

To,
The Director,
Ministry of Environment and Forest,
Regional Office (Southern Zone) Kendriya Sadan, 4th Floor,
17th Main Road, 2nd Block, Koramangala
Bangalore.

30.11.2021

Sub:- 25th Six Monthly Compliance Report to the conditions of Environmental Clearance for Vedanta Ltd. (Formerly known as Sesa Sterlite Limited/Sesa Goa Limited) - Blast Furnace (0.9 MTPA), Sinter Plant (2MTPA), Coke Plant (0.6 MTPA) and Waste Heat Recovery Power Plant (60 MW) located at village Navelim, Taluka Bicholim in, North Goa District, Goa.

Ref:

1. F No.J-11011 /946/2007-IA-II(I) dated June 03,2009.
2. Amendment in Environmental Clearance from MOEF vide letter dated 25/04/2012 and 7/01/2020.

Sir,

With reference to the above, please find enclosed herewith:

25th six monthly compliance report to Environmental Clearance [F No.J-110111946/2007-IA-II(I)] for the period **April 2021 to September 2021** for Vedanta Ltd (Formerly known as Sesa Sterlite Limited/Sesa Goa Limited) Blast Furnace(0.9 MTPA), Sinter Plant (2MTPA), Coke Plant (0.6 MTPA) and Waste Heat Recovery Power Plant (60 MW) located at village Navelim, Taluka Bicholim, North Goa District, Goa.

- Stack monitoring, Ambient Air Quality Monitoring, Water monitoring reports, Ground Water and Workplace Monitoring reports for the said period.

Thanking you,

Yours faithfully,

For Vedanta Ltd.



Saptesh Sardesai

Director :- Value Added Business-Vedanta Ltd.

Cc: Member Secretary, GSPCB, CPCB (SZO)

Enclosures:-

- 25th six monthly compliance status report
- Tabulated Stack monitoring, Ambient Air Quality Monitoring, Water monitoring and Ground Water and Workplace Monitoring Reports for the period April 2021 to September 2021.

VEDANTA LIMITED

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25th Compliance Report to EC No: F. No. J-11011/946/2007-IA-II(I)

(Period:- April 2021 to September 2021)

6 Monthly Compliance Report to Conditions Of Environmental Clearance Issued By MOEF, Govt. of India, for Blast Furnace (0.90MTPA), Sinter Plant (2MTPA), Coke Plant (0.6MTPA), Waste Heat Recovery Power Plant (60MW) by Vedanta Limited (earlier known as Sesa Sterlite Ltd./ Sesa Goa Limited) *

A. Specific Conditions

- I. Electrostatic precipitator (ESP) shall be provided to Sinter plant and WHRB based Power Plant to control gaseous emissions from all the vents/stacks within 100 mg/Nm³. Gas Cleaning Plant along with Ventury scrubber shall be provided to blast furnace. On-line stack monitoring facilities for all the stacks shall be provided to ensure particulate emissions below 100 mg/Nm³ and data submitted to the Ministry's Regional Office at Bangalore, CPCB and Goa Pollution Control Board. Efforts shall be made to reduce RSPM levels in the ambient air and a time bound action plan should be submitted.**

Electrostatic Precipitator (ESP) provided to the Sinter Plant at Head End & Tail End of Sinter Machine. Dry Gas Cleaning Plant (GCP) with a dust catcher & bag filters, provided to Blast Furnace. The sinter plant head end stack is of 100m height and tail end stack of 30m height. Sinter plant stack height is designed based on the exit volume, Temperature of exit gas and the SO_x, NO_x out of the sintering process that has to be emitted out at certain height for better dispersion without effecting the atmosphere. Online stack monitoring facilities is installed for Sinter main stack, Sinter Tail end stack, WHRB-1&2 of Waste Heat Recovery Power plant and Hot Blast Stove of Blast Furnace. Continuous Real time data are connected to CPCB portal. Regular Stack Monitoring & Ambient Air Quality Monitoring is conducted and monthly reports are submitted to GSPCB (Currently uploaded on OCEMS system as per GSPCB Direction). Also half yearly reports are submitted to CPCB & MOEF.

Detail of average reading for all six locations.

Sr.No.	Location	Average from April 21 to September 21			
		PM10	PM2.5	SO2	NO2
1	Amona Gate	61.93	28.74	10.9	17.32
2	Compound wall Towards Maina	60.95	28.21	10.85	17.34
3	Opposite BSNL Exchange	62.15	28.74	10.89	17.44
4	Near Dispatch Gate	62.69	29.05	10.95	17.49
5	Compound wall Towards Navelim	61.38	28.36	10.86	17.42

	Limit= 5 µg/m ³						
10.	Benzo Pyrene (BaP)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Limit = 1 ng/m ³						
11.	Arsenic (As)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Limit= 6 ng/m ³						
12.	Nickel (Ni)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Limit= 20 ng/m ³						

Individual day wise readings are attached as Annexure I.

II. Pulse jet bag filters shall be provided to coal crusher, product house, raw material handling areas. Transfer point etc. Bag filters shall be provided at the crusher. Screening and transfer points. The Coke Oven gases shall be fully utilized for power generation. Water sprinkling system and dry fog system shall be provided to control fugitive emissions at the coal handling area and work zone.

Pulse jet bag filters are provided for coal crusher house, coke screening towers, transfer points, raw material handling sections, etc. Also rain gun sprinklers are provided at raw material yard. Coal is stored in the closed shed. Wind screens are installed along the raw material storage yard. Bag house de-dusting system is provided for proportioning bin, sinter screening building, flux and fuel crushing and small de-dusting units for various transfer stations. Additionally fog/mist cannons have been brought for dust suppression from process activities at the source. Coke Oven Flue Gas (COFG) is fully utilized for Clean Power Generation.

Pulse jet Bag filter system is provided to following:

1. Flux & fuel crushing of sinter plant
2. Proportioning room of sinter plant
3. Sinter screening room of sinter plant
4. Stock house of Blast Furnace 3
5. Cast house of Blast Furnace 3
6. Coke screening plant – Screening tower 1
7. Coke screening plant – Screening tower 2
8. Coke screening plant – Screening tower 3

Windshield at the boundary details:

Location	Length of windshield in meters	Height of windshield above compound wall

		in meters
Dispatch yard	200	9
Raw Material yard	160	9
MCD - Coke yards	404	9
MCD – New Coal shed	70	9

III. Data on ambient air quality stack emission and fugitive emissions shall be uploaded on the company's website and also regularly submitted online to Ministry's Regional office at Bangalore, Goa State Pollution Control Board (GPCB) and Central Pollution Control Board as well as hard copy once in six months. Data on SPM, SO₂ and NO_x shall also be displayed prominently outside the premises at the appropriate place for the general public.

Ambient Air quality & source emission data is submitted on regular basis to GSPCB. Also six monthly data on stack emission & ambient air quality is submitted to GSPCB, CPCB, MOEF & in hard copy and through e-mail and also uploaded on company website :-

<http://sesagoairnore.com/sustainability/hse/environment-reports/>

Display of PM₁₀, PM_{2.5}, and SO₂ & NO₂ is done prominently outside the premises for the general public. Please refer to table in (i) of Specific Conditions. Ambient Air Quality Reports and Stack Monitoring Reports are submitted regularly to MOEF, CPCB & GSPCB along with six monthly compliance reports. All the values are within limits.

Stack emission data is provided in (iii) of General Condition below and as Annexure II.

IV. Secondary fugitive emissions from all the sources including Blast Furnace, Coke Oven and Sinter Plant shall be controlled within the latest permissible limits issued by the Ministry and regularly monitored. Guidelines/Code of Practice issued by the CPCB shall be followed.

There are no specific permissible limits, - guidelines/code of practice issued by CPCB/MOEF for Non-Recovery Coke Oven Plants. Rain guns have been installed at raw material yard for dust suppression. Bag filter de-dusting systems are used to control dust. Wind screen/wind shields are installed at prominent locations as per the instructions of GSPCB. The monitoring is done regularly. Also as an additional improvement initiative we have procured Fog/Mist canons and Road sweeping machine for road dust cleaning and ultimately for fugitive dust suppression and control.

- V. **Total water requirement shall not exceed 16632 m³/day. The effluent from generated utilities shall be treated in the effluent treatment plant and recycled and reused in the process in blast furnace, sinter plant, dust suppression. Ash moistening, firefighting and green belt development etc. No effluent shall be discharged outside the premises and ' zero' discharge shall be followed.**

All Process water from Coke, Blast Furnace, and Sinter Plant is recycled and reused. After appropriate treatment Blow down from Cooling Tower of Power Plant is let out into Mondovi River after temperature & pH monitoring as per Consent conditions from Goa State Pollution Control Board (GSPCB). The river water used for cooling purpose as mentioned above is saline in nature, same is certified by GSPCB through letter numbered 2022/GSPCB/Letter/10492/lab/11522 dated 29/09/2021. The present Water Consumption is on an avg. 6334.75 m³/day (including water for cooling as well as process water) blow down water from Power Plant is around average 201.5 m³/day.

- VI. **Regular monitoring of influent and effluent water shall be ensured and treated wastewater shall meet the norms prescribed by the Goa State Pollution Control Board or described under the E(P) Act whichever are more stringent and reports shall be submitted six monthly to the Ministry's Regional Office at Bangalore, GSPCB and CPCB.**

Blow down from Cooling Tower of Power Plant is let out into Mandovi river after temperature & pH adjustment. Monthly monitoring is carried out as per Consent conditions. Reports are submitted to GSPCB every month and to MOEF (RO), CPCB, and every six monthly as six monthly compliance reports. Blast Furnace, Sinter Plant and Coke Oven Plant operate on zero discharge. Only non-contact type of condenser cooling water is disposed back into Mandovi river as per Consent conditions from Goa State Pollution Control Board (GSPCB). As per CTO condition max. 3600 m³/day blow down water can be disposed, however last six month avg. was around 201.5 m³/day. Temperature & pH is around avg. 27.79°C and 6.91 respectively.

- VII. **All the blast furnace slag shall be granulated and provided to cement manufacturers for further utilization. All the dust from the air pollution control equipments shall be recycled and reused in the Sinter plant. All the other solid wastes shall be disposed off in the environment-friendly manner or provided to authorized recyclers/ re-processors. Used oil shall also be provided to authorized recyclers only. An action plan for the disposal of fly ash and granulated BF & SMS slag shall be submitted to the Ministry and its Regional Office at Bangalore within 3 months.**

Granulated BF slag is disposed to cement industries. Dust from air pollution control equipment is recycled & reused in Sinter Plant. Used oil is disposed off to the authorized recyclers only. Disposal of Fly Ash & SMS slag is not applicable as the facility is limited to iron making through blast furnace and there is no steel making provision and the power plant is based on waste heat hence thermal coal is not used for power generation.

- VIII. **All the fly ash shall be utilized as per Fly Ash Notification, 1999 and amended in 2003.**

Not Applicable as thermal coal is not used. The power plant is run on waste recovery of BF gas and Coke Oven Flue Gas and is a part of the clean development mechanism.

IX. Vehicular pollution due to transportation of raw material and finished product shall be controlled. Proper arrangements shall also be made to control dust emissions during loading and unloading of the raw material and finished product.

Vehicular pollution due to transportation of raw materials and finished product is controlled. Rain Guns (Sprinkling system) have been installed in the raw material yard and water tankers are used for dust suppression. Sprinklers for dust suppression have been installed at Pig Iron Dispatch yard. Pollution under Check certificates of all vehicles entering premises is checked.

Following specific control measures are in place for control of vehicular pollution:

- Vehicles with PUC certificate are only permitted
- Compulsory speed limit of 20km/hr and Speed check for vehicles
- Water sprinkling on the roads done through water tankers
- Rain guns and fog cannons are provided at various places to control dust
- Road sweeping machine deployed to clean internal as well as external roads
- Wheel wash system is installed at the exit gate

X. Green belt shall be developed in 33 % area within and around the plant premises as per the CPCB guidelines in consultation with DFO.

Green belt is developed in phases with plantation drives during the Monsoons. Total land area is 104 Ha. 21Ha is reserved for future usage and 33Ha is earmarked as greenbelt area. Plantation was carried out in consultation of Goa Forest Development Corporation (GFDC) as well as in-house guidance from company expert team.

XI. All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Steel Sector shall be strictly implemented.

The Project is not an Integrated Iron & Steel Plant and hence the CREP guidelines of steel sector are not applicable however, whatever CREP conditions are applicable for blast furnace and non-recovery coke plant have been complied

XII. The company shall provide housing for construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed' after the completion of the project.

All temporary housing structures have been decommissioned after the project is operational.

B. GENERAL CONDITIONS

1. The project authorities must strictly adhere to the stipulations made by the Goa Pollution Control Board (GPCB) and the State Government.

Stipulations made by GSPCB are strictly adhered to. Reports are either sent to Goa State Pollution Control Board (GSPCB) or uploaded on GSPCB Website. Regular site visits are made by GSPCB personnel to check the compliance status.

2. No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment and Forests.

No expansion or modification in the plant is carried out without prior approval of MoEFCC. We have applied for Environment clearance for setting up of Ductile Iron plant, Ferro Silicon Plant, additional Oxygen plant and coke ovens in the existing Pig Iron and Coke Expansion Plant premises near existing mini blast furnace.

3. 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.

Online stack monitoring instrument is installed for main stacks of Sinter plant (At Head End and Tail End), Hot Blast Stove and both WHRB stacks of Power Plant to track TPM and gases. Real time data are continuously going to CPCB portal. Interlock is provided for Sinter Machine, to ensure automatically stopping of the process when emission exceeds the limits.

The stack heights of stacks and latest data is as follows- (From April-21 to September-21)

Plant	Stack connected to	Height of stack	Particulate Matter in mg/Nm ³ (Avg.)	SO ₂ in kg/hr (Avg.)	NO ₂ in mg/Nm ³ (Avg.)
Sinter Plant	Main ESP	100m	51.46	Not Applicable	
	Discharge end ESP	30m	43.41		
	Sinter Screening & Product bunker Bag Filter	30m	23.81		

	Proportioning bin bag filter	30m	15.02	as these are de-dusting stack	
	Flux & Fuel Area bag filter	30m	43.15		
	Cast House De-dusting	30m	34.43		
Blast Furnace	Stock House De-dusting	30m	41.96		
	Hot Blast Stoves (HBS)	60m	24.61	15.71 (mg/nm3)	17.81
Power Plant	Waste Heat Recovery Boiler-1	50m	38.64	4.91	18.99
	Waste Heat Recovery Boiler-2	50m	38.1	5.16	16.62

***99% of the time (on an avg.) stacks connected to coke oven batteries are closed from top and coke oven flue gases with temperature of almost 1100°C are diverted to waste heat recovery boiler for clean power generation. As per latest consent granted by Goa State Pollution Control, the unit should carry out emission monitoring from the stacks of Waste Heat recovery boiler chimney attached to coke oven plant once in three month, which is carried out regularly and reports are sent/uploaded to GSPCB.**

- 4. 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, SO₂ and NO₂. are anticipated in consultation with the GPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bangalore I GSPCB I CPCB once in six months.**

AAQM locations are approved by GSPCB and the monthly reports are submitted to GSPCB. Three Continuous Ambient Air Quality Stations have been installed. Data on Air Quality, Stack emissions is submitted once in six months to MOEF (RO) .Monthly AAQM reports are submitted to GSPCB. All 12 parameters as per NAAQM are monitored; other parameters are Below Detection Limits. Ozone and Ammonia are found in traces. Table is attached in (i) above Ambient Air Quality Reports and Stack Monitoring Reports are submitted regularly to MOEF, CPCB & GSPCB along with six monthly compliance report. All the values are within limits.

- 5. In-plant control measures for checking fugitive emissions from all the vulnerable sources like Sinter plant, Blast Furnace area etc. shall be adopted. Further, specific measures like water sprinkling shall be carried out at the stock piles of raw material, stacker, reclaimer, transfer points etc. Dust extraction system and bag filters shall be provided to the sinter plant, stock house and blast furnace. Centralized 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 shall be provided. Fugitive emissions shall be controlled, regularly monitored and records maintained.**

Individual Pulse Jet Bag Filters are provided for Cast House, Stock House of Blast Furnace and Flux & Fuel House, Proportioning House, Sinter Screening House of Sinter Plant. These Pulse jet bag filters cover various capture points such as screening, transfer stations, etc. Electrostatic precipitators (ESPs) are provided at Head & Tail end of Sinter Machine of the Sinter Plant. Rain gun sprinklers are provided & operated at the Raw material yard of the Sinter Plant & Blast Furnace. Windscreens are also installed along the raw material boundary wall. Windshields are installed at the Pig Iron dispatch yard. All the stacks are of adequate height as per the design. Fugitive emissions are controlled, monitored & records maintained. Dust suppression system installed at raw material hoppers.

6. Industrial wastewater 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 wastewater shall be utilized for plantation purpose.

All Process water from Coke, Blast Furnace, and Sinter Plant is recycled and reused after appropriate treatment. Blow down from Cooling Tower of Power Plant is let out into Mandovi river after temperature & pH adjustment as per GSPCB. Cooling tower blow down is monitored every month before disposal into river. Readings Of the same are attached in Annexure III.

7. The overall noise levels in and around the plant area shall 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).

Overall noise levels in and around the plant area is on an average less than 85dB (A). Enclosures, acoustic hoods, silencers, etc. are provided wherever necessary. The ambient noise levels conforms to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime) at the boundary of the plant.

8. 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 rain water harvesting and ground water recharging are in vogue as per the advise of Sr. hydro geologist from Water Resource Department (WRD) of Goa. Roof top rain water is directed to tanks and reused. Around 266292 m³ of rain water (from mid-June- mid October) which was collected in excavated pits was used for process during the previous monsoon. The stored water is used for process in blast furnace, shell cooling and slag granulation.

9. Occupational Health Surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

Occupational Health Surveillance of the workers is carried out on a regular basis and records maintained as per the Factories Act. An Occupational Health Centre with an ambulance and Occupational physician (Company employee) and Para-medicos are available.

- 10. The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA / EMP report. Further, the company shall undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.**

There are three villages around the units. We have done the need assessment of the area and working towards the overall development of the villages in various thrust areas like Health, Education, livelihood creation & creation of social infrastructure. There is continuous engagement with all the concerned stakeholders to understand the concerns and finding solutions through consultation process. Company also runs two institutes namely Sesa technical school and Sesa football academy in the nearby Sankhalim village.

- 11. The project authorities shall earmark adequate capital cost and recurring cost/annum for environment pollution control measures and utilize judiciously to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Ministry's Regional Office at Bangalore. The funds so provided shall not be diverted for any other purpose**

HSE department with competent employees reporting to the director of the unit looks after Environmental Management with Management support. An earmarked budget has been allotted with adequate provisions for implantation, operation and maintenance of Environment Pollution Control Measures. The total cost spent on Environment and related activities from April`21 to September`21 is Rs:- 3.24 Crores.

- 12. The Regional Office of this Ministry at Bangalore/CPCB/GPCB will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.**

6 monthly compliance report & monitored data is submitted to MoEF, CPCB & GSPCB regularly on six monthly basis. The report & data uploaded on to company website: - <http://sesagoairnore.com/sustainability/hse/environment-reports/>

- 13. The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the GPCB 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 information about grant of Environmental Clearance was published in 2 local newspapers as per the condition of EC. English Daily "Navhind Times" dated 12/06/2009 & Marathi Daily "Tarun Bharat" dated 12/06/2009.

14. 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 first Consent to Operate was granted for following units in below mentioned years:-

Coke Plant	08/9/2011
WHRPP	22/12/2011
BF	08/06/2012
Sinter Plant	09/11/2012

Additional Recommendations on 25/4/12, when amendment in EC was granted

1. The NAAQS issued by the Ministry vide GSR No 826 (E) dated 16th November 2009 shall be followed.

12 parameters as mentioned in NAAQS are monitored at AAQ stations and reports are submitted to GSPCB.

2. The Project Proponent shall also submit 6 monthly reports on the status of the compliance of stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to respective RO of MOEF, respective ZO of CPCB & SPCB. RO of MOEF at Bangalore/CPCB/GSPCB shall monitor the conditions.

Complied. Six monthly compliance reports submitted to RO of MOEF at Bangalore with cc to CPCB & GSPCB. Also monitored parameters are submitted to the authorities as mentioned in above clauses.

3. Environmental Statement for each financial year ending 31st March in Form V as is mandated to be submitted by project proponent to GSPCB as prescribed under EPR 1986 shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to respective ROs of MOEF by e-mail.

Complied. The Environmental Statements for all units, viz, Coke Plant, Power Plant, Blast furnace and Sinter Plant for year 2020-21 are submitted on 30th July 2021.

4. The Company shall submit within 3 months their policy towards Corporate Environment Responsibility which should inter-alia address (i) SOP to bring into focus any

Infringent/deviation/violation of EC conditions (ii) Hierarchical system or Administrative order of the company to deal with environmental issues and ensuring compliance to EC conditions (iii) System of reporting of noncompliance/violation environmental norms to Board of Directors of the company or/and stakeholders or shareholders.

Corporate Environment Responsibility Policy Action Plan was submitted to MOEF, CPCB and GSPCB on 20/11/12 along with 7th Six Monthly EC Compliance. If any changes are incorporated in CER, same will be intimated to the authorities. Environmental issues are discussed periodically in Vedanta Sustainability Committee Meeting. This Sustainability Committee reports to the Board of Directors, which reviews performance on 6 monthly basis.

Additional Conditions as per Amendment to Environmental clearance via letter No:- F. No. J-11011/946/2007-IA.II(I) dated 07/01/2020

1. **Additional filter beds, arrester wall shall be provided along the Storm Water Drainage for settlement of Suspended Particles and to prevent siltation. The runoff water shall be diverted in settling ponds to prevent any siltation of river/nallah/fields.**

Storm water drains are provided channelizing the storm water into the settling ponds. Filter beds and arrester wall are provided in the storm drains and these storm drains are desilted every year before monsoon.. The runoff water is diverted into the settling ponds and to prevent siltation of river/nallah/fields. Storm water passes through series of settling ponds and these settling ponds are desilted every year before monsoon. Also rainwater stored in some of the settling ponds are used in the process. Additional settling pond of capacity 750m³ and two new concrete check dams have been constructed.

2. **All the transportation roads within the project premises shall be fully asphalted/ concreted in a phased manner to ensure the reduction of fugitive emissions and to get a clear runoff during monsoon.**

Most of the internal roads are black top however balance internal road of around 6.38 km will be black topped or concreted in a phased manner by 2022. Road sweeping machine is deployed to keep the roads clean. Also water is sprayed to prevent dust generation.

3. **Regular monitoring of ground water quality shall be carried out in one open well each in three villages i.e., Amona, Navelim and Maina villages in the post and pre-monsoon seasons and the results shall be submitted to GSPCB under intimation to RO, MOEF & CC Bangalore.**

Ground water quality monitoring was done in the surrounding villages i.e. Amona, Navelim and Maina in the month of October 2021 as a part of ground water study post-monsoon and in April 2021 as a part of ground water study in pre-monsoon period The reports are enclosed herewith as Annexure IV for your reference.

4. **One additional Continuous Ambient Air Quality Monitoring Station (CAAQMS), in consultation with GSPCB shall be established within the project premise towards the adjoining village and monitoring reports shall be submitted to Goa State Pollution Control Board (GSPCB) and CPCB.**

Additional CAAQMS machine has been installed, commissioned within the project premises towards the adjoining village and data on real time basis is being sent on GSPCB and CPCB servers.

5. **Additional sprinkling arrangement in the raw material stacking area shall be done to control fugitive dust within the project premise.**

Rain guns are provided in the stacking area for suppressing dust. Also, additional water tanker sprinkling is done in stacking yard. We have also installed fog cannons at multiple locations and sprinkling arrangement has been provided in the yard and on material transfer conveyer belts and also raw material hoppers. The raw material yard is also surrounded by green belt.

6. **Secondary emission generated during charging, tapping of metal, slag tapping may be controlled by providing canopy hoods at proper elevation connected to air pollution control device without interfering with the production process.**

Bag Filters are provided to control the secondary emission with the hoods at the emission sources.

Following measures are implemented at site:

- I. All the Blast furnaces are equipped with state of art and upgraded bag house systems for capturing the emissions at source,
- II. The Coke Ovens are having dust extraction systems installed on the coal charging sides as well as the coke screening plants,
- III. Sinter plant is equipped with ESP's for controlling the dust emissions at head end and tail end,
- IV. The raw material handling systems are equipped with dust extraction systems and/ or dust suppressant systems at the transfer points,
- V. The coking coal is stored in covered sheds,
- VI. Other raw materials which includes mainly of Iron ore is usually stored in shed and if stored in open yard , its covered with silpauline
- VII. Dust suppression systems like fog guns, rain guns, sprinklers are provided at all the raw material yards and sheds,
- VIII. Wind shields are provided at the plant boundary towards the direction of habitation,
- IX. Road sweeping machines are engaged to clean the roads within and outside the premises.

7. **The NO_x and CO levels should be monitored at workplace at regular intervals (minimum once a week and controlled).**

We are monitoring NOx levels at 6 Locations and CO at multiple locations and monitoring is done weekly. Reports are submitted to Goa State Pollution control board.

8. Monthly monitoring of BaP, Pb,HC, VoCs shall be conducted and report shall be submitted to GSPCB and CPCB.

We have non-recovery type coke oven plants. However, we have started carrying out the monthly monitoring of BaP, Pb, HC, VoCs through AAQMS and Reports of the same are submitted to your good office. Reports of the same are attached as Annexure V.

9. Performance evaluation of all air pollution control devices should be carried out through competent agencies as per the predetermined maintenance protocol of each equipment and report submitted to GSPCB and CPCB.

Performance evaluation of Air Pollution control device like Baghouses, ESP's and others have been carried out by MOEF&Cc accredited Lab and the comprehensive report has been sent to GSPCB and CPCB.

10. The tree density in the existing greenbelt should be increased by planting local species within the project boundary areas adjoining villages as per CPCB guideline.

33% of dedicated green belt area has been marked within the premises. Every year plantation is taken up in the monsoon season to increase the density. We have also planted 7500 trees using the advanced Miyawaki technique in our premises in the year 2021.

11. All above condition shall also be incorporated in the Six Monthly report submitted to Regional Office, Bangalore, MoEF&CC.

This is being complied hereby with this 25th E.C Compliance report which was first complied after 22nd E.C. Compliance report.

** Vedanta Limited (earlier known as Sesa Sterlite Ltd./Sesa Goa Ltd.) has implemented Blast Furnace (0.54MTPA), Sinter Plant (1MTPA), Coke Plant (0.3MTPA), Waste Heat Recovery Power Plant (30MW) vis-a-vis 50% of Environmental Clearance Capacity, as Phase I.*

With respect to Letter dated 25/4/12 from MOEF, name of Project Proponent has been changed from Sesa Industries Ltd. to Sesa Goa Ltd. And further to Vedanta Ltd. Also an amendment in EC has been issued by MOEF with respect to change in plant configuration with changes in stack dimensions.

- Vedanta Ltd. has got Environment Clearance and Consent To Operate for hot metal expansion from existing Blast furnace for production enhancement of 0.45 MTPA to 0.54 MTPA.
- We have applied for Environment clearance for setting up of 0.3 MTPA Capacity Ductile Iron plant, 0.005MTPA Capacity Ferro Silicon Plant, Increasing capacity of Existing plant from 0.54 MTPA to

0.65 MTPA through technology up-gradation, Setting up of 4 Coke ovens, Increase in Existing capacity of Production from old unit from 0.29 MTPA to 0.35 MTPA and Oxygen Plant in the existing Pig Iron Expansion Plant premises near existing mini blast furnace and Public Consultation has been completed for the same and the further process for obtaining EC is going on.

Ambient Air Monitoring data from April-21 to September-21

ANNEXURE-I

Ambient Air Monitoring data from April-21 to September-21

1 - NEAR AMONA GATE				
Date	Particular Matter PM 10	Particular Matter PM 2.5	Sulphur Dioxide (SO₂)	Nitrogen Dioxide (NO_x)
01-04-21	74.17	34.69	11.57	17.65
05-04-21	77.48	37.32	12.23	18.37
08-04-21	81.36	40.75	12.45	19.24
12-04-21	75.67	36.32	12.37	18.76
15-04-21	68.9	30.17	10.78	17.44
19-04-21	72.28	33.89	11.05	17.73
22-04-21	75.07	35.03	11.63	17.8

26-04-21	77.31	37.87	12.25	18.51
29-04-21	71.49	32.1	10.98	17.52
03-05-21	76.34	37.52	12.6	18.51
06-05-21	74.15	35.39	12.33	18.24
10-05-21	67.29	33.2	11.34	17.24
13-05-21	72.56	35.86	12.49	17.94
17-05-21	63.47	27.43	10.34	17.14
20-05-21	65.41	29.25	10.84	17.33
24-05-21	71.62	34.54	11.78	18.18
27-05-21	65.08	28.94	10.41	17.46
31-05-21	62.89	25.77	10.27	17.07
03-06-21	63.27	29.56	11.53	17.56
07-06-21	60.52	32.06	11.28	17.42
10-06-21	58.32	27.75	10.55	16.9
14-06-21	63.36	30.51	11.77	17.77
17-06-21	65.89	32.64	11.71	18.19
21-06-21	57.72	27.83	10.86	17.42
24-06-21	59.33	26.36	10.53	17.55
28-06-21	67.43	31.92	11.68	17.8
01-07-21	58.16	25.39	10.74	16.94
05-07-21	60.75	27.58	10.91	17.15
08-07-21	55.77	24.62	10.02	16.32
12-07-21	52.56	21.13	9.78	16.22
15-07-21	54.17	22.07	9.98	16.47
19-07-21	52.73	20.94	9.51	16.59
22-07-21	54.08	22.47	9.76	17.01
26-07-21	57.62	26.18	10.23	17.46
29-07-21	58.1	27.16	10.44	16.95
03-08-21	54.26	25.07	10.58	17.24
06-08-21	52.19	22.64	9.86	16.55
11-08-21	58.7	26.82	11.24	17.35
13-08-21	55.26	24.76	10.77	16.52
18-08-21	49.14	20.66	9.85	15.73
20-08-21	57.68	25.17	9.93	16.61
25-08-21	62.47	28.37	11.18	17.36
27-08-21	61.94	26.82	10.84	17.04
01-09-21	55.67	26.56	10.78	17.17
03-09-21	53.18	23.84	10.35	16.74
08-09-21	47.89	22.62	9.83	16.43
10-09-21	50.13	25.37	10.21	16.79
15-09-21	53.22	27.02	10.68	16.85
17-09-21	56.83	28.59	10.73	17.32
22-09-21	58.64	30.12	11.25	17.75
24-09-21	48.91	23.86	9.83	16.48
29-09-21	51.68	23.86	10.07	16.78

2 - OPP. BSNL EXCHANGE

Date	Particular Matter PM 10	Particular Matter PM 2.5	Sulphur Dioxide (SO2)	Nitrogen Dioxide (NOx)
01-04-21	75.36	36.59	11.32	17.84
05-04-21	79.46	38.94	12.41	18.51
08-04-21	78.35	37.45	12.17	19.15
12-04-21	81.9	39.01	12.66	19.48
15-04-21	69.65	32.71	10.9	17.33
19-04-21	74.14	34.89	11.35	17.84
22-04-21	80.63	40.32	12.78	18.32
26-04-21	75.11	34.87	11.65	18.03
29-04-21	71.32	31.94	11.07	17.68
03-05-21	77.88	38.11	12.52	18.58
06-05-21	75.64	36.77	12.24	18.13
10-05-21	68.49	32.61	11.46	17.45
13-05-21	71.76	34.85	12.16	18.34
17-05-21	64.28	28.49	10.76	17.38
20-05-21	63.72	26.7	10.52	17.26
24-05-21	72.95	33.27	11.95	18.38
27-05-21	64.18	27.2	10.78	17.21
31-05-21	65.07	27.54	11.07	17.72
03-06-21	61.67	28.86	11.24	17.94
07-06-21	58.96	27.73	10.86	17.36
10-06-21	57.13	26.65	10.72	17.22
14-06-21	62.18	30.32	11.46	18.08
17-06-21	64.47	32.74	11.58	17.84
21-06-21	56.68	26.42	10.62	16.89
24-06-21	63.11	31.06	11.34	17.78
28-06-21	65.59	33.36	11.58	18.2
01-07-21	62.48	28.37	10.97	17.14
05-07-21	57.36	26.29	10.47	16.86
08-07-21	54.18	23.87	9.85	16.45
12-07-21	53.52	21.94	9.61	16.29
15-07-21	56.87	23.4	9.35	17.02
19-07-21	51.75	21.38	9.41	16.26
22-07-21	55.19	24.85	9.71	16.74
26-07-21	58.03	26.76	10.2	17.23
29-07-21	60.76	27.07	10.39	17.65
03-08-21	56.21	25.14	10.24	16.78
06-08-21	58.6	26.39	10.43	17.05
11-08-21	53.41	22.48	9.86	16.65
13-08-21	48.34	20.09	9.72	16.4
18-08-21	47.22	19.87	9.51	16.21
20-08-21	54.93	26.77	10.11	17.35
25-08-21	61.95	27.62	11.65	17.68

27-08-21	57.3	25.19	10.95	17.62
01-09-21	53.15	25.16	10.26	17.29
03-09-21	50.46	23.94	9.88	16.8
08-09-21	56.91	27.19	10.47	17.52
10-09-21	48.21	22.54	9.72	16.39
15-09-21	55.9	25.38	10.37	17.41
17-09-21	58.44	27.76	11.24	17.65
22-09-21	62.51	29.01	11.76	17.83
24-09-21	50.36	24.66	10.62	16.57
29-09-21	48.08	21.87	10.43	16.34

3 - NEAR DISPATCH GATE				
Date	Particular Matter PM 10	Particular Matter PM 2.5	Sulphur Dioxide (SO2)	Nitrogen Dioxide (NOx)
01-04-21	73.83	35.22	11.45	17.61
05-04-21	82.14	40.67	12.58	19.4
08-04-21	77.39	38.93	12.24	19.25
12-04-21	75.46	37.07	11.72	18.77
15-04-21	68.28	31.76	10.71	17.69
19-04-21	72.8	35.48	11.84	17.9
22-04-21	81.22	39.63	12.82	19.21
26-04-21	74.69	34.59	11.51	18.43
29-04-21	70.31	33.66	10.92	17.88
03-05-21	74.89	37.28	12.65	18.32
06-05-21	76.33	38.09	12.84	18.47
10-05-21	65.27	33.53	11.21	17.38
13-05-21	70.15	31.38	12.28	18.09
17-05-21	62.58	26.29	10.35	16.77
20-05-21	65.86	28.42	10.78	17.22
24-05-21	71.67	34.9	12.04	18.31
27-05-21	65.79	27.15	11.23	17.53
31-05-21	63.24	26.08	10.74	17.08
03-06-21	63.55	30.55	11.36	17.86
07-06-21	59.64	28.7	10.54	17.27
10-06-21	56.13	26.41	10.22	17.06
14-06-21	60.75	28.79	11.38	17.74
17-06-21	63.89	31.76	11.76	18.01
21-06-21	60.18	27.39	11.24	17.45
24-06-21	57.83	25.84	11.51	16.87
28-06-21	62.24	31.17	11.76	17.98
01-07-21	63.28	30.79	11.08	17.55
05-07-21	59.33	28.04	10.76	16.76
08-07-21	57.77	25.94	9.97	16.52
12-07-21	54.26	22.17	9.52	16.44

15-07-21	57.71	24.83	9.69	17.14
19-07-21	54.59	22.07	9.48	16.53
22-07-21	58.02	25.12	10.16	16.87
26-07-21	62.94	29.76	11.18	17.46
29-07-21	61.29	28.54	10.46	17.34
03-08-21	53.45	22.81	10.16	16.85
06-08-21	60.25	27.26	11.27	17.52
11-08-21	50.38	21.94	9.93	16.74
13-08-21	47.56	19.42	9.64	16.66
18-08-21	53.84	22.07	9.73	16.82
20-08-21	57.69	25.93	10.52	17.22
25-08-21	64.28	30.58	11.47	17.26
27-08-21	61.2	27.64	11.09	17.41
01-09-21	57.43	27.52	10.36	17.48
03-09-21	52.58	24.18	9.96	16.91
08-09-21	62.49	30.95	10.54	17.78
10-09-21	50.78	21.45	9.81	16.46
15-09-21	57.63	26.77	10.75	17.24
17-09-21	59.11	28.02	10.92	17.85
22-09-21	64.05	32.49	11.24	18.14
24-09-21	48.23	20.43	9.74	16.5
29-09-21	53.74	22.89	10.23	16.68

4 - COMPOUND WALL TOWARDS NAVELIM

Date	Particular Matter PM 10	Particular Matter PM 2.5	Sulphur Dioxide (SO ₂)	Nitrogen Dioxide (NO _x)
01-04-21	72.76	34.82	11.24	17.86
05-04-21	77.5	37.35	11.78	18.59
08-04-21	80.22	39.41	12.54	19.12
12-04-21	74.12	35.89	11.65	17.94
15-04-21	65.79	28.63	10.89	17.43
19-04-21	69.92	30.52	11.03	17.67
22-04-21	77.13	37.58	12.33	19.07
26-04-21	72.81	32.31	11.58	17.54
29-04-21	68.46	32.74	11.07	17.43
03-05-21	75.33	36.32	12.47	18.35
06-05-21	73.76	34.78	12.23	18.2
10-05-21	63.89	31.59	10.75	17.28
13-05-21	69.44	32.54	11.59	17.69
17-05-21	63.72	27.85	10.72	17.24
20-05-21	66.18	28.9	11.24	17.58
24-05-21	72.39	33.21	12.38	18.21
27-05-21	63.75	26.54	10.53	17.44
31-05-21	64.16	27.35	10.79	17.63

03-06-21	59.42	28.67	11.26	17.45
07-06-21	57.78	26.73	10.78	17.22
10-06-21	54.33	26.55	10.09	16.74
14-06-21	62.18	29.16	11.56	17.89
17-06-21	58.94	25.72	11.48	17.53
21-06-21	64.16	31.2	11.74	18.34
24-06-21	55.82	26.73	10.63	16.9
28-06-21	65.57	33.84	11.57	18.41
01-07-21	61.52	28.79	10.84	17.22
05-07-21	58.03	26.52	10.52	16.89
08-07-21	56.14	24.35	10.24	16.61
12-07-21	52.88	22.47	9.75	16.34
15-07-21	55.29	25.08	9.72	17.03
19-07-21	53.18	22.64	9.37	16.76
22-07-21	60.75	27.28	10.24	17.25
26-07-21	64.52	31.46	11.46	17.68
29-07-21	57.19	27.31	10.65	16.84
03-08-21	54.16	23.54	10.42	16.92
06-08-21	56.92	25.42	10.76	17.24
11-08-21	46.51	18.39	9.84	16.04
13-08-21	43.84	17.25	9.61	15.79
18-08-21	52.46	20.78	9.88	16.55
20-08-21	55.44	26.82	10.24	16.83
25-08-21	62.1	28.16	11.27	17.67
27-08-21	58.6	26.71	10.65	17.22
01-09-21	54.38	25.2	10.21	17.24
03-09-21	50.95	23.75	9.76	16.76
08-09-21	58.63	27.51	10.43	17.73
10-09-21	48.91	20.92	9.64	16.31
15-09-21	55.39	25.34	10.24	17.59
17-09-21	61.27	30.09	11.09	18.22
22-09-21	62.96	32.45	11.65	18.35
24-09-21	47.75	22.73	9.89	16.46
29-09-21	52.64	26.9	10.55	17.39

5 - NEAR SATERI TEMPLE				
Date	Particular Matter PM 10	Particular Matter PM 2.5	Sulphur Dioxide (SO2)	Nitrogen Dioxide (NOx)
01-04-21	74.64	34.67	11.56	17.91
05-04-21	76.18	36.91	11.95	18.37
08-04-21	78.42	38.35	12.24	18.77
12-04-21	71.58	33.16	11.17	17.32
15-04-21	68.93	29.9	10.73	17.27
19-04-21	70.47	31.27	11.28	17.86

22-04-21	75.38	36.74	11.79	18.54
26-04-21	71.46	33.87	11.07	17.92
29-04-21	69.61	30.13	10.76	17.38
03-05-21	73.47	35.73	12.34	18.31
06-05-21	72.68	33.67	12.07	18.12
10-05-21	66.31	30.18	11.52	17.16
13-05-21	72.08	34.98	11.79	18.09
17-05-21	64.16	28.32	10.68	17.13
20-05-21	62.96	26.77	10.35	16.85
24-05-21	70.73	34.08	11.76	17.78
27-05-21	64.18	27.12	10.64	17.63
31-05-21	62.82	26.89	10.43	17.42
03-06-21	62.18	30.58	11.35	17.81
07-06-21	58.54	28.39	11.15	17.28
10-06-21	56.82	27.14	10.65	16.8
14-06-21	64.19	32.36	12.18	18.24
17-06-21	58.94	26.82	11.43	17.33
21-06-21	65.22	32.53	12.07	18.46
24-06-21	57.24	28.14	10.86	17.21
28-06-21	64.01	31.8	11.74	17.92
01-07-21	62.56	31.75	11.17	17.41
05-07-21	57.31	27.06	10.65	16.92
08-07-21	55.39	25.81	10.21	16.46
12-07-21	51.78	24.27	9.59	16.23
15-07-21	54.26	26.92	9.85	16.67
19-07-21	56.17	28.63	9.96	16.79
22-07-21	62.34	29.11	10.73	17.45
26-07-21	60.82	27.64	10.97	17.21
29-07-21	56.49	25.17	9.85	16.77
03-08-21	56.18	24.12	9.86	16.75
06-08-21	59.23	27.26	10.24	17.16
11-08-21	47.45	19.64	9.77	16.35
13-08-21	49.16	20.48	9.93	16.43
18-08-21	54.02	22.67	10.46	17.16
20-08-21	57.35	25.19	10.85	17.65
25-08-21	61.49	29.11	11.07	18.19
27-08-21	57.58	27.06	10.83	17.11
01-09-21	52.8	24.67	10.48	17.33
03-09-21	47.69	22.13	9.81	16.62
08-09-21	57.35	26.84	10.74	17.86
10-09-21	49.3	22.46	9.94	16.45
15-09-21	57.19	27.95	10.64	17.64
17-09-21	62.58	31.27	11.27	17.94
22-09-21	58.42	28.66	11.06	17.8
24-09-21	49.35	20.37	9.98	16.73
29-09-21	54.86	27.06	10.21	17.44

6 - COMPOUND WALL TOWARDS MAINA

Date	Particular Matter PM 10	Particular Matter PM 2.5	Sulphur Dioxide (SO₂)	Nitrogen Dioxide (NO_x)
01-04-21	71.78	33.8	11.46	17.68
05-04-21	74.29	35.73	12.18	18.42
08-04-21	70.65	34.74	11.59	17.35
12-04-21	68.2	31.94	10.87	17.3
15-04-21	66.81	28.73	10.51	17.18
19-04-21	73.45	34.78	11.45	17.63
22-04-21	76.89	36.82	12.36	18.39
26-04-21	72.18	34.17	11.19	17.82
29-04-21	67.84	29.41	10.85	17.27
03-05-21	75.16	36.28	12.57	18.47
06-05-21	73.82	34.53	12.32	18.23
10-05-21	65.84	31.94	11.68	17.49
13-05-21	71.88	33.76	12.06	18.14
17-05-21	63.72	27.75	10.73	16.87
20-05-21	65.79	28.43	10.89	17.44
24-05-21	72.64	35.02	11.92	17.56
27-05-21	65.31	28.14	10.73	17.43
31-05-21	63.7	27.33	10.46	17.28
03-06-21	57.84	28.55	11.21	17.68
07-06-21	59.15	27.73	11.58	17.22
10-06-21	55.83	26.32	10.75	16.91
14-06-21	60.76	30.71	11.69	17.74
17-06-21	54.27	25.89	10.54	17.2
21-06-21	63.83	30.38	11.94	17.73
24-06-21	61.17	28.42	10.77	17.41
28-06-21	63.09	31.35	11.15	18.14
01-07-21	58.44	28.41	11.06	17.16
05-07-21	54.76	24.75	10.59	16.72
08-07-21	53.21	23.26	10.43	16.54
12-07-21	50.62	22.84	9.68	16.31
15-07-21	53.78	25.03	9.74	16.25
19-07-21	57.16	26.26	10.05	16.86
22-07-21	60.98	28.01	10.31	17.37
26-07-21	57.32	25.47	10.16	16.82
29-07-21	59.16	26.93	10.27	17.08
03-08-21	54.17	25.14	9.74	16.24
06-08-21	56.82	26.39	10.16	17.12
11-08-21	48.16	18.42	9.86	16.47
13-08-21	51.29	21.67	10.16	16.86
18-08-21	57.05	26.08	10.89	17.46

20-08-21	52.94	24.28	10.24	17.34
25-08-21	62.48	30.67	11.29	17.72
27-08-21	64.18	32.49	11.46	18.36
01-09-21	53.77	22.56	10.21	17.34
03-09-21	46.84	19.87	9.59	16.75
08-09-21	55.38	24.32	10.64	17.49
10-09-21	48.16	20.12	9.83	16.37
15-09-21	58.92	26.94	10.49	17.56
17-09-21	61.47	30.34	10.86	18.14
22-09-21	56.82	25.77	11.16	17.49
24-09-21	47.64	21.34	9.74	16.5
29-09-21	52.17	26.85	10.16	17.24

ANNEXURE-II

STACK MONITORING DETAILS FROM April 2021 to September 2021

SINTER PLANT

Sr.No	Month	Parameter	Stack Details				
			Head End ESP	Tail End ESP	Proportioning De-Dusting	Screening De-Dusting	Flux & Fuel De-Dusting Stack
1	April 21- June 21	Particulate Matter (mg/Nm3)	52.66	44.86	15.81	22.7	41.52
2	July 21- September 21	Particulate Matter (mg/Nm3)	50.26	41.95	14.23	24.91	44.77

Blast Furnace

Sr.No	Month	Parameter	Stack Details			
			Hot Blast Stove	PCM Cast House Dedusting	Stock House Dedusting	PCI Stack
1	April 21- June 21	Particulate Matter(Mg/Nm3)	22.58	36.2	43.21	43.8
		SO2 (Mg/Nm3)	15.71	NA	NA	NA
		Nox(Mg/Nm3)	14.24	NA	NA	NA
2	July 21- September 21	Particulate Matter(Mg/Nm3)	26.63	32.65	40.7	45.92
		SO2 (Mg/Nm3)	15.71	NA	NA	NA
		Nox(Mg/Nm3)	21.37	NA	NA	NA

Waste Heat Recovery Power Plant II

Sr.No	Month	Parameter	Stack Details			
			WHRB 1	WHRB 2	WHRB 1	WHRB 2
1	April 21- June 21	Particulate Matter(Mg/Nm3)	36.21	33.16	-	-
		SO2 (kg/hr)	4.67	5.46	-	-
		Nox(Mg/Nm3)	21.37	14.24	-	-
2	July 21- September 21	Particulate Matter(Mg/Nm3)	42.69	38.43	37.03	42.71
		SO2 (kg/hr)	4.59	5.42	5.46	4.59
		Nox(Mg/Nm3)	14.24	21.37	21.37	14.24

Annexure III- Power Plant CT Blowdown Water Analysis Data (April 21 to September 21)

Month	Parameter	CT Blowdown Discharge Before Treatment	CT Blowdown Discharge After Treatment
April 2021	PH	7.01	6.97
	Temperature (Deg. Cel.)	27.9	27.9
	Suspended Solid(mg/Lit)	29	25
	Oil & Grease (mg/Lit)	1.0	1.0
	Free Chlorine (mg/Lit)	Nil	Nil
	Phosphates as P(mg/Lit)	1.27	1.26
	Copper as Cu (mg/Lit)	0.04	0.03
	Chromium as Cr (mg/Lit)	0.06	0.05
	Iron as Fe (mg/Lit)	0.027	0.024
	Zinc as Zn (mg/Lit)	0.011	0.010

Month	Parameter	CT Blowdown Discharge Before Treatment	CT Blowdown Discharge After Treatment
May 2021	PH	6.97	6.93
	Temperature (Deg. Cel.)	27.8	27.927.8

	Suspended Solid(mg/Lit)	21	19
	Oil & Grease (mg/Lit)	1.40	1.20
	Free Chlorine (mg/Lit)	Nil	Nil
	Phosphates as P(mg/Lit)	1.35	1.32
	Copper as Cu (mg/Lit)	0.03	0.02
	Chromium as Cr (mg/Lit)	0.09	0.03
	Iron as Fe (mg/Lit)	0.032	0.027
	Zinc as Zn (mg/Lit)	0.017	0.014

June 2021	PH	6.95	6.90
	Temperature (Deg. Cel.)	27.7	27.7
	Suspended Solid(mg/Lit)	24	22
	Oil & Grease (mg/Lit)	0.80	0.60
	Free Chlorine (mg/Lit)	Nil	Nil
	Phosphates as P(mg/Lit)	1.69	1.64
	Copper as Cu (mg/Lit)	0.03	0.02
	Chromium as Cr (mg/Lit)	0.08	0.06
	Iron as Fe (mg/Lit)	0.037	0.034
	Zinc as Zn (mg/Lit)	0.015	0.012

Month	Parameter	CT Blowdown Discharge Before Treatment	CT Blowdown Discharge After Treatment
July 2021	PH	6.97	6.93
	Temperature (Deg. Cel.)	27.8	27.7
	Suspended Solid(mg/Lit)	28	25
	Oil & Grease (mg/Lit)	1.60	1.20
	Free Chlorine (mg/Lit)	Nil	Nil
	Phosphates as P(mg/Lit)	1.49	1.39
	Copper as Cu (mg/Lit)	0.05	0.03

	Chromium as Cr (mg/Lit)	0.06	0.04
	Iron as Fe (mg/Lit)	0.042	0.040
	Zinc as Zn (mg/Lit)	0.020	0.018

Month	Parameter	CT Blowdown Discharge Before Treatment	CT Blowdown Discharge After Treatment
August 2021	PH	6.99	6.94
	Temperature (Deg. Cel.)	27.8	27.7
	Suspended Solid(mg/Lit)	29	27
	Oil & Grease (mg/Lit)	2.00	1.80
	Free Chlorine (mg/Lit)	Nil	Nil
	Phosphates as P(mg/Lit)	1.55	1.49
	Copper as Cu (mg/Lit)	0.07	0.05
	Chromium as Cr (mg/Lit)	0.09	0.06
	Iron as Fe (mg/Lit)	0.058	0.053
	Zinc as Zn (mg/Lit)	0.038	0.036

Month	Parameter	CT Blowdown Discharge Before Treatment	CT Blowdown Discharge After Treatment
September 2021	PH	6.82	6.79
	Temperature (Deg. Cel.)	27.9	27.8
	Suspended Solid(mg/Lit)	33	30
	Oil & Grease (mg/Lit)	1.40	1.20
	Free Chlorine (mg/Lit)	Nil	Nil
	Phosphates as P(mg/Lit)	1.70	1.67
	Copper as Cu (mg/Lit)	0.09	0.07
	Chromium as Cr (mg/Lit)	0.08	0.06
	Iron as Fe (mg/Lit)	0.049	0.046
	Zinc as Zn (mg/Lit)	0.032	0.029

Parameters	Limits as per CTO (For After treatment water)
pH	5.5-89.0
Suspended Solid(mg/Lit)	100
Oil & Grease (mg/Lit)	20
Free Chlorine (mg/Lit)	0.5
Phosphates as P(mg/Lit)	5
Copper as Cu (mg/Lit)	1
Chromium as Cr (mg/Lit)	0.2
Iron as Fe(mg/Lit)	1
Zinc as Zn(mg/Lit)	1

ANNEXURE IV (Ground water monitoring Post and pre Monsoon)

Pre-monsoon



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OFF. : 15, Hindustan Kohinoor Industrial Complex, L.B.S. Marg, Vikhroli (West), Mumbai - 83.
Tel.: (022) 2577 7069 / 2577 7070 / 2085 0091 • +91 93213 12367

TEST CERTIFICATE

Doc. No: GLPL/QF/5.10/01

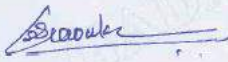
Test Certificate No.	GWE/21/0540	T.C. Date	08/05/2021
Customer Name and Address	M/s. VEDANTA LIMITED (PIG IRON PLANT) SURVEY NO. 30 (PART)41,42/1,27 (PART) AMONA, P.O. MARCELA, BICHOLIM – GOA.		
Letter Ref/Date	As per Dated 03/05/2021		
Lab Reference No.	GWE/21/0540	Page No.	1 of 1
Sampling Done On	03/05/2021	Sample Received on	03/05/2021
Sample Collected by	GLPL	Analysis Period	03/05/2021 To 08/05/2021
Sample Description	Maina - Digamber Naik Well Water, 3 lit in plastic bottle & 1000 ml in glass bottle.		

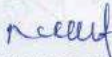
ANALYSIS REPORTS:

Parameters	Units	Test Result	Specification Range as per IS 10500 - 2012		Methods (APHA 23rd Edition)
			Requirement Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
Colour (Pt. Scale)	Hazen unit	< 1.0	5.0 Max.	15.0 Max.	APHA 2120 B
Turbidity	NTU	0.30	1.0 Max.	5.0 Max.	APHA 2130 B
pH	---	6.63	6.5 – 8.5	No Relaxation	APHA 4500 H+ B
Electrical Conductivity	µS/cm	127.00	Not Specified		APHA 2510 B
Total Hardness as CaCO ₃	mg/ltr	62.00	200.0 Max.	600.0 Max.	APHA 2340 C
Chlorides	mg/ltr	17.02	250.0 Max.	1000.0 Max.	APHA 4500 Cl- B
Sulphate	mg/ltr	2.44	200.0 Max.	400.0 Max.	APHA 4500 SO ₄ ²⁻ E
Total Dissolved Solids	mg/ltr	79.00	500.0 Max.	2000.0 Max.	APHA 2540 C
Nitrate	mg/ltr	3.07	45.0 Max.	No Relaxation	APHA 4500 NO ₃ B
Calcium Hardness	mg/ltr	35.03	75.0 Max.	200.0 Max.	APHA 3500 Ca B
Dissolved Iron	mg/ltr	0.038	1.0 Max.	No Relaxation	APHA 3111 B
Magnesium Hardness	mg/ltr	26.97	30.0 Max.	100.0 Max.	APHA 3111 B
Manganese	mg/ltr	< 0.001	0.10 Max.	0.30 Max.	APHA 3111 B
COD	mg/ltr	<4.00	Not Specified		APHA 5220 - B
BOD 3 days 27°C	mg/ltr	<1.00	Not Specified		IS 3025 (Part 44) : 1993
Phosphates	mg/ltr	<0.001	Not Specified		APHA 4500 P D
Total Suspended Solids	mg/ltr	5.00	Not Specified		APHA 2540 D
Oil & Grease	mg/ltr	<0.1	Not Specified		APHA 5520 B

End

For GADARK LAB PVT. LTD.


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4. Customer complaint register is available at laboratory.



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TEST CERTIFICATE

Doc. No: GLPL/QF/5.10/01

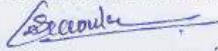
Test Certificate No.	GWE/21/0541	T.C. Date	08/05/2021
Customer Name and Address	M/s. VEDANTA LIMITED (PIG IRON PLANT) SURVEY NO. 30 (PART)41,42/1,27 (PART) AMONA, P.O. MARCELA, BICHOLIM - GOA.		
Letter Ref/Date	As per Dated 03/05/2021		
Lab Reference No.	GWE/21/0541	Page No.	1 of 1
Sampling Done On	03/05/2021	Sample Received on	03/05/2021
Sample Collected by	GLPL	Analysis Period	03/05/2021 To 08/05/2021
Sample Description	Navelim - Sanjay Naik Well Water, 3 lit in plastic bottle & 1000 ml in glass bottle.		

ANALYSIS REPORTS:

Parameters	Units	Test Result	Specification Range as per IS 10500 - 2012		Methods (APHA 23rd Edition)
			Requirement Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
Colour (Pt. Scale)	Hazen unit	< 1.0	5.0 Max.	15.0 Max.	APHA 2120 B
Turbidity	NTU	0.27	1.0 Max.	5.0 Max.	APHA 2130 B
pH	---	6.69	6.5 - 8.5	No Relaxation	APHA 4500 H+B
Electrical Conductivity	μ S/cm	194.00	Not Specified		APHA 2510 B
Total Hardness as CaCO ₃	mg/ltr	93.00	200.0 Max.	600.0 Max.	APHA 2340 C
Chlorides	mg/ltr	17.52	250.0 Max.	1000.0 Max.	APHA 4500 Cl-B
Sulphate	mg/ltr	3.27	200.0 Max.	400.0 Max.	APHA 4500 SO ₄ ²⁻ E
Total Dissolved Solids	mg/ltr	124	500.0 Max.	2000.0 Max.	APHA 2540 C
Nitrate	mg/ltr	3.09	45.0 Max.	No Relaxation	APHA 4500 NO ₃ B
Calcium Hardness	mg/ltr	72.06	75.0 Max.	200.0 Max.	APHA 3500 Ca B
Dissolved Iron	mg/ltr	0.056	1.0 Max.	No Relaxation	APHA 3111 B
Magnesium Hardness	mg/ltr	20.94	30.0 Max.	100.0 Max.	APHA 3111 B
Manganese	mg/ltr	< 0.001	0.10 Max.	0.30 Max.	APHA 3111 B
COD	mg/ltr	<4.00	Not Specified		APHA 5220 - B
BOD 3 days 27°C	mg/ltr	<1.00	Not Specified		IS 3025 (Part 44) : 1993
Phosphates	mg/ltr	<0.001	Not Specified		APHA 4500 P D
Total Suspended Solids	mg/ltr	7.00	Not Specified		APHA 2540 D
Oil & Grease	mg/ltr	<0.1	Not Specified		APHA 5520 B

End

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Doc. No: GLPL/QF/5.10/01

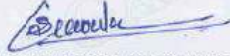
Test Certificate No.	GW/E/21/0542	T.C. Date	08/05/2021
Customer Name and Address	M/s. VEDANTA LIMITED (PIG IRON PLANT) SURVEY NO. 30 (PART)41,42/1,27 (PART) AMONA, P.O. MARCELA, BICHOLIM – GOA.		
Letter Ref/Date	As per Dated 03/05/2021		
Lab Reference No.	GW/E/21/0542	Page No.	1 of 1
Sampling Done On	03/05/2021	Sample Received on	03/05/2021
Sample Collected by	GLPL	Analysis Period	03/05/2021 To 08/05/2021
Sample Description	Amona – Sandesh Naik Well Water, 3 lit in plastic bottle & 1000 ml in glass bottle.		

ANALYSIS REPORTS:

Parameters	Units	Test Result	Specification Range as per IS 10500 - 2012		Methods (APHA 23rd Edition)
			Requirement Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
Colour (Pt. Scale)	Hazen unit	< 1.0	5.0 Max.	15.0 Max.	APHA 2120 B
Turbidity	NTU	0.34	1.0 Max.	5.0 Max.	APHA 2130 B
pH	---	6.77	6.5 – 8.5	No Relaxation	APHA 4500 H ⁺ B
Electrical Conductivity	µS/cm	224.00	Not Specified		APHA 2510 B
Total Hardness as CaCO ₃	mg/ltr	84.00	200.0 Max.	600.0 Max.	APHA 2340 C
Chlorides	mg/ltr	44.55	250.0 Max.	1000.0 Max.	APHA 4500 Cl ⁻ B
Sulphate	mg/ltr	4.17	200.0 Max.	400.0 Max.	APHA 4500 SO ₄ ²⁻ E
Total Dissolved Solids	mg/ltr	142.00	500.0 Max.	2000.0 Max.	APHA 2540 C
Nitrate	mg/ltr	2.74	45.0 Max.	No Relaxation	APHA 4500 NO ₃ B
Calcium Hardness	mg/ltr	49.04	75.0 Max.	200.0 Max.	APHA 3500 Ca B
Dissolved Iron	mg/ltr	0.033	1.0 Max.	No Relaxation	APHA 3111 B
Magnesium Hardness	mg/ltr	34.96	30.0 Max.	100.0 Max.	APHA 3111 B
Manganese	mg/ltr	< 0.001	0.10 Max.	0.30 Max.	APHA 3111 B
COD	mg/ltr	<4.00	Not Specified		APHA 5220 - B
BOD 3 days 27°C	mg/ltr	<1.00	Not Specified		IS 3025 (Part 44) : 1993
Phosphates	mg/ltr	<0.001	Not Specified		APHA 4500 P D
Total Suspended Solids	mg/ltr	8.00	Not Specified		APHA 2540 D
Oil & Grease	mg/ltr	<0.1	Not Specified		APHA 5520 B

End

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ISO 9001 : 2015 Certified & ISO 45001 : 2018 Certified

Post-monsoon



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TEST CERTIFICATE

Doc. No: GLPL/QF/5.10/01

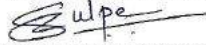
Test Certificate No.	GW/E/21/07134	T.C. Date	25/10/2021
Customer Name and Address	M/s. VEDANTA LIMITED (PIG IRON PLANT) SURVEY NO. 39 (PART)41,42/1,27 (PART) AMONA, P.O. MARCELA, BICHOLIM - GOA.		
Letter Ref/Date	As per Dated 20/10/2021		
Lab Reference No.	GW/E/21/07134	Page No.	1 of 1
Sampling Done On	20/10/2021	Sample Received on	20/10/2021
Sample Collected by	Client	Analysis Period	20/10/2021 To 25/10/2021
Sample Description	Maina - Digamber Naik Well Water, 3 lit in plastic bottle & 1000 ml in glass bottle.		

ANALYSIS REPORTS:

Parameters	Units	Test Result	Specification Range as per IS 10500 - 2012		Methods (APHA 23rd Edition)
			Requirement Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
Colour (Pt. Scale)	Hazen unit	< 1.0	5.0 Max.	15.0 Max.	APHA 2120 B
Turbidity	NTU	0.22	1.0 Max.	5.0 Max.	APHA 2130 B
pH	---	6.74	6.5 - 8.5	No Relaxation	APHA 4500 H ⁺ B
Electrical Conductivity	µS/cm	127.00	Not Specified		APHA 2510 B
Total Hardness as CaCO ₃	mg/ltr	42.00	200.0 Max.	600.0 Max.	APHA 2340 C
Chlorides	mg/ltr	12.51	250.0 Max.	1000.0 Max.	APHA 4500 Cl ⁻ B
Sulphate	mg/ltr	2.03	200.0 Max.	400.0 Max.	APHA 4500 SO ₄ ²⁻ E
Total Dissolved Solids	mg/ltr	82.00	500.0 Max.	2000.0 Max.	APHA 2540 C
Nitrate	mg/ltr	1.96	45.0 Max.	No Relaxation	APHA 4500 NO ₃ B
Calcium Hardness	mg/ltr	23.02	Not Specified		APHA 3500 Ca B
Dissolved Iron	mg/ltr	<0.001	1.0 Max.	No Relaxation	APHA 3111 B
Magnesium Hardness	mg/ltr	18.98	Not Specified		APHA 3111 B
Manganese	mg/ltr	< 0.001	0.10 Max.	0.30 Max.	APHA 3111 B
COD	mg/ltr	<4.00	Not Specified		APHA 5220 - B
BOD 3 days 27°C	mg/ltr	<1.00	Not Specified		IS 3025 (Part 44) : 1993
Phosphates	mg/ltr	<0.001	Not Specified		APHA 4500 P D
Total Suspended Solids	mg/ltr	6.00	Not Specified		APHA 2540 D
Oil & Grease	mg/ltr	<0.1	Not Specified		APHA 5520 B

End

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TEST CERTIFICATE

Doc. No: GLPL/QF/5.10/01

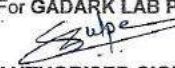
Test Certificate No.	GW/E/21/07135	T.C. Date	25/10/2021
Customer Name and Address	M/s. VEDANTA LIMITED (PIG IRON PLANT) SURVEY NO. 30 (PART)41,42/1,27 (PART) AMONA, P.O. MARCELA, BICHOLIM - GOA.		
Letter Ref/Date	As per Dated 20/10/2021		
Lab Reference No.	GW/E/21/07135	Page No.	1 of 1
Sampling Done On	20/10/2021	Sample Received on	20/10/2021
Sample Collected by	Client	Analysis Period	20/10/2021 To 25/10/2021
Sample Description	Navelim - Sanjay Naik Well Water, 3 lit in plastic bottle & 1000 ml in glass bottle.		

ANALYSIS REPORTS:

Parameters	Units	Test Result	Specification Range as per IS 10500 - 2012		Methods (APHA 23rd Edition)
			Requirement Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
Colour (Pt. Scale)	Hazen unit	< 1.0	5.0 Max.	15.0 Max.	APHA 2120 B
Turbidity	NTU	0.27	1.0 Max.	5.0 Max.	APHA 2130 B
pH	---	6.81	6.5 - 8.5	No Relaxation	APHA 4500 H ⁺ B
Electrical Conductivity	μ S/cm	158.00	Not Specified		APHA 2510 B
Total Hardness as CaCO ₃	mg/ltr	64.00	200.0 Max.	600.0 Max.	APHA 2340 C
Chlorides	mg/ltr	16.02	250.0 Max.	1000.0 Max.	APHA 4500 Cl ⁻ B
Sulphate	mg/ltr	3.42	200.0 Max.	400.0 Max.	APHA 4500 SO ₄ ²⁻ E
Total Dissolved Solids	mg/ltr	96.00	500.0 Max.	2000.0 Max.	APHA 2540 C
Nitrate	mg/ltr	2.61	45.0 Max.	No Relaxation	APHA 4500 NO ₃ B
Calcium Hardness	mg/ltr	42.03	Not Specified		APHA 3500 Ca B
Dissolved Iron	mg/ltr	<0.001	1.0 Max.	No Relaxation	APHA 3111 B
Magnesium Hardness	mg/ltr	21.97	Not Specified		APHA 3111 B
Manganese	mg/ltr	< 0.001	0.10 Max.	0.30 Max.	APHA 3111 B
COD	mg/ltr	<4.00	Not Specified		APHA 5220 - B
BOD 3 days 27°C	mg/ltr	<1.00	Not Specified		IS 3025 (Part 44) : 1993
Phosphates	mg/ltr	<0.001	Not Specified		APHA 4500 P D
Total Suspended Solids	mg/ltr	6.00	Not Specified		APHA 2540 D
Oil & Grease	mg/ltr	<0.1	Not Specified		APHA 5520 B

End

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Note:

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4. Customer complaint register is available at laboratory.



GADARK LAB PVT. LTD.

INDUSTRIAL ANALYSTS & CONSULTANTS

LAB.: H-54, Additional M.I.D.C. Kudal, Taluka - Kudal, District - Sindhudurg - 416 525,
Tel.: (02362) 223519 E-mail: info@gadark.in Website: www.gadark.in

OFF.: 15, Hindustan Kohinoor Industrial Complex, L.B.S. Marg, Vikhroli (West), Mumbai - 83.
Tel.: (022) 2577 7069 / 2577 7070 / 2085 0091 + 91 9321312367

TEST CERTIFICATE

Doc. No: GLPL/QF/5.10/01

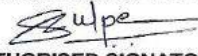
Test Certificate No.	GWE/21/07136	T.C. Date	25/10/2021
Customer Name and Address	M/s. VEDANTA LIMITED (PIG IRON PLANT) SURVEY NO. 30 (PART)41,42/1,27 (PART) AMONA, P.O. MARCELA, BICHOLIM - GOA.		
Letter Ref/Date	As per Dated 20/10/2021		
Lab Reference No.	GWE/21/07136	Page No.	1 of 1
Sampling Done On	20/10/2021	Sample Received on	20/10/2021
Sample Collected by	Client	Analysis Period	20/10/2021 To 25/10/2021
Sample Description	Amona - Sandesh Naik Well Water, 3 lit in plastic bottle & 1000 ml in glass bottle.		

ANALYSIS REPORTS:

Parameters	Units	Test Result	Specification Range as per IS 10500 - 2012		Methods (APHA 23rd Edition)
			Requirement Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
Colour (Pt. Scale)	Hazen unit	< 1.0	5.0 Max.	15.0 Max.	APHA 2120 B
Turbidity	NTU	0.21	1.0 Max.	5.0 Max.	APHA 2130 B
pH	---	6.70	6.5 - 8.5	No Relaxation	APHA 4500 H ⁺ B
Electrical Conductivity	μ S/cm	184.00	Not Specified		APHA 2510 B
Total Hardness as CaCO ₃	mg/ltr	62.00	200.0 Max.	600.0 Max.	APHA 2340 C
Chlorides	mg/ltr	31.03	250.0 Max.	1000.0 Max.	APHA 4500 Cl ⁻ B
Sulphate	mg/ltr	4.06	200.0 Max.	400.0 Max.	APHA 4500 SO ₄ ²⁻ E
Total Dissolved Solids	mg/ltr	111.00	500.0 Max.	2000.0 Max.	APHA 2540 C
Nitrate	mg/ltr	2.07	45.0 Max.	No Relaxation	APHA 4500 NO ₃ B
Calcium Hardness	mg/ltr	40.03	Not Specified		APHA 3500 Ca B
Dissolved Iron	mg/ltr	<0.001	1.0 Max.	No Relaxation	APHA 3111 B
Magnesium Hardness	mg/ltr	21.97	30.0 Max.	100.0 Max.	APHA 3111 B
Manganese	mg/ltr	< 0.001	Not Specified		APHA 3111 B
COD	mg/ltr	<4.00	Not Specified		APHA 5220 - B
BOD 3 days 27°C	mg/ltr	<1.00	Not Specified		IS 3025 (Part 44) : 1993
Phosphates	mg/ltr	<0.001	Not Specified		APHA 4500 P D
Total Suspended Solids	mg/ltr	9.00	Not Specified		APHA 2540 D
Oil & Grease	mg/ltr	<0.1	Not Specified		APHA 5520 B

End

For GADARK LAB PVT. LTD.


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[SANTOSH V. ZULPE]


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ANNEXURE V (Workplace monitoring report)

April`21



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Tel.: (022) 2577 7069 / 2577 7070 / 2085 0091 + 91 9321312367

TEST CERTIFICATE

Doc.No : GLPL/QF/5.10/01

Test Certificate No.	GA/E/04110/21	T. C. Date	08/04/2021
Customer Name and Address	M/s. VEDANTA LIMITED (MET COKE DIVISION) (WASTE HEAT RECOVERY POWER PLANT - I) SURVEY NO. 205,206,207, 31/1, PART OF 177,44,43/1,43/2, & 42/1 & 74,SURVEY NO. 207 (PART) OF NAVELIM VILLAGE AND SURVEY NO. 43/1, 44/4 & 44/5 OF AMONA VILLAGE, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Sample Received on	02/04/2021	Analysis Period	02/04/2021 To 08/04/2021

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	MCD II Battery 2 Area
Date of Sampling	02/04/2021
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	32.9
Relative Humidity [%]	61

ANALYSIS REPORT :-

Parameters	Unit	Results	Limits*	Methods
Ammonia	mg/m ³	3.25	35.00	APHA Method 401 3 rd Edition
Benzo Pyrene	mg/m ³	<0.002	Not Specified	IS 5182 (Part 12):2004
Lead	mg/m ³	<0.001	0.05	IS 5182 (Part 22)
VOC	PPM	<0.01	Not Specified	IS 5182 (Part 11) 2006
HC	PPM	1.1	Not Specified	IS 5182 (Part 17) 1979

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)

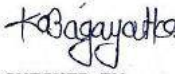
End

For GADARK LAB PVT. LTD.


AUTHORISED SIGNATORY
[KAILAS V. CHITALKAR

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TEST CERTIFICATE

Doc.No : GLPL/QF/5.10/01

Test Certificate No.	GA/E/04109/21,04275,04429,04603 & 04766	T. C. Date	03/05/2021
Customer Name and Address	M/s. VEDANTA LIMITED. (PIG IRON EXPANSION PLANT). SURVEY NO. 61/1,61/3,62,63/0,120/1,177 (PART)205,206,207, VILLAGE NAVELIM, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Month of Sampling	April - 2021		

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	Blast Furnace 3 PID2 Cast House
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	33.6
Relative Humidity [%]	58

ANALYSIS REPORT :-

Sr. No.	Report No.	Date of Sampling	Parameters	
			Oxides of Nitrogen (NO _x) mg/m ³	Carbon Monoxide (CO) mg/m ³
1	GA/E/04109/21	02/04/2021	0.27	1.8
2	GA/E/04275/21	09/04/2021	0.32	2.0
3	GA/E/04429/21	16/04/2021	0.21	1.7
4	GA/E/04603/21	23/04/2021	0.24	1.9
5	GA/E/04766/21	30/04/2021	0.30	2.0
Limits*			9	55
Test methods of analyzed parameters			IS 5182 (Part VI) 2012	IS 5182 (Part X) 1999

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)

End

For GADARK LAB PVT. LTD.

K. V. Chitalkar

AUTHORISED SIGNATORY
[KAILAS V. CHITALKAR]

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K. V. Chitalkar

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May'21



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TEST CERTIFICATE

Doc.No : GLPL/QF/5.10/01

Test Certificate No.	GA/E/05128/21	T. C. Date	13/05/2021
Customer Name and Address	M/s. VEDANTA LIMITED (MET COKE DIVISION) (WASTE HEAT RECOVERY POWER PLANT - I) SURVEY NO. 205,206,207, 31/1, PART OF 177,44,43/1,43/2, & 42/1 & 74,SURVEY NO. 207 (PART) OF NAVELIM VILLAGE AND SURVEY NO. 43/1, 44/4 & 44/5 OF AMONA VILLAGE, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Sample Received on	07/05/2021	Analysis Period	07/05/2021 To 13/05/2021

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	MCD II Battery 2 Area
Date of Sampling	07/05/2021
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	32.2
Relative Humidity [%]	59.7

ANALYSIS REPORT :-

Parameters	Unit	Results	Limits*	Methods
Ammonia	mg/m ³	4.07	35.00	APHA Method 401 3 rd Edition
Benzo Pyrene	mg/m ³	<0.002	Not Specified	IS 5182 (Part 12):2004
Lead	mg/m ³	<0.001	0.05	IS 5182 (Part 22)
VOC	PPM	<0.01	Not Specified	IS 5182 (Part 11) 2006
HC	PPM	1.27	Not Specified	IS 5182 (Part 17) 1979

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)

End

For GADARK LAB PVT. LTD.


AUTHORISED SIGNATORY
[KAILAS V. CHITALKAR]


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Recognised by Ministry of Environment, Forest and CC, Government of India, under the Environment Protection Act, 1986, vide Gazette Notification No. 1357, dated 2nd June 2016, valid upto 1st June 2021
ISO 9001 : 2015 Certified & ISO 45001 : 2018 Certified



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TEST CERTIFICATE

Doc.No : GLPL/QF/5.10/01

Test Certificate No.	GA/E/05127/21, 05371,05553, & 05718	T. C. Date	31/05/2021
Customer Name and Address	M/s. VEDANTA LIMITED. (PIG IRON EXPANSION PLANT), SURVEY NO. 61/1,61/3,62,63/0,120/1,177 (PART)205,206,207, VILLAGE NAVELIM, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Month of Sampling	May - 2021		

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	Blast Furnace 3 PID2 Cast House
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	32.6
Relative Humidity [%]	56

ANALYSIS REPORT :-

Sr. No.	Report No.	Date of Sampling	Parameters	
			Oxides of Nitrogen (NO _x) mg/m ³	Carbon Monoxide (CO) mg/m ³
1	GA/E/05127/21	07/05/2021	0.37	2.0
2	GA/E/05371/21	14/05/2021	0.33	2.3
3	GA/E/05553/21	21/05/2021	0.19	1.4
4	GA/E/05718/21	28/05/2021	0.21	1.7
Limits*			9	55
Test methods of analyzed parameters			IS 5182 (Part VI) 2012	IS 5182 (Part X) 1999

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)

End

For GADARK LAB PVT. LTD.


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June`21



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TEST CERTIFICATE

Doc.No : GLPL/QF/5 10/01

Test Certificate No.	GA/E/06162/21	T. C. Date	12/06/2021
Customer Name and Address	M/s. VEDANTA LIMITED (MET COKE DIVISION) (WASTE HEAT RECOVERY POWER PLANT - I) SURVEY NO. 205,206,207, 31/1, PART OF 177,44,43/1,43/2, & 42/1 & 74,SURVEY NO. 207 (PART) OF NAVELIM VILLAGE AND SURVEY NO. 43/1, 44/4 & 44/5 OF AMONA VILLAGE, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Sample Received on	08/06/2021	Analysis Period	08/06/2021 To 12/06/2021

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	MCD II Battery 2 Area
Date of Sampling	08/06/2021
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	29.8
Relative Humidity [%]	90

ANALYSIS REPORT :-

Parameters	Unit	Results	Limits*	Methods
Ammonia	mg/m ³	6.14	35.00	APHA Method 401 3 rd Edition
Benzo Pyrene	mg/m ³	<0.002	Not Specified	IS 5182 (Part 12):2004
Lead	mg/m ³	<0.001	0.05	IS 5182 (Part 22)
VOC	PPM	<0.01	Not Specified	IS 5182 (Part 11) 2006
HC	PPM	1.35	Not Specified	IS 5182 (Part 17) 1979

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)

End

For GADARK LAB PVT. LTD.

Kailas

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[KAILAS V. CHITALKAR]

K. B. Gupta
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TEST CERTIFICATE

Doc.No : GLPL/QF/5.10/01

Test Certificate No.	GA/E/0685/21, 06161, 06370, 06559 & 06749	T. C. Date	05/07/2021
Customer Name and Address	M/s. VEDANTA LIMITED. (PIG IRON EXPANSION PLANT). SURVEY NO. 61/1,61/3,62,63/0,120/1,177 (PART)205,206,207, VILLAGE NAVELIM, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Month of Sampling	June - 2021		

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	Blast Furnace 3 PID2 Cast House
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	28.5
Relative Humidity [%]	86

ANALYSIS REPORT :-

Sr. No.	Report No.	Date of Sampling	Parameters	
			Oxides of Nitrogen (NO _x) mg/m ³	Carbon Monoxide (CO) mg/m ³
1	GA/E/0685/21	01/06/2021	0.38	1.8
2	GA/E/06161/21	08/06/2021	0.31	2.1
3	GA/E/06370/21	15/06/2021	0.27	1.7
4	GA/E/06559/21	22/06/2021	0.23	1.3
5	GA/E/06749/21	29/06/2021	0.20	2.0
Limits*			9	55
Test methods of analyzed parameters			IS 5182 (Part VI) 2012	IS 5182 (Part X) 1999

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)

End

For GADARK LAB PVT. LTD.

Kailas

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K. Bagayath

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July`21



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TEST CERTIFICATE

Doc.No : GLPL/QF/5.10/01

Test Certificate No.	GA/E/07298/21	T. C. Date	31/07/2021
Customer Name and Address	M/s. VEDANTA LIMITED (MET COKE DIVISION) (WASTE HEAT RECOVERY POWER PLANT - I) SURVEY NO. 205,206,207, 31/1, PART OF 177,44,43/1,43/2, & 42/1 & 74,SURVEY NO. 207 (PART) OF NAVELIM VILLAGE AND SURVEY NO. 43/1, 44/4 & 44/5 OF AMONA VILLAGE, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Sample Received on	08/07/2021	Analysis Period	08/07/2021 To 14/07/2021

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	MCD II Battery 2 Area
Date of Sampling	08/07/2021
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	26.0
Relative Humidity [%]	89

ANALYSIS REPORT :-

Parameters	Unit	Results	Limits*	Methods
Ammonia	mg/m ³	7.04	35.00	APHA Method 401 3 rd Edition
Benzo Pyrene	mg/m ³	<0.002	Not Specified	IS 5182 (Part 12):2004
Lead	mg/m ³	<0.001	0.05	IS 5182 (Part 22)
VOC	PPM	<0.01	Not Specified	IS 5182 (Part 11) 2006
HC	PPM	1.49	Not Specified	IS 5182 (Part 17) 1979

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)
End

For GADARK LAB PVT. LTD.

Kailas V. Chitalkar
 AUTHORISED SIGNATORY
 [KAILAS V. CHITALKAR]

Kabagayathka
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TEST CERTIFICATE

Doc.No : GLPL/QF/5.10/01

Test Certificate No.	GA/E/07130/21, 07297, 07478, 07644 & 07803	T. C. Date	31/07/2021
Customer Name and Address	M/s. VEDANTA LIMITED. (PIG IRON EXPANSION PLANT). SURVEY NO. 61/1,61/3,62,63/0,120/1,177 (PART)205,206,207, VILLAGE NAVELIM, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Month of Sampling	July - 2021		

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	Blast Furnace 3 PID2 Cast House
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	26.0
Relative Humidity [%]	89

ANALYSIS REPORT :-

Sr. No.	Report No.	Date of Sampling	Parameters	
			Oxides of Nitrogen (NO _x) mg/m ³	Carbon Monoxide (CO) mg/m ³
1	GA/E/07130/21	01/07/2021	0.28	2.0
2	GA/E/07297/21	08/07/2021	0.24	1.6
3	GA/E/07478/21	15/07/2021	0.30	1.9
4	GA/E/07644/21	22/07/2021	0.27	1.7
5	GA/E/07803/21	29/07/2021	0.22	2.1
Limits*			9	55
Test methods of analyzed parameters			IS 5182 (Part VI) 2012	IS 5182 (Part X) 1999

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)

End

For GADARK LAB PVT. LTD.

AUTHORISED SIGNATORY
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August`21



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TEST CERTIFICATE

Doc.No : GLPL/QF/5.10/01

Test Certificate No.	GA/E/08302/21	T. C. Date	13/08/2021
Customer Name and Address	M/s. VEDANTA LIMITED (MET COKE DIVISION) (WASTE HEAT RECOVERY POWER PLANT - I) SURVEY NO. 205,206,207, 31/1, PART OF 177,44,43/1,43/2, & 42/1 & 74,SURVEY NO. 207 (PART) OF NAVELIM VILLAGE AND SURVEY NO. 43/1, 44/4 & 44/5 OF AMONA VILLAGE, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Sample Received on	09/08/2021	Analysis Period	09/08/2021 To 13/08/2021

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	MCD II Battery 2 Area
Date of Sampling	09/08/2021
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	27.3
Relative Humidity [%]	69

ANALYSIS REPORT :-

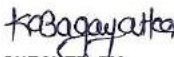
Parameters	Unit	Results	Limits*	Methods
Ammonia	mg/m ³	7.04	35.00	APHA Method 401 3 rd Edition
Benzo Pyrene	mg/m ³	<0.002	Not Specified	IS 5182 (Part 12):2004
Lead	mg/m ³	<0.001	0.05	IS 5182 (Part 22)
VOC	PPM	<0.01	Not Specified	IS 5182 (Part 11) 2006
HC	PPM	1.49	Not Specified	IS 5182 (Part 17) 1979

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)

End

For GADARK LAB PVT. LTD.


AUTHORISED SIGNATORY
[KAILAS V. CHITALKAR]


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Note :

- The results relate only to the samples tested
- Test certificate shall not be reproduced except in full, without written approval of the laboratory.
- Samples will be preserved for a period 15 days from the delivery of Test Certificate.
- Test Results relate only to the conditions prevailing at the time of sampling
- Customer complaint register is available at laboratory.



GADARK LAB PVT. LTD.

INDUSTRIAL ANALYSTS & CONSULTANTS

LAB.: H-54, Additional M.I.D.C. Kudal, Taluka - Kudal, District - Sindhudurg - 416 525,
Tel.: (02362) 223519 E-mail: info@gadark.in Website: www.gadark.in

OFF.: 15, Hindustan Kohinoor Industrial Complex, L.B.S. Marg, Vikhroli (West), Mumbai - 83.
Tel.: (022) 2577 7069 / 2577 7070 / 2085 0091 + 91 9321312367

TEST CERTIFICATE

Doc.No : GLPL/QF/5.10/01

Test Certificate No.	GA/E/08124/21, 08301, 08488, 08701 & 08876	T. C. Date	01/09/2021
Customer Name and Address	M/s. VEDANTA LIMITED. (PIG IRON EXPANSION PLANT), SURVEY NO. 61/1,61/3,62,63/0,120/1,177 (PART)205,206,207, VILLAGE NAVELIM, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Month of Sampling	August - 2021		

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	Blast Furnace 3 PID2 Cast House
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	27
Relative Humidity [%]	90

ANALYSIS REPORT :-

Sr. No.	Report No.	Date of Sampling	Parameters	
			Oxides of Nitrogen (NO _x) mg/m ³	Carbon Monoxide (CO) mg/m ³
1	GA/E/08124/21	02/08/2021	0.21	2.3
2	GA/E/08301/21	09/08/2021	0.23	1.6
3	GA/E/08488/21	16/08/2021	0.26	1.8
4	GA/E/08701/21	23/08/2021	0.30	2.1
5	GA/E/08876/21	30/08/2021	0.24	2.3
Limits*			9	55
Test methods of analyzed parameters			IS 5182 (Part VI) 2012	IS 5182 (Part X) 1999

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)

End

For GADARK LAB PVT. LTD.

AUTHORISED SIGNATORY
[KAILAS V. CHITALKAR]

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September`21



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TEST CERTIFICATE

Doc.No : GLPL/QF/5.10/01

Test Certificate No.	GA/E/09317/21	T. C. Date	13/09/2021
Customer Name and Address	M/s. VEDANTA LIMITED (MET COKE DIVISION) (WASTE HEAT RECOVERY POWER PLANT - I) SURVEY NO. 205,206,207, 31/1, PART OF 177,44,43/1,43/2, & 42/1 & 74,SURVEY NO. 207 (PART) OF NAVELIM VILLAGE AND SURVEY NO. 43/1, 44/4 & 44/5 OF AMONA VILLAGE, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Sample Received on	08/09/2021	Analysis Period	08/09/2021 To 11/09/2021

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	MCD II Battery 2 Area
Date of Sampling	08/09/2021
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	27.2
Relative Humidity [%]	90

ANALYSIS REPORT :-

Parameters	Unit	Results	Limits*	Methods
Ammonia	mg/m ³	9.12	35.00	APHA Method 401 3 rd Edition
Benzo Pyrene	mg/m ³	<0.002	Not Specified	IS 5182 (Part 12):2004
Lead	mg/m ³	<0.001	0.05	IS 5182 (Part 22)
VOC	PPM	<0.01	Not Specified	IS 5182 (Part 11) 2006
HC	PPM	1.62	Not Specified	IS 5182 (Part 17) 1979

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)

End

For GADARK LAB PVT. LTD.

Kailas V. Chitalkar
AUTHORISED SIGNATORY
[KAILAS V. CHITALKAR]

K. Bagyalaksh
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Recognised by Ministry of Environment, Forest and CC, Government of India, New Delhi under the Environment Protection Act, 1986, valid upto 15th October 2023. ISO 9001 : 2015 Certified & ISO 45001 : 2018 Certified.



GADARK LAB PVT. LTD.

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TEST CERTIFICATE

Doc.No : GLPL/QF/5.10/01

Test Certificate No.	GA/E/09138/21, 09316, 09505, 09727 & 09915	T. C. Date	06/10/2021
Customer Name and Address	M/s. VEDANTA LIMITED. (PIG IRON EXPANSION PLANT). SURVEY NO. 61/1,61/3,62,63/0,120/1,177 (PART)205,206,207, VILLAGE NAVELIM, BICHOLIM - GOA.		
Letter Ref / Date	As per Dated 01/04/2021		
Sampling Done By	GLPL	Page No.	1 of 1
Month of Sampling	September - 2021		

SAMPLING DETAILS - WORKPLACE AIR MONITORING:

Sampling Location	Blast Furnace 3 PID2 Cast House
Duration of Sampling [Hrs]	8
Ambient Temperature [°C]	27
Relative Humidity [%]	92

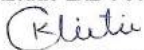
ANALYSIS REPORT :-

Sr. No.	Report No.	Date of Sampling	Parameters	
			Oxides of Nitrogen (NO _x) mg/m ³	Carbon Monoxide (CO) mg/m ³
1	GA/E/09138/21	01/09/2021	0.27	2.7
2	GA/E/09316/21	08/09/2021	0.21	2.2
3	GA/E/09505/21	15/09/2021	0.23	2.6
4	GA/E/09727/21	22/09/2021	0.27	2.4
5	GA/E/09915/21	29/09/2021	0.26	2.0
Limits*			9	55
Test methods of analyzed parameters			IS 5182 (Part Vi) 2012	IS 5182 (Part X) 1999

Limits* - Personal Exposure Limits as per OSHA (TWA for 8hrly)

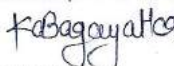
End

For GADARK LAB PVT. LTD.


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[KAILAS V. CHITALKAR]

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