



FAMD/FAPG/ENV/95 /FY20

Date: 27/11/2019

To

The Chief Conservator of Forests (Central)
Eastern Regional Office
Ministry of Environment & Forests
Government of India
A/3, Chandrashekharpur,
Bhubaneswar - 751023, Odisha.

Sub: Half Yearly Compliance Report (April 2019 to September 2019) for Environmental Clearance to M/s Tata Steel Ltd. for 55,000 TPA High Carbon Ferro-Chrome Plant, at Gopalpur, Tehsil-Chhatrapur, District- Ganjam, Odisha.

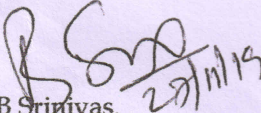
Dear Sir,

We are enclosing the Half Yearly Compliance Report for the period April 2019 to September 2019 for the conditions stipulated in Environmental Clearance to the above referred project vide MoEF's letter No. J-11011/55/2011-IA.II (I) dated 14th August 2012 and amended EC dated 08th August 2014 & letter No. 11-63/2012-IA.III dated 18th March 2013 respectively for your kind consideration. The copy of the compliance report is also being sent in the soft format to e-mail id for your kind perusal.

We wish to mention that all the necessary actions are being taken in compliance to the specific and general conditions of Environmental Clearance granted to the project.

We trust that the information furnished is in line with your requirement.

Thanking You,
Yours faithfully,
For TATA STEEL Ltd.,

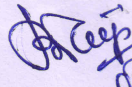

B Srinivas.
Factory Manager
Ferro Chrome Plant, Gopalpur
Tata Steel Limited

Encl. a/a

Copy to:

1. Member Secretary, State Pollution Control Board, Odisha, Bhubaneswar.
2. Member Secretary, Central Pollution Control Board, Kolkata;
3. Regional Officer, State Pollution Control Board, Berhampur.

Received.


03/12/19

M. Tanaji
Private Secretary
Govt of India
Ministry of Env., Forests & CC
EPO

TATA STEEL LIMITED

Project Gopalpur Gajapati Nagar Main lane Berhampur 760010 Dist. Ganjam odisha India

Tel +91 680 2290212 2290046

Registered Office Bombay House 24 Homi Mody Street Fort Mumbai 400 001

Tel 91 22 66658282 Fax 91 22 66657724

Corporate Identity Number L27100MH1907PLC000260 Website www.tatasteel.com

Half-Yearly Compliance Report (April 2019 to September 2019) of Environment Clearance
Vide letter No. J-11011/55/2011-IA-II(I) dated 14.08.2012 and amendment of EC dated 08.08.2014
from MoEF for 55,000 TPA High Carbon Ferro Chrome Plant at Tehsil Chhatrapur, Ganjam,
Odisha by TATA Steel Limited

Sl. No.	Specific Conditions	Compliance/Status
1	The proponent shall obtain necessary CRZ clearance under the provision of CRZ Notification, 2010	We have been granted CRZ Clearance under the provision of CRZ Notification, 2011 on 18.03.2013 vide letter no. F No. 11-63/2012-IA.III from MoEF & CC (IA Division).
2	No Charcoal shall be used as fuel. Pet Coal should be used as fuel instead of charcoal from unknown sources.	No Charcoal is used as fuel for plant operations.
3	Continuous monitoring facilities for all the stacks and sufficient air pollution control equipment viz. fume extraction system with bag filters, ID fan and stack of adequate height to submerged arc furnace shall be provided to control emission below 50 mg/Nm ³	<ul style="list-style-type: none"> • Continuous monitoring of SO_x, NO_x and SPM for process stack has been installed. • Fume Extraction System with bag filters and ID fan has been installed to control emission. • Adequate stack height is maintained in submerged arc furnace. • Dust extraction system also installed.
4	The National Ambient Air Quality Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16 th November 2009 shall be followed.	NAAQ Standards have been referred for air quality monitoring and is being complied.
5	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.	Water sprinkling on roads/operating areas is being carried out on a regular basis to control the fugitive emissions.
6	The total water requirement shall not exceed 5.5 MLD. 'Zero" effluent discharge shall be strictly followed and no wastewater should be discharged outside the premises.	The water requirement for 55,000 TPA of Ferro Chrome Plant is 2 MLD approx. The ETP and STP have been installed and no wastewater is discharged outside the premises.
7	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 should be met from other sources.	The water reservoir of 6.5 lakhs KL capacity is also used to store the rain water during the monsoon. Rain water post treatment is used to meet the water requirement.
8	Regular monitoring of influent and effluent surface, sub-surface and ground water shall be ensured and treated waste water shall 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 should also be regularly carried out and report submitted to the Ministry' Regional Office at Bhubaneswar, SPCB and CPCB.	<ul style="list-style-type: none"> • Surface water quality monitoring is being carried out regularly around the project site by third party registered and NABL accredited labs. • Upstream and downstream surface water is being carried out every month. Ground & Surface Water monitoring results is attached in Annexure-1.

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9	All the Ferro chrome slag shall be used for land filling inside the plant or used as building material only after passing through Toxic Chemical Leachability Potential (TCLP) Test. Otherwise, hazardous substances shall be recovered from the slag and output waste and be disposed in secured landfill as per CPCB guidelines.	Ferro Chrome Slag testing for Toxic Chemical Leachability Potential (TCLP) has been done from IMMT. No hazardous substances found. The same can be used for landfill in low lying areas inside our plant premise.
10	Risk and Disaster Management Plan along with the mitigation measures should be prepared and a copy submitted to the Ministry's Regional Office at Bhubaneswar, SPCB and CPCB within 3 months of issue of environment clearance letter.	Risk and Disaster Management Plan along with the mitigation measures have been submitted to the MoEF vide letter no. OP-Env/C-04/52/2012 dated 12.11.2012 along with a copy to Eastern Regional Office, MoEF and Odisha State Pollution Control Board, Bhubaneswar. Additionally, an onsite emergency plan approved by Directorate of Factories & Boilers is also in place.
11	All the commitments made to the public during the Public Hearing / Public Consultation meeting held on 20th September 2011 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.	Commitments made to the public during Public hearing is being regularly implemented and monitored by Tata Steel Rural Development Society (TSRDS) within the allocated budget.
12	As proposed green belt should be developed in at least 33% of the project area. Selection of plant species shall be as per the CPCB guidelines in consultation with the DFO.	33% green belt has been planned for development over a period of 5 years and is being taken up in phase wise manner. We are pending with only 7000 saplings to complete the target and the average survival rate is greater than 95%.
13	At least 5% of the total cost of the project should be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan should be prepared and submitted to the Ministry's Office at Bhubaneswar. Implementation of such program shall be ensured accordingly in a time bound manner.	<ul style="list-style-type: none"> Separate budget has been earmarked for the CSR activities, community as well as peripheral development activities such as Health, drinking water, Education, Environment etc. and is being done by our Tata Steel Rural Development Society wing. Around Rupees 1,69,78,472.20 have been spent towards the above-mentioned activities in FY 2019-20. (Refer Annexure-2)
14	The Company shall provide housing for construction labor within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	<ul style="list-style-type: none"> Necessary infrastructure & facilities for the construction labors have been provided within the site.

**Half-Yearly Compliance Report (April 2019 to September 2019) of Environment Clearance
Vide letter No. J-11011/55/2011-IA-II(I) dated 14.08.2012 and amendment of EC dated 08.08.2014
from MoEF for 55,000 TPA High Carbon Ferro Chrome Plant at Tehsil Chhatrapur, Ganjam,
Odisha by TATA Steel Limited**

15	The Company shall submit within three months their policy towards Corporate Environment Responsibility which should inter-alia address (i) Standard operating process / procedure to being into focus any infringement/deviation/violation of environmental or forest norms/conditions, (ii) Hierarchical system or administrative order of the Company to deal with environmental issues and ensuring compliance to environmental clearance conditions and (iii) System of reporting of noncompliance/violation environmental norms to the Board of Directors of the company and/or stakeholders or shareholders.	The Corporate Environment Policy is in place and has been submitted to the MoEF&CC vide letter no. OP-Env/C-04/52/2012 dated 12.11.2012 with a copy to Regional Office, OSPCB.
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Sl. No.	General Conditions	Compliance/Status
1	The project authorities must strictly adhere to the stipulations made by the Orissa State Pollution Control Board and the State Government.	Stipulations as made by the State & Central Govt. are being adhered to from time to time.
2	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.	Amendment to Environmental Clearance was granted by MoEF&CC vide File no. J-11011/55/2011-IA II(I) on 08.08.2014.
3	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 relevant parameters keeping in view the nature of the industry and its size and location.	The Process units have the gaseous emissions under control and below the prescribed limits.
4	At least four ambient air quality monitoring stations should 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.	Four ambient Air Quality & fugitive Emission monitoring stations installed. The ground level concentration of PM ₁₀ , SO ₂ and NOX etc. are as per the anticipation of SPCB. The Air Quality, Fugitive emission and Stack monitoring result is attached in Annexure-3 .
5	Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19 th May, 1993 and 31 st December 1993 or as amended from time to time. The treated wastewater shall be utilized for plantation purpose.	Industrial wastewater generated has been treated in Effluent Treatment Plant conforming to the standards and treated wastewater is recycled and re-used for green belt development, water sprinkling on roads, metal cooling activity etc.
6	The overall noise levels in and around the plant area shall be kept well within the standards (85dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).	Ambient Noise monitoring is continuously monitored. Plant area is maintained within the standards. Noise Quality monitoring results is attached in Annexure-4 .

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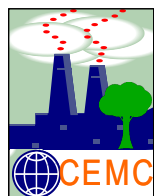
7	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Health Records of the workers are being maintained as per Factories Act. Pre-Employment Medical check-up prior to the issue of their gate pass to work inside the site and Periodic Medical Check-up for the workers is being done.
8	The company shall develop surface water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.	A water reservoir of 6.5 lakhs liter capacity is in place to store the rain water post monsoon which will be used for plant operation post requisite treatment.
9	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 programs, educational programs, drinking water supply and health care etc.	<ul style="list-style-type: none"> • Environmental Protection measures as indicated in the EIA and EMP report has been implemented. • Socio-economic developmental activities in Health, Education, Sports, agriculture, and infrastructure development are being carried out in the surrounding and periphery villages. 5 no. of Mobile Medical Units catering to the surrounding villages are in operation.
10	Requisite amount 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.	Separate budget has been earmarked towards capital and operating environment expenditure. Environment Annual Budget – Approx. Rs. 87,07,250/-
11	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 shall also be put on the web site of the company by the proponent.	<ul style="list-style-type: none"> • Environment Clearance copy has been submitted to the concerned Govt. /Private Bodies in Aug 2012. • Environment Clearance letter has been uploaded on the Tata Steel website, www.tatasteel.com

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12	<p>The project proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent the Regional Office of the MoEF at Bhubaneswar. The respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; PM₁₀, SO₂, 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.</p>	<ul style="list-style-type: none"> • Last six-monthly compliance reports have been uploaded to the company's website www.tatasteel.com. • Electronic multi-line display board was installed on 5th June 2014 which was displaying the results of the monitored data i.e. ambient air quality, noise level, and water quality at the main entrance of. However, it is malfunctioned. Replacement process is in progress. • The compliance reports are being sent to the Regional Office, MoEF and the respective zonal office of CPCB and SPCB.
13	<p>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, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry at Bhubaneswar/ CPCB/ SPCB shall monitor the stipulated conditions.</p>	<p>Last Six-Monthly Compliance report for the period Oct'2018 to Mar'2019 was submitted to MoEF/OSPCB Regional Office both in hard as well as soft copy in July 2019.</p>
14	<p>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 Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company alongwith 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.</p>	<p>The environmental statement has been submitted every year and the same has been uploaded on company's website www.tatasteel.com.</p>

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Odisha by TATA Steel Limited

15	<p>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.</p>	<p>Complied. Paper advertisement details are as follows;</p> <p>a. Odia: SAMBAD, Page No. 9 b. English: The New Indian Express, Page no. 5</p> <p>Advertisement details have been submitted to the MoEF Eastern Regional Office at Bhubaneswar on 19.08.12 and were also attached with the 1st Half Yearly Compliance Report.</p>
16	<p>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.</p>	<ul style="list-style-type: none"> • Project received final approval from Tata Steel Board in August 2010 and is being funded through internal accruals. • Ground leveling activities was started on 04.05.2013 and the same was being intimated to the board vide letter no PG-Env/C-01/03/2013 & PG-Env/C-01/04/2013, dated 10th May 2013. However, frequent strikes by the local people have deferred the plant operation.



CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD.

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Enlisted in Construction Industry Development Council (CIDC) established by the Planning Commission (Govt. of India)
MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report no. - CEMC/TSL/020519/W1

Issued Date-02.05.2019

DRINKING WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 11.04.2019
Sampling by : R.K Das
Date of Sample Received : 12.04.2019
Sample Description : Drinking Water
Sample Location : Bore Well (Back Side of Safety Office)
Date of Analysis : 12.04.2019 to 19.04.2019
Reference No. : CEMC-02052019W1

ANALYSIS RESULT

Sl. No	Parameter	Unit of measurement	Standard as per IS: 10500, 2012		Result
			Acceptable Limit	Permissible Limit	
1	Colour	Hazen	5	15	05
2	Odour	--	AL	AL	AL
3	Taste	--	AL	AL	AL
4	Turbidity	NTU	1	5	1.9
5	pH Value @ 25°C	--	6.5-8.5	No Relaxation	7.92
6	Total Hardness (as CaCO ₃)	mg/l	200	600	202
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.25
8	Chloride (as Cl)	mg/l	250	1000	197.3
9	Residual, free Chlorine	mg/l	0.2	1.0	ND
10	Total Dissolved Solids	mg/l	500	2000	1293
11	Calcium (as Ca)	mg/l	75	200	62.12
12	Magnesium (as Mg)	mg/l	30	100	11.42
13	Copper (as Cu)	mg/l	0.05	1.5	<0.03
14	Manganese (as Mn)	mg/l	0.1	0.3	<0.05
15	Sulphate (as SO ₄)	mg/l	200	400	75.6
16	Nitrate (as NO ₃)	mg/l	45	No Relaxation	3.5
17	Fluoride (as F)	mg/l	1.0	1.5	0.21
18	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001
19	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001
20	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.003
21	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.001
22	Arsenic (as As)	mg/l	0.01	0.05	<0.001
23	Cyanide (as CN)	mg/l	0.05	No Relaxation	ND
24	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01
25	Zinc (as Zn)	mg/l	5	15	<0.05
26	Chromium (as Cr)	mg/l	0.05	No Relaxation	<0.05
27	Mineral Oil	mg/l	0.5	No Relaxation	<0.05
28	Total Alkalinity (as CaCO ₃)	mg/l	200	600	528

Environmental Studies (EIA & EMP), Monitoring, Forest Diversion Planning, DPR, Wildlife Management Plan, Hazardous & Safety Studies, RS& GIS, Baseline Survey, Hydrological & Geological Studies, Socio-economic Studies, DGPS & ETS Survey.

Regd. Office: 1st Floor, N-5/305, IRC village, Nayapalli, Bhubaneswar-751015, Odisha, India, Mobile: 9861032826
E-mail- cemc_consultancy@yahoo.co.in, cemc122@gmail.com, website: www.cemc.in, Landline: 0674-2360344.

Laboratory At: Plot No. 800/1274, Johal, Pahal, Bhubaneswar-752101,
E-mail: cemclab@yahoo.in, Mobile: 9937631956, 8895177314



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Enlisted in Construction Industry Development Council (CIDC) established by the Planning Commission (Govt. of India)
MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

29	Aluminium (as Al)	mg/l	0.03	0.2	<0.01
30	Boron (as B)	mg/l	0.5	1.0	<0.2
31	Total Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent
32	Faecal Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent

NB: ND- Not Detectable, AL- Agreeable, MPN-Most Probable Number


Authorized Signatory



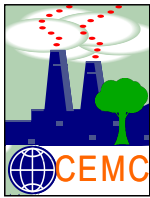
Notes:

- The results relate only to the sample tested.
- This Test Report shall not be reproduced wholly or in part without prior written consent of the laboratory.
- The samples received shall be destroyed after two weeks from the date of issue of the Test Report unless specified otherwise.
- This Test Report shall not be used in any advertising media or as evidence in the court of Law without prior written consent of the laboratory.

Environmental Studies (EIA & EMP), Monitoring, Forest Diversion Planning, DPR, Wildlife Management Plan, Hazardous & Safety Studies, RS& GIS, Baseline Survey, Hydrological & Geological Studies, Socio-economic Studies, DGPS & ETS Survey.

Regd. Office: 1st Floor, N-5/305, IRC village, Nayapalli, Bhubaneswar-751015, Odisha, India, Mobile: 9861032826
E-mail- cemc_consultancy@yahoo.co.in, cemc122@gmail.com, website: www.cemc.in, Landline: 0674-2360344.

Laboratory At: Plot No. 800/1274, Johal, Pahal, Bhubaneswar-752101,
E-mail: cemclab@yahoo.in, Mobile: 9937631956, 8895177314



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MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report no. - CEMC/TSL/020519/W2

Issued Date-02.05.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 11.04.2019
Sampling by : R.K Das
Date of Sample Received : 12.04.2019
Sample Description : Surface Water
Date of Analysis : 12.04.2019 to 19.04.2019
Reference No. : CEMC-02052019W2

ANALYSIS RESULT

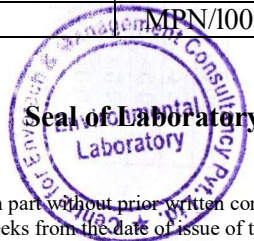
Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Reservoir
1	Colour, Max.	Hazen	300	5
2	pH Value @ 25°C	--	6.5 to 8.5	8.51
3	Iron as Fe, Max.	mg/l	50	0.25
4	Chloride as Cl, Max.	mg/l	600	26.3
5	Dissolved Solids, Max.	mg/l	1500	304.3
6	Dissolved Oxygen, Min.	mg/l	4	6.8
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.6
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	7.8
11	Nitrate as NO ₃ , Max.	mg/l	50	4.5
12	Fluoride as F, Max.	mg/l	1.5	0.15
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	210
23	Faecal Coliform	MPN/100ml	--	6.0

NB: ND- Not Detectable, MPN-Most Probable Number

Authorized Signatory

Notes:

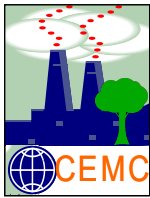
- > The results relate only to the sample tested.
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Report no. - CEMC/TSL/020519/W3

Issued Date-02.05.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 11.04.2019
Sampling by : R.K Das
Date of Sample Received : 12.04.2019
Sample Description : Surface Water
Date of Analysis : 12.04.2019 to 19.04.2019
Reference No. : CEMC-02052019W3

ANALYSIS RESULT

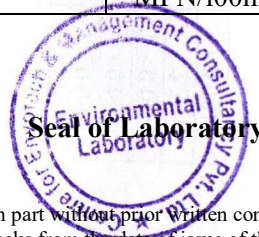
Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Up Stream
1	Colour, Max.	Hazen	300	6
2	pH Value @ 25°C	--	6.5 to 8.5	8.07
3	Iron as Fe, Max.	mg/l	50	0.31
4	Chloride as Cl, Max.	mg/l	600	29.3
5	Dissolved Solids, Max.	mg/l	1500	341.2
6	Dissolved Oxygen, Min.	mg/l	4	6.2
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.6
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	9.9
11	Nitrate as NO ₃ , Max.	mg/l	50	4.7
12	Fluoride as F, Max.	mg/l	1.5	0.12
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	410
23	Faecal Coliform	MPN/100ml	--	17

NB: ND- Not Detectable, MPN-Most Probable Number


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Notes:

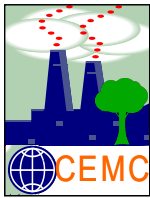
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Report no. - CEMC/TSL/020519/W4

Issued Date-02.05.2019

SURFACE WATER QUALITY TEST REPORT

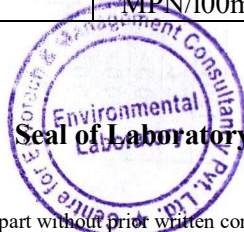
Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 11.04.2019
Sampling by : R.K Das
Date of Sample Received : 12.04.2019
Sample Description : Surface Water
Date of Analysis : 12.04.2019 to 19.04.2019
Reference No. : CEMC-02052019W4

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Down Stream
1	Colour, Max.	Hazen	300	6
2	pH Value @ 25°C	--	6.5 to 8.5	7.99
3	Iron as Fe, Max.	mg/l	50	0.32
4	Chloride as Cl, Max.	mg/l	600	29.9
5	Dissolved Solids, Max.	mg/l	1500	357.3
6	Dissolved Oxygen, Min.	mg/l	4	6.2
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.4
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	9.9
11	Nitrate as NO ₃ , Max.	mg/l	50	4.5
12	Fluoride as F, Max.	mg/l	1.5	0.12
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	410
23	Faecal Coliform	MPN/100ml	--	17

NB: ND- Not Detectable, MPN-Most Probable Number


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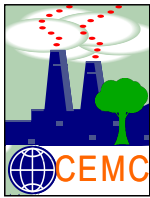
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Report no. - CEMC/TSL/030619/W1

Issued Date-03.06.2019

DRINKING WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 14.05.2019
Sampling by : R.K Das
Date of Sample Received : 15.05.2019
Sample Description : Drinking Water
Sample Location : Bore Well (Back Side of Safety Office)
Date of Analysis : 15.05.2019 to 23.05.2019
Reference No. : CEMC-03062019W1

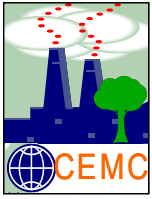
ANALYSIS RESULT

Sl. No	Parameter	Unit of measurement	Standard as per IS: 10500, 2012		Result
			Acceptable Limit	Permissible Limit	
1	Colour	Hazen	5	15	06
2	Odour	--	AL	AL	AL
3	Taste	--	AL	AL	AL
4	Turbidity	NTU	1	5	2.1
5	pH Value @ 25°C	--	6.5-8.5	No Relaxation	7.99
6	Total Hardness (as CaCO ₃)	mg/l	200	600	208
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.26
8	Chloride (as Cl)	mg/l	250	1000	201.9
9	Residual, free Chlorine	mg/l	0.2	1.0	ND
10	Total Dissolved Solids	mg/l	500	2000	1328
11	Calcium (as Ca)	mg/l	75	200	64.13
12	Magnesium (as Mg)	mg/l	30	100	11.66
13	Copper (as Cu)	mg/l	0.05	1.5	<0.03
14	Manganese (as Mn)	mg/l	0.1	0.3	<0.05
15	Sulphate (as SO ₄)	mg/l	200	400	78.2
16	Nitrate (as NO ₃)	mg/l	45	No Relaxation	3.7
17	Fluoride (as F)	mg/l	1.0	1.5	0.22
18	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001
19	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001
20	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.003
21	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.001
22	Arsenic (as As)	mg/l	0.01	0.05	<0.001
23	Cyanide (as CN)	mg/l	0.05	No Relaxation	ND
24	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01
25	Zinc (as Zn)	mg/l	5	15	<0.05
26	Chromium (as Cr)	mg/l	0.05	No Relaxation	<0.05
27	Mineral Oil	mg/l	0.5	No Relaxation	<0.05
28	Total Alkalinity (as CaCO ₃)	mg/l	200	600	536

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29	Aluminium (as Al)	mg/l	0.03	0.2	<0.01
30	Boron (as B)	mg/l	0.5	1.0	<0.2
31	Total Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent
32	Faecal Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent

NB: ND- Not Detectable, AL- Agreeable, MPN-Most Probable Number


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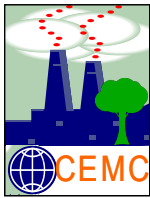
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Report no. - CEMC/TSL/030619/W2

Issued Date-03.06.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 14.05.2019
Sampling by : R.K Das
Date of Sample Received : 15.05.2019
Sample Description : Surface Water
Date of Analysis : 15.05.2019 to 23.05.2019
Reference No. : CEMC-03062019W2

ANALYSIS RESULT

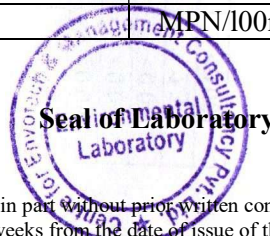
Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Reservoir
1	Colour, Max.	Hazen	300	10
2	pH Value @ 25°C	--	6.5 to 8.5	7.92
3	Iron as Fe, Max.	mg/l	0.5	0.28
4	Chloride as Cl, Max.	mg/l	600	24.2
5	Dissolved Solids, Max.	mg/l	1500	212.4
6	Dissolved Oxygen, Min.	mg/l	4	6.4
7	BOD for 3 days@ 27 ⁰ C, Max.	mg/l	3	2.9
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	6.2
11	Nitrate as NO ₃ , Max.	mg/l	50	4.8
12	Fluoride as F, Max.	mg/l	1.5	0.13
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	280
23	Faecal Coliform	MPN/100ml	--	22

NB: ND- Not Detectable, MPN-Most Probable Number

Authorized Signatory

Notes:

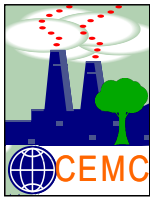
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Report no. - CEMC/TSL/030619/W3

Issued Date-03.06.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
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Date of Sampling : 14.05.2019
Sampling by : R.K Das
Date of Sample Received : 15.05.2019
Sample Description : Surface Water
Date of Analysis : 15.05.2019 to 23.05.2019
Reference No. : CEMC-03062019W3

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Up Stream
1	Colour, Max.	Hazen	300	10
2	pH Value @ 25°C	--	6.5 to 8.5	7.83
3	Iron as Fe, Max.	mg/l	50	0.32
4	Chloride as Cl, Max.	mg/l	600	21.9
5	Dissolved Solids, Max.	mg/l	1500	232.4
6	Dissolved Oxygen, Min.	mg/l	4	6.0
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.8
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	7.2
11	Nitrate as NO ₃ , Max.	mg/l	50	4.9
12	Fluoride as F, Max.	mg/l	1.5	0.11
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	540
23	Faecal Coliform	MPN/100ml	--	34

NB: ND- Not Detectable, MPN-Most Probable Number


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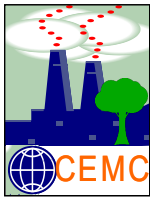
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Report no. - CEMC/TSL/030619/W4

Issued Date-03.06.2019

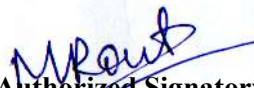
SURFACE WATER QUALITY TEST REPORT

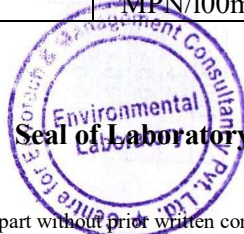
Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 14.05.2019
Sampling by : R.K Das
Date of Sample Received : 15.05.2019
Sample Description : Surface Water
Date of Analysis : 15.05.2019 to 23.05.2019
Reference No. : CEMC-03062019W4

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Down Stream
1	Colour, Max.	Hazen	300	10
2	pH Value @ 25°C	--	6.5 to 8.5	7.56
3	Iron as Fe, Max.	mg/l	50	0.34
4	Chloride as Cl, Max.	mg/l	600	22.6
5	Dissolved Solids, Max.	mg/l	1500	244.6
6	Dissolved Oxygen, Min.	mg/l	4	5.8
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.8
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	7.9
11	Nitrate as NO ₃ , Max.	mg/l	50	5.1
12	Fluoride as F, Max.	mg/l	1.5	0.11
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	480
23	Faecal Coliform	MPN/100ml	--	32

NB: ND- Not Detectable, MPN-Most Probable Number


Authorized Signatory



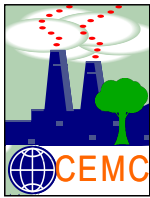
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Report no. - CEMC/TSL/010719/W1

Issued Date-01.07.2019

DRINKING WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 12.06.2019
Sampling by : R.K Das
Date of Sample Received : 13.06.2019
Sample Description : Drinking Water
Sample Location : Bore Well (Back Side of Safety Office)
Date of Analysis : 13.06.2019 to 18.06.2019
Reference No. : CEMC-01072019W1

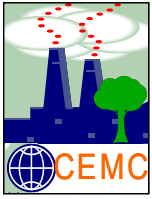
ANALYSIS RESULT

Sl. No	Parameter	Unit of measurement	Standard as per IS: 10500, 2012		Result
			Acceptable Limit	Permissible Limit	
1	Colour	Hazen	5	15	06
2	Odour	--	AL	AL	AL
3	Taste	--	AL	AL	AL
4	Turbidity	NTU	1	5	2.1
5	pH Value @ 25°C	--	6.5-8.5	No Relaxation	7.99
6	Total Hardness (as CaCO ₃)	mg/l	200	600	208
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.26
8	Chloride (as Cl)	mg/l	250	1000	201.9
9	Residual, free Chlorine	mg/l	0.2	1.0	ND
10	Total Dissolved Solids	mg/l	500	2000	1328
11	Calcium (as Ca)	mg/l	75	200	64.13
12	Magnesium (as Mg)	mg/l	30	100	11.66
13	Copper (as Cu)	mg/l	0.05	1.5	<0.03
14	Manganese (as Mn)	mg/l	0.1	0.3	<0.05
15	Sulphate (as SO ₄)	mg/l	200	400	78.2
16	Nitrate (as NO ₃)	mg/l	45	No Relaxation	3.7
17	Fluoride (as F)	mg/l	1.0	1.5	0.22
18	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001
19	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001
20	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.003
21	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.001
22	Arsenic (as As)	mg/l	0.01	0.05	<0.001
23	Cyanide (as CN)	mg/l	0.05	No Relaxation	ND
24	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01
25	Zinc (as Zn)	mg/l	5	15	<0.05
26	Chromium (as Cr)	mg/l	0.05	No Relaxation	<0.05
27	Mineral Oil	mg/l	0.5	No Relaxation	<0.05
28	Total Alkalinity (as CaCO ₃)	mg/l	200	600	536

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29	Aluminium (as Al)	mg/l	0.03	0.2	<0.01
30	Boron (as B)	mg/l	0.5	1.0	<0.2
31	Total Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent
32	Faecal Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent

NB: ND- Not Detectable, AL- Agreeable, MPN-Most Probable Number


Authorized Signatory

Notes.

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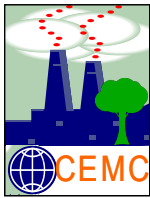


Seal of Laboratory

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Report no. - CEMC/TSL/010719/W2

Issued Date-01.07.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 12.06.2019
Sampling by : R.K Das
Date of Sample Received : 13.06.2019
Sample Description : Surface Water
Date of Analysis : 13.06.2019 to 18.06.2019
Reference No. : CEMC-01072019W2

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Reservoir
1	Colour, Max.	Hazen	300	80
2	pH Value @ 25°C	--	6.5 to 8.5	8.37
3	Iron as Fe, Max.	mg/l	0.5	0.31
4	Chloride as Cl, Max.	mg/l	600	24.6
5	Dissolved Solids, Max.	mg/l	1500	261.4
6	Dissolved Oxygen, Min.	mg/l	4	6.4
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.6
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	7.4
11	Nitrate as NO ₃ , Max.	mg/l	50	4.9
12	Fluoride as F, Max.	mg/l	1.5	0.13
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	240
23	Faecal Coliform	MPN/100ml	--	22

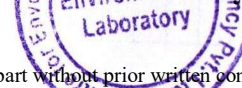
NB: ND- Not Detectable, MPN-Most Probable Number

Authorized Signatory

Notes:

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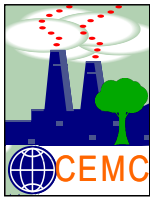
Seal of Laboratory



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Report no. - CEMC/TSL/010719/W3

Issued Date-01.07.2019

SURFACE WATER QUALITY TEST REPORT

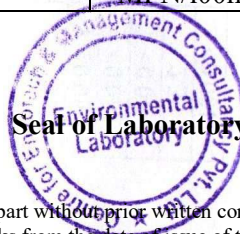
Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 12.06.2019
Sampling by : R.K Das
Date of Sample Received : 13.06.2019
Sample Description : Surface Water
Date of Analysis : 13.06.2019 to 18.06.2019
Reference No. : CEMC-01072019W3

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Up Stream
1	Colour, Max.	Hazen	300	8
2	pH Value @ 25°C	--	6.5 to 8.5	7.79
3	Iron as Fe, Max.	mg/l	50	0.32
4	Chloride as Cl, Max.	mg/l	600	22.3
5	Dissolved Solids, Max.	mg/l	1500	389.9
6	Dissolved Oxygen, Min.	mg/l	4	6.0
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.7
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	9.8
11	Nitrate as NO ₃ , Max.	mg/l	50	5.1
12	Fluoride as F, Max.	mg/l	1.5	0.11
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	540
23	Faecal Coliform	MPN/100ml	--	34

NB: ND- Not Detectable, MPN-Most Probable Number

Authorized Signatory



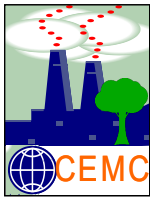
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Report no. - CEMC/TSL/010719/W4

Issued Date-01.07.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 12.06.2019
Sampling by : R.K Das
Date of Sample Received : 13.06.2019
Sample Description : Surface Water
Date of Analysis : 13.06.2019 to 18.06.2019
Reference No. : CEMC-01072019W4

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Down Stream
1	Colour, Max.	Hazen	300	9
2	pH Value @ 25°C	--	6.5 to 8.5	7.71
3	Iron as Fe, Max.	mg/l	50	0.34
4	Chloride as Cl, Max.	mg/l	600	22.9
5	Dissolved Solids, Max.	mg/l	1500	362.9
6	Dissolved Oxygen, Min.	mg/l	4	6.2
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.9
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	10.4
11	Nitrate as NO ₃ , Max.	mg/l	50	5.6
12	Fluoride as F, Max.	mg/l	1.5	0.12
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	480
23	Faecal Coliform	MPN/100ml	--	32

NB: ND- Not Detectable, MPN-Most Probable Number


Authorized Signatory



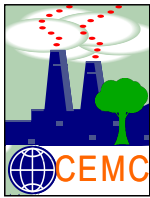
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Report no. - CEMC/TSL/040819/W1

Issued Date-04.08.2019

DRINKING WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 26.07.2019
Sampling by : R.K Das
Date of Sample Received : 27.07.2019
Sample Description : Drinking Water
Sample Location : Bore Well (Back Side of Safety Office)
Date of Analysis : 27.07.2019 to 03.08.2019
Reference No. : CEMC-04082019W1

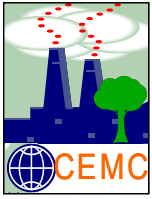
ANALYSIS RESULT

Sl. No	Parameter	Unit of measurement	Standard as per IS: 10500, 2012		Result
			Acceptable Limit	Permissible Limit	
1	Colour	Hazen	5	15	05
2	Odour	--	AL	AL	AL
3	Taste	--	AL	AL	AL
4	Turbidity	NTU	1	5	2.1
5	pH Value @ 25°C	--	6.5-8.5	No Relaxation	7.77
6	Total Hardness (as CaCO ₃)	mg/l	200	600	194
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.24
8	Chloride (as Cl)	mg/l	250	1000	190.9
9	Residual, free Chlorine	mg/l	0.2	1.0	ND
10	Total Dissolved Solids	mg/l	500	2000	1288
11	Calcium (as Ca)	mg/l	75	200	59.32
12	Magnesium (as Mg)	mg/l	30	100	11.18
13	Copper (as Cu)	mg/l	0.05	1.5	<0.03
14	Manganese (as Mn)	mg/l	0.1	0.3	<0.05
15	Sulphate (as SO ₄)	mg/l	200	400	70.2
16	Nitrate (as NO ₃)	mg/l	45	No Relaxation	3.0
17	Fluoride (as F)	mg/l	1.0	1.5	0.2
18	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001
19	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001
20	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.003
21	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.001
22	Arsenic (as As)	mg/l	0.01	0.05	<0.001
23	Cyanide (as CN)	mg/l	0.05	No Relaxation	ND
24	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01
25	Zinc (as Zn)	mg/l	5	15	<0.05
26	Chromium (as Cr)	mg/l	0.05	No Relaxation	<0.05
27	Mineral Oil	mg/l	0.5	No Relaxation	<0.05
28	Total Alkalinity (as CaCO ₃)	mg/l	200	600	490

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29	Aluminium (as Al)	mg/l	0.03	0.2	<0.01
30	Boron (as B)	mg/l	0.5	1.0	<0.2
31	Total Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent
32	Faecal Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent

NB: ND- Not Detectable, AL- Agreeable, MPN-Most Probable Number


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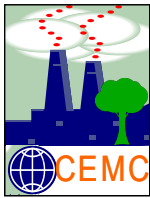


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Report no. - CEMC/TSL/040819/W2

IssueDate 04.08.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 26.07.2019
Sampling by : R.K Das
Date of Sample Received : 27.07.2019
Sample Description : Surface Water
Sample Location : Reservoir
Date of Analysis : 27.07.2019 to 03.08.2019
Reference No. : CEMC-04082019W2

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Reservoir
1	Colour, Max.	Hazen	300	50
2	pH Value @ 25°C	--	6.5 to 8.5	7.92
3	Iron as Fe, Max.	mg/l	0.5	0.3
4	Chloride as Cl, Max.	mg/l	600	20.9
5	Dissolved Solids, Max.	mg/l	1500	212.2
6	Dissolved Oxygen, Min.	mg/l	4	5.1
7	BOD for 3 days @ 27 ^o C, Max.	mg/l	3	2.3
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	6.4
11	Nitrate as NO ₃ , Max.	mg/l	50	3.9
12	Fluoride as F, Max.	mg/l	1.5	0.11
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	120
23	Faecal Coliform	MPN/100ml	--	22

NB: ND- Not Detectable, MPN-Most Probable Number

Authorized Signatory

Notes:

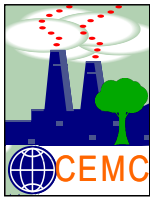
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Report no. - CEMC/TSL/040819/W3

IssueDate04.08.2019


SURFACE WATER QUALITY TEST REPORT

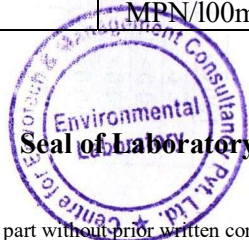
Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 26.07.2019
Sampling by : R.K Das
Date of Sample Received : 27.07.2019
Sample Description : Surface Water
Date of Analysis : 27.07.2019 to 03.08.2019
Reference No. : CEMC-04082019W3

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Up Stream
1	Colour, Max.	Hazen	300	40
2	pH Value @ 25°C	--	6.5 to 8.5	7.33
3	Iron as Fe, Max.	mg/l	50	0.34
4	Chloride as Cl, Max.	mg/l	600	17.9
5	Dissolved Solids, Max.	mg/l	1500	288.6
6	Dissolved Oxygen, Min.	mg/l	4	6.0
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.4
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	6.9
11	Nitrate as NO ₃ , Max.	mg/l	50	4.8
12	Fluoride as F, Max.	mg/l	1.5	0.11
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	350
23	Faecal Coliform	MPN/100ml	--	34

NB: ND- Not Detectable, MPN-Most Probable Number


Authorized Signatory



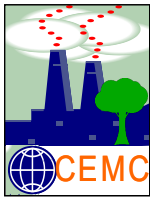
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Report no. - CEMC/TSL/040819/W4

IssueDate 04.08.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 26.07.2019
Sampling by : R.K Das
Date of Sample Received : 27.07.2019
Sample Description : Surface Water
Date of Analysis : 27.07.2019 to 03.08.2019
Reference No. : CEMC-04082019W4

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Down Stream
1	Colour, Max.	Hazen	300	45
2	pH Value @ 25°C	--	6.5 to 8.5	7.38
3	Iron as Fe, Max.	mg/l	50	0.35
4	Chloride as Cl, Max.	mg/l	600	18.9
5	Dissolved Solids, Max.	mg/l	1500	302.2
6	Dissolved Oxygen, Min.	mg/l	4	6.1
7	BOD for 3 days @ 27 ^o C, Max.	mg/l	3	2.6
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	7.2
11	Nitrate as NO ₃ , Max.	mg/l	50	5.1
12	Fluoride as F, Max.	mg/l	1.5	0.11
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	350
23	Faecal Coliform	MPN/100ml	--	40

NB: ND- Not Detectable, MPN-Most Probable Number


Authorized Signatory

Notes:

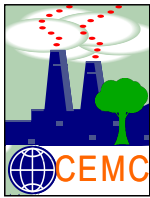
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Report no. - CEMC/TSL/040919/W1

Issued Date-04.09.2019

DRINKING WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 14.08.2019
Sampling by : R.K Das
Date of Sample Received : 16.08.2019
Sample Description : Drinking Water
Sample Location : Bore Well (Back Side of Safety Office)
Date of Analysis : 16.08.2019 to 26.08.2019
Reference No. : CEMC-04092019W1

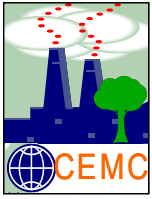
ANALYSIS RESULT

Sl. No	Parameter	Unit of measurement	Standard as per IS: 10500, 2012		Result
			Acceptable Limit	Permissible Limit	
1	Colour	Hazen	5	15	07
2	Odour	--	AL	AL	AL
3	Taste	--	AL	AL	AL
4	Turbidity	NTU	1	5	2.3
5	pH Value @ 25°C	--	6.5-8.5	No Relaxation	7.82
6	Total Hardness (as CaCO ₃)	mg/l	200	600	196
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.25
8	Chloride (as Cl)	mg/l	250	1000	192.9
9	Residual, free Chlorine	mg/l	0.2	1.0	ND
10	Total Dissolved Solids	mg/l	500	2000	1304
11	Calcium (as Ca)	mg/l	75	200	60.12
12	Magnesium (as Mg)	mg/l	30	100	11.18
13	Copper (as Cu)	mg/l	0.05	1.5	<0.03
14	Manganese (as Mn)	mg/l	0.1	0.3	<0.05
15	Sulphate (as SO ₄)	mg/l	200	400	72.1
16	Nitrate (as NO ₃)	mg/l	45	No Relaxation	3.2
17	Fluoride (as F)	mg/l	1.0	1.5	0.21
18	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001
19	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001
20	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.003
21	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.001
22	Arsenic (as As)	mg/l	0.01	0.05	<0.001
23	Cyanide (as CN)	mg/l	0.05	No Relaxation	ND
24	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01
25	Zinc (as Zn)	mg/l	5	15	<0.05
26	Chromium (as Cr)	mg/l	0.05	No Relaxation	<0.05
27	Mineral Oil	mg/l	0.5	No Relaxation	<0.05
28	Total Alkalinity (as CaCO ₃)	mg/l	200	600	502

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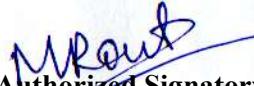


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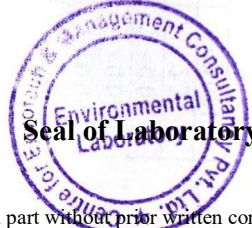
29	Aluminium (as Al)	mg/l	0.03	0.2	<0.01
30	Boron (as B)	mg/l	0.5	1.0	<0.2
31	Total Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent
32	Faecal Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent

NB: ND- Not Detectable, AL- Agreeable, MPN-Most Probable Number


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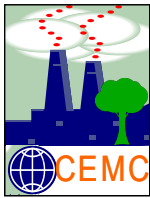


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Report no. - CEMC/TSL/040919/W2

IssueDate04.09.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 14.08.2019
Sampling by : R.K Das
Date of Sample Received : 16.08.2019
Sample Description : Surface Water
Sample Location : Reservoir
Date of Analysis : 16.08.2019 to 26.08.2019
Reference No. : CEMC-04092019W2

ANALYSIS RESULT

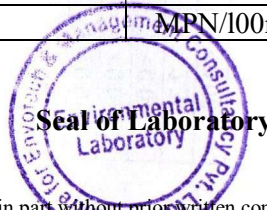
Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Reservoir
1	Colour, Max.	Hazen	300	70
2	pH Value @ 25°C	--	6.5 to 8.5	8.06
3	Iron as Fe, Max.	mg/l	0.5	0.32
4	Chloride as Cl, Max.	mg/l	600	21.9
5	Dissolved Solids, Max.	mg/l	1500	221.4
6	Dissolved Oxygen, Min.	mg/l	4	4.8
7	BOD for 3 days@ 27 ⁰ C, Max.	mg/l	3	2.2
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	6.8
11	Nitrate as NO ₃ , Max.	mg/l	50	4.1
12	Fluoride as F, Max.	mg/l	1.5	0.11
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	170
23	Faecal Coliform	MPN/100ml	--	15

NB: ND- Not Detectable, MPN-Most Probable Number

Authorized Signatory

Notes:

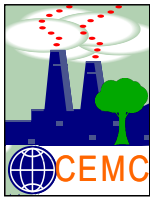
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Report no. - CEMC/TSL/040919/W3

IssueDate04.09.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 14.08.2019
Sampling by : R.K Das
Date of Sample Received : 16.08.2019
Sample Description : Surface Water
Date of Analysis : 16.08.2019 to 26.08.2019
Reference No. : CEMC-04092019W3

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Up Stream
1	Colour, Max.	Hazen	300	45
2	pH Value @ 25°C	--	6.5 to 8.5	7.26
3	Iron as Fe, Max.	mg/l	50	0.36
4	Chloride as Cl, Max.	mg/l	600	19.9
5	Dissolved Solids, Max.	mg/l	1500	322.2
6	Dissolved Oxygen, Min.	mg/l	4	6.2
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.6
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	7.1
11	Nitrate as NO ₃ , Max.	mg/l	50	5.0
12	Fluoride as F, Max.	mg/l	1.5	0.11
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	350
23	Faecal Coliform	MPN/100ml	--	26

NB: ND- Not Detectable, MPN-Most Probable Number


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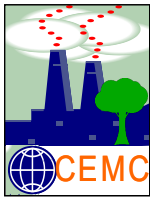
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Report no. - CEMC/TSL/040919/W4

IssueDate 04.09.2019

SURFACE WATER QUALITY TEST REPORT

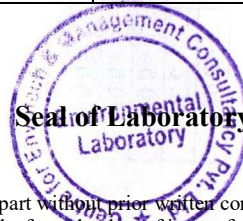
Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 14.08.2019
Sampling by : R.K Das
Date of Sample Received : 16.08.2019
Sample Description : Surface Water
Date of Analysis : 16.08.2019 to 26.08.2019
Reference No. : CEMC-04092019W4

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Down Stream
1	Colour, Max.	Hazen	300	40
2	pH Value @ 25°C	--	6.5 to 8.5	7.32
3	Iron as Fe, Max.	mg/l	50	0.36
4	Chloride as Cl, Max.	mg/l	600	20.6
5	Dissolved Solids, Max.	mg/l	1500	331.8
6	Dissolved Oxygen, Min.	mg/l	4	6.0
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.6
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	7.8
11	Nitrate as NO ₃ , Max.	mg/l	50	5.3
12	Fluoride as F, Max.	mg/l	1.5	0.11
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	350
23	Faecal Coliform	MPN/100ml	--	26

NB: ND- Not Detectable, MPN-Most Probable Number


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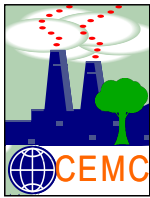
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Report no. - CEMC/TSL/011019/W1

Issued Date-01.10.2019

DRINKING WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 18.09.2019
Sampling by : R.K Das
Date of Sample Received : 19.09.2019
Sample Description : Drinking Water
Sample Location : Bore Well (Back Side of Safety Office)
Date of Analysis : 19.09.2019 to 26.09.2019
Reference No. : CEMC-01102019W1

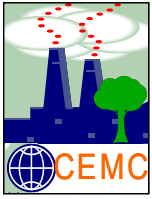
ANALYSIS RESULT

Sl. No	Parameter	Unit of measurement	Standard as per IS: 10500, 2012		Result
			Acceptable Limit	Permissible Limit	
1	Colour	Hazen	5	15	05
2	Odour	--	AL	AL	AL
3	Taste	--	AL	AL	AL
4	Turbidity	NTU	1	5	2.2
5	pH Value @ 25°C	--	6.5-8.5	No Relaxation	7.73
6	Total Hardness (as CaCO ₃)	mg/l	200	600	208
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.26
8	Chloride (as Cl)	mg/l	250	1000	201.9
9	Residual, free Chlorine	mg/l	0.2	1.0	ND
10	Total Dissolved Solids	mg/l	500	2000	1328
11	Calcium (as Ca)	mg/l	75	200	64.13
12	Magnesium (as Mg)	mg/l	30	100	11.66
13	Copper (as Cu)	mg/l	0.05	1.5	<0.03
14	Manganese (as Mn)	mg/l	0.1	0.3	<0.05
15	Sulphate (as SO ₄)	mg/l	200	400	78.2
16	Nitrate (as NO ₃)	mg/l	45	No Relaxation	3.7
17	Fluoride (as F)	mg/l	1.0	1.5	0.22
18	Phenolic Compounds (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001
19	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001
20	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.003
21	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.001
22	Arsenic (as As)	mg/l	0.01	0.05	<0.001
23	Cyanide (as CN)	mg/l	0.05	No Relaxation	ND
24	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01
25	Zinc (as Zn)	mg/l	5	15	<0.05
26	Chromium (as Cr)	mg/l	0.05	No Relaxation	<0.05
27	Mineral Oil	mg/l	0.5	No Relaxation	<0.05
28	Total Alkalinity (as CaCO ₃)	mg/l	200	600	536

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29	Aluminium (as Al)	mg/l	0.03	0.2	<0.01
30	Boron (as B)	mg/l	0.5	1.0	<0.2
31	Total Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent
32	Faecal Coliform	MPN/100 ml	Absent in 100 mL Sample	Absent	Absent

NB: ND- Not Detectable, AL- Agreeable, MPN-Most Probable Number


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Notes:

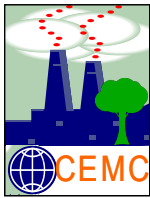
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Report no. - CEMC/TSL/011019/W2

IssueDate-01.10.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 18.09.2019
Sampling by : R.K Das
Date of Sample Received : 19.09.2019
Sample Description : Surface Water
Sample Location : Reservoir
Date of Analysis : 19.09.2019 to 26.09.2019
Reference No. : CEMC-01102019W2

ANALYSIS RESULT

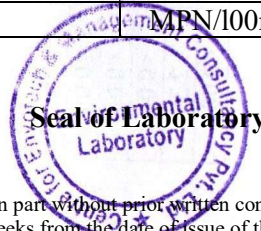
Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Reservoir
1	Colour, Max.	Hazen	300	42
2	pH Value @ 25°C	--	6.5 to 8.5	7.81
3	Iron as Fe, Max.	mg/l	0.5	0.33
4	Chloride as Cl, Max.	mg/l	600	12.9
5	Dissolved Solids, Max.	mg/l	1500	170.8
6	Dissolved Oxygen, Min.	mg/l	4	6.8
7	BOD for 3 days@ 27 ⁰ C, Max.	mg/l	3	2.2
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	5.2
11	Nitrate as NO ₃ , Max.	mg/l	50	3.8
12	Fluoride as F, Max.	mg/l	1.5	0.09
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	170
23	Faecal Coliform	MPN/100ml	--	14

NB: ND- Not Detectable, MPN-Most Probable Number

Authorized Signatory

Notes:

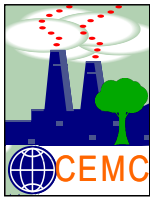
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Report no. - CEMC/TSL/011019/W3

Issued Date-01.10.2019

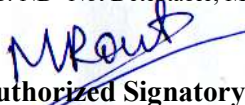
SURFACE WATER QUALITY TEST REPORT

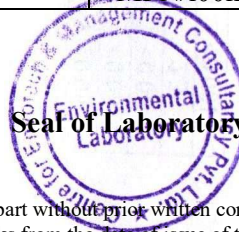
Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
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Date of Sampling : 18.09.2019
Sampling by : R.K Das
Date of Sample Received : 19.09.2019
Sample Description : Surface Water
Date of Analysis : 19.09.2019 to 26.09.2019
Reference No. : CEMC-01102019W3

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Up Stream
1	Colour, Max.	Hazen	300	57
2	pH Value @ 25°C	--	6.5 to 8.5	7.61
3	Iron as Fe, Max.	mg/l	50	0.34
4	Chloride as Cl, Max.	mg/l	600	21.9
5	Dissolved Solids, Max.	mg/l	1500	360.2
6	Dissolved Oxygen, Min.	mg/l	4	5.8
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.8
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	7.4
11	Nitrate as NO ₃ , Max.	mg/l	50	5.3
12	Fluoride as F, Max.	mg/l	1.5	0.11
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
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17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	540
23	Faecal Coliform	MPN/100ml	--	34

NB: ND- Not Detectable, MPN-Most Probable Number


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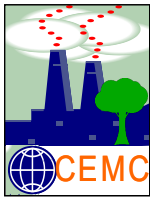
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Report no. - CEMC/TSL/011019/W4

Issued Date-01.10.2019

SURFACE WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. TATA Steel Ltd, (Ferro Alloys Plant),
Gopalpur
Date of Sampling : 18.09.2019
Sampling by : R.K Das
Date of Sample Received : 19.09.2019
Sample Description : Surface Water
Date of Analysis : 19.09.2019 to 26.09.2019
Reference No. : CEMC-01102019W4

ANALYSIS RESULT

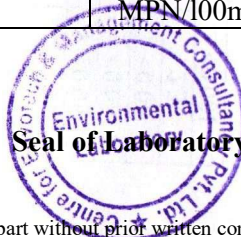
Sl. No.	Test Parameters	Unit	Max. Tolerance Limit as per IS 2296 : Class C	Khori Nala Down Stream
1	Colour, Max.	Hazen	300	58
2	pH Value @ 25°C	--	6.5 to 8.5	7.62
3	Iron as Fe, Max.	mg/l	50	0.36
4	Chloride as Cl, Max.	mg/l	600	22.6
5	Dissolved Solids, Max.	mg/l	1500	371.4
6	Dissolved Oxygen, Min.	mg/l	4	6.0
7	BOD for 3 days@ 27 ^o C, Max.	mg/l	3	2.8
8	Oil & Grease, Max.	mg/l	0.1	ND
9	Copper as Cu, Max.	mg/l	1.5	<0.03
10	Sulphate as SO ₄ , Max.	mg/l	400	8.2
11	Nitrate as NO ₃ , Max.	mg/l	50	5.7
12	Fluoride as F, Max.	mg/l	1.5	0.11
13	Anionic detergent	mg/l	1	ND
14	Cadmium as Cd, Max.	mg/l	0.01	<0.003
15	Selenium as Se, Max.	mg/l	0.05	<0.001
16	Arsenic as As, Max.	mg/l	0.2	<0.001
17	Cyanide as CN, Max.	mg/l	0.05	ND
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	0.005	ND
19	Lead as Pb, Max.	mg/l	0.1	<0.01
20	Zinc as Zn, Max.	mg/l	15	<0.05
21	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	0.05	<0.05
22	Total Coliform, Max.	MPN/100ml	5000	480
23	Faecal Coliform	MPN/100ml	--	34

NB: ND- Not Detectable, MPN-Most Probable Number


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Notes:

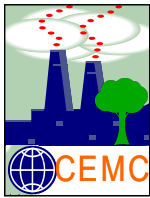
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MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report no.-CEMC/TSL/020519/A1

Issued Date-02.05.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0900 to 0900 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	LBSS Building
Average Flow Rate of SPM (m ³ /min)/ Gases (lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-02052019A1
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
01.04.2019	65.6	36.2	9.7	13.4	0.4	--	--	--	--	--	--	--
04.04.2019	66.8	37.5	9.8	13.7	0.5	--	--	--	--	--	--	--
08.04.2019	67.1	37.8	9.9	13.9	0.5	--	--	--	--	--	--	--
11.04.2019	63.9	36.1	9.5	13.6	0.4	<20	<10	<0.1	<0.6	<0.44	<5	<1
15.04.2019	66.3	37.4	9.8	13.5	0.5	--	--	--	--	--	--	--
18.04.2019	65.7	36.8	9.7	13.7	0.5	--	--	--	--	--	--	--
22.04.2019	66.5	37.3	9.8	13.8	0.5	--	--	--	--	--	--	--
25.04.2019	66.2	36.9	9.4	13.3	0.4	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part- 23)	Gravimetric Method as per CPCB method	IS: 5182 (Part- 2)	IS: 5182 (Part- 6)	IS: 5182 (Part- 10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part- 9)	IS: 5182 (Part- 22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part- 11)	IS: 5182 (Part- 12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Govt. Notification.

END OF REPORT


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Notes:

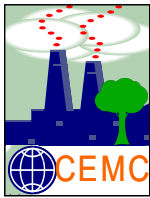
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Report no.-CEMC/TSL/020519/A2

Issued Date-02.05.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	MRSS Building
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-02052019A2
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NOx (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
01.04.2019	65.8	36.7	9.8	13.6	0.5	--	--	--	--	--	--	--
04.04.2019	67.3	37.2	9.9	13.8	0.6	--	--	--	--	--	--	--
08.04.2019	66.7	36.9	9.7	13.9	0.5	--	--	--	--	--	--	--
11.04.2019	65.6	36.5	9.6	13.4	0.4	<20	<10	<0.1	<0.6	<0.44	<5	<1
15.04.2019	66.3	36.8	9.8	13.7	0.5	--	--	--	--	--	--	--
18.04.2019	67.2	37.1	9.9	13.4	0.6	--	--	--	--	--	--	--
22.04.2019	65.4	36.3	9.4	13.5	0.5	--	--	--	--	--	--	--
25.04.2019	67.9	37.4	10.2	13.9	0.6	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009, Govt. Notification.

END OF REPORT


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Notes:

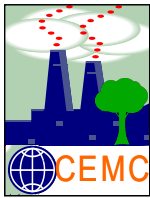
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Report no.-CEMC/TSL/020519/A3

Issued Date-02.05.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	Canteen
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-02052019A3
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Dte	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
01.04.2019	62.6	35.7	9.5	13.4	0.4	--	--	--	--	--	--	--
04.04.2019	64.3	36.2	9.7	13.6	0.5	--	--	--	--	--	--	--
08.04.2019	61.7	35.3	9.4	13.2	0.4	--	--	--	--	--	--	--
11.04.2019	64.9	36.4	9.6	13.5	0.5	<20	<10	<0.1	<0.6	<0.44	<5	<1
15.04.2019	63.4	36.1	9.8	13.4	0.4	--	--	--	--	--	--	--
18.04.2019	65.1	36.8	9.9	13.7	0.5	--	--	--	--	--	--	--
22.04.2019	62.8	35.9	9.5	13.3	0.4	--	--	--	--	--	--	--
25.04.2019	65.7	37.2	9.9	13.8	0.5	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Gairr. Notification.

END OF REPORT


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Seal of Laboratory

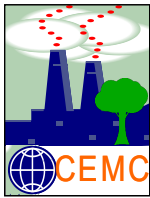
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Report no.-CEMC/TSL/020519/A4

Issued Date-02.05.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	ETP Building
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-02052019A4
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
01.04.2019	66.3	36.2	9.4	13.5	0.5	--	--	--	--	--	--	--
04.04.2019	67.5	36.9	9.8	13.7	0.6	--	--	--	--	--	--	--
08.04.2019	65.7	35.9	9.2	13.4	0.4	--	--	--	--	--	--	--
11.04.2019	67.4	36.8	9.7	13.8	0.6	<20	<10	<0.1	<0.6	<0.44	<5	<1
15.04.2019	66.1	36.0	9.3	13.3	0.5	--	--	--	--	--	--	--
18.04.2019	68.2	37.3	9.5	13.6	0.5	--	--	--	--	--	--	--
22.04.2019	65.9	36.1	9.6	13.2	0.4	--	--	--	--	--	--	--
25.04.2019	68.6	37.5	9.8	13.9	0.6	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Govt. Notification.

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Report no.-CEMC/TSL/020519/F1

Issued Date-02.05.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	RMHS
Instrument Used	Respirable Dust Sample
Date of Sampling	11.04.2019
Date of Receiving	12.04.2019
Date of Testing	12.04.2019 to 20.04.2019
Reference No.	CEMC-02052019F1

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	RMHS (Raw Material Handling Site)	1289.2
Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF		2000
Unit		µg/m³
Testing Method		Gravimetric

END OF REPORT


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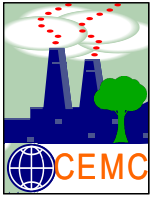
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Report no.-CEMC/TSL/020519/F2

Issued Date-02.05.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	FPHS
Instrument Used	Respirable Dust Sample
Date of Sampling	11.04.2019
Date of Receiving	12.04.2019
Date of Testing	12.04.2019 to 20.04.2019
Reference No.	CEMC-02052019F2

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	FPHS (Fine Product Handling Site)	1263.5
<i>Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF</i>		2000
<i>Unit</i>		µg/m³
<i>Testing Method</i>		Gravimetric

END OF REPORT


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Notes:

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Report no.-CEMC/TSL/020519/F3

Issued Date-02.05.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	I-Bin Building
Instrument Used	Respirable Dust Sample
Date of Sampling	11.04.2019
Date of Receiving	12.04.2019
Date of Testing	12.04.2019 to 20.04.2019
Reference No.	CEMC-02052019F3

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	I-Bin Building	1141.4
<i>Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF</i>		2000
<i>Unit</i>		µg/m³
<i>Testing Method</i>		Gravimetric

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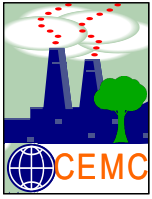


Seal of Laboratory

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Report no. - CEMC/TSL/020519/St

Issued Date-02.05.2019

STACK EMISSION MONITORING TEST REPORT

Name & Address of the Client	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Reference No.	CEMC-02052019St
Nature of Sampling	Source Emission
Sampling By	R.K Das
Instrument Used	Stack monitoring kit, Flue gas Analyzer
Sampling Date	11.04.2019
Stack Connected To	GCP Bag Filter
Job Code Allotted	CEMC/18-19/St

ANALYSIS RESULT

Sl. No	Items	Result	Testing Method
01	Flue Gas Temp. in K	319.2	--
02	Average flue gas Velocity in m/sec	7.77	IS: 11255 (Part 3)
03	Differential Pressure in mmH ₂ O	4.73	Wet dry bulb
04	Particulate Matter (PM) in mg/Nm ³	37.2	IS: 11255 (Part 1)
05	Carbon Dioxide (CO ₂) in %	1.3	Flue Gas Analyzer
06	Oxygen (O ₂) in %	19.1	Flue Gas Analyzer
07	Sulphur Dioxide (SO ₂) in mg/Nm ³	0	IS: 11255 (Part 2)
08	Nitrogen Oxide (NO _x) in mg/Nm ³	0	IS: 11255 (Part 7)
09	Carbon Monoxide (CO) in mg/Nm ³	42	Flue Gas Analyzer

End of Report


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Notes:

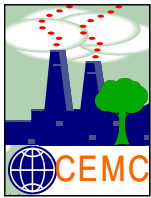
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Report no.-CEMC/TSL/030619/A1

Issued Date-03.06.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT


Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0900 to 0900 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	LBSS Building
Average Flow Rate of SPM (m ³ /min)/ Gases (lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-03062019A1
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
01.05.2019	66.3	36.7	9.9	13.8	0.5	--	--	--	--	--	--	--
07.05.2019	48.6	29.5	8.7	12.1	0.3	--	--	--	--	--	--	--
10.05.2019	51.8	32.4	9.1	12.9	0.4	--	--	--	--	--	--	--
13.05.2019	58.4	33.2	9.4	13.2	0.4	<20	<10	<0.1	<0.6	<0.44	<5	<1
16.05.2019	62.5	34.9	9.7	13.4	0.5	--	--	--	--	--	--	--
20.05.2019	65.9	36.3	9.8	13.7	0.5	--	--	--	--	--	--	--
23.05.2019	66.7	36.8	10.1	13.9	0.5	--	--	--	--	--	--	--
28.05.2019	64.1	36.1	9.3	13.5	0.4	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Govt. Notification.

END OF REPORT


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Notes:

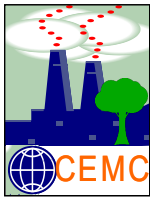
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Report no.-CEMC/TSL/030619/A2

Issued Date-03.06.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	MRSS Building
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-03062019A2
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NOx (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
01.05.2019	64.9	36.3	9.9	13.7	0.6	--	--	--	--	--	--	--
07.05.2019	49.2	30.4	8.7	12.2	0.4	--	--	--	--	--	--	--
10.05.2019	52.7	30.9	9.0	12.9	0.5	--	--	--	--	--	--	--
13.05.2019	57.6	32.7	9.4	13.1	0.5	<20	<10	<0.1	<0.6	<0.44	<5	<1
16.05.2019	61.4	35.6	9.7	13.4	0.5	--	--	--	--	--	--	--
20.05.2019	64.5	36.2	9.9	13.7	0.5	--	--	--	--	--	--	--
23.05.2019	66.3	37.5	10.1	13.8	0.6	--	--	--	--	--	--	--
28.05.2019	63.8	35.8	9.8	13.5	0.5	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009, Govt. Notification.

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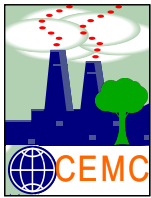
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Report no.-CEMC/TSL/030619/A3

Issued Date-03.06.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	Canteen
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-03062019A3
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Dte	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
01.05.2019	63.4	35.1	9.2	13.5	0.5	--	--	--	--	--	--	--
07.05.2019	49.6	30.2	8.7	12.1	0.3	--	--	--	--	--	--	--
10.05.2019	52.3	31.6	9.1	12.7	0.4	--	--	--	--	--	--	--
13.05.2019	59.2	33.4	9.0	13.2	0.5	<20	<10	<0.1	<0.6	<0.44	<5	<1
16.05.2019	62.8	34.7	9.6	13.5	0.5	--	--	--	--	--	--	--
20.05.2019	64.9	35.9	9.8	13.7	0.5	--	--	--	--	--	--	--
23.05.2019	63.5	35.0	9.3	13.3	0.4	--	--	--	--	--	--	--
28.05.2019	65.2	36.3	9.9	13.8	0.5	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part- 23)	Gravimetric Method as per CPCB method	IS: 5182 (Part- 2)	IS: 5182 (Part- 6)	IS: 5182 (Part- 10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part- 9)	IS: 5182 (Part- 22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part- 11)	IS: 5182 (Part- 12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Gatt. Notification.


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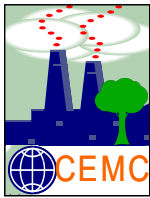

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Report no.-CEMC/TSL/030619/A4

Issued Date-03.06.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	ETP Building
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-03062019A4
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
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07.05.2019	48.5	29.6	8.8	12.4	0.4	--	--	--	--	--	--	--
10.05.2019	51.3	30.9	9.1	12.9	0.4	--	--	--	--	--	--	--
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16.05.2019	64.8	35.2	9.7	13.8	0.5	--	--	--	--	--	--	--
20.05.2019	63.6	35.0	9.5	13.5	0.5	--	--	--	--	--	--	--
23.05.2019	66.1	36.3	9.9	13.9	0.6	--	--	--	--	--	--	--
28.05.2019	65.4	35.8	9.8	13.7	0.5	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Govt. Notification.

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Notes:

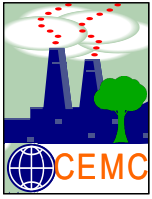
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Laboratory At: Plot No. 800/1274, Johal, Pahal, Bhubaneswar-752101,
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Report no.-CEMC/TSL/030619/F1

Issued Date-03.06.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	RMHS
Instrument Used	Respirable Dust Sample
Date of Sampling	28.05.2019
Date of Receiving	29.05.2019
Date of Testing	29.05.2019 to 31.05.2019
Reference No.	CEMC-03062019F1

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	RMHS (Raw Material Handling Site)	1174.9
Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF		2000
Unit		µg/m³
Testing Method		Gravimetric

END OF REPORT


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Notes:

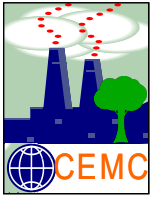
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Report no.-CEMC/TSL/030619/F2

Issued Date-03.06.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	FPHS
Instrument Used	Respirable Dust Sample
Date of Sampling	28.05.2019
Date of Receiving	29.05.2019
Date of Testing	29.05.2019 to 31.05.2019
Reference No.	CEMC-03062019F2

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	FPHS (Fine Product Handling Site)	1219.8
Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF		2000
Unit		µg/m³
Testing Method		Gravimetric

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Seal of Laboratory

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Report no.-CEMC/TSL/030619/F3

Issued Date-03.06.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	I-Bin Building
Instrument Used	Respirable Dust Sample
Date of Sampling	28.05.2019
Date of Receiving	29.05.2019
Date of Testing	29.05.2019 to 31.05.2019
Reference No.	CEMC-03062019F3

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	I-Bin Building	1085.2
<i>Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF</i>		2000
<i>Unit</i>		µg/m³
<i>Testing Method</i>		Gravimetric

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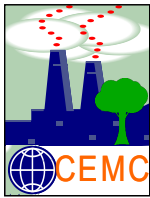


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Report no. - CEMC/TSL/030619/St1

Issued Date-03.06.2019

STACK EMISSION MONITORING TEST REPORT

Name & Address of the Client	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Reference No.	CEMC-03062019St1
Nature of Sampling	Source Emission
Sampling By	R.K Das
Instrument Used	Stack monitoring kit, Flue gas Analyzer
Sampling Date	11.05.2019
Stack Connected To	GCP Bag Filter
Job Code Allotted	CEMC/19-20/St1

ANALYSIS RESULT

Sl. No	Items	Result	Testing Method
01	Flue Gas Temp. in K	322.4	--
02	Average flue gas Velocity in m/sec	7.77	IS: 11255 (Part 3)
03	Differential Pressure in mmH ₂ O	4.68	Wet dry bulb
04	Particulate Matter (PM) in mg/Nm ³	34.9	IS: 11255 (Part 1)
05	Carbon Dioxide (CO ₂) in %	1.4	Flue Gas Analyzer
06	Oxygen (O ₂) in %	19.0	Flue Gas Analyzer
07	Sulphur Dioxide (SO ₂) in mg/Nm ³	0	IS: 11255 (Part 2)
08	Nitrogen Oxide (NO _x) in mg/Nm ³	0	IS: 11255 (Part 7)
09	Carbon Monoxide (CO) in mg/Nm ³	33	Flue Gas Analyzer

End of Report


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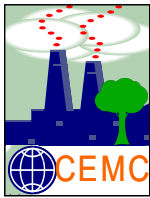
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Report no.-CEMC/TSL/010719/A1

Issued Date-01.07.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0900 to 0900 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	LBSS Building
Average Flow Rate of SPM (m ³ /min)/ Gases (lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-01072019A1
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
04.06.2019	66.7	37.1	9.8	13.7	0.6	--	--	--	--	--	--	--
07.06.2019	65.2	36.4	9.6	13.4	0.5	--	--	--	--	--	--	--
10.06.2019	64.9	35.9	9.4	13.2	0.4	--	--	--	--	--	--	--
14.06.2019	64.6	35.7	9.5	13.5	0.4	<20	<10	<0.1	<0.6	<0.44	<5	<1
18.06.2019	65.4	36.5	9.7	13.8	0.5	--	--	--	--	--	--	--
22.06.2019	66.1	36.8	9.9	13.9	0.6	--	--	--	--	--	--	--
24.06.2019	64.8	35.7	9.6	13.3	0.5	--	--	--	--	--	--	--
27.06.2019	65.5	36.3	9.8	13.6	0.5	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Govt. Notification.

END OF REPORT


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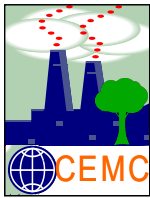
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Report no.-CEMC/TSL/010719/A2

Issued Date-01.07.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	MRSS Building
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-01072019A2
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

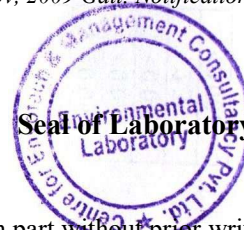
ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NOx (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
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27.06.2019	66.8	36.5	9.5	13.2	0.5	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Gatt. Notification.

END OF REPORT


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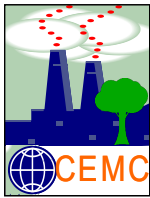


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Report no.-CEMC/TSL/010719/A3

Issued Date-01.07.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	Canteen
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-01072019A3
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Dte	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
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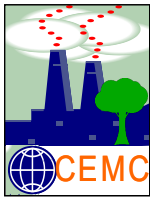
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Report no.-CEMC/TSL/010719/A4

Issued Date-01.07.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	ETP Building
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-01072019A4
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
04.06.2019	67.1	37.0	9.8	13.6	0.6	--	--	--	--	--	--	--
07.06.2019	65.3	35.6	9.3	13.1	0.5	--	--	--	--	--	--	--
10.06.2019	66.7	36.5	9.6	13.4	0.6	--	--	--	--	--	--	--
14.06.2019	65.9	35.7	9.4	13.3	0.6	<20	<10	<0.1	<0.6	<0.44	<5	<1
18.06.2019	64.6	34.8	9.2	13.2	0.5	--	--	--	--	--	--	--
22.06.2019	65.8	35.9	9.5	13.4	0.5	--	--	--	--	--	--	--
24.06.2019	66.5	36.2	9.9	13.5	0.6	--	--	--	--	--	--	--
27.06.2019	65.4	35.3	9.7	13.3	0.5	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Govt. Notification.

END OF REPORT


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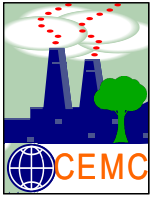
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Report no.-CEMC/TSL/010719/F1

Issued Date-01.07.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	RMHS
Instrument Used	Respirable Dust Sample
Date of Sampling	12.06.2019
Date of Receiving	13.06.2019
Date of Testing	13.06.2019 to 17.06.2019
Reference No.	CEMC-01072019F1

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	RMHS (Raw Material Handling Site)	1207.6
<i>Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF</i>		2000
<i>Unit</i>		µg/m³
<i>Testing Method</i>		Gravimetric

END OF REPORT

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Report no.-CEMC/TSL/010719/F2

Issued Date-01.07.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	FPHS
Instrument Used	Respirable Dust Sample
Date of Sampling	12.06.2019
Date of Receiving	13.06.2019
Date of Testing	13.06.2019 to 17.06.2019
Reference No.	CEMC-01072019F2

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	FPHS (Fine Product Handling Site)	1119.8
Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF		2000
Unit		µg/m³
Testing Method		Gravimetric

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Report no.-CEMC/TSL/010719/F3

Issued Date-01.07.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	I-Bin Building
Instrument Used	Respirable Dust Sample
Date of Sampling	12.06.2019
Date of Receiving	13.06.2019
Date of Testing	13.06.2019 to 17.06.2019
Reference No.	CEMC-01072019F3

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	I-Bin Building	1051.3
<i>Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF</i>		2000
<i>Unit</i>		µg/m³
<i>Testing Method</i>		Gravimetric

END OF REPORT


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Notes:

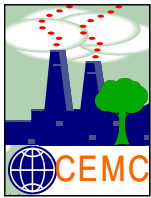


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Report no. - CEMC/TSL/010719/St1

Issued Date-01.07.2019

STACK EMISSION MONITORING TEST REPORT

Name & Address of the Client	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Reference No.	CEMC-01072019St1
Nature of Sampling	Source Emission
Sampling By	R.K Das
Instrument Used	Stack monitoring kit, Flue gas Analyzer
Sampling Date	12.06.2019
Stack Connected To	GCP Bag Filter
Job Code Allotted	CEMC/19-20/St1

ANALYSIS RESULT

Sl. No	Items	Result	Testing Method
01	Flue Gas Temp. in K	318.2	--
02	Average flue gas Velocity in m/sec	7.36	IS: 11255 (Part 3)
03	Differential Pressure in mmH ₂ O	4.48	Wet dry bulb
04	Particulate Matter (PM) in mg/Nm ³	31.2	IS: 11255 (Part 1)
05	Carbon Dioxide (CO ₂) in %	1.6	Flue Gas Analyzer
06	Oxygen (O ₂) in %	18.8	Flue Gas Analyzer
07	Sulphur Dioxide (SO ₂) in mg/Nm ³	0	IS: 11255 (Part 2)
08	Nitrogen Oxide (NO _x) in mg/Nm ³	0	IS: 11255 (Part 7)
09	Carbon Monoxide (CO) in mg/Nm ³	42	Flue Gas Analyzer

End of Report


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Notes:

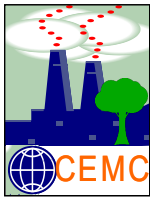
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Report no.-CEMC/TSL/011019/A1

Issued Date-01.10.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0900 to 0900 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	LBSS Building
Average Flow Rate of SPM (m ³ /min)/ Gases (lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-01102019A1
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
17.09.2019	56.1	32.6	9.6	13.5	0.4	--	--	--	--	--	--	--
20.09.2019	54.7	31.3	9.4	13.3	0.5	--	--	--	--	--	--	--
27.09.2019	49.3	28.7	9.0	12.8	0.3	<20	<10	<0.1	<0.6	<0.44	<5	<1
30.09.2019	52.8	30.5	9.3	13.1	0.5	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Gatt. Notification.

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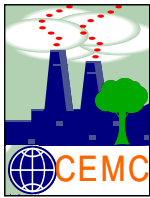


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Report no.-CEMC/TSL/011019/A2

Issued Date-01.10.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	MRSS Building
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-01102019A2
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
17.09.2019	57.3	28.6	9.2	13.0	0.4	--	--	--	--	--	--	--
20.09.2019	56.1	27.9	9.4	13.3	0.5	--	--	--	--	--	--	--
27.09.2019	59.5	29.4	9.5	13.4	0.5	<20	<10	<0.1	<0.6	<0.44	<5	<1
30.09.2019	58.8	29.1	9.3	13.1	0.5	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
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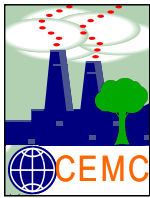


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Report no.-CEMC/TSL/011019/A3

Issued Date-01.10.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	Canteen
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-01102019A3
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

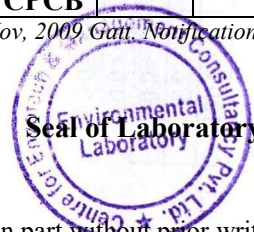
ANALYSIS RESULT

Dte	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
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20.09.2019	57.6	29.1	9.3	12.8	0.5	--	--	--	--	--	--	--
27.09.2019	54.8	26.5	9.4	13.0	0.5	<20	<10	<0.1	<0.6	<0.44	<5	<1
30.09.2019	56.1	28.3	9.3	12.9	0.5	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Govt. Notification.

END OF REPORT


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Notes:

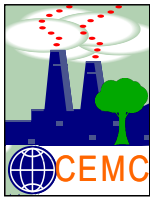


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Report no.-CEMC/TSL/011019/A4

Issued Date-01.10.2019

AMBIENT AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Air Quality
Sample Drawn Period/ Time	Monthly/ 0600 to 0600 next day
Sample Drawn by	Mr. R.K Das
Sampling Location	ETP Building
Average Flow Rate of SPM (m ³ /min)/ Gases(lpm)	1.1/1.0
Weather Conditions	Clear
Reference No.	CEMC-01102019A4
Instrument Used	Respirable Dust Sampler, Fine Dust Sampler, Gaseous Attachment

ANALYSIS RESULT

Date	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	O ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	BaP (ng/m ³)
17.09.2019	58.2	29.4	9.6	13.3	0.5	--	--	--	--	--	--	--
20.09.2019	56.7	28.2	9.5	13.5	0.5	--	--	--	--	--	--	--
27.09.2019	54.9	27.6	8.9	12.9	0.4	<20	<10	<0.1	<0.6	<0.44	<5	<1
30.09.2019	60.1	29.8	9.1	12.8	0.5	--	--	--	--	--	--	--
Avg												
NAAQ* Standard	100	60	80	80	4	400	100	1.0	20	6	5	1
Methods of Analysis	IS: 5182 (Part-23)	Gravimetric Method as per CPCB method	IS: 5182 (Part-2)	IS: 5182 (Part-6)	IS: 5182 (Part-10)	Indophenol Blue Method followed by CPCB	IS: 5182 (Part-9)	IS: 5182 (Part-22)	As per CPCB method followed by AAS	As per CPCB method followed by AAS	IS: 5182 (Part-11)	IS: 5182 (Part-12)

N.B- *NAAQ- National Ambient Air Quality Standard as per 18th Nov, 2009 Gatt. Notification.

END OF REPORT


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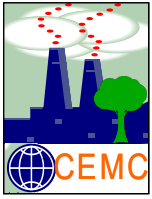


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Report no.-CEMC/TSL/011019/F1

Issued Date-01.10.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	RMHS
Instrument Used	Respirable Dust Sample
Date of Sampling	21.09.2019
Date of Receiving	23.09.2019
Date of Testing	23.09.2019 to 27.09.2019
Reference No.	CEMC-01102019F1

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	RMHS (Raw Material Handling Site)	1023.5
<i>Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF</i>		2000
<i>Unit</i>		µg/m³
<i>Testing Method</i>		Gravimetric

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Report no.-CEMC/TSL/011019/F2

Issued Date-01.10.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	FPHS
Instrument Used	Respirable Dust Sample
Date of Sampling	21.09.2019
Date of Receiving	23.09.2019
Date of Testing	23.09.2019 to 27.09.2019
Reference No.	CEMC-01102019F2

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	FPHS (Fine Product Handling Site)	1017.8
Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF		2000
Unit		µg/m³
Testing Method		Gravimetric

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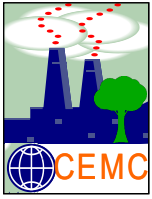


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Report no.-CEMC/TSL/011019/F3

Issued Date-01.10.2019

FUGITIVE AIR QUALITY MONITORING TEST REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Fugitive Air Quality
Sample Drawn Period	Monthly Once
Sample Drawn by	Mr. R.K Das
Sampling Location	Day Bin Building
Instrument Used	Respirable Dust Sample
Date of Sampling	21.09.2019
Date of Receiving	23.09.2019
Date of Testing	23.09.2019 to 27.09.2019
Reference No.	CEMC-01102019F3

ANALYSIS RESULT

Sl. No.	Locations	Suspended Particulate Matter (SPM)
1	I-Bin Building	1062.3
<i>Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF</i>		2000
<i>Unit</i>		µg/m³
<i>Testing Method</i>		Gravimetric

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Report no. - CEMC/TSL/011019/St1

Issued Date-01.10.2019

DG STACK ANALYSIS REPORT

Name & Address of the Client	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Reference No.	CEMC-01102019St2
Nature of Sampling	Source Emission
Sampling By	R.K Das
Instrument Used	Stack monitoring kit, Flue gas Analyzer
Sampling Date	21.09.2019
Stack Connected To	LBSS (500 KVA)
Job Code Allotted	CEMC/19-20/St1

ANALYSIS RESULT

Sl. No	Items	Result	Testing Method
01	Flue Gas Temp. in K	378	Flue Gas Analyzer
02	Average flue gas Velocity in m/sec	4.93	Wet dry bulb
03	Particulate Matter (PM) in mg/Nm ³	32.5	Gravimetric Method
05	Nitrogen Oxide (NO _x) in ppm	157	Colorimetric followed by PDS
06	Sulphur Dioxide (SO ₂) in ppm	01	Flue Gas Analyzer
07	Carbon Monoxide (CO) in ppm	44	Flue Gas Analyzer


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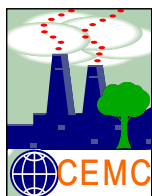
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Report no. - CEMC/TSL/020519/N

Issued Date-02.05.2019

NOISE LEVEL MONITORING REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Noise Quality
Sample Drawn Period/ Time	Monthly/ 0700 to 0700 next day
Sample Drawn by	Mr. R.K Das
Weather Conditions	Clear
Monitoring Period	01.04.2019 to 30.04.2019
Reference No.	CEMC-02052019N
Instrument Used	Noise Meter

Date	Location	NL Day Time dB (A)			NL Night Time dB (A)		
		Max	Min.	Avg.	Max.	Min.	Avg.
17.04.2019	LBSS Building	72.4	68.2	70.3	68.7	63.9	66.3
15.04.2019	MRSS Building	71.5	65.9	68.7	67.8	61.2	64.5
16.04.2019	Canteen	54.6	50.2	52.4	43.7	40.5	42.1
18.04.2019	ETP Building	71.3	64.9	68.1	68.2	62.6	65.4

NATIONAL STANDARD OF NOISE LEVEL

Area Code	Category of Area/Zone	Permissible Limit in dB (A)	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40


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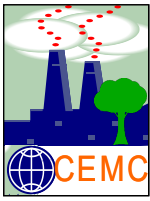


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Report no. - CEMC/TSL/030619/N

Issued Date-03.06.2019

NOISE LEVEL MONITORING REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Noise Quality
Sample Drawn Period/ Time	Monthly/ 0700 to 0700 next day
Sample Drawn by	Mr. R.K Das
Weather Conditions	Clear
Monitoring Period	01.05.2019 to 31.05.2019
Reference No.	CEMC-03062019N
Instrument Used	Noise Meter

Date	Location	NL Day Time dB (A)			NL Night Time dB (A)		
		Max	Min.	Avg.	Max.	Min.	Avg.
09.05.2019	LBSS Building	71.8	69.4	70.6	69.2	62.6	65.9
07.05.2019	MRSS Building	70.6	66.2	68.4	67.3	61.9	64.6
08.05.2019	Canteen	53.7	51.5	52.6	43.6	40.2	41.9
10.05.2019	ETP Building	71.4	65.8	68.6	67.9	63.5	65.7

NATIONAL STANDARD OF NOISE LEVEL

Area Code	Category of Area/Zone	Permissible Limit in dB (A)	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40


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Report no. - CEMC/TSL/010719/N

Issued Date-01.07.2019

NOISE LEVEL MONITORING REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Noise Quality
Sample Drawn Period/ Time	Monthly/ 0700 to 0700 next day
Sample Drawn by	Mr. R.K Das
Weather Conditions	Clear
Monitoring Period	01.06.2019 to 30.06.2019
Reference No.	CEMC-01072019N
Instrument Used	Noise Meter

Date	Location	NL Day Time dB (A)			NL Night Time dB (A)		
		Max	Min.	Avg.	Max.	Min.	Avg.
05.06.2019	LBSS Building	71.8	69.4	70.6	69.2	62.6	65.9
07.06.2019	MRSS Building	70.6	66.2	68.4	67.3	61.9	64.6
06.06.2019	Canteen	53.7	51.5	52.6	43.6	40.2	41.9
04.06.2019	ETP Building	71.4	65.8	68.6	67.9	63.5	65.7

NATIONAL STANDARD OF NOISE LEVEL

Area Code	Category of Area/Zone	Permissible Limit in dB (A)	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40


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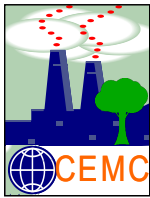
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Report no.-CEMC/TSL/011019/N

Issued Date-01.10.2019

NOISE LEVEL MONITORING REPORT

Issued to	M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
Sample Description	Ambient Noise Quality
Sample Drawn Period/ Time	Monthly/ 0700 to 0700 next day
Sample Drawn by	Mr. R.K Das
Weather Conditions	Clear
Monitoring Period	01.09.2019 to 30.09.2019
Reference No.	CEMC-01102019N
Instrument Used	Noise Meter

Date	Location	NL Day Time dB (A)			NL Night Time dB (A)		
		Max	Min.	Avg.	Max.	Min.	Avg.
24.09.2019	LBSS Building	71.4	66.8	69.	68.4	61.8	65.1
25.09.2019	MRSS Building	70.4	66.8	68.6	67.1	61.3	64.2
26.09.2019	Canteen	54.1	51.3	52.7	43.2	40.6	41.9
27.09.2019	ETP Building	70.2	62.6	66.4	66.8	62.2	64.5

NATIONAL STANDARD OF NOISE LEVEL

Area Code	Category of Area/Zone	Permissible Limit in dB (A)	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40


Authorized Signatory



Notes:

- The result given above related to the tested sample, as received. The customer asked for the above test only.
- This Test Report shall not be reproduced wholly or in part without prior written consent of the laboratory.
- The samples received shall be destroyed after two weeks from the date of issue of the Test Report unless specified otherwise.
- This Test Report shall not be used in any advertising media or as evidence in the court of Law without prior written consent of the laboratory.

Environmental Studies (EIA & EMP), Monitoring, Forest Diversion Planning, DPR, Wildlife Management Plan, Hazardous & Safety Studies, RS& GIS, Baseline Survey, Hydrological & Geological Studies, Socio-economic Studies, DGPS & ETS Survey.

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