TSL/MoEF&CC/BS-01/2021-03/128
22nd Nov' 2021

The Dy. Director General
Ministry of Environment, Forests and Climate Change,
Regional Office (EZ),
A/3, Chandrasekharpur
Bhubaneswar-751023

Sub: Half yearly EC compliance reports of 5.6, 3.1 and 1.5 MTPA capacity of integrated steel plant of Tata Steel Limited for the period Apr to Sep'21.

Ref: 1. EC vide letters no.J-11011/829/2008-IA-II (I), dated 20.07.2012 of 5.6 MTPA
2. EC vide letters no J-11011/405/2007-IA-II (I), dated 22.09.2008 of 3.1 MTPA
3. EC vide letters no.J-11011/8/2005-IA-II (I), dated 29.06.2005 of 1.5 MTPA

Dear Sir,

As per EIA notification 2006 and its subsequent amendments, we have mailed soft copies of the half yearly compliance status of the Environmental Clearances of 5.6 MTPA, 3.1 MTPA and 1.5 MTPA capacity of our integrated steel plant at Maramandali for the period from April to September'21 to the mail ID**:** **roez.bsr-mef@nic.in** on dated 22.11.2021 from the mail ID: santosh.pattajoshi@tatasteel.com.

In case of non-receipt of our half yearly status report through email, request you to inform us, so that we will be happy to submit hard copies in your good office by hand.

Thanking you,

Yours faithfully,
f:Tata Steel Limited

Saroj Kumar Banerjee
Chief Environment

Hard copies submitted by post to:

1. The Member Secretary, CPCB, Parivesh Bhawan, East Arjun Nagar, Delhi-110032.
2. The Member Secretary, SPCB, Parivesh Bhawan,A/118,Nilakahanta Nagar, Unit- VIII, Odisha, Bhubaneswar-751012.

HALF YEARLY COMPLIANCE REPORT

for the period from

Apr to Sep'21

Environment Clearance of 5.6 MTPA, 3.1MTPA and 1.5 MTPA Integrated Steel Plant

Letter nos.J-11011/8/2005-IA-II (I) dated 29.06.2005
J-11011/405/2007-IA-II (I) dated 22.09.2008
J-11011/829/2008-IA-II (I) dated 20.07.2012

TATA STEEL LIMITED

Narendrapur, Kusupanga, Meramandali, Dhenkanal, Odisha

HALF YEARLY COMPLIANCE REPORT

April to September' 21

Environment clearance of 5.6 MTPA Integrated Steel Plant
Letter no.: 1011/829/2008-IA-II (I) dated 20.07.2012

SL	CONDITIONS	COMPLIANCE STATUS
i	Compliance to all the specific and general conditions stipulated for the existing plant by the Central / State Government shall be ensured and regular reports submitted to the Ministry's Regional Office at Bhubaneswar / SPCB.	• Compliance reports including monitoring data are being sent to MOEF&CC, CPCB and SPCB regularly. • The last half yearly compliance report was submitted vide letter no. TSBSL/MoEF&CC/BS-01/2020-02/59 dated 01.06.2021.
ii	The target dates / schedule given for compliance to the conditions of environmental clearance for 3.1 MTPA Steel Plant to the State Pollution Control Board and to the Ministry shall be adhered to and reports regularly submitted to MoEF Regional Office at Bhubaneswar.	• Six monthly compliance report including monitoring data for EC conditions of earlier 3.1 MTPA capacity is being sent to MOEF&CC, CPCB and SPCB regularly. • The last half yearly compliance report was submitted vide letter no. TSBSL/MoEF&CC/BS-01/2020-02/59 dated 01.06.2021.
iii	The 'Consent to Operate' shall be granted by SPCB only after satisfactory compliance of the conditions stipulated in the environmental clearance and Consent granted by the SPCB for the 3.1 MTPA steel plant. A joint visit shall be conducted by MoEF Regional Office at Bhubaneswar and SPCB in this regard. Periodic review of the project regarding compliance to the conditions stipulated shall be undertaken based on the compliance report submitted by the proponent within four months. The compliance status shall be monitored by the Regional Office of the Ministry at Bhubaneswar.	• Consent to Operate for 5.6 MTPA integrated steel plant has been obtained from SPCB vide letter no 4049/IND–I–CON-5440, dated.17.03.2021 and is valid up to 31.03.2023.
iv	Measures shall be undertaken to mitigate particulate matter levels in the ambient air and a time bound action plan shall be submitted. On-line ambient air quality monitoring and continuous stack monitoring facilities for all the stacks shall be provided and sufficient air pollution control devices viz. Electro Static Precipitator (ESP), Gas cleaning plant (GCP), Bag Filter (BF) etc. shall be provided to keep the emission levels below by installing energy efficient technology.	• Adequate air pollution control devices have been installed to reduce particulate matter level in ambient air. Details list of pollution control devices installed is enclosed **as Annexure-I.** • 04 numbers of scrubbers have been installed at Blast Furnace I, II and BOF. • To monitor the ambient air quality, 7 numbers of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) have installed in the entire complex of Tata Steel Limited in consultation with SPCB, Odisha.

		• During Fy 21, detail analysis was done on the various point sources, line sources & area sources & implemented various improvement project e.g installation of new technology power supply controller at Sinter plant (HFTR- High frequency transformer rectifier & Micropulse in ESP of sinter plant is the first of its kind technology application in ESP).
v	The bag filter shall be installed at the coal crusher and the screening area. Pneumatic dust handling system shall be provided at ESP hoppers in the sinter plant. The existing bag filters shall be upgraded. Fixed type water sprinklers shall be installed in the internal roads and at the material handling area to control the fugitive emission. Dry fog system shall be installed in the coal handling area. Dry sweeping (vacuum process) shall be carried out prior to water sprinkling on roads.	• Two de-dusting systems have been provided at the coal circuit. • Five numbers of bag filters have also been provided in the iron ore circuit at crushing and screening points of raw material handling areas at the following locations. • Pneumatic dust handling system has been provided at ESP hoppers in the Sinter Plant-I. • Chain conveyor dust handling system has been provided at ESP hoppers of sinter plants II and III. • Mechanized road sweepers have been deployed for dry sweeping of roads and shop floors with dust suction facility. • Martin double lip seals with dual sealing system have been installed in the conveying route of RMHS and in junction houses to minimize material spillage. • 5 Nos. of dust collectors have also been installed in the sinter conveyor line. • New Dust extraction system has also been commissioned in Iron making conveyor routes for further improvements.
vi	The National Ambient Air Quality Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 shall be followed.	• National Ambient Air Quality Standards (NAAQS) are being followed.
vii	Gaseous emission levels including secondary fugitive emissions from all the sources 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.	• Adequate air pollution control devices have been installed to keep gaseous emission within limit. • Stack Monitoring reports w.r.t to gaseous emissions are attached as **Annexure-II.** • Fugitive dust monitoring report is attached as **Annexure-III.**
viii	Proper PPE shall be provided to all the workers including contract workers.	• Necessary PPEs such as safety helmet, safety shoes, gloves, goggles, ear plugs and ear muffs etc. are being provided to all the

		workers working in the shop floors including contract workers. This is now a mandatory requirement and one of the conditions of employment in our company & also a part of personal safety action plan for each employee. • The company has institutionalized Safety excellence management system in line with Du Pont (World benchmark in safety excellence) safety management system
ix	The natural drain / nallah present on the northern side of the project site shall not be disturbed. The main gate of the plant beyond the nallah shall be shifted and the area should be developed into garden for public use.	• The natural nallah present on the northern side of the plant has not been disturbed. • A drop gate has been provided on the main road beyond nallah to control traffic.
x	Water requirement for expansion from River Brahmani shall not exceed 3,400m^3/hr. All the effluent should be treated and used for ash handling, dust suppression and green belt development. No effluent shall be discharged and 'zero discharge' shall be adopted. Sanitary sewage should be treated in septic tank followed by soak pit for treatment of effluent run-off from the coal washery area, settling pond shall be de-silted regularly and additional settling tank shall be constructed.	• The present water consumption for the Steel plant is about 1517 m3 / hr. • All effluents are being treated in settling tanks (19 nos.) and Effluent Treatment Plants (3 nos.). • Treated water is being used for dust suppression, ash handling, make up for DRI & cooling towers and for green area development. • Process effluent after treatment has been reused. During the period April to Sept'21, 3257655 m3 of water has been recycled. However, we are further improving the efficiency of the water management system by technology intervention to increase the utilization. • The sanitary sewage is being treated in 4 Sewage Treatment Plants and used for greenbelt development and low-end application in plant. • HDPE pond of 50000m3 capacity has been constructed to store & reuse rainwater.
xi	Efforts shall be made to make use of rain water harvested. If needed, capacity of the reservoir should be enhanced to meet the maximum water requirement. Only balance water requirement shall be met from other sources.	• Lagoons and HDPE pond have been created to store rainwater and process water. This water is reused in the process when required. However, recently detailed scientific study has been carried out for management of surface runoff & rainwater harvesting. During the period April to Sept'21, 52407 m3 of rain water has been utilized in process.

		• RWH potential has been studied by engaging an expert M/s. KRG Foundation, Chennai & the suggested projects are being implemented in phases. In the first phase 50000 Cum capacity storage pond has been constructed in the year 2021. Also, rain water collected from DRI & RMHS area are channelized through drains into a series of storage cum percolation pond (3nos lagoons have been in operation).
xii	Regular monitoring of influent and effluent, surface, sub-surface and ground water (including chromite) should be ensured and treated waste water should meet the norms prescribed by the State Pollution Control Board or described under the Environment (Protection) Act whichever are more stringent. Leachate study for the effluent generated and analysis shall also be regularly carried out and report submitted to the Ministry's Regional Office at Bhubaneswar, SPCB and CPCB.	• Monitoring of influent, effluent, surface and ground water quality is done regularly in our laboratory. However, analysis of surface and ground water quality is being carried out quarterly by a Govt. laboratory and the monitoring results are submitted to SPCB / CPCB / MOEF&CC at regular intervals. • The monitoring reports are enclosed as **Annexure- IV.**
xiii	All the blast furnace (BF) slag shall be provided to the cement manufacturers. Scrap shall be used in steel melting shop (SMS) and SMS slag and kiln accretions shall be properly utilized. All the other solid waste including broken refractory mass shall be properly disposed off in environment-friendly manner. Fly ash shall be utilized for the cement manufacturing and filling of mined out area after carrying geo hydrological study to prevent ground water pollution.	• The entire quantity of blast furnace slag is dispatched to cement manufacturers (M/s Dalmia Bharat, J.K.Laxmi, Ramco, Toshali and Ultratech) • Details of generation and utilization of Blast Furnace slag is given as Annexure-V. • SMS slag is being used in sinter plant after processing in metal recovery plant. • Balance slag is being used for soling of roads. • Fly ash brick & paver block manufacturing units have been installed inside the plant for use in construction activities including road construction etc. inside the plant. This is also helping in maximum utilization of fly ash. • Fly ash bricks are utilized in all construction works in the plant. • Fly ash is also being given to nearby fly ash brick manufacturing units, free of cost, for maximum utilization of ash. • Fly ash is also being supplied to cement plants through rake & bulker.

		• Fly ash is used in construction of national highway. • Ash is also being used in filling low lying areas & abandoned stone quarries as per direction given by OSPCB.
xiv	Proper handling, storage, utilization and disposal of all the solid waste shall be ensured and regular report regarding toxic metal content in the waste material and its composition, end use of solid / hazardous waste should be submitted to the Ministry's Regional Office at Bhubaneswar, SPCB and CPCB.	• Solid waste handling, storage, utilization and disposal is being done in scientific manner. The toxic metal content and compositional analysis of solid waste are being carried out regularly. The analysis report of solid waste is attached as **Annexure-VI**. • Annual return of hazardous waste is being regularly submitted to SPCB and MoEF & CC, Odisha. The copy of HW annual return for the period April'20 to March'21 is attached as **Annexure-VII.**
xv	Vehicular pollution due to transportation of raw material and finished products shall be controlled. Proper arrangements shall also be made to control dust emissions during loading and unloading of the raw material and finished product.	• Vehicles carrying raw materials and finished products are being covered with tarpaulin. • Water sprinkling arrangement has been made by installation of 108 numbers of rotary gun sprinklers at raw material handling areas to control dust emissions during loading and unloading of raw materials at site. • Additionally, dry fog dust suppression system having 252 nos. of nozzles have been installed in entire coal circuit and at the unloading points of raw material handling area to control fugitive dust. • Three Nos. of wheel washing systems have been installed at RMHS , BFPP1 and BFPP2
xvi	The raw materials should regularly (six monthly) be monitored for trace metals and management plan shall be submitted to SPCB and MOEF Regional Office at Bhubaneswar.	• The analysis of trace metals in raw materials is being done by IMMT, Bhubaneswar. Copy of the same is enclosed as **Annexure-VIII.**
xvii	All internal roads shall be black topped. The roads shall be regularly cleaned with mechanical sweepers. A 3-tier avenue plantation using native species shall be developed along the roads.	• 37 km of internal roads have been concreted/paved. Those roads are being cleaned regularly by using mechanical road sweepers. • Avenue plantation using native species has been developed along the roads.

xviii	An action plan for transfer from wet to dry quenching shall be submitted to the SPCB and MOEF Regional Office at Bhubaneswar within three months. The target date shall not be more than six years from the date of environmental clearance accorded for 3.1 MTPA Steel Plant i.e. 22.9.2008. Adequate space shall be provided for the retro fitting the dry coke quenching facility	• Dry quenching has been commissioned at Coke Oven – II and now in operation. However, construction of Dry Quenching at Coke Oven – I is in the process. The completion timeline of CDQ - 1 has been extended up to July 2022 by the MoEF&CC.
xix	Risk and tragedy Management Plan along with the mitigation measures shall be prepared and a copy submitted to the Ministry's Regional Office at Bhubaneswar, SPCB and CPCB within three months of issue of environment clearance letter.	• A copy of the report of onsite emergency management plan along with mitigation measures was submitted after grant of EC. However, the modified document was again submitted along with the half yearly EC compliance on 01st June, 2021.
xx	As proposed, green belt shall be developed in 33 % of plant area as per the CPCB guidelines in consultation with the DFO.	• Green belt development is under progress in and around the plant complex by planting indigenous species as per CPCB guidelines. Till March'21, 33.2% area (including inside and outside plantation) has been covered under green belt. Rapid afforestation using MiyaWaki method in consultation with IIT, Kharagpur has been initiated. • Total 70975 nos. saplings have been planted during April to Sept'21 both inside and outside the plant premises. • Proper maintenance of green coverage is being ensured throughout the year by a dedicated horticulture team.
xxi	All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Steel Plants should be implemented	• Tata Steel Limited has implemented all CREP recommendations.
xxii	All the commitments made to the public during the Public Hearing in Public Consultation meeting held on 28th October, 2010 should be satisfactorily implemented and a separate budget for implementing the same should be allocated and information submitted to the Ministry's Regional Office at Bhubaneswar.	• Various socio - economic development programs covering education (Green school project in collaboration with TERI), Roads in the nearby villages, safe drinking water, sanitation, sports and health care etc. are undertaken in nearby villages as per the suggestions made in public hearing. The above includes social engineering as well as infrastructure projects.
xxiii	At least 5 % of the total cost of the project should be earmarked towards the Enterprise	• Various CSR activities have been undertaken since the inception of the plant

	Social Commitment (ESC) based on Public Hearing issues and item-wise details along with time bound action plan should be prepared and submitted to the Ministry's Regional Office at Bhubaneswar. Implementation of such program should be ensured accordingly in a time bound manner.	by providing facilities of sanitation, drinking water, education, health care, road and communication etc. Further, CSR activities and its related expenditure has been substantially increased after acquisition of the industry by Tata Steel Limited.
xxiv	The company shall provide housing for construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, 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 necessary infrastructure and housing facilities were provided for workers during construction phase of the plant within the site. Same facilities are being continued during operational phase of the plant also. A full-fledged township with amenities (school, health center, recreation club) has also been constructed to improve quality of life of employees & their family members.
xxv	The company shall set up State-of-the-art-environment control/monitoring and research lab with R& D facilities for waste utilization studies. The laboratory staff shall be provided with adequate training for use and maintenance of the equipment's. An action plan in this regard shall be submitted to SPCB and MOEF Regional Office at Bhubaneswar within three months.	• An environment laboratory having facilities for monitoring of all environmental parameters have established. However, it is in process of being upgraded to environment research laboratory with the help of Tata Steel R&D. One project has also been recognized in Tata Innovista & received several patents from govt. of India. • This laboratory also caters to the waste characterization studies based on which the waste can be utilized in different units substituting the raw materials.

GENERAL CONDITION:

SL	CONDITIONS	COMPLIANCE STATUS
i	The project authorities must strictly adhere to the stipulations made by the Orissa State Pollution Control Board and the State Government.	• All relevant stipulations made by Sate Pollution Control Board Odisha and the State Government are being complied.
ii	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.	• No expansion or modification has been carried out without prior approval of Ministry of Environment, Forests and 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\	• All the existing units have been provided with adequate air pollution control devices to keep the emission within the stipulated standards. • Results of gaseous emission levels from various stacks confirm to the standards and details are enclosed as **Annexure-II.**
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 PM_{10}, SO_2 and NOx are anticipated in consultation with the SPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bhubaneswar and the SPCB/CPCB once in six months.	• Seven CAAQM stations have been established in consultation with the SPCB in Tata Steel Meramandali integrated complex. Half yearly reports are being submitted to the Regional Office of MoEF&CC, SPCB and CPCB at regular intervals. Summary of AAQ monitoring report is attached as **Annexure-IX.** • The last half yearly compliance report was submitted vide letter no. TSBSL/MoEF&CC/BS-01/2020-02/59 dated 01.06. 2021.
v	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 form time to time. The treated waste water shall be utilized for plantation purpose.	• The industrial as well as domestic wastewater is being treated and utilized for various purposes like slag quenching, coke quenching, dust suppression and green belt development inside the plant premises. • The monitoring reports of Industrial wastewater are being submitted to SPCB/CPCB/MOEF&CC at regular intervals.
vi	The overall noise levels in and around the plant area shall be kept well within the standards 85 dB(A) 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 dB (A) (daytime) and 70 dB (A) (nighttime).	• Work zone noise monitoring results are within the standards and reports are being submitted to SPCB/ CPCB/MOEF&CC at regular interval. The report is enclosed as **Annexure-X.** • The ambient noise levels recorded within the premises is enclosed as **Annexure-X** for kind reference.
vii	Occupational health surveillance of the workers should be done on a regular basis and records maintained as per the Factories Act. The workers including the contract workers shall be provided with proper personal protection equipment.	• Occupational health surveillance of the workers is being periodically done. • Necessary PPEs are provided to all the employees including the contractual workers.

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.	• Lagoons and HDPE pond have been created to store rain water and process water. This water is reused in the process when required. However, recently detailed scientific study has been carried out for management of surface runoff & rain water harvesting. During the period April to Sept'21, 52407 m3 of rain water has been utilized in process. • RWH potential has been studied by engaging an expert M/s. KRG Foundation, Chennai & the suggested projects are being implemented in phases. In the first phase 50000 Cum capacity storage pond has been constructed in the year 2021. Also, rain water collected from DRI & RMHS area are channelized through drains into a series of storage cum percolation pond (3nos lagoons have been in operation).
ix	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.	• Compliance to all environmental protection measures as recommended in EIA / EMP report is ensured. • Various socio-economic development programs covering education, safe drinking water, sports and health care etc are undertaken in nearby villages. • Details of breakup of CSR initiatives are enclosed as **Annexure- XI.**
x	The requisite funds shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures 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 Regional Office of the Ministry at Bhubaneswar. The funds so provided shall not be diverted for any other purpose.	• Adequate funds are being provided by the management for pollution control and to meet recurring costs. Environmental requirements are given top priority for fund allocation and approval of capital projects. • The funds earmarked for environment pollution control measures are not diverted for any other purpose. • The company has invested adequate capital expenditure to improve mix of clean power & also reduction of carbon emissions
xi	A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban Local Body and the local NGO, If any, from whom suggestions/representations, if any, were received while processing the proposal. The	• Clearance letter was sent to all concerned and also uploaded in our Company web site, which can be viewed at http://www.tatasteel.com.

	clearance letter shall also be put on the web site of the company by the proponent.	
xii	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF at Bhubaneswar. The respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely PM_{10}, SO_2, NO_x (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects, shall be monitored and displayed at a convenient location near the main gate of the Company in the public domain.	• Compliance status is uploaded in the Company's web site at http://www.tatasteel.com. The compliance report including results of monitored data is periodically submitted to the Regional Office of MoEF&CC, CPCB and SPCB, Odisha. • The pollutant levels namely PM10, SO2, NOx (ambient levels as well as stack emissions) are monitored. • The Ambient Air Quality parameters are displayed near the main gate of the Company.
xiii	The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF&CC, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry at Bhubaneswar / CPCB / SPCB shall monitor the stipulated conditions	• The half yearly compliance report is being submitted to the Regional Office of the MoEF&CC, CPCB and SPCB. • The last half yearly compliance report was submitted vide our letter no. TSBSL/MoEF&CC/BS-01/2020-02/59 dated 01.06.2021.
xiv	The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Office of the MOEF at Bhubaneswar by e-mail.	• The Environmental Statement in Form-V is being submitted to SPCB/CPCB/MOEF&CC regularly. • The Environment Statement for the FY 2020-21 was submitted vide our letter no. TSBSL/SPCB/BS-03/2021-15/97, dated. 29.09.2021.
xv	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB 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	• The advertisement was published in both Odia & English newspapers named "The Sambad" and "The New Indian Express" respectively on dated 24.07.2012. • The same has already been communicated to the Regional Office of MOEF&CC, Bhubaneswar vide our letter no.

	issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional office at Bhubaneswar.	BSL/MoEF&CC/BS-01/2012-08 dated 24.07.2012.
xvi	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.	• This is an existing plant where project activities are going on. We shall inform the Regional Office as well as the Ministry about the financial closure, when it is completed.

HALF YEARLY COMPLIANCE REPORT

April to September' 2021

Environment clearance of 3.1 MTPA Integrated Steel Plant
Letter no.: J-11011/405/2007-IA-II (I) dated 22.09.2008

SPECIFIC CONDITIONS:

SL	CONDITIONS	COMPLIANCE STATUS
i	Efforts shall be made to reduce RSPM levels in the ambient air and a time bound action plan shall be submitted. Online ambient air quality monitoring and continuous stack monitoring facilities for all the stacks and sufficient air pollution control devices like ESP and Bag house etc. shall be provided to keep the emission levels below 100 mg/Nm^3. Bag filters should be provided to the induction furnace to control the particulate emission below 100 mg/Nm^3. Inter-locking system shall be provide to ESP's. Monitoring reports shall be submitted to the Ministry's Regional office at BBSR, CPCB, and OPCB on six monthly basis.	• Adequate air pollution control devices have been installed to reduce particulate matter levels in ambient air. Details list of pollution control devices installed is enclosed as **annexure-I.** • 23 nos. online CEMS w.r.t gas and 34 nos. online CEMS w.r.t dust have been installed and operated continuously. • To monitor the ambient air quality, we have installed 7 numbers of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) in the entire complex of Tata Steel Limited and Angul Energy Limited, in consultation with SPCB, Odisha. • Six monthly monitoring report is being submitted to MoEF&CC, CPCB and SPCB regularly. • During Fy 21, detail analysis was done on the various point sources, line sources & area sources & implemented various improvement project e.g installation of new technology power supply controller at Sinter plant (HFTR- High frequency transformer rectifier & Micro pulse in ESP of sinter plant is the first of its kind technology application in ESP)

ii	Electrostatic precipitators (ESP's) to DRI plant, waste heat recovery boiler (WHRB) and fluidized bed boiler (FBB) and bag house to blast furnace (BF) shall be provided to control gaseous emission within 100 mg/Nm$^{3.}$ The gases from the DRI Kilns and BF after recovery of heat in WHRB shall be passed through ESP to control gaseous emissions. Smoke hood and fume extraction system with cyclone and bag filters should provided to IF, LRF and CCM to keep the dust in work zone environment within the permissible limit. Cyclone and bag filters shall be provided to SMS.	Following facilities have been installed to control dust emissions: **DRI & WHRB:** • The Plant has installed 10 nos. of DRI Kiln of 500 TPD each with WHRB system connected to 10 nos. of ESP at the hot end of the DRI Kiln and 5 nos. of De-dusting system at the cold end of the DRI kiln. **BLAST FURNACE:** • Two nos. of de-dusting systems have been installed in Cast House and stock house. To keep the emission well within the norms. **IF, LRF & CCM:** • Smoke hood and fume extraction system of adequate capacity have been provided to IF, LRF & CCM to keep the dust in work zone environment within the permissible limit. **SMS II:** • Two nos. of fume extraction system along with cyclonic system and bag filters have been installed to take care of the fugitive emissions in the Steel Making Shop.
iii	All the standards prescribed for the coke oven plants shall be followed as per the latest guidelines. Proper and full utilization of coke oven gases in power plant using waste heat recovery steam generators shall be ensured and no flue gases should discharged into the air.	All efforts are being taken to comply with the prescribed standards and guidelines for the coke oven facility, for which the following provisions has been made: • De-dusting system for coke pushing and coal charging • De-dusting system for coke screening building

		• De-dusting system for coal preparation and crushing room • Wastewater Treatment Plant (BOD Plant) The cleaned Coke Oven Gas (COG) is utilized in HSM, CO battery heating, Lime Plant, BF power plant and gas fired boiler for power generation. Provisions have also been made for storage of COG in gas holder tank of capacity 50,000 m^3.
iv	Dry coke quenching method shall be adopted in the proposed recovery type of the coke oven within 5 years of grant of environmental clearance.	• Dry quenching has been commissioned for Coke Oven – II and now in operation. However, Coke Oven – I is in the process of transfer from wet to dry quenching. Detail engineering of CDQ-I has been completed and the order has been placed to Nippon Steel, Japan. The completion timeline of CDQ - 1 has been extended up to July 2022 by the MoEF&CC.
v	Gaseous emission levels including secondary fugitive emissions from all the sources 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.	• Adequate air pollution control devices have been installed to keep gaseous emission within limit. • Monitoring report is attached as **Annexure-II.**
vi	Bag filters, dust suppression system and extraction system shall be provided to raw materials handling areas, crusher house, junction towers, feed points, etc. to control fugitive emissions. Water sprinkling shall be done at loading and unloading points.	• Two de-dusting systems have been provided at the coal circuit. Further, bag filters of different capacities have been installed at different locations as given below: ✓ Coal Screening Building - I of capacity 70,000 m^3/hr. ✓ Coal Screening Building - II with 93,400 m^3/hr capacity. ✓ Ore Primary Screening with 48,000 m^3 / hr capacity ✓ Ore Secondary Crushing with 5,000 m^3 / hr capacity

		✓ Ore Tertiary Crushing with 7,500 m^3 / hr capacity ✓ Ore Secondary and Tertiary Screening with 40,000 m^3 / hr capacity. ✓ Ore Screening Building with 48,000 m^3 / hr capacity. • Five numbers of bag filters have also been provided in the iron ore circuit at crushing and screening points of raw material handling areas at the following locations: • Pneumatic dust handling system has been provided at ESP hoppers in the Sinter Plant-I. • Chain conveyor dust handling system has been provided at ESP hoppers of sinter plants II and III. • 252 numbers of nozzles in dry fog dust suppression system have been provided at 46 numbers of junction houses of raw material handling area. • Further, 108 nos. of rotary gun sprinklers have been installed throughout the raw material handling yards. • Mechanized road sweepers have been deployed for dry sweeping of roads and shop floors with dust suction facility.
vii	Vehicular pollution due to transportation of raw material and finished products shall be controlled. Proper arrangements shall also be made to control dust emissions during loading and unloading of the raw material and finished product.	• Vehicles carrying raw materials and finished products are being covered with tarpaulin. • Water sprinkling arrangement has been made by installation of 108 numbers of rotary gun sprinklers at raw material handling areas to control dust emissions during loading and unloading of raw materials at site. • Additionally, dry fog dust suppression system having 252 nos. of nozzles have been installed in entire coal circuit and also at the unloading points of raw material handling area to control fugitive dust.

		• Wheel washing system have been installed in RMHS and BFPP area.
viii	Total water requirement should not exceed 1, 29,600 m^3/day. Permission for drawl of 2,40,000 m^3/day is obtained from Department of water resources, Govt. of Orissa, vide letter dated 4th December, 2003. No ground water shall be used. Closed circuit circulating/ cooling water shall be provided to reduce the water consumption. The wastewater from the de-mineralized (DM) plant shall be neutralized in neutralization pit. The wastewater from BF-GCP and coal washery shall be treated in thickener and used in the pig casting machine. Acidic and alkaline effluent from DM water plant shall be neutralized and reused in the plant through ash pond. Blow down from boilers and cooling tower shall be reused in the plant itself. All the other effluent shall be treated in effluent treated plant (ETP) and all the treated wastewater from process or for dust suppression, green belt development and various other activities at the sites. No wastewater shall be discharged outside the premises and zero effluent discharge shall be ensured. Domestic effluent shall be treated in existing sewage treatment plant (ETP) and used for green belt development.	• The present water consumption for the Steel plant is about 1517 m3 / hr. • All effluents are being treated in settling tanks (19 nos.) and common Effluent Treatment Plants (3 nos.). • Treated water is used for dust suppression, ash handling, make up for DRI & cooling towers and also for green area development. • Process effluent after treatment has been reused. During the period April to Sept'21, 3257655 m3 of water has been recycled. However, we are further improving the efficiency of the water management system by technology intervention to increase the utilization. • The sanitary sewage is treated in 4 Sewage Treatment Plants and used for greenbelt development and low end application in plant. • HDPE pond of 50000m3 capacity has been constructed to store & reuse rainwater.
ix	Phenolic effluent shall be treated in BOD plant and used for quenching of hot coke. Continuous monitoring of total organic compounds shall be done at the outlet of ETP (BOD plant)	• The Phenolic effluent is being treated in the BOD plant and treated effluent is being reused for quenching of hot Coke at Coke Oven-I. • Online analyzer has been installed to have a check on the treated water quality of the effluent generated from the BOD Plant.

x	DRI fines, coke breeze, sinter dust, GCP dust, SMS dust, Scale, Iron ore fines shall be used in sinter plant. The coal washery rejects and middling shall be used in AFBC based power plant and shall not be disposed off anywhere else. All the blast furnace slag shall be granulated and provided to cement manufactures for further utilization.	• DRI fines are being used in SMS and Sinter Dust, GCP dust, SMS dust, Scales, Iron Ore Fines are used in Sinter plant. • The entire quantity of blast furnace slag is dispatched to cement manufacturers (M/s Dalmia Bharat, J.K. Laxmi, Ramco, Toshali and Ultratech) • Details of generation and utilization of Blast Furnace slag is given as **Annexure-V.**
xi	AFBC plant shall be installed before installation of sponge iron plant so that utilization of char in the AFBC boiler is ensured. All the char from DRI plant shall be utilized in AFBC boiler of power plant and no char shall be disposed off anywhere else. Unusable scrap, coal and iron ore fines will be used in SMS. All the other solid wastes including broken refractory mass and kiln accretions shall be properly disposed off in environment- friendly manner.	• AFBC plant is not in operation. • Char is being stored in demarcated places and utilized in CFBC boiler. • All unusable scrap, coal and iron ore fines are being utilized in SMS. • Refractory mass and kiln accretions are being properly disposed off.
xii	All the slag from SMS, EAF, LRF and IF shall be used for land filling and road making only after passing through Toxic Chemical Leachability Potential (TCLP) test. Otherwise, slag shall be disposed in secured landfill as per CPCB guidelines. Used oil shall be sold to authorized recyclers/ re-processors only.	• SMS slag is being used in sinter plant after processing in metal recovery plant. • Balance slag is being used for soling of roads. • We have written to the RDSO, Lucknow and ECoR, Bhubaneswar for possible use of SMS slag as railway ballast. • We are also exploring the use of SMS slag in cement plant and bricks manufacturing.
xiii	Proper handling, storage, utilization and disposal of all the solid waste shall be ensured and regular report regarding toxic metal content in the waste material and its composition, end use of solid/hazardous	• Solid waste handling, storage, utilization and disposal is being done in scientific manner. The toxic metal content and compositional analysis of solid waste are being carried out regularly. The analysis

	waste shall be submitted to Ministry's Regional office at BBSR, CPCB and OPCB.	report of solid waste is attached as **Annexure-VI**. • Annual return of hazardous waste is being regularly submitted to SPCB and MoEF & CC, Odisha. The copy of HW annual return for the period April'20 to March'21 is attached as **Annexure-VII.**
xiv	A time bound action plan shall be submitted to reduce solid waste its proper utilization and disposal.	• The solid waste generated from various plant units are being efficiently recycled back within the plant processes. Necessary steps are being taken for minimum utilization of solid waste.
xv	Proper utilization of fly ash shall be ensured as per Fly Ash Notification 1999 as amendment in 2003. S	• Fly ash bricks are utilized in all construction works in the plant. • Fly ash is also being given to nearby fly ash brick manufacturing units, free of cost, for maximum utilization of ash. • Fly ash is also being supplied to cement plants through rake & bulker. • Fly ash is used in construction of national highway. • Ash is also being used in filling low lying areas & abandoned stone quarries as per direction given by OSPCB.
xvi	As proposed, green belt shall be developed in 550 acres (33%) out of total 1, 664.5 acres in and around the plant as per the CPCB guidelines in consultation with DFO.	• Green belt development is under progress in and around the plant complex by planting indigenous species as per CPCB guidelines. Till March'21, 33.2% area (including inside and outside plantation) has been covered under green belt. Rapid afforestation using MiyaWaki method in consultation with IIT, Kharagpur has been initiated. • Total 70975 nos. saplings have been planted during April to Sept'21 both inside and outside the plant premises. • Proper maintenance of green coverage is being ensured throughout the year by a dedicated horticulture team.

xvii	All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the steel plants shall be implemented.	• Tata Steel Limited has implemented all CREP recommendations.

GENERAL CONDITIONS:

SL	CONDITIONS	COMPLIANCE STATUS
i	The project authorities must strictly adhere to the stipulations made by the Orissa State Pollution Control Board and the State Government.	All relevant stipulations made by SPCB and the State Government are being complied.
ii	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.	No expansion or modification has been carried out without prior approval of Ministry of Environment, Forests and 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. Interlocking facility shall be provided so that process can be automatically stopped in case emission level exceeds the limit.	• All the existing units have been provided with adequate air pollution control devices to keep the emission within the stipulated standards. • Results of gaseous emission levels from various stacks confirm to the standards and details are enclosed as **Annexure-II.**
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 PM10, SO2 and NOx are anticipated in consultation with the SPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bhubaneswar and the SPCB/CPCB once in six months.	• Seven CAAQM stations have been established in consultation with the SPCB in Tata Steel Meramandali integrated complex. Half yearly reports are being submitted to the Regional Office of MoEF&CC, SPCB and CPCB at regular intervals. Summary of AAQ monitoring report is attached as **Annexure-IX.** • The last half yearly compliance report was submitted vide letter no. TSBSL/MoEF&CC/BS-01/2020-02/59 dated 01.06.2021.

v	In-plant control measures for checking fugitive emissions from all the vulnerable sources shall be provided. Further, specific measures like water sprinkling around the coal stock piles and asphalting or concreting of the roads shall be done to control fugitive emission.	To have a control on fugitive emissions, following measures have taken: Installation of 10 nos. of bag filters at various junction houses, • Continuous sprinkling of water is being done around the coal stock piles. • Installation of Dry fog system in entire Coal circuit and unloading points of Raw material handling area. • Installation of 21 nos. of rotary gun sprinklers throughout the raw material conveying facility. • Construction of Paved Quality Concrete (PQC) roads are being made within the plant premises and is being cleaned and maintained through mechanized housekeeping systems. • Periodical water sprinkling on all the internal roads within the plant premises is being done as per the planned schedule. • Martin double lip seals with dual sealing system have been installed. • Installed dust collector system in conveyor line.
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 form time to time. The treated waste water shall be utilized for plantation purpose.	The industrial as well as domestic wastewater is being treated and utilized for various purposes like slag quenching, coke quenching, dust suppression and green belt development inside the plant premises. The monitoring reports of Industrial wastewater are being submitted to SPCB / CPCB / MOEF&CC at regular intervals.
vii	The overall noise levels in and around the plant area shall be kept well within the standards 85 dB(A) 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 dB (A) (daytime) and 70 dB (A) (night time).	• Work zone noise monitoring results are within the standards and reports are being submitted to SPCB/ CPCB/MOEF&CC at regular interval. The report is enclosed as **Annexure-X.** • The ambient noise levels recorded within the premises is enclosed as **Annexure-X** for kind reference.

viii	Occupational health surveillance of the workers should be done on a regular basis and records maintained as per the Factories Act.	Occupational health surveillance of the workers is being periodically done. Necessary PPEs are provided to all the employees including the contractual workers
ix	The company shall develop surface rain water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.	• Lagoons and HDPE pond have been created to store rain water and process water. This water is reused in the process when required. However, recently detailed scientific study has been carried out for management of surface runoff & rain water harvesting. During the period April to Sept'21, 52407 m3 of rain water has been utilized in process. • RWH potential has been studied by engaging an expert M/s. KRG Foundation, Chennai & the suggested projects are being implemented in phases. In the first phase 50000 Cum capacity storage pond has been constructed in the year 2021. Also, rain water collected from DRI & RMHS area are channelized through drains into a series of storage cum percolation pond (3nos lagoons have been in operation).
x	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.	Compliance to all environmental protection measures as recommended in EIA / EMP report is ensured. Various socio-economic development programs covering education, safe drinking water, sports and health care etc are undertaken in nearby villages. Details of breakup of CSR initiatives are enclosed as **Annexure- XI.**
xi	The adequate funds shall be earmarked towards capital cost and recurring cost / annum for environment pollution control measures to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. The funds so provided shall not be diverted for any other purpose.	• Adequate funds are being provided by the management for pollution control and to meet recurring costs. Environmental requirements are given top priority for fund allocation and approval of capital projects. • The funds earmarked for environment pollution control measures are not

		diverted for any other purpose. • The company has invested adequate capital expenditure to improve mix of clean power & also reduction of carbon emissions.
xii	The Regional Office of this Ministry at Bhubaneswar / CPCB/ OPCB shall monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	• The half yearly compliance report is being submitted to the Regional Office of the MoEF&CC, CPCB and SPCB. • The last half yearly compliance report was submitted vide our letter no. TSBSL/MoEF&CC/BS-01/2020-02/59 dated 01.06.2021.
xiii	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB 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 should be forwarded to the Regional office at Bhubaneswar.	The advertisement was published in both Odia & English newspapers named "The Sambad" and "The New Indian Express" respectively. The same has already been communicated to the Regional Office of MOEF&CC, Bhubaneswar vide letter no. BSL/ENV/10/08 dated 17.10.2008.
xiv	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.	This is an existing plant where project activities are going on. We shall inform the Regional Office as well as the Ministry about the financial closure, when it is completed.

HALF YEARLY COMPLIANCE REPORT

April to September'21

Environment clearance of 1.5 MTPA Integrated Steel Plant
Letter no.: 11011/8/2005-IA-II (I) dated 29.06.2005

SPECIFIC CONDITIONS:

SL	CONDITIONS	COMPLIANCE STATUS
i	The gaseous emissions from various process units shall conform to the load/mass based standards notified by the Ministry on 19th May, 1993 and standards prescribed from time to time. The state board may specify more stringent standards for the parameters keeping in the view the nature of the industry and its size and location. At no time the emission level should go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desired efficiency.	• All the existing units have been provided with adequate air pollution control devices to keep the emission within the stipulated standards. • Results of gaseous emission levels from various stacks confirm to the standards and details are enclosed as **Annexure-II.** • Mechanized road sweepers have been deployed to clean all concrete roads, shop floors of individual units. • Water tankers have been deployed for water sprinkling whenever it is required. • Due to all these latest and efficient air pollution control measures, ambient air quality in the complex is as per the AAQ standard. • 23 numbers of online gas analyzers for gaseous parameters have been provided on stacks. • 34 numbers of online dust monitors have also been installed and commissioned at the stacks. • To monitor the ambient air quality, we have installed 7 numbers of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) in the entire complex of Tata Steel Limited and Angul Energy Limited, in consultation with SPCB, Odisha.
ii	There shall be no discharge of process effluent. As reflected in the EIA/EMP report, the company shall undertake water conservation measures by recycling the water from the gas cleaning plant and cooling tower blow down. The plant design shall be base on 100% recirculation system	• The present water consumption for the Steel plant is about 1517 m3 / hr. • All effluents are being treated in settling tanks (19 nos.) and Effluent Treatment Plants (3 nos.). • Treated water is being used for dust suppression, ash handling, make up

	to achieve zero discharge. The domestic waste water after treatment in STP shall be used for green belt development.	for DRI & cooling towers and for green area development. • Process effluent after treatment has been reused. During the period April to Sept'21, 3257655 m3 of water has been recycled. However, we are further improving the efficiency of the water management system by technology intervention to increase the utilization. • The sanitary sewage is being treated in 4 Sewage Treatment Plants and used for greenbelt development and low-end application in plant. • HDPE pond of 50000m3 capacity has been constructed to store & reuse rainwater.
iii	In plant control measures for checking fugitive emissions from spillage/raw materials handling shall be provided. Further specific measures like provisions of dust extraction & dust suppression system for product & raw materials handling, conveyor transfer points, water sprinkling system at waste disposal area to control the fugitive emissions shall be provided. Data on fugitive emission shall be regularly monitored & records maintained.	• Two de-dusting systems have been provided at the coal circuit. • Bag filter at Coal Screening Building - I with 70,000 m3/hr capacity. • Bag filter at Coal Screening Building - II with 93,400 m3/hr capacity. • Five numbers of bag filters have also been provided in the iron ore circuit at crushing and screening points of raw material handling areas at the following locations: • Ore Primary Screening with 48,000 m3 / hr capacity • Ore Secondary Crushing with 5,000 m3 / hr capacity • Ore Tertiary Crushing with 7,500 m3 / hr capacity • Ore Secondary and Tertiary Screening with 40,000 m3 / hr capacity. • Ore Screening Building with 48,000 m3 / hr capacity • Pneumatic dust handling system has been provided at ESP hoppers in the Sinter Plant 1. • Chain conveyor dust handling system

		has been provided at ESP hoppers of sinter plants 2 and 3. • 252 numbers of nozzles in dry fog dust suppression system have been provided at 46 numbers of junction houses of raw material handling area. • Further, 108 nos. of rotary gun sprinklers have been installed throughout the raw material handling yards. • Mechanized road sweepers have been deployed for dry sweeping on roads and shop floors. • Regular monitoring of fugitive emission is carried out and report being submitted. • To improve AQI further, the company is analyzing the various point sources, line sources & area sources & continuously working to reduce work place emission by standardizing maintenance practices, adopting new technology (HFTR, MFTR. Mist Gun water sprinklers, Portable Donaldson Dust extraction system) & also installation new dust extraction system wherever required.
iv	The company shall use gas from the DRI for power generation & blast furnace gas for BF Stoves, sinter plant & furnace heating. The exhaust gas from the kiln shall be cleaned by dry gas cleaning system. The waste gas shall be passed through dust settling chamber to settle the coarse dust particulate & post combustion chamber to burn the CO in the flue gas. The boiler shall utilize the waste heat for steam generation. The particulate emissions shall be controlled by installation of ESP & the particulate emissions shall not exceed 100 mg/Nm3.	• The Plant has installed 10 nos. of DRI kiln of 500 TPD each with WHRB system to utilize the waste heat for steam generation. • Each kiln has ESP each at the hot end and 5 nos. of De-dusting system in the cold end of the DRI Kiln. • The particulate emission from the Stack is well within the limit. The monitoring data are enclosed.

v	The company shall install centralized de-dusting system to control the primary emissions from the induction furnace top as canopy hood at the top of furnace to capture secondary emissions.	• The centralized de-dusting system has been established to control primary emissions from the induction furnace top as canopy hood to capture secondary emissions.
vi	The company shall take measures for installation of continuous ambient air quality monitoring stations and data sent electronically to SPCB/CPCB.	• Seven CAAQM stations have been established in consultation with the SPCB in Tata Steel Meramandali integrated complex. Half yearly reports are being submitted to the Regional Office of MoEF&CC, SPCB and CPCB at regular intervals. Summary of AAQ monitoring report is attached as **Annexure-IX.** • The last half yearly compliance report was submitted vide letter no. TSBSL/MoEF&CC/BS-01/2020-02/59 dated 01.06. 2021.
vii	SMS slag from induction furnace, EAF & LF shall be used for road making and railway blast. Coal washery middling and char from DRI shall be used for power generation. BF Slag should be granulated & sold to cement manufacturers. Scrap, coal & iron ore fines shall be reused. Fly ash shall be used for bricks manufacturing.	• The entire quantity of blast furnace slag is dispatched to cement manufacturers (M/s Dalmia Bharat, J.K.Laxmi, Ramco, Toshali and Ultratech) • Details of generation and utilization of Blast Furnace slag is given as Annexure-V. • SMS slag is being used in sinter plant after processing in metal recovery plant. • Balance slag is being used for soling of roads. • Fly ash brick & paver block manufacturing units have been installed inside the plant for use in construction activities including road construction etc. inside the plant. This is also helping in maximum utilization of fly ash. • Fly ash bricks are utilized in all construction works in the plant. • Fly ash is also being given to nearby fly ash brick manufacturing units, free

		of cost, for maximum utilization of ash. • Fly ash is also being supplied to cement plants through rake & bulker. • Fly ash is used in construction of national highway. • Ash is also being used in filling low lying areas & abandoned stone quarries as per direction given by OSPCB.
viii	Resettlement & Rehabilitation plan for displacement of families shall be as per the land acquisition Act & state government guidelines.	• The Resettlement & Rehabilitation plan for displacement of families has already made as per the Land Acquisition Act & State Government guidelines.
ix	A green belt of adequate width density shall be developed in 195 acres of plant area. Selection of plant species as per the CPCB guidelines.	• Green belt development is under progress in and around the plant complex by planting indigenous species as per CPCB guidelines. Till March'21, 33.2% area (including inside and outside plantation) has been covered under green belt. Rapid afforestation using MiyaWaki method in consultation with IIT, Kharagpur has been initiated. • Total 70975 nos. saplings have been planted during April to Sept'21 both inside and outside the plant premises. Proper maintenance of green coverage is being ensured throughout the year by a dedicated horticulture team.
x	The company shall undertake community welfare measures for the local villagers & earmark separate funds for construction of schools, hospitals, community hall for peripheral development of all the villagers located around the plant site.	• All necessary infrastructure and housing facilities were provided for workers during construction phase of the plant within the site. Same facilities are being continued during operational phase of the plant also. A full-fledged township with amenities (school, health center, recreation club) has also been constructed to improve quality of life of employees &

		their family members.
xi	The company shall obtain forest clearance for diversion of 151.92 acres of village forest land under forest (conservation) act, 1980 before undertaking construction activity.	• Necessary forest clearances have already been obtained.
xii	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 being periodically done. • Necessary PPEs are provided to all the employees including the contractual workers.
xiii	Recommendations made in the CREP shall be implemented	• Tata Steel Limited has implemented all CREP recommendations.
xiv	Company shall keep proper housekeeping within the plant premises.	• Various initiatives are being taken for proper housekeeping within the Plant premises. Mechanized Road Sweepers, truck mounted mix canon have also deployed to clean up roads periodically.
xv	The company shall undertake rainwater harvesting measures to harvest the rainwater for utilization in the lean season as well as to recharge the ground water table.	• Lagoons and HDPE pond have been created to store rainwater and process water. This water is reused in the process when required. However, recently detailed scientific study has been carried out for management of surface runoff & rainwater harvesting. During the period April to Sept'21, 52407 m3 of rain water has been utilized in process. • RWH potential has been studied by engaging an expert M/s. KRG Foundation, Chennai & the suggested projects are being implemented in phases. In the first phase 50000 Cum capacity storage pond has been constructed in the year 2021. Also, rain water collected from DRI & RMHS area are channelized through

		drains into a series of storage cum percolation pond (3nos lagoons have been in operation)

GENERAL CONDITION:

SL	CONDITIONS	COMPLIANCE STATUS
i	The project authorities must strictly adhere to the stipulations made by the Orissa State Pollution Control Board and the State Government.	• All relevant stipulations made by SPCB and the State Government are being complied.
ii	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.	• No expansion or modification has been carried out without prior approval of Ministry of Environment, Forests and Climate Change.
iii	At least four ambient air quality monitoring stations shall be established in the downward direction as well as where maximum ground level concentration of PM_{10}, SO_2 and NOx are anticipated in consultation with the SPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bhubaneswar and the SPCB/CPCB once in six months.	• Seven CAAQM stations have been established in consultation with the SPCB in Tata Steel Meramandali integrated complex. Half yearly reports are being submitted to the Regional Office of MoEF&CC, SPCB and CPCB at regular intervals. Summary of AAQ monitoring report is attached as **Annexure-IX.** • The last half yearly compliance report was submitted vide letter no. TSBSL/MoEF&CC/BS-01/2020-02/59 dated 01.06. 2021.
iv	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 form time to time. The treated wastewater shall be utilized for plantation purpose.	• The industrial as well as domestic wastewater is being treated and utilized for various purposes like slag quenching, coke quenching, dust suppression and green belt development inside the plant premises. • The monitoring reports of Industrial wastewater are being submitted to SPCB/CPCB/MOEF&CC at regular intervals.
v	The overall noise levels in and around the plant area shall be kept well within the standards 85 dB(A) by providing noise control measures including acoustic hoods,	• Work zone noise monitoring results are within the standards and reports are being submitted to SPCB / CPCB / MOEF&CC at regular

	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 dB (A) (daytime) and 70 dB (A) (nighttime).	interval. The report is enclosed as **Annexure- X.** • The ambient noise levels recorded within the premises is enclosed as **Annexure-X** for kind reference
vi	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.	• Compliance to all environmental protection measures as recommended in EIA / EMP report is ensured. • Various socio-economic development programs covering education, safe drinking water, sports and health care etc are undertaken in nearby villages. • Details of breakup of CSR initiatives are enclosed as **Annexure- XI**.
vii	The project authority will provide separate fund both recurring and non-recurring to implement the conditions stipulated by the MoEF as well as the State Govt. along with the implementation schedule for all the conditions stipulated therein. The funds so provided should not be diverted for any other purposes	• Adequate funds are being provided by the management for pollution control and to meet recurring costs. Environmental requirements are given top priority for fund allocation and approval of capital projects. • The funds earmarked for environment pollution control measures are not diverted for any other purpose. • The company has invested adequate capital expenditure to improve mix of clean power & also reduction of carbon emissions.
viii	The Regional Office of the Ministry at Bhubaneswar / CPCB / SPCB will monitor the stipulated conditions. A six monthly compliance report and monitoring data along with statistical interpretation should be submitted to them regularly.	• Six monthly compliance report and monitoring data are being submitted regularly. Last report has been submitted on 01.06.2021.
ix	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment and Forests at http:/envfor.nic.in. This shall be	• Published in Times of India (English) dated 06.07.2005 and in Samaya (Oriya) dated 07.07.2005. • The same has already been communicated to the Regional Office of MOEF&CC, Bhubaneswar.

	advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional office at Bhubaneswar.	
x	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.	This is an existing plant where project activities are going on. We shall inform the Regional Office as well as the Ministry about the financial closure, when it is completed.

Annexure-I

DETAILS OF AIR POLLUTION CONTROL DEVICES

SL	Process	Bag filters (Nos.)	ESP (Nos.)	Other Pollution Control Devices
1	Sinter Plant-I	02	03	-
2	Sinter plant - II	-	02	-
3	Sinter plant - III	04	02	-
4	Coke oven - I	05	-	-
5	Coke oven - II	11	-	-
6	Blast Furnace-I	03	-	Scrubber-01 nos.
7	Blast Furnace-II	07	-	Scrubber-01 nos.
8	Blast Furnace Power Plant-I	-	03	-
9	Blast Furnace Power Plant-II	-	04	-
10	SMS-I	04	-	-
11	SMS-II	07	-	-
12	SMS-III	03	-	Scrubber-01 nos.
13	RMPP	07	-	Gun sprinklers-108nos.
14	DRI	03	15	-
15	Lime Plant	10	-	-
16	RMHS	-	-	DFS Nozzles -252 nos.
17	BOF Briquetting Plant	07	-	

Annexure - II

SUMMARY OF STACK MONITORING

Period: From April to September'21

S.N	Sampling Location	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sept'21	Standard mg/Nm^3
01	AFBC	SD						100
02	Sinter Plant -1(85 M2 ESP)	7.76	8.74	11.64	23.76	17.30	17.59	100
03	Blast Furnace –I, Cast House	9.32	9.09	9.48	9.04	25.39	12.06	100
04	Blast Furnace –I, Stock House	12.51	9.88	10.36	11.40	18.66	24.90	100
05	SMS- 1	SD						100
06	SMS 2 (FES 1)	23.15	25.70	23.23	16.35	20.62	16.09	100
07	SMS 2 (FES 2)	39.74	30.60	38.27	23.16	14.24	24.99	100
08	BFPP ESP 1	25.95	16.03	11.25	20.74	13.33	14.20	50
09	BFPP ESP 2	24.61	28.08	51.97	42.01	SD	15.69	50
10	BFPP ESP 3	SD	24.73	26.13	15.49	17.16	14.70	50
11	Sinter Plant- 2	49.95	45.22	48.58	46.46	37.32	39.57	50
12	Sinter Plant- 3	35.61	40.84	42.55	42.88	41.38	40.25	50
13	SMS- 3 BOF (Secondary chimney)	11.47	17.36	24.28	24.83	23.6	18.99	50
14	BFPP- 2 Boiler- 2 &3	7.76	15.11	15.11	23.88	10.09	16.23	50
15	Coke oven (Battery- 1)	44.48	38.92	33.03	28.51	11.9	28.37	50
16	Coke oven (Battery- 2)	39.57	40.00	29.12	27.80	16.05	11.60	50
17	Coke oven- 2 (Battery- 2)	37.47	36.67	37.87	37.64	37.07	36.86	50
18	Blast Furnace –2, Cast House	10.32	5.66	12.67	5.34	3.31	2.80	50
19	Blast Furnace –2, Stock House	32.53	13.45	5.48	14.82	14.46	15.78	50
20	WHRB-1	SD						50
21	WHRB-2							50
22	WHRB-3	32.34	30.89	67.71	17.30	27.48	25.77	50
23	WHRB-4	35.16	48.65	32.45	25.39	18.71	21.63	50
24	WHRB-5	59.98	26.81	22.51	18.66	11.53	SD	50
25	WHRB-6	40.87	17.37	16.93	37.25	24.47	28.26	50
26	WHRB-7	40.92	42.09	44.51	15.62	34.84	13.63	50
27	WHRB-8	SD	14.92	19.82	10.73	SD	SD	50
28	WHRB-9	16.34	28.73	60.25	18.72	12.16	8.32	50
29	WHRB-10	28.27	29.28	34.11	17.30	SD	23.74	50

SD- Shut Down

Annexure - III

SUMMARY OF FUGITIVE EMISSION RESULTS MONTHLY AVARAGE VALUES			
TATA STEEL BSL LIMITED			
Sl. No	**Location**	**PM 10 in µg/m3**	**Standard in µg/m3**
Sinter Plant II			
1	Near SP-2 cooling tower F-200	446	2000
2	Near SP-2 chimney Backside area	610	
3	Near 7003 conveyor Belt	664	
4	Near 7002 conveyor Belt	645	
Sinter Plant III			
1	Near chiller Plant SP-2,3 & parking area	349	
2	Near 7008 conveyor Belt SP-3	1807	
3	Near screening Building	1979	
4	Near cooler area B/50	298	
5	Near Fire water pump House SP-2 (Screening Building)	650	
6	Near conveyor -2E 08-002	1200	
7	Near weigh feeder 1020	506	
8	Near cooler SP-3 D/15	302	
Sinter Plant I			
1	Near SP-1 conveyor J-29	656	
2	Near SP-1 aglomineration Plant	392	
3	Near propertionating Building	882	
4	Near SP-1 Mixing House	1802	
5	Near Crusher Building	1493	
6	Near Flux Screening Buiding	656	
Lime Plant			
1	Near DM Water storage Tank	315	-
2	Conveyor 2A&B	315	
3	Conveyor 2C&D	329	
4	Kiln 1&2 Screen House	1450	
5	Kiln 3&4 Screen House	1896	
6	Near DE system	330	
7	Near Mechnical Work shop	331	
8	Near Blower house(Waste gun filter 1,2&3)	354	
9	Near Compressor House	279	
10	Lime delivery building	1315	
11	Near Dedusting -3 ID Fan	308	
12	Near lime dolo sizing unit	508	
13	Near dedusting 01 Area	316	
14	Under Conveyor	318	
Blast furnace-I			
1	Near Thickener	298	4000
2	Near Main pump house	227	
3	Secondary cooling tower	252	
4	Near Chiller Plant	232	
5	Near stock house	3094	

6	Near Cast house	534	
Blast furnace-II			
1	Cast house	687	3000
2	Dry Pit	536	
3	Furnace	1175	
4	Stock House	1961	
5	Near Thickener	376	
Coke Oven-1			
1	Coke cutter section	614	4000
2	Fine crusher station	551	
3	Near Battery Stack	344	
4	Near quenching tower	373	
5	Secondary crusher	510	
6	Near Coke Yard	598	
Coke Oven-II			
1	Coke treatment building	998	4000
2	Near BOD plant	258	
3	Near Tar recovery system/byproduct recovery	321	
4	Near Canteen	302	
5	Coal crushing building	772	
6	Near CDQ stack	340	
7	Near Coal mixing building	502	
8	Near Coke Oven-II junction (Plaza-I)	313	
RMHS			
1	RMHS Entry Point	275	2000
2	Coal Yard -7 Lucky Mineral Office	360	
3	Infront of PCI building	353	
4	Near JH-21 Yard-7 (Iron ore conveying)	702	
5	Near Stacker yard No. 4&5	336	
6	Near Non cooking coal shed	307	
7	Near RMPP Office JH	554	
8	Near DRI -10 traffic post	230	
9	Near DRI -1 traffic post Plaza -1	306	
RMPP			
1	Near CSB-1	917	2000
2	Near CSB-2	878	
3	Near tertiary Crushing & Screening Building Area	2450	
4	Near Iron Crusher Area	2040	
5	Near Ground Hopper Area	617	
DRI			
1	Near WHRB -5 ash silo	646	2000
2	Near WHRB -4 ash silo	592	
3	Near Briquetting plant	618	
4	Near PSB-2 building	574	
5	Near PSB-3 building	527	
6	Near PSB- 4 building	660	
7	Near PSB-5 building	635	
8	Near training center	269	

9	Near DRI -5 day bin	611	
10	Near DRI-I char silo	893	
11	Near DRI -III car Silo	953	
B.B Plant			
1	Plant Office	537	2000
2	Storage building	1667	
3	Flux crushing and screen building	2134	
Power Plant			
1	BFPP1 Ash silo	867	-
2	AEL ash silo	1027	
3	Near BOF gas holder	286	
4	Near stack -II AEL	228	
SMS-II			
1	SMS-2 Near Canteen	389	4000
2	SMS-2 Furnace area	1246	
3	Lime briquetting plant	523	
4	Baghouse SMS-II	638	
SMS-III			
1	BOF sludge Yard	320	3000
2	BOF DE system	363	
3	BOF Furnace area	1036	
4	Slag yard entrance	1427	
5	MRSS-II	579	
IBMD Sales yard			
1	Near Brick area	96	-
2	Near Wooden area	142	
3	Near Scarp Cutting Area	234	
MRP Plant near Sarpa boundary			
1	Near BC-12 Area	1205	-
2	Near BC-13 Area	976	
3	Near Drump Magnet area	691	
4	Near Feed Hopper Area	773	
Old MRP Plant			
1	Discharge Of BC-12 &13	1245	-
2	Discharge Of BC-9 &10	1032	
3	Material Feeding Area	1107	
4	Slag Pit Ramp Entrance Area	1972	
5	Slag Pit unloading Point Area	2019	
6	Slag pit near MRP plant side	1036	
Wagon Tippler Area			
1	Near Wagon Tippler Entrance Area	439	-
2	Near Wagon Tippler No-1	649	
3	Near Wagon Tippler No-2	546	
4	Near Wagon Tippler No-3	391	
5	Near Wagon Tippler No-4	378	
6	Track Hopper No-1&2	2187	
7	Foot Over Bridge	242	
BFPP-2			
1	Near ESP Area	352	-
2	Near Ash silo Area	786	

BFPP-1			
1	Near ESP Area	352	-
2	Near Ash silo Area	786	
HSM			
1	Near Stack area	246	-
2	Nera Gate 10 Area	325	
3	Nera Coil Yard area	919	
CRM			
1	Near ETP Area	329	-
2	Near canteen area	159	
3	Near Used Oil Storage Area	158	

Annexure-IV

Summary of Surface Water Quality Analysis

Period: From Apr to Sep'21

S.N	Parameter	Unit	Lingala Nala		Kishinda Nala		Standard as per Class C -IS 2296 /CPCB
			U/S	D/S	U/S	D/S	
1	pH Value	-	7.78-8.31	7.88-8.08	7.54-8.14	7.3-8.07	6.0-9.0
2	Colour	Hazen	0.74-3.1	0.8-1.59	0.56-2.3	0.69-1.9	300 (max)
3	Electrical Conductivity	µs/cm	340-464	412-906	486-774	271-591	--
4	Total Dissolved Solids	mg/l	240-340	307-670	362-603	204-479	1500 (max)
5	Dissolved Oxygen	mg/l	6.5-8.6	6.5-7.6	6.9-7.9	7.1-8.5	4 (min)
6	BOD , 3days at 27°C	mg/l	0.3-2.1	0.5-2.6	0.5-1.7	0.3-2.4	3 (max)
7	Chlorides as Cl	mg/l	10.5-27.7	7.8-33.65	12.5-39	10.5-39	600 (max)
8	Fluoride as F-	mg/l	0.58-0.87	0.62-4.0	1.9-9.6	1.3-5.0	1.5 (max)
9	Sulphate mg/l	mg/l	7.63-48.9	10.31-80.9	41.12-196.8	27.72-120.6	400 (max)
10	Nitrate as NO3-	mg/l	6.8-15.6	10.7-19.4	5.9-16.8	6.7-25.6	50 (max)
11	Hexa Chromium as Cr +6	mg/l	0.008-0.041	0.012-0.042	0.004-0.037	0.009-0.042	0.05
12	Cyanide as CN	mg/l	<0.03	<0.03	<0.03	<0.03	0.05 (max)
13	Copper as Cu	mg/l	0.001-0.049	0.007-0.023	0.007-0.041	0.013-0.083	1.5 (max)
14	Iron as Fe	mg/l	0.041-0.437	0.063-0.373	0.019-2.162	0.078-0.759	0.5 (max)
15	Cadmium as Cd	mg/l	0.001-0.007	0.001-0.009	0.001-0.009	0.003-0.008	0.01 (max)
16	Selenium as Se	mg/l	<0.001	<0.001	<0.001	<0.001	0.05 (max)
17	Arsenic as As As	mg/l	0.001-0.007	0.005-0.009	0.002-0.008	0.003-0.009	0.2 (max)
18	Lead as Pb(max)	mg/l	<0.001	<0.001	<0.001	<0.001	0.1 (max)
19	Zinc as Zn(max)	mg/l	0.01-0.3	0.003-0.154	0.001-0.11	0.001-0.06	15 (max)
20	Sodium Absorption Ratio	-	5.98-7.57	5.68-14.74	3.83-10	4.29-8.9	--
21	Total Coliform	Nos.	168-244	78->300	113-598	>300-670	5000
22	FC	-	ND-122	ND-59	ND-410	ND-180	300
23	T. Hardness(as CaCO3)	mg/l	122-203	144-211	178-330	150-260	200
24	Calcium as Ca	mg/l	20.04-39.68	34.46-47.29	36.07-86.57	34.01-60.12	75
25	Magnesium as Mg	mg/l	13.12-25.28	14.09-28.23	21.38-36.08	11.29-26.73	30
26	Manganese as Mn,	mg/l	0.005-0.056	0.003-0.041	0.007-0.064	0.037-0.049	0.1
27	Sodium as Na,	mg/l	30.99-45.33	31.8-85.76	29.0-53.63	22.90-58.7	$
28	Potassium as K,	mg/l	0.5-3.12	0.55-21.11	0.98-3.87	1.39-5.98	$
29	Nickel as Ni	mg/l	0.018-0.059	0.017-0.61	<0.01-0.076	0.021-0.08	0.02
30	Chemical Oxygen Demand	mg/l	16-56	20.2-46.0	16-74	14-80	$
31	Free Ammonia	mg/l	<0.01	<0.01	<0.01	<0.01	0.5
32	Boron as B	mg/l	0.007-0.028	0.012-0.028	0.007-0.042	0.012-0.029	0.5
33	Total alkalinity as (as CaCO3)	mg/l	150-217	114-198	133-224	106-206	200

Note: $ - No specific standards, ND - Not detected, U/S: Upstream D/S: Downstream

Source: IMMT, Bhubaneswar

Summary of Treated Domestic Effluent Analysis

Period: From Apr to Sep'21

S.N	Location	Parameters in Range			
		pH	Suspended Solid in mg/l	Chemical Oxygen Demand in mg/l	BOD (3days at 27°C) in mg/l
1.	Colony STP	7.52-7.92	48-58	18.2-27.5	7.52-7.92
2.	BEL STP	7.1-8.2	48-64	20.0-24.0	7.1-8.2
3.	SMS-1 STP	7.2-7.9	45-54	16.0-22.0	7.2-7.9
4.	BF-1 STP	7.3-8.1	36-46	12.0-19.8	7.3-8.1
Standard		**5.5-9.0**	**100**	**250**	**30**

Summary of Effluent Treatment Plant Analysis

S.N	Location	Parameters in Range			
		pH	Suspended Solid in mg/l	Chemical Oxygen Demand in mg/l	BOD (3days at 27°C) in mg/l
1.	ETP-1(Outlet)	7.5-8.2	42-63	38-63	2.5-3.2
2.	ETP-2(Outlet)	7.1-7.9	47-59	38-60	2.5-3.6
3.	ETP-3(Outlet)	6.8-8.1	38-63	48-77	3.4-4.6
4.	BF-1(Thickener Outlet)	6.6-7.1	70-80	58-67	2.8-5.4
5	BF-2(Thickener Outlet)	7.5-8.2	59-77	55-70	3.0-4.8
6	CRM (ETP Outlet)	7.4-8.1	44-55	180-210	15.6-20.6
7	SMS-3 (Thickener Outlet)	9.6-10.5	59-81	67-86	3.2-5.2
8	Coke Oven-1 (ETP Outlet)	7.0-8.1	52-63	140-172	17.4-23.4
9	Coke Oven-2 (ETP Outlet)	7.2-8.1	47-58	154-186	19.2-22.4
Standard		**5.5-9.0**	**100**	**250**	**30**

Summary of ground water level monitoring report inside plant premises

Period: From Apr to Sep'21

S.N	Location with description	Depth of Bore Well	Longitude	Latitude	Monitoring Point (mtr.agl)	Water level in mtr bgl	
						June-21	Sept-21
1	Near CRM	163ft	20°47.956'	85°15.076'	1.58	3.93	2.11
2	Colony near STP	165ft	20°49.045'	85°15.734'	1.19	2.11	1.68
3	RMHS Near Wagon Tippler	300ft	20°47.752'	85°15.993'	1.2	4.8	3.12
4	Near Blast Furnace-2	162ft	20°47.25'	85°15.613'	1.0	2.68	1.50
5	Near Gate no-10	166ft	20°48.653'	85°15.754'	0.9	3.58	2.16
6	Near Railway bridge	156ft	20°48.920'	85°15.858'	1.46	5.12	2.88

Ground Water Quality Analysis

S.N	Parameter	Unit	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	Standard as per IS-10500-2012 (Acceptable Limit)	Standard as per IS-10500-2012 (Permissible Limit)
1	p H	-	7.50	8.06	8.21	7.92	7.56	7.66	6.5-8.5	6.5-8.5
2	Colour	Hazen	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless	5	15
3	Odour	-	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Agreeable
4	T. Hardness (as $CaCO_3$)	mg/l	244	416	464	310	390	378	200	600
5	Calcium as Ca	mg/l	59.32	100.2	112.22	74.55	93.78	91.38	75	200
6	Magnesium as Mg	mg/l	23.42	40.5	44.40	30.26	38.06	36.6	30	100
7	Iron as Fe	mg/l	0.09	0.12	0.07	0.10	0.07	0.08	0.3	0.3
8	Chlorides as Cl	mg/l	68.16	254.18	259.86	183.18	242.82	239.98	250	1000
09	Fluoride as F^-	mg/l	0.75	0.82	0.69	0.70	0.82	0.64	1.0	1.5
10	Dissolved solids	mg/l	337	518	591	432	488	568	500	2000
11	Nitrate as NO_3^-	mg/l	1.8	2.2	2.8	2.0	2.3	2.5	45	45
12	Chromium as Cr^{+6}	mg/l	0.009	0.012	0.010	0.014	0.008	0.018	0.05	0.05
13	Alkalinity as CaCO3	mg/l	44	58	60	50	46	52	200	600
14	Phosphate as PO4	mg/l	0.62	0.78	0.88	0.70	0.72	0.82	$	$
15	Mineral Oil	mg/l	ND	ND	ND	ND	ND	ND	0.5	0.5

N.B-GW-1-Near colony STP, GW-2-Near CRM, GW-3-Near Wagon Tippler are, GW-4- Near BF-2, GW-5-Near Gate Number-1,GW-6- Near Railway Bridge at material road.

Ground Water Level

Period: Apr to Sep'21

S.N	Location	Sample Code	Monitoring Point (mtr.agl)	Longitude	Latitude	Water Level in mtr bgl	Water Level in mtr bgl
						June-21	Aug-21
1	Kharagprasad	GW-01	0.5	20^0 49.299'	85^0 18.923'	3.2	3.34
2	Charadagadia	GW-02	1	20^0 47.768'	85^0 17.083'	5.55	7.66
3	Sibpur	GW-03	0	20^0 46.941'	85^0 14.394'	5.9	7.29
4	Kochilamara	GW-04	0.21	20^0 47.541'	85^0 16.802'	4.8	5.25
5	Galpada	GW-05	0.39	20^0 48.142'	85^0 18.600'	6.1	4.76
6	Motonga	GW-06	0.64	20^0 48.143'	85^0 18.599'	3.1	3.95
7	Asanabania	GW-07	0.7	20^0 47.534'	85^0 16.802'	6.4	6.71
8	Narendrapur	GW-08	0.25	20^0 49.483'	85^0 15.530'	4.88	4.06
9	Khaliberena	GW-09	0.18	20^0 46.946'	85^0 14.396'	5.1	5.7
10	Ganthigadia	GW-10	0.52	20^0 48.501'	85^0 15.118'	3.8	4

Ground Water Quality Analysis Report of surrounding villages

June ,2021

S. N	Parameter	GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-09	GW-10	Drinking water desirable limits IS-10500-2012(permissible limit)
1	pH	7.2	7.3	7.2	7.0	7.5	7.5	7.2	7.3	7.2	7.1	6.5-8.5
2	Conductivity µs/cm	1012	996	920	752	1080	720	1060	788	695	888	-
3	TDS mg/l	608	598	552	451	648	432	636	473	417	534	2000
4	Total Hardness as CaCO3 mg/l	388	390	352	330	410	322	420	312	302	355	600
5	Calcium Hardness as CaCO3 mg/l	234	234	212	198	246	193	252	188	182	212	-
6	Magnesium Hardness as CaCO3 mg/l	154	156	140	132	164	129	168	124	120	143	-
7	Total. Alkalinity	172	192	188	166	210	148	222	156	149	162	600
8	P. Alkalinity as CaCO3 mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
9	Chloride mg/l	193.12	151.94	180.34	164.72	189.57	151.94	180.34	165.43	146.26	161.88	1000
10	Fluoride mg/l	0.72	0.72	0.82	0.66	0.66	0.58	0.54	0.78	0.82	0.72	1.5
11	Total Phosphate as P mg/l	0.55	0.56	0.32	0.62	0.52	0.29	0.66	0.44	0.44	0.56	-
12	Nitrate NO3 -2 mg/l	1.88	0.92	1.52	2.52	1.52	1.10	1.20	1.10	1.42	0.92	45
13	Iron as Fe mg/l	0.12	0.08	0.08	0.10	0.11	0.06	0.14	0.10	0.10	0.09	0.3

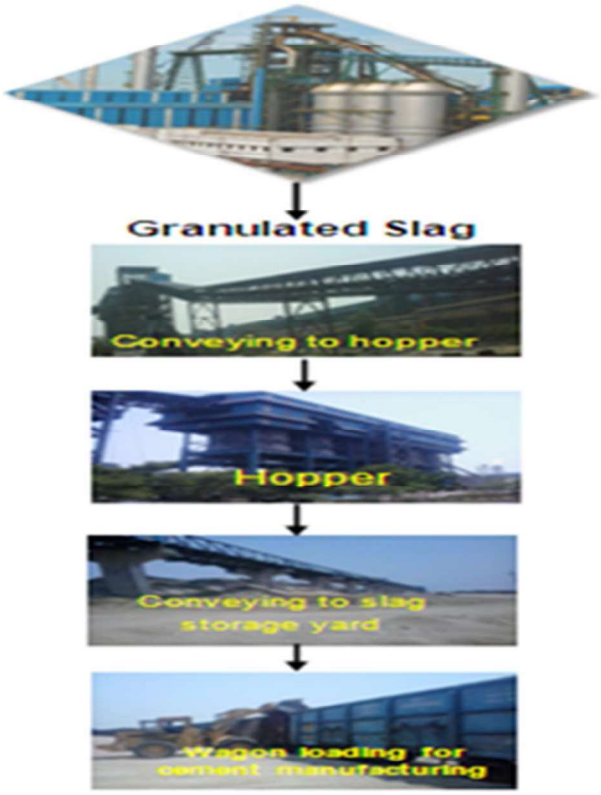
September,2021

S. N	Parameter	GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-09	GW-10	Drinking water desirable limits IS-10500-2012(permissible limit)
1	pH	7.2	7.0	7.1	7.3	7.2	7.5	7.2	7.0	7.1	7.3	6.5-8.5
2	Conductivity µs/cm	888	1568	452	902	352	860	1221	688	588	1012	-
3	TDS mg/l	497	878	271	505	197	482	685	386	330	560	2000
4	Total Hardness as CaCO3 mg/l	368	620	252	452	288	292	278	232	188	392	600
5	Calcium Hardness as CaCO3 mg/l	222	372	152	272	174	175	168	140	114	235	-
6	Magnesium Hardness as CaCO3 mg/l	146	248	100	150	114	117	110	92	74	157	-
7	Total. Alkalinity	88	96	82	102	66	106	136	112	65	156	600
8	P. Alkalinity as CaCO3 mg/l	0	0	0	0	0	0	0	0	0	0	-
9	Chloride mg/l	65.32	115.02	41.18	63.19	39.05	90.88	72.42	61.06	48.28	79.52	1000
10	Fluoride mg/l	0.48	0.68	0.72	0.92	0.55	0.86	0.81	0.72	0.36	1.05	1.5
11	Total Phosphate as P mg/l	0.92	0.82	0.52	0.48	0.46	0.78	0.42	0.58	0.29	0.64	-
12	Nitrate NO3 -2 mg/l	2.8	1.6	1.1	1.5	1.2	0.92	1.28	1.56	0.88	0.78	45
13	Iron as Fe mg/l	0.12	0.07	0.13	0.08	0.07	0.12	0.10	0.11	0.09	0.13	0.3

Annexure - V

Details of Slag Generation and Utilization In Blast Furnace – 1 & 2

Month	Quantity Generated (MT)	Quantity Dispatched (MT)
Apr'21	126205	125515
May'21	145004	145004
Jun'21	137906	132615
Jul'21	153674	130617
Aug'21	141712	135950
Sep'21	133660	126784
Total	**838161**	**796485**



BF Granulated Slag for Dispatch to Cement Plants

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(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)
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Bhubaneswar - 751013, Odisha, INDIA

TEST REPORT

Ref. No. IMMT/CCD/07/2021 **Date: 30.07.2021**

Name & Address of the Party:	Tata Steel BSL Ltd. At-Narendrapur, P.O.-Kusupanga Via-Meramandali, Dist-Dhenkanal
Sample Details:	1. Fly ash, BFPP-1 2. Bed ash, BFPP-1 3. Fly ash, BFPP-2 4. Bed ash, BFPP-2
Date of Receiving:	25.06.2021
Date(s) of Conducting Test:	30.06.2021
Date of Completion of Test:	23.07.2021

Method Adopted: 1. Major element analysis of ash samples through wet chemical route by using Volumetric, gravimetric, photometric, nephelometric, AAS and ICP-OES techniques.

2. TCLP study of ash samples as per US-EPA method 1311 or ASTM-D5233-92. Leaching solution analysis by ICP-OES and AAS.

Detail Report: Following data tables are enclosed

Table-1. Chemical composition analysis of fly ash and bed ash samples.

Table-2. Experimental variables for Toxicity Characteristic Leaching Procedure (TCLP) study of Ash samples conducted as per US-EPA method 1311.

Table-3. Trace element analysis of TCLP or WET Procedure solutions of Ash samples; leaching studies conducted as per US-EPA method 1311 and Appendix II of section 66261 of Title 22 of California Code Regulations (CCR).

(J. Das)
Principal Technical Officer
Central Characterization Dept.

N.B.:- The samples are not drawn by CSIR-IMMT. Liability, if any, for CSIR/IMMT arising in connection with the testing shall be subject to ceiling of amount received by the institute from the client. The report should not be interpreted in part.

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TEST REPORT

Ref. No. IMMT/CCD/07/2021 **Date: 30.07.2021**

Table-1. Chemical composition analysis of fly ash and bed ash samples.

Sl. No.	Component	Concentration in Test Samples, %			
		Fly Ash, BFPP-1	Bed Ash, BFPP-1	Fly Ash, BFPP-2	Bed Ash, BFPP-2
1	SiO_2	49.85	52.45	56.4	54.9
2	Al_2O_3	25.8	24.6	16.8	17.5
3	Fe_2O_3	2.64	3.66	4.35	5.18
4	TiO_2	1.38	1.41	0.88	0.79
5	MnO_2	0.02	0.04	0.11	0.16
6	CaO	1.66	2.34	4.99	7.67
7	MgO	0.97	1.12	1.10	2.21
8	Na_2O	1.39	1.37	1.21	1.16
9	K_2O	1.18	1.29	1.20	1.14
10	Cr_2O_3	0.018	0.017	0.031	0.027
11	NiO	0.004	0.005	0.005	0.003
12	CuO	0.009	0.009	0.007	0.004
13	ZnO	0.008	0.009	0.017	0.007
14	BaO	0.046	0.049	0.036	0.031
15	P_2O_5	0.38	0.34	0.32	0.21
16	SO_3	0.27	0.10	0.15	0.43
17	Cl^-	0.38	0.64	0.21	0.42
18	LOI	6.56	2.37	3.34	3.70
19	F^-, mg/L	0.94	1.23	1.65	1.79

30/7/21

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TEST REPORT

Ref. No. IMMT/CCD/07/2021 **Date: 30.07.2021**

Table-2. Experimental variables for Toxicity Characteristic Leaching Procedure (TCLP) study of Ash samples conducted as per US-EPA method 1311.

Sl. No.	TCLP study Variables	Variable Data			
		Fly Ash, BFPP-1	Bed Ash, BFPP-1	Fly Ash, BFPP-2	Bed Ash, BFPP-2
1	TCLP study method	US-EPA Method-1311			
2	Sample type	Dust, Particle size < 100 µm	Dust and Gravels, Particle size < 8 mm	Dust, Particle size < 100 µm	Dust and Gravels, Particle size < 8 mm
3	Sample particle size taken for leaching	Original sample	Original sample	Original sample	Original sample
4	Initial pH of samples	9.11	12.29	10.30	12.41
5	pH after HCl + heat	2.04	10.13	2.37	11.29
6	Extraction fluid used	Extraction fluid -1	Extraction fluid -2	Extraction fluid -1	Extraction fluid -2
7	pH of Extraction fluids	4.94	2.90	4.94	2.90
8	Sample taken for leaching, gm	50			
9	Volume of extraction fluid used, ml	1000			
10	Liquid/solid ratio	20:1			
11	Head space	10 %			
12	Extraction Temperature °C	28			
13	Extraction Time, hour	18			
14	Filter	Glass micro fiber, Whatman GF/C			
15	Washing of filters	With dil. HNO_3 and distilled water			
16	pH of recovered extraction fluid	5.12	4.78	4.95	5.66

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Table-3. Trace element analysis of TCLP or WET Procedure solutions of Ash samples; leaching studies conducted as per US-EPA method 1311 and Appendix II of section 66261 of Title 22 of California Code Regulations (CCR).

Sl. No.	Component	Concentrations in TCLP or WET* leaching solutions of Ash test samples (mg/L)				Waste constituents concentration limits of TCLP or STLC. US-EPA and California Code of Regulations (mg/L)
		Fly Ash, BFPP-1	Bed Ash, BFPP-1	Fly Ash, BFPP-2	Bed Ash, BFPP-2	
1	Hg	0.005	0.004	0.004	0.003	0.2
2	As	0.034	0.054	0.041	0.025	5.0
3	Se	0.080	0.044	0.085	0.047	1.0
4	Sb*	0.056	0.049	0.038	0.021	15.0
5	Ba	0.46	0.20	0.38	0.27	100.0
6	Cd	0.001	0.002	0.001	0.002	1.0
7	Cr	0.026	0.021	0.031	0.025	5.0
8	Cr (VI)	0.012	0.009	0.015	0.010	5.0
9	Pb	0.024	0.028	0.024	0.016	5.0
10	Mn	0.42	0.31	0.69	0.27	10.0
11	Ag	0.012	0.009	0.034	0.008	5.0
12	Co*	0.18	0.14	0.16	0.13	80.0
13	Cu*	0.51	0.16	0.55	0.12	25.0
14	Mo*	0.19	0.54	0.29	0.06	350
15	Ni*	0.31	0.19	0.31	0.16	20.0
16	V*	1.23	0.39	1.72	0.31	24.0
17	Zn*	0.64	0.13	1.12	0.09	250

Remark: The TCLP and WET leaching solution analyses of fly ash and bed ash samples reveal that trace element concentrations are much below the Waste constituent concentration limits. Therefore, the ash samples are non-hazardous materials and their use as land filling or mine void dumping will not have any adverse effect on the ground water quality in respect of the analyzed parameters and no separate lining is required for dumping of the tested ash samples.

30/07/21

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TEST REPORT

Ref. No. IMMT/CCD/08/2021 **Date: 03.08.2021**

Name & Address of the Party:	Tata Steel BSL Ltd. At-Narendrapur, P.O.-Kusupanga Via-Meramandali, Dist-Dhenkanal
Sample Details:	Solid Waste samples (17 Nos.)
Date of Receiving:	02.06.2021
Date(s) of Conducting Test:	07.06.2021
Date of Completion of Test:	23.07.2021

Method Adopted: 1. Major element analysis of Solid waste samples through wet chemical route by using Volumetric, gravimetric, photometric, nephelometric, AAS and ICP-OES techniques.
2. TCLP study of waste samples as per US-EPA method 1311 or ASTM-D5233-92. Leaching solution analysis by ICP-OES and AAS.

Detail Report: Following data tables are enclosed

Table-1. Physical characteristics analysis of Solid Waste samples of Tata Steel BSL Limited, Meramandali

Table-2. Size (Sieve) analysis of Solid Waste samples of Tata Steel BSL Limited, Meramandali

Table-3. Chemical composition analysis of Solid Waste samples of Tata Steel BSL Limited, Meramandali

Table-4(a) Experimental variables for Toxicity Characteristic Leaching Procedure (TCLP) study of Solid Waste samples (SW1, SW2, SW3, SW4, SW5 & SW8) conducted as per US-EPA method 1311.

Table-4(b) Trace element analysis of TCLP or WET Procedure solutions of Solid waste samples(SW1, SW2, SW3, SW4, SW5 & SW8); Leaching studies conducted as per US-EPA method 1311 and Appendix II of section 66261 of Title 22 of California Code Regulations (CCR).

Table-5(a) Experimental variables for Toxicity Characteristic Leaching Procedure (TCLP) study of Solid Waste samples (SW9, SW10, SW11, SW12, SW13 & SW14) conducted as per US-EPA method 1311.

Table-5(b) Trace element analysis of TCLP or WET Procedure solutions of Solid waste samples(SW9, SW10, SW11, SW12, SW13 & SW14); Leaching studies conducted as per US-EPA method 1311 and Appendix II of section 66261 of Title 22 of California Code Regulations (CCR).

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Table-6(a) Experimental variables for Toxicity Characteristic Leaching Procedure (TCLP) study of Solid Waste samples (SW15, SW17, SW18, SW19 & SW20) conducted as per US-EPA method 1311.

Table-6(b) Trace element analysis of TCLP or WET Procedure solutions of Solid waste samples (SW15, SW17, SW18, SW19 & SW20); Leaching studies conducted as per US-EPA method 1311 and Appendix II of section 66261 of Title 22 of California Code Regulations (CCR).

03/08/21
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N.B.:- The samples are not drawn by CSIR-IMMT. Liability, if any, for CSIR/IMMT arising in connection with the testing shall be subject to ceiling of amount received by the institute from the client. The report should not be interpreted in part.

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TEST REPORT

Ref. No. IMMT/CCD/08/2021 **Date: 03.08.2021**

Table-1. Physical characteristics analysis of Solid Waste samples of Tata Steel BSL Limited, Meramandali.

Sl. No.	Sample ID.	Concentration in Test Solid waste samples			
		pH	Bulk Density, (g/cc)	Dry Matter, %	Volatile Matter, %
1	SW-1 (ETP-1 Sludge)	7.86	0.62	97.5	14.7
2	SW-2 (ETP-2 Sludge)	8.07	0.69	98.1	12.0
3	SW-3 (ETP-3 Sludge)	8.31	0.71	98.4	18.9
4	SW-4 (CRM ETP Sludge)	8.45	0.65	94.5	37.8
5	SW-5 (BOD -1 Sludge)	6.71	0.75	86.5	47.8
6	SW-8 (BF-1 Flue Dust)	9.08	2.04	99.5	3.18
7	SW-9 (BF-2 Flue Dust)	10.4	1.61	99.6	3.44
8	SW-10 (BOF GCP Dust)	11.2	1.15	99.0	2.75
9	SW-11 (DRI Cold ESP Dust)	10.9	0.76	98.1	4.50
10	SW-12 ((DRI Wet Scrapper Dust)	9.57	0.85	97.7	4.67
11	SW-13 (SMS Slag)	12.2	1.86	99.9	0.47
12	SW-14 (BF Granulated Slag)	9.60	1.29	99.8	0.41
13	SW-15 (Lime Plant De-dusting Dust)	12.5	0.78	99.7	14.3
14	SW-17 (Mill Scale)	8.61	2.89	99.9	0.09
15	SW-18 (SMS-II FES Dust)	12.6	1.41	99.8	4.24
16	SW-19 (BF-1 GCP Dust)	9.26	1.02	99.5	4.16
17	SW-20 (BF-2 GCP Dust)	9.47	1.25	99.2	5.17

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TEST REPORT

Ref. No. IMMT/CCD/08/2021 **Date: 03.08.2021**

Table-2. Size (Sieve) analysis of Solid Waste samples of Tata Steel BSL Limited, Meramandali

Sl. No.	Sample ID	Seive Fractions							
		+2 mm	-2+1 mm	-1+500 micron	-500+250 micron	-250+150 micron	-150+75 micron	-75+45 micron	-45 micron
1	SW-1	73.95	9.31	5.62	3.50	0.80	1.32	1.42	4.08
2	SW-2	62.59	16.21	8.68	4.09	0.42	0.38	0.90	6.74
3	SW-3	36.28	11.91	10.09	9.46	6.25	6.67	11.89	7.46
4	SW-4	88.51	6.70	2.84	0.93	0.52	0.50	0	0
5	SW-5	83.54	11.30	3.49	0.42	0.87	0.16	0.10	0.11
6	SW-8	6.05	3.02	3.77	3.75	4.78	11.69	13.44	53.48
7	SW-9	0	0.09	0.25	0.51	1.91	29.37	56.56	11.30
8	SW-10	33.52	15.92	15.29	11.98	5.10	6.67	8.29	3.22
9	SW-11	6.40	7.13	4.61	5.65	3.44	14.33	40.13	18.31
10	SW-12	5.12	4.75	7.91	10.29	11.28	23.15	17.61	19.89
11	SW-13	57.97	9.22	6.74	4.73	3.00	5.44	3.53	9.38
12	SW-14	2.31	12.91	43.91	16.23	4.56	6.46	5.05	8.57
13	SW 15	0.93	0.63	0.96	1.47	2.50	15.33	52.18	26.00
14	SW-17	39.15	13.71	12.83	16.48	8.68	6.29	2.09	0.77
15	SW-18	0.49	1.06	2.55	7.33	47.34	21.35	12.43	7.46
16	SW-19	45.08	3.33	2.71	3.70	7.08	17.62	10.22	10.26
17	SW-20	29.96	12.53	5.22	3.78	7.02	17.35	13.72	10.42

N. B.: SW1-ETP-1 Sludge, SW2-ETP-2 Sludge, SW3-ETP-3 Sludge, SW4-CRM ETP Sludge, SW5-BOD-1 Sludge, SW8-BF-1 Flue Dust, SW9-BF-2 Flue Dust, SW10-BOF GCP Dust, SW11-DRI Cold ESP Dust, SW12-DRI Wet Scrapper Dust, SW13-SMS Slag, SW14-BF Granulated Slag, SW15-Lime Plant De-dusting Dust, SW17-Mill Scale, SW18-SMS-II FES Dust, SW19-BF-1 GCP Dust & SW20-BF-2 GCP Dust

03/08/21

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TEST REPORT

Ref. No. IMMT/CCD/08/2021 **Date: 03.08.2021**

Table-3. Chemical composition analysis of Solid Waste samples of Tata Steel BSL Limited, Meramandali.

Sl. No.	Sample Ids.	Concentration in Test Solid waste samples, %													
		SiO_2	Al_2O_3	Fe (T)	TiO_2	MnO	CaO	MgO	Na_2O	K_2O	P_2O_5	SO_3	C	Cl^-	LOI
1	SW-1	39.21	23.32	10.3	0.36	0.049	0.78	1.21	0.41	1.65	0.06	0.28	3.51	0.23	16.28
2	SW-2	37.91	19.30	12.5	0.94	0.085	5.07	1.40	0.65	1.24	0.16	0.07	6.02	0.29	16.46
3	SW-3	9.07	4.01	5.11	0.21	0.038	3.16	0.94	0.40	0.69	0.001	0.85	56.0	0.16	73.22
4	SW-4	2.40	1.15	3.72	0.03	0.10	21.81	2.54	1.22	0.52	0.45	0.17	17.5	1.13	42.75
5	SW-5	1.29	2.02	16.2	0.19	0.021	0.69	0.62	1.29	0.65	0.001	7.70	30.6	0.48	75.98
6	SW-8	4.17	1.88	59.15	0.10	0.093	2.09	0.58	1.47	1.02	0.001	0.82	2.12	0.40	3.18
7	SW-9	4.18	1.79	57.7	0.09	0.056	2.28	0.74	1.13	1.37	0.001	1.78	10.24	0.13	11.4
8	SW-10	4.32	1.78	53.1	0.12	0.095	12.45	4.02	1.16	0.97	0.001	0.31	0.85	0.075	2.75
9	SW-11	24.28	12.61	10.98	0.56	0.039	5.36	2.32	1.29	1.16	0.35	2.49	33.4	0.09	35.57
10	SW-12	12.76	7.96	22.74	0.39	0.025	2.60	0.71	1.19	0.99	0.20	0.42	30.3	0.03	46.21
11	SW-13	13.42	1.78	26.7	0.84	0.022	45.22	10.80	1.58	0.88	1.20	0.20	0.07	0.27	0.52
12	SW-14	32.99	15.58	1.10	0.71	0.065	31.77	9.14	1.55	1.34	0.001	1.61	0.24	0.14	0.61
13	SW 15	2.41	1.12	2.68	0.10	0.066	45.63	12.8	3.01	0.89	0.03	0.26	5.01	0.58	23.15
14	SW-17	0.09	0.32	65.4	0.01	0.012	0.20	0.99	1.33	0.74	0.001	0.03	0.13	0.05	2.47
15	SW-18	1.94	0.96	54.7	0.08	0.011	11.51	3.38	1.81	1.87	0.001	1.28	1.50	2.68	4.24
16	SW-19	10.84	3.21	32.9	0.17	0.046	2.74	1.31	1.36	0.93	0.001	1.01	27.7	0.31	31.6
17	SW-20	14.65	1.94	29.3	0.15	0.049	3.44	1.45	1.33	0.87	0.001	1.46	30.7	0.45	35.71

N. B.: SW1-ETP-1 Sludge, SW2-ETP-2 Sludge, SW3-ETP-3 Sludge, SW4-CRM ETP Sludge, SW5-BOD-1 Sludge, SW8-BF-1 Flue Dust, SW9-BF-2 Flue Dust, SW10-BOF GCP Dust, SW11-DRI Cold ESP Dust, SW12-DRI Wet Scrapper Dust, SW13-SMS Slag, SW14-BF Granulated Slag, SW15-Lime Plant De-dusting Dust, SW17-Mill Scale, SW18-SMS-II FES Dust, SW19-BF-1 GCP Dust & SW20-BF-2 GCP Dust

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Bhubaneswar - 751013, Odisha, INDIA

TEST REPORT

Ref. No. IMMT/CCD/08/2021 **Date: 03.08.2021**

Table-4(a). Experimental variables for Toxicity Characteristic Leaching Procedure (TCLP) study of Solid Waste samples conducted as per US-EPA method 1311.

Sl. No.	TCLP study Variables	Variable Data					
		SW 1	SW 2	SW3	SW 4	SW 5	SW 8
1	TCLP study method	US-EPA Method-1311					
2	Sample type	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm
3	Sample particle size taken for leaching	Original sample	Original sample	Original sample	Original sample	Original sample	Original sample
4	Initial pH of samples	7.86	8.07	8.31	8.45	6.71	9.08
5	pH after HCl + heat	3.01	5.69	6.82	7.15	4.16	3.67
6	Extraction fluid used	Extraction fluid -1	Extraction fluid -2	Extraction fluid -2	Extraction fluid -2	Extraction fluid -1	Extraction fluid -1
7	pH of Extraction fluid	4.91	2.88	2.88	2.88	4.91	4.91
8	Sample taken for leaching, gm	50					
9	Volume of extraction fluid used, ml	1000					
10	Liquid/solid ratio	20:1					
11	Head space	10 %					
12	Extraction Temperature °C	28					
13	Extraction Time, hour	18					
14	Filter	Glass micro fiber, Whatman GF/C					
15	Washing of filters	With dil. $HNO_3$and distilled water					
16	pH of recovered extraction fluid	4.75	4.47	4.46	4.52	4.65	4.78

03/08/21

(J. Das)
Principal Technical Officer
Central Characterization Deptt.

Tel.: +91 (0674) 2379212, 2379430, Tel.: 2379408/9501(Admn) / 2379510/9341 (F & AO) / 2379258/9513(Pur) / Tel.: 2567126, Fax:2567160(Dir)
Web site: www.immt.res.in

सीएसआइआर - खनिज एवं पदार्थ प्रौद्योगिकी संस्थान
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Ref. No. IMMT/CCD/08/2021 **Date: 03.08.2021**

Table-4(b). Trace element analysis of TCLP or WET Procedure solutions of Solid waste samples; leaching studies conducted as per US-EPA method 1311 and Appendix II of section 66261 of Title 22 of California Code Regulations (CCR).

Sl. No.	Component	Concentrations in TCLP or WET* leaching solutions of Solid Waste test samples (mg/L)						Waste constituents concentration limits of TCLP or STLC. US-EPA and California Code of Regulations (mg/L)
		SW1	SW2	SW3	SW4	SW5	SW8	
1	Hg	0.002	0.004	0.003	0.002	0.002	0.004	0.2
2	As	0.019	0.037	0.032	0.010	0.015	0.001	5.0
3	Se	0.047	0.067	0.056	0.036	0.169	0.011	1.0
4	Sb*	0.044	0.039	0.045	1.13	0.001	0.11	15.0
5	Ba	0.37	1.39	1.16	0.08	0.13	0.07	100.0
6	Cd	0.002	0.002	0.008	0.001	0.001	0.001	1.0
7	Cr	0.019	0.018	0.026	0.513	0.023	0.025	5.0
8	Pb	0.021	0.027	0.126	0.021	0.025	0.013	5.0
9	Mn	0.29	5.04	3.66	1.72	0.57	2.12	10.0
10	Ag	0.001	0.001	0.001	0.003	0.002	0.003	5.0
11	Co*	0.21	0.18	0.15	0.21	0.19	0.21	80.0
12	Cu*	0.53	0.02	9.6	0.04	12.3	0.05	25.0
13	Mo*	0.071	0.074	0.052	0.175	0.002	0.008	350
14	Ni*	0.27	0.22	0.25	1.04	0.49	0.24	20.0
15	V*	1.07	1.32	0.46	0.23	0.001	0.74	24.0
16	Zn*	2.62	1.05	3.39	2.33	0.73	2.86	250
17	F-*	0.67	1.03	1.21	2.69	38.6	19.5	180

Remark: The TCLP and WET leaching solution analyses of Solid Waste samples reveal that trace element concentrations are much below the Waste constituent concentration limits.

03/08/21
(J. Das)
Principal Technical Officer
Central Characterization Dept.

सीएसआइआर - खनिज एवं पदार्थ प्रौद्योगिकी संस्थान
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Bhubaneswar - 751013, Odisha, INDIA

TEST REPORT

Ref. No. IMMT/CCD/08/2021 **Date: 03.08.2021**

Table-5(a). Experimental variables for Toxicity Characteristic Leaching Procedure (TCLP) study of Solid Waste samples conducted as per US-EPA method 1311.

Sl. No.	TCLP study Variables	Variable Data					
		SW9	SW10	SW11	SW12	SW13	SW14
1	TCLP study method	US-EPA Method-1311					
2	Sample type	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm
3	Sample particle size taken for leaching	Original sample	Original sample	Original sample	Original sample	Original sample	Original sample
4	Initial pH of samples	10.3	11.2	10.9	9.57	12.2	9.60
5	pH after HCl + heat	3.34	5.61	9.64	8.13	11.9	3.81
6	Extraction fluid used	Extraction fluid -1	Extraction fluid -2	Extraction fluid -2	Extraction fluid -2	Extraction fluid -2	Extraction fluid -1
7	pH of Extraction fluid	4.91	2.88	2.88	2.88	2.88	4.91
8	Sample taken for leaching, gm	50					
9	Volume of extraction fluid used, ml	1000					
10	Liquid/solid ratio	20:1					
11	Head space	10 %					
12	Extraction Temperature °C	28					
13	Extraction Time, hour	18					
14	Filter	Glass micro fiber, Whatman GF/C					
15	Washing of filters	With dil. $HNO_3$and distilled water					
16	pH of recovered extraction fluid	4.95	5.09	5.04	4.82	4.54	4.55

03/08/14

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TEST REPORT

Ref. No. IMMT/CCD/08/2021 **Date: 03.08.2021**

Table-5(b). Trace element analysis of TCLP or WET Procedure solutions of Solid waste samples; leaching studies conducted as per US-EPA method 1311 and Appendix II of section 66261 of Title 22 of California Code Regulations (CCR).

Sl. No.	Component	Concentrations in TCLP or WET* leaching solutions of Solid Waste test samples (mg/L)						Waste constituents concentration limits of TCLP or STLC. US-EPA and California Code of Regulations (mg/L)
		SW9	SW10	SW11	SW12	SW13	SW14	
1	Hg	0.002	0.004	0.004	0.003	0.005	0.001	0.2
2	As	0.002	0.006	0.002	0.029	0.003	0.023	5.0
3	Se	0.049	0.011	0.002	0.063	0.052	0.051	1.0
4	Sb*	0.10	0.11	0.07	0.04	0.04	0.05	15.0
5	Ba	0.38	0.06	0.88	1.02	0.05	0.29	100.0
6	Cd	0.001	0.001	0.001	0.001	0.001	0.001	1.0
7	Cr	0.024	0.016	0.027	0.030	0.031	0.023	5.0
8	Pb	1.14	0.011	0.003	0.024	0.015	0.022	5.0
9	Mn	1.96	0.07	2.58	1.66	3.04	0.39	10.0
10	Ag	0.003	0.001	0.003	0.001	0.002	0.001	5.0
11	Co*	0.21	0.13	0.22	0.19	0.16	0.17	80.0
12	Cu*	0.04	0.03	0.03	0.16	0.04	0.02	25.0
13	Mo*	0.024	0.01	0.001	0.01	0.001	0.001	350
14	Ni*	0.18	0.06	0.07	0.21	0.15	0.18	20.0
15	V*	0.79	0.36	0.23	0.14	1.72	0.16	24.0
16	Zn*	4.01	2.54	0.14	0.42	0.05	1.38	250
17	F-*	18.0	0.07	2.07	1.33	0.16	7.74	180

Remark: Remark: The TCLP and WET leaching solution analyses of Solid Waste samples reveal that trace element concentrations are much below the Waste constituent concentration limits.

03/08/21
(J. Das)
Principal Technical Officer
Central Characterization Dept.

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TEST REPORT

Ref. No. IMMT/CCD/08/2021 **Date: 03.08.2021**

Table-6(a). Experimental variables for Toxicity Characteristic Leaching Procedure (TCLP) study of Solid Waste samples conducted as per US-EPA method 1311.

Sl. No.	TCLP study Variables	Variable Data				
		SW15	SW17	SW18	SW19	SW20
1	TCLP study method	US-EPA Method-1311				
2	Sample type	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm	Dust and Gravels, Particle size < 8 mm
3	Sample particle size taken for leaching	Original sample	Original sample	Original sample	Original sample	Original sample
4	Initial pH of samples	12.5	8.61	12.5	9.26	9.47
5	pH after HCl + heat	12.3	1.71	12.2	3.02	6.32
6	Extraction fluid used	Extraction fluid -2	Extraction fluid -1	Extraction fluid -2	Extraction fluid -1	Extraction fluid -2
7	pH of Extraction fluids	2.88	4.91	2.88	4.91	2.88
8	Sample taken for leaching, gm	50				
9	Volume of extraction fluid used, ml	1000				
10	Liquid/solid ratio	20:1				
11	Head space	10 %				
12	Extraction Temperature °C	28				
13	Extraction Time, hour	18				
14	Filter	Glass micro fiber, Whatman GF/C				
15	Washing of filters	With dil. HNO_3 and distilled water				
16	pH of recovered extraction fluid	8.21	4.64	7.85	4.57	4.60

03/08/21

(J. Das)
Principal Technical Officer
Central Characterization Dept.

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TEST REPORT

Ref. No. IMMT/CCD/08/2021 **Date: 03.08.2021**

Table-6(b). Trace element analysis of TCLP or WET Procedure solutions of Solid waste samples; leaching studies conducted as per US-EPA method 1311 and Appendix II of section 66261 of Title 22 of California Code Regulations (CCR).

Sl. No.	Component	Concentrations in TCLP or WET* leaching solutions of Solid Waste test samples (mg/L)					Waste constituents concentration limits of TCLP or STLC. US-EPA and California Code of Regulations (mg/L)
		SW15	SW17	SW18	SW19	SW20	
1	Hg	0.002	0.004	0.002	0.003	0.002	0.2
2	As	0.018	0.018	0.026	0.018	0.003	5.0
3	Se	0.055	0.054	0.181	0.057	0.019	1.0
4	Sb*	0.014	0.079	0.070	0.063	0.015	15.0
5	Ba	0.35	0.16	0.22	0.17	0.59	100.0
6	Cd	0.001	0.001	0.002	0.080	0.030	1.0
7	Cr	0.057	0.021	0.038	0.022	0.027	5.0
8	Pb	0.025	0.019	0.021	21.5	22.4	5.0
9	Mn	0.02	0.27	0.12	0.39	0.97	10.0
10	Ag	0.001	0.001	0.005	0.002	0.001	5.0
11	Co*	0.16	0.17	0.17	0.19	0.19	80.0
12	Cu*	0.07	0.02	0.14	0.19	0.01	25.0
13	Mo*	0.014	0.057	0.067	0.021	0.039	350
14	Ni*	0.08	0.27	0.10	0.18	0.14	20.0
15	V*	0.01	0.06	0.75	0.77	0.59	24.0
16	Zn*	0.03	0.18	2.06	3.87	4.98	250
17	F^-*	19.7	0.61	18.8	9.57	17.8	180

Remark: Remark: The TCLP and WET leaching solution analyses of Solid Waste samples reveal that trace element concentrations are much below the Waste constituent concentration limits.

03/08/21

(J. Das)
Principal Technical Officer
Central Characterization Dept.

TSBSL /SPCB/BS-07/2021-07/50
7th May, 2021

The Member Secretary,
State Pollution Control Board, Odisha
Paribesh Bhawan,
A/118, Nilakanthanager, Unit-VIII
Bhubaneswar-751012

Sub: Submission of annual return of Hazardous wastes for the period from April, 2020 to March, 2021.

Ref: Authorization no.IND-IV-HW-622/12122 dated 03.12.2020.

Dear Sir,

In compliance to Hazardous & Other wastes (Management & Transboundary Movement) Rules, 2016, we are enclosing herewith annual return in Form-4 for generation, handling, collection, storage and disposal of Hazardous Wastes for the period from April, 2020 to March, 2021 for the integrated steel plant of Tata Steel BSL Limited, Meramandali, Dhenkanal

Thanking you,

Yours faithfully,

f: Tata Steel BSL Limited

KC Das
Head Environment

Encl: As above

Copy to: 1. The PCCF (C) MoEF&CC, Eastern Zone, Bhubaneswar
2. The Divisional Head, CPCB, Eastern Region, Kolkata
3. The Regional Officer, State Pollution Control Board, Odisha, Angul

FORM 4

[See rules 6(5), 13(8), 16(6) and 20 (2)]

FORM FOR FILING ANNUAL RETURNS

[To be submitted to State Pollution Control Board by 30th day of June of every year for the preceding period April to March]

1. Name and address of facility:

Tata Steel BSL Limited
At-Narendrapur, PO- Kusupanga
Via- Meramandali, Dist-Dhenkanal
PIN-759121, Odisha (India)
Tel: 91-6762-300000
Fax: 011-66173997

2. Authorisation no. and date of issue: Authorization no.IND-IV-HW-622/12122, dated. 03.12.2020

3. Name of the authorised person and full address with telephone, fax and e-mail:

S. K. Banerjee
Chief Environment
At-Narendrapur, Po- Kusupanga
Via- Meramandali, Dist-Dhenkanal
PIN-759121, Odisha (India)
Tel: 91-6762-300000
Fax: 011- 66173997

4. Production during the year:

Total Production (Crude steel) during 2020-21: **4083158.476** MT

Part A. To be filled by hazardous waste generators

1. Total quantity of waste generated category wise:

SL	Physical form with description	Category	Quantity (in Tonnes/KL)
1	Used /Spent Oil	5.1	289.33 T
2	Waste/Residue Containing Oil	5.2	24.036 T
3	Oil and grease skimming (Oily Sludge	35.4	93.33 T
4	Residue from Coke Oven by-product plant (BOD Plant Sludge)	13.6	1563.35 T
5	Decanter tank sludge and tar sludge tank residue	13.4 & 13.5	1385 T
6	Acidic & Alkali Residues/Spent Acid and Alkali	12.1 & 12.2	17.66 T

7	ETP Sludge of CRM/Chemical Sludge from wastewater Treatment Plant	35.3	872.25 T
8	Spent Ion Exchange Resin containing toxic metals	35.2	1.25 T
9	Insulation material (Glass wool)	Class-C	83.47 T
10	Empty Barrels/Containers/Liners contaminated with Hazardous chemicals/wastes	33.1	193.47 T
11	Exhaust Air or Gas Cleaning Residue /LD Sludge	35.1 &C2	37141.4 T
12	Zinc Dross/Ash/Skimmings/Residues	11 to 15	480.85 T

2. Quantity dispatched

(i) to disposal facility:

SL	Physical form with description	Quantity (in Tonnes/KL)	Name of the Disposal Facilities
1	Oil and grease skimming (Oily Sludge)	79.12 T	M/s Ramky Enviro Engineer Ltd. Jajpur, Odisha
2	Insulation material (Glass wool)	83.47 T	
3	Acidic & Alkali Residues/Spent Acid and Alkali	17.66 T	
4	ETP Sludge of CRM/Chemical Sludge from wastewater Treatment Plant	872.25 T	

(i) to recycler or co-processors or pre-processor:

SL	Physical form with description	Quantity (in Tonnes/KL)	Name of the Reprocessing Facilities
1	Used /Spent Oil	289.33 T	M/s Bristol Petroleum Pvt. Ldt. At-26/5/D E,A.M.Ghosh Road,Budge,24 Parganas (S),WB
2	Empty Barrels/Containers/Liners contaminated with Hazardous chemicals/wastes	193.47 T	Sale to actual users /recycler
3	Zinc Dross/Ash/Skimmings/Residues	480.85 T	M/s Neelam Metal Products M/s Cosmo Agromet Industries M/s G M Admixtures M/s Alfa Pigment & Chemicals PVT. Ltd.
4	LD Sludge	2838.58 T	M/s Ardent Steel Limited, At/Po-Phuljhar, Via-Suakati, Dist-Keonjhar, Odisha

(ii) others : Not applicable

3. Quantity utilised in-house, if any:

SL	Physical form with description	Quantity (in Tonnes/KL)	Mode of utilization
1	Waste/Residue Containing Oil	24.036 T	Burnt in furnaces
2	Residue from Coke Oven by-product plant (BOD Plant Sludge)	1563.35 T	Internally reused in coke oven
3	Decanter tank sludge and tar sludge tank residue	1385 T	Internally reused in coke oven
4	Exhaust Air or Gas Cleaning Residue	34363.9 T	Reused in sinter plant

4. Quantity in storage at the end of the year – Only LD sludge being stored.

Date: 07.05.2021
Place: Meramandali

Signature of the Occupier or
Operator of the disposal facility

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Bhubaneswar - 751013, Odisha, INDIA

TEST REPORT

Ref. No. IMMT/CCD/05/2021 **Date: 21.05.2021**

Name & Address of the Party:	Tata Steel BSL Ltd. At-Narendrapur, P.O.-Kusupanga Via-Meramandali, Dist-Dhenkanal Pin-759121, Odisha.
Sample Details:	1. Indian Coal (01 No.) 2. Imported Coal (01 No.) 3. Iron Ore (01 No.) 4. Lime stone (01 No.)
Date of Receiving:	30.03.2021
Date(s) of Conducting Test:	05.04.2021
Date of Completion of Test:	12.05.2021

Method Adopted:
1. Proximate analysis of coal samples by classical methods.
2. Major and trace element analysis of coal, iron ore and lime stone samples through wet chemical route by gravimetric, nephelometric, AAS and ICP-OES techniques.
3. Coal samples were leached with distilled water at a solid:liquid ratio of 1:20 for fluoride analysis.

Detail Report: Following data tables are enclosed:

Table-1. Proximate analysis of coal samples.
Table-2. Chemical composition analysis of coal samples.
Table-3. Trace element analysis of coal samples.
Table-4. Chemical composition analysis of iron ore and lime stone samples.
Table-5. Trace element analysis of iron ore and lime stone samples.

21/05/2021
(J. Das)
Principal Technical Officer
Central Characterization Dept.

N.B.: The samples are not drawn by CSIR-IMMT. Liability if any for CSIR/IMMT arising in connection with the testing shall be subject to ceiling of amount received by the institute from the client. The report should not be interpreted in part.

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TEST REPORT

Ref. No. IMMT/CCD/05/2021 **Date: 21.05.2021**

Table-1. Proximate analysis of coal samples.

Sample ID	Moisture (%)	Volatile Matter (%)	Ash (%)	Fixed Carbon (%)
Indian coal	3.96	27.91	36.36	31.77
Imported coal	1.86	22.64	8.6	66.90

Table-2. Chemical composition analysis of coal samples.

Sl. No.	Component	Concentration in Test Samples, %	
		Indian Coal	Imported Coal
1	SiO_2	21.84	1.76
2	Al_2O_3	8.71	1.82
3	Fe_2O_3	0.59	0.42
4	TiO_2	0.95	0.24
5	MnO	0.003	0.007
6	CaO	0.17	0.89
7	MgO	0.03	0.24
8	Na_2O	1.78	0.28
9	K_2O	0.46	0.15
10	P_2O_5	0.05	0.03
11	SO_3	0.41	0.52
12	LOI	63.64	91.4

21/05/2021

(J. Das)
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Web site: www.immt.res.in

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Bhubaneswar - 751013, Odisha, INDIA

TEST REPORT

Ref. No. IMMT/CCD/05/2021 **Date: 21.05.2021**

Table-3. Trace element analysis of coal samples

Sl. No.	Parameters	Trace element concentrations in test samples		
		Unit	Indian coal	Imported coal
1	Pb	mg/kg	28.57	0.67
2	Cd	mg/kg	0.19	0.10
3	Cu	mg/kg	41.45	5.18
4	Ni	mg/kg	15.18	6.34
5	Co	mg/kg	27.74	10.93
6	Cr	mg/kg	72.36	22.91
7	Zn	mg/kg	11.42	5.64
8	Ag	mg/kg	0.68	0.32
9	Sb	mg/kg	7.27	0.86
10	Mo	mg/kg	4.17	0.21
11	V	mg/kg	74.26	4.63
12	Se	mg/kg	1.02	0.38
13	Ba	mg/kg	145.32	23.44
14	As	mg/kg	52.83	4.67
15	Hg	mg/kg	3.12	1.35
16	B	%	0.17	0.08
17	F^- in water leaching (1:20) solutions.	mg/L	0.06	0.05

21/05/2021

(J. Das)
Principal Technical Officer
Central Characterization Dept.

सीएसआईआर - खनिज एवं पदार्थ प्रौद्योगिकी संस्थान
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)
भुवनेश्वर-751013, ओडिशा, भारत
CSIR - INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY
(Council of Scientific & Industrial Research)
Bhubaneswar - 751013, Odisha, INDIA

TEST REPORT

Ref. No. IMMT/CCD/05/2021 **Date: 21.05.2021**

Table-4. Chemical composition analysis of iron ore and lime stone samples.

Sl. No.	Component	Concentration in Test Samples, %	
		Iron Ore	Lime Stone
1	SiO_2	2.18	1.74
2	Al_2O_3	1.21	1.32
3	Fe_2O_3	88.36	0.35
4	TiO_2	0.05	0.01
5	MnO	0.07	0.003
6	CaO	0.03	53.85
7	MgO	0.007	0.85
8	Na_2O	1.31	0.93
9	K_2O	0.69	0.25
10	P_2O_5	0.02	0.01
11	SO_3	0.05	0.09
12	LOI	0.91	38.52

21/05/2021

(J. Das)
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TEST REPORT

Ref. No. IMMT/CCD/05/2021 **Date: 21.05.2021**

Table-5. Trace element analysis of iron ore and lime stone samples.

Sl. No.	Parameters	Trace element concentrations in test samples		
		Unit	Iron Ore	Lime Stone
1	Pb	mg/kg	12.22	1.89
2	Cd	mg/kg	0.16	0.14
3	Cu	mg/kg	3.15	0.81
4	Ni	mg/kg	1.66	8.91
5	Co	mg/kg	25.6	24.4
6	Cr	mg/kg	34.0	5.88
7	Zn	mg/kg	13.4	5.15
8	Ag	mg/kg	0.53	0.48
9	Sb	mg/kg	1.02	0.41
10	Mo	mg/kg	0.21	0.42
11	V	mg/kg	7.23	2.69
12	Se	mg/kg	0.13	0.11
13	Ba	mg/kg	48.14	12.4
14	As	mg/kg	10.02	6.21
15	Hg	mg/kg	0.23	0.12
16	B	%	0.31	0.42

21/05/2021

(J. Das)
Principal Technical Officer
Central Characterization Dept.

SUMMARY OF AMBIENT AIR QUALITY
MONTHLY AVERAGE VALUES

Month	Pollutant	Standard	CAAQMS						
			# 01	# 02	# 03	# 04	# 05	# 06	# 07
April 2021	PM 10	100	66.52	170.35	197.04	95.10	75.81	87.45	145.22
	PM 2.5	60	17.62	47.89	34.72	16.81	52.81	24.71	42.46
	SO2	80	26.79	4.06	19.79	10.05	16.87	14.94	6.38
	NOx	80	14.69	9.41	61.47	19.65	22.32	37.53	32.75
	CO	2	0.22	0.85	0.30	0.32	0.58	0.57	0.47
May 2021	PM 10	100	47.19	106.18	153.82	65.81	83.70	83.76	91.26
	PM 2.5	60	20.86	27.12	27.41	17.44	39.15	35.09	27.82
	SO2	80	31.93	5.49	15.41	12.13	20.41	10.70	7.10
	NOx	80	15.26	9.31	34.73	23.73	14.14	27.29	32.62
	CO	2	1.42	0.84	1.61	2.96	0.56	0.51	0.47
June 2021	PM 10	100	52.71	94.68	90.30	67.16	83.79	62.34	89.89
	PM 2.5	60	21.26	26.96	22.22	15.99	23.27	23.74	25.00
	SO2	80	33.11	4.09	14.65	10.71	18.61	26.66	7.02
	NOx	80	15.39	9.38	20.90	20.12	26.06	23.63	32.74
	CO	2	0.58	0.80	0.30	0.32	0.71	0.84	0.45
July 2021	PM 10	100	31.72	61.32	55.08	44.67	55.65	63.67	78.42
	PM 2.5	60	21.61	16.21	20.62	15.18	16.86	20.18	16.95
	SO2	80	26.48	3.80	11.35	10.16	23.95	26.23	7.39
	NOx	80	14.98	9.44	32.55	21.70	22.22	21.50	32.61
	CO	2	0.37	0.76	0.30	0.32	0.94	0.63	0.48
August 2021	PM 10	100	26.07	59.49	80.60	54.76	57.59	UM	69.61
	PM 2.5	60	7.42	20.10	28.03	17.54	9.75		18.94
	SO2	80	19.23	12.53	9.16	13.85	8.94		7.80
	NOx	80	14.97	9.42	34.99	17.11	18.29		32.58
	CO	2	0.51	0.77	0.30	0.36	0.32		1.16
September 2021	PM 10	100	27.98	54.61	57.26	58.03	71.61	UM	35.61
	PM 2.5	60	6.74	16.82	23.43	16.47	12.25		11.73
	SO2	80	15.68	20.08	17.34	5.86	10.47		9.53
	NOx	80	14.87	9.44	67.02	3.55	22.67		32.67
	CO	2	0.60	0.76	0.30	0.42	0.32		0.51

CAAQMS 1: Near Township; CAAQMS 2: Near Utility Department; CAAQMS 3: Near CRM CAAQMS 4: Near Water Complex; CAAQMS 5: Near Coke Oven 2; CAAQMS 6: Near Wagon Tippler; CAAQMS 7: Near Material Gate, UM: Under Maintenance.

All values are in $\mu g/m^3$ and CO values are in mg/m^3. Values are derived from 24 hourly average data.

Annexure-X

SUMMARY OF WORK ZONE NOISE MONITORING

TATA STEEL LIMITED

PERIOD: From Apr to Sep,21

SL	Name of the unit	Location	Noise level in d B(A) at 3 mt. Range	Standard as per Factory Act 1950
1	AFBC 33 MW PP	Near ID fan-1 area	SD	
		Near PA fan area		
		Near SA fan area		
		Near Boiler area		
		Near Control area		
		Near Air Compressed House area		
		Near Cooling tower area		
		Near 77 TG area		
2	BF-1 STOCK HOUSE	Near ID fan area-1	85.6-87.9	
		Near ID fan area-2	85.3-88.3	
		Near Fines Building area	83.7-84.6	
3	BF-1 CAST HOUSE	Near ID fan-1 area	85.0-87.5	
		Near ID fan-2 area	84.8-87.3	
		Near ID fan-3 area	84.8-88.0	
		Near ID fan-4 area	84.6-85.8	
		Near Main Pump House area	83.9-87.9	
		Near furnace area	83.2-88.8	
		Near Secondary Cooling tower area	83.3-84.5	
4	SP-1	Near Main ID fan area	90.5-91.7	
		Near HT Control room area	83.5-85.6	
		Near Proportioning building area	83.5-85.0	
		Near Cooler fan area-1	84.1-87.2	
		Near Cooler fan area-2	84.2-85.2	
		Near Cooler fan area-3	84.3-87.5	
		Near Cooler fan area-4	85.2-86.9	
		Near 85m2 ESP IN D Fan area	84.8-86.2	
		Near 110m2 ESP ID fan area	84.4-87.2	
		Near Pump House Building area	82.5-84.4	
		Near bag filter ID fan area	84.3-85.9	
5	SP-2	Near Main ESP ID area	84.1-87.6	
		Near PD ESP ID fan area	83.8-86.0	
		Near Cooler fan area-1	85.2-88.0	
		Near Cooler fan area-2	84.4-87.9	
		Near Cooler fan area-3	83.3-87.5	
		Near M. N. D Area	83.4-84.3	

SL	Name of the unit	Location	Noise level in d B(A) at 3mtr	Standard as per Factory Act 1950
			Range	
6	SP-3	Near Main ESP ID area	85.1-88.0	
		Near PD ESP ID fan area	83.4-87.3	
		Near Cooler fan area-1	83.7-87.6	
		Near Cooler fan area-2	84.6-87.3	
		Near Cooler fan area-3	85.0-87.6	
		Near M. N. D Area	83.0-84.3	
7	HSM	Near COG Fan area-1	83.8-85.7	
		Near COG Fan area-2	84.7-87.6	
		Near RHF Office area	84.7-88.0	
		Near Recuperation Zone	83.2-85.0	
		Near Roughing Mill area	83.5-85.0	
		Near Roll Shot area	82.6-84.9	
		Near Roll Shop area	83.2-85.8	
		Near HSM Quality Lab area	83.0-86.8	
		Near B F G Motor fan RHF	83.4-84.0	
		Near Combustion fan area	83.3-91.2	
		Near Re-heating Furnace	83.8-87.6	
8	BOF	Near Secondary ID fan area-1	86.5-89.5	
		Near Secondary ID fan area-2	86.4-89.8	
		Near Secondary ID fan area-3	86.1-88.3	
		Near Secondary ID fan area-4	87.3-88.0	
		Near Cooling Tower area	86.0-87.8	
		Near Weigh bridge area	83.1-85.1	
		Near Primary ID Fan-1 area	83.4-85.8	
9	BF-2 (CH)	Near Motor I D fan-1 area	84.3-85.3	
		Near Motor I D fan-2 area	84.5-85.3	
		Near Motor I D fan-3 area	84.5-85.6	
		Near Cooling tower area	84.3-7.2	
		Near Fire Pump House	84.0-87.5	
		Near C F Fan area	83.8-88.8	

S.N	Name of the unit	Location87.0	Noise level in d B(A) at 3mtr Range	Standard as per Factory Act 1950
10	BF-2 (SH)	Near ID fan area-1	85.6-87.0	
		Near ID fan area-2	85.2-87.7	
		Near Control room Area	82.8-85.2	
11	OXYGEN PLANT-2	Near Nitrogen compressor House-1	103.7-109.7	
		Near Nitrogen compressor House-2	104.4-108.4	
		Near Nitrogen compressor House-3	105.2-109.8	
		Near Air compressor House area-1	103.0-111.2	
		Near Control room office	87.4-97.8	
		Near A C Package room	84.4-87.8	
		Near Argon cold box area	83.6-85.2	
		Near Turbine-1 area	84.8—87.4	
12	CRM	Near CRM mill Control room area	84.1-84.6	
		Near Air Receiver Tank	86.0-88.2	
		Near Fire water pump house	83.5-84.4	
		Near ETP area	86.5-88.4	
		Near JP-1 Coil yard area	84.2-87.4	
		Near JP-2 Coil yard area	85.2-86.6	
		Near JP-3 Coil yard area	84.8-87.0	
		Near Hot Generator Area	83.6-87.5	
13	CO-1	Near Coal Pushing ID fan area	68.6-87.7	
		Near Stone Cutter Building area	84.2-85.8	
		Near Battery-1 area	83.8-85.1	
		Near NHS ID Fan Area	83.4-85.4	
		Near Battery-2 area	83.5-85.7	
14	CO-2	Near Pusher car Emission control system I D Fan area	82.8-84.5	
		Near Guide car emission I D Fan 1/2 area	83.5-85.5	
		Near Exhauster house area	86.2-88.3	
		Near pushing emission control system ID Fan 1/2 area	82.7-87.6	
		Near Water pump house area	83.3-87.1	
		Near Chemical Dosing E.T.P room area	82.3-86.2	

S.N	Name of the unit	Location	Noise level in d B(A) at 3mtr Range	Standard as per Factory Act 1950
15	BFPP-1 (Boiler-1)	Near ID Fan Area-1	82.6-83.3	
		Near ID Fan Area-2	83.4-86.0	
		Near FD fan Area	85.5-88.0	
		Near Boiler Area	83.5-87.2	
	BFPP-1 (Boiler-2)	Near ID Fan Area-1	85.1-85.1	
		Near ID Fan Area-2	84.7-86.7	
		Near FD fan Area	88.6-90.6	
		Near Boiler Area	85.2-88.0	
	BFPP-1 (Boiler-3)	Near ID Fan Area-1	84.585.3	
		Near ID Fan Area-2	86.0-88.2	
		Near FD fan Area	87.6-90.7	
		Near Boiler Area	85.1-87.3	
16	BFPP-2 (Boiler-2)	Near ID Fan Area-1	83.6-87.7	
		Near ID Fan Area-2	82.4-84.1	
		Near PA fan Area	87.0-88.1	
		Near Boiler Area	88.1-88.2	
		Near SA Fan	84.0-85.2	
	BFPP-2 (Boiler-3)	Near ID Fan Area-1	82.2-84.8	
		Near ID Fan Area-2	83.7-85.2	
		Near PA fan Area	87.0-91.3	
		Near Boiler Area	85.1-89.5	
		Near SA Fan	84.5-90.1	
17	Lime Plant	Near De dusting-2 ID fan area	84.0-85.7	
		Near Blower room area	109.8-111.8	
		Near Cooling tower area	84.5-88.3	
		Near De dusting-3 ID fan area	83.3-84.4	
		Near Pump House area	85.6-89.5	
		Near Compressor building area	85.6-88.2	

S.N	Name of the unit	Location	Noise level in d B(A) at 3mtr	Standard as per Factory Act 1950
			Range	
18	WHRB-1	Near ID fan area	SD	
		Near Boiler area		
		Near Cooling tower area		
		Near De-dusting area		
19	WHRB-02	Near ID fan area	SD	
		Near Boiler area		
		Near Cooling tower area		
		Near De-dusting area		
20	WHRB-03	Near ID fan area	84.1-85.3	
		Near Boiler area	85.4-87.4	
		Near Cooling tower area	84.2-85.4	
		Near De-dusting area	84.7-88.0	
21	WHRB-04	Near ID fan area	84.5-86.3	
		Near Boiler area	85.4-88.1	
		Near Cooling tower area	84.1-86.0	
22	WHRB-05	Near ID fan area	83.5-85.0	
		Near Boiler area	85.0-88.2	
		Near Cooling tower area	84.8-86.1	
		Near De-dusting area	85.3-86.9	
23	WHRB-06	Near ID fan area	83.8-85.8	
		Near Boiler area	84.6-87.6	
		Near Cooling tower area	84.6-85.9	
		Near De-dusting area	84.7-85.4	
24	WHRB-07	Near ID fan area	83.7-85.0	
		Near Boiler area	83.9-86.8	
		Near cooling tower area	85.0-85.9	
		Near De-dusting area	85.0-86.0	
25	WHRB-08	Near ID fan area	83.6-84.9	
		Near Boiler area	83.6-86.0	
		Near Cooling tower area	83.5-86.1	
		Near De-dusting area	84.9-85.0	
26	WHRB-09	Near ID fan area	83.9-84.8	
		Near Boiler area	85.3-86.5	
		Near Cooling tower area	83.5-86.0	
27	WHRB-10	Near ID fan area	82.9-85.9	
		Near Boiler area	84.9-85.4	
		Near Cooling tower area	83.6-86.0	
		Near De-dusting area	84.8-85.8	
28	Gas fired Boiler 60 TPH	Near ID fan -1 area	83.1-84.2	
		Near ID fan -2 area	83.3-84.5	
		Near FD fan -1 area	83.6-85.1	
		Near FD fan -2 area	84.2-85.1	
		Near Boiler area	83.2-84.4	

S.N	Name of the unit	Location	Noise level in d B(A) at 3mtr Range	Standard as per Factory Act 1950
29	Gas fired Boiler 125 TPH	Near ID fan -1 area	84.9-87.9	
		Near ID fan -2 area	85.1-89.2	
		Near FD fan -1 area	85.4-88.7	
		Near FD fan -2 area	85.4-87.4	
		Near Boiler area	84.2-86.9	
30	Gas fired Boiler 250 TPH	Near ID fan -1/2 area	85.1-87.0	
		Near FD fan -1/2 area	84.5-87.5	
		Near Boiler area	85.2-85.0	
31	RMHS- 2 & 3 area	Near RMHS-3EP3-2Electrical building Area	81.2-86.6	
		Near RMHS -2 Yard No-4,5 Area	83.3-84.8	
		Near Yard No-2/3 Area	83.3-84.7	
		Near BB Plant site Office Area	83.6-84.9	
32	RMPP	Near Pump House Area	82.8-85.9	
		Near RMPP CSB-1 ID Fan area	84.2-86.8	
		Near RMPP CSB-2 ID Fan area	83.9-86.3	
33	Coal Washery	Near Hammer Mill Area	83.9-84.8	
		Near Flip Flop Screen Area	82.4-84.2	
		Near Silo Feeder Area	83.1-92.5	
34	SMS-2	Near Motor ID fan area-1 area	87.5-92.5	
		Near Motor ID fan area-2 area	86.4-91.3	
		Near Motor ID fan area-3 area	86.1-91.4	
		Near Motor ID fan area 4 area	87.3-92.4	
		Near Motor ID fan area 5 area	87.0-91.2	
		Near Control room area	84.2-87.4	

SUMMARY OF AMBIENT NOISE MONITORING

TATA STEEL LIMITED

Period: Apr to Sep'21

S.N	Location	Noise level in dB(A) Leq (Day time-Range)	Noise level in dB(A) Leq (Night time-Range)	Standard Day Time
1.	Colony	51.2-52.4	42.8-44.5	55
2.	Near Boundary (Sarapa)	53.1-57.2	47.2-53.4	75
3.	Near Cooling tower of AEL	54.9-57.3	50.8-53.2	75

Annexure-XI

CSR Expenditure and Activity highlights

S. No.	Theme	CSR expenditure in Lakhs (Apr to Sep'21)	Activity Highlights
1	Livelihood	97.64	• WEE Project : Socio-economic empowerment of women thro SHG enterprises (Training, Supporting & Linking for income generation activities both farm & non-farm) • Livelihood promotion thro Agriculture (Commercial Vegetable cultivation) and Allied (Fishery) Poultry, activities. • Construction/renovation of water bodies for livelihood resource creation.
2	Health & drinking Water	40.84	• Mobile Medical Unit • Drive to prevent vector born (Malaria/Dengue) diseases • Maternal health training, institution building and nutrition garden • Adolescents health programs: PRAYAS • Drinking water
3	Women Empowerment	-	
4	Sports, Culture & Community engagement	6.67	• Sports tournament & coaching, • Gymnasium development for youth club • Promotion of traditional culture
5	Education	37.34	• Education infrastructure, • Project QUEST through Aspire is the implementation partner.
6	Infrastructure	410.41	• Construction & repair of road • Solar Street light • Other community infrastructure & amenities
7	Disaster/Emergency response	753.86	• COVID Hospital, Relief work related to COVID • Natural disaster and other relief
	TOTAL	**1346.76**	

Note: Environment: plantation done in villages and school, saplings being provided by TSL Meramandali, Horticulture dept. So no expenditure