



TSM-CPP/MoEF&CC/TS-01/2024-04/167  
November 25, 2024

**The Director(s)**

Ministry of Environment, Forest & Climate Change,  
Integrated Regional Office,  
A/3, Chandrasekharpur,  
**Bhubaneswar-751023**

**Subject:** Submission of half yearly EC compliance reports for expansion of existing 300MW TPP by installation of 185MW coal based TPP at M/s. Tata Steel Limited – TSM-CPP (formerly known as Angul Energy Limited), Odisha for the period from April' 24 to September' 24.

**Reference:** EC vide letter No. J-13012/78/2011-IA-II (T); dated: 12.02.2015 & its amendment dated: 25.09.2020.

Dear Sir,

With reference to the captioned subject and cited reference, we are herewith submitting six monthly compliance reports for the conditions stipulated in the Environmental Clearance for expansion of existing (2x150) 300MW TPP by installation of 185MW coal based TPP at M/s. Tata Steel Limited – TSM-CPP (formerly known as Angul Energy Limited), Odisha for the period from April 2024 to September 2024 along with monitoring reports for your kind perusal.

The soft copies of the aforesaid compliance report are also being sent through mail to [roez.bsr-mef@nic.in](mailto:roez.bsr-mef@nic.in) for your kind information and necessary record please. Also copy of EC compliance is being uploaded on MoEF&CC web site on portal <http://environmentalclearance.nic.in>.

Hope, the above are in line with the statutory requirements.

Thanking you  
Yours faithfully,  
**For TSM-CPP**

  
**Rajesh Kumar Agarwal,**  
**(Factory Manager, TSM-CPP)**

**Encl:** As above

**Copy to:**

1. The Zonal Officer, Central Pollution Control Board, Southern Conclave Block, 502, 5<sup>th</sup> & 6<sup>th</sup> Floors, 1582 Rajdanga Main Road, Kolkata – 700107.
2. The Member Secretary, SPCB, Parivesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII, Odisha, Bhubaneswar-751012
3. The Regional Officer, State Pollution Control Board, Angul, Odisha.

**TATA STEEL LIMITED**

Ganthigadia Nuahata Banarpal Angul 759 128 Odisha India Tel 91 6762 352000  
Registered Office Bombay House 24 Homi Mody Street Fort Mumbai 400 001 India Tel 91 22 66658282 Fax 91 22 66657724  
Corporate Identity Number L27100MH1907PLC000260 Website [www.tatasteel.com](http://www.tatasteel.com)



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



## TEST REPORT

Ref. No. LT02-CCD/11/24

Date: 18.11.2024

Name & Address of the Party:

Tata Steel Ltd.  
At-Narendrapur, P.O.-Kusupanga  
Via-Meramandali, Dist-Dhenkanal  
Pin-759121, Odisha.

Your Ref. No.:

Work Order No.: 3000156889/A06, Date: 26.10.2023

Sample Details:

1. Indian Coal (01 No.) 2. Imported Coal (01 No.)  
3. Iron Ore (01 No.) 4. Lime stone (01 No.)

Date of Receiving:

18.09.2024

Date(s) of Conducting Test:

03.10.2024

Date of Completion of Test:

08.11.2024

Method Adopted:

1. proximate analysis of coal samples by classical methods.
2. Major and trace element analysis of Coal, Iron ore, lime stone and Dolomite samples through wet chemical route by gravimetric, AAS and ICP-OES techniques.
3. Coal samples were leached with distilled water at a solid: liquid ratio of 1:20 for Fluoride analysis using ISE.

**Detail Report:** Following data tables are enclosed:

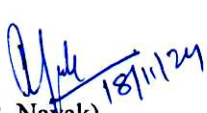
**Table-1.** Proximate analysis of coal samples.


**Table-2.** Chemical composition analysis of coal samples.

**Table-3.** Trace element analysis of coal samples.

**Table-4.** Chemical composition analysis of Iron ore, Lime stone and Dolomite samples.

**Table-5.** Trace element analysis of Iron ore, Lime stone and Dolomite samples.

  
(Dr. B. Nayak)  
Chief Scientist  
PL & Head, CCD

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

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



## TEST REPORT

Ref. No. LT02-CCD/11/24


Date: 18.11.2024


**Table-1.** Proximate analysis of coal samples.

Sample ID	Moisture (%)	Volatile Matter (%)	Ash (%)	Fixed Carbon (%)
Indian coal	2.43	24.71	43.31	29.55
Imported coal	2.58	22.64	12.32	62.46

**Table-2.** Chemical composition analysis of coal samples.

Sl. No.	Component	Concentration in Test Samples, %	
		Indian Coal	Imported Coal
1	SiO <sub>2</sub>	21.91	5.76
2	Al <sub>2</sub> O <sub>3</sub>	13.64	3.93
3	Fe <sub>2</sub> O <sub>3</sub>	1.56	0.35
4	TiO <sub>2</sub>	0.78	0.10
5	MnO	0.007	0.006
6	CaO	0.28	0.44
7	MgO	0.10	0.08
8	Na <sub>2</sub> O	0.62	0.32
9	K <sub>2</sub> O	0.74	0.11
10	P <sub>2</sub> O <sub>5</sub>	0.09	0.18
11	S/SO <sub>3</sub>	0.34/0.85	0.66/1.65
12	LOI	57.29	86.05

  
(Dr. B. Nayak)  
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PL & Head, CCD

  
(J. Das)  
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Central Characterization Dept.


## TEST REPORT


Ref. No. LT02-CCD/11/24

Date: 18.11.2024

**Table-3.** Trace element analysis of coal samples

Sl. No.	Parameters	Trace element concentrations in test samples		
		Unit	Indian coal	Imported coal
1	Pb	mg/kg	15.68	2.15
2	Cd	mg/kg	0.19	0.07
3	Cu	mg/kg	39.07	12.81
4	Ni	mg/kg	37.62	18.04
5	Co	mg/kg	17.62	8.36
6	Cr	mg/kg	65.05	18.62
7	Zn	mg/kg	53.84	25.96
8	Ag	mg/kg	1.09	0.39
9	Sb	mg/kg	6.33	1.73
10	Mo	mg/kg	3.46	0.39
11	V	mg/kg	70.84	22.08
12	Se	mg/kg	1.28	0.21
13	Ba	mg/kg	174.08	31.01
14	As	mg/kg	110.6	25.7
15	Hg	mg/kg	1.17	0.86
16	B	%	0.28	0.11
17	F <sup>-</sup> in water leaching (1:20) solutions.	mg/L	0.58	0.21

  
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PL & Head, CCD

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




## TEST REPORT


Ref. No. LT02-CCD/11/24

Date: 18.11.2024

**Table-4.** Chemical composition analysis of Iron ore and Lime stone samples.

Sl. No.	Component	Concentration in Test Samples, %	
		Iron Ore	Lime Stone
1	SiO <sub>2</sub>	1.61	1.92
2	Al <sub>2</sub> O <sub>3</sub>	2.82	0.88
3	Fe <sub>2</sub> O <sub>3</sub>	89.90	0.04
4	TiO <sub>2</sub>	0.19	0.007
5	MnO	0.015	0.005
6	CaO	0.16	44.37
7	MgO	0.02	11.1
8	Na <sub>2</sub> O	0.87	1.24
9	K <sub>2</sub> O	0.07	0.18
10	P <sub>2</sub> O <sub>5</sub>	0.11	0.008
11	S/SO <sub>3</sub>	0.08/0.20	0.09/0.23
12	LOI	2.86	42.09

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

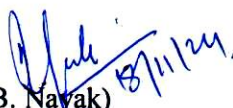
## TEST REPORT


Ref. No. LT02-CCD/11/24

Date: 18.11.2024

**Table-5.** Trace element analysis of Iron ore and Lime stone samples.

Sl. No.	Parameters	Trace element concentrations in test samples		
		Unit	Iron Ore	Lime Stone
1	Pb	mg/kg	0.67	0.09
2	Cd	mg/kg	BDL	BDL
3	Cu	mg/kg	10.71	4.42
4	Ni	mg/kg	0.58	2.49
5	Co	mg/kg	7.42	5.95
6	Cr	mg/kg	64.03	9.93
7	Zn	mg/kg	28.95	12.88
8	Ag	mg/kg	0.15	0.35
9	Sb	mg/kg	0.08	0.03
10	Mo	mg/kg	BDL	0.26
11	V	mg/kg	39.10	2.47
12	Se	mg/kg	BDL	BDL
13	Ba	mg/kg	65.0	10.04
14	As	mg/kg	1.86	15.90
15	Hg	mg/kg	0.67	0.36
16	B	%	0.56	0.78

  
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Central Characterization Dept.



# Mitra S.K.Private Limited

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Mumbai, Nashik Highway, Pimples Village, Bhiwandi, Near  
Kalyan Bhiwandi Bypass, Tal - Bhiwandi  
Dist Thane- 421302  
Tel : 0252 2672352  
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Web : [www.mitrask.com](http://www.mitrask.com)



## TEST REPORT

TC-8673

ULR: TC-867324000000282F

**Name & Address of the Customer:**

Tata Steel Ltd.  
NH-55, Narendrapur, Maramandli,  
Dhenkanal, Odisha-759129, India

**Report No.**

:C/2024/282

**Date**

:21.06.2024

**Sample No.**

:MSK/MUM/2024/282

**Date of receipt of sample**

:14.06.2024

**Date(s) of performance**

:14.06.2024-21.06.2024

**Ref. No. & Date**

:3000148695/A06 dt.15.12.2022

**Discipline**

:Chemical

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Stack Emission
3	Sample Mark (if any, given by the customer)	: NA
4	Date of sampling	: 12.06.2024 at 08.30 AM to 08.58 AM
5	Place of sampling	: BF PP-1, Boiler-3(1st Sample)
6	Environmental conditions during sampling	: Cold Chain Maintained
7	Sampling Drawn By	: Mr. Chinmaya Biswal
8	Sampling Plan & Procedures used	: IS 11255 (Part-1, Part-2, Part-3, Part-7)
9	Location of performance of laboratory activities	: Laboratory Permanent Facility
10	Deviation from the method (if any)	: No

**Reviewed By:**

Signature

Name

Designation

: Ms. Rekha Patel

: Technical Manager

**Authorized Signatory**

For Mitra S.K. Private Limited

Signature

Name

Designation

: Ms. Rekha Patel

: Technical Manager

# Mitra S.K.Private Limited

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TC-8673

ULR: TC-867324000000282F

Report No. : C/2024/282

Sample No. : MSK/MUM/2024/282

## ANALYSIS RESULT

<b>A: GENERAL INFORMATION ABOUT STACK:</b>				
1	Stack connected to	BF PP-1, Boiler-3(1st Sample)		
2	Emission due to	Process Emission		
3	Material of construction of Stack	RCC		
4	Shape of Stack	Circular		
5	Whether Stack is provided with permanent platform	Yes		
6	Capacity	NA		
<b>B: PHYSICAL CHARACTERISTICS OF STACK:</b>				
1	Height of Stack from ground level	85.5 m		
2	Diameter of Stack at sampling point	4.8 m		
3	Height of the sampling point from ground level	30 m		
4	Area of Stack	18.02 m2		
<b>C: ANALYSIS/CHARACTERSTIC OF STACK:</b>				
1	Fuel used :Coal	2. Fuel consumption: NA		
<b>D: RESULTS OF SAMPLING &amp; ANALYSIS OF GASEOUS EMISSION:</b>				
		<u>Unit</u>	<u>RESULT</u>	<u>METHOD</u>
1	Temperature of emission	°C	126	IS 11255 (Part-3)
2	Barometric pressure	mm of Hg	748	IS 11255 (Part-3)
3	Velocity of gas	m/sec	5.87	IS 11255 (Part-3)
4	Flow rate of the flue gas	Nm³/hr	274009	IS 11255 (Part-3)
5	Sulphur Dioxide	mg/Nm3	712.5	IS 11255 (Part-2)
6	Nitrogen oxide	mg/Nm3	351.6	IS 11255 (Part-7)
7	Particulate Matters	mg/Nm³	11.6	IS 11255 (Part-1)
8	Moisture	%v/v	BDL(DL:2.0)	IS 11255 (Part-3)
<b>E: POLLUTION:</b> - Details of pollution control devices attached with the stack: ESP				

Note:	1.Equipment name: - Stack Sampler	2.Model No: TEI-131
	3.Make: - THERMO	4.SI. No. 204-B-23
	5.Calibration Done: - 27.03.2024	6.Calibration Due: - 26.03.2025

End

Reviewed By:

Signature

Name

Designation

*Ms. Rekha Patel*

Ms. Rekha Patel

Technical Manager

Authorized Signatory

For Mitra S.K. Private Limited

Signature

Name

Designation

*Ms. Rekha Patel*

Ms. Rekha Patel

Technical Manager

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Tel. : 0252 2672352.

Email: [mumbailab@mitrask.com](mailto:mumbailab@mitrask.com)

## TEST REPORT

<b>Name &amp; Address of the Customer:</b>	<b>Report No.</b>	:C/2024/282A
<b>Tata Steel Ltd.</b>	<b>Date</b>	:21.06.24
NH-55, Narendrapur, Meramandli,	<b>Sample No.</b>	:MSK/MUM/2024/282A
Dhenkanal, Odisha-759129, India	<b>Date of receipt of sample</b>	:14.06.24
	<b>Date(s) of performance</b>	:14.06.24-21.06.24
	<b>Ref. No. &amp; Date</b>	:3000147168/A06 dt.15.12.2022
	<b>Discipline</b>	:Chemical

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Stack Emission
3	Sample Mark (if any, given by the customer)	: NA
4	Date of sampling	: 12.06.24 at 08.30 AM to 08.58 AM
5	Place of sampling	: BF PP-1, Boiler-3 (1 <sup>st</sup> Sample)
6	Environmental conditions during sampling	: Cold Chain Maintained
7	Sampling Drawn By	: Mr. Chinmaya Biswal
8	Sampling Plan & Procedures used	: IS 11255 (Part-1,2,3,7)
9	Location of performance of laboratory activities	: Laboratory Permanent Facility
10	Deviation from the method (if any)	: No


## ANALYSIS RESULT

RESULTS OF SAMPLING & ANALYSIS OF GASEOUS EMISSION:	Unit	RESULT	METHOD
Mercury	mg/Nm <sup>3</sup>	0.002	USEPA 29 : 1996

### Reviewed By:

Signature :   
Name : Mr. Ananta Kumar Rath  
Designation : Operation Manager

### Authorized Signatory For Mitra S.K. Private Limited

Signature :   
Name : Mr. Ananta Kumar Rath  
Designation : Operation Manager

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Web : [www.mitrask.com](http://www.mitrask.com)

**TEST REPORT**

TC-0073

ULR: TC-867324000000218F

**Name & Address of the Customer:**

Tata Steel Ltd.  
N11-55, Narendrapur, Meramandli,  
Dhenkanal, Odisha-759129, India

**Report No.**

:C/2024/218

**Date**

:11.06.2024

**Sample No.**

:MSK/MUM/2024/218

**Date of receipt of sample**

:06.06.2024

**Date(s) of performance**

:06.06.2024-11.06.2024

**Ref. No. & Date**

:3000148695/A06 dt.15.12.2022

**Discipline**

:Chemical

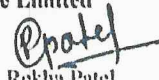
We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Stack Emission
3	Sample Mark (if any, given by the customer)	: NA
4	Date of sampling	: 03.06.2024 at 04.46 PM to 05.15 PM
5	Place of sampling	: AEL STACK 2
6	Environmental conditions during sampling	: Cold Chain Maintained
7	Sampling Drawn By	: Mr. Chinmaya Biswal
8	Sampling Plan & Procedures used	: IS 11255 (Part-1,Part2,Part3,Part7)
9	Location of performance of laboratory activities	: Laboratory Permanent Facility
10	Deviation from the method (if any)	: No

**Reviewed By:**

Signature :   
Name : Ms. Rekha Patel  
Designation : Technical Manager

**Authorized Signatory**  
**For Mitra S.K. Private Limited**

Signature :   
Name : Ms. Rekha Patel  
Designation : Technical Manager



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Web : [www.mitrask.com](http://www.mitrask.com)



Doc No MSK/GJN/19/01



TC-9078

ULR: TC-867324000000218F

Report No. : C/2024/218

Sample No. : MSK/MUM/2024/218


## ANALYSIS RESULT

A: GENERAL INFORMATION ABOUT STACK:				
1	Stack connected to	AEL STACK 2		
2	Emission due to	Process Emission		
3	Material of construction of Stack	RCC		
4	Shape of Stack	Circular		
5	Whether Stack is provided with permanent platform	Yes		
6	Capacity	NA		
B: PHYSICAL CHARACTERISTICS OF STACK:				
1	Height of Stack from ground level	120 m		
2	Diameter of Stack at sampling point	7.7 m		
3	Height of the sampling point from ground level	50 m		
4	Area of Stack	46.5426 m2		
C: ANALYSIS/CHARACTERSTIC OF STACK:				
1	Fuel used : Coke		2. Fuel consumption: NA	
D: RESULTS OF SAMPLING & ANALYSIS OF GASEOUS EMISSION:				
		Unit	RESULT	METHOD
1	Temperature of emission	°C	130	IS 11255 (Part-3)
2	Barometric pressure	mm of Hg	746	IS 11255 (Part-3)
3	Velocity of gas	m/sec	10.29	IS 11255 (Part-3)
4	Flow rate of the flue gas	Nm³/hr	1206820	IS 11255 (Part-3)
5	Sulphur Dioxide	mg/Nm3	855.4	IS 11255 (Part-2)
6	Nitrogen oxide	mg/Nm3	415.4	IS 11255 (Part-7)
7	Particulate Matters	mg/Nm³	29.9	IS 11255 (Part-1)
8	Moisture	%v/v	3.0	IS 11255 (Part-3)
E: POLLUTION: - Details of pollution control devices attached with the stack: ESP				

Note:	1.Equipment name: - Stack Sampler	2.Model No: TEI-131
	3.Make: - THERMO	4.SI. No. 204-B-23
	5.Calibration Done: - 27.03.2024	6.Calibration Due: - 26.03.2025

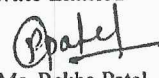
End

Reviewed By:

Signature :   
Name : Ms. Rekha Patel  
Designation : Technical Manager

Authorized Signatory

For Mitra S.K. Private Limited

Signature :   
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## TEST REPORT

<b>Name &amp; Address of the Customer:</b>	<b>Report No.</b>	:C/2024/218A
<b>Tata Steel Ltd.</b>	<b>Date</b>	:11.06.24
NH-55, Narendrapur, Meramandli,	<b>Sample No.</b>	:MSK/MUM/2024/218A
Dhenkanal, Odisha-759129, India	<b>Date of receipt of sample</b>	:06.06.24
	<b>Date(s) of performance</b>	:06.06.24-11.06.24
	<b>Ref. No. &amp; Date</b>	:3000147168/A06 dt.15.12.2022
	<b>Discipline</b>	:Chemical


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3	Sample Mark (if any, given by the customer)	: NA
4	Date of sampling	: 03.06.24 at 04.46 PM to 05.15 PM
5	Place of sampling	: AEL STACK 2
6	Environmental conditions during sampling	: Cold Chain Maintained
7	Sampling Drawn By	: Mr. Chinmaya Biswal
8	Sampling Plan & Procedures used	: IS 11255 (Part-1,2,3,7)
9	Location of performance of laboratory activities	: Laboratory Permanent Facility
10	Deviation from the method (if any)	: No


## ANALYSIS RESULT

RESULTS OF SAMPLING & ANALYSIS OF GASEOUS EMISSION:	Unit	RESULT	METHOD
Mercury	mg/Nm <sup>3</sup>	0.002	USEPA 29 : 1996

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### Summary of Surface Water Quality Analysis

(Period: From April 2024 to September 2024)

S. N	Parameter	Unit	Kishinda Nala		Lingara Nala		Brahamani River	
			U/S	D/S	U/S	D/S	U/S	D/S
1	pH Value	-	6.92-8.58	7.32-8.20	6.78-8.50	7.36-8.4	6.87-8.29	7.02-8.13
2	Colour	Hazen	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
3	Temperature	Deg C	25-25.3	25-25.2	25-25.2	25-25.2	25-25.3	25-25.0
4	Total Suspended Solids	mg/l	3.8-15.6	2.6-20.0	3.8-19	8.6-18.2	10.8-90	3.2-120
5	Arsenic as As	mg/l	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
6	BOD, 3days at 27°C	mg/l	2.7-5.6	2.0-5.6	BDL(DL:2.0)	5.7-6.4	2.4-9.6	3.8-13
7	Boron as B	mg/l	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)
8	Cadmium as Cd	mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
9	Calcium as Ca	mg/l	34-80.8	34-80.8	13-89.0	26-64.4	12-26.0	12.12-27.0
10	Chlorides as Cl	mg/l	35-158.35	35-148.45	14-152	20-126	11-29.69	12.0-108.0
11	COD	mg/l	9.6-28	16.0-23	10.0-20	19.0-28	8.4-34	13.0-40
12	Copper (as Cu)	mg/l	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
13	Cyanide as CN	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)

14	Fluoride as F-	mg/l	0.22-2.65	0.21-1.80	0.26-0.38	0.19-1.54	0.25-0.41	0.20-0.52
15	Hexa Chromium as Cr +6	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
16	Iron as Fe	mg/l	0.96-4.9	0.17-4.9	0.18-2.0	0.59-1.0	0.17-2.1	2.1-2.2
17	Lead (as Pb)	mg/l	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
18	Manganese (as Mn)	mg/l	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
19	Mercury (as Hg)	mg/l	BDL(DL:0.0002)	BDL(DL:0.0002)	BDL(DL:0.0002)	BDL(DL:0.0002)	BDL(DL:0.0002)	BDL(DL:0.0002)
20	Nickel (as Ni)	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
21	O&G	mg/l	BDL(DL:1.4)	BDL(DL:1.4)	BDL(DL:1.4)	BDL(DL:1.4)	BDL(DL:1.4)	BDL(DL:1.4)
22	Phenolic Comp	mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
23	Phosphate as P	mg/l	0.11-0.85	0.07-0.84	0.10-0.29	0.10-0.40	0.08-0.35	0.12-0.59
24	RFC	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
25	Selenium (as Se)	mg/l	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
26	TKN	mg/l	BDL(DL:0.3)	BDL(DL:0.3)	BDL(DL:0.3)	BDL(DL:0.3)	BDL(DL:0.3)	BDL(DL:0.3)
27	Zinc (as Zn)	mg/l	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)

**Note:** BDL: Below Detectable Limit; DL: Detectable Limit, U/S: Upstream D/S: Downstream

**Source:** Monitoring/ Analysis report of S.K. Mitra Private Limited and Environment Laboratory of TSM.



## **Summary of Treated Domestic Effluent Analysis**

**(Period: From April 2024 to September 2024)**

<b>S.N.</b>	<b>Location</b>	<b>Parameters in Range</b>		
		<b>pH</b>	<b>Suspended Solid in mg/l</b>	<b>BOD (3 days at 27°C) in mg/l</b>
1.	Colony STP	7.40-7.85	23-36	9.0-10.7
2.	AEL STP	7.04-7.81	18-28	8.7-11.3
3.	BF-1 STP	6.91-7.85	18-32	7.8-9.8

**Summary of Effluent Treatment Plant Analysis**  
**(Period: From April 2024 to September 2024)**

S.N	Location	Parameters in Range					
		pH	Suspended Solid in mg/l	Chemical Oxygen Demand in mg/l	BOD (3days at 27°C) in mg/l	Oil & Grease	Iron as Fe
1.	ETP-1 (Outlet)	7.18-8.15	13-26	19-45	3.5-7.0	<4.0	0.27-0.72
2.	ETP-2 (Outlet)	6.53-7.88	18-24	18-30	3.3-5.2	<4.0	0.10-0.60
3.	ETP-3 (Outlet)	6.76-8.02	25-41	29-37	3.7-5.2	<4.0	0.29-0.89
4.	CRM (ETP Outlet)	7.16-8.13	18-58	100-160	14.6-24.9	<4.0	0.79-2.80
5.	BF-1 (Thickener Outlet)	6.63-7.86	35-86	33-48	4.5-9.5	<4.0	-
6.	BF-2 (Thickener Outlet)	6.69-7.58	42-76	36-47	4.4-9.5	<4.0	-
7.	BOF (Thickener Outlet)	>10.0	63-78	36-51	4.5-8.0	<4.0	-

S.N.	Location	Parameters in Range						
		pH	Suspended Solid in mg/l	Chemical Oxygen Demand in mg/l	BOD (3days at 27°C) in mg/l	Oil & Grease	TCN	Phenol
8.	Coke Oven-1 (BOD-1 Outlet)	6.80-7.64	28-80	120-210	16.5-28.5	<4.0	0.12-0.18	0.76-0.87
9.	Coke Oven-2 (BOD-2 Outlet)	6.77-7.23	22-41	130-180	20.1-26.8	<4.0	0.11-0.14	0.71-0.81

## **Summary of ground water level monitoring report inside plant premises**

**(Period: From April 2024 to September 2024)**

S.N.	Location with description	Sample Code	Depth of Monitoring Bore Well (m)	Longitude	Latitude	Ground Water Level (m)
1	Colony near STP	GW-1	50.29	20°49.045'	85°15.734'	4.10
2	RMHS Near Wagon Tippler	GW-2	91.44	20°47.752'	85°15.993'	2.12
3	Near Blast Furnace-2	GW-3	49.38	20°47.25'	85°15.613'	5.20
4	Near Railway bridge	GW-4	47.55	20°48.920'	85°15.858'	2.50

## **Ground Water Quality Analysis**

S.N.	Parameter	Unit	GW-2	GW-3	GW-4	GW-6	Standard as per IS-10500-2012
1	p H	-	7.55	7.21	7.80	7.76	6.50-8.50
2	Colour	Hazen	Colourless	Colourless	Colourless	Colourless	15
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	-
4	T. Hardness (as CaCO <sub>3</sub> )	mg/l	278	310	244	282	300
5	Calcium as Ca	mg/l	67.33	74.54	58.52	68.14	75
6	Magnesium as Mg	mg/l	26.84	30.26	23.91	27.33	30
7	Iron as Fe	mg/l	0.13	0.20	0.16	0.15	0.3
8	Chloride as Cl	mg/l	94.30	114.15	71.96	81.89	250
9	Fluoride as F-	mg/l	0.64	0.49	0.68	0.72	1
10	Dissolved solids	mg/l	344	390	298	366	500
11	Nitrate as NO <sub>3</sub>	mg/l	4.80	6.20	4.20	7.80	45
12	Chromium as Cr+6	mg/l	0.016	0.020	0.024	0.012	0.050
13	Alkalinity as CaCO <sub>3</sub>	mg/l	78	108	66	86	200



## Summary of ground water level monitoring report inside plant premises

Ground Water Level  
Period: March 2024

S.N	Location	Sample Code	Longitude	Latitude	Water Level from GL (m) BGL
					May'24
1	Kharagprasad	GW-01	20 <sup>0</sup> 49.299'	85 <sup>0</sup> 18.923'	4.2
2	Charadagadia	GW-02	20 <sup>0</sup> 47.768'	85 <sup>0</sup> 17.083'	7.5
3	Sibpur	GW-03	20 <sup>0</sup> 46.941'	85 <sup>0</sup> 14.394'	6.8
4	Kochilamada	GW-04	20 <sup>0</sup> 47.541'	85 <sup>0</sup> 16.802'	5.9
5	Galapada	GW-05	20 <sup>0</sup> 48.142'	85 <sup>0</sup> 18.600'	4.7
6	Motonga	GW-06	20 <sup>0</sup> 48.143'	85 <sup>0</sup> 18.599'	4.1
7	Narendrapur	GW-08	20 <sup>0</sup> 49.483'	85 <sup>0</sup> 15.530'	9.2
8	Khaliberena	GW-09	20 <sup>0</sup> 46.946'	85 <sup>0</sup> 14.396'	4.6
9	Ganthigadia	GW-10	20 <sup>0</sup> 48.501'	85 <sup>0</sup> 15.118'	2.2

## Ground Water Quality Analysis Report of surrounding villages

**March 2024**

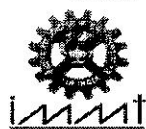
S.N.	Parameters	unit	GW-01	GW-02	GW-03	GW-04	GW-05	GW-06	GW-07	GW-08	GW-9
1	pH	-	6.76	7.11	7.59	7.16	7.05	7.29	7.52	7.57	7.54
2	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Colour	mg/l	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
4	Turbidity	N.T. U	3.45	1.70	2.70	0.75	1.19	1.66	7.75	1.10	4.71
5	Total Dissolved Solids (as TDS)	mg/l	277	1268	493	503	186.0	7.29	565	484	591
6	Aluminium as Al	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
7	Anionic Surface-Active Agents as (MBAS)	mg/l	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
8	Boron as B	mg/l	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)
9	Calcium as Ca	mg/l	40.08	35.27	80.16	52.91	32.06	89.78	16.03	83.37	83.37
10	Chloride as Cl	mg/l	29.0	240.0	57.0	50.0	15.00	118.0	45.0	40.0	47.0
11	Copper as Cu	mg/l	0.012	0.007	0.014	0.011	0.032	0.005	0.008	0.018	0.013
12	Fluoride as F	mg/l	0.12	0.98	0.46	1.10	0.19	1.00	0.94	0.55	1.10
13	Residual Free Chlorine	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
14	Iron as Fe	mg/l	0.228	0.125	0.157	0.238	0.989	0.153	0.172	0.339	0.301
15	Magnesium as Mg	mg/l	14.58	126.62	32.08	44.71	5.83	99.14	69.01	39.85	55.40
16	Manganese as Mn	mg/l	0.025	0.032	0.086	0.027	0.077	0.060	0.354	0.027	0.028
17	Mineral Oil	mg/l	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)
18	Nitrate as NO3	mg/l	12.30	182.0	3.76	49.60	3.12	12.10	10.63	3.58	17.20
19	Phenolic Compounds as C6H5OH	mg/l	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)
20	Selenium as Se	mg/l	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)
21	Sulphate as SO4	mg/l	30.67	125.41	63.39	57.25	13.61	129.96	62.25	47.26	82.02
22	Total Alkalinity as CaCO3	mg/l	140	484	304	392	96	320	376	364	413
23	Total Hardness	mg/l	160	608	332	316	104	632	324	372	436





	<b>Mn</b>										
17	<b>Mineral Oil</b>	<b>mg/l</b>	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)
18	<b>Nitrate as NO3</b>	<b>mg/l</b>	31.4	BDL(DL:0.2)	BDL(DL:0.2)	32.6	BDL(DL:0.2)	11.6	8.9	25.6	12.4
19	<b>Phenolic Compounds as C6H5OH</b>	<b>mg/l</b>	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)
20	<b>Selenium as Se</b>	<b>mg/l</b>	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)
21	<b>Sulphate as SO4</b>	<b>mg/l</b>	87	65	142	54	59	27	97	52	88
22	<b>Total Alkalinity as CaCO3</b>	<b>mg/l</b>	270	356	749	272	360	372	349	437	312
23	<b>Total Hardness as CaCO3</b>	<b>mg/l</b>	298	292	178	318	232	280	290	212	504
24	<b>Zinc as Zn</b>	<b>mg/l</b>	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
25	<b>Cadmium as Cd</b>	<b>mg/l</b>	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
26	<b>Cyanide as CN</b>	<b>mg/l</b>	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
27	<b>Lead as Pb</b>	<b>mg/l</b>	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
28	<b>Mercury as Hg</b>	<b>mg/l</b>	BDL (DL:0.0002)	BDL (DL:0.0002)	BDL (DL:0.0002)	BDL (DL:0.0002)	BDL (DL:0.0002)	BDL (DL:0.0002)	BDL (DL:0.0002)	BDL (DL:0.0002)	BDL (DL:0.0002)
29	<b>Nickel (as Ni)</b>	<b>mg/l</b>	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
30	<b>Total Arsenic (as As)</b>	<b>mg/l</b>	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)
31	<b>E. coli</b>	<b>/100ml</b>	Detected	Detected	Detected	Detected	Detected	Not Detected	Not Detected	Detected	Detected

----- End of Report -----



# CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
TEST REPORT



Issued to : TATA STEEL LIMITED, MERAMANDALI	Date : 23.09.2024
Test report No – 08/2024-007	
Source of Sample : Charadagadia	Sample receiving Date : 09.08.2024
Type of Sample : well water	Sample Analysis Date : 09.08.2024

Sl No	Characteristics	Test Method (P) of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	0.78
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	6.96@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	1241.0
4.	Total Hardness (as CaCO <sub>3</sub> ), mg/L	Part 21	200	600	604.0
5.	Calcium as Ca, mg/L	Part 40	75	200	36.07
6.	Magnesium as Mg, mg/L	Part 46	30	100	124.9
7.	Alkalinity as CaCO <sub>3</sub> , mg/L	Part 23	200	600	456.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	180.0
9.	Sulfate as SO <sub>4</sub> , mg/L	Part 24	200	400	138.13
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.72
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.168
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.031
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.009
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.107
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.001
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.001
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	<0.001
18.	Nickel as Ni, mg/L	Part 54	0.02	No relaxation	<0.001

Authorized Signatory

  
23.09.24

**Dr. Arakshita Majhi**

Senior Principal Scientist

Phone : 0674-2379236,

E mail - arakshita@immt.res.in

## NOTES :

1. The sample is drawn by EC Laboratory & result relates to the sample tested.
2. This certificate shall not be reproduced wholly or in part without prior written consent of the laboratory.
3. This certificate shall not be used in any advertising media or as evidence in the court of Law without prior written consent of laboratory.
4. Latest version of test methods used as per latest specification.
5. It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned in "acceptable limit" render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicate under "permissible limit" in the absence of alternative sources, above which the source will have to be rejected.

Non NABL Test report – P.T.O

'End of Test Report'



# CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI

Date : 23.09.2024

Test report No – 08/2024-007

Source of Sample : Charadagadia

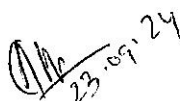
Sample receiving Date : 09.08.2024

Type of Sample : well water

Sample Analysis Date : 09.08.2024

19.	*Color, Hazen units	Part 4	5	15	<5
20.	*Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	*Conductivity, $\mu\text{S}/\text{cm}$	Part 14	-	-	1804
22.	*Total Suspended Solid, mg/l	Part 17	-	-	7.0
23.	*Nitrite as $\text{NO}_2$ , mg/L	Part 34	-	-	0.618
24.	*Nitrate as $\text{NO}_3$ , mg/L	Part 34	45	No relaxation	162.0
25.	Sodium, mg/l	Part 45	-	-	167.95
26.	Potassium, mg/l	Part 45	-	-	5.55
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.001
29.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	>542
30.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	>542

Authorized Signatory

  
23.09.24

**Dr. Arakshita Majhi**  
Senior Principal Scientist  
Phone : 0674-2379236,  
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'End of Test Report'





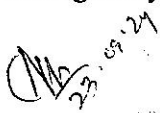
# CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
**TEST REPORT**

Issued to : TATA STEEL LIMITED, MERAMANDALI	Date : 23.09.2024
Test report No – 08/2024-012	
Source of Sample : ETAPA	Sample receiving Date : 09.08.2024
Type of Sample : Well water	Sample Analysis Date : 09.08.2024

19.	*Color, Hazen units	Part 4	5	15	10
20.	*Odour	Part 5	Agreeable	Agreeable.	Agreeable
21.	*Conductivity, $\mu\text{S}/\text{cm}$	Part 14	-	-	1123
22.	*Total Suspended Solid, mg/l	Part 17	-	-	12.0
23.	*Nitrite as $\text{NO}_2$ , mg/L	Part 34	-	-	0.091
24.	*Nitrate as $\text{NO}_3$ , mg/L	Part 34	45	No relaxation	4.62
25.	Sodium, mg/l	Part 45	-	-	141.75
26.	Potassium, mg/l	Part 45	-	-	11.35
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.001
29.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	212
30.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	9

Authorized Signatory

  
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(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
**TEST REPORT**



<b>Issued to :</b> TATA STEEL LIMITED, MERAMANDALI	<b>Date :</b> 23.09.2024
<b>Test report No – 08/2024-012</b>	
<b>Source of Sample :</b> ETAPA	<b>Sample receiving Date :</b> 09.08.2024
<b>Type of Sample :</b> Well water	<b>Sample Analysis Date :</b> 09.08.2024

Sl No	Characteristics	Test Method (P) of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	14.82
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.13@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	655.0
4.	Total Hardness (as CaCO <sub>3</sub> ),mg/L	Part 21	200	600	284.0
5.	Calcium as Ca, mg/L	Part 40	75	200	8.01
6.	Magnesium as Mg, mg/L	Part 46	30	100	64.15
7.	Alkalinity as CaCO <sub>3</sub> , mg/L	Part 23	200	600	416.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	92.0
9.	Sulfate as SO <sub>4</sub> , mg/L	Part 24	200	400	1.42
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	1.02
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.285
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.029
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.479
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.224
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.001
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.001
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	<0.001
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	<0.001

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*(Signature)*  
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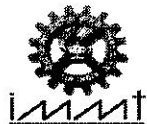
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Non NABL Test report – P.T.O

'End of Test Report'





# CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
TEST REPORT



Issued to : TATA STEEL LIMITED, MERAMANDALI	Date : 23.09.2024
Test report No – 08/2024-011	
Source of Sample : GALPADA	Sample receiving Date : 09.08.2024
Type of Sample : Well water	Sample Analysis Date : 09.08.2024

Sl No	Characteristics	Test Method (P) of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	0.59
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	6.88@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	252.0
4.	Total Hardness (as CaCO <sub>3</sub> ),mg/L	Part 21	200	600	166.0
5.	Calcium as Ca, mg/L	Part 40	75	200	54.51
6.	Magnesium as Mg, mg/L	Part 46	30	100	7.29
7.	Alkalinity as CaCO <sub>3</sub> , mg/L	Part 23	200	600	158.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	22.0
9.	Sulfate as SO <sub>4</sub> , mg/L	Part 24	200	400	21.26
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.22
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.29
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.025
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.048
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.096
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.001
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.001
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	<0.001
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	<0.001

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23.09.24  
**Dr. Arakshita Majhi**

Senior Principal Scientist

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Non NABL Test report – P.T.O

'End of Test Report'



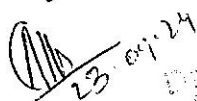
# CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	Date : 23.09.2024
Test report No – 08/2024-011	
Source of Sample : GALPADA	Sample receiving Date : 09.08.2024
Type of Sample : Well water	Sample Analysis Date : 09.08.2024

19.	*Color, Hazen units	Part 4	5	15	<5
20.	*Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	*Conductivity, $\mu\text{S}/\text{cm}$	Part 14	-	-	389
22.	*Total Suspended Solid, mg/l	Part 17	-	-	3.0
23.	*Nitrite as $\text{NO}_2$ , mg/L	Part 34	-	-	0.031
24.	*Nitrate as $\text{NO}_3$ , mg/L	Part 34	45	No relaxation	2.65
25.	Sodium, mg/l	Part 45	-	-	15.09
26.	Potassium, mg/l	Part 45	-	-	0.70
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.001
29.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	>542
30.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	5

Authorized Signatory

  
23.09.24

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Bhubaneswar, Odisha  
TEST REPORT



Issued to : TATA STEEL LIMITED, MERAMANDALI	Date : 23.09.2024
Test report No – 08/2024-003	
Source of Sample : Ganthagadia	Sample receiving Date : 09.08.2024
Type of Sample : Well water	Sample Analysis Date : 09.08.2024

Sl No	Characteristics	Test Method (P) of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	2.43
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.60@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	473.0
4.	Total Hardness (as CaCO <sub>3</sub> ),mg/L	Part 21	200	600	324.0
5.	Calcium as Ca, mg/L	Part 40	75	200	36.87
6.	Magnesium as Mg, mg/L	Part 46	30	100	56.38
7.	Alkalinity as CaCO <sub>3</sub> , mg/L	Part 23	200	600	240.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	40.0
9.	Sulfate as SO <sub>4</sub> , mg/L	Part 24	200	400	115.7
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.95
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.090
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.029
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.018
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.117
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.001
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.001
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	<0.001
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	<0.001

Authorized Signatory

  
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Senior Principal Scientist

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E mail - arakshita@immt.res.in

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Non NABL Test report – P.T.O

'End of Test Report'





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Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
**TEST REPORT**

Issued to : TATA STEEL LIMITED, MERAMANDALI

Date : 23.09.2024

Test report No – 08/2024-003

Source of Sample : Ganthigadia

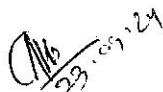
Sample receiving Date : 09.08.2024

Type of Sample : Well water

Sample Analysis Date : 09.08.2024

19.	*Color, Hazen units	Part 4	5	15	<5
20.	*Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	*Conductivity, $\mu\text{S}/\text{cm}$	Part 14	-	-	773
22.	*Total Suspended Solid, mg/l	Part 17	-	-	8.0
23.	*Nitrite as $\text{NO}_2$ , mg/L	Part 34	-	-	0.247
24.	*Nitrate as $\text{NO}_3$ , mg/L	Part 34	45	No relaxation	40.5
25.	Sodium, mg/l	Part 45	-	-	29.15
26.	Potassium, mg/l	Part 45	-	-	18.66
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.001
29.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	>542
30.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	21

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23.09.24

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Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
**TEST REPORT**

Issued to : TATA STEEL LIMITED, MERAMANDALI

Date : 23.09.2024

Test report No – 08/2024-004

Source of Sample : Khaliberena

Sample receiving Date : 09.08.2024

Type of Sample : Well water

Sample Analysis Date : 09.08.2024

19.	*Color, Hazen units	Part 4	5	15	<5
20.	*Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	*Conductivity, $\mu\text{S}/\text{cm}$	Part 14	-	-	481
22.	*Total Suspended Solid, mg/l	Part 17	-	-	5.0
23.	*Nitrite as $\text{NO}_2$ , mg/L	Part 34	-	-	0.037
24.	*Nitrate as $\text{NO}_3$ , mg/L	Part 34	45	No relaxation	5.65
25.	Sodium, mg/l	Part 45	-	-	15.12
26.	Potassium, mg/l	Part 45	-	-	3.43
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.001
29.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	>542
30.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	348

Authorized Signatory

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Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
**TEST REPORT**



Issued to : TATA STEEL LIMITED, MERAMANDALI	Date : 23.09.2024
Test report No – 08/2024-004	
Source of Sample : Khaliberena	Sample receiving Date : 09.08.2024
Type of Sample : Well water	Sample Analysis Date : 09.08.2024

Sl No	Characteristics	Test Method (P) of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	1.17
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.22@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	267.0
4.	Total Hardness (as CaCO <sub>3</sub> ),mg/L	Part 21	200	600	176.0
5.	Calcium as Ca, mg/L	Part 40	75	200	14.43
6.	Magnesium as Mg, mg/L	Part 46	30	100	34.02
7.	Alkalinity as CaCO <sub>3</sub> , mg/L	Part 23	200	600	200.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	18.0
9.	Sulfate as SO <sub>4</sub> , mg/L	Part 24	200	400	35.98
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.59
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.053
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.049
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.013
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.128
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.001
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.001
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	<0.001
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	<0.001

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*(Signature)*  
23.09.24

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Non NABL Test report – P.T.O

'End of Test Report'





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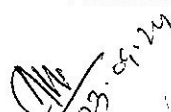
(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
**TEST REPORT**



Issued to : <b>TATA STEEL LIMITED, MERAMANDALI</b>	Date : <b>23.09.2024</b>
Test report No – <b>08/2024-009</b>	
Source of Sample : <b>KHARAGPRASAD</b>	Sample receiving Date : <b>09.08.2024</b>
Type of Sample : <b>Well water</b>	Sample Analysis Date : <b>09.08.2024</b>

Sl No	Characteristics	Test Method (P) of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	0.56
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	6.46@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	258.0
4.	Total Hardness (as CaCO <sub>3</sub> ),mg/L	Part 21	200	600	168.0
5.	Calcium as Ca, mg/L	Part 40	75	200	46.49
6.	Magnesium as Mg, mg/L	Part 46	30	100	12.64
7.	Alkalinity as CaCO <sub>3</sub> , mg/L	Part 23	200	600	140.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	30.0
9.	Sulfate as SO <sub>4</sub> , mg/L	Part 24	200	400	29.19
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.21
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.065
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.031
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.019
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.199
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.001
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.001
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	<0.001
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	<0.001

Authorized Signatory

  
23.09.24  
Senior Principal Scientist  
Environmental Chemical Lab  
IMMT, Bhubaneswar

**Dr. Arakshita Majhi**

Senior Principal Scientist

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Non NABL Test report – P.T.O

'End of Test Report'



# CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI

Date : 23.09.2024

Test report No – 08/2024-009

Source of Sample : KHARAGPRASAD

Sample receiving Date : 09.08.2024

Type of Sample : Well water

Sample Analysis Date : 09.08.2024

19.	*Color, Hazen units	Part 4	5	15	<5
20.	*Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	*Conductivity, $\mu\text{S}/\text{cm}$	Part 14	-	-	432
22.	*Total Suspended Solid, $\text{mg}/\text{l}$	Part 17	-	-	3.0
23.	*Nitrite as $\text{NO}_2$ , $\text{mg}/\text{L}$	Part 34	-	-	0.217
24.	*Nitrate as $\text{NO}_3$ , $\text{mg}/\text{L}$	Part 34	45	No relaxation	20.9
25.	Sodium, $\text{mg}/\text{l}$	Part 45	-	-	14.59
26.	Potassium, $\text{mg}/\text{l}$	Part 45	-	-	14.57
27.	Residual Free Chlorine, $\text{mg}/\text{l}$	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, $\text{mg}/\text{l}$	Part 37	0.01	No relaxation	<0.001
29.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	>542
30.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	17

Authorized Signatory

  
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'End of Test Report'

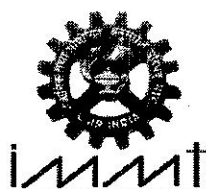
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(A Govt. of India Autonomous Body)

**Environmental Chemical Laboratory**

**Bhubaneswar, Odisha**

(An NABL Accredited Laboratory)



TC-12319

## TEST REPORT

Issued to: Tata Steel Limited, Meramandali

Date : 23.09.2024

Test Report No.08/2024-001

Sample Condition: In Plastic Jar

Sample quantity: 2 Litre

Sampling Method: APHA1060B

Source of Sample :Kisinda UP & Down stream

Sample Collected on: 09.08.2024

Letter Reference :

Sample Analysed on: 09.08.2024

Sl No	Characteristics	Test Method As Per APHA	Kisinda UP- stream	Kisinda down stream	Standard as per Class C-IS 2296/CPCB/SPCB
1	pH Value	APHA 4500H+ B	7.66	7.69	6.0-9.0
2	Colour	APHA 2120 B, C	<5	<5	300 (max)
3	Electrical Conductivity, $\mu\text{S}/\text{cm}$	APHA 2510 B	447	481	--
4	Total Dissolved Solids, mg/l	APHA 2540 C	232	263	1500 (max)
5	Dissolved Oxygen, mg/l	APHA 2540 C	6.2	5.8	4 (min)
6	BOD (3) days at 27°C	APHA 5210 B	5.2	1.6	3 (max)
7	Chloride , mg/l	APHA 4500Cl- B	26.0	26.0	600 (max)
8	Fluoride as F , mg/l	APHA 4500F- C	3.1	2.6	1.5 (max)
9	Sulphates (SO <sub>4</sub> ) , mg/l	APHA 4500 SO42- E	23.1	40.2	400 (max)
10	Nitrate as NO <sub>3</sub> , mg/l	APH4500 NO3- E	5.55	3.92	50 (max)
11	Hexa Chromium as Cr <sup>+6</sup> , mg/l	APHA 3500Cr B	0.016	0.024	0.05
12	Cyanide as CN , mg/l	APHA 4500 CN- C,D	<0.03	<0.03	0.05 (max)
13	Copper as Cu , mg/l	APHA 3111 B,C	0.019	0.026	1.5 (max)
14	Iron as Fe , mg/l	APHA 3500Fe, B	0.128	0.149	0.5 (max)
15	Cadmium as Cd , mg/l	APHA 3111 B,C	<0.003	<0.003	0.01 (max)
16	Selenium as Se, mg/l	APHA 3114 B	<0.001	<0.001	0.05 (max)

1 of 2

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E-Mail: [dir@immt.res.in](mailto:dir@immt.res.in).

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23/09/24

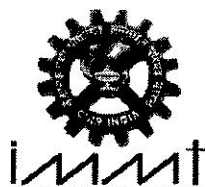
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## Environmental Chemical Laboratory

Bhubaneswar, Odisha

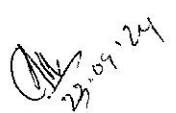
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### TEST REPORT

17	Arsenic as As, mg/l	APHA 3114 B	<0.001	<0.001	0.2 (max)
18	Lead as Pb(max), mg/l	APHA 3111 B,C	<0.001	<0.001	0.1 (max)
19	Zinc as Zn(max), mg/l	APHA 3111 B,C	0.129	0.053	15 (max)
20	Sodium Absorption Ratio	By Calculation	4.95	6.45	--
21	Total Coliform	APHA 9221 B	345	>542	5000
22	Fecal Coliform	APHA 9221 B	109	278	300
23	Manganese as Mn, mg/l		0.039	0.045	0.1
24	Sodium as Na, mg/l		23.67	31.24	
25	Potassium as K, mg/l		3.66	3.69	
26	Nickel as Ni, mg/l		<0.001	<0.001	0.02
27	Chemical Oxygen Demand, mg/l		24.0	28.0	
28	Free Ammonia, mg/l		<0.01	<0.01	0.5
29	Boron as B, mg/l		<0.01	<0.01	0.5

Authorized Signatory

  
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# CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
TEST REPORT



Issued to : TATA STEEL LIMITED, MERAMANDALI	Date : 23.09.2024
Test report No – 08/2024-008	
Source of Sample : KOCHILAMARA	Sample receiving Date : 09.08.2024
Type of Sample : Well water	Sample Analysis Date : 09.08.2024

Sl No	Characteristics	Test Method (P) of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	0.43
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.21@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	643.0
4.	Total Hardness (as CaCO <sub>3</sub> ), mg/L	Part 21	200	600	420.0
5.	Calcium as Ca, mg/L	Part 40	75	200	76.15
6.	Magnesium as Mg, mg/L	Part 46	30	100	55.89
7.	Alkalinity as CaCO <sub>3</sub> , mg/L	Part 23	200	600	362.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	58.0
9.	Sulfate as SO <sub>4</sub> , mg/L	Part 24	200	400	102.15
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.81
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.169
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.028
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.034
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.078
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.001
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.001
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.206
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	<0.001

## Authorized Signatory

  
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Senior Principal Scientist  
Phone : 0674-2379236,  
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Non NABL Test report – P.T.O

'End of Test Report'



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Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI

Date : 23.09.2024

Test report No – 08/2024-008

Source of Sample : KOCHILAMARA

Sample receiving Date : 09.08.2024

Type of Sample : Well water

Sample Analysis Date : 09.08.2024

19.	*Color, Hazen units	Part 4	5	15	<5
20.	*Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	*Conductivity, $\mu\text{s/cm}$	Part 14	-	-	1052
22.	*Total Suspended Solid, mg/l	Part 17	-	-	2.0
23.	*Nitrite as $\text{NO}_2$ , mg/L	Part 34	-	-	0.341
24.	*Nitrate as $\text{NO}_3$ , mg/L	Part 34	45	No relaxation	68.0
25.	Sodium, mg/l	Part 45	-	-	78.67
26.	Potassium, mg/l	Part 45	-	-	2.14
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.001
29.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	>542
30.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	7

Authorized Signatory

  
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'End of Test Report'

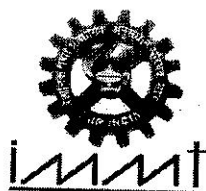
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## Environmental Chemical Laboratory

Bhubaneswar, Odisha

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TC-12319

### TEST REPORT

Issued to: Tata Steel Limited, Meramandali

Date : 23.09.2024

Test Report No.08/2024-002

Sample Condition: In Plastic Jar

Sample quantity: 2 Litre

Sampling Method: APHA1060B

Source of Sample :Lingra UP & Down stream

Sample Collected on: 09.08.2024

Letter Reference :

Sample Analysed on: 09.08.2024

Sl No	Characteristics	Test Method As Per APHA	Lingra UP- stream	Lingra down stream	Standard as per Class C-IS 2296/CPCB/SPCB
1	pH Value	APHA 4500H+ B	7.45	7.43	6.0-9.0
2	Colour	APHA 2120 B, C	<5	<5	300 (max)
3	Electrical Conductivity, $\mu\text{S}/\text{cm}$	APHA 2510 B	270	272	--
4	Total Dissolved Solids, mg/l	APHA 2540 C	145.0	151.0	1500 (max)
5	Dissolved Oxygen, mg/l	APHA 2540 C	5.4	5.8	4 (min)
6	BOD (3) days at 27°C	APHA 5210 B	1.6	2.0	3 (max)
7	Chloride , mg/l	APHA 4500Cl- B	16.0	14.0	600 (max)
8	Fluoride as F , mg/l	APHA 4500F- C	0.41	0.41	1.5 (max)
9	Sulphates (SO <sub>4</sub> ) , mg/l	APHA 4500 SO42- E	5.11	21.44	400 (max)
10	Nitrate as NO <sub>3</sub> , mg/l	APH4500 NO3- E	2.72	2.48	50 (max)
11	Hexa Chromium as Cr <sup>+6</sup> , mg/l	APHA 3500Cr B	0.012	0.014	0.05
12	Cyanide as CN , mg/l	APHA 4500 CN- C,D	<0.03	<0.03	0.05 (max)
13	Copper as Cu , mg/l	APHA 3111 B,C	0.020	0.019	1.5 (max)
14	Iron as Fe , mg/l	APHA 3500Fe, B	0.369	0.702	0.5 (max)
15	Cadmium as Cd , mg/l	APHA 3111 B,C	<0.001	<0.001	0.01 (max)

1 of 2

Laboratory: Acharya Vihar, Bhubaneswar, Odisha-751013. Tel: 0674-2379236, Mobile: 9760387460.

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23.09.24

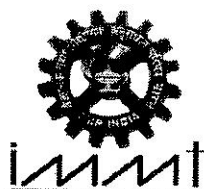
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## Environmental Chemical Laboratory

Bhubaneswar, Odisha

(An NABL Accredited Laboratory)



### TEST REPORT

16	Selenium as Se, mg/l	APHA 3114 B	<0.001	<0.001	0.05 (max)
17	Arsenic as As, mg/l	APHA 3114 B	<0.001	<0.001	0.2 (max)
18	Lead as Pb(max), mg/l	APHA 3111 B,C	<0.001	<0.001	0.1 (max)
19	Zinc as Zn(max), mg/l	APHA 3111 B,C	0.063	0.081	15 (max)
20	Sodium Absorption Ratio	By Calculation	3.88	3.56	--
21	Total Coliform (CFU/ml)	APHA 9221 B	542	>542	5000
22	Fecal Coliform (CFU/ml)	APHA 9221 B	348	120	300
23	Manganese as Mn, mg/l		0.083	0.064	0.1
24	Sodium as Na, mg/l		15.12	14.69	
25	Potassium as K, mg/l		3.43	3.37	
26	Nickel as Ni, mg/l		<0.001	<0.001	0.02
27	Chemical Oxygen Demand, mg/l		12.0	16.0	
28	Free Ammonia, mg/l		<0.01	<0.01	0.5
29	Boron as B, mg/l		<0.01	<0.01	0.5

Authorized Signatory

*(Signature)*  
23.09.24

**Dr Arakshita Majhi**

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2 of 2

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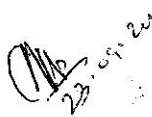
# CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	Date : 23.09.2024
Test report No – 08/2024-010	
Source of Sample : MOTANGA	Sample receiving Date : 09.08.2024
Type of Sample : Well water	Sample Analysis Date : 09.08.2024

19.	*Color, Hazen units	Part 4	5	15	<5
20.	*Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	*Conductivity, $\mu\text{S}/\text{cm}$	Part 14	-	-	1094
22.	*Total Suspended Solid, mg/l	Part 17	-	-	5.0
23.	*Nitrite as $\text{NO}_2$ , mg/L	Part 34	-	-	0.102
24.	*Nitrate as $\text{NO}_3$ , mg/L	Part 34	45	No relaxation	25.6
25.	Sodium, mg/l	Part 45	-	-	77.71
26.	Potassium, mg/l	Part 45	-	-	2.99
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.001
29.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	221
30.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	79

Authorized Signatory

 23.09.24  
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*'End of Test Report'*



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(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha



## TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	Date : 23.09.2024
Test report No – 08/2024-010	
Source of Sample : MOTANGA	Sample receiving Date : 09.08.2024
Type of Sample : Well water	Sample Analysis Date : 09.08.2024

Sl No	Characteristics	Test Method (P) of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	0.73
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	6.97@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	697.0
4.	Total Hardness (as CaCO <sub>3</sub> ),mg/L	Part 21	200	600	418.0
5.	Calcium as Ca, mg/L	Part 40	75	200	84.17
6.	Magnesium as Mg, mg/L	Part 46	30	100	50.54
7.	Alkalinity as CaCO <sub>3</sub> , mg/L	Part 23	200	600	326.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	70.0
9.	Sulfate as SO <sub>4</sub> , mg/L	Part 24	200	400	139.13
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.80
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.068
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.026
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.014
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.197
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.001
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.001
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	<0.001
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	<0.001

Authorized Signatory

*(Signature)*  
23.09.24

**Dr. Arakshita Majhi**

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Non NABL Test report – P.T.O

'End of Test Report'



# CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
**TEST REPORT**



Issued to : <b>TATA STEEL LIMITED, MERAMANDALI</b>	Date : <b>23.09.2024</b>
Test report No – <b>08/2024-013</b>	
Source of Sample : <b>NARENDRAPUR</b>	Sample receiving Date : <b>09.08.2024</b>
Type of Sample : <b>Well water</b>	Sample Analysis Date : <b>09.08.2024</b>

Sl No	Characteristics	Test Method (P) of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	4.08
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.22@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	535.0
4.	Total Hardness (as CaCO <sub>3</sub> ),mg/L	Part 21	200	600	318.0
5.	Calcium as Ca, mg/L	Part 40	75	200	11.22
6.	Magnesium as Mg, mg/L	Part 46	30	100	70.47
7.	Alkalinity as CaCO <sub>3</sub> , mg/L	Part 23	200	600	264.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	48.0
9.	Sulfate as SO <sub>4</sub> , mg/L	Part 24	200	400	79.51
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.68
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.027
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.027
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.008
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.086
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.001
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.001
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	<0.001
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	<0.001

Authorized Signatory

  
23.09.24  
Dr. Arakshita Majhi  
Senior Principal Scientist  
Environmental Chemical Lab (ISO17025:2017)  
Environmental & Sustainability Department  
Institute of Minerals & Materials Technology  
Bhubaneswar-751013, Odisha, India

**Dr. Arakshita Majhi**  
Senior Principal Scientist  
Phone : 0674-2379236,  
E mail - arakshita@immt.res.in

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Non NABL Test report – P.T.O

'End of Test Report'



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(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI

Date : 23.09.2024

Test report No – 08/2024-013

Source of Sample : NARENDRAPUR

Sample receiving Date : 09.08.2024

Type of Sample : Well water

Sample Analysis Date : 09.08.2024

19.	*Color, Hazen units	Part 4	5	15	<5
20.	*Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	*Conductivity, $\mu\text{s/cm}$	Part 14	-	-	842
22.	*Total Suspended Solid, mg/l	Part 17	-	-	10.0
23.	*Nitrite as $\text{NO}_2$ , mg/L	Part 34	-	-	0.267
24.	*Nitrate as $\text{NO}_3$ , mg/L	Part 34	45	No relaxation	51.9
25.	Sodium, mg/l	Part 45	-	-	55.50
26.	Potassium, mg/l	Part 45	-	-	6.39
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.001
29.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	348
30.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	11

Authorized Signatory

  
**Dr. Arakshita Majhi**  
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Phone : 0674-2379236,  
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6. Testing parameters which are not set limitation has marked as "-".

'End of Test Report'





# CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
**TEST REPORT**



Issued to : <b>TATA STEEL LIMITED, MERAMANDALI</b>	Date : <b>23.09.2024</b>
Test report No – <b>08/2024-005</b>	
Source of Sample : <b>SARAPA</b>	Sample receiving Date : <b>09.08.2024</b>
Type of Sample : <b>Well water</b>	Sample Analysis Date : <b>09.08.2024</b>

Sl No	Characteristics	Test Method (P) of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	0.49
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.48@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	505.0
4.	Total Hardness (as CaCO <sub>3</sub> ),mg/L	Part 21	200	600	390.0
5.	Calcium as Ca, mg/L	Part 40	75	200	79.36
6.	Magnesium as Mg, mg/L	Part 46	30	100	46.66
7.	Alkalinity as CaCO <sub>3</sub> , mg/L	Part 23	200	600	304.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	42.0
9.	Sulfate as SO <sub>4</sub> , mg/L	Part 24	200	400	92.59
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.55
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.204
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.024
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.018
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.098
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.001
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.001
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.153
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	<0.001

Authorized Signatory

**Dr. Arakshita Majhi**

Senior Principal Scientist

Phone : 0674-2379236,

E mail - arakshita@immt.res.in

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Non NABL Test report – P.T.O

'End of Test Report'



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(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI

Date : 23.09.2024

Test report No – 08/2024-005

Source of Sample : SARAPA


Sample receiving Date : 09.08.2024

Type of Sample : Well water

Sample Analysis Date : 09.08.2024

19.	*Color, Hazen units	Part 4	5	15	<5
20.	*Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	*Conductivity, $\mu\text{S}/\text{cm}$	Part 14	-	-	790
22.	*Total Suspended Solid, mg/l	Part 17	-	-	6.0
23.	*Nitrite as $\text{NO}_2$ , mg/L	Part 34	-	-	0.079
24.	*Nitrate as $\text{NO}_3$ , mg/L	Part 34	45	No relaxation	4.39
25.	Sodium, mg/l	Part 45	-	-	20.54
26.	Potassium, mg/l	Part 45	-	-	1.63
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.001
29.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	542
30.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	< 2

Authorized Signatory

  
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'End of Test Report'



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(A Govt. of India Autonomous Body)  
Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
**TEST REPORT**



Issued to : <b>TATA STEEL LIMITED, MERAMANDALI</b>	Date : <b>23.09.2024</b>
Test report No – <b>08/2024-006</b>	
Source of Sample : <b>SIBAPUR</b>	Sample receiving Date : <b>09.08.2024</b>
Type of Sample : <b>Well water</b>	Sample Analysis Date : <b>09.08.2024</b>

Sl No	Characteristics	Test Method (P) of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	2.03
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.42@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	240.0
4.	Total Hardness (as CaCO <sub>3</sub> ),mg/L	Part 21	200	600	154.0
5.	Calcium as Ca, mg/L	Part 40	75	200	52.10
6.	Magnesium as Mg, mg/L	Part 46	30	100	5.83
7.	Alkalinity as CaCO <sub>3</sub> , mg/L	Part 23	200	600	126.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	24.0
9.	Sulfate as SO <sub>4</sub> , mg/L	Part 24	200	400	33.46
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.64
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.113
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.039
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.019
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.277
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.001
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.001
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	<0.001
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	<0.001

Authorized Signatory

  
23.09.24

**Dr. Arakshita Majhi**  
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Non NABL Test report – P.T.O

'End of Test Report'



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Environmental Chemical Laboratory  
Bhubaneswar, Odisha  
TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI

Date : 23.09.2024

Test report No – 08/2024-006

Source of Sample : SIBAPUR

Sample receiving Date : 09.08.2024

Type of Sample : Well water

Sample Analysis Date : 09.08.2024

19.	*Color, Hazen units	Part 4	5	15	<5
20.	*Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	*Conductivity, $\mu\text{S}/\text{cm}$	Part 14	-	-	415
22.	*Total Suspended Solid, mg/l	Part 17	-	-	8.0
23.	*Nitrite as $\text{NO}_2$ , mg/L	Part 34	-	-	0.148
24.	*Nitrate as $\text{NO}_3$ , mg/L	Part 34	45	No relaxation	25.30
25.	Sodium, mg/l	Part 45	-	-	16.38
26.	Potassium, mg/l	Part 45	-	-	13.85
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.001
29.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	>542
30.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	32

Authorized Signatory

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*'End of Test Report'*





# Visiontek Consultancy Services Pvt. Ltd.

(Committed For Better Environment)

ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017 Certified

Ref. no: Envlab/24-25/TR-12306

Date: 18.11.2024

## ASH ANALYSIS REPORT

1. Name of the Indus : M/s TATA Steel Limited Meramandali, Dhenkanal
2. Sampling Location : S-1: Fly Ash collected from BFPP-1  
: S-2: Bed Ash collected from BFPP-1  
: S-3: Fly ash collected from AEL-165  
: S-4: Bed ash collected from ASL-165
3. Date of Sampling : 11.11.2024
4. Date of Analysis : 12.11.2024 to 18.11.2024
5. Sample Collected by : VCSPL Representative

Sl. No.	Name of the Parameters	Unit	Govt. of India, MoEF & CC Schedule-II based on leachable concentration limits (TCLP) or Soluble Threshold limit Concentration (STLC), Class A2016	Analysis Results			
				S-1	S-2	S-3	S-4
01	Arsenic as As	mg/l	5.0 mg/l	0.004	0.002	0.003	0.002
02	Barium as Ba	mg/l	100.0 mg/l	BDL	BDL	BDL	BDL
03	Cadmium as cd	mg/l	1.0 mg/l	BDL	BDL	BDL	BDL
04	Chromium as Cr	mg/l	5.0 mg/l	BDL	BDL	BDL	BDL
05	Lead as Pb	mg/l	5.0 mg/l	BDL	BDL	BDL	BDL
06	Mercury as Hg	mg/l	0.2 mg/l	BDL	BDL	BDL	BDL
07	Selenium as Se	mg/l	1.0 mg/l	0.003	0.003	0.003	0.003
08	Iron as Fe	mg/l	--	0.81	0.41	0.69	0.36
09	Nickel as Ni	mg/l	20.0 mg/l	0.22	0.16	0.24	0.17
10	Zinc as Zn	mg/l	250.0 mg/l	0.48	0.35	0.49	0.33
11	Manganese as Mn	mg/l	10.0 mg/l	0.41	0.28	0.50	0.32
12	Cobalt as Co	mg/l	80.0 mg/l	BDL	BDL	BDL	BDL
13	Copper as Cu	mg/l	25.0 mg/l	0.37	0.28	0.39	0.26
14	Vanadium as V	mg/l	24.0 mg/l	BDL	BDL	BDL	BDL
15	Aluminium as Al	mg/l	--	4.7	4.3	5.3	4.8
16	Fluoride as F	mg/l	180.0 mg/l	1.79	1.31	1.89	1.36

Reviewed By:   


Approved By:   


## CSR Expenditure and Activities

(Around Tata Steel Ltd, Meramandali &amp; TSM-CPP(AEL))

Period: From April'24 to October'24

PROGRAM HEAD	Expenditure in Lakh	MAJOR INTERVENTIONS/REMARKS
HEALTH	62.07	Public Health Unit; Rishta; Project Drishti
Agriculture	57.18	Agricultural activity
Environment	2.91	Plantation
Skill Development	6.89	Disability program
DRINKING WATER	61.72	Installation of tubewells; supply of drinking water
EDUCATION	307.98	School infrastructure; Education project: Green school project
SPORTS	4.86	
Miscellaneous	189.25	
<b>TOTAL</b>	<b>692.86</b>	

**Environment Laboratory**  
**TATA Steel Meramandali, Odisha**

Ref.No.EMD/LAB/2024/0002

			April-24	May-24	June-24	July-24	August-24	September-24
S. N	Name of the unit	Location	Leq					
1	RMPP	Near CSB-1 I D Fan	81.7	SD	83	82.5	SD	83.5
		Near CSB-2 I D Fan	SD	85.1	84.1	85.1	SD	84.9
		Near BB plant site office	78.5	80.3	79.3	78.6	77.9	80.2
		Near P.C.S building	80	81.5	78.4	80.9	SD	81.1
		Near T.C.S building	79.6	81.7	80	81.6	SD	82.3
		Near S.C.S building	79.8	82	79.9	81.4	SD	80.7
		Control Room Office	58.7	56	58.4	58.1	60.7	58.5
		Near Pumphouse Area	80.4	80.5	83.4	81.2	80.6	81.1
		Near O.P.S building	81.8	81.4	82.6	81.5	80.1	80.6
		Near O.S.C building	82.5	82.4	82	81.7	79.6	80.4
		Near O.T.C building	83	82.6	81.5	82.3	83.5	83.6
2	110 MW Compressor House AEL	Near Entrance Point	84.1	82.1	83.8	84.2	84.5	83.5
		Near Compressor	90.2	92.3	90.7	91.5	92.3	92.8
		Inside Operator office	79.7	80.3	75.1	80	75.9	80.3
	150 MW Ash Conveying Compressor House AEL	Near Entrance Point	85.1	84.4	84.5	85.8	85.2	85.1
		Near Compressor	91.7	90.4	91	92	90.3	93.6
		Inside Operator office	81.4	80.6	76.3	79.9	76.5	81.4
3	165 MW Compressor House AEL	Near Entrance Point	81.7	82.5	79.3	81.5	85.1	80.5
		Near Compressor	92	90.3	92	91.7	91.9	92.8
		Inside Operator office	78.6	77.5	69.2	80.2	80.1	80.4
4	300 MW Power Plant AEL	<b>CFBC Boiler-1</b>						
		Near ID Fan-1	SD	SD	SD	SD	SD	SD
		Near ID Fan-2	SD	SD	SD	SD	SD	SD
		Near S A Fan	SD	SD	SD	SD	SD	SD
		Near P.A. Fan	SD	SD	SD	SD	SD	SD
		Near Boiler -1 Area	SD	SD	SD	SD	SD	SD
		<b>CFBC- Boiler-2</b>						
		Near ID Fan-1	SD	85.4	85.9	SD	SD	85.9
		Near ID Fan-2	SD	85.8	86	SD	SD	85.7
		Near S A Fan	SD	91	95.5	SD	SD	91.3
		Near P.A. Fan	SD	91.1	96	SD	SD	91.5
		Near Boiler -2 Area	SD	84.5	84.9	SD	SD	85.8
		<b>CFBC- Boiler-3</b>						
		Near ID Fan-1	85.8	84.9	86.8	85.1	SD	85.2
		Near ID Fan-2	86.1	85.1	86.2	85.4	SD	85.9
		Near S A Fan	90.7	90.4	94.5	94.1	SD	91.8
		Near P.A. Fan	90.9	91.6	94.3	94.7	SD	91.2
		Near Boiler -3 Area	85.6	85.1	84.8	84.1	SD	85
		<b>CFBC- Boiler-4</b>						
		Near ID Fan-1	85.4	SD	84.1	84.4	SD	85.1
		Near ID Fan-2	86	SD	83.6	84	SD	85.4
		Near S A Fan	90.5	SD	94.3	93.7	SD	92
		Near P.A. Fan	91	SD	93.7	94.2	SD	91.3
		Near Boiler -4	85.2	SD	83.9	84.6	SD	85.8

**Environment Laboratory**  
**TATA Steel Meramandali, Odisha**

			April-24	May-24	June-24	July-24	August-24	September-24
S. N	Name of the unit	Location	Leq					
5	185 MW Power Plant AEL	<b>CFBC- Boiler-5</b>						
		Near ID Fan-1	78.2	80	83.1	80.4	80.3	SD
		Near ID Fan-2	79.3	80.3	82.6	80.5	80.5	SD
		Near S A Fan	92.1	91.7	87.1	91.5	91.7	SD
		Near P.A. Fan	91.3	91.5	88.8	91.1	91.5	SD
		Near Boiler -5	85.4	85.8	84.7	85.1	85.1	SD
		<b>CFBC- Boiler-6</b>						
		Near ID Fan-1	80	80.8	SD	80.1	81.6	SD
		Near ID Fan-2	80.2	81.6	SD	80.4	80.7	SD
		Near S A Fan	91.5	91	SD	90.5	91.6	SD
		Near P.A. Fan	90.8	91.6	SD	91.4	91.4	SD
		Near Boiler -6	86	85.4	SD	85.3	83.9	SD
		Near Silo Area	84.8	84.3	84.5	83.5	83.7	82.5
		Near 150 MW TG	91.1	90.4	89.8	90.1	90	90.1
		Near 165 MW TG	91.5	90.2	90.6	90	89.6	90.5
		Control Room Office	59.3	61.5	61.8	61.8	59.3	60.8

**SUMMARY OF AMBIENT AIR QUALITY  
MONTHLY AVERAGE VALUES**

Month	Locations of Monitoring	Monthly Average				
		Unit in $\mu\text{g}/\text{m}^3$				Unit in $\text{mg}/\text{m}^3$
	Pollutant	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
	Standard	100	60	80	80	2
Apr'24	CAAQMS-1	102.28	62.32	10.93	18.19	0.65
	CAAQMS-2	175.93	65.91	21.66	11.29	0.73
	CAAQMS-3	190.14	57.82	6.32	17.72	0.74
	CAAQMS-4	188.94	92.00	6.74	15.49	0.25
	CAAQMS-5	242.45	103.72	14.83	10.14	0.26
	CAAQMS-6	187.03	42.24	9.46	21.26	0.60
	CAAQMS-7	171.23	56.78	47.08	22.41	0.75
May'24	CAAQMS-1	96.68	42.29	10.96	18.44	0.65
	CAAQMS-2	197.94	49.97	21.52	10.88	0.73
	CAAQMS-3	188.34	46.43	2.46	17.04	0.73
	CAAQMS-4	180.35	64.39	5.92	8.59	0.25
	CAAQMS-5	212.01	79.43	12.89	8.09	0.96
	CAAQMS-6	119.63	54.33	8.74	26.53	1.00
	CAAQMS-7	88.12	30.45	42.26	15.57	0.74
June'24	CAAQMS-1	69.79	33.19	10.94	18.23	0.65
	CAAQMS-2	133.17	44.09	22.35	10.14	0.73
	CAAQMS-3	140.52	38.25	2.47	17.10	0.74
	CAAQMS-4	129.88	46.72	5.63	7.52	0.25
	CAAQMS-5	172.83	66.47	14.20	8.11	0.29
	CAAQMS-6	111.10	43.96	9.98	25.51	0.61
	CAAQMS-7	81.98	31.77	42.92	14.76	0.74
July'24	CAAQMS-1	60.65	23.87	11.18	18.23	0.65
	CAAQMS-2	69.64	26.84	23.40	10.92	0.73
	CAAQMS-3	130.47	40.19	2.88	18.68	0.73
	CAAQMS-4	64.11	26.06	6.57	7.56	0.25
	CAAQMS-5	70.88	23.19	12.56	7.37	0.26
	CAAQMS-6	93.72	32.33	14.15	22.00	1.00
	CAAQMS-7	79.19	31.86	42.77	15.56	0.74



Aug'24	CAAQMS-1	39.77	13.36	10.94	18.17	0.66
	CAAQMS-2	70.70	26.51	22.80	10.40	0.73
	CAAQMS-3	116.34	44.98	2.42	18.57	0.73
	CAAQMS-4	41.51	14.87	5.50	7.25	0.25
	CAAQMS-5	64.21	22.33	17.89	8.22	0.96
	CAAQMS-6	103.24	34.32	17.38	22.77	1.00
	CAAQMS-7	81.22	32.12	44.71	16.96	0.74
Sept'24	CAAQMS-1	53.36	14.71	12.02	19.18	0.65
	CAAQMS-2	117.33	33.27	22.93	12.45	0.73
	CAAQMS-3	109.91	35.40	2.13	18.83	0.74
	CAAQMS-4	41.72	16.18	5.62	7.97	0.24
	CAAQMS-5	69.92	23.59	16.41	14.66	0.26
	CAAQMS-6	85.08	35.78	15.30	21.52	1.00
	CAAQMS-7	82.82	36.70	46.91	15.00	0.74

All values are in  $\mu\text{g}/\text{m}^3$  except CO values are in  $\text{mg}/\text{m}^3$ . All Values are derived from 24 hourly average data except CO values which are derived from 8 hourly average data.

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

01C



## ANGUL ENERGY LIMITED

(Formerly Bhushan Energy Limited)

AEL/SPCB/AE-06/2024-02/140

May 29, 2024

### The Member Secretary

Central Pollution Control Board,  
Parivesh Bhawan, East Arjun Nagar,  
Delhi - 110032

**Subject:** Submission of annual implementation report for the financial year 2023-24.

**Reference:** I. CPCB letter No. IPC-II/TPP/CP-II/76/2022/1252 dtd. 06.03.2023.

II. Fly Ash Notification dated 14<sup>th</sup> September 1999 and its amendment.

Dear Sir,

This has reference to the captioned subject and letter cited above. We are submitting herewith the annual implementation report of Angul Energy Limited at Ganthagadia, Angul, Odisha for the year 2023-24 (From 01.04.2023 to 31.03.2024) in the prescribed format.

This is for your kind information and necessary action.

Thanking you

Yours faithfully,  
**For Angul Energy Limited**

  
**Rajesh Agarwal**

**Managing Director, AEL**

Encl: As above



**Copy to:** I. The Member Secretary, State Pollution Control Board, Parivesh Bhawan A/118, Nilakhanta Nagar, Unit -VIII, Bhubaneswar, Odisha,  
II. The Dy. Director General of Forests, (Central) Govt. of India, MoEF&CC Integrated Regional Office, A/3 Chandrasekharapur, Bhubaneswar.  
III. Chief Engineer (TCD) Central Electricity Authority (CEA), New Delhi.  
IV. Regional Officer, Odisha State Pollution Control Board, Angul, Odisha



Ganthigadia, P.O. Nuahata, Via Banarpal, Dist. Angul 759 128

Registered Office: Ground Floor, Mira Corporate Suites, Plot No. 1 & 2, Ishwar Nagar, Mathura Road, New Delhi 110 065  
Tel: +91 11 3919 4000, Fax: 91 11 4101 0050, E-mail: ael@anugulenergy.co.in, Website: www.angulenergy.co.in, CIN No: U40105DL2005PLC140748

**Ash Compliance/Implementation Report**  
**(For the period 1<sup>st</sup> April-31<sup>st</sup> March) to be submitted on or before 31<sup>st</sup> May.**

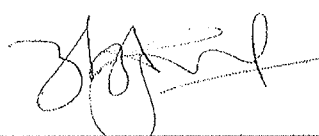
Sl.No.	Details	
1.	Name of Power Plant	Angul Energy Limited
2.	Name of the company	Angul Energy Limited
3.	District	Angul
4.	State	Odisha
5.	Postal address for communication:	At - Ganthagadia, PO - Nuahata, Via - Banarpal, Dist – Angul 759128
6.	E-mail:	ael@angulenergy.co.in/ santosh.pattajoshi@tatasteel.com/ anoop.srivastava@tatasteel.com
7.	Power Plant installed capacity (MW):	465 MW
8.	Plant Load Factor (PLF):	47.99%
9.	No. of units generated (MWh):	1960040
10.	Total area under power plant (ha): (Including area under ash ponds)	40.48 Ha
11.	Quantity of coal consumption during reporting period (Metric Tons per Annum):	1690055
12.	Average ash content in percentage (per cent):	45.76% (wet basis)
13.	Quantity of current ash generation during reporting period (Metric Tons per Annum):	773450
	Fly ash (Metric Tons per Annum):	672865
	Bottom ash (Metric Tons per Annum):	100585
14.	Capacity of dry fly ash storage silo(s) (Metric Tons)	8500
15.	Details of utilisation of current ash generated during reporting period (a) Total quantity of current ash utilised (MTPA) during reporting period:	673320
	(b) Quantity of fly ash utilised (MTPA):	
	(i) Fly ash-based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):	88395
	(ii) Cement manufacturing:	191913
	(iii) Ready mix concrete:	Nil

	(iv) Ash and Geo-polymer-based construction material:	Nil	Fig
	(v) Manufacturing of sintered or cold bonded ash aggregate:	Nil	
	(vi) Construction of roads, road and fly over embankment:	308843	
	(vii) Construction of dams:	Nil	
	(viii) Filling up of low-lying area/stone quarry:	10755	
	(ix) Filling of mine voids/ abandoned stone quarry:	33444	
	(x) Use in overburden dumps:	Nil	
	(xi) Agriculture:	Nil	
	(xii) Construction of shoreline protection structures in coastal districts:	Nil	
	(xiii) Export of ash to other countries:	Nil	
	(xiv) Others (please specify):	79970	
	<b>(c) Quantity of bottom ash utilised (MTPA):</b>	<b>100244</b>	
	(i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):	51846	
	(ii) Cement manufacturing:	Nil	
	(iii) Ready mix concrete:	Nil	
	(iv) Ash and Geo-polymer based construction material:	Nil	
	(v) Manufacturing of sintered or cold bonded ash aggregate:	Nil	
	(vi) Construction of roads, road and flyover embankment:	39844	
	(vi) Construction of dams:	Nil	
	(vii) Filling up of low lying area:	90	
	(vii) Filling of mine voids/ abandoned stone quarry:	8464	
	(viii) Use in overburden dumps:	Nil	
	(ix) Agriculture:	Nil	
	(x) Construction of shoreline protection structures in coastal districts:	Nil	
	(xi) Export of ash to other countries:	Nil	
	(xii) Others (please specify):	Nil	
	<b>Total quantity of current ash unutilised (MTPA) during reporting period:</b>	<b>341</b>	

16.	Percentage utilisation of current ash generated during reporting period (percent):	100%	Fig
17.	Details of disposal of ash in ash ponds	Nil	
	(a) Total quantity of ash disposed in ash pond (s) (Metric Tons) as on 31st March (excluding reporting period):	NA	
	(b) Quantity of ash disposed in ash pond(s) during reporting period (Metric Tons):	NA	
	(c) Total quantity of water consumption for slurry discharge into ash ponds during reporting period (m3):	NA	
	(d) Total number of ash ponds:	NA	
	(i) Active:	NA	
	(ii) Exhausted (yet to be reclaimed):	NA	
	(iii) Reclaimed:	NA	
	(e) total area under ash ponds (ha):	NA	
18.	Individual ash pond details Ash pond-1,2, etc (please provide below mentioned details separately, if number of ash ponds is more than one)	Interim ash pond (4.8 Acre) has been constructed to manage ash in case of emergency.	
	(a) Status: Under construction or Active or Exhausted or Reclaimed:	NA	
	(b) Date of start of ash disposal in ash pond (DD/MM/YYYY or MMYYYY):	NA	
	(c) Date of stoppage of ash disposal in ash pond after completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds)	N	
	(c) area (hectares):	NA	
	(d) dyke height (m):	NA	
	(d) volume (m3):	NA	
	(e) quantity of ash disposed as on 31st March (Metric Tons):	NA	
	(f) available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons):	NA	



	<p>(g) expected life of ash pond (number of years and months):</p> <p>(e) co-ordinates (Lat and Long): (Please specify minimum 4 co-ordinates)</p> <p>(f) type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining</p>	<p>NA</p> <p>NA</p> <p>NA</p>
	<p>(g) mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD)</p> <p>(h) Ratio of ash: water in slurry mix (1:___):</p> <p>(i) Ash water recycling system (AWRS) installed and functioning: Yes or No</p> <p>(j) Quantity of wastewater from ash pond discharged into land or water body (m3):</p> <p>(k) Last date when the dyke stability study was conducted and name of the organisation who conducted the study:</p> <p>(l) Last date when the audit was conducted and name of the organisation who conducted the audit:</p>	<p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p>
19.	<p>Quantity of legacy ash utilised (MTPA):</p> <ol style="list-style-type: none"> <li>Fly ash-based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):</li> <li>Cement manufacturing:</li> <li>Ready mix concrete:</li> <li>Ash and Geo-polymer-based construction material:</li> <li>Manufacturing of sintered or cold bonded ash aggregate:</li> <li>Construction of roads, road and flyover embankment:</li> <li>Construction of dams:</li> <li>Filling up of low lying area:</li> <li>Filling of mine voids:</li> <li>Use in overburden dumps:</li> <li>Agriculture:</li> <li>Construction of shoreline protection structures in coastal districts;</li> <li>Export of ash to other countries:</li> <li>Others (please specify):</li> </ol>	<p>vi. 455 Tonnes</p>

20.	Summary: <span style="float: right;">१५</span>			
	Details	Quantity generated (MTPA)	Quantity utilised and (MTPA) (percent)	Balance quantity (MTPA)
	Current ash during reporting period	773450	773109 and 99.9%	341
	Legacy ash	455	455 and 100%	
	Total	773905	773564	341
21.	Any other information: Soft copy of the annual compliance report, and shape files of power plant and ash ponds may be e-mailed to:- moefcccoalash@gov.in		Will be sent through mail	
22.	Signature of Authorised Signatory			

**SUMMARY OF GASEOUS EMISSION****Period: From April 2024 to September 2024**

<b>AEL, CEMS- 1 (Boiler 1 &amp; 2)</b>				<b>AEL, CEMS- 2 (Boiler 3 &amp; 4)</b>			<b>AEL, CEMS- 3 (Boiler 5 &amp; 6)</b>		
<b>Month</b>	<b>PM in mg/m<sup>3</sup></b>	<b>SO2 in mg/m<sup>3</sup></b>	<b>NOx in mg/m<sup>3</sup></b>	<b>PM in mg/m<sup>3</sup></b>	<b>SO2 in mg/m<sup>3</sup></b>	<b>NOx in mg/m<sup>3</sup></b>	<b>PM in mg/m<sup>3</sup></b>	<b>SO2 in mg/m<sup>3</sup></b>	<b>NOx in mg/m<sup>3</sup></b>
April, 24	17.94	798.69	83.67	34.92	1063.59	101.87	32.12	1044.33	177.59
May, 24	19.05	954.93	97.89	28.42	1207.15	99.51	27.84	688.80	125.97
June, 24	24.76	888.30	85.23	33.73	996.17	87.6	27.49	791.50	113.09
July, 24	SD			30.14	942.68	131.57	619.61	85.64	83.20
August, 24	17.03	827.31	82.29	30.52	549.13	76.13	28.04	1072.43	159.13
September, 24	22.28	910.23	94.56	28.21	1204.14	97.59	22.84	606.74	119.13