver	Test Re		
S. No.	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	Unit
1.	Lmax	IS 9989 R-2003	58.5	45.4	dB(A)
2.	Lmin	IS 9989 R-2003	38.2	33.8	dB(A)
3.	Leq	IS 9989 R-2003	49.50	39.60	dB(A)
4.	CPCB Limits in dB(A [*]) Leq (Residential Area)	1	55.00	45.00	dB(A)

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

Date of Monitoring

Time of Monitoring

Surrounding Activity

Scope of Monitoring

Sampling Duration

Control measure if Any

Sampling & Analysis Protocol

ACENU KAUSHIK



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Test Report

Sample Number:	VEL/HPCL/AN/11	Report No.:	VEL/AN/2002/24/011
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
		Reporting Date:	29/02/2020
		Receipt Date:	24/02/2020

Sample Description:

General Information:-

AMBIENT NOISE LEVEL MONITORING

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	: 20/02/2020 to 21/02/2020
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human, Vehicular and Cement plant Activitie
Scope of Monitoring	Regulatory Requirement
Control measure if Any	No any
Sampling & Analysis Protocol	IS-9989 R-2003
Sampling Duration	24 Hours
Parameter Required	As per Work Order

	e Vardan ErteroLab Vardar ab Vardan ErteroLab Vardar	n Erwinolab Vordar, Erwinolab Vorder i sin rdan En-Inolab Vardan Erwinolab Varmin		Test Result dB (A)		
S. No.	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	Unit	
l.	Lmax	IS 9989 R-2003	56.7	46.9	dB(A)	
2.	Lmin	IS 9989 R-2003	35.3	30.2	dB(A)	
3.	Leq	IS 9989 R-2003	47.60	37.49	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.

MEENU KAUSHIK SR ANALYST

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Test Report

Sample Number:	VEL/HPCL/AN/12	Report No.:	VEL/AN/2002/24/012
Name & Address of the Project:	M/s Hindustan Petroleum Cogporation Ltd.	Format No.:	7.8 F-01
	Village Nasibpura, Bhatinda Punjab	Party Reference No.:	NIL
		Reporting Date:	29/02/2020
		Receipt Date:	24/02/2020
Sample Description:	AMBIENT NOISE LEVEL MONITORING		
General Information:-			
Sample collected by	: Vardan En	viroLab Representative	
Sampling Location	: Kot Fatta		

Sampling Location	: Kot Fatta
Latitude	: 30 ⁰ 6'48.99"N
Longitude	: 75 ⁰ 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	: 20/02/2020 to 21/02/2020
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-2003
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

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S. No.	Parameters	Protocol	Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	Unit
1.	Lmax	IS 9989 R-2003	63.5	51.6	dB(A)
2.	Lmin	IS 9989 R-2003	41.2	37.2	dB(A)
3.	Leq	IS 9989 R-2003	51.64	42.15	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.

MEENU KAUSHIK SR. ANALYST (Pestad By)

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Test Report

Sample Number:	VEL/HPCL/W/01	Report No.:	VEL/W/2002/24/001
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd.	Format No.:	7.8 F-01
	Village Nasibpura, Bhatinda Punjab	Party Reference No.:	NIL
Latitude:	30°3'13.34"N	Reporting Date:	29/02/2020
Longitude:	75 ⁰ 0'41.57"E	Period of Analysis:	24/02/2020 - 29/02/2020
Sample Description:	Ground Water Sample	Receipt Date:	24/02/2020
Sample Location:	Near Project Site	Sampling Date:	20/02/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Quantity:	2.0 Ltr
Parameter Required	As per work order	Sampling Type:	Garb
Sampling & Analysis Protocol:	IS-10500-2012, APHA	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	7.58	-	6.5 to 8.5	No Relaxation
- 2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3,	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1 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 CaCO3	APHA, 2340 C, EDTA Titrimetric Method	314.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	79.96	mg/l	75	200
8.	Alkalinity as CaCO3	APHA, 2320 B, Titrimetric Method	218.37	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	86.51	mg/l	250	1000
10.	Cyanide as CN	APHA, 4500 CN ⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	27.82	mg/l	30	100
12.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	952.00	mg/l	500	2000
13.	Sulphate as SO4	APHA, 4500 E, Turbidimetric Method	51.34	mg/l	200	400
14.	Fluoride as F	APHA, 4500-F ⁻ D, SPADNS Method	0.95	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	12.05	mg/l	45	No Relaxation
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.23	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

SR. ANALYST

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Test Report

Sample No.: VEL/HPCL/W/01		Report No.: VEL/W/2002/24/001				
	Parameter	Test-Method	Vardan Envirol ab	Unit	Limits of IS:10500 -2012	
S. No.			Result		Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA, 3111 B, Direct Air, Acetylene Flame Method	0.32	mg/l	5	15
24.	Copper as Cu	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA, 3112 B, Cold Vapour AAS Method	*BDL (**DL 0.001 mg/l)	mg/l	0.001	No Relaxation
31.	Total Coliform	IS 1622	< 2	MPN/100ml	Shall not be detectable in any 100ml sample	
32.	E. Coli	IS 1622	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

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

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NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the Invoice amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Test Report

Sample Number:	VEL/HPCL/W/02	Report No.:	VEL/W/2002/24/002
Name & Address of Party:	M/s Hindustan Petroleum Cogporation Ltd.	Format No.:	7.8 F-01
	Village Nasibpura, Bhatinda Punjab	Party Reference No.:	NIL
Latitude:	30 ⁰ 3'37.63"N	Reporting Date:	29/02/2020
Longitude:	75 [°] 2'75.30"E	Period of Analysis:	24/02/2020 - 29/02/2020
Sample Description:	Ground Water Sample	Receipt Date:	24/02/2020
Sample Location:	Jiwan Singh Wala	Sampling Date:	20/02/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Quantity:	2.0 Ltr
Parameter Required	As per work order	Sampling Type:	Garb
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Preservation:	Refrigerated

	Parameter	er Test-Method	「「「の」の言語に	erilar	Limits of IS:10500 -2012	
S. No.			Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.78		6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**(DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1 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	288.00	mg/l	200	600
7_	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	65.21	mg/l	75	200
8.	Alkalinity as CaCO3	APHA, 2320 B, Titrimetric Method	176.13	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	82.69	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN D	*BDL (**DL 0.02 mg/i)	mg/l	0.05	No Relaxation
Ц.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	30.45	mg/l	30	100
12.	Total Dissolved Solids	APHA , 2540 C, Gravimetric Method	919.00	mg/l	500	2000
13.	Sulphate as SO4	APHA, 4500 E, Turbidimetric Method	35.69	mg/l	200	400
14.	Fluoride as F	APHA, 4500-F D, SPADNS Method	0.89	mg/l	1.0	1.5
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	9.98	mg/l	45	No Relaxation
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.21	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL, 0.03 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample	No.: VEL/HPCL/W/02			Report	No.: VEL/W/2	2002/24/002
	Envirolab Vardon Env	trollais Vardan Kevirol als Vérdan E	hvirotati Vardah P	nuirousb V	Limits of IS:	10500 -2012
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA, 3111 B, Direct Air, Acetylene Flame Method	0.56	mg/l	5	15
24.	Copper as Cu	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27,	Lead as Pb	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0:13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA, 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31,	Total Coliform	IS 1622	< 2	MPN/100ml	Shall not be do 100ml	sample
32.	E. Ĉoli	IS 1622	Absent	MPN/100ml	Shall not be d 100 ml	etectable in any sample

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

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Test Report

Sample Number:	VEL/HPCL/W/03	Report No.:	VEL/W/2002/24/003
Name & Address of Party:	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:	29/02/2020
Longitude:	75 ⁰ 58'6.88"E	Period of Analysis:	24/02/2020 - 29/02/2020
Sample Description:	Ground Water Sample	Receipt Date:	24/02/2020
Sample Location:	Maanwala	Sampling Date:	20/02/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Quantity:	2.0 Ltr
Parameter Required	As per Client Requirement	Sampling Type:	Garb
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Preservation:	Refrigerated
Sample Description: Sample Location: Sample Collected by: Parameter Required Sampling & Analysis Protocol:	Ground Water Sample Maanwala Vardan Enviro Lab Representative As per Client Requirement IS-10500-2012, APHA	Receipt Date: Sampling Date: Sampling Quantity: Sampling Type: Preservation:	24/02/2020 20/02/2020 2.0 Ltr Garb Refrigerated

	Parameter	Test-Method		A ab th	Limits of IS:10500 -2012		
S. No.			Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source	
4	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.83	1.00	6.5 to 8.5	No Relaxation	
2,	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15	
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1 NTU)	NTU	I	5	
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable		Agreeable	Agreeable	
5	Taste	APHA, 2160 B, Threshold Test Method	Agreeable	12.	Agreeable	Agreeable	
6.	Total Hardness as CaCO3	APHA, 2340 C, EDTA Titrimetric Method	467.00	mg/l	200	600	
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	89.67	mg/l	75	200	
8.	Alkalinity as CaCO3	APHA, 2320 B, Titrimetric Method	311.54	mg/l	200	600	
9.	Chloride as Cl	APHA, 4500-CI B, Argentometric Method	215.93	mg/l	250	1000	
10,	Cyanide as CN	APHA , 4500 CN ⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation	
116	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	59.11	mg/l	30	100	
12.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	995.00	mg/l	500	2000	
13.	Sulphate as SO4	APHA, 4500 E, Turbidimetric Method	129.54	mg/l	200	400	
14.	Fluoride as F	APHA, 4500-F D, SPADNS Method	1.38	mg/l	1.0	1.5	
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	15.43	mg/l	45	No Relaxation	
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.39	mg/l	0.3	No relaxation	
17,	Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2	
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1	
19.	Total Chromium as Cr	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation	

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Test Report

Sample	No.: VEL/HPCL/W/03			Repor	t No.: VEL/W/	2002/24/003		
lan En	uno Lab Mandain Envirol	ab Vardan EnviroLab Vardan Envi	olab Vardau Envi	olah Verdi	Limits of IS:			
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source		
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002		
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation		
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0		
23.	Zinc as Zn	APHA, 3111 B, Direct Air, Acetylene Flame Method	0.49	mg/l	5	15		
24.	Copper as Cu	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5		
25.	Manganese as Mn	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3		
26.	Cadmium as Cd	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation		
27.	Lead as Pb	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation		
28.	Selenium as Se	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation		
29.	Arsenic as As	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05		
30.	Mercury as Hg	APHA, 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation		
31.	Total Coliform	IS 1622	< 2	MPN/100ml	Shall not be d 100ml	etectable in any sample		
32.	E. Coli	IS 1622	Absent	MPN/100ml	Shall not be d 100 m	etectable in any I sample		

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

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Test Report

Sample Number:	VEL/HPCL/W/04	Report No.:	VEL/W/2002/24/004
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd.	Format No.:	7.8 F-01
	Village Nasibpura, Bhatinda Punjab	Party Reference No.:	NIL
Latitude:	30 ⁰ 1 ['] 13.05"N	Reporting Date:	29/02/2020
Longitude:	75 ⁰ 1'3.89"E	Period of Analysis:	24/02/2020 - 29/02/2020
Sample Description:	Ground Water Sample	Receipt Date:	24/02/2020
Sample Location:	Mahi Nangal	Sampling Date:	20/02/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Quantity:	2.0 Ltr
Parameter Required	As per Client Requirement	Sampling Type:	Garb
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Preservation:	Refrigerated

	Parameter	rameter Test-Method	or a child The bar will be the	at day	Limits of IS:10500 -2012	
S. No.			Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.68	(1	6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1 NTU)	NTU	1	5
4,	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	11.840	Agreeable	Agreeable
5.	Taste	APHA, 2160 B, Threshold Test Method	Agreeable		Agreeable	Agreeable
6.	Total Hardness as CaCO3	APHA, 2340 C, EDTA Titrimetric Method	396.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	96.35	mg/l	75	200
8.	Alkalinity as CaCO3	APHA, 2320 B, Titrimetric Method	296.32	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-CI' B, Argentometric Method	91.05	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN ⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	37.81	mg/l	30	100
12.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	979.00	mg/l	500	2000
13.	Sulphate as SO4	APHA, 4500 E, Turbidimetric Method	86.75	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	12.06	mg/l	45	No Relaxation
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.28	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample	No.: VEL/HPCL/W/04			Report	No.: VEL/W/	2002/24/004
Cm En	rest als well an Eriotron	ph Varikas Envirol sh Vardso Envi	of als Varslan Erivit	aliah Varda	Limits of IS:	10500 -2012
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA, 3111 B, Direct Air, Acetylene Flame Method	0.68	mg/l	5	15
24.	Copper as Cu	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA, 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Total Coliform	IS 1622	< 2	MPN/100ml	Shall not be de 100ml	etectable in any sample
32.	E. Coli	IS 1622	Absent	MPN/100ml	Shall not be d 100 m	etectable in any sample

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

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Test Report

Sample Number:	VEL/HPCL/W/05	Report No.:	VEL/W/2002/24/005
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd.	Format No.:	7.8 F-01
	Village Nasibpura, Bhatinda Punjab	Party Reference No.:	NIL
Latitude:	30 [°] 6 ['] 34.53"N	Reporting Date:	29/02/2020
Longitude:	75 ⁰ 0'23.67"E	Period of Analysis:	24/02/2020 - 29/02/2020
Sample Description:	Ground Water Sample	Receipt Date:	24/02/2020
Sample Location:	Kot Kashmir	Sampling Date:	20/02/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Quantity:	2.0 Ltr
Parameter Required	As per Client Requirement	Sampling Type:	Garb
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Preservation:	Refrigerated

	Parameter	ameter Test-Method		Unit	Limits of IS:10500 -2012	
S. No.			Result		Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1,	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.89		6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1 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 CaCO3	APHA, 2340 C, EDTA Titrimetric Method	453.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	102.86	ıng/l	75	200
8.	Alkalinity as CaCO3	APHA, 2320 B, Titrimetric Method	334.02	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl B, Argentometric Method	124.85	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN ⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	47.71	mg/l	30	100
12.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	1086.00	mg/l	500	2000
13.	Sulphate as SO4	APHA, 4500 E, Turbidimetric Method	98.66	mg/l	200	400
14,	Fluoride as F	APHA, 4500-F D, SPADNS Method	0.97	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	14.33	mg/l	45	No Relaxation
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.32	mg/l	0.3	No relaxation
17 -	Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample	No.: VEL/HPCL/W/05			Repor	t No.: VEL/W/	2002/24/005
	Aristah Vardan Emeliou	an Vardan English Sh Vardas First	atab Vastan Pour	al at Vando	Limits of IS:	10500 -2012
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA, 3111 B, Direct Air, Acetylene Flame Method	0.76	mg/l	5	15
24.	Copper as Cu	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27,	Lead as Pb	APHA , 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA, 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31+	Total Coliform	IS 1622	< 2	MPN/100ml	Shall not be de 100ml	etectable in any sample
32,	E. Coli	IS 1622	Absent	MPN/100ml	Shall not be d 100 ml	etectable in any sample

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





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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/HPCL/W/06	Report No.:	VEL/W/2002/24/006
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd.	Format No.:	7.8 F-01
	Village Nasibpura, Bhatinda Punjab	Party Reference No.:	NIL
Latitude:	30 [°] 4 ['] 34.79"N	Reporting Date:	29/02/2020
Longitude:	74 ⁰ 59'57.45"E	Period of Analysis:	24/02/2020 - 29/02/2020
Sample Description:	Ground Water Sample	Receipt Date:	24/02/2020
Sample Location:	Nasibpura	Sampling Date:	20/02/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Quantity:	2.0 Ltr
Parameter Required	As per Client Requirement	Sampling Type:	Garb
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Preservation:	Refrigerated

	tvicolab Vardau Env	and the second		ardan Isotak	Limits of IS:10500 -201	
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.93		6.5 to 8.5	No Relaxation
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1 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 CaCO3	APHA, 2340 C, EDTA Titrimetric Method	421.00	mg/l	200	600
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	115.63	mg/l	75	200
8.	Alkalinity as CaCO3	APHA, 2320 B, Titrimetric Method	285.32	mg/l	200	600
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	108.12	mg/l	250	1000
10.	Cyanide as CN	APHA , 4500 CN ⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	32.20	mg/l	30	100
12.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	1010.00	mg/l	500	2000
13.	Sulphate as SO4	APHA, 4500 E, Turbidimetric Method	109.50	mg/l	200	400
14.	Fluoride as F	APHA, 4500-F ⁻ D, SPADNS Method	0.90	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) ,Chromotropic Method	11.32	mg/l	45	No Relaxation
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.38	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1
19.	Total Chromium as Cr	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation

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Test Report

Sample	Sample No.: VEL/HPCL/W/06		Report No.: VEL/W/2002/2			2002/24/006
Core Err	Groupsb Vardan Edvarat	ab Vardan Envirol als Vardan Envi	el ab Verdau Erivit	obab Varda	Limits of IS:	10500 -2012
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23,	Zinc as Zn	APHA, 3111 B, Direct Air, Acetylene Flame Method	0.84	mg/l	5	15
24.	Copper as Cu	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0:13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA , 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA, 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Total Coliform	IS 1622	< 2	MPN/100ml	Shall not be de 100ml	etectable in any sample
32.	E. Coli	IS 1622	Absent	MPN/100ml	Shall not be d 100 m	etectable in any sample

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

MEENU KAUSHIK SR-ANALYST



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Test Report

Sample Number:	VEL/HPCL/W/07	Report No.:	VEL/W/2002/24/007
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd.	Format No.:	7.8 F-01
	Village Nasibpura, Bhatinda Punjab	Party Reference No.:	NIL
Latitude:	30°1'27.46"N	Reporting Date:	29/02/2020
Longitude:	75 ⁰ 4'8.62"E	Period of Analysis:	24/02/2020 - 29/02/2020
Sample Description:	Ground Water Sample	Receipt Date:	24/02/2020
Sample Location:	Baghi Bandar	Sampling Date:	20/02/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Quantity:	2.0 Ltr
Parameter Required	As per Client Requirement	Sampling Type:	Garb
Sampling & Analysis Protocol:	IS-10500-2012, APHA	Preservation:	Refrigerated

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S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source	
1.	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.75		6.5 to 8.5	No Relaxation	
2,	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen	5	15	
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	*BDL (**DL 1 NTU)	NTU	1	5	
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable		Agreeable	Agreeable	
5,	Taste	APHA, 2160 B, Threshold Test Method	Agreeable	223	Agreeable	Agreeable	
6.	Total Hardness as CaCO ₃	APIIA, 2340 C, EDTA Titrimetric Method	454.00	mg/l	200	600	
7.	Calcium as Ca	APHA, 3500 Ca B, EDTA Titrimetric Method	104.47	mg/l	75	200	
8,	Alkalinity as CaCO3	APHA, 2320 B, Titrimetric Method	269.54	mg/l	200	600	
9.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	93.44	mg/l	250	1000	
10,	Cyanide as CN	APHA , 4500 CN ⁻ D	*BDL (**DL 0.02 mg/l)	mg/l	0.05	No Relaxation	
11_{\odot}	Magnesium as Mg	APHA, 3500 Mg B, Calculation Method	46.98	mg/l	30	100	
12.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	1132.00	mg/l	500	2000	
13.	Sulphate as SO4	APHA, 4500 E, Turbidimetric Method	98.75	mg/l	200	400	
14.	Fluoride as F	APHA, 4500-F ⁻ D, SPADNS Method	0.88	mg/l	1.0	1.5	
15.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	12.98	mg/l	45	No Relaxation	
16.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.32	mg/l	0.3	No relaxation	
17.	Aluminium as Al	APHA, 3111 D Nitrous Oxide Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.03	0.2	
18.	Boron	APHA, 4500B C, Carmine Method	*BDL(**DL 0.1 mg/l)	mg/l	0.5	1	
19,	Total Chromium as Cr	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	No Relaxation	

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Test Report

Sample	Sample No.: VEL/HPCL/W/07		Report No.: VEL/W/2002/			2002/24/007
Laven	dioLats Vacian Environ	die Usedan Envirol als Vardan Em I	el ab vastas result	atab Varda	Limits of IS	10500 -2012
S. No.	Parameter	Test-Method	Result	Unit	Requirement (Acceptable Limit)	Permissible limit in the Absence of Alternate Source
20.	Phenolic Compounds	APHA, 5530 C Chloroform Extraction Method	*BDL(**DL 0.001 mg/l)	mg/l	0.001	0.002
21.	Mineral Oil	Clause 6 of IS:3025(Part 39)	*BDL(**DL 0.01mg/l)	mg/l	0.5	No Relaxation
22.	Anionic Detergents as MBAS	APHA, 5540 C MBAS Method	*BDL(**DL 0.02 mg/l)	mg/l	0.2	1.0
23.	Zinc as Zn	APHA, 3111 B, Direct Air, Acetylene Flame Method	0.71	mg/l	5	15
24.	Copper as Cu	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.05	1.5
25.	Manganese as Mn	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.06 mg/l)	mg/l	0.1	0.3
26.	Cadmium as Cd	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.03 mg/l)	mg/l	0.003	No Relaxation
27.	Lead as Pb	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l	0.01	No Relaxation
28.	Selenium as Se	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.13 mg/l)	mg/l	0.01	No Relaxation
29.	Arsenic as As	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/i)	mg/l	0.01	0.05
30.	Mercury as Hg	APHA, 3112 B, Cold Vapour AAS Method	*BDL(**DL 0.01 mg/l)	mg/l	0.001	No Relaxation
31.	Total Coliform	IS 1622	< 2	MPN/100ml	Shall not be d 100ml	etectable in any sample
32.	E. Coli	IS 1622	Absent	MPN/100ml	Shall not be d 100 m	etectable in any sample

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

MEENU KAUSHIK SR: ANALYST

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NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the Invoice amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Test Report

VEL/HPCL/W/08	Report No.:	VEL/W/2002/24/008
M/s Hindustan Petroleum Cogporation Ltd.	Format No.:	7.8 F-01
Village Nasibpura, Bhatinda Punjab	Party Reference No.:	NIL
30°6'48.99"N	Reporting Date:	29/02/2020
75 ⁰ 4'54.51"E	Period of Analysis:	24/02/2020 - 29/02/2020
Surface Water Sample	Receipt Date:	24/02/2020
Kot Fatta	Sampling Date:	20/02/2020
Vardan Enviro Lab Representative	Sampling Quantity:	2.0 Ltr
As per Client Requirement	Sampling Type:	122
IS 2296 & CPCB, 1979, APHA	Preservation:	Refrigerated
	VEL/HPCL/W/08 M/s Hindustan Petroleum Cogporation Ltd. Village Nasibpura, Bhatinda Punjab 30% (48.99"N 75% (45.51"E Surface Water Sample Kot Fatta Vardan Enviro Lab Representative As per Client Requirement IS 2296 & CPCB, 1979, APHA	VEL/HPCL/W/08Report No.:M/s Hindustan Petroleum Corporation Ltd.Format No.:Village Nasibpura, Bhatinda PunjabParty Reference No.:30% (*8.99"NReporting Date:75% 4'54.51"EPeriod of Analysis:Surface Water SampleReceipt Date:Kot FattaSampling Date:Vardan Enviro Lab RepresentativeSampling Quantity:As per Client RequirementSampling Type:IS 2296 & CPCB, 1979, APHAPreservation:

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.91	Fourie al ala
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	23	NTU
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	
5.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	121.05	mg/l
6.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1315	μS/cm
7.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	20.16	mg/l
8.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.39	mg/l
9.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	789.00	mg/l
10.	Lead as Pb	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
Π_{\odot}	Boron	APHA, 4500B C, Carmine Method	0.22	mg/l
12.	Sulphate as SO ⁴	APHA, 4500 E, Turbidimetric Method	16.78	mg/l
13.	Fluoride as F	APHA, 4500-F ⁻ D, SPADNS Method	0.61	mg/l
14.	BOD (3 Days at 27°C)	APHA, 5210 C / IS 3025,P-44	3.56	mg/l
15.	COD	APHA, 5220 B, Open Reflux Method	32.58	mg/l
16.	Free Ammonia as NH3	IS 3025 (P-34), Titrimetric Method	14.95	mg/l
17.	Total Coliform	IS 1622	32	MPN/100m
18.	Arsenic as As	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mø/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/2002/24/009
Name & Address of Party:	M/s Hindustan Petroleum Corporation Ltd.	Format No.:	7.8 F-01
	Village Nasibpura, Bhatinda Punjab	Party Reference No.:	NIL
Latitude:	30 ⁰ 3 ['] 45.41"N	Reporting Date:	29/02/2020
Longitude:	75 ⁰ 4'6.08"E	Period of Analysis:	24/02/2020 - 29/02/2020
Sample Description:	Surface Water Sample	Receipt Date:	24/02/2020
Sample Location:	Chathewala	Sampling Date:	20/02/2020
Sample Collected by:	Vardan Enviro Lab Representative	Sampling Quantity:	2.0 Ltr
Parameter Required	As per Client Requirement	Sampling Type:	
Sampling & Analysis Protocol:	IS 2296 & CPCB, 1979, APHA	Preservation:	Refrigerated

S. No.	Parameter	Test-Method	Result	Unit
1,	pH (at 25 °C)	APHA ,4500-H ⁺ B Electrometric Method	7.69	
2.	Colour	APHA ,2120 B, Visual Comparison Method	*BDL (**DL 5Hazen)	Hazen
3.	Turbidity	APHA, 2130 B, Nephlelometric Method	17	NTU
4.	Odour	APHA, 2150 B, Threshold Test Method	Agreeable	
5.	Chloride as Cl	APHA, 4500-Cl ⁻ B, Argentometric Method	117.62	mg/l
6.	Conductivity	APHA, 2510 B, Conductivity Meter Method	1270	µS/cm
7.	Nitrate as NO3	IS 3025 (P-34) ,Chromotropic Method	9.92	mg/l
8.	Iron as Fe	APHA, 3500-Fe B 1,10 Phenanthroline Method	0.47	mg/l
9.	Total Dissolved Solids	APHA, 2540 C, Gravimetric Method	762.00	mg/l
10.	Lead as Pb	APHA, 3111 B, Direct Air, Acetylene Flame Method	*BDL(**DL 0.01 mg/l)	mg/l
$\Pi_{\rm e}$	Boron	APHA, 4500B C, Carmine Method	0.19	mg/l
12.	Sulphate as SO ⁴	APHA, 4500 E, Turbidimetric Method	32.54	mg/l
13.	Fluoride as F	APHA, 4500-F ⁻ D, SPADNS Method	0.52	mg/l
14.	BOD (3 Days at 27 ⁰ C)	APHA, 5210 C / IS 3025,P-44	9.00	mg/l
15.	COD	APHA, 5220 B, Open Reflux Method	26.70	mg/l
16.	Free Ammonia as NH3	IS 3025 (P-34), Titrimetric Method	12.63	mg/l
17.	Total Coliform	IS 1622	38	MPN/100m
18.	Arsenic as As	APHA, 3114 B, Manual Hydride Generation	*BDL(**DL 0.01 mg/l)	mg/l

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



c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law



Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number: Name & Address of the Project:	VEL/HPCL/S/01 M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Report No.: Format No.: Party Reference No.: Reporting Date:	VEL/S/2002/24/001 7.8 F-01 NIL 29/02/2020	
Latitude: Longitude:	30 ⁰ 3'13.34"N 75 ⁰ 0'41.57"E	Period of Analysis : Receipt Date: Sampling Date:	24/02/2020-29/02/2020 24/02/2020 20/02/2020	
Sample Description: Sampling Location: Sample Collected by:	Soil Sample Near Project Site Vardan Enviro Lab Team	Type of Sampling: Sampling Quantity: Packing Status:	Composite 2.0 Kg Temp Sealed	
Sampling & Analysis Protocol:	IS 2720, USEPA & USDA			

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.82	1.
2	Conductivity	IS:14767 by Conductivity meter	0.336	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish Red	
5	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	27.64	%
6	Bulk density	SOP , SP-80, Issue No -01& Issue Date-14/02/2013	1.66	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	57.52	mg/100g
8.	Calcium as Ca	SOP , SP-82,1ssue No01& Issue Date-14/02/2013	42.37	mg/100g
9	Sodium as Na	SOP , SP-84, Issue No01& Issue Date-14/02/2013	51.06	mg/kg
10.	Potassium as K	SOP , SP-84, Issue No -01& Issue Date-14/02/2013	142.84	kg/hec
11.	Iron as Fe	USDA Method, 1968	0.73	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.61	%
13	Magnesium as Mg	SOP, SP-83, Issue No01& Issue Date-14/02/2013	20.61	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	219.34	kg./hec.
15.	Available Phosphorus	SOP, SP-86;Issue No01& Issue Date-14/02/2013	19.45	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	11.51	mg/kg
17.	Organic Carbon	USEPA 3050B	0.42	%
18	Lead (as Pb)	USEPA 3050B	0.86	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.75	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.97	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.76	mg/kg
22,	Molybdenum as MO	USEPA 3050B	0.41	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100e

Note: SOP-Standard Operating Procedure

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NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the invoice amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Test Report

Sample Number:	VEL/HPCL/S/02	Report No.:	VEL/S/2002/24/002	
Name & Address of the	M/s Hindustan Petroleum Corporation Ltd.	Format No.:	7.8 F-01	
Project:	Village Nasibnurg Bhatinda Punjab	Party Reference No.:	NIL	
	vinage Masiopula, Diatinua I unjab	Reporting Date:	29/02/2020	
Latitude:	3003137 63"N	Period of Analysis :	24/02/2020-29/02/2020	
Longitude:	50 5 57.05 R	Receipt Date:	24/02/2020	
	/5 2 /5.30 E	Sampling Date:	20/02/2020	
Sample Description:	Soil Sample	Type of Sampling:	Composite	
Sampling Location:	Jiwan Singh Wala	Sampling Quantity:	2.0 Kg	
Sample Collected by:	Vardan Enviro Lab Team	Depth of Sampling:	30 cm	
Sampling & Analysis Protocol:	IS 2720, USEPA & USDA	Packing Status:	Temp Sealed	

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.57	Giol all Varel
2.	Conductivity	IS:14767 by Conductivity meter	0.329	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish	
5	Water holding capacity	SOP, SP-81,Issue No01& Issue Date-14/02/2013	31.05	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.53	gm/cc
7,	Chloride as Cl	SOP, SP-85, Issue No01& Issue Date-14/02/2013	51.03	mg/100g
8	Calcium as Ca	SOP, SP-82, Issue No01& Issue Date-14/02/2013	42.65	mg/100g
9.	Sodium as Na	SOP, SP-84, Issue No01& Issue Date-14/02/2013	53.12	mg/kg
10.	Potassium as K	SOP, SP-84,Issue No01& Issue Date-14/02/2013	156.84	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.53	mg/100g
12.	Organic Matter	1S:2720 (P-22) Titrimetric Method	0.57	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	31.33	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	249-52	kg./hec.
15	Available Phosphorus	SOP, SP-86, Issue No01& Issue Date-14/02/2013	22.16	kg /hee
16	Zinc (as Zn)	SOP, SP-86,Jssue No01	11.65	mg/kg
17.	Organic Carbon	USEPA 3050B	0.35	%
18-	Lead (as Pb)	USEPA 3050B	0.76	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.86	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.54	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.87	mg/kg
22,	Molybdenum as MO	USEPA 3050B	0.43	mg/100g
23-	Nickel	USEPA 3050B	*BDL	mg/100g

Note: SOP-Standard Operating Procedure

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NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the invoice amount only c) The sample will be destroyed after retention time unless otherwise specified d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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VEL/HPCL/S/03

Test Report

Sample Number: Name & Address of the Project:

Latitude: Longitude:

Sample Description: Sampling Location: Sample Collected by: Vardan Enviro Lab Team Sampling & Analysis Protocol: IS 2720, USEPA & USDA

M/s Hindustan Petroleum Cogporation Ltd. Village Nasibpura, Bhatinda Punjab 30°2'33.23"N 75°58'6.88"E Soil Sample Maanwala

Report No .: VEL/S/2002/24/003 Format No.: 7.8 F-01 Party Reference No.: NIL Reporting Date: 29/02/2020 Period of Analysis : 24/02/2020-29/02/2020 Receipt Date: 24/02/2020 Sampling Date: 20/02/2020 Type of Sampling: Composite Sampling Quantity: 2.0 Kg Depth of Sampling: 30 cm Packing Status: **Temp Sealed**

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	0.331	mS/cm
3	Soil Texture	lS : 2720 (P-22, RA2003)	Silt	<i>17</i> .
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish Red	12
5.	Water holding capacity	SOP . SP-81.Issue No01& Issue Date-14/02/2013	33.51	%
6	Bulk density	SOP , SP-80, Issue No01& Issue Date-14/02/2013	1.83	gm/cc
7.	Chloride as Cl	SOP, SP-85, Issue No01& Issue Date-14/02/2013	45.12	mg/100g
8.	Calcium as Ca	SOP, SP-82, Issue No01& Issue Date-14/02/2013	65.47	mg/100g
9,	Sodium as Na	SOP, SP-84, Issue No01& Issue Date-14/02/2013	61.02	mg/kg
10.	Potassium as K	SOP, SP-84, Issue No01& Issue Date-14/02/2013	133.12	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.35	mg/100g
12,	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.75	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	24.33	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	234.12	kg./hec.
15	Available Phosphorus	SOP, SP-86, Issue No01& Issue Date-14/02/2013	33.85	kg./hec.
16	Zinc (as Zn)	SOP, SP-86,Issue No01	14.59	mg/kg
17.	Organie Carbon	USEPA 3050B	0.27	%
18.	Lead (as Pb)	USEPA 3050B	0.63	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.78	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.69	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.21	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.49	mg/100
23.	Nickel	USEPA 3050B	*BDL	mg/100

Note: SOP-Standard Operating Procedure

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NOTE: a)The results listed refer only to the tested samples & applicable parameters b) Total liabilities of our lab will be restricted to the involce amount only c) The sample will be destroyed after retention time unless otherwise specified
 d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law



Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001 | ISO 14001 | ISO 45001

Test Report

Sample Number: Name & Address of the Project:	VEL/HPCL/S/04 M/s Hindustan Petroleum Cozporation Ltd. Village Nasibpura, Bhatinda Punjab	Report No.: Format No.: Party Reference No.: Reporting Date:	VEL/S/2002/24/004 7.8 F-01 NIL 29/02/2020
Latitude: Longitude:	30 ⁰ 1 ['] 13.05"N 75 ⁰ 1'3.89"E	Period of Analysis : Receipt Date: Sampling Date:	24/02/2020-29/02/2020 24/02/2020 20/02/2020
Sample Description: Sampling Location: Sample Collected by:	Soil Sample Mahi Nangal Vardan Enviro Lab Team	Type of Sampling: Sampling Quantity: Depth of Sampling:	Composite 2.0 Kg 30 cm
Sampling & Analysis Protocol:	IS 2720, USEPA & USDA	Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.55	
2.	Conductivity	IS:14767 by Conductivity meter	0.341	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	77.0
4	Color	SOP, SP-78, Issue No -01& Issue Date-14/02/2013	Yellowish Red	
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	26.38	%
6.	Bulk density	SOP, SP-80, Issue No01& Issue Date-14/02/2013	1.24	gin/cc
7.	Chloride as Cl	SOP, SP-85, Issue No01& Issue Date-14/02/2013	51.21	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	45.98	mg/100g
9	Sodium as Na	SOP, SP-84, Issue No01& Issue Date-14/02/2013	61.42	mg/kg
10.	Potassium as K	SOP, SP-84, Issue No -01& Issue Date-14/02/2013	146.35	kg/hec.
11,	Iron as Fe	USDA Method, 1968	0.71	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.79	%
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	236.12	kg./hec.
15.	Available Phosphorus	SOP, SP-86, lssue No01& Issue Date-14/02/2013	19.87	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	8.96	mg/kg
17.	Organic Carbon	USEPA 3050B	0.25	%
18	Lead (as Pb)	USEPA 3050B	0.67	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.72	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.45	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.87	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.86	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Note: SOP-Standard Operating Procedure

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VEL/HPCL/S/05

Test Report

M/s Hindustan Petroleum Corporation Ltd.

Sample Number:	
Name & Address	of the
Project:	

Latitude: Longitude:

Sample Description: Sampling Location: Sample Collected by: Sampling & Analysis Protocol: Village Nasibpura, Bhatinda Punjab 29°59'40.64"N 75°1'17.61"E Soil Sample Leleana Vardan Enviro Lab Team

IS 2720, USEPA & USDA

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

VEL/S/2002/24/005 7.8 F-01 NIL 29/02/2020 24/02/2020-29/02/2020 24/02/2020 20/02/2020 Composite 2.0 Kg 30 cm

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.78	
2.	Conductivity	IS:14767 by Conductivity meter	0,349	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	+4
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish	
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	37.54	%
6,	Bulk density	SOP , SP-80.Issue No01& Issue Date-14/02/2013	1.89	gm/cc
7	Chloride as Cl	SOP , SP-85, Issue No01& Issue Date-14/02/2013	67.21	mg/100g
8.	Calcium as Ca	SOP, SP-82, Issue No01& Issue Date-14/02/2013	54.88	mg/100g
9.	Sodium as Na	SOP, SP-84, Issue No01& Issue Date-14/02/2013	61.67	mg/kg
10,	Potassium as K	SOP, SP-84, Issue No01& Issue Date-14/02/2013	163.15	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.84	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.79	%
13,	Magnesium as Mg	SOP, SP-83, Issue No -01& Issue Date-14/02/2013	28.00	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	240.26	kg./hec.
15.	Available Phosphorus	SOP, SP-86, Issue No01& Issue Date-14/02/2013	28.32	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	8.94	mg/kg
17.	Organic Carbon	USEPA 3050B	0.27	%
18.	Lead (as Pb)	USEPA 3050B	0.97	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.86	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.98	mg/kg
21.	Copper (as Cu)	USEPA 3050B	7.32	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.51	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Note: SOP-Standard Operating Procedure

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 d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/HPCL/S/06	
Name & Address of the	M/s Hindustan	
Project:	Village Nasibp	
Latitude:	3001'27 46"N	
Longitude:	75°4'8.62"E	

 Sample Description:
 Soil Sample

 Sampling Location:
 Baghi Bandar

 Sampling Location:
 Vardan Enviro Lab Team

 Sampling & Analysis Protocol:
 IS 2720, USEPA & USDA

M/s Hindustan Petroleum Cogporation Ltd. Village Nasibpura, Bhatinda Punjab 30°1'27.46"N 75°4'8.62"E Soil Sample Baghi Bandar Vardan Enviro Lab Team

Report No.: VEL/S/2002/24/006 Format No.: 7.8 F-01 Party Reference No.: NIL Reporting Date: 29/02/2020 Period of Analysis : 24/02/2020-29/02/2020 Receipt Date: 24/02/2020 Sampling Date: 20/02/2020 Type of Sampling: Composite Sampling Quantity: 2.0 Kg Depth of Sampling: 30 cm Packing Status: **Temp Sealed**

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	0.353	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	**
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish	75
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	41.02	%
6.	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.71	gm/cc
7.	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	56.87	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	45.23	mg/100g
9	Sodium as Na	SOP , SP-84,Issue No -01& Issue Date-14/02/2013	57.49	mg/kg
10	Potassium as K	SOP , SP-84,1ssue No01& 1ssue Date-14/02/2013	167.52	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.69	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.78	%
13	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	37.12	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	257.89	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	22.15	kg./hec.
16	Zinc (as Zn)	SOP, SP-86,Issue No01	9,98	mg/kg
17,	Organic Carbon	USEPA 3050B	0.37	%
18.	Lead (as Pb)	USEPA 3050B	0.78	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.86	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.57	ing/kg
21.	Copper (as Cu)	USEPA 3050B	2.92	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.41	mg/100
23.	Nickel	USEPA 3050B	*BDL	mg/100

Note: SOP-Standard Operating Procedure MEENU KAUSHIK

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Test Report

Sample Number:	VEL/HPCL/S/07	Report No.:	VEL/S/2002/24/007
Name & Address of the	M/s Hindustan Petroleum Corporation Ltd.	Format No.:	7.8 F-01
Project:	Village Nasibnura, Rhafinda Puniah	Party Reference No.:	NIL
	i mage i asispara, matinaa i anjab	Reporting Date:	29/02/2020
Latitude:	30 ⁰ 4'34 70"N	Period of Analysis :	24/02/2020-29/02/2020
Longitude:	74 ⁰ 50/57 457F	Receipt Date:	24/02/2020
	74 59 57.45 E	Sampling Date:	20/02/2020
Sample Description:	Soil Sample	Type of Sampling:	Composite
Sampling Location:	Nasibpura	Sampling Quantity:	2.0 Kg
Sample Collected by:	Vardan Enviro Lab Team	Depth of Sampling:	30 cm
Sampling & Analysis Protocol:	IS 2720, USEPA & USDA	Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
12	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.82	•
2.	Conductivity	IS:14767 by Conductivity meter	0.361	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	
4	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish Red	
5	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	42.53	%
6	Bulk density	SOP, SP-80, Issue No01& Issue Date-14/02/2013	1.87	gm/cc
7	Chloride as Cl	SOP, SP-85, Issue No01& Issue Date-14/02/2013	56.49	mg/100g
8.	Calcium as Ca	SOP, SP-82, Issue No01& Issue Date-14/02/2013	73.21	mg/100g
9.	Sodium as Na	SOP, SP-84, Issue No01& Issue Date-14/02/2013	60.54	mg/kg
10.	Potassium as K	SOP, SP-84, Issue No01& Issue Date-14/02/2013	135.62	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.59	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.78	%
13	Magnesium as Mg	SOP, SP-83, Issue No01& Issue Date-14/02/2013	27.12	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	249.80	kg./hec.
15	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	39.32	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86, Issue No01	20.12	mg/kg
17.	Organic Carbon	USEPA 3050B	0.46	%
18.	Lead (as Pb)	USEPA 3050B	0.68	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.81	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.88	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.31	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.62	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Note: SOP-Standard Operating Procedure

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number:	VEL/IOCL/S/08	Report No.:	VEL/S/2002/24/008
Name & Address of the	M/s Hindustan Petroleum Corporation Ltd.	Format No.:	7.8 F-01
Project:	Village Nasiboura, Bhatinda Puniah	Party Reference No.:	NIL
	ininge i insispara, biannaa i anjab	Reporting Date:	29/02/2020
Latitude:	30 ⁰ 5'40 22"N	Period of Analysis :	24/02/2020-29/02/2020
Longitude:	75 ⁰ 4%5 30%F	Receipt Date:	24/02/2020
	73 4 3.30 E	Sampling Date:	20/02/2020
Sample Description:	Soil Sample	Type of Sampling:	Composite
Sampling Location:	Kotbhara	Sampling Quantity:	2.0 Kg
Sample Collected by:	Vardan Enviro Lab Team	Depth of Sampling:	30 cm
Sampling & Analysis Protocol:	IS 2720 , USEPA & USDA	Packing Status:	Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1.0	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.43	
2.	Conductivity	IS:14767 by Conductivity meter	0.337	mS/cm
3	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.0	Color	SOP, SP-78,Issue No01& Issue Date-14/02/2013	Yellowish	
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	25.86	%
6.	Bulk density	SOP, SP-80, Issue No01& Issue Date-14/02/2013	1,20	gm/cc
7	Chloride as Cl	SOP , SP-85 Issue No01& Issue Date-14/02/2013	40.31	mg/100g
8,	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	46.00	mg/100g
9.	Sodium as Na	SOP, SP-84, Issue No01& Issue Date-14/02/2013	50.54	mg/kg
10.	Potassium as K	SOP, SP-84, Issue No01& Issue Date-14/02/2013	143.25	kg/hec.
11.	Iron as Fe	USDA Method, 1968	0.58	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.65	%
13.	Magnesium as Mg	SOP, SP-83, Issue No01& Issue Date-14/02/2013	36.12	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	218.00	kg./hec.
15.	Available Phosphorus	SOP, SP-86, Issue No01& Issue Date-14/02/2013	16.25	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	78.12	mg/kg
17.	Organic Carbon	USEPA 3050B	0.49	%
18	Lead (as Pb)	USEPA 3050B	0.57	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.68	mg/kg
20	Chromium (as Cr)	USEPA 3050B	1.41	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.28	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.87	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Note: SOP-Standard Operating Procedure

ARHIN, RAWAT

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122052, Haryana Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035, Rajasthan NABL Accredited | MoEF&CC Recognized | ISO 9001|ISO 14001|ISO 45001

Test Report

Sample Number: Name & Address of the Project:	VEL/HPCL/S/09 M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Report No.: Format No.: Party Reference No.: Reporting Date:	VEL/S/2002/24/009 7.8 F-01 NIL 29/02/2020
Latitude: Longitude:	30 [°] 6 ['] 34.53"N 75 [°] 0'23.67"E	Period of Analysis : Receipt Date: Sampling Date:	24/02/2020-29/02/2020 24/02/2020 20/02/2020
Sample Description: Sampling Location: Sample Collected by: Sampling & Analysis Protocol:	Soil Sample Kot Kashmir Vardan Enviro Lab Team IS 2720, USEPA & USDA	Type of Sampling: Sampling Quantity: Depth of Sampling: Packing Status:	Composite 2.0 Kg 30 cm Temp Scaled

S. No.	Parameter	Test-Method	Result	Unit
L	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.75	
2	Conductivity	IS:14767 by Conductivity meter	0.324	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish Red	
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	26.12	%
6.	Bulk density	SOP, SP-80, Issue No01& Issue Date-14/02/2013	1,61	gm/cc
7	Chloride as Cl	SOP, SP-85, Issue No01& Issue Date-14/02/2013	57.36	mg/100g
8	Calcium as Ca	SOP, SP-82, Issue No01& Issue Date-14/02/2013	42.15	mg/100g
9.	Sodium as Na	SOP, SP-84, Issue No01& Issue Date-14/02/2013	50.01	mg/kg
10.	Potassium as K	SOP, SP-84, Issue No01& Issue Date-14/02/2013	153.00	kg/hec
11.	Iron as Fe	USDA Method, 1968	0.78	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.65	%
13.	Magnesium as Mg	SOP, SP-83, Issue No01& Issue Date-14/02/2013	23.00	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	219.00	kg./hec.
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	22.68	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	8.23	mg/kg
17.	Organic Carbon	USEPA 3050B	0.45	%
18.	Lead (as Pb)	USEPA 3050B	0.84	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.74	ing/kg
20.	Chromium (as Cr)	USEPA 3050B	0.89	mg/kg
21	Copper (as Cu)	USEPA 3050B	6.41	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.37	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK A SABANALYST

ARJUN RAWAT Checked By) 0

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VEL/HPCL/S/10

Test Report

M/s Hindustan Petroleum Corporation Ltd.

Sample Number:				
Name & Address	of the			
Project:				

Latitude: Longitude:

Sample Description: Sampling Location: Sample Collected by: Sampling & Analysis Protocol: Village Nasibpura, Bhatinda Punjab 30°6'44.02"N 74°57'21.06"E Soil Sample Gehri Boghi Vardan Enviro Lab Team IS 2720, USEPA & USDA

Report No.: VEL/S/2002/24/010 Format No.: 7.8 F-01 Party Reference No.: NIL Reporting Date: 29/02/2020 Period of Analysis : 24/02/2020-29/02/2020 Receipt Date: 24/02/2020 Sampling Date: 20/02/2020 Type of Sampling: Composite Sampling Quantity: 2.0 Kg Depth of Sampling: 30 cm Packing Status: **Temp Sealed**

S. No.	Parameter	Test-Method	Result	Unit
1	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.53	
2.	Conductivity	IS:14767 by Conductivity meter	0.327	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silty Loam	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish Red	
5	Water holding capacity	SOP, SP-81,Issue No01& Issue Date-14/02/2013	35.42	%
6.	Bulk density	SOP , SP-80,Issue No01& Issue Date-14/02/2013	1.57	gm/ec
7.	Chloride as Cl	SOP, SP-85, Issue No01& Issue Date-14/02/2013	58.66	mg/100g
8	Calcium as Ca	SOP, SP-82, Issue No01& Issue Date-14/02/2013	48.13	mg/100
9.	Sodium as Na	SOP, SP-84,Issue No01& Issue Date-14/02/2013	59.74	mg/kg
10	Potassium as K	SOP , SP-84, Issue No01& Issue Date-14/02/2013	167 65	kg/hec
11,	Iron as Fe	USDA Method, 1968	0.77	mg/100
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	36.21	mg/100
14.	Available Nitrogen as N	IS:14684 Distillation Method	260.10	kg./hec
15.	Available Phosphorus	SOP, SP-86, Issue No01& Issue Date-14/02/2013	23.65	kg./hec
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	12.37	mg/kg
17	Organic Carbon	USEPA 3050B	0.37	%
18	Lead (as Pb)	USEPA 3050B	0.76	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.86	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	0.64	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.98	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.35	mg/100
23	Nickel	USEPA 3050B	*BDI	mg/100

Note: SOP-Standard Operating Procedure

SR. ANALYST

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Test Report

Sample Number: Name & Address of the Project:	VEL/HPCL/S/11 M/s Hindustan Petroleum Co _r poration Ltd. Village Nasibpura, Bhatinda Punjab	Report No.: Format No.: Party Reference No.: Reporting Date:	VEL/S/2002/24/011 7.8 F-01 NIL 29/02/2020
Latitude: Longitude:	30 ⁰ 3 ['] 45.41"N 75 ⁰ 4'6.08"E	Period of Analysis : Receipt Date: Sampling Date:	24/02/2020-29/02/2020 24/02/2020 20/02/2020
Sample Description:	Soil Sample	Type of Sampling:	Composite
Sampling Location:	Chathewala	Sampling Quantity:	2.0 Kg
Sample Collected by: Sampling & Analysis Protocol:	Vardan Enviro Lab Team IS 2720 , USEPA & USDA	Depth of Sampling: Packing Status:	30 cm Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
l.	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	IS : 2720 (P-22, RA2003)	Silty Loam	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish Red	**
5.	Water holding capacity	SOP , SP-81, Issue No01& Issue Date-14/02/2013	32.64	%
6	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.84	gm/cc
7.	Chloride as Cl	SOP , SP-85,Issue No -01& Issue Date-14/02/2013	65.21	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	49.33	mg/100g
9.	Sodium as Na	SOP, SP-84,Issue No -01& Issue Date-14/02/2013	50.74	mg/kg
10.	Potassium as K	SOP, SP-84, Issue No01& Issue Date-14/02/2013	144.55	kg/hec.
11,	Iron as Fe	USDA Method, 1968	0.78	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.67	%
13	Magnesium as Mg	SOP, SP-83, Issue No01& Issue Date-14/02/2013	25.36	mg/100g
14.	Available Nitrogen as N	IS:14684 Distillation Method	216.12	kg./hec.
15.	Available Phosphorus	SOP, SP-86,1ssue No -01& Issue Date-14/02/2013	27.61	kg./hec.
16.	Zinc (as Zn)	SOP, SP-86,Issue No01	8.93	mg/kg
17	Organic Carbon	USEPA 3050B	0.55	%
18	Lead (as Pb)	USEPA 3050B	1.02	mg/kg
19.	Cadmium (as Cd)	USEPA 3050B	0.89	mg/kg
20	Chromium (as Cr)	USEPA 3050B	0.99	mg/kg
21.	Copper (as Cu)	USEPA 3050B	6.58	mg/kg
22	Molybdenum as MO	USEPA 3050B	0.47	mg/100g
23.	Nickel	USEPA 3050B	*BDL	mg/100g

Note: SOP-Standard Operating Procedure

KAUSHIK SR. ANALYST Tested By

AR IHAI BAIMAT (Checked By)

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Test Report

Sample Number: Name & Address of the Project:	VEL/HPCL/S/12 M/s Hindustan Petroleum Corporation Ltd. Village Nasibpura, Bhatinda Punjab	Report No.: Format No.: Party Reference No.: Reporting Date:	VEL/S/2002/24/012 7.8 F-01 NIL 29/02/2020
Latitude: Longitude:	30 ⁰ 6'48.99"N 75 ⁰ 4'54.51"E	Period of Analysis : Receipt Date: Sampling Date:	24/02/2020-29/02/2020 24/02/2020 20/02/2020
Sample Description: Sampling Location: Sample Collected by: Sampling & Analysis Protocol:	Soil Sample Kot Fatta Vardan Enviro Lab Team IS 2720 , USEPA & USDA	Type of Sampling: Sampling Quantity: Depth of Sampling: Packing Status:	Composite 2.0 Kg 30 cm Temp Sealed

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	IS : 2720 (P-26) by pH Meter	7.89	Alterian Sin
2	Conductivity	IS:14767 by Conductivity meter	0.351	mS/cm
3.	Soil Texture	IS : 2720 (P-22, RA2003)	Silt	
4.	Color	SOP, SP-78, Issue No01& Issue Date-14/02/2013	Yellowish Red	
5.	Water holding capacity	SOP, SP-81, Issue No01& Issue Date-14/02/2013	35.76	%
6	Bulk density	SOP, SP-80,Issue No01& Issue Date-14/02/2013	1.98	gm/cc
7	Chloride as Cl	SOP, SP-85,Issue No01& Issue Date-14/02/2013	60.45	mg/100g
8.	Calcium as Ca	SOP, SP-82,Issue No01& Issue Date-14/02/2013	71.24	mg/100g
9.	Sodium as Na	SOP, SP-84, Issue No01& Issue Date-14/02/2013	53.22	mg/kg
10	Potassium as K	SOP, SP-84,Issue No01& Issue Date-14/02/2013	116.00	kg/hec
11.	Iron as Fe	USDA Method, 1968	0.37	mg/100g
12.	Organic Matter	IS:2720 (P-22) Titrimetric Method	0.89	%
13.	Magnesium as Mg	SOP, SP-83,Issue No01& Issue Date-14/02/2013	26.19	mg/100g
14	Available Nitrogen as N	IS:14684 Distillation Method	216.86	kg./hec
15.	Available Phosphorus	SOP, SP-86,Issue No01& Issue Date-14/02/2013	55.26	kg./hec.
16	Zinc (as Zn)	SOP, SP-86,Issue No01	15.91	mg/kg
17.	Organic Carbon	USEPA 3050B	0.48	%
18.	Lead (as Pb)	USEPA 3050B	0.69	mg/kg
19	Cadmium (as Cd)	USEPA 3050B	0.81	mg/kg
20.	Chromium (as Cr)	USEPA 3050B	1.78	mg/kg
21.	Copper (as Cu)	USEPA 3050B	2.73	mg/kg
22.	Molybdenum as MO	USEPA 3050B	0.48	mg/100g
23	Nickel	USEPA 3050B	*BDI	mg/100g

Note: SOP-Standard Operating Procedure

MEENU KAUSHIK RANALYST

ARJUN RAWAT

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