भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड
भारत सरकार का उपक्रम
कोच्चि रिफाइनरी

BHARAT PETROLEUM CORPORATION LIMITED
A Govt. of India Enterprise
Kochi Refinery

KR.HSE.ENV.05. HSSE.HECCR/01/2025/EC No: J-11011/369/2005-IA II (I)
30.06.2025

To
The Additional Principal Chief conservator of Forests (C)
Ministry of Environment, Forest & Climate Change
4th Floor, E&F Wings, Kendriya sadan, Koramangala, Bangalore-560 034

Dear Sir,

Sub: Submission of Half yearly Compliance report – Environmental Clearance issued by the Ministry of Environment, Forests and Climate Change.

Ref: EC No: J-11011/369/2005-IA II (I) dated 2nd February 2006, granting environmental clearance for **Capacity Expansion cum Modernisation Project (Phase-II).**

Please find enclosed the compliance report on the various conditions laid down by MoEF &CC, pertaining to the half year period from **1st October 2024 to 31st March 2025** for the Project mentioned in above reference.

Thanking you

Very truly yours
For BPCL Kochi Refinery

Roshan Shihab P M
General Manager (HSE)

Encl:
1. Six Monthly Compliance Report
2. Stack Emission Details
3. Ambient Air Details
4. Treated Water effluent discharge report

CC:

1.
The Member Secretary
Central Pollution Control Board
Parivesh Bhawan
East Arjun Nagar, New Delhi- 110032

2.
The Member Secretary
Kerala State Pollution Control Board
Plamoodu Junction
Pattom Palace, Thiruvananthapuram - 695 004

Compliance status of Environmental clearance conditions for CAPACITY EXPANSION CUM MODERNISATION PROJECT (PHASE-II) accorded by J-11011/369/2005-IA II (I) dated 2nd February 2006

Status of the project: Project commissioned in 2010 -11

Sl. No	Conditions	Status as on 31.03.2025
A.	**SPECIFIC CONDITIONS**	
1.	The gaseous emissions from various process units shall conform to the standards prescribed by the concerned authorities from time to time. The KSPCB may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location. At no time, the emissions levels should go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desired efficiency.	All emissions within the prescribed standards. No failures of any pollution control system.
2.	On-line continuous monitoring facilities shall be provided on all the stacks of adequate height as per CPCB guidelines. SO_2, CO, HC, NOx etc. shall be maintained within the CPCB limits. Low sulphur fuels shall be used for heaters. Sulphur Recovery Unit (SRU) shall be installed and SO_2 emissions from the plant shall not exceed existing 1607 kg/h and further efforts shall be made to further reduce SO_2 emissions. Low NO_X burners shall be installed to control the NO_X emissions.	Online continuous monitoring facilities are provided on all operational stacks. BPCL KR has an Annual Rate Contract with NABL accredited lab for the manual sampling and analysis of stack emission parameters like SO2, CO, NO_X, PM, H2S and Ni/Vanadium. BPCL Kochi Refinery is using de-sulfurized fuel gas and low sulphur fuel oil (Sulphur content less than 1%) in old heaters and less than 0.5% in newly installed heaters boilers. Total SO_2 emission from the refinery is within the limit. The allowable limit as per latest EC /CTO (BS – VI MS Project) is 1579 kg/hr: maintaining well below this value. For reducing the sulphur content of fuel gas used in heaters, sulphur recovery unit (SRU) of capacity 80 TPD, has been installed as part of CEMP Phase-II project and 340 x 2 TPD SRU has been installed as part of IREP. Heaters and boilers installed as part of CEMP Phase-II project are provided with low NOx burners.
3.		

Sl. No	Conditions	Status as on 31.03.2025
	Continuous ambient air quality monitoring stations for SO_2, SPM, and H.C. shall be installed in all the 4 directions in consultation with the KSPCB. Data shall be regularly monitored, and records maintained, and report submitted to the Ministry/CPCB/KSPCB once in six months.	In consultation with KSPCB, the refinery has installed 6 nos. of CAAQMS stations in all the four directions. Data on ambient air quality for the period from 1st October 2024 to 31st March 2025 is attached.
4.	As indicated in the EIA/EMP reports, out of total 1700 m^3/d industrial effluent generated, 360 m^3/d sour water will be recycled in the plant after stripping of Ammonia and Hydrogen Sulphide and will be used for desalting of crude in de-salters and as wash water in air fin condensates etc. Besides, 300 KL /day, treated wastewater will be used for firefighting, process area cleaning, cooling water make up and for green belt development. Remaining treated effluent will be discharged to Chitrapuzha river after conforming to the prescribed standards. Generation of wastewater shall be reduced by installation of sour water stripper unit; use of closed blow down system for all hydrocarbon liquid discharge from the process units, proper segregation and collection of various effluents; paving the process area to avoid contamination of soil, ground water, comprehensive wastewater management etc.	A new Sour water Stripping unit (SWS) of capacity 412.8 m^3/d was installed along with the project. The stripped water is recycled in the plant. Stripped water is used in De-salters in Crude Distillation units Closed blow down (CBD) system is provided in all units. Proper collection /segregation facilities are installed for effluent streams. The effluent treatment plant (ETP) put up as part of CEMP-Phase II project is running continuously. The treated effluent water is being recycled through RO based DM plant and producing DM water for further process usages. Any quantity other than this is being discharged to Chithrappuzha with prescribed standards. Process areas are paved to avoid contamination of the soil.
5.	No ground water contamination in and around factory premises shall be ensured by making all the underground lines carrying hydrocarbons, closed drainage system, storage tank etc. leak proof in order to avoid any leakages. Regular monitoring of ground water in and around factory premises shall be carried out by installing piezometer wells and six-monthly reports shall be submitted to the Regional Office of this Ministry at Bangalore/CPCB/KSPCB.	Hydrocarbon storage tanks are provided with MS plates at the bottom to avoid leaching of oil to land. Moreover, LDPE lining is also provided on the tank pad of new tanks as an additional precaution to prevent oil seepage to underground water. In addition, closed drainage system is provided for all storage tanks, to avoid any possible land/ ground water contamination during tank draining. Around forty-five borewells are dug inside the refinery premises and the water sample from the wells are monitored regularly, to assess the ground water quality.
6.	The domestic wastewater shall be treated in the sewage treatment plant and treated wastewater conforming to the standards for land application shall be reused for green belt development.	STP of 250 m3/day capacity has been installed and running continuously for treating the domestic wastewater. The treated effluent is being used for green belt development.

Sl. No	Conditions	Status as on 31.03.2025
7.	Regular monitoring of the quality of effluent discharged and at river water intake point shall be ensured to ensure no pollution of the Chitrapuzha river.	Quality of treated effluent water discharged to the Chitrapuzha river is being analysed and monitored on regular / continuous basis to ensure the stipulated standards. The river water intake to refinery is located at Periyar river and the quality of the same is also monitored.
8.	In-plant control measures for checking fugitive emissions from spillage/raw materials handling etc. should be provided. Proper maintenance of equipment shall be ensured to reduce fugitive emissions.	Closed Blow Down (CBD) systems are provided in all process plants to enable closed loop recycling of all hydrocarbon drains, without fugitive emissions. Double seal floating roof are provided for all the Crude tanks. Hydrocarbon detectors are provided as per requirement. Proper maintenance of equipment (including preventive maintenance) is carried out on a regular basis. Quarterly based fugitive emission monitoring and maintenance system (LDAR) has been followed and is being attended any identified emissions / leaks.
9.	Solid waste generated in the form of oil sludge, chemical sludge, catalyst, spent molecular sieves and bio-sludge shall be properly treated / reprocessed / reused or properly disposed-off. Spent catalyst, a hazardous waste shall either be sent back to supplier(s) for reprocessing or disposed-off in the secured landfill. Oil sludge shall be subjected to maximum recovery followed by bioremediation. Bio-sludge for ETP shall be used as manure after ensuring all the parameters within the permissible limits whereas chemical sludge from ETP shall be collected and disposed in Secured Landfill (SLF).	Post IREP, ETP chemical sludge is processed in DCU. Oily sludge to the maximum possible is processed in DCU. BPCL Kochi Refinery has implemented a scheme for recovery of oil from oily sludge, solids after oil recovery are bio remediated and disposed in TSDF. Spent catalyst is disposed by either returning to the original supplier or selling to the authorized recycler or is disposed in secured land fill depends on the nature of the catalyst. Bio sludge from effluent treatment plant is used as manure.
10.	Green belt of adequate width and density shall be provided to mitigate the effects of fugitive emissions all around the plant. Green belt shall be developed in 116 hectares out of total 461.7 hectares land with local species in consultation with the DFO and as per the CPCB guidelines.	BPCL-KR is having a total area of 1336.05 acres of land (including the new projects IREP/ MSBP / PDPP). In this, Plant area accounts (including offsite, Pipe rack, Buildings, Roads) for 767.20 acres. The statutory requirement of green belt as specified in this Environmental Clearance is 25% (116 hectares out of 461.7 hectares). Based on latest survey done by Kerala State Remote Sensing And Environment Centre, total

Sl. No	Conditions	Status as on 31.03.2025
		green cover of 441.263 acres (33%) which is well above the required.
11.	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Health surveillance done regularly, and records maintained.
12.	As committed in the EIA/EMP report, the company shall earmark Rs.78.30 crores for environment protection measures and Rs.51.00crores for community development activities.	Complied.
13.	All the other recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Refinery sector shall be implemented. CREP guidelines regarding discharge of treated effluent within 0.4 m^3/MT of crude shall be strictly followed.	Complied. The discharge of treated effluent was 0.21 m^3/MT of crude for the half year period from 1st October 2024 to 31st March 2025
B.	**GENERAL CONDITIONS:**	
1.	The project authorities must strictly adhere to the stipulations made by the KSPCB and the State Government.	Complied.
2.	No expansion or modification in the plant shall be carried out without prior approval of the Ministry of Environment & Forests.	Complied.
3.	Adequate AAQMS should be established in the downward direction as well as where maximum ground level concentration of SPM, SO_2 and NOx are anticipated in consultation with the KSPCB. Data on ambient air quality, fugitive emission and stack emissions shall be regularly submitted to this Ministry including its Regional Office at Bangalore once in six months and monthly to KSPCB.	In consultation with KSPCB, the refinery has installed Six continuous AAQM Stations. Online data are being continuously transferred to CPCB from all AAQMS stations. Compiled data on ambient air quality for the half yearly period from 1st October 2024 to 31st March 2025 is attached. Data on stack emissions for the half year period from 1st October 2024 to 31st March 2025 is attached.

Sl. No	Conditions	Status as on 31.03.2025
4.	The overall noise levels in and around the plant area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules. 1989 viz 75 dBA (daytime) and 70 dBA (night-time).	Complied. Continuous Noise monitoring station also installed in the boundary area at two locations near to Motor Spirit Block Project and Pet-chem Project. The noise levels are well within limit.
5.	The project authorities shall provide adequate funds (both recurring and non-recurring) to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the condition stipulated herein. The funds so provided should not be diverted for any other purposes.	Complied.
6.	The Regional Office of this Ministry at Bangalore/CPCB/ KSPCB will monitor the stipulated conditions. A six-monthly compliance report and the monitored data along with statistical interpretation should be submitted to them regularly.	Complied.
7.	The company 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 KSPCB / Committee and may also be seen at Website of the MoEF &CC at http:/envfor.nic.in. This should 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 should be forwarded to the Regional Office.	Complied.
8.		

Sl. No	Conditions	Status as on 31.03.2025
	The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	The final approval for the implementation of the project was obtained on 27.04.2006. The same was informed MoEF & CC vide letter No. 10/MPT/CEMP-II/04 dated 18th May 2006. The project has been commissioned.

Air Quality data for the period 1st October 2024 to 31st March 2025										
AAQMS - CISF Quarters (Old W/L) area										
Parameter	SO2	H2S	NOx	NH3	CO	Benzene	Methane	NMHC	PM 10	PM 2.5
Units	µg/m3	µg/m3	µg/m3	µg/m3	mg/m3	µg/m3	PPM	PPM	µg/m3	µg/m3
Limit	Daily 80 Annual 50	Daily 80 Annual 140	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05	No limits are prescribed		Daily 100 Annual 60	Daily 60 Annual 140
Oct-24	16.1	4.6	38.0	17.4	1.7	0.0	0.1	0.4	33.9	21.6
Nov-24	27.7	7.4	26.7	29.9	1.9	0.0	0.1	0.2	66.1	49.7
Dec-24	49.2	10.2	25.2	24.5	2.2	0.0	0.0	0.0	84.9	52.3
Jan-25	40.2	6.9	27.1	26.0	1.5	0.0	0.0	0.7	107.9	70.7
Feb-25	20.6	8.3	23.4	21.0	0.7	0.0	0.0	0.0	88.0	58.6
Mar-25	6.3	1.0	24.0	23.1	0.6	0.0	0.0	0.0	58.6	35.2
AAQMS - Jwalagiri Colony area										
Parameter	SO2	H2S	NOx	NH3	CO	Benzene	Methane	NMHC	PM 10	PM 2.5
Units	µg/m3	µg/m3	µg/m3	µg/m3	mg/m3	µg/m3	PPM	PPM	µg/m3	µg/m3
Limit	Daily 80 Annual 50	Daily 80 Annual 140	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05	No limits are prescribed		Daily 100 Annual 60	Daily 60 Annual 140
Oct-24	51.0	21.2	8.0	0.0	2.0	0.0	0.0	0.0	38.4	16.2
Nov-24	20.8	0.6	7.6	0.0	0.8	0.0	0.0	0.0	54.2	37.7
Dec-24	39.0	0.6	10.4	0.0	0.9	0.0	0.0	0.0	56.5	41.5
Jan-25	51.5	0.7	5.7	0.0	0.9	0.0	0.0	0.0	89.8	59.1
Feb-25	51.8	1.2	12.8	0.7	1.0	0.0	0.0	0.0	76.7	40.3
Mar-25	39.3	0.4	14.7	2.7	0.8	0.0	0.0	0.0	52.7	33.4
AAQMS - DHDS Chalikkara Gate										
Parameter	SO2	H2S	NOx	NH3	CO	Benzene	Methane	NMHC	PM 10	PM 2.5
Units	µg/m3	µg/m3	µg/m3	µg/m3	mg/m3	µg/m3	PPM	PPM	µg/m3	µg/m3
Limit	Daily 80 Annual 50	Daily 80 Annual 140	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05	No limits are prescribed		Daily 100 Annual 60	Daily 60 Annual 140
Oct-24	43.6	16.4	19.4	0.0	0.9	0.0	0.0	0.9	23.2	20.0
Nov-24	45.0	14.3	17.7	0.0	1.1	0.0	0.0	0.9	48.4	41.5
Dec-24	51.9	20.5	22.8	0.1	1.3	0.0	0.0	0.0	49.5	43.7
Jan-25	12.8	5.4	32.8	0.0	1.5	0.0	0.0	0.0	71.8	62.0
Feb-25	40.8	12.8	18.2	0.0014	1.2	0.0	0.0	0.0	62.6	40.7
Mar-25	24.0	8.3	18.5	0.0	0.8	0.0	0.0	0.0	38.8	32.5

Air Quality data for the period 1st October 2024 to 31st March 2025										
AAQMS - Marketing Office area										
Parameter	**SO2**	**H2S**	**NOx**	**NH3**	**CO**	**Benzene**	**Methane**	**NMHC**	**PM 10**	**PM 2.5**
Units	**µg/m3**	**µg/m3**	**µg/m3**	**µg/m3**	**mg/m3**	**µg/m3**	**PPM**	**PPM**	**µg/m3**	**µg/m3**
Limit	Daily 80 Annual 50	Daily 80 Annual 40	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05	No limits are prescribed		Daily 100 Annual 60	Daily 60 Annual 40
Oct-24	**14.2**	**20.1**	**20.8**	**11.1**	**1.0**	**0.00**	**0.0**	**0.0**	**33.8**	**23.5**
Nov-24	**14.7**	**22.0**	**24.1**	**9.8**	**0.8**	**0.00**	**0.0**	**0.0**	**66.2**	**48.4**
Dec-24	**27.0**	**12.0**	**28.5**	**13.2**	**0.9**	**0.0**	**0.0**	**0.0**	**67.3**	**51.1**
Jan-25	**48.4**	**1.5**	**31.6**	**17.0**	**0.8**	**0.0**	**0.0**	**0.0**	**81.2**	**52.2**
Feb-25	**36.40**	**0.00**	**19.90**	**15.60**	**0.90**	**0.00**	**0.0**	**0.0**	**79.00**	**26.40**
Mar-25	**33.7**	**0.5**	**25.7**	**11.3**	**0.9**	**0.0**	**0.0**	**0.0**	**51.4**	**25.5**
AAQMS - NHT CCR - 01 south side										
Parameter	**SO2**	**H2S**	**NOx**	**NH3**	**CO**	**Benzene**	**Methane**	**NMHC**	**PM 10**	**PM 2.5**
Units	**µg/m3**	**µg/m3**	**µg/m3**	**µg/m3**	**mg/m3**	**µg/m3**	**PPM**	**PPM**	**µg/m3**	**µg/m3**
Limit	Daily 80 Annual 50	Daily 80 Annual 40	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05	No limits are prescribed		Daily 100 Annual 60	Daily 60 Annual 40
Oct-24	**4.0**	**1.5**	**4.3**	**3.7**	**0.7**	**0.0**	**6.4**	**7.9**	**58.0**	**15.49**
Nov-24	**4.9**	**2.02**	**4.93**	**2.88**	**1.23**	**0.00**	**1.37**	**8.9**	**82.72**	**48.58**
Dec-24	**4.8**	**2.0**	**4.9**	**2.7**	**1.3**	**0.0**	**8.4**	**4.0**	**78.0**	**41.7**
Jan-25	**4.5**	**2.2**	**4.9**	**2.9**	**10.7**	**0.0**	**6.9**	**2.1**	**146.4**	**40.9**
Feb-25	**4.90**	**2.80**	**4.90**	**2.80**	**0.20**	**0.00**	**2.10**	**2.0**	**105.10**	**44.40**
Mar-25	**5.2**	**2.5**	**6.1**	**2.3**	**0.1**	**0.00**	**3.5**	**6.0**	**89.3**	**25.8**
AAQMS - PDPP side										
Parameter	**SO2**	**H2S**	**NOx**	**NH3**	**CO**	**Benzene**	**Methane**	**NMHC**	**PM 10**	**PM 2.5**
Units	**µg/m3**	**µg/m3**	**µg/m3**	**µg/m3**	**mg/m3**	**µg/m3**	**PPM**	**PPM**	**µg/m3**	**µg/m3**
Limit	Daily 80 Annual 50	Daily 80 Annual 40	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05	No limits are prescribed		Daily 100 Annual 60	Daily 60 Annual 40
Oct-24	**10.6**	**0.0**	**37.2**	**2.3**	**3.4**	**0.0**	**0.0**	**0.0**	**24.9**	**33.0**
Nov-24	**11.7**	**0.0**	**51.4**	0.47	**3.6**	**0.0**	**0.0**	**0.0**	**67.4**	**22.4**
Dec-24	**12.6**	**0.0**	**8.3**	**0.8**	**3.8**	**0.0**	**0.0**	**0.0**	**61.8**	**39.8**
Jan-25	**13.4**	**0.0**	**12.9**	**2.0**	**3.7**	**0.0**	**0.0**	**0.0**	**89.1**	**66.9**
Feb-25	**13.0**	**0.0**	**14.4**	**1.8**	**0.0**	**0.0**	**0.0**	**0.0**	**70.7**	**52.8**
Mar-25	**12.5**	**0.0**	**13.2**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**39.2**	**26.9**

Water discharge Quality data for the period 1st October 2024 to 31st March 2025

Parameter	pH	BOD	COD	Oil & Grease	Sulphide	TSS	Phenol
Spec. Limit	**6-8.5**	**15**	**125**	**5**	**0.5**	**20**	**0.35**
Unit	**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**
Oct-24	7.2	13.1	42.9	3.1	0.40	15.8	0.1
Nov-24	7.11	13.34	40.8	3.07	0.40	15.4	0.15
Dec-24	7.24	13.26	41.77	3.05	0.40	17.71	0.15
Jan-25	7.24	13.26	41.77	3.05	0.40	17.71	0.15
Feb-25	7.41	13.92	43.37	3.05	0.40	16.81	0.15
Mar-25	7.42	13.5	42.71	3.05	0.40	17.23	0.15

CORPORATE RESPONSIBILITY FOR ENVIRONMENTAL PROTECTION (CREP)

PROGRESS REPORT ON ACTION POINTS

Sl. No.	Task	Remarks/Status
1	All the refineries provide online emission and effluent monitoring systems and give linkages to SPCB and CPCB server and detailed note shall be submitted by individual refineries indicating number of sensors, make and type etc.	Online connectivity of all Six AAQMS given and intimated to CPCB/KSPCB. All the operating Stacks are being on-line connected to the CPCB site. Total 926 No's of Hydrocarbon (HC) detectors, 267 No's of Hydrogen sulphide (H2S) detectors and 42 No's of Hydrogen (H2) detectors are installed at different locations of refinery including product loading, storage tank farms and process plants etc. Most of sensors are made up of M/s Honeywell. HC sensors belong to Infra-red type and H2S/H2 sensors belong to electrochemical type.
2	The refineries shall submit action plan to achieve zero discharge (except once through cooling water in coastal region) within three months.	As part of integrated Refinery expansion project (IREP), an integrated ETP has been setup and the 100% treated effluent water is being routed to RO-DM plant for further processing and recycling as DM water.
3	The HSE department of refineries shall co-ordinate with marketing divisions for submission of note on evaporation during loading, leakage possibilities, steps taken for fire safety, management of oily sludge	HSE department of BPCL has initiated coordination and various measures to control evaporation during loading, leakage, fire safety, management of oily sludge etc. It includes vapor recovery system, bottom loading, fugitive emission survey, LDAR etc. Separate scheme is adopted for the management of oily sludge which includes centrifuging, oil recovery and bioremediation.
4	The refineries who have not completed the task of providing low NOx burners shall complete within six month and submit completion note without further delay.	All the heaters under CEMP phase-II/IREP have been provided with low NOx burners.

Status as on 31st March 2025

1. Air Pollution Management		
a)	All the Refineries located in the critically polluted areas, identified by CPCB, will submit an action plan for phase wise reduction of SO2 emission from the present level:	Total SO_2 emission from the refinery is within the limit. The allowable limit as per latest CTO is 1579 kg/hr.: maintaining well below this value. KR meets its average total SO_2 emission of 650 kg/hr. from the complex. It contributes to net reduction in SO2 emission by producing Euro- VI MS and Diesel. Following steps are taken to reduce SO2 emissions from the refinery. • Modifications to plant fuel system to facilitate usage of low sulfur liquid fuel. • Amine treatment of fuel gas • Sulfur Recovery Units with 99.9% efficiency as part of IREP with inclusion of TGTU (Tail Gas Treating Unit) • Low Pressure Amine treatment of vacuum column vent gas. • Employing Biturox technology for Bitumen production, where off gas is incinerated and further treated.
b)	Future Refineries will have sulphur recovery with minimum 99% efficiency	SRUs have more than 99% efficiency. New SRU have 99.9% efficiency.
c)	Road map to improve the efficiency of SRU:	BPCL Kochi refinery has been explored the possibility of Oxygen enrichment technology for enhancing the efficiency of SRU and the same has been commissioned.
d)	With regard to NOx emission, the new Refineries / process units will install low NOx burners. For retrofitting of low NOx burners in existing units the same expert committee will suggest the strategies and action plan within six months:	The expert committee, during their visit to Kochi Refinery, had suggested replacing the burners in heaters with more than 10 million Kcal/hr duty with low NOx type burners. We have installed low NOx in the existing Refinery. Moreover, all the new process heaters and steam boilers (total six numbers) installed as part of capacity expansion cum modernization project, CEMP - Phase II and all IREP units have been provided with low NOx burners.
e)	The Expert Committee will also suggest an action plan, within 6 months, for control and monitoring of hydrocarbon loss and VOC emissions, leak detection and repair (LDAR) program and vapor recovery systems (for loading and unloading operations within Refineries only):	Following provisions exists for VOC control a) Provision of mechanical seals on pumps for leak free operation. b) Use of submerged filling in product loading gantries. c) Closed blow down system for process plants. d) Floating roof tanks for volatile product storage. e) Conversion of floating roof tanks to double seal arrangement. f) Closed loop sampling system in process plants. g) Covered facility for oily effluent storage. h) VOC control system is in place in new ETPs for treatment of VOCs generated during in the effluent treatment area.

		i) 926 No's of HC detectors, 267 No's of H2S detectors and 42 No's of H2 detectors are installed at different locations of refinery including product loading, storage tank farms and process plants etc. j) Benzene monitoring is carried out using "dragger" chip technique in the aromatic recovery unit daily. k) Six ambient air quality monitoring stations (AAQMS) are working online to monitor the ambient air quality on continuous basis. They provide eleven ambient air quality parameters, including hydrocarbons and the data is transferred online to CPCB/KSPCB. l) Vapor recovery system is being implemented in Isom Naphtha tank farm. m) New vapor recovery system is being implemented for Benzene & Toluene truck loading area.
f)	The flare losses to be minimized and monitored regularly	Flare losses are monitored continuously through flare meters installed in the process units daily and are reviewed at the senior management level Further, the fuel gas flow to the pilot burner is maintained at the minimum level required to sustain the pilot flame. Various process schemes implemented to reduce flaring. Advanced process control (APC) system was implemented in hydrogen network for decreasing hydrogen flaring. Flare Gas recovery system is installed as part of IREP project and commissioned in December 2017.
g)	Refineries will install continuous emission monitoring systems for SO2 and NOx in major stacks. Action plan for this will be submitted within six months	Kochi Refinery has provided continuous SO_2 and NOx analyzing system for all the heater/boiler stacks and is connected to the CPCB server system.
h)	Refineries will also monitor total HC and Benzene in the premises (particularly in loading / unloading operations and ETP). The status and action plan will be submitted within six months	18 No's of HC detectors are installed in the truck loading/wagon loading area.2 No's of HC detectors and 2 No's of H2S detectors are installed in ETP-V area. Benzene monitoring is carried out using "dragger" chip technique in the Aromatic Recovery Unit (ARU) daily. 6 No's of Ambient air quality monitoring stations (AAQMS) are installed at the peripheries of the Refinery to enable close monitoring of ambient air quality near the refinery area. The ambient air quality information is also communicated to general public through an electronic display board.
2. **Wastewater Management:**		
a)	Refineries will prepare an action plan for conservation of water resources and maximizing reuse / recycle of treated effluent within six months. The treated effluent discharge quantity will be	The discharge of treated water from Kochi refinery is 0.006 m3 /MT of crude processed. Steam condensate in the process plants is being recycled back to the boilers as feed water for the steam generation, there by resulting in reduction in the fresh water consumption. Approximately 130-150 m^3/hr.

	limited to 0.4 m3/tons (for 90% of time) except for the monsoon season;	steam condensate is being recycled to steam boilers in the refinery. The stripped water from the stripped water units is recycled as make up water to the desalting process in the crude unit. 150 m3/hr. of liquid effluent generation is avoided by recycle. Treated effluent water from the wastewater treatment plants are recycled to RO plant.
3	Oil spill response facilities at Coastal Refineries will be in position within two years;	Oil spill response (OSR) facility at Cochin port is already in place. Additionally, BPCL Kochi refinery has procured oil containment booms as part of SBM facilities commissioning to augment the capabilities of oil spill response related facilities. We have also conducted a mock drill to build confidence for the safe operation of SBM facilities with the help of port trust/coast guard personnel. It was decided to further strengthen the oil spill response facilities at Cochin port through purchase and installation of additional equipment and the major share of the investment was shouldered by BPCL Kochi refinery.

3. Solid Waste Management: Refineries will explore new technologies for reduction in the generation of oily sludge. Strategy and action plan for liquidation of existing sludge will be submitted within six months

To reduce the sludge generation, Kochi Refinery follows the following best practices:

- ETP oily sludge is processed continuously in DCU. The oily sludge generated from tank cleaning is also processed in DCU.
- Any excess sludge generated have the provision for oil recovery through centrifuging.
- Switching of service of storage tanks between different crude oils (high wax and low wax) ensures minimum formation of sludge at the bottom of storage tanks.
- Using side entry mixers in the crude oil tank for minimization of sludge accumulation.

4. Refineries will carry out monitoring and survey to assess HC loss and concentration of VOC in Ambient Air / Wastewater Treatment Plant.

a) BPCL Kochi refinery has implemented leak detection and repair (LDAR) program using portable hydrocarbon detector instrument. These programs are carried out on continuous basis on many valves, flanges etc.in all process units and offsite areas. The leaks identified are attended by maintenance crew immediately and are monitored on regular basis.

b) Secondary seals have been provided in all storage tanks storing volatile hydrocarbons to reduce fugitive hydrocarbon emissions.

c) HC detectors are installed in sufficient numbers at the storage tank farm areas, process plants, product loading areas and LPG bottling plants to identify any hydrocarbon leaks immediately.

d. Benzene monitoring is carried out using "dragger" chip technique in the aromatic recovery unit on daily basis.

e. Six ambient air quality monitoring stations (AAQMS) are working online to monitor the ambient air quality on continuous basis. The ambient air quality information is also communicated to public through an electronic display board.

f. Pressure relief valves for column and vessel are routed to flare to avoid fugitive emission during emergencies.

5. Refineries will assess the quantity of flare gas (install the measurement system if the same is not possible)

a. At BPCL Kochi refinery, flare losses are monitored continuously from different process units and are reviewed at the senior management level daily. Flare meters are installed in the process units for this purpose. Further, the fuel gas flow to the pilot burner is maintained at the minimum level required to sustain the pilot flame.

Various process schemes implemented to reduce flaring

Advanced process control (APC) system was implemented in Hydrogen network for decreasing hydrogen flaring.

Flare gas recovery system is installed as part of IREP, and it can recover around **7.25 TPD** flare gas to fuel gas system.

6. Assessment of Potential leakages from petroleum storage tanks

Inspection of petroleum storage tanks is being carried out by following API 653 standard, OISD standard 129 and other relevant standards. Maintenance work is carried out as per the standard procedure when tank is taken for the outage.

Total 45 No's of bore wells have been constructed at various locations inside the refinery in order to monitor the ground water for any hydrocarbon leakages from the refinery storage tanks and processing plants. The ground water samples from the bore wells are tested periodically for presence of hydrocarbons. In addition, 14 piezometer wells have been installed for monitoring of ground water quality.

7. Cleaner Technology options and information to be provided to CPCB

Clean technologies adopted to combat Air Pollution includes:

1. BPCL Kochi refinery has consistently met all deadlines for up gradation of auto fuel quality, set by the Government of India. KR is producing MS and HSD of BS VI norms.
2. Hydro desulphurization of feed stock to fluid catalytic cracking unit (FCCU)
3. Modifications in plant fuel system facilitate to usage of low sulfur Bombay high vacuum residue as liquid fuel, to lower sulfur dioxide emissions during processing of crude.
4. Amine treatment of fuel gas for removal hydrogen sulfide to produce sweet fuel gas.
5. Installation five trains of sulfur recovery unit with more than 99.9% recovery.
6. Low pressure Amine treatment of vacuum column vent gas. This is a unique environmental protection technology developed by BPCL KR for removing toxic hydrogen sulfide gas produced during vacuum distillation process. This technology has been developed exclusively with in-house expertise. The uniqueness of the technology lies in the fact that the process for hydrogen sulfide removal is carried out under extremely low pressure drop conditions.
7. Desulphurization of low-pressure gas from crude unit overhead and kerosene unit fractionator utilizing amine absorption.
8. Reduction furnace for conversion of ammonia stream to nitrogen in order to reduce NOx emissions.
9. State of the art Biturox Technology has been adopted for production of Bitumen without any harmful emission. Unlike the traditional bitumen blowing technology, this technology helps for no odor or

pollutants emissions. The off gases generated is subjected to incineration and caustic scrubbing in this technique. The wastewater stream generated is also oxidized, thereby resulting in zero BOD for effluent. The freshwater consumption is also significantly reduced by the adoption of this technique.

10. An electrostatic precipitator has been installed downstream of CO boiler for minimizing particulate matter emission from FCCU regenerator flue gases. As part of PFCCU (part of IREP project) we have installed a tertiary cyclone separator and another ESP (Electrostatic precipitator) for particulate capture.
11. Closed loop sampling system in process plants.

b) Clean technologies adopted to improve effluent water quality:

1. We have 4 effluent treatment plants catering to the different process units.
2. Installation of 5 numbers of Sour water strippers and recycling of stripped water in process units.
3. Provision of two stage API oil separation system for effluent streams.
4. Spent caustic treatment utilizing H2O2 and air oxidation methods for treatment in an in an environment friendly way.
5. Closed drainage system for tank farm drains.
6. Two stage biological treatment system for effluent streams including tricking filter and activated sludge process, automated Chemostat Treatment and sequential batch reactor.(SBR)
7. Hydrogen Peroxide is utilized in our ETP's instead of FeCl3 to avoid chemical sludge formation.
8. Chemical de-contamination technique is being adopted at BPCL KR during turnarounds. The vessels, columns etc. are decontaminated using specially formulated chemical which is environment friendly, non-hazardous and fully biodegradable. The Hydrocarbons are recovered in the form of slop after de-emulsification process.

c) clean technologies implemented for optimal solid waste management

GREEN INITIATIVES or RENEWABLE ENERGY Projects

- 3.37 MWp Solar plant at Rainwater Harvesting Pond Commissioned
- 6.0 MWp Solar plant commissioned at CISF Colony
- 3.83 MWp solar plant at Shore Tank Farm, Puthuvypu, Kochi, Commissioned.

Mechanical oil recovery system for oil recovery from oily sludge. Post IREP, ETP sludge is processed in DCU.

1. In-situ recovery of oil from crude tank bottom sludge.
2. BPCL Kochi refinery constructed two secured landfills for the safe disposal of hazardous solid wastes as per the standard norms laid down by CPCB. The first landfill pit has a capacity of 590m3 and is dedicated to the disposal of FCC catalyst fines and spent molecular sieves. The second land fill pit with a capacity of 390 m3 is dedicated for the disposal of sludge from effluent treatment plants.
3. Installation of bio gas plant of capacity 1 T/day to convert canteen food waste into gas for use in canteen. The plant is developed based on the NISARGRUNA technology developed by Bhabha Atomic Research Centre. (BARC)
4. We have an agreement with KEIL (Kerala Enviro Infrastructure Limited) for disposing solid hazardous wastes at their TSD Facility.
5. Wherever possible, spent catalyst containing recoverable metals are disposed /sold to authorized recyclers only.
6. Recycle value e – waste materials are being sold to approved recyclers only.

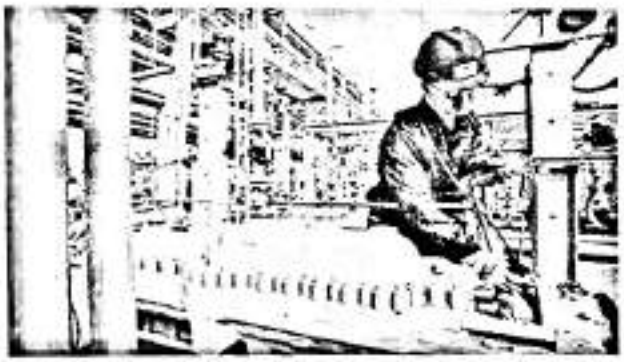
Bharat Petroleum

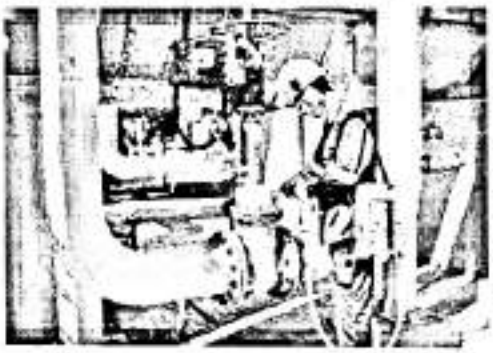
Bharat Petroleum Corporation Limited

(Refineries Division)

Kochi Refinery, Ambalamugal, Kochi, Ernakulam-682 302, Kerala, India

Reports on Fugitive Emission Management (Leak Detection & Repair)





Study Period: January 2025

Prepared By

Nitya

Work for Quality

NITYA LABORATORIES

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Nitya
Work for Quality

LDAR (Fugitive Emission) Survey Report for Bharat Petroleum Corporation Limited, Kochi Refinery

Name of Client	:	**M/s Bharat Petroleum Corporation Limited** **(Refinery Division)** Kochi Refinery, Ambalamugal Kochi, Ernakulam-682 302, Kerala, India
Name of Vendor	:	**M/s Nitya Laboratories** Plot No.118, Church Road, Behind Kausik Vatika Bhagat Singh Colony, Ballabgarh-121 004 Distt. Faridabad (Haryana) Delhi NCR, India
Nature of Job	:	**Conducting Fugitive Emission Survey as Part of LDAR Program at BPCL Kochi Refinery**
Report Period	:	**April 2024**

FOR NITYA LABORATORIES

RAVINDER MITTAL

Head-Environmental Division

CONTENTS

Executive Summary

Bharat Petroleum Corporation Limited (Refineries Division) has intended to conduct the Fugitive Emission survey/Leal Detection and Repair (LDAR) program at its refinery Kochi, Kerala. As a part of this program Bharat Petroleum Corporation Limited (Refineries Division) has awarded the contract to M/s Nitya Laboratories for conducting the LDAR survey for the period 01/2024 to 01/2026.

The LDAR Program at site included the detection, tagging and measurement of VOC emission from these identified points which included valves, pump seal, compressor & pressure relieve valves for the measurement for the Month April 2024.

Plant Wise Summary of VOC

Sr. No.	Date of Monitoring	Unit	Total Nos of Points Monitored	Total Nos of Leakage	Total Leak (kg/hr)	Total Leak (kg/day)
1	21-01-2025	ARU-HC	359	7	0.00109	0.04527
2	22-01-2025	CDU-II	2277	30	0.011540	0.297008
3	24-01-2025	TANK FORM LPG GROUP	361	7	0.002086	0.070128
4	29-01-2025	TRUCK LOADING AREA	671	12	0.00568451	0.13643604
5	30-01-2025	MSBP-PENEX	2165	17	0.004917	0.138111
6	31-01-2025	CCR-NHT	2007	15	0.004759	0.114226
7	01-02-2025	VGO-HSD	1413	20	0.00736080	0.17797222
8	06-02-2025	TANK FROM -1	930	17	0.004000	0.096013
9	07-02-2025	CDU-III	3428	13	0.006061	0.145468
10	10-02-2025	PFCCU	2474	19	0.007608	0.182624
11	13-02-2025	DCU	2994	15	0.004455	0.106906
12	15-02-2025	DHDT	2139	19	0.0073648	1.1735059
13	17-02-2025	VGO-HDT	2725	12	0.00424104	0.10180318
14	02-02-2025	PDA ACRYLIC ACID UNIT	1612	13	0.005899	0.161205
15	02-02-2025	PDA OXO ALCOHAL UNIT	1364	11	0.003585	0.086055
16	05-02-2025	TANK FROM OFF SIDE AREA-2	585	5	0.0012667	0.0304003
TOTAL			27504	232	0.08191785	3.06413184

Confirmatory Statement: The monitored values are within the limits as per CPCB Guidelines.

Stack Emission Data as per On-line Analyzer data _ December 2024										
SL No.	Stack Name	Flow rate (Nm^3/hr) Avg. Value	PM (mg/Nm^3)	NOx (mg/Nm^3)	PM (kg/hr)	NOx (kg/hr) (kg/hr)	CO (mg/Nm^3)	CO (kg/hr)	SO2 (mg/Nm3)	SO2 (kg/hr)
1	KHD1B (KHDS)	22953	11.8	97.851	0.27	2.25	11.75	0.27	22.355	0.51
2	FH01 (FCCU)	24235	1.3	38.669	0.03	0.94	6.6	0.16	8.647	0.21
3	FH03/COB (FCCU)	84321	23.8	13.231	2.01	1.12	53.6	4.52	25.508	2.15
4	CH21 (CDU - II)	90531	0	78.761	0.00	7.13	2.08	0.19	55.456	5.02
5	CH22 (CDU - II)	33510	0	72.538	0.00	2.43	1.9	0.06	27.030	0.91
6	CH223 (CDU - II)	30563	2.4	33.786	0.12	1.71	1.2	0.06	71.135	3.60
7	DD-HO1 (DHDS)	25998	3.00	38.830	0.08	1.01	5.6	0.15	65.743	1.71
8	DS-X-002 (SRU - 01)	29135	36.9	183.662	1.08	5.35	229.4	6.68	3804.677	110.85
9	DSX 301 (SRU - 02)	14151	27.1	154.026	0.38	2.18	76.88	1.09	8251.825	116.77
10	BS-101 (Biturox)	14174	18	29.980	0.26	0.42	7.483	0.11	9.978	0.14
11	VH H01/02 (VGO HDS)	52233	5.1	40.526	0.27	2.12	4.6	0.24	8.664	0.45
12	NHT CCR - 01	10443	7.4	38.264	0.77	4.00	13.25	1.38	39.188	4.09
13	UB07 (Boiler)	11963	9.45	0.624	1.06	0.07	12.77	1.43	7.883	0.88
14	UB08 (Boiler)	29524	17.17	0.583	0.51	0.02	4	0.12	5.682	0.17
15	UB09 (Boiler) (UX200)	30622	0.33	11.2	0.01	0.34	2.867	0.09	0	0.00
16	UB 10 (Boiler)	40255	4.8	101.832	0.19	4.10	3.78	0.15	405.449	16.32
17	UB 11 (Boiler)	71246	28.2	184.703	2.01	13.16	8.2	0.58	953.857	67.96
18	HRSG 1 (CPP - 01)	161184	0	46.475	0.00	7.49	3.3	0.53	3.255	0.52
19	GT2/HRSG -02 (CPP - 02)	151867	2.67	83.932	0.41	12.75	10.2	1.55	27.102	4.12
20	SRU III Train A (IS LZ 102)	91703	25.8	62.815	2.37	5.76	6.99	0.64	1233.286	113.10
21	SRU III Train B (IS LZ 202)	90130	13.3	25.794	1.20	2.32	2.2	0.20	311.424	28.07
22	CDU-III (ICH 101/102)	252659	0.6	57.991	0.00	14.65	1.6	0.40	37.892	9.57
23	DHDT (IGH 101/102)	58678	1.47	26.298	0.00	1.54	5.9	0.35	8.532	18.27
24	VGO-HDT (IVH 101/201)	54092	0.97	31.582	0.05	1.71	0.73	0.04	19.367	1.05
25	PFCCU-Heater (IFH 002)	21661	0	32.3	0.00	0.70	6.7	0.15	8.987	0.19
26	PFCCU-Regen. (IFLS 001)	170940	13.74	10.893	2.35	1.86	200.8	34.32	10.168	1.74
27	DCU-1 (IDH 101)	77894	1.57	51.118	0.12	3.98	3.7	0.29	15.037	1.17
28	DCU-2 (IDH 102)	77012	0.9	47.535	0.07	3.66	5.4	0.42	11.433	0.88
29	HRSG 3 (IUS HRSG 05LZ554)	161009	3.3	44.867	0.53	7.22	11.4	1.84	7.859	1.27
30	HRSG 4 (IUS HRSG 05LZ554)	142276	3.569	92.256	0.51	13.13	9.02	1.28	2.095	0.30
31	HRSG-5 (IUS HRSG 05LZ554)	143306	54.7	5.677	7.84	0.81	15.6	2.24	6.265	0.90
32	UB 12 (Boiler) (IUS UB12 LZ08)	122932	2.14	100.806	0.26	12.39	7.75	0.95	44.089	5.42
33	UB 13 (Boiler) (IUS UB12 LZ08)	123507	3.06	96.979	0.38	11.98	4.15	0.51	45.935	5.67
34	NHT -Isom. (NH-2/ H H 101)	53005	0.00	57.8	0.00	3.06	0.823	0.04	0.00	0.00
35	PWI LS 110 (PDPP INC - 01)	70957	0.64	0.611	0.05	0.04	1.03	0.07	0.376	0.03
36	LS021A (PDPP INC - 02)	71424	0.18	5.215	0.01	0.38	2.66	0.19	4.413	0.32
37	MSBP _ HOH	158034	0.93	7.833	0.15	1.24	29.50	4.66	26.664	4.21
38	MRH 01/02/03/04 (MSBP _ CCR)	90964	1.90	86.072	0.18	8.35	4.88	0.47	10.203	0.99
					25.51	163.37		68.43		529.53
					PM (kg/hr)	NOx (kg/hr)		CO (kg/hr)		SO2 (kg/hr)

Stack Emission Data as per On-line Analyzer data _ October 2024										
Sl. No.	Stack Name	Flow rate (Nm^3/hr) Avg. Value	PM (mg/Nm^3)	NOx (mg/Nm^3)	PM (kg/hr)	NOx (kg/hr)	CO (mg/Nm^3)	CO (kg/hr)	SO2 (mg/Nm3)	SO2 (kg/hr)
1	KH01B (KHDS)	22993	5.6	17.894	0.13	0.41	18.27	0.42	22.058	0.51
2	FH01 (FCCU)	24235	4.7	4.526	0.11	0.11	34.67	0.84	59.724	1.45
3	FH03/COB (FCCU)	84321	4.89	8.711	0.41	0.73	105.4	8.89	3.291	0.28
4	CH21 (CDU - II)	90531	0	7.1	0.00	0.64	134.29	12.16	13.014	1.18
5	CH22 (CDU - II)	33510	0	35.3	0.00	1.18	8.2	0.27	13.940	0.47
6	CH223 (CDU - II)	50563	78.362	0	3.96	0.00	0	0.00	0	0.00
7	DD-H01 (DHDS)	25998			0.00	0.00		0.00		0.00
8	DS-X-002 (SRU - 01)	29135			0.00	0.00		0.00		0.00
9	DSX 301 (SRU - 02)	34131			0.00	0.00		0.00		0.00
10	BS-101 (Biturox)	14174	51.7	1.8	0.73	0.03	4.5	0.06	35.350	0.50
11	VH H01/02 (VGO HDS)	52233			0.00	0.00		0.00		0.00
12	NHT CCR - 01	104483	128.56	6.5	13.43	0.68	3.9	0.41	52.849	5.52
13	UB07 (Boiler)	111963	9	10.5	1.01	1.18	2.5	0.28	0	0.00
14	UB08 (Boiler)	29524			0.00	0.00		0.00		0.00
15	UB09 (Boiler) (UX200)	30622			0.00	0.00		0.00		0.00
16	UB 10 (Boiler)	40255	52.1	37.2	2.10	1.50	0.5	0.02	154.562	6.22
17	UB 11 (Boiler)	71246			0.00	0.00		0.00		0.00
18	HRSG 1 (CPP - 01)	161184	0	9.5	0.00	1.53	1.894	0.31	0.0	0.00
19	GT2/HRSG -02 (CPP - 02)	151867	2.6	81.957	0.39	12.45	8.3	1.26	1.474	0.22
20	SRU III Train A (IS LZ 102)	91703	25.1	73.070	2.30	6.70	27.44	2.52	988.979	90.69
21	SRU III Train B (IS LZ 202)	90130	11.98	37.574	1.08	3.39	2.3	0.21	444.815	40.09
22	CDU-III (ICH 101/102)	252659	1.08	55.118	0.00	13.93	21.9	5.53	31.816	8.04
23	DHDT (IGH 101/102)	58678	1.77	36.461	0.00	2.14	2.9	0.17	14.499	26.10
24	VGO-HDT (IVH 101/201)	54092	0.885	31.093	0.05	1.68	1.26	0.07	21.374	1.16
25	PFCCU-Heater (IFH 002)	21661	0	40.5	0.00	0.88	0	0.00	14.433	0.31
26	PFCCU-Regen. (IFLS 001)	170940	34.3	5.701	5.86	0.97	186.1	31.81	10.465	1.79
27	DCU-1 (IDH 101)	77894	0.9	8.423	0.07	0.66	12.67	0.99	0	0.00
28	DCU-2 (IDH 102)	77012	0.97	57.655	0.07	4.44	7.8	0.60	24.204	1.86
29	HRSG 3 (IUS HRSG 05LZ554)	161009			0.00	0.00		0.00		0.00
30	HRSG 4 (IUS HRSG 05LZ554)	142236	3.7	99.770	0.53	14.19	8.3	1.18	2.107	0.30
31	HRSG 5 (IUS HRSG 05LZ554)	141306	82.2	6.174	11.78	0.88	14.25	2.04	7.013	1.01
32	UB 12 (Boiler) (IUS UB12 LZ08)	122932	2.2	91.735	0.27	11.28	8.54	1.05	28.838	3.55
33	UB 13 (Boiler) (IUS UB12 LZ08)	123507	3.1	87.016	0.38	10.75	5.8	0.72	33.359	4.12
34	NHT -Isom. (NH-2/ H H 101)	53005			0.00	0.00		0.00		0.00
35	PWI LS 110 (PDPP INC - 01)	70957	0.57	0.608	0.04	0.04	0.80	0.06	0.370	0.03
36	LS021A (PDPP INC - 02)	31924	0.19	98.632	0.01	7.09	93.75	6.74	58.207	4.19
37	MSBP _ HDH	158034	0.95	5.984	0.15	0.95	29.00	4.58	17.115	2.70
38	MRH 01/02/03/04 (MSBP _ CCR)	96964	2.20	71.518	0.21	6.93	3.87	0.38	8.388	0.81
					45.10	107.34		83.56		203.09
Note: Turnaround shutdown activities were there. Hence many units were under maint during the period Oct 2024					PM (kg/hr)	NOx (kg/hr)		CO (kg/hr)		SO2 (kg/hr)

Stack Emission Data as per On-line Analyzer data _ January 2025										
Sl. No.	Stack Name	Flow rate (Nm^3/hr) Avg. Value	PM (mg/Nm^3)	NOx (mg/Nm^3)	PM (kg/hr)	NOx (kg/hr)	CO (mg/Nm^3)	CO (kg/hr)	SO2 (mg/Nm3)	SO2 (kg/hr)
1	KH01B (KHDS)	22953	10.04	106.717	0.23	2.45	11.3	0.26	28.568	0.66
2	FH01 (FCCU)	24235	1.1	24.152	0.03	0.59	11.23	0.27	19.919	0.48
3	FH03/COB (FCCU)	84321	23.06	22.627	1.94	1.91	140.5	11.85	17.365	1.46
4	CH21 (CDU - II)	90531	0	106.332	0.00	9.63	1.7	0.15	35.183	3.19
5	CH22 (CDU - II)	33510	0	82.4	0.00	2.76	3.04	0.10	17.948	0.60
6	CH223 (CDU - II)	50563	4.6	34.5	0.23	1.74	2.96	0.15	16.043	0.81
7	DD-HO1 (DHDS)	25998	3.20	24.260	0.08	0.63	3.8	0.10	22.309	0.58
8	DS-X-002 (SRU - 01)	29135	35.56	117.882	1.04	3.43	77.2	2.25	3915.423	114.08
9	DSX 301 (SRU - 02)	14151	25.2	127.545	0.36	1.80	60.3	0.85	6314.206	89.35
10	BS-101 (Biturox)	14174	31.7	33.396	0.45	0.47	5.83	0.08	13.097	0.19
11	VH 1101/02 (VGO HDS)	52233	11.4	50.8	0.60	2.65	7.2	0.38	48.799	2.55
12	NHT CCR - 01	104483	7.9	51.9	0.83	5.42	2.4	0.25	38.035	3.97
13	UB07 (Boiler)	111963	9.8	0.894	1.10	0.10	3.2	0.36	6.819	0.76
14	UB08 (Boiler)	29524	14.9	0.252	0.44	0.01	4.3	0.13	3.216	0.09
15	UB09 (Boiler) (UX200)	38632	1.67	57.9	0.05	1.77	5.751	0.18	0	0.00
16	UB 10 (Boiler)	48255	0	1.23	0.00	0.05	0.090	0.00	0	0.00
17	UB 11 (Boiler)	71246	28.5	184.531	2.03	13.15	7.7	0.55	945.365	67.35
18	HRSG 1 (CPP - 01)	161184	0	44.2	0.00	7.12	2.8	0.45	6.326	1.02
19	GT2/HRSG -02 (CPP - 02)	151867	2.5	128.464	0.38	19.51	5.661	0.86	0	0.00
20	SRU III Train A (IS LZ 102)	91703	19.5	132.659	1.79	12.17	7.05	0.65	4888.673	448.31
21	SRU III Train B (IS LZ 202)	90130	13.75	73.135	1.24	6.59	2.5	0.23	821.126	74.01
22	CDU-III (ICH 101/102)	252659	0.32	62.775	0.00	15.86	1.5	0.38	37.588	9.50
23	DHDT (IGH 101/102)	58678	1.5	27.712	0.00	1.63	4.1	0.24	12.429	48.18
24	VGO-HDT (IVH 101/201)	54092	0.89	32.803	0.05	1.77	1.8	0.10	27.175	1.47
25	PFCCU-Heater (IFH 002)	21661	0	32.5	0.00	0.70	1.8	0.04	13.073	0.28
26	PFCCU-Regen. (IFLS 001)	170940	15.75	13.653	2.69	2.33	177.4	30.32	16.436	2.81
27	DCU-1 (IDH 101)	77894	1.34	45.349	0.10	3.53	4.3	0.33	16.085	1.25
28	DCU-2 (IDH 102)	77012	0.5	39.294	0.04	3.03	6.8	0.52	15.305	1.18
29	HRSG 3 (IUS HRSG 051Z554)	161089	3.2	78.306	0.52	12.61	8.8	1.42	1.156	0.19
30	HRSG 4 (IUS HRSG 051Z554)	142176	3.4	85.403	0.48	12.15	8.8	1.25	2.196	0.31
31	HRSG-5 (IUS HRSG 051Z554)	143306	15.44	3.770	2.21	0.54	18.5	2.65	1.526	0.22
32	UB 12 (Boiler) (IUS UB12 LZ08)	131932	2.2	71.542	0.27	8.79	8.6	1.06	33.346	4.10
33	UB 13 (Boiler) (IUS UB12 LZ08)	133507	2.9	98.850	0.36	12.21	5.9	0.73	44.142	5.45
34	NHT -Isom. (NH-2/ H H 101)	53005	0.25	57.963	0.01	3.07	2.40	0.13	0.00	0.00
35	PWI LS 110 (PDPP INC - 01)	70957	0.65	0.650	0.05	0.05	1.10	0.08	0.413	0.03
36	LS021A (PDPP INC - 02)	71924	0.00	2.843	0.00	0.20	0.33	0.02	1.192	0.09
37	MSBP HOH	158024	0.89	8.456	0.14	1.34	31.50	4.98	31.445	4.97
38	MRH 01/02/03/04 (MSBP CCR)	96964	1.80	89.289	0.17	8.65	2.90	0.28	6.431	0.62
					19.90	182.43		64.62		890.11
					PM (kg/hr)	NOx (kg/hr)	CO (kg/hr)			SO2 (kg/hr)

Stack Emission Data as per On-line Analyzer data _ February 2025										
Sl. No.	Stack Name	Flow rate (Nm^3/hr) Avg. Value	PM (mg/Nm^3)	NOx (mg/Nm^3)	PM (kg/hr)	NOx (kg/hr)	CO (mg/Nm^3)	CO (kg/hr)	SO2 (mg/Nm^3)	SO2 (kg/hr)
1	KHDLB (KHDS)	22953	4.43	100.111	0.10	2.30	11.42	0.26	31.485	0.72
2	FH01 (FCCU)	24235	1.08	33.646	0.03	0.82	36.61	0.40	12.311	0.30
3	FH03/COB (FCCU)	84321	18.68	2.458	1.58	0.21	203.3	17.14	1.893	0.16
4	CH21 (CDU - II)	90531	0	96.2	0.00	8.71	3.98	0.36	37.529	3.40
5	CH22 (CDU - II)	33510	0	77.8	0.00	2.61	6.11	0.20	25.782	0.86
6	CH223 (CDU - II)	50563	5.248	28.887	0.27	1.46	1.58	0.08	29.574	1.50
7	DD-H01 (DHDS)	25998	2.60	33.536	0.07	0.87	3.6	0.09	17.353	0.45
8	DS-X-002 (SRU - 01)	29135	32.9	130.184	0.96	3.79	54.9	1.60	3201.310	93.27
9	OSX 301 (SRU - 02)	14151	25.355	120.2	0.36	1.70	42.7	0.60	5855.956	82.87
10	BS-101 (Bitumix)	14174	6.62	41.670	0.09	0.59	5.606	0.08	4.504	0.06
11	VH H01/02 (VGO HDS)	52233	7.4	46.040	0.39	2.40	7.8	0.41	19.168	1.00
12	NHT CCR - 01	104483	7.8	49.8	0.81	5.20	9.78	1.02	5.623	0.59
13	UB07 (Boiler)	111963	9.8	0.615	1.10	0.07	3.94	0.44	3.997	0.45
14	UB08 (Boiler)	29524	10.2	0.278	0.30	0.01	5.1	0.15	5.256	0.16
15	UB09 (Boiler) (UX200)	30622	0.17	24.5	0.01	0.75	3.747	0.11	0	0.00
16	UB 10 (Boiler)	40255	6.1	14.5	0.25	0.58	10.02	0.40	83.540	3.36
17	UB 11 (Boiler)	71246	28.3	172.073	2.02	12.26	8.14	0.58	973.326	69.35
18	HRSG 1 (CPP - 01)	161184	0	48.3	0.00	7.79	1.9	0.31	7.361	1.19
19	GT2/HRSG -02 (CPP - 02)	151867	2.4	143	0.36	21.72	2.870	0.44	0	0.00
20	SRU III Train A (IS LZ 102)	91703	19.34	86.581	1.77	7.94	7.95	0.73	1053.685	96.63
21	SRU III Train B (IS LZ 202)	90130	15.66	72.891	1.41	6.57	2.44	0.22	908.845	81.91
22	CDU-III (ICH 101/102)	252659	0.142	62.716	0.00	15.85	1.25	0.32	38.520	9.73
23	DHDT (IGH 101/102)	58678	1.5	34.921	0.00	2.05	3.14	0.18	16.064	53.33
24	VGO-HDT (IVH 101/201)	54092	0.84	35.055	0.05	1.90	2.92	0.16	21.208	1.15
25	PFCCU-Heater (IFH 002)	21661	0	42.6	0.00	0.92	1.7	0.04	13.842	0.30
26	PFCCU-Regen. (IFLS 001)	170940	14.46	8.303	2.47	1.42	210.9	36.05	13.727	2.35
27	DCU-1 (IDH 101)	77894	1.36	32.199	0.11	2.51	12.8	1.00	16.349	1.27
28	DCU-2 (IDH 102)	77012	1.05	53.784	0.08	4.14	2.8	0.22	22.676	1.75
29	HRSG 3 (IUS HRSG 05LZ554)	161009	3.2	84.942	0.52	13.68	5.45	0.88	3.523	0.57
30	HRSG 4 (IUS HRSG 05LZ554)	142276	3.3	80.953	0.47	11.52	4.5	0.64	1.564	0.28
31	HRSG-5 (IUS HRSG 05LZ554)	143306	0	1.17	0.00	0.17	0	0.00	0.534	0.08
32	UB 12 (Boiler) (IUS UB12 LZ08)	122932	2.217	87.463	0.27	10.75	6.03	0.74	42.983	5.28
33	UB 13 (Boiler) (IUS UB12 LZ08)	123507	2.57	94.379	0.32	11.66	3.88	0.48	44.356	5.48
34	NHT -Isom. (NH-2/ H H 101)	53005	0.18	42.989	0.01	2.28	6.70	0.36	3.558	0.19
35	PWI LS 110 (PDPP INC - 01)	70957	0.54	0.674	0.04	0.05	1.21	0.09	0.444	0.03
36	LS021A (PDPP INC - 02)	71924	0.00	2.884	0.00	0.21	0.24	0.02	1.240	0.09
37	MSBP _ HDH	158034	0.87	12.523	0.14	1.98	33.17	5.24	29.694	4.69
38	MRH 01/02/03/04 (MSBP _ CCR)	96964	1.65	88.910	0.16	8.62	0.81	0.08	10.300	1.05
					16.49	178.03		72.11		525.82
					PM (kg/hr)	NOx (kg/hr)		CO (kg/hr)		SO2 (kg/hr)

Stack Emission Data as per On-line Analyzer data _ March 2025										
Sl. No.	Stack Name	Flow rate (Nm^3/hr) Avg. Value	PM (mg/Nm^3)	NOx (mg/Nm^3)	PM (kg/hr)	NOx (kg/hr)	CO (mg/Nm^3)	CO (kg/hr)	SO2 (mg/Nm3)	SO2 (kg/hr)
1	KH01B (KHDS)	22953	5.2	92.484	0.12	2.12	11.31	0.26	29.409	0.68
2	FH01 (FCCU)	24235	1.8	17.683	0.04	0.43	23.73	0.58	10.823	0.26
3	FH03/COB (FCCU)	84321	23.65	7.192	1.99	0.61	683.67	57.65	11.021	0.93
4	CH21 (CDU - II)	90531	0	96.6	0.00	8.75	4.9	0.44	42.281	3.83
5	CH22 (CDU - II)	33510	0	80.2	0.00	2.69	9	0.30	19.059	0.64
6	CH223 (CDU - II)	50563	5.33	21	0.27	1.06	0.56	0.03	27.848	1.41
7	DD-H01 (DHDS)	25998	2.11	28.810	0.05	0.75	3.5	0.09	20.206	0.53
8	DS-X-002 (SRU - 01)	29135	37.9	168.737	1.10	4.92	54.34	1.58	2889.975	84.20
9	DSX 301 (SRU - 02)	14151	39.77	129.204	0.56	1.83	59.06	0.84	6591.782	93.28
10	BS-101 (Biturox)	14174	3.5	46.219	0.05	0.66	5.4	0.08	5.441	0.08
11	VH H01/02 (VGO HDS)	52233	8.06	28.387	0.42	1.48	7.09	0.37	40.472	2.11
12	NHT CCR - 01	104483	8.007	48.996	0.84	5.12	1.01	0.11	9.802	1.02
13	UB07 (Boiler)	111963	11.13	0.478	1.25	0.05	4.3	0.48	3.770	0.42
14	UB08 (Boiler)	29524	10.13	0.836	0.30	0.02	2.42	0.07	15.779	0.47
15	UB09 (Boiler) (UX200)	30622	0.17	0.3	0.01	0.01	2.810	0.09	0	0.00
16	UB 10 (Boiler)	40255	6.1	11.911	0.25	0.48	1.93	0.08	54.436	2.19
17	UB 11 (Boiler)	71246	24.46	157.989	1.74	11.26	8.62	0.61	798.355	56.88
18	HRSG 1 (CPP - 01)	161184	0	43.219	0.00	6.97	1.9	0.31	7.768	1.25
19	GT2/HRSG -02 (CPP - 02)	151867	2.66	111.801	0.40	16.98	5.9	0.90	2.729	0.41
20	SRU III Train A (IS LZ 102)	91703	17.63	140.902	1.62	12.92	12.2	1.12	2986.343	273.86
21	SRU III Train B (IS LZ 202)	90130	16.3	85.823	1.47	7.74	2.56	0.23	1494.142	134.67
22	CDU-III (ICH 101/102)	252659	0.021	62.616	0.00	15.82	0.82	0.21	49.078	12.40
23	DHDT (IGH 101/102)	58678	1.35	32.722	0.00	1.92	1.9	0.11	25.823	87.67
24	VGO-HDT (IVH 101/201)	54092	0.738	32.717	0.04	1.77	1.19	0.06	25.562	1.38
25	PFCCU-Heater (IFH 002)	21661	0	36.3	0.00	0.79	1.18	0.03	14.363	0.31
26	PFCCU-Regen. (IFLS 001)	170940	9.1	4.785	1.56	0.82	222.8	38.09	13.186	2.25
27	DCU-1 (IDH 101)	77894	1.39	53.002	0.11	4.13	1.35	0.11	28.848	2.25
28	DCU-2 (IDH 102)	77012	0.747	42.740	0.06	3.29	8.16	0.63	20.672	1.59
29	HRSG 3 (IUS HRSG 05LZ554)	161009	3.263	80.987	0.53	13.04	5.63	0.91	1.593	0.26
30	HRSG 4 (IUS HRSG 05LZ554)	142276	3.905	69.743	0.56	9.92	1.996	0.28	2.730	0.39
31	HRSG-5 (IUS HRSG 05LZ554)	143306	47.1	5.521	6.75	0.79	17.09	2.45	7.681	1.10
32	UB 12 (Boiler) (IUS UB12 LZ08)	122932	2.2	90.596	0.27	11.14	9.17	1.13	38.450	4.73
33	UB 13 (Boiler) (IUS UB12 LZ08)	123507	2.644	96.354	0.33	11.90	7.65	0.94	41.863	5.17
34	NHT -Isom. (NH-2/ H H 101)	53005	0.87	12.76	0.05	0.68	2.438	0.13	0.00	0.00
35	PWI LS 110 (PDPP INC - 01)	70957	0.44	0.704	0.03	0.05	1.27	0.09	0.468	0.03
36	LS021A (PDPP INC - 02)	71924	0.00	2.947	0.00	0.21	0.26	0.02	1.268	0.09
37	MSBP _ HOH	158034	0.88	11.529	0.14	1.82	31.20	4.93	28.790	4.55
38	MRH 01/02/03/04 (MSBP _ CCR)	96964	1.86	78.496	0.18	7.61	0.32	0.03	9.195	0.89
					23.07	172.52		116.34		784.18
					PM (kg/hr)	NOx (kg/hr)		CO (kg/hr)		SO2 (kg/hr)

Stack Emission Data as per On-line Analyzer data _ November. 2024										
Sl. No.	Stack Name	Flow rate (Nm^3/hr) Avg. Value	PM (mg/Nm^3)	NOx (mg/Nm^3)	PM (kg/hr)	NOx (kg/hr) (kg/hr)	CO (mg/Nm^3)	CO (kg/hr)	SO2 (mg/Nm3)	SO2 (kg/hr)
1	KH01B (KHDS)	22953	0.727	95.719	0.02	2.20	15.88	0.36	13.770	0.32
2	FH01 (FCCU)	24235	0.807	25.012	0.02	0.61	7.9	0.19	7.559	0.18
3	FH03/COB (FCCU)	84321	21.3	27.1	1.80	2.29	172.578	14.55	0	0.00
4	CH21 (CDU - II)	90531	0	65.1	0.00	5.89	6.35	0.57	56.709	5.13
5	CH22 (CDU - II)	33510	0	45.5	0.00	1.52	6.8	0.23	36.050	1.21
6	CH223 (CDU - II)	50563	8.7	66.2	0.44	3.35	67.7	3.42	83.635	4.23
7	DD-H01 (DHDS)	25998	4.2	42.0	0.11	1.09	1.4	0.04	47.4	1.23
8	DS-X-002 (SRU - 01)	29135	15.22	36	0.44	1.05	219	6.38	2403	70.01
9	DSX 301 (SRU - 02)	14151	29.1	79.087	0.41	1.12	103.4	1.46	7146.599	101.13
10	BS-101 (Biturox)	14174	22.8	3.077	0.32	0.04	5.5	0.08	24.843	0.35
11	VH H01/02 (VGO HDS)	52233	0	34.433	0.00	1.80	18.2	0.95	30.507	1.59
12	NHT CCR - 01	104483	88.7	35.759	9.27	3.74	2.4	0.25	312.039	32.60
13	UB07 (Boiler)	111963	9.6	20.609	1.07	2.31	7.9	0.88	28.973	3.24
14	UB08 (Boiler)	29324	38.7	19.175	1.14	0.57	4.6	0.14	149.960	4.43
15	UB09 (Boiler) (UX200)	30622	8.64	1.378	0.26	0.04	2.4	0.07	3.239	0.10
16	UB 10 (Boiler)	40255	7.25	96.648	0.29	3.89	13.45	0.54	373.989	15.05
17	UB 11 (Boiler)	71246	28.5	139.526	2.03	9.94	9.04	0.64	878.682	62.60
18	HRSG 1 (CPP - 01)	161184	0	35.1	0.00	5.66	2.8	0.45	1.233	0.20
19	GT2/HRSG -02 (CPP - 02)	151867	2.76	66.976	0.42	10.17	12.8	1.94	0.859	0.13
20	SRU III Train A (IS LZ 102)	91703	28.3	73.694	2.60	6.76	14.3	1.31	936.551	85.88
21	SRU III Train B (IS LZ 202)	90130	13.7	28.532	1.23	2.57	2.2	0.20	344.542	31.05
22	CDU-III (ICH 101/102)	252659	0.875	53.241	0.00	13.45	28.5	7.20	24.248	6.13
23	DHDT (IGH 101/102)	58678	1.6	30.512	0.00	1.79	4.3	0.25	7.660	20.22
24	VGO-HDT (IVH 101/201)	54092	0.9	26.373	0.05	1.43	1.8	0.10	14.587	0.79
25	PFCCU-Heater (IFH 002)	21661	0	33.8	0.00	0.73	5.2	0.11	7.361	0.16
26	PFCCU-Regen. (IFLS 001)	170940	30.76	3.468	5.26	0.59	184.7	31.57	7.296	1.25
27	DCU-1 (IDH 101)	77894	1.1	18.171	0.09	1.42	16.1	1.25	7.527	0.59
28	DCU-2 (IDH 102)	77012	0.3	49.969	0.02	3.85	2.5	0.19	12.904	0.99
29	HRSG 3 (IUS HRSG 05LZ554)	161009	3.5	54.049	0.56	8.70	7.2	1.16	3.544	0.57
30	HRSG 4 (IUS HRSG 05LZ554)	142276	3.63	82.878	0.52	11.79	9.1	1.29	1.940	0.28
31	HRSG-5 (IUS HRSG 05LZ554)	143306	58.5	6.259	8.38	0.90	14.8	2.12	6.144	0.88
32	UB 12 (Boiler) (IUS UB12 LZ08)	122932	2.2	99.023	0.27	12.17	6.8	0.84	40.384	4.96
33	UB 13 (Boiler) (IUS UB12 LZ08)	123507	3.3	98.653	0.41	12.18	6.9	0.85	37.037	4.57
34	NHT -Isom. (NH-2/ H H 101)	53005	0.48	46.88	0.03	2.48	2.070	0.11	0.00	0.00
35	PWI LS 110 (PDPP INC - 01)	70957	0.77	0.596	0.05	0.04	1.20	0.09	0.367	0.03
36	LS021A (PDPP INC - 02)	71924	0.18	34.801	0.01	2.50	31.40	2.26	28.346	2.04
37	MSBP _ HOH	158034	-0.98	5.149	-0.15	0.81	14.80	2.34	12.190	1.93
38	MRH 01/02/03/04 (MSBP _ CCR)	96964	2.20	71.2	0.21	6.90	4.10	0.40	12.318	1.19
					37.59	**148.35**		**86.81**		**467.26**
					PM (kg/hr)	NOx (kg/hr)		CO (kg/hr)		SO2 (kg/hr)

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Stack Emission Monitoring Report for the Month of October 2024

Report No: NL/KR/FGM/10/101
Issue Date: 18/10/2024

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref. No.: PO. No. 4601005329 dated 07.03.2024
Sampling done by: Nitya Laboratories

Sl. No:	Stack / Unit	Date of Monitoring / Sampling	Time of Monitoring	Lab Id. Code / No:	Analysis Started on (date)	Analysis completed on (date)
1	VGO-HDT (Vacuum Gas Oil Hydro Treater) (IVH 101/201)	02-10-2024	09:3[illegible] AM	S/10/1	11-10-2024	17-10-2024
2	UB 12 (Boiler) (IUS UB12 LZ08)	02-10-2024	11:23 AM	S/10/2	11-10-2024	17-10-2024
3	UB 13 (Boiler) (IUS UB12 LZ08)	02-10-2024	03:45 PM	S/10/3	11-10-2024	17-10-2024
4	HRSG 4 (IUS HRSG 05LZ554)	03-10-2024	08:50 AM	S/10/4	11-10-2024	17-10-2024
5	HRSG-5 (IUS HRSG 05LZ554)	03-10-2024	10:25 AM	S/10/5	11-10-2024	17-10-2024
6	CDU-III (ICH 101/102)	03-10-2024	03:15 PM	S/10/6	11-10-2024	17-10-2024
7	PFCCU-Heater (IFH 002)	04-10-2024	09:20 AM	S/10/7	11-10-2024	17-10-2024
8	PFCCU-Regen. (IFLS 001)	04-10-2024	10:34 AM	S/10/8	11-10-2024	17-10-2024
9	DHDT (Diesel Hydro Treater) (IGH 101/102)	04-10-2024	11:40 AM	S/10/9	11-10-2024	17-10-2024
10	UB 10 (Boiler)	04-10-2024	03:35 PM	S/10/10	11-10-2024	17-10-2024
11	HRSG 2 (IUS HRSG 05LZ554)	05-10-2024	08:40 AM	S/10/11	11-10-2024	17-10-2024
12	SRU III Train A (IS LZ 102)	05-10-2024	10:10 AM	S/10/12	11-10-2024	17-10-2024
13	SRU III Train B (IS LZ 202)	05-10-2024	12:00 PM	S/10/13	11-10-2024	17-10-2024
14	MSBP _ HOH (Hot Oil Heater)	05-10-2024	03:20 PM	S/10/14	11-10-2024	17-10-2024
15	MRH 01/02/03/04 (MSBP _ CCR)	07-10-2024	08:00 AM	S/10/15	11-10-2024	17-10-2024
16	PWI LS 110 (PDPP INC - 01)	07-10-2024	09:35 AM	S/10/16	11-10-2024	17-10-2024
17	LS021A (PDPP INC - 02)	07-10-2024	03:38 PM	S/10/17	11-10-2024	17-10-2024

Instruments used for Monitoring

Stack Monitoring kit, with all assembly Make: Enviro instruments	Calibrated on	06-03-2024	Calibration due on	05-03-2025

[illegible]

..... End of the Report.....

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Stack Emission Monitoring Report for the Month of October 2024

Report No. NL/KR/FGM/10/101
Issue Date: 18/10/2024

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref. No.: PO. No. 4601005329 dated 07.03.2024
Sampling done by: Nitya Laboratories

Sl. No:	Stack / Unit	Date of Sampling	Ambient Air Temp.	Sampling Temp. (0C)	Flow rate Result (Nm3/Hr)	PM (mg/Nm3)	SO2 (mg/Nm3)	NOx (mg/Nm3)	H2S (mg/Nm3)	CO (mg/Nm3)	Ni + V (mg/Nm3)
1	VGO-HDT (Vacuum Gas Oil Hydro Treater) (IVH 101/201)	02-10-2024	26.0	167.0	167730.2	5.9	7.6	23.8	N.A.	2.9	ND (DL-0.5)
2	UB 12 (Boiler) (IUS UB12 LZ06)	02-10-2024	26.0	102.0	138064.8	21	138	178	N.A.	7.5	ND (DL-0.5)
3	UB 13 (Boiler) (IUS UB12 LZ08)	02-10-2024	26.0	108.0	837685.2	14	18	7.8	N.A.	4.1	ND (DL-0.5)
4	HRSG 4 (IUS HRSG 05LZ554)	03-10-2024	25.0	176.0	94573.0	6	8	24.0	N.A.	5.2	ND (DL-0.5)
5	HRSG-5 (IUS HRSG 05LZ554)	03-10-2024	25.0	156.0	323496.6	13	3	17	N.A.	4.6	ND (DL-0.5)
6	CDU-III (ICH 101/102)	03-10-2024	25.0	92.0	366470.7	7.5	31	48	3.9	1.3	ND (DL-0.5)
7	PFCCU-Heater (IFH 002)	04-10-2024	26.0	105.0	383894.9	6.5	16	19	N.A.	10.2	ND (DL-0.5)
8	PFCCU-Regen. (IFLS 001)	04-10-2024	26.0	98.0	349595.7	7.2	18	23	N.A.	56	ND (DL-0.5)
9	DHDT (Diesel Hydro Treater) (IGH 101/102)	04-10-2024	26.0	189.0	234439.9	5.2	7.1	21.9	N.A.	3.9	ND (DL-0.5)
10	UB 10 (Boiler)	04-10-2024	26.0	134.0	300154.2	10	102	167	N.A.	6.7	ND (DL-0.5)
11	HRSG 2 (IUS HRSG 05LZ554)	05-10-2024	25.0	193.0	312650.6	12	8.1	28	N.A.	4.1	ND (DL-0.5)
12	SRU III Train A (IS LZ 102)	05-10-2024	25.0	124.0	197583.3	13	1037.0	15	4.1	2.9	ND (DL-0.5)
13	SRU III Train B (IS LZ 202)	05-10-2024	25.0	128.0	148542.5	16	1293.0	17.0	2.9	2.1	ND (DL-0.5)
14	MSBP _ HOH (Hot Oil Heater)	05-10-2024	25.0	123.0	147493.9	ND (DL-5)	6.0	78	ND (0.1)	31.2	ND (DL-0.5)
15	MRH 01/02/03/04 (MSBP _ CCR)	07-10-2024	25.0	89.0	250595.0	7.8	3.2	12	N.A.	6.0	ND (DL-0.5)
16	PWI LS 110 (PDPP INC - 01)	07-10-2024	25.0	214.0	134329.2	ND (DL-5)	4.2	36	N.A.	2.1	ND (DL-0.5)
17	LS021A (PDPP INC - 02)	07-10-2024	25.0	234.0	64450.8	ND (DL-5)	5.9	78	N.A.	3.3	ND (DL-0.5)

Remark:
ND-Not Detected DL-Detection Limit

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Treated Effluent Water Analysis Report for the Month of October 2024

Report No. NL/KR/AAQ/10/104
Issue Date 18/10/2024

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref No PO. No. 4601005329 dated 07.03.2024
Sampling done by: Nitya Laboratories

Sl. No:	Parameter	Unit	Value reported	Limits as per notification- GSR 186 (E) dt. 18.03.2008	Test Method
1	pH	**	7.4	6 - 8.5	IS 3025 (P-11)
2	Oil & Grease	mg/l	3.2	5.0	IS 3025 (P-39)
3	BOD (3days) 27°C	mg/l	13	15.0	IS 3025 (P-44)
4	Total Suspended Solids (TSS)	mg/l	16	20.0	IS:3025 (P-17)
5	Phenols	mg/l	ND	0.4	IS 3025 (P-43)
6	Sulfides	mg/l	0.30	0.5	IS:3025 (P-29)
7	Chemical Oxygen Demand (COD)	mg/l	68	125.0	IS:3025 (P-58)
8	Cyanide (CN)	mg/l	ND	0.2	IS 3025 (P-27)
9	Ammonia as Nitrogen	mg/l	0.5	15.0	IS 3025 (P-34)
10	Total Kjeldahl Nitrogen (TKN)	mg/l	1.12	40.0	IS:3025 (P-34)
11	Phosphate (P)	mg/l	ND	3.0	IS:3025 (P-31)
12	Chromium (Cr) (Hexavalent)	mg/l	ND	0.1	APHA 23rd Ed.
13	Chromium (Cr) (Total)	mg/l	ND	2.0	APHA 23rd Ed.
14	Lead (Pb)	mg/l	ND	0.1	APHA 23rd Ed
15	Mercury (Hg)	mg/l	ND	0.0	APHA 23rd Ed.
16	Zinc (Zn)	mg/l	ND	5.0	APHA 23rd Ed.
17	Nickel (Ni)	mg/l	ND	1.0	APHA 23rd Ed.
18	Copper Cu)	mg/l	ND	1.0	APHA 23rd Ed
19	Vanadium (V)	mg/l	ND	0.2	IS 3025 (P-56)
20	Benzene	mg/l	ND	100.0	USEPA 8270C
21	Benzo (a) - Pyrene	mg/l	ND	200.0	USEPA 8270C

Remark:
ND-Not Detected (Detection Limit

..... End of the Report .....

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Ambient Air Quality Monitoring Report for the Month of October 2024 of AAQM – 01

Report No: NL/KR/AAQ/10/101
Issue Date: 18/10/2024

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref. No.: PO. No. 4601005329 dated 07.03.2024
Sampling done by: Nitya Laboratories

24 hrs. Ambient Air Sampling Particulars

Sampling Method: IS 5182 (P-14)
Sampling Location: 3.5 m above the ground level
Sampling Protocol: CPCB Guidelines

Sampling Locations	VGO HDT	UB-12,13	HRSG-3,4,5	CDU-III	GT-2/ HRSG-2	DCU	Pet-Coke dome area
Dates of monitoring	02/10/2024	02/10/2024	03/10/2024	03/10/2024	04/10/2024	04/10/2024	07/10/2024
Time of monitoring	9:30 AM	9:50 AM	9:40 AM	10:00 AM	10:00 AM	10:15 AM	10:40 AM
Sample ID	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6	AAQ7
Sample receipt Ref. No. with date	NL/101/11-10-24	NL/101/11-10-24	NL/102/11-10-24	NL/102/11-10-24	NL/10311-10-24	NL/103/11-10-24	NL/104/11-10-24
Sample receiving date	11-10-2024	11-10-2024	11-10-2024	11-10-2024	11-10-2024	11-10-2024	11-10-2024
Analysis starting date	11-10-2024	11-10-2024	11-10-2024	11-10-2024	11-10-2024	11-10-2024	11-10-2024
Analysis completion date	17-10-2024	17-10-2024	17-10-2024	17-10-2024	17-10-2024	17-10-2024	17-10-2024
Ambient condition	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Amb. Temp	26	26	25	25	26	26	25
Rel. Humidity %	72	72	71	71	74	74	73

Remark:
ND-Not Detected DL-Detection Limit

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Ambient Air Quality Monitoring Report for the Month of October 2024 of AAQM – 01

Report No NL/KR/AAQ/10/102
Issue Date 18/10/2024

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Sl. No:	Parameters	Sampling Locations with results					Units	Limit	Test method	LOQ
		VGO HDT	UB-12,13	HRSG-3,4,6	CDU-III	GT-2/ HRSG-2				
1	Sulphur dioxide	16.49	15.24	20.13	19.15	17.21	µg/m3	80	IS:5182(P-2)	DL-6
2	Nitrogen dioxide	21.24	24.10	27.48	25.12	23.10	µg/m3	80	IS:5182(P-6)	DL-5
3	Respirable Particulate Matter (Size less than 10µm) or PM10	43.27	48.12	62.10	58.26	42.13	µg/m3	100	IS:5182(P-23)	DL-10
4	Respirable Particulate Matter (Size less than 2.5µm) or PM 2.5	28.16	32.14	35.12	38.32	28.67	µg/m3	60	40CFR Appendix L Part 53 CPCB Guidelines	DL-10
5	Ozone(O3)	16.28	18.26	20.12	23.12	16.21	µg/m3	100	IS:5182(P-9)	DL-10
6	Ammonia (NH3)	26.24	26.12	30.42	28.30	25.30	µg/m3	400	Method of Air Sampling & Analysis CPCB Guidelines	DL-5
7	Carbon Monoxide (CO)	0.31	0.43	0.51	0.43	0.54	mg/m3	2	IS:5182 (P-10)	DL-0.1
8	Lead (Pb)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	1	NL/SOP/AAQ-11	DL-0.5
9	Nickel (Ni)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ng/m3	20	NL/SOP/AAQ-13	DL-1.0
10	Arsenic (As)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	6	NL/SOP/AAQ-12	DL-0.5
11	Benzene (C6H6)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	5	IS:5182 (P-11)	DL-0.5
12	Benzo (a) Pyrene (Particulate phase)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	1	IS:5182 (P-12)	DL-0.5

Remark
ND-Not Detected DL-Detection Limit

..... End of the Report.....

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Ambient Air Quality Monitoring Report for the Month of October 2024 of AAQM – 01

Report No. NL/KR/AAQ/10/103
Issue Date 18/10/2024

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Sl. No:	Parameters	Sampling Locations with results		Units	Limit	Test method	LOQ
		DCU	Pet-Coke dome area				
1	Sulphur dioxide	19.18	20.32	µg/m3	80	IS:5182(P-2)	DL-6
2	Nitrogen dioxide	22.39	24.28	µg/m3	80	IS:5182(P-6)	DL-5
3	Respirable Particulate Matter (Size less than 10µm) or PM10	50.17	57.18	µg/m3	100	IS:5182(P-23)	DL-10
4	Respirable Particulate Matter (Size less than 2.5µm) or PM 2.5	30.16	34.14	µg/m3	60	40CFR Appendix L Part 53 CPCB Guidelines	DL-10
5	Ozone(O3)	16.21	19.24	µg/m3	100	IS:5182(P-9)	DL-10
6	Ammonia (NH3)	24.42	31.28	µg/m3	400	Method of Air Sampling & Analysis CPCB Guidelines	DL-5
7	Carbon Monoxide (CO)	0.32	0.82	mg/m3	2	IS:5182 (P-10)	DL-0.1
8	Lead (Pb)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	1	NL/SOP/AAQ-11	DL-0.5
9	Nickel (Ni)	ND (DL-1.0)	ND (DL-1.0)	ng/m3	20	NL/SOP/AAQ-13	DL-1.0
10	Arsenic (As)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	6	NL/SOP/AAQ-12	DL-0.5
11	Benzene (C6H6)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	5	IS:5182 (P-11)	DL-0.5
12	Benzo (a) Pyrene (Particulate phase)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	1	IS:5182 (P-12)	DL-0.5

Remark:
ND-Not Detected, DL-Detection Limit

..... End of the Report.....

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Noise Monitoring Report for the Month of October 2024

Report No.	NL/KR/Noise/10/101	Issued To	
Issue Date:	18/10/2024	M/s Bharat Petroleum Corporation Limited	
		Kochi Refinery	
		Ambalamugal, Kochi, Pin-682 302	

Ref. No.: PO. No. 4601005329 dated 07.03.2024

Sampling done by: Nitya Laboratories

Sr. No.	Location	Test Result dB(A), Day Time	Test Result dB(A), Night Time	Test Method
1	West Side Robotic Drum Filling Plant	62.7	51.8	IS 9989
2	OXO Alcohol unit PDO opposite cabin	64.9	54.2	
3	PDPP-Cooling tower north	66.5	56.5	
4	PDPP-Cooling tower east	74.2	64.8	
5	PDPP-River gate	49.5	38.5	
6	PDPP-Flare gate	71.6	58.9	
7	NHT-CCR AAQ MS area	64.8	55.7	
8	New chemical storage shed	66.5	53.8	
9	South end corner off clmp	51.7	43.9	
10	MSBP Cooling tower east	61.3	52.5	

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NOTE: [illegible]

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Stack Emission Monitoring Report for the Month of December 2024

Report No. NL/KR/FGM/12/101		Issued To
Issue Date: 13/01/2025		M/s Bharat Petroleum Corporation Limited Kochi Refinery Ambalamugal, Kochi, Pin-682 302
Ref No :PO No 4601005329 dated 07.03.2024		
Sampling done by: Nitya Laboratories		

SL No:	Stack / Unit	Date of Monitoring / Sampling	Time of Monitoring	Lab Id. Code / No:	Analysis Started on (date)	Analysis completed on (date)
1	DCU-1 (Delayed Coker Unit - 01) (IDH 101)	27-12-2024	09:12AM	S/12/1	06-01-2025	11-01-2025
2	DCU-2 (Delayed Coker Unit - 02) (IDH 102)	27-12-2024	11:12 AM	S/12/2	06-01-2025	11-01-2025
3	PFCCU-Heater (IFH 002)	27-12-2024	03:00 PM	S/12/3	06-01-2025	11-01-2025
4	PFCCU-Regen (IFLS 001)	27-12-2024	04:10PM	S/12/4	06-01-2025	11-01-2025
5	HRSG 3 (IUS HRSG 05LZ554)	28-12-2024	10:25 AM	S/12/5	06-01-2025	11-01-2025
6	HRSG 4 (IUS HRSG 05LZ554)	28-12-2024	11:40AM	S/12/6	06-01-2025	11-01-2025
7	UB 12 (Boiler) (IUS UB12 LZ08)	28-12-2024	02:20 PM	S/12/7	06-01-2025	11-01-2025
8	UB 13 (Boiler) (IUS UB12 LZ08)	28-12-2024	03:20 PM	S/12/8	06-01-2025	11-01-2025
9	GT2/HRSG -02 (CPP - 02)	30-12-2024	09:40 AM	S/12/9	06-01-2025	11-01-2025
10	DHDT (Diesel Hydro Treater) (IGH 101/102)	30-12-2024	11:10 AM	S/12/10	06-01-2025	11-01-2025
11	VGO-HDT (Vacuum Gas Oil Hydro Treater) (IVH 101/201)	30-12-2024	02:40 PM	S/12/11	06-01-2025	11-01-2025
12	CDU-III (ICH 101/102)	30-12-2024	03:50 PM	S/12/12	06-01-2025	11-01-2025
13	PWI LS 110 (PDPP INC - 01)	31-12-2024	09:20 AM	S/12/13	06-01-2025	11-01-2025
14	LS021A (PDPP INC - 02)	31-12-2024	10:50 AM	S/12/14	06-01-2025	11-01-2025
15	CH21 (CDU - II)	31-12-2024	11:40 AM	S/12/15	06-01-2025	11-01-2025
16	CH22 (CDU - II)	31-12-2024	02:50 PM	S/12/16	06-01-2025	11-01-2025
17	CH223 (CDU - II)	31-12-2024	04:05 PM	S/12/17	06-01-2025	11-01-2025

Instruments used for Monitoring

Instrument				
Stack Monitoring kit, with all assembly Make: Enviro Instruments	Calibrated on	06-03-2024	Calibration due on	06-03-2025

Note:
ND-Not Detected, DL-Detection Limit

.... End of the Report......................

(CHECKED BY)
(SANDEEP SAINI)

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(RAVINDER MITTAL)

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Stack Emission Monitoring Report for the Month of December 2024

Report No. NL/KR/FGM/12/101
Issue Date: 13/01/2025

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref. No.:PO. No. 4601005329 dated 07.03.2024
Sampling done by: Nitya Laboratories

Sl. No:	Stack / Unit	Date of Sampling	Ambient Air Temp.	Sampling Temp. (0C)	Flow rate Result (Nm3/Hr)	PM (mg/Nm3)	SO2 (mg/Nm3)	NOx (mg/Nm3)	H2S (mg/Nm3)	CO (mg/Nm3)	Ni + V (mg/Nm3)
1	DCU-1 (Delayed Coker Unit - 01) (IDH 101)	27-12-2024	25.0	145.0	260059.2	ND (DL-5)	32.2	136.4	ND (0.1)	5.6	ND (DL-0.5)
2	DCU-2 (Delayed Coker Unit - 02) (IDH 102)	27-12-2024	25.0	132.0	244171.0	ND (DL-5)	8.5	125.7	ND (0.1)	2.8	ND (DL-0.5)
3	PFCCU-Heater (IFH 002)	27-12-2024	25.0	104.0	92421.7	4.7	16.4	14.3	N.A.	10.5	ND (DL-0.5)
4	PFCCU-Regen. (IFLS 001)	27-12-2024	25.0	110.0	303469.3	7.6	19.7	28.9	N.A.	60.7	ND (DL-0.5)
5	HRSG 3 (IUS HRSG 05LZ554)	28-12-2024	26.0	178.0	268565.0	9.4	7.6	28.6	N.A.	4.1	ND (DL-0.5)
6	HRSG 4 (IUS HRSG 05LZ554)	28-12-2024	26.0	172.0	253049.5	11.8	6.9	30.4	N.A.	3.6	ND (DL-0.5)
7	UB 12 (Boiler) (IUS UB12 LZ06)	28-12-2024	26.0	112.0	258933.8	23.6	140.6	190.8	N.A.	6.1	ND (DL-0.5)
8	UB 13 (Boiler) (IUS UB12 LZ06)	28-12-2024	26.0	108.0	285616.0	17.9	16.9	10.8	N.A.	4.1	ND (DL-0.5)
9	GT2/HRSG -02 (CPP - 02)	30-12-2024	20.5	136.0	325067.7	5.9	8.6	23.4	N.A.	4.2	ND (DL-0.5)
10	DHDT (Diesel Hydro Treater) (IGH 101/102)	30-12-2024	25.0	178.0	177733.4	6.4	8.2	26.4	N.A.	5.3	ND (DL-0.5)
11	VGO-HDT (Vacuum Gas Oil Hydro Treater) (IVH 101/201)	30-12-2024	25.0	165.0	131601.8	5.6	7.6	23.9	N.A.	2.0	ND (DL-0.5)
12	CDU-III (ICH 101/102)	30-12-2024	25.0	98.0	796610.7	9.5	38.1	48.9	3.9	2.1	ND (DL-0.5)
13	PWI LS 110 (PDPP INC - 01)	31-12-2024	26.0	198.0	181577.5	ND (DL-5)	4.6	38.9	N.A.	1.1	ND (DL-0.5)
14	LS021A (PDPP INC - 02)	31-12-2024	26.0	203.0	124523.8	ND (DL-5)	6.6	76.9	N.A.	2.3	ND (DL-0.5)
15	CH21 (CDU - II)	31-12-2024	26.0	89.0	194829.3	6.7	32.9	52.7	3.6	1.6	ND (DL-0.5)
16	CH22 (CDU - II)	31-12-2024	26.0	92.0	78140.7	7.5	36.4	116.7	6.6	4.8	ND (DL-0.5)
17	CH223 (CDU - II)	31-12-2024	26.0	103.0	255359.1	4.8	58.6	46.5	7.5	2.7	ND (DL-0.5)

Remark: ND=Not Detected DL-Detection Limit

..... End of the Report.....

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(SANDEEP SAINI)

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Ambient Air Quality Monitoring Report for the Month of December2024 of AAQM – 01

Report No: NL/KR/AAQ/12/101
Issue Date: 13-01-2025

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref No: PO No 4601005329 Dated 07.03.2024
Sampling done by: Nitya Laboratories

24 hrs. Ambient Air Sampling Particulars

Sampling Method: IS 5182 (P-14)
Sampling Location: 3.5m above the ground level
Sampling Protocol: CPCB Guidelines

Sampling Locations	Satellite Fire Station	Pet-Coke dome area	PFCCU Cabin Area	DCU	UB-12,13	HRSG-3,4
Dates of monitoring	23-12-2024	23-12-2024	27-12-2024	27-12-2024	28-12-2024	28-12-2024
Time of monitoring	10.10 AM	11.02 AM	10.30 AM	11:15 AM	10.40 AM	11:20 AM
Sample ID	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6
Sample receipt/Ref. No. with Date	NL/101/23-12-24	NL/102/23-12-24	NL/103/27-12-24	NL/104/27-12-24	NL/105/28-12-24	NL/106/28-12-24
Sample receiving Date	06-01-2025	06-01-2025	06-01-2025	06-01-2025	06-01-2025	06-01-2025
Analysis starting Date	06-01-2025	06-01-2025	06-01-2025	06-01-2025	06-01-2025	06-01-2025
Analysis completion Date	11-01-2025	11-01-2025	11-01-2025	11-01-2025	11-01-2025	11-01-2025
Ambient condition	Normal	Normal	Normal	Normal	Normal	Normal
Amb. Temp	24	24	25	25	24	24
Rel. Humidity %	71	71	72	72	72	72

Remark:
ND-not Detected, DL-Detection Limit

..... End of the Report.....

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Ambient Air Quality Monitoring Report for the Month of December2024 of AAQM – 01

Report No. NL/KR/AAQ/12/102
Issue Date: 13-01-2025

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref. No.:PO. No. 4601005329 Dated 07.03.2024
Sampling done by: Nitya Laboratories

24 hrs. Ambient Air Sampling Particulars

Sampling Method: IS 5182 (P-14)
Sampling Location: 3 5m above the ground level
Sampling Protocol: CPCB Guidelines

Sampling Locations	VGO HDT	CDU-III	CDU-III/ARU	PDPP
Dates of monitoring	30-12-2024	30-12-2024	31-12-2024	31-12-2024
Time of monitoring	11.10 AM	11:40 AM	11.30 AM	11:50 AM
Sample ID	AAQ7	AAQ8	AAQ9	AAQ10
Sample receiptRef. No. with Date	NL/107/30-12-24	NL/108/30-12-24	NL/109/31-12-24	NL/110/31-12-24
Sample receiving Date	06-01-2025	06-01-2025	06-01-2025	06-01-2025
Analysis starting Date	06-01-2025	06-01-2025	06-01-2025	06-01-2025
Analysis completion Date	11-01-2025	11-01-2025	11-01-2025	11-01-2025
Ambient condition	Normal	Normal	Normal	Normal
Amb. Temp.	24	24	24	24
Rel. Humidity %	70	70	70	70

Remark:
ND-Not Detected, DL-Detection Limit

..... End of the Report.....

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Ambient Air Quality Monitoring Report for the Month of December2024 of AAQM – 01

Report No: NL/KR/AAQ/12/103
Issue Date: 13-01-2025

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Sl. No:	Parameters	Sampling Locations with results					Units	Limit	Test method	LOQ
		Satellite Fire Station	Pet-Coke dome area	PFCCU Cabin Area	DCU	UB-12,13				
1	Sulphur dioxide	18.40	18.50	22.30	21.50	20.40	µg/m3	80	IS:5182(P-2)	DL-6
2	Nitrogen dioxide	23.40	26.20	29.50	27.20	26.30	µg/m3	80	IS:5182(P-6)	DL-5
3	Respirable Particulate Matter (Size less than 10µm) or PM10	46.80	50.40	64.20	60.30	44.30	µg/m3	100	IS:5182(P-23)	DL-10
4	Respirable Particulate Matter (Size less than 2.5µm) or PM 2.5	30.00	34.20	37.20	40.20	30.70	µg/m3	60	40CFR Appendix L Part 53 CPCB Guidelines	DL-10
5	Ozone(O3)	18.30	20.60	22.20	26.20	18.30	µg/m3	100	IS:5182(P-9)	DL-10
6	Ammonia (NH3)	28.50	28.20	32.50	30.20	28.20	µg/m3	400	Method of Air Sampling & Analysis CPCB Guidelines	DL-5
7	Carbon Monoxide (CO)	0.43	0.54	0.61	0.53	0.64	mg/m3	2	IS:5182 (P-10)	DL-0.1
8	Lead (Pb)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	1	NL/SOP/AAQ-11	DL-0.5
9	Nickel (Ni)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ng/m3	20	NL/SOP/AAQ-13	DL-1.0
10	Arsenic (As)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	6	NL/SOP/AAQ-12	DL-0.5
11	Benzene (C6H6)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	5	IS:5182 (P-11)	DL-0.5
12	Benzo (a) Pyrene (Particulate phase)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	1	IS:5182 (P-12)	DL-0.5

Remark: ND-Not Detected, DL-Detection Limit

..... End of the Report.....

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Ambient Air Quality Monitoring Report for the Month of December2024 of AAQM – 01

Report No. NL/KR/AAQ/12/104
Issue Date: 13-01-2025

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Sl. No:	Parameters	Sampling Locations with results					Units	Limit	Test method	LOQ
		HRSG-3,4	VGO HDT	CDU-III	CDU-III/ARU	PDPP				
1	Sulphur dioxide	21.10	22.40	23.50	21.50	22.60	µg/m3	80	IS:5182(P-2)	DL-6
2	Nitrogen dioxide	24.40	26.30	27.20	23.40	25.60	µg/m3	80	IS:5182(P-6)	DL-5
3	Respirable Particulate Matter (Size less than 10µm) or PM10	53.20	59.20	58.70	57.20	58.50	µg/m3	100	IS:5182(P-23)	DL-10
4	Respirable Particulate Matter (Size less than 2.5µm) or PM 2.5	32.90	36.20	38.50	37.20	36.30	µg/m3	60	40CFR Appendix L Part 53 CPCB Guidelines	DL-10
5	Ozone(O3)	18.30	21.25	20.30	22.30	21.50	µg/m3	100	IS:5182(P-9)	DL-10
6	Ammonia (NH3)	27.40	33.30	32.80	34.50	32.50	µg/m3	400	Method of Air Sampling & Analysis CPCB Guidelines	DL-5
7	Carbon Monoxide (CO)	0.44	0.92	0.56	0.62	0.78	mg/m3	2	IS:5182 (P-10)	DL-0.1
8	Lead (Pb)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	1	NL/SOP/AAQ-11	DL-0.5
9	Nickel (Ni)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ng/m3	20	NL/SOP/AAQ-13	DL-1.0
10	Arsenic (As)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	6	NL/SOP/AAQ-12	DL-0.5
11	Benzene (C6H6)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	5	IS:5182 (P-11)	DL-0.5
12	Benzo (a) Pyrene (Particulate phase)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	1	IS:5182 (P-12)	DL-0.5

Remark:
ND-Not Detected, DL-Detection Limit

..... End of the Report.....

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Stack Emission Monitoring Report for the Month of January 2025

Report No.	NL/KR/FGM/01/101	Issued To
Issue Date	13/01/2025	M/s Bharat Petroleum Corporation Limited Kochi Refinery Ambalamugal, Kochi, Pin-682 302

Ref. No.:PO. No. 4601006329 dated 07.03.2024

Sampling done by: Nitya Laboratories

Sl. No:	Stack / Unit	Date of Monitoring / Sampling	Time of Monitoring	Lab Id. Code / No:	Analysis Started on (date)	Analysis completed on (date)
1	MSBP _ HOH (Hot Oil Heater)	02-01-2025	09:20 AM	S/01/1	06-01-2025	11-01-2025
2	MRH 01/02/03/04 (MSBP _ CCR)	02-01-2025	10:50 AM	S/01/2	06-01-2025	11-01-2025
3	SRU III Train A (IS LZ 102)	02-01-2025	03:10 PM	S/01/3	06-01-2025	11-01-2025
4	SRU III Train B (IS LZ 202)	02-01-2025	04:20 PM	S/01/4	06-01-2025	11-01-2025
5	DS-X-002 (SRU - 01)	03-01-2025	10:05 AM	S/01/5	06-01-2025	11-01-2025
6	NH H01 & CRH 01/02/03/04 (NHT CCR - 01)	03-01-2025	11:10 AM	S/01/6	06-01-2025	11-01-2025

Instruments used for Monitoring				
Stack Monitoring kit, with all assembly Make: Enviro Instruments	Calibrated on	06-03-2024	Calibration due on	05-03-2025

Remarks:

ND-Not Detected DL-Detection Limit

.... End of the Report ....

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Stack Emission Monitoring Report for the Month of January 2025

Report No.	NL/KR/FGM/01/101
Issue Date	13/01/2025

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref. No.:PO. No. 4601005329 dated 07.03.2024
Sampling done by: Nitya Laboratories

Sl. No:	Stack / Unit	Date of Sampling	Ambient Air Temp.	Sampling Temp. (0C)	Flow rate Result (Nm3/Hr)	PM (mg/Nm3)	SO2 (mg/Nm3)	NOx (mg/Nm3)	H2S (mg/Nm3)	CO (mg/Nm3)	Ni + V (mg/Nm3)
1	MSBP _ HOH (Hot Oil Heater)	02-01-2025	24.0	123.0	363414.8	ND (DL-0.5)	6.8	78.6	ND (DL-0.1)	32.7	ND (DL-0.5)
2	MRH 01/02/03/04 (MSBP _ CCR)	02-01-2025	24.0	102.0	176174.7	10.2	3.8	12.8	N.A.	7.3	ND (DL-0.5)
3	SRU III Train A (IS LZ 102)	02-01-2025	24.0	121.0	155408.2	12.6	1250.3	15.2	2.9	1.8	ND (DL-0.5)
4	SRU III Train B (IS LZ 202)	02-01-2025	24.0	126.0	143250.5	10.3	1289	17.6	3.0	3.6	ND (DL-0.5)
5	DS-X-002 (SRU - 01)	03-01-2025	24.0	156.0	64920.5	19.2	16890	45.5	3.3	72.9	ND (DL-0.5)
6	NH H01 & CRH 01/02/03/04 (NHT CCR - 01)	03-01-2025	24.0	131.0	362549.6	ND (DL-0.5)	0.0	119.9	ND (DL-0.1)	47.6	ND (DL-0.5)

Remark: ND-Not Detected, DL-Detection Limit

.... End of the Report.......................

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Treated Effluent Water Analysis Report for the Month of January 2025

Report No. NL/KR/ETP/01/101	Issued To
Issue Date: 13-01-2025	M/s Bharat Petroleum Corporation Limited Kochi Refinery Ambalamugal, Kochi, Pin-682 302
Ref. No.: PO No. 4601005329 dated 07.03.2024	
Sampling done by: Nitya Laboratories	

Sl. No:	Parameter	Unit	Value reported	Limits as per notification- GSR 186 (E) dt. 18.03.2008	Test Method
1	pH	--	7.56	6 - 8.5	IS:3025 (P-11)
2	Oil & Grease	mg/l	2.0	5.0	IS:3025 (P-39)
3	BOD (3days) 27°C	mg/l	10	15.0	IS:3025 (P-44)
4	Total Suspended Solids (TSS)	mg/l	18	20.0	IS:3025 (P-17)
5	Phenols	mg/l	ND	0.4	IS:3025 (P-43)
6	Sulfides	mg/l	0.20	0.5	IS:3025 (P-29)
7	Chemical Oxygen Demand (COD)	mg/l	50	125.0	IS:3025 (P-58)
8	Cyanide (CN)	mg/l	ND	0.2	IS:3025 (P-27)
9	Ammonia as Nitrogen	mg/l	0.42	15.0	IS:3025 (P-34)
10	Total Kjeldahl Nitrogen (TKN)	mg/l	0.84	40.0	IS:3025 (P-34)
11	Phosphate (P)	mg/l	ND	3.0	IS:3025 (P-31)
12	Chromium (Cr) (Hexavalent)	mg/l	ND	0.1	APHA 23rd Ed.
13	Chromium (Cr) (Total)	mg/l	ND	2.0	APHA 23rd Ed.
14	Lead (Pb)	mg/l	ND	0.1	APHA 23rd Ed.
15	Mercury (Hg)	mg/l	ND	0.0	APHA 23rd Ed.
16	Zinc (Zn)	mg/l	ND	5.0	APHA 23rd Ed.
17	Nickel (Ni)	mg/l	ND	1.0	APHA 23rd Ed.
18	Copper Cu)	mg/l	ND	1.0	APHA 23rd Ed.
19	Vanadium (V)	mg/l	ND	0.2	IS:3025 (P-56)
20	Benzene	mg/l	ND	100.0	USEPA-8270C
21	Benzo (a) - Pyrene	mg/l	ND	200.0	USEPA-8270C

Remark:
ND-Not Detected DL-Detection Limit

.... End of the Report......................

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Ambient Air Quality Monitoring Report for the Month of January 2025 of AAQM – 01

Report No.	NL/KR/AAQ/01/101	**Issued To**
Issue Date	13-01-2025	M/s Bharat Petroleum Corporation Limited Kochi Refinery Ambalamugal, Kochi, Pin-682 302

Ref. No. PO. No. 4601005329 Dated 07.03.2024
Sampling done by: Nitya Laboratories

24 hrs. Ambient Air Sampling Particulars

Sampling Method: IS 5182 (P-14)
Sampling Location: 3.5m above the ground level
Sampling Protocol: CPCB Guidelines

Sampling Locations	**SRU III Op. Cabin**	**MSBP Op. Cabin**
Dates of monitoring	02-01-2025	02-01-2025
Time of monitoring	09.10 AM	09.40 AM
Sample ID	AAQ1	AAQ2
Sample receiptRef. No. with Date	NL/101/02-01-2025	NL/102/02-01-2025
Sample receiving Date	06-01-2025	06-01-2025
Analysis starting Date	06-01-2025	06-01-2025
Analysis completion Date	11-01-2025	11-01-2025
Ambient condition	Normal	Normal
Amb. Temp.	24	24
Rel. Humidity %	71	71

Remark:
ND-Not Detected, DL-Detection Limit

.... **End of the Report**....................

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Ambient Air Quality Monitoring Report for the Month of January 2025 of AAQM – 01

Report No. NL/KR/AAQ/01/102
Issue Date 13-01-2025

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Sl. No:	Parameters	Sampling Locations with results		Units	Limit	Test method	LOQ
		SRU III Op. Cabin	MSBP Op. Cabin				
1	Sulphur dioxide	18.43	17.30	µg/m3	80	IS 5182(P-2)	DL-6
2	Nitrogen dioxide	23.50	26.30	µg/m3	80	IS 5182(P-6)	DL-5
3	Respirable Particulate Matter (Size less than 10µm) or PM10	46.30	50.20	µg/m3	100	IS 5182(P-23)	DL-10
4	Respirable Particulate Matter (Size less than 2.5µm) or PM 2.5	30.00	34.20	µg/m3	60	40CFR Appendix L Part 53 CPCB Guidelines	DL-10
5	Ozone(O3)	18.30	20.30	µg/m3	100	IS 5182(P-9)	DL-10
6	Ammonia (NH3)	29.40	28.00	µg/m3	400	Method of Air Sampling & Analysis CPCB Guidelines	DL-5
7	Carbon Monoxide (CO)	0.42	0.53	mg/m3	2	IS 5182 (P-10)	DL-0.1
8	Lead (Pb)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	1	NL/SOP/AAQ-11	DL-0.5
9	Nickel (Ni)	ND (DL-1.0)	ND (DL-1.0)	ng/m3	20	NL/SOP/AAQ-13	DL-1.0
10	Arsenic (As)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	6	NL/SOP/AAQ-12	DL-0.5
11	Benzene (C6H6)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	5	IS 5182 (P-11)	DL-0.5
12	Benzo (a) Pyrene (Particulate phase)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	1	IS 5182 (P-12)	DL-0.5

Remark: ND-Not Detected, DL-Detection Limit

..... End of the Report.....

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Stack Emission Monitoring Report for the Month of March 2025

ULR No. TC148142500001723F-1726F,1730F-1734F 1810F-1814F,1819F-1823F,1825F-1829F

Issue Date: 03/04/2025

Ref. No.: PO. No. 4601005329 dated 07.03.2024

Sampling done by: Nitya Laboratories

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Sl. No:	Stack / Unit	Date of Sampling	Ambient Air Temp.	Sampling Temp. (0C)	Flow rate Result (Nm3/Hr)	PM (mg/Nm3)	H2S (mg/Nm3)
1	PWI LS 110 (PDPP INC - 01)	21-03-2025	37.2	260.5	174300.0	ND (DL-5)	N.A
2	LS021A (PDPP INC - 02)	21-03-2025	37.2	354.2	111294.5	ND (DL-5)	N.A
3	CH21 (CDU - II)	21-03-2025	35.4	158.0	180866.9	4.7	4.1
4	CH22 (CDU - II)	21-03-2025	35.3	155.1	74071.0	7.9	4.9
5	CH223 (CDU - II)	21-03-2025	35.8	115.8	254292.3	6.6	5.7
6	HRSG 3 (IUS HRSG 05LZ554)	22-03-2025	34.5	77.1	311960.9	8	N.A.
7	HRSG 5 (IUS HRSG 05LZ554)	22-03-2025	35.3	80.0	294770.4	15	N.A.
8	UB 12 (Boiler) (IUS UB12 LZ08)	22-03-2025	34.3	49.6	284693.3	21	N.A.
9	UB 13 (Boiler) (IUS UB12 LZ08)	22-03-2025	34.0	41.6	321423.4	17	N.A.
10	DCU-1 (Delayed Coker Unit - 01)	24-03-2025	32.2	139.9	249397.0	ND (DL-5)	ND (0.1)
11	DCU-2 (Delayed Coker Unit - 02)	24-03-2025	33.0	107.4	262960.1	ND (DL-5)	ND (0.1)
12	BS-101 (Biturox)	24-03-2025	33.9	48.8	31157.0	8.9	ND (0.1)
13	FH-01 (FCCU)	24-03-2025	28.2	80.6	53821.2	ND (DL-5)	N.A
14	FH03/COB (FCCU)	24-03-2025	34.1	76.4	187420.9	ND (DL-5)	N.A
15	PFCCU-Heater (IFH 002)	25-03-2025	37.3	263.1	80169.4	5.4	ND (0.1)
16	PFCCU-Regen. (IFLS 001)	25-03-2025	36.8	215.1	285805.9	7.2	ND (0.1)
17	DHDT (Diesel Hydro Treater) (IGH	25-03-2025	28.6	178.6	185389.7	4.4	N. A
18	VGO-HDT (Vacuum Gas Oil Hydro Treater) (IVH 101/201)	25-03-2025	35.1	168.4	135883.8	5.7	N. A
19	CDU-III (ICH 101/102)	25-03-2025	31.2	80.0	860582.0	6.8	3.6
20	SRU III Train A (IS LZ 102)	26-03-2025	31.2	273.1	133660.6	12	3.3
21	SRU III Train B (IS LZ 202)	26-03-2025	32.3	301.8	117961.8	14	2.7
22	DS-X-002 (SRU - 01)	26-03-2025	33.8	603.6	48090.5	19	4.0
23	MSBP _ HOH (Hot Oil Heater)	26-03-2025	34.6	194.8	349024.9	ND (DL-5)	ND (0.1)
24	MRH 01/02/03/04 (MSBP _ CCR)	26-03-2025	35.6	197.3	152233.7	9.6	N.A

TC-14814

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Stack Emission Monitoring Report for the Month of March 2025

ULR No.	TC148142500001723F-1726F,1730F-1734F 1810F-1814F,1819F-1823F,1825F-1829F	Issued To M/s Bharat Petroleum Corporation Limited Kochi Refinery Ambalamugal, Kochi, Pin-682 302
Issue Date:	03/04/2025	

Ref. No.: PO. No. 4601005329 dated 07.03.2024

Sampling done by: Nitya Laboratories

Sl. No:	Stack / Unit	Date of Monitoring / Sampling	Time of Monitoring	Lab Id. Code / No:	Analysis Started on (date)	Analysis completed on (date)
1	PWI LS 110 (PDPP INC - 01)	21-03-2025	10:15AM	S/03/1	27-03-2025	02-04-2025
2	LS021A (PDPP INC - 02)	21-03-2025	11:42 AM	S/03/2	27-03-2025	02-04-2025
3	CH21 (CDU - II)	21-03-2025	02:10 PM	S/03/3	27-03-2025	02-04-2025
4	CH22 (CDU - II)	21-03-2025	03:20PM	S/03/4	27-03-2025	02-04-2025
5	CH223 (CDU - II)	21-03-2025	11:55 AM	S/03/5	27-03-2025	02-04-2025
6	HRSG 3 (IUS HRSG 05LZ554)	22-03-2025	10:50AM	S/03/6	27-03-2025	02-04-2025
7	HRSG 5 (IUS HRSG 05LZ554)	22-03-2025	02:10 PM	S/03/7	27-03-2025	02-04-2025
8	UB 12 (Boiler) (IUS UB12 LZ08)	22-03-2025	12:20 PM	S/03/8	27-03-2025	02-04-2025
9	UB 13 (Boiler) (IUS UB12 LZ08)	22-03-2025	11:40 AM	S/03/9	27-03-2025	02-04-2025
10	DCU-1 (Delayed Coker Unit - 01) (IDH 101)	24-03-2025	09:10 AM	S/03/10	27-03-2025	02-04-2025
11	DCU-2 (Delayed Coker Unit - 02) (IDH 102)	24-03-2025	03:40 PM	S/03/11	27-03-2025	02-04-2025
12	BS-101 (Brturox)	24-03-2025	04:20 PM	S/03/12	27-03-2025	02-04-2025
13	FH01 (FCCU)	24-03-2025	10:40 AM	S/03/13	27-03-2025	02-04-2025
14	FH03/COB (FCCU)	24-03-2025	12:20 PM	S/03/14	27-03-2025	02-04-2025
15	PFCCU-Heater (IFH 002)	25-03-2025	10:40 AM	S/03/15	27-03-2025	02-04-2025
16	PFCCU-Regen. (IFLS 001)	25-03-2025	03:30 PM	S/03/16	27-03-2025	02-04-2025
17	DHDT (Diesel Hydro Treater) (IGH 101/102)	25-03-2025	03:50 PM	S/03/17	27-03-2025	02-04-2025
18	VGO-HDT(Vacuum Gas Oil Hydro Treater)	25-03-2025	04:20 PM	S/03/18	27-03-2025	02-04-2025
19	CDU-III (ICH 101/102)	25-03-2025	10:30 AM	S/03/19	27-03-2025	02-04-2025
20	SRU III Train A (IS LZ 102)	26-03-2025	9:50 AM	S/03/20	27-03-2025	02-04-2025
21	SRU III Train B (IS LZ 202)	26-03-2025	10:10 AM	S/03/21	27-03-2025	02-04-2025
22	DS-X-002 (SRU - 01)	26-03-2025	02:10 PM	S/03/22	27-03-2025	02-04-2025
23	MSBP _ HOH (Hot Oil Heater)	26-03-2025	03:45 PM	S/03/23	27-03-2025	02-04-2025
24	MRH 01/02/03/04 (MSBP _ CCR)	26-03-2025	04:35 PM	S/03/24	27-03-2025	02-04-2025

Instruments used for Monitoring				
Stack Monitoring kit, with all assembly Make: Enviro Instruments	Calibrated on	05-03-2025	Calibration due on	06-03-2026

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TC-14814

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Stack Emission Monitoring Report for the Month of March 2025

Test Report No.: 2025032*0110-134
Issue Date: 03/04/2025

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref. No.: PO. No. 4601005326 dated 07.03.2024
Sampling done by: Nitya Laboratories

Sl. No.	Stack / Unit	Date of Sampling	Ambient Air Temp.	Sampling Temp. (0C)	Flow rate Result (Nm3/Hr)	SO2 (mg/Nm3)	NOx (mg/Nm3)	CO (mg/Nm3)	Ni + V (mg/Nm3)	O2 %
1	PW LS 110 (PDPP INC - 01)	21-03-2025	37.2	260.5	174300.9	3.9	41	16	ND (DL-0.5)	4.8
2	LS021A (PDPP INC - 02)	21-03-2025	37.2	354.2	111294.5	3.0	78	9	ND (DL-0.5)	4.3
3	CH21 (CDU - II)	21-03-2025	35.4	158.0	180655.9	26.4	49	4.0	ND (DL-0.5)	7.8
4	CH22 (CDU - II)	21-03-2025	35.3	155.1	74071.0	35.9	109	1	ND (DL-0.5)	7.6
5	CH223 (CDU - II)	21-03-2025	35.6	115.6	254292.3	65.9	49	2	ND (DL-0.5)	8.5
6	HRSG 3 (IUS HRSG 05LZ564)	22-03-2025	34.5	77.1	311960.9	7.5	27.9	ND (DL-1)	ND (DL-0.5)	16.5
7	HRSG 5 (IUS HRSG 05LZ564)	22-03-2025	35.3	80.9	294770.4	ND (DL-1)	14	ND (DL-1)	ND (DL-0.5)	14.6
8	UB 12 (Boiler) (IUS UB12 LZ06)	22-03-2025	34.3	49.6	284660.3	136	184	ND (DL-1)	ND (DL-0.5)	13.6
9	UB 13 (Boiler) (IUS UB12 LZ06)	22-03-2025	34.0	41.6	321423.4	12	7.2	ND (DL-1)	ND (DL-0.5)	13.7
10	DCU-1 (Delayed Coker Unit - 01) (DH 101)	24-03-2025	32.2	139.9	249367.0	28	129	ND (DL-1)	ND (DL-0.5)	7.6
11	DCU-2 (Delayed Coker Unit - 02) (DH 102)	24-03-2025	33.0	107.4	262960.1	7.9	124	ND (DL-1)	ND (DL-0.5)	13.3
12	BS-101 (Bitumen)	24-03-2025	33.9	48.8	31157.0	32.8	90.9	ND (DL-1)	ND (DL-0.5)	16
13	FH-01 (FCCU)	24-03-2025	28.2	86.6	53821.2	12	98.9	10	ND (DL-0.5)	12.4
14	FH03/COB (FCCU)	24-03-2025	34.1	76.4	187420.9	118	106	12	ND (DL-0.5)	14.2
15	PFCCU-Heater (IFH 002)	25-03-2025	37.3	263.1	80169.4	15.9	12.7	19	ND (DL-0.5)	4.6
16	PFCCU-Regen. (IFLS 001)	25-03-2025	36.8	215.1	285805.9	20.8	24.9	1	ND (DL-0.5)	5.8
17	DHDT (Diesel Hydro Treater) (GH 101/102)	25-03-2025	28.6	178.6	165389.7	5	30	38	ND (DL-0.5)	6.9
18	VGO-HDT (Vacuum Gas Oil Hydro Treater) (VH 101/201)	25-03-2025	35.1	166.4	135883.8	6.1	27	1	ND (DL-0.5)	8.6

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Stack Emission Monitoring Report for the Month of March 2025

Test Report No. 202503210110-134
Issue Date: 03/04/2025

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref. No.: PO. No. 4601005329 dated 07.03.2024
Sampling done by: Nitya Laboratories

19	CDU-III (ICH 101/102)	25-03-2025	31.2	80.0	860582.0	32	40	1	ND (DL-0.5)	6.5
20	SRU III Train A (IS LZ 102)	26-03-2025	31.2	273.1	133660.6	1247	14	16	ND (DL-0.5)	7.5
21	SRU III Train B (IS LZ 202)	26-03-2025	32.3	301.6	117961.8	1288	23	159	ND (DL-0.5)	7.4
22	DS-X-002 (SRU - 01)	26-03-2025	33.8	603.6	48090.5	16258	56	1696	ND (DL-0.5)	5.2
23	MSBP _ HOH (Hot Oil Heater)	26-03-2025	34.6	194.8	349024.9	5.8	80	1	ND (DL-0.5)	7.6
24	MRH 01/02/03/04 (MSBP _ CCR)	26-03-2025	35.6	197.3	152233.7	3.8	16.8	ND (DL-1)	ND (DL-0.5)	7.4

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Treated Effluent Water Analysis Report for the Month of March 2025

ULR No TC148142500001824F Issue Date 03/04/2025	Issued To M/s Bharat Petroleum Corporation Limited Kochi Refinery Ambalamugal, Kochi, Pin-682 302
Ref. No : PO No. 4601005329 dated 07.03.2024 Sampling done by Nitya Laboratories	

Sl. No:	Parameter	Unit	Value reported	Limits as per notification- GSR 186 (E) dt. 18.03.2008	Test Method
1	pH	**	7.59	6 - 8.5	IS 3025 (P-11)
2	Oil & Grease	mg/l	2.0	5.0	IS 3025 (P-39)
3	BOD (3days) 27^{0}C	mg/l	12	15.0	IS 3025 (P-44)
4	Total Suspended Solids (TSS)	mg/l	14	20.0	IS 3025 (P-17)
5	Phenols	mg/l	ND	0.4	IS 3025 (P-43)
6	Sulfides	mg/l	0.20	0.5	IS 3025 (P-29)
7	Chemical Oxygen Demand (COD)	mg/l	60	125.0	IS 3025 (P-58)
8	Cyanide (CN)	mg/l	ND	0.2	IS 3025 (P-27)
9	Ammonia as Nitrogen	mg/l	0.20	15.0	IS 3025 (P-34)
10	Total Kjeldahl Nitrogen (TKN)	mg/l	0.84	40.0	IS:3025 (P-34)
11	Phosphate (P)	mg/l	ND	3.0	IS 3025 (P-31)
12	Chromium (Cr) (Hexavalent)	mg/l	ND	0.1	APHA 23rd Ed
13	Chromium (Cr) (Total)	mg/l	ND	2.0	APHA 23rd Ed
14	Lead (Pb)	mg/l	ND	0.1	APHA 23rd Ed
15	Mercury (Hg)	mg/l	ND	0.0	APHA 23rd Ed
16	Zinc (Zn)	mg/l	ND	5.0	APHA 23rd Ed
17	Nickel (Ni)	mg/l	ND	1.0	APHA 23rd Ed
18	Copper Cu)	mg/l	ND	1.0	APHA 23rd Ed
19	Vanadium (V)	mg/l	ND	0.2	IS 3025 (P-56)
20	Benzene	mg/l	ND	100.0	USEPA-8270C
21	Benzo (a) - Pyrene	mg/l	ND	200.0	USEPA-8270C

Remark:
ND-Not Detected DL-Detection Limit

.... End of the Report ....

TC-14814

(AUTHORISED SIGNATORY)

(RAVINDER MITTAL)

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Ambient Air Quality Monitoring Report for the Month of March 2025 of AAQM – 01

ULR No. TC148142500001628F-1629F,1727F-1728F 1799F-1800F
Issue Date: 03-04-2025

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref. No.: PO. No. 4601005329 Dated 07.03.2024
Sampling done by: Nitya Laboratories

24 hrs. Ambient Air Sampling Particulars

Sampling Method: IS 5182 (P-14)
Sampling Location: 3.5m above the ground level
Sampling Protocol: CPCB Guidelines

Sampling Locations	PDY	CDU-III	UB-12,13	HRSG-3,4	PFCCU Cabin Area	DCU
Dates of monitoring	21-03-2025	21-03-2025	22-03-2025	22-03-2025	24-03-2025	24-03-2025
Time of monitoring	11.20 AM	11:40 AM	10.50 AM	11:40 AM	11.10 AM	10:25 AM
Sample ID	AAQ1	AAQ2	AAQ3	AAQ4	AAQ5	AAQ6
Sample receipt Ref. No. with Date	NL/101/21-03-25	NL/108/30-12-24	NL/105/22-03-25	NL/106/22-03-25	NL/103/24-03-25	NL/104/24-03-25
Sample receiving Date	27-03-2025	27-03-2025	27-03-2025	27-03-2025	27-03-2025	27-03-2025
Analysis starting Date	27-03-2025	27-03-2025	27-03-2025	27-03-2025	27-03-2025	27-03-2025
Analysis completion Date	02-04-2025	02-04-2025	02-04-2025	02-04-2025	02-04-2025	02-04-2025
Ambient condition	Normal	Normal	Normal	Normal	Normal	Normal
Amb. Temp.	26	26	24	24	23	23
Rel. Humidity %	69	69	74	74	71	71

Remarks:
ND-Not Detected, DL-Detection Limit

..... End of the Report.....

(CHECKED BY)
(SANDEEP SAINI)

TC-14814

NITYA LABORATORIES Authorised

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Ambient Air Quality Monitoring Report for the Month of March 2025 of AAQM – 01

ULR No: TC146142500001815F-1816F
Issue Date: 03-04-2025

Issued To
M/s Bharat Petroleum Corporation Limited
Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Ref. No. PO No. 4601005329 Dated 07.03.2024

Sampling done by: Nitya Laboratories

24 hrs. Ambient Air Sampling Particulars

Sampling Method: IS 5182 (P-14)
Sampling Location: 3.5m above the ground level
Sampling Protocol: CPCB Guidelines

Sampling Locations	VGO HDT	Pet-Coke dome area
Dates of monitoring	25-03-2025	25-03-2025
Time of monitoring	11.10 AM	12.15 PM
Sample ID	AAQ7	AAQ8
Sample receipt Ref. No. with Date	NL/107/30-12-24	NL/102/25-03-25
Sample receiving Date	27-03-2025	27-03-2025
Analysis starting Date	27-03-2025	27-03-2025
Analysis completion Date	02-04-2025	02-04-2025
Ambient condition	Normal	Normal
Amb. Temp.	27	25
Rel. Humidity %	71	72

Remark:
NO-Not Detected, DL-Detection Limit

..... End of the Report.....

(CHECKED BY)
(SANDEEP SAINI)

TC-14814

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Ambient Air Quality Monitoring Report for the Month of March 2025 of AAQM – 01

ULR No: TC148142500001626F-1629F,1727F-1728F 1799F	Issued To
Issue Date: 03-04-2025	M/s Bharat Petroleum Corporation Limited Kochi Refinery Ambalamugal, Kochi, Pin-682 302

Sl. No:	Parameters	Sampling Locations with Results					Units	Limit	Test method	LOQ
		PDY	CDU-III	UB-12,13	HRSG-3,4	PFCCU Cabin Area				
1	Sulphur dioxide	16.60	21.10	18.20	19.20	20.40	µg/m3	80	IS:5182(P-2)	DL-6
2	Nitrogen dioxide	21.20	24.90	24.20	22.30	27.60	µg/m3	80	IS:5182(P-6)	DL-5
3	Respirable Particulate Matter (Size less than 10µm) or PM10	43.20	55.10	42.10	50.60	61.10	µg/m3	100	IS:5182(P-23)	DL-10
4	Respirable Particulate Matter (Size less than 2.5µm) or PM 2.5	28.50	35.20	27.60	30.60	35.50	µg/m3	60	40CFR Appendix L Part 53 CPCB Guidelines	DL-10
5	Ozone(O3)	16.20	18.40	16.50	16.20	20.50	µg/m3	100	IS:5182(P-9)	DL-10
6	Ammonia (NH3)	26.20	30.60	26.10	24.50	30.40	µg/m3	400	Method of Air Sampling & Analysis CPCB Guidelines	DL-5
7	Carbon Monoxide (CO)	0.52	0.46	0.52	0.52	0.52	mg/m3	2	IS:5182 (P-10)	DL-0.1
8	Lead (Pb)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	1	NL/SOP/AAQ-11	DL-0.5
9	Nickel (Ni)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ng/m3	20	NL/SOP/AAQ-13	DL-1.0
10	Arsenic (As)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	6	NL/SOP/AAQ-12	DL-0.5
11	Benzene (C6H6)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	5	IS:5182 (P-11)	DL-0.5
12	Benzo (a) Pyrene (Particulate phase)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	1	IS:5182 (P-12)	DL-0.5

Remark:
ND-Not Detected; DL-Detection Limit

.... End of the Report.....................

(CHECKED BY)
(SANDEEP SAINI)

TC-14814

NITYA LABORATORIES Authorised

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Ambient Air Quality Monitoring Report for the Month of March 2025 of AAQM – 01

ULR No. TC148142500001800F, 1815F-1816F
Issue Date: 03-04-2025

Issued To
M/s Bharat Petroleum Corporation Limited

Kochi Refinery
Ambalamugal, Kochi, Pin-682 302

Sl. No.	Parameters	Sampling Locations with Results			Unit	Limit	Test Method	LOQ
		DCU	VGO HDT	Pet-Coke dome area				
1	Sulphur dioxide	19.30	20.60	17.10	µg/m3	80	IS:5182(P-2)	DL-6
2	Nitrogen dioxide	25.10	23.40	24.10	µg/m3	80	IS:5182(P-6)	DL-5
3	Respirable Particulate Matter (Size less than 10µm) or PM10	58.10	26.40	46.20	µg/m3	100	IS:5182(P-23)	DL-10
4	Respirable Particulate Matter (Size less than 2.5µm) or PM 2.5	38.10	34.60	32.10	µg/m3	60	40CFR Appendix L Part 53 CPCB Guidelines	DL-10
5	Ozone(O3)	24.00	19.20	18.90	µg/m3	100	IS:5182(P-9)	DL-10
6	Ammonia (NH3)	28.10	31.20	26.00	µg/m3	400	Method of Air Sampling & Analysis CPCB Guidelines	DL-5
7	Carbon Monoxide (CO)	0.46	0.74	0.46	mg/m3	2	IS:5182 (P-10)	DL-0.1
8	Lead (Pb)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	1	NL/SOP/AAQ-11	DL-0.5
9	Nickel (Ni)	ND (DL-1.0)	ND (DL-1.0)	ND (DL-1.0)	ng/m3	20	NL/SOP/AAQ-13	DL-1.0
10	Arsenic (As)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	6	NL/SOP/AAQ-12	DL-0.5
11	Benzene (C6H6)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	µg/m3	5	IS:5182 (P-11)	DL-0.5
12	Benzo (a) Pyrene (Particulate phase)	ND (DL-0.5)	ND (DL-0.5)	ND (DL-0.5)	ng/m³	1	IS:5182 (P-12)	DL-0.5

Remark:
ND-Not Detected, DL-Detection Limit

..... End of the Report.....

(CHECKED BY)
(SANDEEP SAINI)

TC-14814

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Hazardous waste Disposal data for the year 2024 - 25

Hazardous waste disposed to TSDF (2024 - 25)

SNo	HAZARDOUS WASTE MATERIALS to TSDF	Quantity in (M.T)												Item total in year
		Apr. 24	May. 24	Jun. 24	Jul. 24	Aug. 24	Sept. 24	Oct. 24	Nov. 24	Dec. 24	Jan. 25	Feb. 25	Mar. 25	
1	PHCCU / FCCU Catalyst fines	0	0	0	52.58	83.12	0	0	20.8	52.98	23.98	0	71.72	355.18
2	Oily Sludge (Tank sludge) / S/D sludge / ROOM Cirfe sludge	0	0	0	0	9.75	0	51.29	0	0	54.4	103.84	117.9	337.08
3	Bio-remidiated sludge	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Insulation Waste (Glass wool)	0	42.28	85.7	0	47.38	40.66	293.49	102.74	26.03	22.93	0	0	661.21
5	Insulation Waste (Perlite)	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Spent Clay	0	61.83	39.65	27.66	28.4	0.00	0	63.57	34.11	17.76	46.58	0	319.56
7	Cooling Tower Chemically Treated Timber, fills & Fap	0	0	0	0	8.00	4.04	0	0	0	0	0	0	12.04
8	RO OM / NHT CCR Poly Propylene filter material	0	0	0	0	0	0	7.02	7.06	0	0	0	0	14.08
9	RO OM Poly Amide Membrane material	0	0	0	0	0	0	8.92	9.49	0	0	0	0	18.41
10	Asbestos / Refractory waste	0	0	0	0	0	0	31.13	0	0	21.39	6.89	0	59.41
11	Spent Catalyst / Adsorbent (Alumina - Silica)	0	15.31	32.45	130.85	19.09	9.76	0	0	9.00	16.52	8.51	0	241.29
12	Alumina Balls / Alumina Dessicant	0	0	0	0	14.87	0	0	0	0	5.91	0	0	20.78
13	Reformer Tube Catalyst R 67 N HGU	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Lubes Additives	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Spent Charcoal to TSDF	0	0	0	5.9	0	0	7.74	0	21.95	0	18.47	0	54.06
16	Spent Coke	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Spent Molecular Sieves	0	0	0	0	0	0	0	0	0	0	0	0	0
18	Spent Resin	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Sulfur Guard N HGU / Chloride Guard	0	0	0	0	0	0	20.49	0	0	0	0	0	20.49
20	Waste Bituminous Oil: (Litres)	0	0	0	0	0	0	0	0	0	0	0	0	0
21	Haz. Chemical Drums/ Tins / Bags	0	0	10.64	0	1.79	0	13.43	11.85	0	9.27	5.34	17.05	69.35
22	Non spec Acrylic Acid Polymer waste	0	67.77	35.63	10.49	29.98	0	37.69	37.63	11.23	11.7	59.5	84.41	386.03
23	Polymer waste (SAP)	0	0	0	0	0	0	6.18	0	0	0	0	0	6.18
24	Soiled Sulfur / TGTU Column sludge	0	0	0	49.2	21.67	0	0	0	41.37	78.65	20.15	0	211.04
25	Fluroct Lights / CFL / Cable insulation Waste	0	0	0	0	0	0	0	0	0	0	0	0	0
	total Hazardous waste transported out of your premises during the reporting period	0	187.19	204.07	276.68	264.05	54.46	477.28	253.12	196.67	306.31	269.28	291.08	2780.19
1	ETP Oily / Chemical Sludge to DCU (m3)	1047	494	578	367	935	798	671	864	1373	1106	916	908	10057
2	ETP - 4 _ Slop Oil transferred to ACTP (KL)	4755	7254	7177	6112	7364	10319	7833	5964	8509	9577	7942	13135	95921

Hazardous waste to Product / domestic usage

1	Spent Charcoal to DCU coke	0	0	20	0	0	0	0	0	0	0	0	0	20
													total	20

RECYCLE VALUE SPENT CATALYST to Recyclers.

SNo	RECYCLING SPENT CATALYST	VALUES (M.T)												Item total in year
		Apr. 24	May. 24	Jun. 24	Jul. 24	Aug. 24	Sept. 24	Oct. 24	Nov. 24	Dec. 24	Jan. 25	Feb. 25	Mar. 25	
2	VGO HDS Spent Catalyst	0	0	289.79	0	0	0	0	0	0	0	0	0	289.79
3	DHDT Spent Catalyst	0	0	265.55	0	0	0	0	0	0	0	0	0	265.55
	TGTU Spent catalyst	0	0	65.41	0	0	0	0	0	0	0	0	0	65.41
	Total Hazardous Spent Catalyst to Recyclers	0	0	620.75	0	0	0	0	0	0	0	0	0	620.75

QUALITY CONTROL DEPARTMENT
BPCL-KOCHI REFINERY, AMBALAMUGAL

DRINKING WATER TEST REPORT

Date of Sample: 09.10.2024 Source: Canteen KR.TECH.QC.26.DRINK.WATR

Sl No:	Test Parameters	Unit	Method	Result	Acceptabl
1	Colour	Color units	IS 3025 (P:4)	2	5 (Max)
2	Odour	-	IS 3025 (P:5)	Agreeable	Agreeable
3	Taste	-	IS 3025 (P:7 & 8)	Agreeable	Agreeable
4	Turbidity	NTU	IS 3025 (P:10)	BDL (MDL- 1.0)	1 (Max)
5	pH	-	IS 3025 (P:11)	7.6	6.5 – 8.5
6	Total Hardness (as CaCO3)	mg/L	IS 3025 (P:21)	26	200 (Max)
7	Total Dissolved Solids	mg/L	IS 3025 (P:16)	20	500 (Max)
8	Chloride (as Cl)	mg/L	IS 3025 (P:32)	21	250 (Max)
9	Free Residual Chlorine	mg/L	IS 3025 (P:26)	0.25	0.2 (Min)
10	Nitrate (as NO3)	mg/L	IS 3025 (P:34)	BDL (MDL- 0.1)	45 (Max)
11	Sulphate (as SO4)	mg/L	IS 3025 (P:24)	22	200 (Max)
12	Phenolic compounds (as C6H5OH)	mg/L	IS 3025 (P:43)	BDL(MDL-0.001)	0.001(Max)
13	Ammonia (as Total NH3-N)	mg/L	IS 3025 (P:34)	BDL (MDL-0.5)	0.5 (Max)
14	Sulphide (as H2S)	mg/L	IS 3025 (P:29)	BDL (MDL-0.05)	0.05 (Max)
15	Cyanide (as CN)	mg/L	IS 3025 (P:27)	BDL (MDL-0.01)	0.05 (Max)
16	Silver (as Ag)	mg/L	IS13428 Annexe J	0.005	0.1 (Max)
17	Aluminium (as Al)	mg/L	IS 3025 (P:55)	0.01	0.03 (Max)
18	Boron (as B)	mg/L	IS 3025 (P:57)	0.005	0.5 (Max)
19	Barium (as Ba)	mg/L	IS13428 Annexe F	0.05	0.7 (Max)
20	Calcium (as Ca)	mg/L	IS 3025 (P:40)	5	75 (Max)
21	Cadmium (as Cd)	mg/L	IS 3025 (P:41)	0.0001	0.003 (Max)
22	Chromium (as Cr)	mg/L	IS 3025 (P:52)	0.001	0.05 (Max)
23	Copper (as Cu)	mg/L	IS 3025 (P:42)	0.001	0.05 (Max)
24	Iron (as Fe)	mg/L	IS 3025 (P:53)	0.06	(0.3max)
25	Magnesium (as Mg)	mg/L	IS 3025 (P:46)	0.6	30 (Max)
26	Manganese (as Mn)	mg/L	IS 3025 (P:59)	0.005	0.1 (Max)
27	Nickel (as Ni)	mg/L	IS 3025 (P:54)	0.001	0.02 (Max)
28	Molybdenum (as Mo)	mg/L	IS 3025 (P:02)	0.001	0.07 (Max)
29	Lead (as Pb)	mg/L	IS 3025 (P:47)	0.001	0.01 (Max)
30	Zinc (as Zn)	mg/L	IS 3025 (P:49)	0.04	5 (Max)
31	Arsenic (as As)	mg/L	IS 3025 (P:37)	BDL(MDL0.0001)	0.01 (Max)
32	Mercury (as Hg)	mg/L	IS 3025 (P:48)	BDL(MDL0.0001)	0.001(Max)
33	Selenium (as Se)	mg/L	IS 3025 (P:56)	0.001	0.01 (Max)
34	Antimony (as Sb)	mg/L	APHA:3113B	0.001	

BDL: Below Detection Limit
MDL: Minimum Detection Limit

S.Mahamed Iqbal
Sr.Manager (Quality Control)

QUALITY CONTROL DEPARTMENT
BPCL-KOCHI REFINERY, AMBALAMUGAL

DRINKING WATER TEST REPORT

Date of Sample: 27.1.2025 Source: Canteen KR.TECH.QC.26.DRINK.WATR

Sl No:	Test Parameters	Unit	Method	Result	Acceptable
1	Colour	Color units	IS 3025 (P:4)	3	5 (Max)
2	Odour	-	IS 3025 (P:5)	Agreeable	Agreeable
3	Taste	-	IS 3025 (P:7 & 8)	Agreeable	Agreeable
4	Turbidity	NTU	IS 3025 (P:10)	BDL (MDL- 1.0)	1 (Max)
5	pH	-	IS 3025 (P:11)	7.4	6.5 – 8.5
6	Total Hardness (as CaCO3)	mg/L	IS 3025 (P:21)	29	200 (Max)
7	Total Dissolved Solids	mg/L	IS 3025 (P:16)	28	500 (Max)
8	Chloride (as Cl)	mg/L	IS 3025 (P:32)	24	250 (Max)
9	Free Residual Chlorine	mg/L	IS 3025 (P:26)	0.28	0.2 (Min)
10	Nitrate (as NO3)	mg/L	IS 3025 (P:34)	BDL (MDL- 0.1)	45 (Max)
11	Sulphate (as SO4)	mg/L	IS 3025 (P:24)	20	200 (Max)
12	Phenolic compounds (as C6H5OH)	mg/L	IS 3025 (P:43)	BDL(MDL-0.001)	0.001(Max)
13	Ammonia (as Total NH3-N)	mg/L	IS 3025 (P:34)	BDL (MDL-0.5)	0.5 (Max)
14	Sulphide (as H2S)	mg/L	IS 3025 (P:29)	BDL (MDL-0.05)	0.05 (Max)
15	Cyanide (as CN)	mg/L	IS 3025 (P:27)	BDL (MDL-0.01)	0.05 (Max)
16	Silver (as Ag)	mg/L	IS13428 Annexe J	0.005	0.1 (Max)
17	Aluminium (as Al)	mg/L	IS 3025 (P:55)	0.01	0.03 (Max)
18	Boron (as B)	mg/L	IS 3025 (P:57)	0.005	0.5 (Max)
19	Barium (as Ba)	mg/L	IS13428 Annexe F	0.05	0.7 (Max)
20	Calcium (as Ca)	mg/L	IS 3025 (P:40)	5	75 (Max)
21	Cadmium (as Cd)	mg/L	IS 3025 (P:41)	0.0001	0.003 (Max)
22	Chromium (as Cr)	mg/L	IS 3025 (P:52)	0.001	0.05 (Max)
23	Copper (as Cu)	mg/L	IS 3025 (P:42)	0.001	0.05 (Max)
24	Iron (as Fe)	mg/L	IS 3025 (P:53)	0.06	(0.3max)
25	Magnesium (as Mg)	mg/L	IS 3025 (P:46)	0.6	30 (Max)
26	Manganese (as Mn)	mg/L	IS 3025 (P:59)	0.005	0.1 (Max)
27	Nickel (as Ni)	mg/L	IS 3025 (P:54)	0.001	0.02 (Max)
28	Molybdenum (as Mo)	mg/L	IS 3025 (P:02)	0.001	0.07 (Max)
29	Lead (as Pb)	mg/L	IS 3025 (P:47)	0.001	0.01 (Max)
30	Zinc (as Zn)	mg/L	IS 3025 (P:49)	0.04	5 (Max)
31	Arsenic (as As)	mg/L	IS 3025 (P:37)	BDL(MDL0.0001)	0.01 (Max)
32	Mercury (as Hg)	mg/L	IS 3025 (P:48)	BDL(MDL0.0001)	0.001(Max)
33	Selenium (as Se)	mg/L	IS 3025 (P:56)	0.001	0.01 (Max)
34	Antimony (as Sb)	mg/L	APHA:31138	0.001	

BDL: Below Detection Limit
MDL: Minimum Detection Limit

S.Mahamed Iqbal
Sr.Manager (Quality Control)

QUALITY CONTROL DEPARTMENT
BPCL-KOCHI REFINERY, AMBALAMUGAL

DRINKING WATER TEST REPORT

Date of Sample: 18.2.2025 Source: Canteen KR.TECH.QC.26.DRINK.WATR

Sl No:	Test Parameters	Unit	Method	Result	Acceptable
1	Colour	Color units	IS 3025 (P:4)	3	5 (Max)
2	Odour	-	IS 3025 (P:5)	Agreeable	Agreeable
3	Taste	-	IS 3025 (P:7 & 8)	Agreeable	Agreeable
4	Turbidity	NTU	IS 3025 (P:10)	BDL (MDL- 1.0)	1 (Max)
5	pH	-	IS 3025 (P:11)	7.6	6.5 – 8.5
6	Total Hardness (as CaCO3)	mg/L	IS 3025 (P:21)	32	200 (Max)
7	Total Dissolved Solids	mg/L	IS 3025 (P:16)	26	500 (Max)
8	Chloride (as Cl)	mg/L	IS 3025 (P:32)	22	250 (Max)
9	Free Residual Chlorine	mg/L	IS 3025 (P:26)	0.23	0.2 (Min)
10	Nitrate (as NO3)	mg/L	IS 3025 (P:34)	BDL (MDL 0.1)	45 (Max)
11	Sulphate (as SO4)	mg/L	IS 3025 (P:24)	17	200 (Max)
12	Phenolic compounds (as C6H5OH)	mg/L	IS 3025 (P:43)	BDL(MDL-0.001)	0.001(Max)
13	Ammonia (as Total NH3-N)	mg/L	IS 3025 (P:34)	BDL (MDL-0.5)	0.5 (Max)
14	Sulphide (as H2S)	mg/L	IS 3025 (P:29)	BDL (MDL-0.05)	0.05 (Max)
15	Cyanide (as CN)	mg/L	IS 3025 (P:27)	BDL (MDL-0.01)	0.05 (Max)
16	Silver (as Ag)	mg/L	IS13428 Annexe J	0.005	0.1 (Max)
17	Aluminium (as Al)	mg/L	IS 3025 (P:55)	0.01	0.03 (Max)
18	Boron (as B)	mg/L	IS 3025 (P:57)	0.005	0.5 (Max)
19	Barium (as Ba)	mg/L	IS13428 Annexe F	0.05	0.7 (Max)
20	Calcium (as Ca)	mg/L	IS 3025 (P:40)	5	75 (Max)
21	Cadmium (as Cd)	mg/L	IS 3025 (P:41)	0.0001	0.003 (Max)
22	Chromium (as Cr)	mg/L	IS 3025 (P:52)	0.001	0.05 (Max)
23	Copper (as Cu)	mg/L	IS 3025 (P:42)	0.001	0.05 (Max)
24	Iron (as Fe)	mg/L	IS 3025 (P:53)	0.06	(0.3max)
25	Magnesium (as Mg)	mg/L	IS 3025 (P:46)	0.5	30 (Max)
26	Manganese (as Mn)	mg/L	IS 3025 (P:59)	0.005	0.1 (Max)
27	Nickel (as Ni)	mg/L	IS 3025 (P:54)	0.001	0.02 (Max)
28	Molybdenum (as Mo)	mg/L	IS 3025 (P:02)	0.001	0.07 (Max)
29	Lead (as Pb)	mg/L	IS 3025 (P:47)	0.001	0.01 (Max)
30	Zinc (as Zn)	mg/L	IS 3025 (P:49)	0.04	5 (Max)
31	Arsenic (as As)	mg/L	IS 3025 (P:37)	BDL(MDL0.0001)	0.01 (Max)
32	Mercury (as Hg)	mg/L	IS 3025 (P:48)	BDL(MDL0 0001)	0.001(Max)
33	Selenium (as Se)	mg/L	IS 3025 (P:56)	0.001	0.01 (Max)
34	Antimony (as Sb)	mg/L	APHA:3113B	0.001	

BDL: Below Detection Limit
MDL: Minimum Detection Limit

S.Mahamed Iqbal
Sr.Manager (Quality Control)

QUALITY CONTROL DEPARTMENT
BPCL-KOCHI REFINERY, AMBALAMUGAL

DRINKING WATER TEST REPORT

Date of Sample: 19.3.2025 Source: Canteen KR.TECH.QC.26.DRINK.WATR

Sl No:	Test Parameters	Unit	Method	Result	Acceptable
1	Colour	Color units	IS 3025 (P:4)	4	5 (Max)
2	Odour	-	IS 3025 (P:5)	Agreeable	Agreeable
3	Taste	-	IS 3025 (P:7 & 8)	Agreeable	Agreeable
4	Turbidity	NTU	IS 3025 (P:10)	BDL (MDL- 1.0)	1 (Max)
5	pH	-	IS 3025 (P:11)	7.7	6.5 – 8.5
6	Total Hardness (as CaCO3)	mg/L	IS 3025 (P:21)	30	200 (Max)
7	Total Dissolved Solids	mg/L	IS 3025 (P:16)	29	500 (Max)
8	Chloride (as Cl)	mg/L	IS 3025 (P:32)	27	250 (Max)
9	Free Residual Chlorine	mg/L	IS 3025 (P:26)	0.25	0.2 (Min)
10	Nitrate (as NO3)	mg/L	IS 3025 (P:34)	BDL (MDL- 0.1)	45 (Max)
11	Sulphate (as SO4)	mg/L	IS 3025 (P:24)	19	200 (Max)
12	Phenolic compounds (as C6H5OH)	mg/L	IS 3025 (P:43)	BDL(MDL-0.001)	0.001(Max)
13	Ammonia (as Total NH3-N)	mg/L	IS 3025 (P:34)	BDL (MDL-0.5)	0.5 (Max)
14	Sulphide (as H2S)	mg/L	IS 3025 (P:29)	BDL (MDL-0.05)	0.05 (Max)
15	Cyanide (as CN)	mg/L	IS 3025 (P:27)	BDL (MDL-0.01)	0.05 (Max)
16	Silver (as Ag)	mg/L	IS13428 Annexe J	0.005	0.1 (Max)
17	Aluminium (as Al)	mg/L	IS 3025 (P:55)	0.01	0.03 (Max)
18	Boron (as B)	mg/L	IS 3025 (P:57)	0.005	0.5 (Max)
19	Barium (as Ba)	mg/L	IS13428 Annexe F	0.05	0.7 (Max)
20	Calcium (as Ca)	mg/L	IS 3025 (P:40)	5	75 (Max)
21	Cadmium (as Cd)	mg/L	IS 3025 (P:41)	0.0001	0.003 (Max)
22	Chromium (as Cr)	mg/L	IS 3025 (P:52)	0.001	0.05 (Max)
23	Copper (as Cu)	mg/L	IS 3025 (P:42)	0.001	0.05 (Max)
24	Iron (as Fe)	mg/L	IS 3025 (P:53)	0.06	(0.3max)
25	Magnesium (as Mg)	mg/L	IS 3025 (P:46)	0.5	30 (Max)
26	Manganese (as Mn)	mg/L	IS 3025 (P:59)	0.005	0.1 (Max)
27	Nickel (as Ni)	mg/L	IS 3025 (P:54)	0.001	0.02 (Max)
28	Molybdenum (as Mo)	mg/L	IS 3025 (P:02)	0.001	0.07 (Max)
29	Lead (as Pb)	mg/L	IS 3025 (P:47)	0.001	0.01 (Max)
30	Zinc (as Zn)	mg/L	IS 3025 (P:49)	0.04	5 (Max)
31	Arsenic (as As)	mg/L	IS 3025 (P:37)	BDL(MDL0.0001)	0.01 (Max)
32	Mercury (as Hg)	mg/L	IS 3025 (P:48)	BDL(MDL0.0001)	0.001(Max)
33	Selenium (as Se)	mg/L	IS 3025 (P:56)	0.001	0.01 (Max)
34	Antimony (as Sb)	mg/L	APHA:3113B	0.001	

BDL: Below Detection Limit
MDL: Minimum Detection Limit

S.Mahamed Iqbal
Sr.Manager (Quality Control)

QUALITY CONTROL DEPARTMENT

BHARAT PETROLEUM CORPORATION LIMITED - KOCHI REFINERY

QC/51/18

Date08/11/24.

Please find below the Analysis report of Bore well water samples collected in the month of Oct. 2024.

Date	Bore well Nos.	Oil %	Remarks
19.10.2024	BW 46,25,54,48,24,26,27,44,23,28,45,,30,49	NIL	OK
25.10.2024	BW 70,30,4,28,29,45,34,4,44,3,46,48,2	NIL	OK

Bore well No.	COD in mg/l
24	13

Bore Well No.	COD in mg/l
45	13

Mahamed Iqbal. S
Senior Manager (QC)

To: DGM (QC) (r) GM (OM&S) (r) GM I/C (I/C HSE)

Cc: CGM (Tech)

	QUALITY CONTROL DEPARTMENT
	BHARAT PETROLEUM CORPORATION LIMITED - KOCHI REFINERY

QC/51/18

Date09/12/24.

Please find below the Analysis report of Bore well water samples collected in the month of Nov. 2024.

<table>
<tr><th>Date</th><th>Bore well Nos.</th><th>Oil %</th><th>Remarks</th></tr>
<tr><td>16.11.2024</td><td>BW 45,21,49,44,19,20,334,18,4,70,39,8,16,54,17,57
<table><tr><td>Bore well No.</td><td>COD in mg/l</td></tr><tr><td>19</td><td>14</td></tr></table></td><td>NIL</td><td>OK</td></tr>
<tr><td>28.11.2024</td><td>BW 33,70,39,8,26,48,54,50,48,45,25,24
<table><tr><td>Bore Well No.</td><td>COD in mg/l</td></tr><tr><td>26</td><td>13</td></tr></table></td><td>NIL</td><td>OK</td></tr>
</table>

Mahamed Iqbal. S
Senior Manager (QC)

To: DGM (QC) (r) GM (OM&S) (r) GM I/C (I/C HSE)

Cc: CGM (Tech)

Bharat Petroleum	QUALITY CONTROL DEPARTMENT
	BHARAT PETROLEUM CORPORATION LIMITED - KOCHI REFINERY

QC/51/18

Date12/2/25.

Please find below the Analysis report of Bore well water samples collected in the month of JAN. 2025.

<table>
<tr><th>Date</th><th>Bore well Nos.</th><th>Oil %</th><th>Remarks</th></tr>
<tr><td>15.1.2025</td><td>BW16,39,57,33,48,17,54,18,8,13,19,70,44,45,4
<table><tr><td>Bore well No.</td><td>COD in mg/l</td></tr><tr><td>18</td><td>14</td></tr></table></td><td>NIL</td><td>OK</td></tr>
<tr><td>23.1.2025</td><td>BW 7,12,39,15,54,14,2,34,8,70,4,11,3,43,49,7,13
<table><tr><td>Bore Well No.</td><td>COD in mg/l</td></tr><tr><td>39</td><td>12</td></tr></table></td><td>NIL</td><td>OK</td></tr>
</table>

Mahamed Iqbal. S
Senior Manager (QC)

To: DGM (QC) (r) GM (OM&S) (r) GM I/C (I/C HSE)

Cc: CGM (Tech)

QUALITY CONTROL DEPARTMENT

BHARAT PETROLEUM CORPORATION LIMITED - KOCHI REFINERY

QC/51/18

Date10/4/25.

Please find below the Analysis report of Bore well water samples collected in the month of MARCH. 2025.

Date	Bore well Nos.	Oil %	Remarks
7.3.2025	BW:43,49,7,70,11,15,8,33,54,14,12,39,13 Bore well No. 43 — COD in mg/l 15	NIL	OK
14.3.2025	BW:18,16,54,39,33,46,17,8,50,7,48,70,45,4,2 Bore Well No. 46 — COD in mg/l 14	NIL	OK

Mahamed Iqbal. S
Senior Manager (QC)

To: DGM (QC) (r) GM (OM&S) (r) GM I/C (I/C HSE)

Cc: CGM (Tech)

Health surveillance data for the period 01/10/2024 to 31/03/2025

Health Surveillance Data (01/10/2024 to 31/03/2025)		
1	No of persons undergone comprehensive health check up	Total: 628 Completed: 628
2	No of Audiometry Test Conducted (%)	Total: 388 Completed: 388 Percentage: 100 %
3	No of people undergone comprehensive blood testing	Total: 511 Completed: 511 Percentage: 100 %
4	No of employees undergone statutory eye check-up (%)	Total: 66 Completed: 66 Percentage: 100%
5	No of employees who have done statutory urine phenol test.	No. of samples tested : 122
6	Number of Contract Employees covered under Statutory Health check-up Plan.	Total: 626 Completed: 626 Percentage: 100%
7	Number of Health Talks Conducted(Cumulative)	18
8	Injury on Duty Employees	Total: 3 Minor: 1 First Aid: 2
9	Injury on Duty Contract Workers	Total: 18 Minor: 7 First Aid: 11
10	Diabetic Clinic	Not yet started
11	Cardiac Clinic	3