JINDAL
COKE LIMITED

JCL/JRD/ENV/2024-25/08

Date:31.05.2024

To

Deputy Director General of Forests (C)
Ministry of Environment, Forest & Climate Change
Regional Office (EZ)
A/3, Chandrasekharpur
**Bhubaneswar-751023**

**Sub: Half Yearly Compliance Report of Environment Clearance for the period from October, 2023 to March, 2024.**

**Ref: 1.** Environment Clearance vide Letter No. IA-J-11011/111/2018-IA-II(I), dated 9th May 2022 for Expansion of Coke production from 0.425 MTPA to 0.78 MTPA by installation of a new Stamp charged by-product recovery type Coke Oven Battery.

2. Environment Clearance vide Letter No . IA-J-11011/111/2018-IA-II(I), dated 25.05.2018 for 0.425 MTPA Coke Oven Battery (Recovery Type).

Dear Sir,

With reference to the above Environment Clearances, please find enclosed herewith the half yearly compliance of the stipulated conditions for the period from October, 2023 to March, 2024.

The soft copy of the same has also been sent to email –id *roez.bsr-mef@nic.in.*

Thanking You,

Yours faithfully,
For **Jindal Coke Limited**

**Deepak Agiwal**
**Head - COBP**

GOVT. OF INDIA
MoEF & CC Integrated R.O.
Bhubaneswar-751023
31 MAY 2024
RECEIVED

Enc: As Above

**CC:**

1. The Director, Industry – I, MOEF&CC, Indira Paryavaran, Jor Bagh Road, Aliganj, New Delhi – 110003.
2. The In-Charge, Central Pollution Control Board, 502, Southernd Conclave 1582, Rajdanga Main Road, Kolkata – 700017.

# M/S. JINDAL COKE LIMITED

# HALF YEARLY EC COMPLIANCE REPORT

OCTOBER, 2023 TO MARCH, 2024


**M/s. JINDAL COKE LIMITED**
**Kalinganagar Industrial Complex**
**Duburi, Dist. Jajpur - 755026, Orissa, India**
**Tel: +91 06726 266260 Fax: +91 06726 266006**
**E-mail: info@jindalcoke.com**

**Status of compliance report of Environment Clearance conditions of 0.425 MTPA Coke Oven Battery (Recovery type)**
**Ref: IA-J-11011/111/02018-1A II (I), dt. 25th May 2018**

## A. SPECIFIC CONDITIONS:

| S. No. | Condition | Compliance |
|---|---|---|
| i. | The Industry shall follow coke oven standards as per Environment (P) Act, 1986. VOCs from the coke oven shall be monitored and controlled as per CPCB guideline | • Coke Oven standard as per EP Act and MoEF&CC notification for Iron & Steel dated 31st March 2012 is being followed.<br>• VOC from coke oven battery stack is being monitored by NABL Accredited Laboratory. The latest monitoring report is enclosed as **Annexure – I.** |
| ii. | Bag filter shall be installed to control the emissions from the coal crusher section, charging fume car section of the Coke Oven Plant. Online continuous monitoring system shall be installed to monitor various pollutants and data submitted to the Ministry's Regional Office at Bhubaneswar, CPCB and OPCB. Dust suppression system shall be installed at raw material handling areas, material transfer points and solid waste dumps to control fugitive emissions. Water sprinkling shall be done on the roads to control fugitive emissions. | • Bag filter having adequate capacity has been installed at Primary coal crusher, secondary coal crusher section and coke crushing section of the Coke Oven Plant<br>• Online continuous monitoring system has been installed at battery stack of Coke Oven and data is being transmitted to SPCB & CPCB uninterrupted.<br>• M type gas transfer car has been installed at the existing unit to control process emission during charging. Dust suppression & extraction system has also been installed at raw material handling areas, material transfer points to control fugitive dust emission.<br>• The entire internal road is paved and water sprinkling is being done to control fugitive emission. |
| iii. | No ground water shall be used for the plant. All the treated waste water shall be recycled and reused in the process and 'Zero' discharge shall be strictly adopted as per direction of OPCB. Phenolic effluent from Coke Oven complex shall be treated in the ETP of BOD Plant and recycled and reused for quenching of coke. Ammonia, Phenol and Cyanide in the effluent should be treated. | No ground water is being used in the plant.<br><br>Effluent generated from process is being treated in BOD Plant for all pollutant including ammonia, phenol & cyanide and the treated water is completely reused for coke quenching.<br><br>The treated effluent is being monitored parameters like Ammonia, Phenol and Cyanide, TDS etc. from internal as well as external approved laboratory. The monitoring report is enclosed as **Appendix-A.** |

| S. No. | Condition | Compliance |
|---|---|---|
| | Cyanide shall meet the standard of 0.2 ppm.TDS in the effluent shall not be more than 2100 mg/l. The domestic waste water after treatment in STP shall be used for green belt development. | |
| iv. | Coke oven by-product effluent shall be treated as per notified standards and only treated effluents after meeting the norms shall be used for coke quenching. No fresh water shall be used for this purpose. | Coke oven by-product treated effluent from BOD plant is being analyzed by NABL accredited third party laboratory on monthly basis and the result is found to be within the permissible limit. The treated water is being used in coke quenching. The monitoring report is enclosed as **Appendix – A.** |
| v. | Ground water monitoring around the solid waste disposal site/ secured landfill (SLF) shall be carried out regularly and report submitted to the Ministry's Regional Office at Bhubaneswar / CPCB and OPCB. | There is no solid waste landfill site constructed in JCL. Ground water monitoring is carried out in core zone as well as peripheral areas and analysis report is enclosed as **Appendix-A.**<br><br>BOD sludge is completely reused in process. |
| vi. | Solid waste shall be disposed of in secured landfill designed as per the specifications of the CPCB. Coke breeze from Coke oven shall be sold to the parent company (JSL) for recycling | Process Solid waste generated from JCL is being completely reused into the process.<br><br>Coke breeze from Coke oven is being sold to outside sinter plant for recycling. |
| vii. | Green belt shall be developed within and around the plant premises as per the CPCB guidelines in consultation with DFO. | Greenbelt has been developed with native species |
| iii. | As, proposed, modified wet quenching for 1st Coke oven battery as per CPCB guidelines shall be adopted. | Wet quenching is installed for existing unit. & Installation of Coke Dry Quenching (CDQ) along with WHRB is under progress for the proposed expansion project. Post installation, this will cater the requirement for quenching of Coke generated from the operation of both existing Battery #1 & Battery #2. |

**B. GENERAL CONDITIONS:**

| S. No. | Condition | Compliance |
|---|---|---|
| i. | The project authorities must strictly adhere to the stipulations made by the Orissa Pollution Control Board (OPCB) and the | All the stipulations made by Orissa Pollution Control Board is being complied. |

| S. No. | Condition | Compliance |
|---|---|---|
| | State Government. | |
| ii. | No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment and Forests. | The unit has obtained EC, CTE and CTO for expansion project from 0.425 MTPA to 0.78 MTPA. Any further expansion shall be in accordance with the prevailing guidelines from Ministry of Environment, Forests & Climate Change. |
| iii. | The gaseous emissions from various process units shall conform to the load/ mass-based standards notified by this Ministry on 19th May, 1993 and standards prescribed from time to time. The state board 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 emission level shall go beyond the prescribed standards. On-line continuous monitoring system shall be installed in stacks to monitor SPM and interlocking facilities shall be provided so that process can be automatically stopped in case emission level exceeds the limit. NOx burners shall be installed to control Nox levels. | • The gaseous emissions from coke oven battery stacks are being monitored internally as well as by NABL Accredited third party Laboratory. The analysis reports are being submitted to SPCB and MoEF&CC regularly.<br>• Online continuous emission monitoring system has been installed Coke Oven battery stack to monitor PM, SO2 & NOx.<br>• The NOx monitored in online and offline found well within the stipulated limit. |
| iv. | At least four ambient air quality-monitoring stations shall be established in the downward direction as well as where maximum ground level concentration of SPM, $SO_2$ and $NO_x$ is anticipated in consultation with the OPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bhubaneswar/ OPCB/ CPCB once in six months. | • One no. of continuous ambient air quality station has been installed in JCL which cater the requirement of downwind installation.<br>• For upwind installation there are 3 no. of stations which share the common boundary of JSL & JCL to monitor PM10, PM2.5, Sox & NOx.<br>• All data are continuously transmitted to OSPCB & CPCB and submitted periodically to MoEF&CC.<br>• Both the manual and online monitoring report of Stack & ambient air quality is |

| S. No. | Condition | Compliance |
|---|---|---|
| | | enclosed as ***Appendix-A and Appendix-B*** *respectively.* |
| v. | In-plant control measures for checking fugitive emissions from all the vulnerable sources of Coke oven area shall also be provide. De-dusting system i.e. collection of fugitive emissions through suction hood and subsequent treatment through bag filter or any other device and finally emitted through a stack of appropriately designed and height conforming to the standards shall be provided. Fugitive emissions shall be controlled, regularly monitored and records maintained. | • Dedusting systems (Bag filters) have been installed in coal crushing and coke screening operations to minimize fugitive emission.<br><br>• Fugitive emission monitoring is being carried out by internal as well as NABL Accredited external Laboratory. The monitoring data for the is enclosed as **Appendix – A**. |
| vi. | Industrial waste water shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. The treated waste water shall be utilized for plantation purpose. | Effluent generated from process is being treated in BOD Plant for all pollutant including ammonia, phenol & cyanide and the treated water is completely reused for coke quenching. |
| vii. | The overall noise levels in and around the plant area shall be kept 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 EIA Rules, 1989 viz. 75 dBA (daytime) and 70 (dBA) night time. | Adequate measures like Silencers, Acoustic Enclosures are provided to noise generating equipments like Diesel Generator set etc. to control the noise generation.<br><br>The Ambient Noise levels are being monitored and the noise monitoring results are enclosed as ***Appendix-A.*** |
| viii. | The company shall develop surface water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table. | Surface runoffs from all source of JCL complex are routed through storm water drains for further treatment in common Surface Runoff Treatment System (SRTS) of JSL group companies. Further, the treated water from SRTS is stored in a settling pit for further reuse inside the plant. |

| S. No. | Condition | Compliance |
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| | | |
| ix. | Occupational Health Surveillance of the workers shall be done on a regular basis and record maintained as per the Factories Act. | Occupational health surveillance of the workers is being carried out on a regular basis and records are being maintained as per the Factories Act. |
| x. | Recommendations made in the CREP guidelines issued for the steel plants shall be implemented. | CREP guidelines are being followed. The recommendation made in the Chapter on Corporate Responsibility for Environment Protection (CREP) is followed regarding control of air pollution, installation of state of art air pollution control equipment. Pollution control equipments are installed as per CREP Guidelines of CPCB, such as bag filters, Effluent Treatment Plant etc. |
| xi. | The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/ EMP report for Coke oven plant. | The Plant has taken all the environmental protection measures and safeguards recommended in the EIA/EMP report.<br><br>The details are enclosed as - **Annexure II.** |
| xii. | The project authorities shall utilize Rs. 6.0 Crores earmarked for the environment pollution control measures judiciously 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 conditions stipulated herein. The funds so provided shall not be diverted for other purpose. | The project has earmarked the cost incurred for environment pollution control and judiciously implementing the control measures. Till date JCL has spent Rs.57 crore in pollution control measure. A detailed breakup of the spent cost is mentioned below.<br>Environment Control Cost / Capital (in Cr)<br>Water: 40.0<br>Air: 12.0<br>Solid waste: 1.0<br>Green belt: 0.5<br>Online monitoring: 1.5<br>Surface runoff management: 2.0<br>Public Hearing Commitment: 1.79 |
| xiii. | The regional office of the Ministry at Bhubaneswar/ CPCB/ OPCB will monitor the stipulated conditions. A six-monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly. | Six monthly compliance report along with monitored data is being submitted to the Ministry regularly. The last compliance report was submitted on 29.05.2023. |

| S. No. | Condition | Compliance |
|---|---|---|
| xiv. | The project proponent shall inform to the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the OPCB/ Committee and may also be seen at Website of the Ministry of Environment and Forests at http/envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the regional Office. | The grant of Environment clearance was advertised in two daily newspapers. In English at Orissa post and in regional language in Prameya on 25.05.2018. The advertisement was published within 7 days of grant of EC. |
| xv. | 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 plant (Battery -1) is in operation and OSPCB has granted CTO via letter no. 3686/IND-I-CON-6566 dated 15.03.2023 valid up to 31.03.2025.<br><br>Battery 2 is also in operation and OSPCB has granted CTO via letter no. 6523/IND-I-CON-6566 dated 30.04.2024 valid up to 31.03.2025. |
| xvi. | The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory. | **Noted.** |
| xvii. | The Ministry reserves the right to stipulate additional conditions if found necessary. The company in a time bound manner will implement these conditions | **Noted.** |
| xviii. | The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the | All the prevailing acts under the provision Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Waste (Management & Handling) Rules, 2016 and the Public (Insurance) Liability Act, 1991 along with their amendments and rules is being complied. |

| S. No. | Condition | Compliance |
|---|---|---|
| | Environment (Protection) Act, 1986, Hazardous Waste (Management & Handling) Rules, 2016 and the Public (Insurance) Liability Act, 1991 along with their amendments and rules. | |

**Status of compliance report of environment clearance conditions for Expansion of Coke production from 0.425 MTPA to 0.78 MTPA by installation of a new Stamp charged by-product recovery type Coke Oven Battery within the existing steel plant.**

**EC Identification No.: EC22A008OR150400**

**Ref: IA-J-11011/111/2018-IA-II(I), dated 9th May 2022**

## C. SPECIFIC CONDITIONS:

| S. No. | Condition | Compliance |
|---|---|---|
| i. | Coke Dry Quenching (CDQ) and Zero Liquid Discharge (ZLD) facilities shall be installed in the Coke Oven Plant as committed by PP. | Installation of Coke Dry Quenching (CDQ) along with WHRB is under progress. Post installation, this will cater the requirement for quenching of Coke generated from the operation of both existing Battery #1 & Battery #2.<br>After commissioning of CDQ, surplus effluent will be treated in ETP followed by RO system for further treatment. The treated water will be recycled back to the system. The ZLD facility will be operational by 2025. |
| ii. | Tar sludge from BOD plant of Coke Oven shall be reused in coke oven plant | Tar sludge generated from BOD plant of Coke Oven Battery is being reused in coke oven plant. |
| iii. | Coke Oven Gas shall be desulfurized | The coke oven gas is presently being desulfurized in Desulphurization unit. |
| iv. | Out of 24 acres area for green belt development, project proponent has developed green belt in 15 acres area. Remaining 9 acres area of green belt shall be completed by December, 2022. Three tier Green Belt shall be developed after consult with local forest department with native species all along the periphery of the project site of adequate width and tree density shall not be less than 2500 per ha. Survival rate of green belt developed shall be monitored on periodic basis to ensure that damaged plants are replaced with new plants in the subsequent years. | Green belt development inside JCL is in progress and will take full swing in coming monsoon to cover up rest areas as required.<br>The survival of the saplings is being closely monitored and replaced all the damaged plants with new saplings. |
| v. | Greening and Paving shall be implemented in the plant area to arrest soil erosion and dust pollution from exposed soil surface. | All the effort is being taken to control soil erosion. The roads are being paved and in vacant areas greeneries, landscaping and laws are being provided to control dust pollution. |

| S. No. | Condition | Compliance |
|---|---|---|
| vi. | PM10 values are almost near the threshold limit, the PP shall prepare and implement a project specific Air Quality Management Plan with best practices. Develop a control strategy and incorporates in the pollution control measures. Emission control measures related to transportation shall include with the use of cleaner fuels. | Ambient air quality is a combined effect of internal & external factors. To control internal factors dust extraction and suppression techniques are implemented wherever applicable.<br><br>The ambient air quality is being monitored through online and offline methods. |
| vii. | The progress made in the implementation of Corporate Environment Responsibility (CER) related activities shall be submitted along with six monthly compliance report to the concerned IRO and also be uploaded on the company web site. | The implementation status of the Corporate Environment Responsibility (CER) related activities are enclosed as Annexure – II. |
| viii. | All stockyards shall be having impervious flooring and shall be equipped with water spray system for dust suppression. Stock yards shall also have garland drains to trap the run off material. | Storm water drains all along the JCL complex have been constructed and inter connected. Surface runoffs from all source of JCL complex are routed through these storm water drains for further treatment in common SRTS of JSL group of companies. |
| ix. | All internal roads and connecting roads from project site to main highway shall be developed and maintained with suitable Million Axle Standard (MSA) as per the traffic load due to existing and proposed project | All the internal roads and connecting road from project site to main highway are made with RCC/PCC. |
| x. | Performance test shall be conducted on all pollution control systems every year and report shall be submitted to Regional Office of the MoEF&CC. | Pollution control system's efficiency is being cheeked regularly by analyzing the output of the system.<br>The detailed performance test by emplaned institute has been undertaken. |
| xi. | Particulate matter emission from stacks shall be less than 30 mg/Nm3. | Stack emission is within the stipulated standard of 50 mg/Nm3 as mentioned in CTO. The monitoring report is enclosed as Appendix – A.<br><br>To reduce further, utilization of Mixed gas is being explored. |
| xii. | Following additional arrangements to control fugitive dust shall be provided:<br>a. Fog / Mist Sprinklers at all conveyors point and on bulk raw material storage area (at the transfer points) like Iron Ore, Coal and for Fly | • The major raw material for the Coke making process is coking coal which is being transported through rail for which JSL group company has railway siding inside the plant premises. |

| S. No. | Condition | Compliance |
|---|---|---|
| | Ash and similar solid waste storage areas.<br><br>b. Proper covered vehicle shall be used while transport of materials.<br><br>c. Wheel Washing mechanism shall be provided in entry and exit gates with complete recirculation system. | • In coal storage yard water sprinkling system has been implemented<br>• The transportation of coal from Coal yard to Coke oven is being done through closed conveyor.<br>• However, mechanized wheel washing facility is available at the exit point of Common Raw Material Handling Section (CRMHS) and as per SOP all vehicles passes through wheel washing system. |

## D. SPECIFIC CONDITIONS:

| S. No. | Condition | Compliance |
|---|---|---|
| **I. Statutory compliance** | | |
| ix. | The Environment Clearance (EC) granted to the project/ activity is strictly under the provisions of the EIA Notification, 2006 and its amendments issued from time to time. It does not tantamount/ construe to approvals/ consent/ permissions etc., required to be obtained or standards/conditions to be followed under any other Acts/Rules/Subordinate legislations, etc., as may be applicable to the project. | **Noted.** |
| **II. Air quality monitoring and preservation** | | |

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|---|---|---|
| i | The project proponent shall install 24x7 continuous emission monitoring system at process stacks to monitor stack emission as well as 04 Nos. Continuous Ambient Air Quality Station (CAAQS) for monitoring AAQ parameters with respect to standards prescribed in Environment (Protection) Rules 1986 as amended from time to time. The CEMS and CAAQMS shall be connected to SPCB and CPCB online servers and calibrate these systems from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories. | CEMS have been installed existing Coke Oven Battery # 1 stack and connected to SPCB/CPCB servers.<br>• One no. of continuous ambient air quality station has been installed in JCL which cater the requirement of downstream installation.<br>• For upstream installation there are 3 no. of stations which share the common boundary of JSL & JCL to monitor PM10, PM2.5, Sox & NOx.<br>• All data are continuously transmitted to OSPCB & CPCB and submitted periodically to MoEF&CC.<br>Both the manual and online monitoring report of Stack & ambient air quality is enclosed as ***Appendix-A and Appendix-B*** *respectively.* |
| x. | The project proponent shall monitor fugitive emissions in the plant premises at least once in every quarter through laboratories recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories. | Fugitive emission monitoring at various locations of coke oven plant is being carried out through NABL accredited laboratory on monthly basis. |
| xi. | Sampling facility at process stacks and at quenching towers shall be provided as per CPCB guidelines for manual monitoring of emissions. | Sampling facility at process stacks of the unit is available and the sampling facilities where applicable will be provided in dry dust quenching system. |
| xii. | Appropriate Air Pollution Control (APC) system shall be provided for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed stack emission and fugitive emission standards. | Coke Oven Battery # 1 & Battery # 2 is equipped with natural draft system as per present available design of oven battery. dust generating from material handling systems like coal crusher, coke screening appropriate DE systems have been provided to mitigate fugitive dust emission. |
| xiii. | The project proponent shall provide leakage detection and mechanized bag cleaning facilities for better maintenance of bags. | The bag filters provided are equipped with mechanical bag cleaning which is interlocked with differential pressure of the bag. |

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| xiv. | Sufficient number of mobile or stationery vacuum cleaners shall be provided to clean plant roads, shop floors, roofs, regularly. | Vacuum road sweepers are provided for cleaning of plant roads, shop floors of Coke Oven Plant. |
| xv. | Recycle and reuse iron ore fines, coal and coke fines, lime fines and such other fines collected in the pollution control devices and vacuum cleaning devices in the process after briquetting/ agglomeration. | Coal and coke fines collected from pollution control devices are being reused in Coke oven plant in coke manufacturing. |
| xvi. | The project proponent use leak proof trucks/dumpers carrying coal and other raw materials and cover them with tarpaulin. | Coal is transported through rail and covered trucks. |
| xvii. | Facilities for spillage collection shall be provided for coal and coke on wharf of coke oven batteries (Chain conveyors, land based industrial vacuum cleaning facility). | Provision for spillage collection has been provided for coal and coke on wharf of coke oven battery. |
| xviii. | Land-based APC system shall be installed to control coke pushing emissions. | Jindal Coke Limited has installed double M-type gas transfer car that runs on oven top rail and the smoke generated during coal charging is being collected into gas collecting pipe from the oven being charged controlling the emission escape to atmosphere. Similar arrangement has been installed for new Battery-II. |
| xix. | Monitor CO, HC and O2 in flue gases of the coke oven battery to detect combustion efficiency and cross leakages in the combustion chamber. | VOC, CO & O2 monitoring at stack connected to Coke Oven Battery is being conducted periodically through NABL accredited third party laboratory.<br><br>Monitoring report is enclosed as annesure- Annexure –I. |
| xx. | Vapor absorption system shall be provided in place of vapour compression system for cooling of coke oven gas in case of recovery type coke ovens. | Vapor absorption system has been provided for cooling of Coke Oven gas |
| xxi. | Wind shelter fence and chemical spraying shall be provided on the raw material stock piles. | Coal is covered with tarpaulin. In addition, in dry season water sprinkling is being done at stock piles for mitigating any fugitive emission.<br>Installation of Wind fence or Chemical spray is being explored. |
| xxii. | Design the ventilation system for adequate air changes as per prevailing norms for all tunnels, motor houses, Oil Cellars. | Adequate ventilation measure has been taken for air changes for all tunnels, motor houses and shop cellars. |
| xiii. | Dry quenching (CDQ) system shall be installed along with power generation facility from waste heat recovery from hot coke | Dry quenching (CDQ) system along with WHRB is in progress for power generation from waste heat recovery from hot coke. |

| | | |
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| **III. Water quality monitoring and preservation** | | |
| i. | The project proponent shall provide appropriate ETP for effluents discharged from coke oven and by-product to meet the standards prescribed in G.S.R 277 (E) 31st March 2012 (applicable to Coke oven plants) as amended from time to time. | The effluent water generated from both existing Battery # 1 and Battery # 2 is being treated in the existing ETP of capacity 90 $M^3$/hr (2 x 45 $M^3$/hr). Continuous Effluent Quality Monitoring System (EQMS) has already been installed for Effluent Treatment Plant to monitor compliance prescribed in in G.S.R 277 (E) 31st March 2012 (ETP) and data is being sent to SPCB/CPSB server. |
| ii. | The project proponent shall monitor regularly ground water quality at least twice a year (pre- and post-monsoon) at sufficient numbers of piezometers/sampling wells in the plant and adjacent areas through labs recognized under Environment (Protection) Act, 1986 and NABL accredited laboratories. | Ground water quality inside plant and in nearby area is being monitored pre-monsoon & post monsoon. Report is annexed as **Appendix – A.** |
| iii. | Sewage Treatment Plant shall be provided for treatment of domestic wastewater to meet the prescribed standards. | • A common STP is in operation sharing both JSL & JCL manpower load.<br>• Additional soak pits have been provided at site.<br>• Modular STPs are being explored for ready installation for augmented requirement if any. |
| iv. | Garland drains and collection pits shall be provided for each stock pile to arrest the run-off in the event of heavy rains and to check the water pollution due to surface run off. | Storm water drains all along the JCL complex have been constructed and inter connected. Surface runoffs from all source of JCL complex are routed through these storm water drains for further treatment in common SRTS of JSL company. |
| v. | Water meters shall be provided at the inlet to all unit processes in the coke oven plants. | Water meter has been provided at all water inlet points. |
| **IV. Noise monitoring and prevention** | | |
| i. | Noise pollution shall be monitored as per the prescribed Noise Pollution (Regulation and Control) Rules, 2000 and report in this regard shall be submitted to Regional Officer of the Ministry as a part of six-monthly compliance report. | The monitoring of work zone noise level as well as ambient noise level is being carried out periodically and the monitoring data is annexed as **Appendix – A.** |

<table>
<tr><td colspan="3">V. Energy Conservation measures</td></tr>
<tr><td>i.</td><td>Provide solar power generation on roof tops of buildings, for solar light system for all common areas, street lights, parking around project area and maintain the same regularly;</td><td>Due to ongoing construction activity for expansion project, installation of roof top solar power project has not been physically initiated. However, preliminary assessment for putting solar panel in Coke oven has been undertaken and installation of approximately 130 KWp roof top solar panel is envisaged.</td></tr>
<tr><td>ii.</td><td>Provide LED lights in their offices and residential areas.</td><td>LED lights are provided at office area, roads and shop floors.</td></tr>
<tr><td colspan="3">VII. Green Belt</td></tr>
<tr><td>i.</td><td>The project proponent shall prepare GHG emissions inventory for the plant and shall submit the program for reduction of the same including carbon sequestration by trees.</td><td>GHG emissions inventory for the plant has been carried out for the FY 2022-23.<br><table><tr><td colspan="3">GHG Emission Intensity (TCO2e/T)</td></tr><tr><td rowspan="2">2022-23</td><td>Scope 1</td><td>0.177</td></tr><tr><td>Scope 2</td><td>0.073</td></tr></table><br>Detail reduction road map which mainly focusing on renewables and Dry quenching under preparation.</td></tr>
<tr><td>ii.</td><td>Project proponent shall submit a study report on Decarbonization program, which would essentially consist of company's carbon emissions, carbon budgeting/ balancing, carbon sequestration activities and carbon capture, use and storage and offsetting strategies. Further, the report shall also contain time bound action plan to reduce its carbon intensity of its operations and supply chains, energy transition pathway from fossil fuels to Renewable energy etc. All these activities/ assessments should be measurable and monitor able with defined time frames.</td><td>GHG inventorization of JCL has been completed and vetted by third Party assurance.<br><br>Roof top solar & CDQ will significantly contribute to GHG emission reduction. Details of project undertaken are enclosed as Annexure-III.</td></tr>
<tr><td colspan="3">VIII. Public hearing and Human health issues</td></tr>
<tr><td>i.</td><td>Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented</td><td>Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan has been implemented for the existing operation and same shall be followed for the expansion project.</td></tr>
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|---|---|---|
| ii. | The project proponent shall carry out heat stress analysis for the workmen who work in high temperature work zone and provide Personal Protection Equipment (PPE) as per the norms. | Heat Stress analysis for the workmen working in high temperature work zone is being carried out by third party and suitable Personal Protective Equipment (PPE) are being provided to the workman of Coke Oven.<br><br>Third party report is enclosed as Annexure – IV. |
| iii. | Occupational health surveillance of the workers shall be done on a regular basis and records maintained. | Annual health check up of workers of Coke Oven is being carried out and records are maintained. |
| **IX. Environment Management** | | |
| i. | The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No. 22-65/2017-IA.III dated 30/09/2020. As part of Corporate Environment Responsibility (CER) activity, company shall adopt nearby villages namely Siaria, Banshipur, Hudi Shai and Katipur. | Necessary initiative has been taken to adopt the villages as per the need base programme. |
| ii. | The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms / conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report. | Copy of the latest Quality, Environment, Occupational Health & Safety Policy of Jindal Coke Limited is attached as Annexure-V.<br><br>Copy of the Board resolution issued by Company Secretary certifying Mr. Deepak Kesharlal Agiwal as occupier of the company is attached as Annexure-VI. |
| iii. | A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization. | An Environment department with qualified and experienced officers under the leadership of Head Environment has been established. Head environment reports directly to Unit Head. |
| **X. Miscellaneous** | | |

| | | |
|---|---|---|
| i. | The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently. | Advertisement on grant of Environment Clearance had been published in newspapers namely The New Indian Express (English) and Prameya (Odia) on 14.05.2022. Environment Clearance is displayed in the website of the company permanently. |
| ii. | The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt. | The copies of the environmental clearance have been submitted to the Heads of local bodies, Panchayats. On 18.05.2022 vide our letter no. JCL/JRD/ENV/2022-23/04. |
| iii. | The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis. | Six-monthly compliance reports on the status of the compliance of the stipulated environmental conditions uploaded on company website and is being updated periodically. |
| iv. | The project proponent shall monitor the criteria pollutants level namely; PM10, SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company. | Ambient air and stack emission is being carried out and are displayed at the display board installed at main gate for public view. |
| v. | The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal. | Six-monthly reports on the status of the compliance of the stipulated environmental conditions is being submitted to MOEF&CC and also uploaded on MoEF&CC website. |
| vi. | The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company. | Environmental statement for each financial year in Form-V is being submitted to SPCB, Odisha in due time and last report was submitted to SPCB on 28.09.2023. |

| | | |
|---|---|---|
| vii. | The project proponent 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, commencing the land development work and start of production operation by the project. | The plant (Battery -1) is in operation and OSPCB has granted CTO via letter no. 3686/IND-I-CON-6566 dated 15.03.2023 valid up to 31.03.2025.<br><br>Battery 2 is also in operation and OSPCB has granted CTO via letter no. 6523/IND-I-CON-6566 dated 30.04.2024 valid up to 31.03.2025. |
| viii. | The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee. | All the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during presentation to the Expert Appraisal Committee is being complied.<br><br>Details is enclosed as annexure- II. |
| ix. | No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC). | Expansion project if any will be routed through the prevailing guideline of MoEF&CC. |
| x. | Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986. | **Noted** |
| xi. | The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory. | **Noted** |
| xii. | The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions. | **Noted** |
| xiii. | The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports. | Full cooperation will be extended to the officer (s) of the Regional Office of MoEF&CC. |
| xiv. | Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010. | **Noted** |

# LIST OF ENCLOSURES

| Sl. No. | Description | Annexure /Appendix |
|---|---|---|
| 1 | VOC, CO & O2 monitoring Report | Annexure - I |
| 2 | CER Compliance | Annexure - II |
| 3 | Report on De carbonization programme | Annexure - III |
| 4 | Heat Stress analysis report | Annexure - IV |
| 5 | QEOHS policy | Annexure - V |
| 6 | Board Resolution copy | Annexure - VI |
| 7 | Manual Monitoring Report | Appendix –A |
| 8 | Online Monitoring report | Appendix –B |

# Mitra S. K. Private Limited

**Address of Laboratory :**
Building No. P- 48, Udayan Industrial Estate,
3, Pagladanga Road, Kolkata 700015
West Bengal
Tel. : +91 7044036120
Email: udayanlab@mitrask.com

TC-6950

Scan for Portal

ULR: TC-695024000000413F

## TEST REPORT

**Name & Address of Customer :**

Jindal Coke Limited

Kalinga Nagar Industrial Complex Jajpur Odisha India Pin 755026

| | |
|---|---|
| **Report No. :** | MSKPL/ED/2023-24/28F0FX |
| **Date :** | 10/01/2024 |
| **Sample No. :** | MSKNB/ED/2023-24/12/QX5FFR |
| **Date of receipt of sample:** | 30/12/2023 |
| **Date(s) of performance:** | 30/12/2023 - 10/01/2024 |
| **Location of performance of** | Permanent Facility |
| **Reference No. & Date :** | 6200011876, Date - 21/12/2023 |
| **Discipline:** | Chemical |

*We hereby certify that the following sample Drawn by us has been analyzed with the following results:*

| | |
|---|---|
| **1. Group** | Atmospheric Pollution |
| **2. Description of sample** | Stack |
| **3. Unique Identification of sample(if any)** | NA |
| **4. Date of sampling** | 28/12/2023 |
| **5. Time of sampling** | 12.18 PM |
| **6. Place of sampling** | Coke Oven |
| **7. Environmental conditions during sampling & Transport** | (2 - 5) deg C Cold chain maintained |
| **8. Sampling Plan & Method used** | IS:11255(P-3), USEPA 18 & USEPA 31 |
| **9. Identification of the personnel performing sampling by MSK** | Subhrakanta Mohanty |
| **10. Field Equipments Used** | MSK/BBSR/FIELD/S-02 |

**Report No. :** MSKPL/ED/2023-24/28F0FX **Sample No. :** MSKNB/ED/2023-24/12/QX5FFR

## RESULT

| | | |
|---|---|---|
| **General Information about Stack** | | |
| 1 | Emmission due to | Burning of Diesel |
| 2 | Material of construction of stack | RCC |
| 3 | Shape of stack | Circular |
| 4 | Stack capacity | NA |
| 5 | Stack connected to | Coke Oven |
| 6 | Whether stack is provided with permanent platform | Yes |
| **Physical Characteristics of Stack** | | |
| 1 | Area of stack | 13.532 m2 |
| 2 | Diameter of the stack at sampling point | 4.15 m |
| 3 | Height of stack from ground level | 120 m |
| 4 | Height of the sampling point from GL | 37 m |
| **Pollution Control Device** | | |
| 1 | Details of pollution control devices attched with | NA |
| **Analysis/Characteristic of Stack** | | |

Reviewed By:
Signature :
Name : Mr. Bapsi Jana, Ms. Piali Ganguly
Designation : Executive Chemist

Authorized Signatory:
Signature :
Name : Mr. Bapsi Jana, Ms. Piali Ganguly
Designation : Executive Chemist

# Mitra S. K. Private Limited

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West Bengal
Tel. : +91 7044036120
Email: udayanlab@mitrask.com

TC-6950

Scan for Portal

**ULR:** TC-695024000000413F

**Report No. :** MSKPL/ED/2023-24/28F0FX

**Sample No. :** MSKNB/ED/2023-24/12/QX5FFR

## RESULT

| Analysis/Characteristic of Stack | | |
|---|---|---|
| 1 | Fuel consumption | NA |
| 2 | Fuel used | Coal |

**Chemical**

| SL No. | Parameter | Unit | Method | Value |
|---|---|---|---|---|
| 1 | 1,1,1,2-Tetrachloroethane | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 2 | 1,2,3-Trichlorobenzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 3 | 1,2,4-Trimethylbenzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 4 | 1,2-Dibromo-3-chloropropapane | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 5 | 1,3,5-Trimethylbenzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 6 | 1,4-Dichlorobenzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 7 | Benzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 8 | Bromobenzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 9 | Chlorobenzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 10 | Ethyl Benzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 11 | Hexachlorobutadiene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 12 | Isopropylbenzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 13 | M-Xylene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 14 | O-Xylene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 15 | P-Xylene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 16 | Sec-Butylbenzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 17 | Tert-Butylbenzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 18 | Toluene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 19 | Trichloroethylene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |
| 20 | n-Butylbenzene | mg/m3 | USEPA 18 & USEPA 31 | <0.01 |

**Sampling & Analysis of Gaseous Emission**

| SL No. | Parameter | Unit | Method | Value |
|---|---|---|---|---|
| 1 | Barometric pressure | mm of Hg | IS : 11255 (Part 3) | 751 |
| 2 | Flow Rate of the Flue Gas | Nm3/hr | IS : 11255 (Part 3) | 211910 |
| 3 | Temperature | Deg C | IS : 11255 (Part 3) | 208 |
| 4 | Velocity | m/s | IS : 11255 (Part 3) | 7.3 |

Reviewed By:
Signature :
Name : Mr. Bansi Jana, Ms. Piali Ganguly
Designation : Executive Chemist

Authorized Signatory:
Signature :
Name : Mr. Bansi Jana, Ms. Piali Ganguly
Designation : Executive Chemist

# Mitra S. K. Private Limited

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West Bengal
Tel. : +91 7044036120
Email: udayanlab@mitrask.com

TC-6950

Scan for Portal

**ULR:** TC-695024000000413F

**Opinion :** NA

**Statement of Conformity** NA

-------- END --------

Reviewed By:
Signature :
Name : Mr. Bansi Jana, Ms. Piali Ganguly
Designation : Executive Chemist

Authorized Signatory
Signature :
Name : Mr. Bansi Jana, Ms. Piali Ganguly
Designation : Executive Chemist





**Head Office:** Shrachi Centre (5th Floor), 74B, A.J.C. Bose Road, Kolkata - 700016, West Bengal, India.
Tel. : 91 33 40143000 / 22650007 Fax : 91 33 22650008
Email : info@mitrask.com Website : www.mitrask.com

## TEST REPORT

*ULR No:* **TC794423000001055F** *Date:* **05.03.2024**

| | | | | | |
|---|---|---|---|---|---|
| Name of the Industry | : | **M/s Jindal Coke Limited, Kalinga Nagar Industrial Complex, Jajpur, Odisha** | | | |
| Sample Code | : | **2023/ST/099/S1** | Date of Sampling | : | **23.02.2024** |
| | | | Sample Received on | : | **24.02.2024** |
| Sample Description | : | **Source Emission** | Sampling Procedure | : | VCSPL/SOP/003, Dt. 01.08.2019 |
| Identification by Customer | : | **ST-1** | Sampling Location | : | **Battery Stack – Coke Oven** |
| Sample Condition | ; | Air Tight Sealed and gaseous Sample Solution Refrigerated | Sampling done by | : | Chittoranjan Sahoo |
| | | | Sampling plan reference No. | : | 6200011032/ 29.05.2023 |
| Test Started on | : | **24.02.2024** | Test Completed on | : | **28.02.2024** |

**1. Chemical Testing**

***A. Atmospheric Pollution***

| | | |
|---|---|---|
| **A.** | **General Information :** | |
| 1. | Emission due to | Carbonization of coke |
| 2. | Material of construction of stack | R.C.C |
| 3. | Shape of stack | Circular |
| 4. | Whether stack is provided with permanent platform & Ladder | Yes |
| **B.** | **Physical Characteristics of Stack :** | |
| 1. | Height of stack from ground level | 120.0 m |
| 2. | Diameter of stack at sampling point | 4.15 m |
| 3. | Height of the sampling point from ground level | 36.5 m |
| 4. | Area of stack | 13.532 $m^2$ |
| **C.** | **Analysis/Characteristic of Stack :** | |
| 1. | Fuel used | Coal |
| 2. | Fuel Consumption | - |
| **D.** | **Pollution :** | |
| 1. | Details of pollution control devices attached with the stack | - |

**E. Results of sampling & Analysis of Gaseous emission :**

| Sl. No. | Parameters | Testing Method | Standard as per SPCB | Unit of Measurement | Analysis Results |
|---|---|---|---|---|---|
| 1. | Stack Temperature | IS 11255: Part-3, (2008) RA 2019 | -- | $^0K$ | **477** |
| 2. | Velocity | IS 11255: Part-3, (2008) RA 2019 | -- | m/sec | **6.9** |
| 3. | Quantity of gas flow | IS 11255: Part-3, (2008) RA 2019 | -- | $Nm^3/Hr$ | **209996** |
| 4. | Carbon Monoxide as CO | VCSPL/STACK-SOP/003 2019 | -- | ppm | **475.5** |
| 5. | Carbon dioxide as $CO_2$ | VCSPL/STACK-SOP/003 2019 | -- | % v/v | **7.2** |
| 6. | Oxygen as $O_2$ | VCSPL/STACK-SOP/003 2019 | -- | % v/v | **13.0** |
| 7. | Particulate Matter as PM | IS 11255: Part-I (1985), RA 2019 | **50.0** | $mg/Nm^3$ | **43.2** |
| 8. | Sulphur Dioxide as $SO_2$ | IS 11255: Part-2, 2019 | -- | $mg/Nm^3$ | **412.8** |
| 9. | Oxides of Nitrogen as NOx | IS 11255: Part-7, 2017 | -- | $mg/Nm^3$ | **178.4** |

*** End Report***

*Reviewed by*
*PriyankaPati*
*(Dy. Technical Manager)*

*Approved by*
*Soumendra manajit Biswal*
*(Authorized Signatory)*

*TERMS AND CONDITION:-*

1. The Test result is relevant only to the item tested.
2. This report shall not be reproduced in full or part without written approval of Visiontek consultancy services.(P) Ltd
3. The laboratory is not responsible for the authenticity of photocopied test report.
4. The test item will not be retained for more than 15 days from the date of issue of test report except in case as required by applicable regulations.
5. The laboratory's responsibility under this report is limited to; proven willful negligence.
6. Decision rule applied whenever the requirements/specification provided by customers/standard requirement.
7. The data and information (i.e., A. Atmospheric pollution 1 to 4), identified & provided by the customer, the laboratory did not provide the data & information required for the test report.




Plot No.-M-22&23, Chandaka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel.: 0674-3511721

E-mail : visiontek@visiontek.org, visiontekin@gmail.com, Visit us at: www.visiontek.org

Annexure - II

# CER Compliance

## Jindal Coke Limited

| Major Issue Raised | Action Plan | Time Line for Execution | | | Total Budget (Lakhs) | Spent as on date |
|---|---|---|---|---|---|---|
| | | Year 1st | Year 2nd | Year 3rd | | |
| **Area Development** | | | | | | |
| Development of park | Set up of park along with area development at two nos. of places. | Development of park with construction of tennis court at village panikoili.<br><br>**Status: The ground development Work has been successfully Completed at Panikoili.**<br><br>**GYM Equipment has been given at PAnikoili Sp Office** | Development of park at village Telibahali by construction of boundary wall, land scaping, Temple Development.<br><br>**Status: Park at telibahali has been developed by State Govt, However the Development of Mahapat temple is to be executed** | Continuation of Development work of park at village Telibahali by arrangement of permanent entire walkway, sitting arrangement.<br><br>**Status: The Work is yet to be initiated.** | 180 | 49 |
| Development of public community hall | New establishment of community hall at 5 nos. Of villages. | Set up in villages namely: Khurunti Malikasahi by providing new building with electrification.<br><br>**Status: towards development of public community hall,JCL has approached Khurunti Malikasahi village. The land of the proposed community hall is yet to be finalized by village representatives. After finalization of land, construction will be started.** | Set up in villages namely: Ostapal by providing new building with electrification.<br><br>**Status: Instead of Community Centre as per requested by villagers, Khudurukuni Puja mandap with Electrification has been done.** | Set up in villages namely: Karadapal, Suanlo by providing new Building with electrification.<br><br>**Status: new community center has been established with complete electrification. For village Suanlo, work for a new adivashisahi community center has been started.** | 60 | 29 |
| Plantation Activities in peripheral villages | Plantation drive at five numbers of village. | Village: Solei<br>**Status – Plantation has been carried out at Govt. Polytechnic college, Ragadi. -200 Nos.**<br>**Further, we shall make plantation in village solei & pataranga in consultation with local authority** | Village: Marutikar, Danagadi<br>**Status - At Kumbhiragadhia High School (Danagadi)-107 Nos of saplings have been planted.** | Village: Patrangi, Mantira:<br>**Status - At Manatira Sr. Secondary School-350Nos of saplings have been planted.** | 30 | 9 |
| **Medical Facilities** | | | | | | |
| Provision of health care facilities | Establishment of Homeopathic clinic at six numbers of viilages. | At village: Kumbirgadia, Marutikar Construction of building for homeopathic clinic along with supply of essential medicines.<br><br>**Status: The Homeopathy clinic at** | At village: Mantira, Olala Construction of building for homeopathic clinic along with supply of essential medicines.<br><br>**Status: The said Work is cancelled** | At village: Tikara, Danagadi Construction of building for homeopathic clinic along with supply of essential medicines.<br><br>Status: Work is yet to be initiated. | 70 | 16 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | **Kumbhiragadia and Classroom at marutikar(as requested by the Villagers) has been successfully Completed.** | **due to land issue at the village.** | | | |
| **Local Employment** | | | | | | |
| Provide employment with preference to local people | Priority to be given for local employment during both construction and operation phase. | During Construction phase it is envisaged for Direct employmentof 40 Nos. and Indirect employment of 200 Nos & during operation phase direct employment of 150 Nos.and Indirect employment of 120 Nos..<br><br>During construction phase 70% indirect employment and 30 % direct employment will be through local employment.<br><br>During operation phase 90 % indirect employment and 30% direct employment will be through local employment. | | | Jindal coke has given 27 nos. of direct employment and 304 nos. of direct employments locally within the state from 2022 onwards. | |
| **Education** | | | | | | |
| Renovation/Construction of additional new 2 Nos. of classrooms and electrification with sanitation facility at four nos. school. | | At village : Danagadi<br><br>**Status : Classroom and toilet of Sisumandir at Danagadi has been completed.** | At village : Kharadi, Kankadajhar:<br><br>**Status: Yet to be intiated** | At village : JK Road<br><br>**Status: Yet to be intiated** | 60 | 10 |
| Facilitate students in providing special training on Stainless Steel related works to make knowledgeable in getting jobs insteel sector. | | At : Ragadi Polytechnic College | As on 31st March 2024 high end training on Stainless Steel Welding has ben provided to 177 nos. of students of the govt. polytechnic, jajpur, ragadi persuing diploma course in mechanical/electrical branch(Final Year ) for enhancement of technical skill. | Shall Continue | 15 | |
| **Women Empowerment** | | | | | | |
| Strengthening of women empowerment measures in peripheral villages. | Focus on various livelihood programme for women empowerment in peripheral villages. | Livelihood promotion that includestailoring, beauty parlor, training, skilldevelopment training at village mantira.<br><br>**Status: Its ongoing as committed** | Livelihood promotion that includes dairy farming, paultry, goatery, wheatgrinding at village Jakhapura.<br><br>**Status: Its ongoing as committed** | Establishment of skill development center to provide training in Computer education, electrical, mechanical at village Trijanga (Dangadi).<br><br>**Status: Its ongoing as committed** | 150 | 35 |
| **Environment** | | | | | | |

| | | | | |
|---|---|---|---|---|
| Air and Water pollution control | Effective APC devices to be in place during plant operation and set up ofETP for treatment of process of effluent. No waste water discharge to be ensured. | Effective pollution control equipment s with interlocking facility with process to be in place for proposed expansion project. Continuous emission monitoring, ambient air quality monitoring and effluent quality monitoring to be done. Periodical Ambient air quality monitoring to be done in buffer zone of plant site. | As per EMP budget of plant | |
| **Total** | | | **565** | **148** |

**Annexure -V**

| DE-CARBONIZATION PROJECTS ON BEHALF OF JINDAL COKE LIMITED (FY 2023-24) | | | |
|---|---|---|---|
| **Sl No** | **Project Name** | **Carbon Abatement Potential in tCO2** | **Status/Timeline** |
| 1 | Installation of Coke Dry Quenching (CDQ) of 120 TPH and power generation of 12 MW from Waste Heat Recovery | 59,558 | On-going (Expected date of completion 30.09.2024) |
| 2 | 130 KWp of rooftop solar power plant | 150 | 30.04.2025 |
| | Total | 59,708 | |

# REPORT ON
# HEAT STRESS MEASUREMENT
# for

## M/s. JINDAL COKE LIMITED,

Kalinga Nagar Industrial Complex, Duburi, Jajpur-755026

**December, 2023**

**PREPARED BY:-**

M/s. Pollution And Project Consultants,
P – 145, Bangur Avenue, Block – A,
Kolkata – 700 055

| | | |
|---|---|---|
| **Name of the Factory** | : | **M/s. JINDAL COKE LIMITED,**<br>Kalinga Nagar Industrial Complex, Duburi, Jajpur-755026 |
| **Date of Execution of job** | : | 12th December, 2023 |

**Introduction**

M/s. Pollution And Project Consultants have been asked to carry out the measurement of Heat Stress. Accordingly, the Heat Stress measurements have been conducted with the use of Dry & Wet Bulb Thermometer and Heat Stress Globe attached with Glass Thermometer.

**Acknowledgement**

We acknowledge our sincere thanks and gratitude to the following persons for their co-operation and help to our sampling team during the survey.

i) All employees & management of Jindal Coke Limited, Kalinga Nagar Industrial Complex, Duburi, Jajpur-755026.

**Notes:**

Four locations were identified in consultation with the customer. The WBGT Effective ($WBGT_{eff}$) was found to be below the Threshold Limit Value (TLV).

However, work practice recommendations might include the following:

- Limit time in the heat and/or increase recovery time spent in a cool area.
- Use tools intended to minimize manual strain.
- Increase the number of workers per task.
- Train supervisors and workers about heat stress.
- Use a buddy system where workers observe each other for signs of heat-related illnesses.
- Require workers to conduct self-monitoring and create a work group (i.e., workers, a qualified healthcare provider, and a safety manager) to make decisions on self-monitoring options and standard operating procedures.
- Provide adequate amounts of cool, potable water near the work area and encourage workers to drink often.
- Use a heat alert program whenever the weather service forecasts a heat wave.

➢ Training

Train workers before hot outdoor work begins. Tailor the training to worksite conditions.

Employers should provide a heat stress training program for all workers and supervisors about the following:

- Recognition of the signs and symptoms of heat-related illnesses and administration of first aid.
- Causes of heat-related illnesses and steps to reduce the risk. These include drinking enough water and monitoring the color and amount of urine output.
- Proper care and use of heat-protective clothing and equipment and the added heat load caused by exertion, clothing, and personal protective equipment.
- Effects of other factors (drugs, alcohol, obesity, etc.) on tolerance to occupational heat stress.
- The importance of acclimatization.
- The importance of immediately reporting any symptoms or signs of heat-related illness in themselves or in coworkers to the supervisor.
- Procedures for responding to symptoms of possible heat-related illness and for contacting emergency medical services.

:: TABLE - 1 ::

TEST REPORT
ON
HEAT STRESS MEASUREMENT

**Customer Name** : **M/s. Jindal Coke Limited**

**Address** : **Kalinga Nagar Industrial Complex, Duburi, Jajpur-755026**

Name of Department / Plant : **Coke Oven Plant**

| Sl. No. | Location | Date & Time of Monitoring | $T_{db}$(°C) | $T_{nwb}$(°C) | $T_g$(°C) | WBGT(°C) | CAF | $WBGT_{eff}$(°C) | Metabolic Rate (Watt) | TLV(°C) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Charging/Pushing Side Door Operating Platform | 12/12/2023 at 9:50 A.M | 37 | 23 | 41 | 28.00 | 0 | 28.00 | 180 | 31 | $WBGT_{eff}$ is below the TLV |
| 2 | Oven Top | 12/12/2023 at 10:25 A.M | 41 | 25 | 46.5 | 30.90 | 0 | 30.90 | 180 | 31 | $WBGT_{eff}$ is below the TLV |
| 3 | Quenching/Coke Side Door Operating Platform | 12/12/2023 at 11:05 A.M | 34 | 21 | 38 | 25.70 | 0 | 25.70 | 180 | 31 | $WBGT_{eff}$ is below the TLV |
| 4 | Celler Area | 12/12/2023 at 11:40 A.M | 30 | 19 | 34 | 23.50 | 0 | 23.50 | 180 | 31 | $WBGT_{eff}$ is below the TLV |

NOTE:
1) $T_{db}$: the dry-bulb temperature
2) $T_{nwb}$: the natural wet-bulb temperature
3) $T_g$= the globe temperature
4) WBGT: Wet Bulb Globe Temperature
5) CAF: Clothing Adjustment Factors
6) $WBGT_{eff}$: WBGT Effective
7) TLV: Threshold Limit Value

Ref: 1) OSHA Technical Manual Section III: Chapter 4 - Heat Stress

Pollution And Project Consultants Kolkata

J. Dey

(J. DEY)
Authorized Signatory
For POLLUTION AND PROJECT CONSULTANTS

JINDAL
COKE LIMITED

## QUALITY, ENVIRONMENT, OCCUPATIONAL HEALTH & SAFETY POLICY

Jindal Coke Limited is committed to produce and supply high quality coke and by-products through capability building, use of best practices, maintaining reliable relationships with all stakeholders and innovative stain-less solutions with a commitment to maintain environment friendly, safe, healthy and sustainable working conditions in all its operations.

We are committed to:

- Meeting and exceeding customer needs and expectations through deployment of state of the art manufacturing technologies, performance improvement and innovative practices.
- Comply with all applicable legal and other specific requirements to which organization subscribes.
- Protect environment and prevent pollution by reducing emissions, sustainable and efficient usage of natural resources.
- Prevent injury and ill health by establishing safe working condition and adopting safe working practices as identified through occupational health & safety risk assessment.
- Review this policy periodically to ensure relevance, appropriateness and continual improvement of integrated management system with involvement of all interested parties as applicable.
- Consultation and participation of workers and their representatives at all applicable levels and functions.

Date: 25th April 2024

Deepak Agiwal
(Director)
Jindal Coke Limited

**CERTIFIED TRUE COPY OF THE BOARD RESOLUTION PASSED BY THE BOARD OF DIRECTORS IN ITS MEETING HELD ON APRIL 04, 2023**

**APPROVAL FOR APPOINTMENT OF MR. DEEPAK KESHARLAL AGIWAL AS THE OCCUPIER OF THE COMPANY**

**"RESOLVED UNANIMOUSLY THAT** pursuant to the applicable provisions of the Factories Act, 1948, Mr. Deepak Kesharlal Agiwal, Wholetime Director of the Company be and is hereby nominated as Occupier of the factory or the Company w.e.f. April 04, 2023;

**RESOLVED FURTHER THAT** Mr. Udai Vashisht, Director, Mr. Nitin Kumar Agarwal, Chief Finance Officer and Mrs. Hanisha Gabrani, Company Secretary of the Company be and are hereby severally authorized to inform the concerned State and Central Government Departments about the said nomination and to do all acts, deeds, matters and things and take all actions as may be necessary, proper or expedient and also to sign, execute and issue any and all documents including without limitation applications / declaration(s) / undertaking(s), as they may consider necessary and expedient to give effect to the above resolution;

**RESOLVED FURTHER THAT** copies of the above resolution, certified to be true by any one of the Directors or Chief Financial Officer or Company Secretary of the Company, be furnished to the concerned State and/ or Central Government Department and they be requested to act thereon."

Certified to be true/-
For **Jindal Coke Limited**

JINDAL COKE LIMITED

**Hanisha Gabrani**
**Company Secretary**
**ACS-30542**
**Address: - Jindal Stainless Tower,**
**Plot No. 50, Institutional Area,**
**Sector 32, Gurugram-122001**

# Environmental Monitoring Report for the Period October-2023 to March-2024

## INDEX

## A. Stack Analysis:

### Particulate Matter (PM):

| Monitoring Results of Stack Analysis | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sl. No. | Sampling Stations | Monthly Average Concentration of Particulate Matter (mg/Nm$^3$) | | | | | | |
| | | Oct. - 23 | Nov. - 23 | Dec. - 23 | Jan. -24 | Feb. - 24 | Mar. - 24 | Permissible limit |
| 1 | Coke Oven Main Stack | 42.8 | 41.6 | 38.5 | 45.3 | 43.2 | 41.8 | **50** |

### Sulphur Dioxide (SO2):

| Monitoring Results of Stack Analysis | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sl. No. | Sampling Stations | Monthly Average Concentration of Sulphur Dioxide (mg/Nm$^3$) | | | | | | |
| | | Oct. - 23 | Nov. - 23 | Dec. - 23 | Jan. -24 | Feb. - 24 | Mar. - 24 | Permissible limit |
| 1 | Coke Oven Main Stack | 417.9 | 402.8 | 433.2 | 428.8 | 412.8 | 457.2 | **800** |

### Oxide of Nitrogen (NOx):

| Monitoring Results of Stack Analysis | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sl. No. | Sampling Stations | Monthly Average Concentration of Oxide of Nitrogen (mg/Nm$^3$) | | | | | | |
| | | Oct. - 23 | Nov. - 23 | Dec. - 23 | Jan. -24 | Feb. - 24 | Mar. - 24 | Permissible limit |
| 1 | Coke Oven Main Stack | 184.6 | 178.8 | 190.3 | 197.1 | 178.4 | 154.2 | **500** |

## B. Ambient Air Monitoring Report:

**AAQ near Nursery**

| Sl. No. | Parameters | Monthly Average concentration | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct. - 23 | Nov. - 23 | Dec. - 23 | Jan. -24 | Feb. - 24 | Mar. - 24 | Permissible limit |
| 1 | $PM_{10}$ µg/m³ | 73.6 | 71.8 | 73.4 | 71.7 | 70.2 | 73.8 | 100(24 Hrs) |
| 2 | $PM_{2.5}$ µg/m³ | 26.1 | 25.4 | 25.6 | 23.2 | 24.3 | 26.2 | 60 (24 Hrs) |
| 3 | $SO_2$ µg/m³ | 17.4 | 17.0 | 16.8 | 29.1 | 29.3 | 25.8 | 80(24 Hrs) |
| 4 | $NO_x$ µg/m³ | 16.1 | 15.8 | 15.4 | 13.4 | 13.7 | 13.4 | 80(24 Hrs) |
| **NB:** Parameters such as Lead, Benzene, Benzopyrene, Arsenic & Nickel found to be below detection limit (BDL). | | | | | | | | |

**AAQ near Security Barrack**

| Sl. No. | Parameters | Monthly Average concentration | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct. - 23 | Nov. - 23 | Dec. - 23 | Jan. -24 | Feb. - 24 | Mar. - 24 | Permissible limit |
| 1 | $PM_{10}$ µg/m³ | 81.7 | 82.4 | 80.8 | 77.4 | 72.6 | 84.6 | 100(24 Hrs) |
| 2 | $PM_{2.5}$ µg/m³ | 29.8 | 30.8 | 28.6 | 28.4 | 21.3 | 32.2 | 60 (24 Hrs) |
| 3 | $SO_2$ µg/m³ | 26.3 | 27.4 | 25.4 | 27.2 | 27.6 | 29.2 | 80(24 Hrs) |
| 4 | $NO_x$ µg/m³ | 20.2 | 21.6 | 20.2 | 25.3 | 25.4 | 25.4 | 80(24 Hrs) |
| **NB:** Parameters such as Lead, Benzene, Benzopyrene, Arsenic & Nickel found to be below detection limit (BDL). | | | | | | | | |

**AAQ near Admin. Building**

| Sl. No. | Parameters | Monthly Average concentration | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct. - 23 | Nov. - 23 | Dec. - 23 | Jan. -24 | Feb. - 24 | Mar. - 24 | Permissible limit |
| 1 | $PM_{10}$ µg/m³ | 80.8 | 79.8 | 78.2 | 73.2 | 75.5 | 80.6 | 100(24 Hrs) |
| 2 | $PM_{2.5}$ µg/m³ | 29.3 | 28.8 | 28.4 | 27.2 | 25.8 | 29.4 | 60 (24 Hrs) |
| 3 | $SO_2$ µg/m³ | 26.1 | 26.4 | 25.8 | 24.0 | 26.2 | 28.2 | 80(24 Hrs) |
| 4 | $NO_x$ µg/m³ | 19.6 | 19.8 | 19.2 | 18.6 | 20.2 | 18.2 | 80(24 Hrs) |
| **NB:** Parameters such as Lead, Benzene, Benzopyrene, Arsenic & Nickel found to be below detection limit (BDL). | | | | | | | | |

**AAQ near Silo DCS Panel Room**

| Sl. No. | Parameters | Monthly Average concentration | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct. - 23 | Nov. - 23 | Dec. - 23 | Jan. -24 | Feb. - 24 | Mar. - 24 | Permissible limit |
| 1 | $PM_{10}$ µg/m$^3$ | 75.1 | 78.8 | 77.8 | 70.6 | 70.8 | 74.4 | 100(24 Hrs) |
| 2 | $PM_{2.5}$ µg/m$^3$ | 27.6 | 27.4 | 27.2 | 26.4 | 28.8 | 32.8 | 60 (24 Hrs) |
| 3 | $SO_2$ µg/m$^3$ | 19.2 | 21.4 | 22.4 | 20.2 | 24.6 | 22.6 | 80(24 Hrs) |
| 4 | $NO_x$ µg/m$^3$ | 17.8 | 18.6 | 17.8 | 17.2 | 18.8 | 16.1 | 80(24 Hrs) |
| **NB:** Parameters such as Lead, Benzene, Benzopyrene, Arsenic & Nickel found to be below detection limit (BDL). | | | | | | | | |

## C. Fugitive Visual Emission:

| Sl. No. | Parameters | Monthly Average concentration | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct. - 23 | Nov. - 23 | Dec. - 23 | Jan. -24 | Feb. - 24 | Mar. - 24 | Standard |
| 1 | Leakage from Door (PLD) | 3.51 | 3.51 | 2.73 | 1.17 | 3.51 | 2.73 | 5 |
| 2 | Leakage from Charging Lids (PLL) | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 1 |
| 3 | Leakage from AP Covers (PLO) | 3.12 | 2.34 | 1.56 | 1.56 | 3.12 | 1.56 | 4 |
| 4 | Charging Emission (Second/ Charge (HPLA) | 12.0 | 13.0 | 11.5 | 12.0 | 14.0 | 14.0 | 16 |
| 5 | Carbon Monoxide Kg/MT of Coke product | 1.8 | 1.9 | 1.5 | 1.7 | 1.6 | 1.3 | 3 |

## D. Noise Monitoring Report:

### i. Ambient Noise Monitoring Data

| Noise Level Monitoring Results at Different Locations of the Plant | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sl. No. | Location | Monthly Average Noise Level | | | | | | Permissible limit |
| | | Oct. - 23 | Nov. - 23 | Dec. - 23 | Jan. - 24 | Feb. - 24 | Mar. - 24 | |
| | | DAY TIME | | | | | | |
| 1. | At Nursery | 68.6 | 68.2 | 68.8 | 68.4 | 70.0 | 69.4 | 75 dB(A) |
| 2. | At Security Barrack | 72.4 | 72.2 | 70.6 | 72.6 | 72.0 | 73.5 | |
| 3. | At Admin. Building | 72.1 | 73.4 | 72.5 | 73.6 | 72.2 | 72.8 | |
| 4. | At Silo DCS panel room | 69.9 | 70.6 | 71.3 | 73.2 | 72.0 | 70.9 | |
| | | NIGHT TIME | | | | | | |
| 1. | At Nursery | 57.5 | 54.2 | 54.0 | 55.6 | 56.0 | 56.8 | 70 dB(A) |
| 2. | At Security Barrack | 59.4 | 58.8 | 56.4 | 58.2 | 56.4 | 57.4 | |
| 3. | At Admin. Building | 55.9 | 55.6 | 54.7 | 54.1 | 56.1 | 56.4 | |
| 4. | At Silo DCS panel room | 55.4 | 55.0 | 55.2 | 52.8 | 55.0 | 54.4 | |

### ii. Work Zone Noise Monitoring Data

| Noise Level Monitoring Results at Different Locations of the Plant | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sl. No. | Location | Monthly Average Noise Level ( Leq in dB(A) ) | | | | | | Permissible limit |
| | | Oct. - 23 | Nov. - 23 | Dec. - 23 | Jan. - 24 | Feb. - 24 | Mar. - 24 | |
| 1 | Near cooling tower area | 73.6 | 75.4 | 74.8 | 76.8 | 78.8 | 78.2 | 85 dB(A) |
| 2 | Near By product area | 74.9 | 75.2 | 75.3 | 79.4 | 80.1 | 80.4 | |
| 3 | Near Secondary Crusher area | 79.7 | 80.1 | 79.8 | 78.8 | 78.5 | 79.4 | |
| 4 | Near compressor Room | 78.6 | 79.8 | 80.1 | 82.1 | 82.2 | 82.4 | |
| 5 | Near Administrative Building/Near DG Room | 74.1 | 75.6 | 77.7 | 78.1 | 79.4 | 82.0 | |

## E 1. Ground Water Quality: March'24

| Sl. No. | Parameter | Limit as per IS 10500 :2012 | | Date of sampling: 25.03.2024 | |
|---|---|---|---|---|---|
| | | Acceptable Limit | Permissible limit | GW1 | GW2 |
| 1 | Colour, Hazen Units | 5 | 15 | <5 | <5 |
| 2 | Odour | Agreeable | Agreeable | Agreeable | Agreeable |
| 3 | pH | 6.5 - 8.5 | 6.5 - 8.5 | 7.4 | 7.6 |
| 4 | Turbidity, NTU | 1 | 5 | <1.0 | <1.0 |
| 5 | Total dissolve solid, mg/l | 500 | 2000 | 196.3 | 203.0 |
| 6 | Total Hardness (as $CaCO_3$), mg/l | 200 | 600 | 48.6 | 54.6 |
| 7 | Iron (as Fe), mg/l | 1.0 | 1.0 | 0.2 | 0.4 |
| 8 | Chloride (as Cl), mg/l | 250 | 1000 | 38.7 | 52.2 |
| 9 | Residual Free Chlorine, mg/l | 0.2 | 1.0 | <0.1 | <0.1 |
| 10 | Fluoride (as F), mg/l | 1.0 | 1.5 | <0.1 | <0.1 |
| 11 | Calcium (as Ca), mg/l | 75 | 200 | 30.2 | 38.1 |
| 12 | Magnesium(as Mg), mg/l | 30 | 100 | 12.4 | 18.3 |
| 13 | Copper(as Cu), mg/l | 0.05 | 1.5 | <0.02 | <0.02 |
| 14 | Manganese (as Mn), mg/l | 0.1 | 0.3 | <0.05 | <0.05 |
| 15 | Sulphate (as $SO_4$), mg/l | 200 | 400 | 6.2 | 17.4 |
| 16 | Nitrate (as $NO_3$), mg/l | 45 | 45 | 14.6 | 10.3 |
| 17 | Phenol (as $C_6H_5OH$), mg/l | 0.001 | 0.002 | < 0.002 | < 0.002 |
| 18 | Mercury,(as Hg), mg/l | 0.001 | 0.001 | <0.001 | <0.001 |
| 19 | Cadmium (as Cd), mg/l | 0.003 | 0.003 | <0.01 | <0.01 |
| 20 | Selenium (as Se ), mg/l | 0.01 | 0.01 | < 0.001 | < 0.001 |
| 21 | Arsenic ( as As), mg/l | 0.01 | 0.05 | < 0.004 | < 0.004 |
| 22 | Cyanide (as CN), mg/l | 0.05 | 0.05 | <0.02 | <0.02 |
| 23 | Lead (as Pb), mg/l | 0.01 | 0.01 | <0.01 | <0.01 |
| 24 | Zinc (as Zn ), mg/l | 5 | 15 | <0.01 | <0.01 |
| 25 | Anionic Detergents (as MBAS), mg/l | 0.2 | 1.0 | <0.1 | <0.1 |
| 26 | Total Chromium (as Cr), mg/l | 0.05 | 0.05 | < 0.05 | <0.05 |
| 27 | Mineral Oil, mg/l | 0.5 | 0.5 | < 0.2 | < 0.2 |
| 28 | Total Alkalinity( as $CaCO_3$), mg/l | 200 | 600 | 64.4 | 76.8 |
| 29 | Aluminium (as Al ), mg/l | 0.03 | 0.2 | < 0.01 | < 0.01 |
| 30 | Boron (as B), mg/l | 0.5 | 1.0 | < 0.1 | < 0.1 |
| 31 | Nickel (as Ni), mg/l | 0.02 | 0.02 | <0.02 | <0.02 |

| | | | | | |
|---|---|---|---|---|---|
| 32 | Molybdenum (as Mo), mg/l | 0.07 | 0.07 | <0.05 | <0.05 |
| 33 | Coliform Organisms, (MPN/100ml) | Nil | Nil | Absent | Absent |
| 34 | E Coli (MPN/100 ml) | Nil | Nil | Absent | Absent |

**N.B:-** GW1: Tube well near Manpur Haulting Colony, GW2: Tube well near Visa Railway Crossing

## E 2. Ground Water Quality: April'24

| Sl. No. | Parameter | Limit as per IS 10500 :2012 | | Date of sampling: 23.04.2024 | |
|---|---|---|---|---|---|
| | | Acceptable Limit | Permissible limit | GW3 | GW4 |
| 1 | Colour, Hazen Units | 5 | 15 | <5 | <5 |
| 2 | Odour | Agreeable | Agreeable | Agreeable | Agreeable |
| 3 | pH | 6.5 - 8.5 | 6.5 - 8.5 | 7.2 | 7.3 |
| 4 | Turbidity, NTU | 1 | 5 | <1.0 | <1.0 |
| 5 | Total dissolve solid, mg/l | 500 | 2000 | 285.2 | 358.6 |
| 6 | Total Hardness (as $CaCO_3$), mg/l | 200 | 600 | 129.5 | 178.4 |
| 7 | Iron (as Fe), mg/l | 1.0 | 1.0 | 0.24 | 0.26 |
| 8 | Chloride (as Cl), mg/l | 250 | 1000 | 11.6 | 147.6 |
| 9 | Residual Free Chlorine, mg/l | 0.2 | 1.0 | <0.1 | <0.1 |
| 10 | Fluoride (as F), mg/l | 1.0 | 1.5 | 0.2 | 0.4 |
| 11 | Calcium (as Ca), mg/l | 75 | 200 | 58.1 | 72.2 |
| 12 | Magnesium(as Mg), mg/l | 30 | 100 | 34.3 | 104.3 |
| 13 | Copper(as Cu), mg/l | 0.05 | 1.5 | <0.02 | <0.02 |
| 14 | Manganese (as Mn), mg/l | 0.1 | 0.3 | <0.05 | <0.05 |
| 15 | Sulphate (as $SO_4$), mg/l | 200 | 400 | 19.4 | 59.6 |
| 16 | Nitrate (as $NO_3$), mg/l | 45 | 45 | 1.9 | 39.1 |
| 17 | Phenol (as $C_6H_5OH$), mg/l | 0.001 | 0.002 | < 0.002 | < 0.002 |
| 18 | Mercury,(as Hg), mg/l | 0.001 | 0.001 | <0.001 | <0.001 |
| 19 | Cadmium (as Cd), mg/l | 0.003 | 0.003 | <0.01 | <0.01 |
| 20 | Selenium (as Se ), mg/l | 0.01 | 0.01 | < 0.001 | < 0.001 |
| 21 | Arsenic ( as As), mg/l | 0.01 | 0.05 | < 0.004 | < 0.004 |
| 22 | Cyanide (as CN), mg/l | 0.05 | 0.05 | <0.02 | <0.02 |
| 23 | Lead (as Pb), mg/l | 0.01 | 0.01 | <0.01 | <0.01 |
| 24 | Zinc (as Zn ), mg/l | 5 | 15 | <0.01 | <0.01 |
| 25 | Anionic Detergents (as MBAS), mg/l | 0.2 | 1.0 | <0.1 | <0.1 |
| 26 | Total Chromium (as Cr), mg/l | 0.05 | 0.05 | <0.05 | <0.05 |
| 27 | Mineral Oil, mg/l | 0.5 | 0.5 | < 0.2 | < 0.2 |

| | | | | | |
|---|---|---|---|---|---|
| 28 | Total Alkalinity( as $CaCO_3$), mg/l | 200 | 600 | 72.4 | 117.8 |
| 29 | Aluminium (as Al ), mg/l | 0.03 | 0.2 | < 0.01 | < 0.01 |
| 30 | Boron (as B), mg/l | 0.5 | 1.0 | < 0.1 | < 0.1 |
| 31 | Nickel (as Ni), mg/l | 0.02 | 0.02 | <0.02 | <0.02 |
| 32 | Molybdenum (as Mo), mg/l | 0.07 | 0.07 | <0.05 | <0.05 |
| 33 | Coliform Organisms, (MPN/100ml) | Nil | Nil | Absent | Absent |
| 34 | E Coli (MPN/100 ml) | Nil | Nil | Absent | Absent |

**N.B:-** GW3: Bore well at Captive Power Plant , GW4: Bore well at Ferro Alloy Plant

## F. Treated Effluent Quality At COBP – PETP OUTLET:

### Table $F_1$:

| Sl. No. | PARAMETER | Norm as per G.S.R. 422 (E)(Inland Surface water) | Oct. -2023 | Nov. -2023 |
|---|---|---|---|---|
| | | | Date of Sampling – 18.10.2023 | Date of Sampling – 25.11.2023 |
| 1 | Colour & Odour | Colourless & Odourless | <5 & Agreeable | <5 & Agreeable |
| 2 | Suspended Solid, mg/l | 100 | 49.7 | 48.2 |
| 3 | Total Dissolved Solids, mg/l | 2100 | 716.7 | 705.3 |
| 4 | pH Value | 5.5 to 9.0 | 7.8 | 7.5 |
| 5 | Temperature, 0C | Shall not exceed by + $5^0$C | 26.6 | 27.5 |
| 6 | Oil & grease, mg/l | 10 | 5.7 | 5.5 |
| 7 | Total Res. Chlorine, mg/l | 1 | ND | ND |
| 8 | BOD (3 days at 270C), mg/l | 30 | 16.2 | 17.2 |
| 9 | COD, mg/l | 250 | 69.8 | 72.3 |
| 10 | Hexavalent chromium (as Cr6+), mg/l | 0.1 | <0.01 | <0.01 |
| 11 | Cyanide (as CN), mg/l | 0.2 | <0.01 | <0.01 |
| 12 | Fluoride (as F), mg/l | 2 | <0.1 | <0.1 |
| 13 | Sulphide (as S) mg/l | 2 | <1.0 | <1.0 |
| 14 | Phenol (as C6H5OH), mg/l | 1 | <0.05 | <0.05 |
| 15 | Iron (as Fe), mg/l | 3 | 1.7 | 1.6 |
| 16 | Nitrate Nitrogen, mg/l | 10 | 7.4 | 7.7 |
| 17 | Dissolved Phosphate, mg/l | 5 | 0.7 | 0.6 |
| 18 | Arsenic, mg/l | 0.2 | < 0.004 | < 0.004 |
| 19 | Lead, mg/l | 0.1 | <0.01 | <0.01 |
| 20 | Zinc, mg/l | 5 | <0.01 | <0.01 |
| 21 | Mercury, mg/l | 0.01 | <0.004 | <0.004 |
| 22 | Total Chromium, mg/l | 2 | 0.11 | 0.12 |
| 23 | Copper, mg/l | 3 | <0.02 | <0.02 |
| 24 | Nickel, mg/l | 3 | <0.05 | <0.05 |

| | | | | |
|---|---|---|---|---|
| 25 | Manganese, mg/l | 2 | <0.05 | <0.05 |
| 26 | Vanadium, mg/l | 0.2 | <0.02 | <0.2 |
| 27 | Selenium, mg/l | 0.05 | <0.001 | <0.001 |
| 28 | Bio-assay test | 90% survival of fish after 96 hr. in 100% effluent | 93% | 91% |

## Table $F_2$:

| Sl. No. | PARAMETER | Norm as per G.S.R. 422 (E)(Inland Surface water) | Dec. - 2023 | Jan. - 2024 |
|---|---|---|---|---|
| | | | Date of Sampling – 13.12.2023 | Date of Sampling – 12.01.2024 |
| 1 | Colour & Odour | Colourless & Odourless | <5 & Agreeable | <5 & Agreeable |
| 2 | Suspended Solid, mg/l | 100 | 65.8 | 47.6 |
| 3 | Total Dissolved Solids, mg/l | 2100 | 562.4 | 524.6 |
| 4 | pH Value | 5.5 to 9.0 | 7.9 | 7.8 |
| 5 | Temperature, 0C | Shall not exceed by + $5^0$C | 26.5 | 23.7 |
| 6 | Oil & grease, mg/l | 10 | <5.0 | <5.0 |
| 7 | Total Res. Chlorine, mg/l | 1 | ND | ND |
| 8 | BOD (3 days at 270C), mg/l | 30 | 12.8 | 18.8 |
| 9 | COD, mg/l | 250 | 64.6 | 82.0 |
| 10 | Hexavalent chromium (as Cr6+), mg/l | 0.1 | <0.01 | <0.01 |
| 11 | Cyanide (as CN), mg/l | 0.2 | <0.01 | <0.02 |
| 12 | Fluoride (as F), mg/l | 2 | <0.1 | <0.1 |
| 13 | Sulphide (as S) mg/l | 2 | <1.0 | <1.0 |
| 14 | Phenol (as C6H5OH), mg/l | 1 | <0.05 | <0.05 |
| 15 | Iron (as Fe), mg/l | 3 | 1.8 | 1.8 |
| 16 | Nitrate Nitrogen, mg/l | 10 | 7.4 | 6.8 |
| 17 | Dissolved Phosphate, mg/l | 5 | 1.8 | 1.0 |
| 18 | Arsenic, mg/l | 0.2 | < 0.004 | < 0.004 |
| 19 | Lead, mg/l | 0.1 | <0.01 | <0.01 |
| 20 | Zinc, mg/l | 5 | <0.01 | <0.01 |
| 21 | Mercury, mg/l | 0.01 | <0.004 | <0.004 |
| 22 | Total Chromium, mg/l | 2 | 0.14 | 0.14 |
| 23 | Copper, mg/l | 3 | <0.02 | <0.02 |
| 24 | Nickel, mg/l | 3 | <0.05 | <0.05 |
| 25 | Manganese, mg/l | 2 | <0.05 | <0.05 |
| 26 | Vanadium, mg/l | 0.2 | <0.2 | <0.2 |
| 27 | Selenium, mg/l | 0.05 | <0.001 | <0.001 |
| 28 | Bio-assay test | 90% survival of fish after 96 hr. in 100% effluent | 92% | 92% |

## Table $F_3$:

| Sl. No. | PARAMETER | Norm as per G.S.R. 422 (E)(Inland Surface water) | Feb. - 2024 | Mar. - 2024 |
|---|---|---|---|---|
| | | | Date of Sampling – 24.02.2024 | Date of Sampling – 25.09.2023 |
| 1 | Colour & Odour | Colourless & Odourless | <5 & Agreeable | <5 & Agreeable |
| 2 | Suspended Solid, mg/l | 100 | 72.4 | 69.2 |
| 3 | Total Dissolved Solids, mg/l | 2100 | 508.4 | 628.4 |
| 4 | pH Value | 5.5 to 9.0 | 7.7 | 7.9 |
| 5 | Temperature, 0C | Shall not exceed by + $5^0$C | 26.4 | 26.3 |
| 6 | Oil & grease, mg/l | 10 | <5.0 | <5.0 |
| 7 | Total Res. Chlorine, mg/l | 1 | ND | ND |
| 8 | BOD (3 days at 270C), mg/l | 30 | 18.4 | 16.4 |
| 9 | COD, mg/l | 250 | 80.0 | 78.2 |
| 10 | Hexavalent chromium (as Cr6+), mg/l | 0.1 | <0.01 | <0.01 |
| 11 | Cyanide (as CN), mg/l | 0.2 | <0.02 | <0.02 |
| 12 | Fluoride (as F), mg/l | 2 | <0.1 | <0.1 |
| 13 | Sulphide (as S) mg/l | 2 | <1.0 | <0.1 |
| 14 | Phenol (as C6H5OH), mg/l | 1 | <0.05 | <0.05 |
| 15 | Iron (as Fe), mg/l | 3 | 1.3 | 1.8 |
| 16 | Nitrate Nitrogen, mg/l | 10 | 4.6 | 7.2 |
| 17 | Dissolved Phosphate, mg/l | 5 | 3.0 | 2.6 |
| 18 | Arsenic, mg/l | 0.2 | < 0.004 | < 0.004 |
| 19 | Lead, mg/l | 0.1 | <0.01 | <0.01 |
| 20 | Zinc, mg/l | 5 | <0.01 | <0.01 |
| 21 | Mercury, mg/l | 0.01 | <0.004 | <0.004 |
| 22 | Total Chromium, mg/l | 2 | 0.13 | 0.2 |
| 23 | Copper, mg/l | 3 | <0.01 | <0.02 |
| 24 | Nickel, mg/l | 3 | <0.05 | <0.05 |
| 25 | Manganese, mg/l | 2 | <0.05 | <0.055 |
| 26 | Vanadium, mg/l | 0.2 | <0.2 | <0.2 |
| 27 | Selenium, mg/l | 0.05 | <0.001 | <0.001 |
| 28 | Bio-assay test | 90% survival of fish after 96 hr. in 100% effluent | 92% | 92% |

## G. Fugitive Air Emission :

| Monitoring Results of Fugitive Air Emission | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sl. No.** | **Sampling Stations** | **Concentration of Particulate Matter Below 10 micron as $PM_{10}$ (µg/$m^3$)** | | | | | | |
| | | **Oct. - 23** | **Nov. - 23** | **Dec. - 23** | **Jan. -24** | **Feb. - 24** | **Mar. - 24** | **Permissible limits** |
| 1 | Near Secondary Crusher area of COBP/Near Battery Top | 725.4 | 812.6 | 810.8 | 697.4 | 426.8 | 588.7 | - |
| 2 | Near Booster Control Room of COBP/Near By Product Area | 716.7 | 789.4 | 791.2 | 767.3 | 386.2 | 342.9 | |
| 3 | Near Battery Coal Tower area of COBP | 706.7 | 738.4 | 740.2 | 688.9 | 785.4 | 724.4 | |

**Appendix - B**

## A. Continuous Ambient Air Quality Monitoring System (CAAQMS) report:

**Location - Near Nursery**

| Sl. No. | Parameters | Monthly Average concentration | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct'23 | Nov'23 | Dec'23 | Jan'24 | Feb'24 | March'24 | Permissible limits as per SPCB |
| 1 | $PM_{10}$ (µg/m³) | 58.61 | 55.81 | 59.52 | 71.52 | 69.93 | 53.97 | 100(24 Hrs) |
| 2 | $PM_{2.5}$ (µg/m³) | 45.35 | 36.71 | 37.08 | 43.83 | 35.70 | 29.67 | 60 (24 Hrs) |
| 3 | $SO_2$ (µg/m³) | 44.52 | 42.95 | 34.05 | 38.87 | 37.41 | 48.19 | 80(24 Hrs) |
| 4 | $NO_x$(µg/m³) | 13.33 | 13.33 | 13.35 | 13.36 | 13.36 | 13.35 | 80(24 Hrs) |
| 5 | CO ( µg/m³) | 0.60 | 0.77 | 0.76 | 0.99 | 0.77 | 0.66 | 02 (08 Hrs) |

**Location - Near Security Barrack**

| Sl. No. | Parameters | Monthly Average concentration | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct'23 | Nov'23 | Dec'23 | Jan'24 | Feb'24 | March'24 | Permissible limits as per SPCB |
| 1 | $PM_{10}$ (µg/m³) | 62.25 | 76.18 | 82.12 | 57.30 | 66.89 | 63.55 | 100(24 Hrs) |
| 2 | $PM_{2.5}$ (µg/m³) | 32.79 | 44.17 | 26.97 | 18.18 | 15.66 | 24.12 | 60 (24 Hrs) |
| 3 | $SO_2$ (µg/m³) | 25.92 | 26.82 | 29.21 | 27.26 | 27.42 | 26.18 | 80(24 Hrs) |
| 4 | $NO_x$(µg/m³) | 29.54 | 34.40 | 36.93 | 23.05 | 25.16 | 26.90 | 80(24 Hrs) |
| 5 | CO ( µg/m³) | 0.36 | 0.40 | 0.41 | 0.61 | 0.41 | 0.32 | 02 (08 Hrs) |

**Location - Near CPP**

| Sl. No. | Parameters | Monthly Average concentration | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct'23 | Nov'23 | Dec'23 | Jan'24 | Feb'24 | March'24 | Permissible limits as per SPCB |
| 1 | $PM_{10}$ (µg/m³) | 45.97 | 59.62 | 58.37 | 67.64 | 53.42 | 50.68 | 100(24 Hrs) |
| 2 | $PM_{2.5}$ (µg/m³) | 30.30 | 36.67 | 31.75 | 49.40 | 25.51 | 32.62 | 60 (24 Hrs) |
| 3 | $SO_2$ (µg/m³) | 31.92 | 32.67 | 33.54 | 35.55 | 36.94 | 30.06 | 80(24 Hrs) |
| 4 | $NO_x$(µg/m³) | 21.56 | 21.60 | 21.58 | 21.62 | 21.61 | 21.62 | 80(24 Hrs) |
| 5 | CO ( µg/m³) | 0.63 | 0.70 | 0.70 | 0.92 | 0.68 | 0.59 | 02 (08 Hrs) |

**Location - Near Tata Corner**

| Sl. No. | Parameters | Monthly Average concentration | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct'23 | Nov'23 | Dec'23 | Jan'24 | Feb'24 | March'24 | Permissible limits as per SPCB |
| 1 | $PM_{10}$ (µg/m³) | 73.99 | 62.17 | 44.30 | 49.60 | 72.03 | 59.91 | 100(24 Hrs) |
| 2 | $PM_{2.5}$ (µg/m³) | 43.59 | 52.23 | 12.06 | 14.26 | 21.45 | 21.75 | 60 (24 Hrs) |
| 3 | $SO_2$ (µg/m³) | 35.06 | 36.95 | 43.38 | 37.25 | 39.05 | 40.42 | 80(24 Hrs) |
| 4 | $NO_x$(µg/m³) | 11.07 | 11.00 | 10.17 | 11.18 | 11.18 | 11.15 | 80(24 Hrs) |
| 5 | CO ( µg/m³) | 0.40 | 0.47 | 0.50 | 0.66 | 0.45 | 0.36 | 02 (08 Hrs) |

**Location - Near Admin Building**

| Sl. No. | Parameters | Monthly Average concentration | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct'23 | Nov'23 | Dec'23 | Jan'24 | Feb'24 | March'24 | Permissible limits as per SPCB |
| 1 | $PM_{10}$ (µg/m³) | 73.48 | 65.52 | 70.09 | 54.81 | 51.13 | 83.56 | 100(24 Hrs) |
| 2 | $PM_{2.5}$ (µg/m³) | 27.01 | 30.90 | 32.55 | 32.50 | 41.58 | 28.11 | 60 (24 Hrs) |
| 3 | $SO_2$ (µg/m³) | 6.65 | 7.19 | 6.32 | 6.94 | 7.48 | 7.82 | 80(24 Hrs) |
| 4 | $NO_x$(µg/m³) | 24.75 | 28.26 | 31.80 | 33.69 | 35.63 | 27.25 | 80(24 Hrs) |
| 5 | CO ( µg/m³) | 0.74 | 0.62 | 0.68 | 0.89 | 0.60 | 0.49 | 02 (08 Hrs) |

## B. Continuous Emission Monitoring System (CEMS) report

| Sl. No. | Sampling Stations | Parameters | Monthly Average Concentration of PM and $SO_2$ ($mg/Nm^3$) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Oct'23 | Nov'23 | Dec'23 | Jan'24 | Feb'24 | March'24 | Permissible limits as per SPCB |
| 1 | Coke Oven Stack | PM | 36.89 | 35.01 | 35.06 | 35.12 | 35.01 | 35.04 | 50 |
| | | SO2 | 257.78 | 254.79 | 254.49 | 255.15 | 254.66 | 254.77 | 800 |
| | | NOx | 87.41 | 67.11 | 67.53 | 68.07 | 67.01 | 67.31 | 500 |

## C. Effluent Quality Monitoring System (EQMS) report:

**Location: Coke Oven ETP Out let**

| Sl. No. | Parameters | Monthly Average concentration | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Oct'23 | Nov'23 | Dec'23 | Jan'24 | Feb'24 | March'24 | Permissible limits as per SPCB |
| 1 | TSS | 16.80 | 16.51 | 14.24 | 16.65 | 16.35 | 15.24 | 0 - 100.0 mg |
| 2 | pH | 8.02 | 8.11 | 7.93 | 7.95 | 8.06 | 8.32 | 5.5 - 9.0 pH |
| 3 | BOD | 7.87 | 6.92 | 6.76 | 6.96 | 7.21 | 6.89 | 0 - 30.0 mg/l |
| 4 | COD | 78.51 | 79.27 | 77.67 | 77.87 | 78.98 | 81.41 | 0 - 250.0 mg/l |