

To, The Additional Principal Chief Conservator of Forest, Regional Office (Eastern Central Zone) Ministry of Environment, Forests and Climate Change, Govt. of India Bungalow No. A-2, Shyamali Colony, Ranchi – 834002, Jharkhand.

Ref No. - JMB/ENV/KOCP/24/ 397 /2021

May 28, 2021

Ref.: Environmental Clearance letter no. - J-11015/252/2005-IA.II (M) dated June 22, 2006

SUB: Half Yearly Compliance Status Report of Environment Clearance conditions issued by MoEF&CC, New Delhi to Kalimela Open Cast Project, Tata Steel Limited, Dhanbad for the period October'20 to March'21

Dear Sir,

We are enclosing herewith compliance report for the period **October'20 to March'21** for the EC granted vide letter no.- J-11015/252/2005-IA.II(M), Dated-22<sup>nd</sup> June 2006 issued by Ministry of Environment, Forest and Climate Change, New Delhi.

Copy of the compliance report is also being sent in soft format through email at  $\underline{\text{ro.ranchi-}} \underset{\text{mef}(\widehat{a}, \text{gov.in})}{\text{mef}(\widehat{a}, \text{gov.in})}$  for your kind perusal. We trust the information furnished is in line with your requirement.

Thanking you,

Yours faithfully,

Head<sup>(</sup>(Planning) Jharia Division, Tata Steel Ltd.

Encl: As above.

- Copy to: Member Secretary, CPCB, Eastern Zonal Office, Southend Conclave, 502, 5<sup>th</sup> Floor 1582, Rajdanga Main Road, Kolkata -700107.
- Copy to: Member Secretary, JSPCB, T.A. Division Building (Ground Floor), H.E.C, Dhurwa, Ranchi 834004.
- Copy to: Regional Officer, JSPCB, HIG-1 Sardar Patel Nagar, Housing Colony, Hirapur, Dhanbad

#### TATA STEEL LIMITED

Jharia Collieries Jamadoba 828 112 Dhanbad India Tel 91 326 2320263/2320265/2320267 Fax 91 326 2320268 HALF YEARLY COMPLIANCE REPORT (PERIOD: OCTOBER'20 – MARCH'21)

## OCP KALIMELA PROJECT UNDER JAMADOBA COLLIERY



## TATA STEEL LIMITED, JHARIA DIVISION

P.O.- JAMADOBA, DIST. - DHANBAD, STATE- JHARKHAND, PIN CODE – 828112.

ENVIRONMENTAL CLEARANCE GRANTED VIDE LETTER NO. - J-11015/252/2005-IA.II(M) DATED- 22<sup>ND</sup> JUNE 2006 ISSUED BY GOVT. OF INDIA, MINISTRY OF ENVIRONMENT & FOREST, NEW DELHI.

S. No.	Condition	Compliance Status
Specif	ic Condition:	
(i)	All the conditions stipulated by SPCB in their NOC no N-35 dated 31.01.2005 are to be implemented effectively.	NOC conditions are being complied with. The open cast operations have ceased, and no raw coal production has been taking place since Nov'2014. Now backfilling of the mine void by the OB is going on which is expected to be completed by Mar'22.
(ii)	The bund/embankment shall be designed taking into account highest flood level, based on past data, in the Damodar River/ Dungri Jore so as to guard against mine inundation.	The embankment exists along Dungri Jore. The HFL (Highest flood line) of Damodar river is way below the surface level of open cast mine hence bunds across the river is not necessary.
(iii)	Topsoil should be stacked properly with proper slope at earmarked sites and should not be kept active and shall be used for reclamation and development of green belt.	No further top soil will be generated as coal mining activity has been cease since Nov'14. After backfilling of mine void, top soil will be used for biological reclamation of backfilled and OB area.
(iv)	OB should be stacked at earmarked external OB dumpsite(s) within ML area and shall be a maximum height of 60m only and consist of benches of 10m each. The ultimate slope of the dump shall not exceed 28°. Backfilling shall begin at the end of 3rd year in the decoaled area. Monitoring and management of existing reclaimed dumpsites should continue until the vegetation becomes self- sustaining. Compliance Status should be submitted to the MOEF and its regional office at Bhubaneswar on yearly basis.	OB is stacked within ML area at an area of 12 ha approx. About 24.08 lakh cum of OB generated has been stacked with an approximate height reached of 50 mts. The other conditions are being followed as well. This OB is being used for backfilling the mine pit as part of our mine closure plan.
(v)		Catch drain and siltation ponds have been constructed to arrest the debris, silt and sediment flows from OB dumps. Collected water had been used for watering mine area, roads & plantation. Total length of catch drains was 2200 mts. Garland drains (about 1790 mts) had been completely constructed around the mine site to ensure runoff water during rainy season is properly drained off. Since mine area has not going to expand, no additional garland drains are required as of now.

(vi)	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data	Retention wall (or Toe wall) of about 2200 mts. exists around the dump area to check run-off and siltation.
(vii)	The effluents from the coal washery shall be treated to prescribed norms before discharge from the lease.	There is no separate coal washery for OCP Kalimela. We have a central coal washery for Jamadoba group of mines, about 1.5 kms away, which has a closed water circuit system to maintain zero discharge.
(viii)	Crushers at the CHP should be operated with high efficiency bag filters, water sprinkling system should be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.	There is no separate CHP for OCP Kalimela. The existing CHP for Jamadoba group of mines already has adequate measures in place such as water sprinkling system (fixed and movable) and dry fog system.
(ix)	Drills should be wet operated.	It is not applicable now as mining has ceased.
(x)	Controlled blasting should be practiced only during daytime with use of delay detonators. The mitigative measures for control of ground vibration and to arrest the fly rocks and boulders should be implemented.	It is not applicable now as mining has ceased.
(xi)	Area brought under afforestation includes reclaimed external OB dump (12.89 ha), backfilled area (25.15 ha), along ML boundary, along roads (0.45 ha) and in undisturbed area (1.14 ha) within the lease area by planting native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.	We are utilising the external OB to backfill the mine voids. The whole area including void and dump area is being reclaimed and plantation will be done after backfilling jobs are over.
(xii)		Around 1 Ha area was backfilled when the mine was in operation. The remaining area has also been taken up for backfilling and subsequent restoration to original land-use as per approved mining plan. The mine closure plan under mining plan of Jamadoba Colliery (including MCP of Kalimela) has been approved by MOC, Delhi.
(xiii)	Conservation Plan for endangered species, if any, found in and around the project area shall be formulated, if required, in consultation with the State Forest and Wildlife Departments.	Not Applicable.

(viv)	The company shall obtain prior approval of	Not Applicable
(xiv)	CGWA/ CGWB Regional Office for use of	Not Applicable.
	groundwater if any, for mining operations.	
(xv)	Regular monitoring of groundwater level and quality should be carried out by establishing a network of existing wells and construction of new peizometers. The monitoring for quantity should be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected should be submitted to the Ministry of Environment & Forest and to the Central Pollution Control Board quarterly within one month of monitoring.	Now there will be no impact on ground water as mining has ceased. However, water level & quality of groundwater is regularly analysed as required (Annexure-I)
(xvi)	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource. The project authorities should meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	Construction of new ponds and renovation of old ponds is a continuous process and is being done through TSRDS, the CSR wing of Tata Steel for collection of rain water and mine water. These water is being utilised by the communities and also helps in recharging the ground water.
(xvii)	ETP should also be provided for workshop, coal washery and CHP wastewater.	It is not applicable. Though ETP for Central Workshop has been commissioned having facility of Oil & Grease Trap.
(xviii)	R&R shall not be less than the norms laid down by the State Government and shall be completed within a specified time-frame.	It is not applicable.
(xix)	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests for approval 5 years in advance of final mine closure for approval.	It has been approved by MOC, Delhi.
(xx)	Consent to operate shall be obtained before starting mining operations.	Consent to operate has been obtained from JSPCB vide letter ref. No. JSPCB/HO/RNC/CTO-2512557/2018/1469 dated-18.09.2018 valid upto 30.09.2022.
Gene	ral Conditions:	
(i)	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and forest.	All mining excavation activities are terminated since Nov'14.
(i)	No change in the calendar plan including excavation, quantum of mineral coal and waste should be made.	All mining excavation activities are terminated since Nov'14.

(ii)	Four Ambient Air quality monitoring station should be established in the core zones as well as in the buffer zone SPM, RSPM, SO2 and NOX monitoring location of the stations should be decided based on the metrological data & topographical features & environmentally & ecologically sensitive targets in consultation with SPCB.	The operations have now ceased. The ambient air monitoring is done at 4 locations and the reports are attached as <b>Annexure-I</b>
(iii)	Fugitive dust emissions (SPM & RSPM) from all the sources should be controlled regularly monitored & data recorded properly. Water spraying arrangement on haul roads, wagon loading, and dump trucks (loading & unloading) points should be provided & properly maintained.	Presently no coal excavation and coal transportation jobs are going on. Backfilling of OB into mine void is going on and water sprinkling on transport roads is being done regularly. Fugitive dust emission is monitored and recorded.
(iv)	Data on ambient air quality (SPM, RSPM, SOx & NOx) should be regularly submitted to the Ministry including its regional office at Bhubaneswar and to the SPCB & CPCB once in six months.	The ambient air monitoring is done at 4 locations and the reports are submitted to SPCB, CPCB & MoEFCC on half yearly basis. The report is attached as <b>Annexure-I</b>
(v)	Adequate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations of HEMM etc. All should be provided with Ear Plug/Muff.	It is not applicable now.
(vi)	Industrial waste water (Workshop and Waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharged. Oil and Grease trap should be installed before discharge of Work shop effluent.	There is no generation of waste water.
(vii)	Vehicular emissions should be kept under control and regularly monitored. Vehicle used for transporting the mineral should be covered with tarpaulins and optimally loaded.	No mineral is being transported now. The vehicles carrying OB are only allowed to ply after securing full compliance on vehicle check list. Check list ensures the optimum load, good condition, emissions under limit.
(viii	Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the SPCB.	We have a fully equipped Environment Cell Laboratory with qualified personnel. The monitoring and analysis is also done at regular intervals by M/s Ecomen Laboratories Pvt Ltd., an NABL and MoEF&CC recognised laboratory
(ix)	Personnel working in dusty area should wear protective respiratory devices and they should also be provided with adequate	It is not applicable now.

	training and information on safety and health	
	aspect. Occupational Health Surveillance	
	programme of the worker should be under	
	taken periodically to observe any contraction	
	due to exposure to dust and to take corrective	
	measures if needed.	
(x)	A separate Environmental Management cell with suitable qualified personnel should be set up under the control of a senior executive, who will report directly to the Head of the Company.	We have a separate Environmental Management Cell with four qualified personnel. The reporting of Environmental Cell is directly to General Manager of the Division.
(xi)		The environment expenditure is incurred in back filling of the mine void, dust suppressions and greengren belt etc. The environment expenditure for FY 21 is /- 2.684 Crores.
(xii)	The regional office of this ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities shall extend full co-operation to the officer of regional office by furnishing the requisite Data/ information/ monitoring report.	Being complied. All data is being furnished in the compliance report and during inspection.

#### Annexure- I

#### AMBIENT AIR QUALITY REPORT

Core zone & Buffer zone

Period- October'20 to December'20

#### No. of sampling points: 4

	Core zone (as per Air quality standards for coal mines in EPA Notification, 1988						
Location	Latitude/ Longitude	Date	Weather Condition	SPM 24 Hourly Limit- 700 μg/m <sup>3</sup>	RSPM 24 Hourly Limit- 300 μg/m <sup>3</sup>	SO2 24 Hourly Limit- 120 μg/m <sup>3</sup>	NOx 24 Hourly Limit-120 µg/m <sup>3</sup>
Jamadoba	23°42'15.3''	08.10.20	Cloudy	176.8	84.9	14.7	15.3
Group	N/	17.11.20	Clear	215.6	87.5	15.2	14.0
Office	86°24'11'' E	07.12.20	Cloudy	198.8	86.9	14.4	13.8
	Buffe	er zone (as p	er NAAQS 2	2009 for ambient	t air quality sta	ndards)	
Location	Latitude/ Longitude	Date	Weather Condition	PM10	PM2.5	SO₂	NO <sub>2</sub>
				24 Hourly Limit100µg/m <sup>3</sup>	24 Hourly Limit60ug/m <sup>3</sup>	24 Hourly Limit80µg/m <sup>3</sup>	24 Hourly Limit80µg/m <sup>3</sup>
<b>D</b> : 11							
Digwadih	23°41'42''	27.10.20	Rainy	86.4	50.2	14.1	14.8
12 No.	N/	27.10.20 18.11.20	Rainy Clear	86.4 85.4	50.2 52.5	14.1 14.7	14.8 13.2
-							-
12 No.	N/ 86°24'45.3''	18.11.20	Clear	85.4	52.5	14.7	13.2
12 No. Colony	N/ 86°24'45.3'' E	18.11.20 23.12.20	Clear Clear	85.4 87.2	52.5 49.7	14.7 13.6	13.2 14.2
12 No. Colony New	N/ 86°24'45.3'' E 23°41'51''	18.11.20 23.12.20 05.10.20	Clear Clear Clear	85.4 87.2 85.7	52.5 49.7 46.7	14.7 13.6 11.8	13.2 14.2 12.2
12 No. Colony New Village Colony,	N/ 86°24'45.3'' E 23°41'51'' N/	18.11.20 23.12.20 05.10.20 23.11.20	Clear Clear Clear Clear Clear	85.4 87.2 85.7 85.5	52.5 49.7 46.7 48.7	14.7 13.6 11.8 13.5	13.2 14.2 12.2 13.0
12 No. Colony New Village Colony, Jamadoba	N/ 86°24'45.3'' E 23°41'51'' N/ 86°23'19'' E	18.11.20 23.12.20 05.10.20 23.11.20 21.12.20	Clear Clear Clear Clear Clear Cloudy	85.4 87.2 85.7 85.5 84.8	52.5 49.7 46.7 48.7 43.6	14.7 13.6 11.8 13.5 12.3	13.2 14.2 12.2 13.0 13.6

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#### Annexure- I

#### AMBIENT AIR QUALITY REPORT

Core zone & Buffer zone

Period- January'21 to March'21

#### No. of sampling points: 4

	Core zone (a	s per Air qu	ality standa	rds for coal mine	s in EPA Notifica	ition, 1988)	
Location	Latitude/ Longitude	Date	Weather Condition	SPM 24 Hourly Limit- 700 µg/m <sup>3</sup>	RSPM 24 Hourly Limit- 300 µg/m <sup>3</sup>	SO2 24 Hourly Limit- 120 μg/m <sup>3</sup>	NOx 24 Hourly Limit-120 μg/m <sup>3</sup>
Jamadoba	23°42'15.3"	18.01.21	Clear	186.2	84.9	15.7	14.2
Group	N/	22.02.21	Clear	224.6	92.4	14.2	13.1
Office	86°24'11'' E	08.03.21	Clear	215.7	89.6	15.8	13.9
	Buffer	zone (as p	er NAAQS 20	009 for ambient a	ir quality standa	ards)	
Location	Latitude/ Longitude	Date	Weather Condition	PM10 24 Hourly Limit100µg/m <sup>3</sup>	PM2.5 24 Hourly Limit60µg/m <sup>3</sup>	SO2 24 Hourly Limit80µg/m <sup>3</sup>	NO₂ 24 Hourly Limit- 80µg/m³
Digwadih	23°41'42''	05.01.21	Clear	84.2	45.8	12.6	13.1
12 No.	N/	04.02.21	Clear	82.3	40.8	11.6	12.4
Colony	86°24'45.3'' E	03.03.21	Clear	87.9	42.1	13.6	12.7
New	23°41'51''	04.01.21	Clear	86.8	44.3	11.4	12.2
Village	N/	10.02.21	Clear	89.4	43.6	12.8	13.5
Colony, Jamadoba	86°23'19'' E	10.03.21	Clear	92.8	48.3	11.4	12.6
6&7 Pits	23°43'15''	06.01.21	Clear	88.4	49.5	12.6	12.1
Kalimandir	N/	17.02.21	Clear	92.7	46.5	10.4	11.2
colony	86°24'12'' E	02.03.21	Clear	89.4	43.5	12.3	13.4

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#### Annexure- I

## Ground Water Quality Analysis (Hand Pump & Dug Well)

S.No	Date	Location	Time	Depth in meter	рН	Electrical Conductivity, µS/m	Total Hardness (as CaCO₃), mg/l
1	06.11.20	Purnadih (Jorapokhar)	12:20 PM	4.78	7.4	758	542
2	06.11.20	Bhowra 13 No	12:05 PM	2.10	7.2	648	552
3	06.11.20	Mohalbani Basti	01:45 PM	6.50	7.2	722	584
4	06.11.20	Digwadih 12 No	01:58 PM	3.12	7.1	580	816
5	06.11.20	Digwadih 10 No F & J	02:18 PM	2.63	7.3	1030	584
6	06.11.20	Kalimela Shivmandir	11:30 AM	2.03	7.2	799	682
7	06.11.20	Kalimela Kalimandir	11:40 AM	2.84	7.2	788	564
8	06.11.20	Lower Dungari	11:15 AM	3.48	7.3	619	532
9	06.11.20	Upper Dungari	10:55 AM	2.32	7.2	698	528
10	06.11.20	Pattia Basti	10:25 AM	2.48	7.3	692	706
11	06.11.20	Kenduadih Basti	10:10 AM	1.98	7.1	724	586
12	06.11.20	Jorapokhar Kushtand	12:40 PM	3.65	7.3	742	602
13	06.11.20	Jamadoba 3 No	09:35AM	3.12	7.1	720	584
14	06.11.20	6&7 Pits (Ayodhya Nagri)	01:25 PM	2.88	7.2	668	622

## (Post- Monsoon Season- November'2020)

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#### Annexure- I

## Ground Water Quality Analysis (Hand Pump & Dug Well)

S.No	Date	Location	Time	Depth in meter	рН	Electrical Conductivity µS/m	Total Hardness(as CaCO <sub>3</sub> ),mg/l
1	07.01.21	Purnadih (Jorapokhar)	09:40 AM	5.10	7.3	768	548
2	07.01.21	Bhowra 13 No	10:15 AM	2.28	7.4	652	546
3	07.01.21	Mohalbani Basti	10:45 AM	6.64	7.1	748	588
4	07.01.21	Digwadih 12 No	11:05 AM	3.48	7.2	584	812
5	07.01.21	Digwadih 10 No F & J	11:30 AM	2.98	7.3	1028	586
6	07.01.21	Kalimela Shivmandir	01:10 PM	2.26	7.4	812	688
7	07.01.21	Kalimela Kalimandir	01:25 PM	2.98	7.5	782	552
8	07.01.21	Lower Dungari	01:50 PM	3.62	7.2	630	546
9	07.01.21	Upper Dungari	02:20 PM	2.63	7.3	720	532
10	07.01.21	Pattia Basti	02:45 PM	2.62	7.4	706	686
11	07.01.21	Kenduadih Basti	03:10 PM	2.12	7.2	732	590
12	07.01.21	Jorapokhar Kushtand	09:15 AM	3.74	7.1	764	610
13	07.01.21	Jamadoba 3 No	04:00 PM	3.42	7.0	724	588
14	07.01.21	6&7 Pits (Ayodhya Nagri)	12:05 PM	2.92	7.1	672	568

## (Winter Season- January'2021)

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E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601, GSTIN : 09AAACE6076H1ZI

An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

## FORMAT NO. ECO/QS/FORMAT/10

### TEST REPORT NO: ECO LAB/AAQ-1/11/20 TEST REPORT ISSUE DATE: 11.12.2020

## TEST REPORT OF AMBIENT AIR\*

Name of the Customer Address of the Customer

- : Tata Steel Colliery (Jamadoba Group)
- : Jamadoba, Distt. Dhanbad Jharkhand
  - : 13.11.2020
- : Mr. Virendra Pandey
- Sample Collected By Sampling Method
- Instrument Used

Date of Sampling

- Location
- : IS: 5182 : RDS & FDS
- : Central Work Shop Area, Jamadoba

SL No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 <sup>th</sup> , 2009
1.	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	47.5	12.5-1000	60
2.	PM10 (µg/m3)	IS:5182 (Part-23)	92.5	12.5-1000	100
3.	SO2(µg/m3)	IS:5182 (Part-2)	23.5	9-200	80
4.	$NO_2(\mu g/m^3)$	IS:5182 (Part-6)	30.5	6-200	80
5.	NH3(µg/m <sup>3</sup> )	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	17.5	2-700	400
6.	O3 (µg/m <sup>3</sup> )	1S:5182(Part-9)	18.8	2-200	180
7.	CO (mg/m <sup>3</sup> )	IS:5182 (Part-10)	1.05	0.2-500	04
8.	Pb(µg/m3)	1S:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m <sup>3</sup> )	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	\$
10.	Cd (µg/m3)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	*
11.	As (ng/m <sup>3</sup> )	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m <sup>3</sup> )	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

"The results is related only to tested item. Note: Below Detection Limit

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

## FORMAT NO. ECO/QS/FORMAT/10

#### TEST REPORT NO: ECO LAB/AAQ-2/11/20 TEST REPORT ISSUE DATE: 11.12.2020

### **TEST REPORT OF AMBIENT AIR\***

 Name of the Customer
 : Tata Steel Colliery (Jamadoba Group)

 Address of the Customer
 : Jamadoba, Distt. Dhanbad

 Date of Sampling
 : 08.11.2020

 Sample Collected By
 : Mr. Virendra Pandey

 Sampling Method
 : IS: 5182

 Instrument Used
 : RDS & FDS

 Location
 : Officers Colony, 12 No. Digwadih

SI. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 <sup>th</sup> , 2009
١,	PM2.5 (µg/m3)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.5	12.5-1000	60
2.	PM10 (µg/m3)	IS:5182 (Part-23)	88.6	12.5-1000	100
3.	$SO_2(\mu g/m^3)$	IS:5182 (Part-2)	18.5	9-200	80
4.	NO2(µg/m3)	IS:5182 (Part-6)	36.3	6-200	80
5.	NH3(μg/m <sup>3</sup> )	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	17.8	2-700	400
6.	O3 (µg/m3)	IS:5182(Part-9)	20.6	2-200	180
7.	CO (mg/m <sup>3</sup> )	1S:5182 (Part-10)	1.8	0.2-500	04
8.	Pb(µg/m <sup>3</sup> )	1S:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	
10.	Cd (µg/m <sup>3</sup> )	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11. As (ng/m <sup>3</sup> )		SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m <sup>3</sup> )	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

\*The results is related only to tested item.Note: Below Detection Limit.

Authorized Signatory Ecomen Laboratories Pvt. Ltd

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

## FORMAT NO. ECO/QS/FORMAT/10

#### TEST REPORT NO: ECO LAB/AAQ-3/11/20 TEST REPORT ISSUE DATE: 11.12.2020

## **TEST REPORT OF AMBIENT AIR\***

Name of the Customer Address of the Customer : Tata Steel Colliery (Jamadoba Group)

; Jamadoba, Distt. Dhanbad

Date of Sampling Sample Collected By Sampling Method

Instrument Used

Location

- Jharkhand : 09.11.2020
- : Mr. Virendra Pandey
- : IS: 5182

: RDS & FDS

: General Manager's Office Area

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 <sup>th</sup> , 2009
Ŀ.	PM25 (µg/m3)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	40.5	12.5-1000	60
2,	PM10 (µg/m3)	1S:5182 (Part-23)	83.6	12.5-1000	100
3.	SO <sub>2</sub> (µg/m <sup>3</sup> )	1S:5182 (Part-2)	18.5	9-200	80
4.	NO2(µg/m3)	IS:5182 (Part-6)	32.4	6-200	80
5.	NH3(μg/m <sup>3</sup> )	SOP NO. A -26, Issue No.1	13.7	2-700	400
6,	O3 (µg/m <sup>3</sup> )	IS:5182(Part-9)	18.6	2-200	180
7.	CO (mg/m <sup>3</sup> )	IS:5182 (Part-10)	1.65	0.2-500	04
8.	Pb(µg/m <sup>3</sup> )	1S:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m <sup>3</sup> ) SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100		
10.	Cd (µg/m <sup>3</sup> )	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL.	1-100	
11,	As (ng/m <sup>3</sup> )	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m <sup>3</sup> ) SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)		BDL	1-100	20

\*The results is related only to tested item. Note: Below Detection Limit

Analyst

Authorized Signatory Econien Laboratories Pvt. Ltd



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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

## FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-4/11/20 TEST REPORT ISSUE DATE: 11.12.2020

## TEST REPORT OF AMBIENT AIR\*

Name of the Customer Address of the Customer

- : Tata Steel Colliery (Jamadoba Group)
- r : Jamadoba, Distt. Dhanbad
- Date of Sampling Sample Collected By Sampling Method Instrument Used Location
- : 12.11.2020 : Mr. Virendra Pandey
- : IS: 5182
- : RDS & FDS
- : Jamadoba Colliery

SL No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 <sup>th</sup> , 2009
1.	PM2.5 (µg/m <sup>3</sup> )	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.5	12.5-1000	60
2.	PM10 (µg/m3)	IS:5182 (Part-23)	80.5	12.5-1000	100
3.	SO <sub>2</sub> (µg/m <sup>3</sup> )	IS:5182 (Part-2)	15.3	9-200	80
4.	NO2(µg/m <sup>3</sup> )	1S:5182 (Part-6)	18.8	6-200	80
5.	NH3(µg/m <sup>3</sup> )	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	32.8	2-700	400
6.	O3 (µg/m <sup>3</sup> )	1S:5182(Part-9)	19.6	2-200	180
7.	CO (mg/m <sup>3</sup> )	1S:5182 (Part-10)	1.04	0.2-500	04
8.	Pb(µg/m <sup>3</sup> )	1S:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m <sup>3</sup> )	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL.	1-100	
10.	Cd (µg/m3)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m <sup>3</sup> )	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m <sup>3</sup> )	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

\*The results is related only to tested item. Note: Below Detection Limit.

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y Manager



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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

#### FORMAT NO. ECO/QS/FORMAT/10

#### TEST REPORT NO: ECO LAB/AN/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF AMBIENT NOISE LEVEL

Name of the Customer Address of the Customer : Tata Steel Colliery (Jamadoba Group) : Jamadoba, Distt. Dhanbad

Jharkhand : Mr. Virendra Pandey

Sample Collected By Instrument Used

: Noise Meter (HTC)

SI.		Date of	of Day Time			Night Time		
No.	Locations	Monitoring	Max.	Min.	Leq.	Max.	Min.	Leq
١.	Central Work Shop Area Jamadoba	11,11,2020	69.3	56.8	58.1	63.5	50.5	54.0
2.	Officer'sColony, 12 No, Digwadih	11.11.2020	60.8	54.1	56.3	49.8	45,3	47.2
3,	GeneralManager's Office Area	09,11,2020	54.2	48.9	51.4	47.4	41.4	43.0
4.	Jamadoba Colliery	11.11.2020	71.7	55.6	67.5	67,5	50.3	53.6

#### Noise (Ambient Standard)

Area Cod	e Category of area	Limit in dB	(A) Leq
- <u>5,55,55,55,</u> 2,002	• • • • • • • • • • • • • • • • • • •	Day Time	Night Time
A	Industrial Area	75	70
в	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

Day time is reckoned in between 6:00 AM and 10:00 PM. 1.

Night time is reckoned in between 10:00 PM and 6:00 AM 2.

Silence zone is defined as area up to 100m around such premises as hospitals. 3.

Educational institutions & courts. The silence zones are to be declared by a competent authority.

Mixed categories of areas should be declared as one of the four above-mentioned 4 Categories by the competent authority and the corresponding standard shall apply.

Anatyst

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#### FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/MCPM/11/20 TEST REPORT ISSUE DATE: 11.12.2020

## MINERALOGICAL COMPOSITION OF PARTICULATE MATTER

Address of the Customer: Jamadoba,

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group) Distt. Dhanbad - 828 112 : November, 2020

Month

S.NO,	Mineralogical Compo				Composition (	in %)
	Locations	Date of Sampling	Silica (SiO2)	Ferrous oxide (FeO)	Alumina (Al <sub>2</sub> O <sub>3</sub> )	Calcium Oxide CaO
1	Central Workshop Area, Jamadoba	09.11.2020	2.7	0.19	1,38	2.84
2	Officer's Colony, 12 No Digwadih	10.11.2020	1.64	0.08	1.41	2.88

Anatyst

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

## TEST REPORT OF DRINKING WATER\*

Name of the Customer Address of the Customer

Sampling Method

Sample Quantity

Date of Sampling

Date of Analysis

Sample ID Code

Source of Sample

Sample Collected by

Date of Sample Receiving

: M/s Tata Steel Ltd. (Jamadoba Group)

: Jamadoba,

Distt, Dhanbad - 828 112

: APHA, 23rd Ed. 2017

: Mr. Virendra Pandey

: As per requirement : 10.11.2020 to 12.11.2020

: 18.11.2020

: 18.11.2020 to 02.12,2020

: Jamadoba Canteen

: ELW-12619

	TESTS	PROTOCOL.	RESULT	Detection	INDIAN STANDARDS as per IS 10506:1991(Reaffi2012)	
\$5. Nn.			HART LY	Range	Desirwhie	Permissible
_		APRA, 23rd E4, 2017, 2120-B	<5.0	5-100	5.00	15.0
L	Colour (Huzen unit)	AP91A, 23rd E4, 2017, 2150 B	Agrecable	Qualitative	Agreeable	Agreeable
2	Odaur	APHA, 23rd Ed. 2017, 2160 A+B	Agreeable	Qualitative	Agreeable	Agreeable
3	Taxte	APHA, 25rd £4, 2017, 2130-A+B	1.51	1-300	1.0	5.0
4	Turbidity an (NTU)	AP16A, 23rd E4, 2017. 45008+ A+B	7.16	2-12	6.5-8.5	No Relax.
5.	pai	APRA, 23rd Ed. 2017, 2540-C	685.0	5-5000	500	3000
6	Total Disarived Salids as TDS (mg7)	APHA, 23rd E6, 2017, 2320 A+B	192.0	5-1500	200	600
7	Alkalinity (mg/l)		204.0	5.3500	200.0	690,0
8	Total Hardness as CaCO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 2348 A+C	56.0	5-1000	25,8	280.0
9,	Calcium as Ca (reg/l)	APHA, 23rd Ed. 2917, 3560 Ca A+8	BDL	0.05-5	0.05	1.5
10.	Copper as Cu (mg/l)	APRA, 23rd Ed. 2007, 3111 A+B	0.21	0.02-50	0.3	No Reizz.
11.	Tron as Fe (mg/b)	APHA, 23ed Ed. 2017, 3580 Fe 8	BDL	0.1-5	0.19	0,30
12	Manganese as Min (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	30,0	5-1000	250.0	1000.0
13.	Chleride as Cl (mg/l)	APELA, 23rd Ed. 2017, 4500 CFA+B	41.1	1.0-250	296,9	409.0
14.	Sulfate as SO <sub>4</sub> (mpl)	APHA, 23rd Ed. 2017, 4509-5042- E	9.22	5-100	65.0	No Relat
15.	Nitrate Nitrogen as NO <sub>2</sub> (mg/l)	APIEA, 23ed Ed. 2017, 4500-NO3- B	0.30	0.05-10	1.0	1.5
16	Fluorides as F (mp?)	APIEA, 23rd Ed. 2017, 4508-C	BDL	8,001-1	0,001	No Relax
17.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B		0,002-2	0,003	No Relay
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+8	BDL		0,61	No Relat
19.	Arsenic as As (10g%)	APHA, 2Jed Ed. 2017, 3111 A48	BDL	0.01-2.0	0.01	No Relay
20	Lend as Pb (mg/l)	APHEA, 23ed Ed. 2017, 3131 A+B	IIDE.	0.01-1.0	5	15
21	Zine in Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	8,26		0.03	8.2
22	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017, 3500.41 A+B	BDL BDL	0.05-100		No Reins
23.	Chromium as Cr+6 (mp1)	APHA, 23rd Ed. 2017, 3111A+B	101010		8,65	No Relat
24.	Cyanide as CN (mp/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-30	8.20	1.0
24	Free Residual Chlories (mg/l)	APHA, 23rd Ed. 2017, 4500-C3 B	BDL	0,1-5	0.001	0.002
26:	Phenolic Compounds as CalloOH (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5530 A+C	BDL.	1-10		
27.	Mineral O8 6 (mp?)	APHA, 23rd Ed. 2017, Class-6 Infrared Partition Method	BD1.	9,81-10	0.5	No Relat
28	Boron as B (mg8)	APHA, 23rd Ed. 2017, 4500 B A+C	0.27	0.2-10		Absent
20	Total Coliform (MPN/100ml)	APHA, 23rd E6, 2017, 9221 A+B	Absent	1.8	Absent	Arsen

\*The result are related only to item tested BDL = Below Detection Limit

Kalleomes Analyst

Authorized Signatory

Manager

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FORMAT NO. ECO/Q5/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF DRINKING WATER\*

Name of the Customer Address of the Customer

Date of Sampling

Date of Analysis

: M/s Tata Steel Ltd. (Jamadoba Group)

Sampling Method Sample Collected by Sample Quantity

Date of Sample Receiving

- : Iamadoba. Distt, Dhanbad - 828 112
- : APHA, 23rd Ed. 2017
- : Mr. Virendra Pandey
- : As per requirement
- : 10.11.2020 to 12.11.2020
- : 18.11.2020
- : 18.11.2020 to 02.12.2020
- : Digwadih Club
- Source of Sample : ELW-12620 Sample ID Code

	TESTS	TESTS PROTOCOL	RESULT	Detection	INDIAN STANDARD5 as per 15 (0506-1991(Reeff:2012)	
51, Na.			exercise (	Range	Desirable	Permissible
-	Colear (Ilacon anit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-108	5.00	15.0
*	Odeur	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreesble	Agreeable
2.	Tatle	APHA, 23rd Ed. 2017, 2168 A*B	Agreeable	Qualitative	Agreeable	Agreeable
4	Turbidits as (NTU)	APHA, 23rd Ed. 2017, 2120-A+B	1.26	1-100	1.0	4.0
1	all	APHA, 23rd Ed. 2817, 4500B+ A+B	7,36	2-12	6.5-8.5	No Relat.
ů.	Tetal Dissolved Solids as TDS (mg/l)	APHA, 13rd E4, 2017, 2548-C	651.0	5-5000	500	2000
1.	Alkalinity (mgf)	APHA, 23rd Ed. 2407, 2320 A+ B	188.0	5-1500	200	600
8.	Total Bardness as CaCO <sub>2</sub> (egf)	APHA, 23rd Ed. 2017, 2340 A+C	212.0	5-1500	200,0	600.0
9	Calcium as Ca (mg/l)	APRA, 23rd Ed. 2017, 3500 Ca A+B	54,0	5-1000	75.0	206.0
10	Capper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1,5
11.	fran as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.26	0.02-50	0,3	No Relax.
12	Manganese as Mn (mg/l)	APHA, 13rd Ed, 2017, 3111 A+B	BDL.	0.1-5	0.10	0.50
13.	Chloride as CI (mgil)	APHA, 23rd Ed. 2017, 4506 CI A+B	36.0	5-1000	250.0	1006.0
14.	Sulfate as SO <sub>4</sub> (mp <sup>1</sup> )	APHA, 13rd Ed. 2017, 4500-8042- E	41,1	1.0-250	296.0	409.0
15.	Nitrate Nitrogen as NOs/mg/0	APRA, 23rd Ed. 2017, 4580-803- 8	12.02	5-100	45.0	Ne Relax
10.	Fluorides as F (mg/0)	APRA, 23rd Ed. 2017, 4599-C	0.30	0.05-10	1.0	1.5
17.	Meetery as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0,001-1	0.001	No Relax
18.	Cadmium as Cd (mgft)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	9,002-2	0,003	No Relax
19.	Arumic st As (mp?)	APHA, 23rd Ed. 2017, 3111 A+8	BDL.	0.01-2.0	0,05	No Relat
20	Lead as Pb (mpl)	APHA, 21rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0,91	No Belas
21	Zinc as Zn (mg/l)	APILA, 23rd Ed. 2017, 3111 A+B	20.0	0.02-50	*	15
22	Aluminium as Al (mg/0	APIEA, 23rd Ed. 2017, 3500AJ A+0	BDI,	1-100	0.63	0.2
21.	Chromium as Cr+6 (mg/l)	APHA, 23rd Ed. 2017, 3111A+8	BDI.	0,05-100	0.05	No Relax
24	Cyanide as CN (mg/b)	APHA, 23rd Ed. 2017, 4509CN , A+D	801.	0.02-10	9.05	No Rolan
25.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4590-CLB	BDL	0.1-5	0.20	1,0
26.	Phenalic Compounds in ColliOH (reg/l)	APHA, 23" E6, 2017, 5530 A+C	BDL.	1-10	6.001	0,002
17	Mineral Oil 6 (mg/l)	APHA, 23rd Ed. 2017, Class -6 Infrared Partition Method	BOL	0.01-10	0.5	No Relat
28.	Boron as B.(mgfl)	APHA, 23rd Ed. 2017, 4500 B A+C	0,22	0.2-10	0,5	1.0
29:	Total Culiform (MPN/100ol)	APHA, 23rd Ed. 2017, 9221 A+B	Absett	1,8	Absent	Absent

\*The result are related only to item tested. BDL = Below Detection Limit

Analyst

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#### FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### **TEST REPORT OF GROUND WATER\***

Name of the Customer Address of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group) : Jamadoba,
Sampling Method	Distt. Dhanbad - 828 112 : APHA, 23rd Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: Purnadih (Jorapokhar)
Sample ID Code	: ELW-12623

SL.	TESTS	PROTOCOL	RESULT	Detection	INDIAN STANDARDS as per 15 10500:1991(Reaff:2012)	
No.		Contraction (Section	0.00446454860	Range	Desirable	Permissible
L.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	27.3	10-100		
3.	Electrical Conductivity (µmhos/cm)	APHA,23rd Ed.2017, 2510-A+B	932.0	1-2000	121	3.70
4.	Dissolved Solids (mg/l)	APHA,23rd Ed.2017 (25408)	639.0	5-10000	35	5.55
\$0	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.56	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	220.0	5-1500	200	600
7.	Total Hardness as CaCO <sub>2</sub> (mg/l)	APHA, 23rd Ed, 2017, 2340 A+C	240,0	5-1500	200,0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	62.4	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 29# Ed. 2017, 3500 Mg A+B	20.41	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	fron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.13	0.02-50	.0.3	No Relax.
12	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 CI A+B	80.0	5-1000	250.0	1000.0
13.	Sulfate as SO4 (mg/l)	APHA, 23rd Ed. 2017, 4500-5042- E	63.5	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 4800-NO3- B	10.2	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.40	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL.	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23 <sup>-4</sup> Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	10,01	No Relax.
21.	Zine as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.10	0.02-50	5	15
22	Total Chromism as Cr (mg/l)	APHA, 234 Ed. 2017,3111 A+B	BDL	0.05-50	0,05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL.	0.02-10	0.05	No Relay.

\*The result are related only to item tested. BDL = Below Detection Limit

Analyst

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/DW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF GROUND WATER\*

Name of the Customer Address of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

Sample ID Code

Distt. Dhanbad - 828 112 : APHA, 23rd Ed. 2017 : Mr. Virendra Pandey : As per requirement : 10.11.2020 to 12.11.2020 : 18.11.2020 : 18.11.2020 to 02.12.2020

: Digwadih 10 No, F&] : ELW-12624

: Jamadoba,

SL.	TESTS	PROTOCOL	RESULT	Detection	INDIAN STANDARDS as per 15 10500:1991(Reaff:2012)	
No.				Range	Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.9
2	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	26.3	10-100	1	
3,	Electrical Conductivity (umbos/cm)	APHA,23* Ed.2017, 2510-A+B	768.0	1-2000	-	221
4.	Dissolved Solids (mg/l)	APHA,23 <sup>st</sup> Ed.2017 (2540B)	520.0	5-10000		4
5,	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.62	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	196.0	5-1500	200	600
7.	Total Hardness as CaCO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	228,0	5-1500	200.0	600.0
â.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	52.8	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 3500 Mg A+B	23.32	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0,05-5	0.05	1.5
11.	Iron as Fe (mg/i)	APHA, 23rd Ed. 2017, 3500 Fe B	0.23	0.02-50	0.3	No Relax.
12.	Chloride as CI (mg/l)	APHA, 23rd Ed. 2017, 4500 CLA+B	70.0	5-1000	250.0	1000.0
13.	Sulfate as SO4 (mg/l)	APHA, 23rd Ed. 2017, 4500-5/042- E	55.01	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NOs(mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	13.21	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.39	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23* Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relay
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL.	0.01-1.0	10.0	No Relax
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.13	0.02-50	5	15
22	Total Chromium as Cr (mg/l)	AFHA, 23-4 Ed. 2017,3111 A+B	BDL	0.05-50	0.05	No Relm
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax

\*The result are related only to item tested.BDL = Below Detection Limit

Allenterones Analyst

Authorized Signatory

Quality Manager

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/DW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF GROUND WATER\*

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23rd Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: Kalimela Kalimandir
Sample ID Code	: ELW-12625

SI.	TESTS	PROTOCOL	RESULT	Detection	INDIAN STANDARDS as per IS 10500;1991(Reaff:2012)	
No.			12490300000	range	Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	26.7	10-100		
3.	Electrical Conductivity (umbos/cm)	APHA,23* Ed.2017, 2510-A+B	812.0	1-2000	85	. 87
4.	Dissolved Solids (mg/l)	APHA,23* Ed.2017 (2540B)	505.0	5-10000		
5,	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.37	2-12	65-85	No Relax.
6,	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	176.0	5-1500	200	600
7.	Total Hardness as CaCO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	192.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	48.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23 <sup>+/</sup> Ed. 2017, 3500 Mg A+B	17.49	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3131 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.16	0.02-50	0.3	No Relax.
12	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	48.0	5-1000	250.0	1000.0
13.	Sulfate as SO <sub>4</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	54.27	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO3 (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	9.99	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed, 2017, 4500-C	0.69	0.05-10	1,0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed, 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL.	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23-4 Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+8	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+8	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.09	0.02-50	5	15
22.	Total Chromium as Cr (wg/l)	APHA, 23rd Ed. 2017,3111 A+B	BDL	0.05-50	0.05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL.	0.02-10	0.05	No Relax

\*The result are related only to item tested.BDL = Below Detection Limit

Analyst

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/DW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### **TEST REPORT OF GROUND WATER\***

Name of the Customer Address of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group) : Jamadoba,
Sampling Method	Distt. Dhanbad - 828 112 : APHA, 23rd Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: Upper Dungari
Sample ID Code	: ELW-12626

SL	TESTS	PROTOCOL	RESULT	Detection	INDIAN STANDARD5 as per IS 10500:1991(Reaff:2012)		
No.		Andersteineunenta	0.009.0805	Range	Desirable	Permissible	
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 H	<5.0	5-100	5.00	15.0	
2.	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	26.1	10-100			
3.	Electrical Conductivity (umbos/cm)	APHA,23* Ed.2017, 2510-A+B	1020.0	1-2000	68	3	
4.	Dissolved Solids (mg/l)	APHA,234 Ed.2017 (25408)	695.0	5-10000			
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.50	2-12	6.5-8.5	No Relax.	
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	216.0	5-1500	200	600	
7.	Total Hardness as CaCO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	240.0	5-1500	200,0	600,0	
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	65.6	5-1000	75.0	200.0	
9.	Magnesium as Mg (mg/l)	APHA, 23* Ed. 2017, 3500 Mg A+B	18.46	5-1000	30.0	100.0	
10.	Copper as Co (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5	
11.	from as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.20	0.02-50	0.3	No Relax.	
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 CI A+B	64,0	5-1000	250.0	1000.0	
13.	Sulfate as SO <sub>8</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-5/042- E	60.2	1.9-250	200.0	400.0	
14.	Nitrate Nitrogen as NO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	15.3	5-100	45.0	No Relax.	
15,	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.61	0.05-10	1.0	1.5	
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDI,	0.001-1	0.001	No Relax.	
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDI.	0.002-2	0.003	No Relax	
18,	Nickel as Ni (mg/l)	APHA, 234 Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax	
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+8	BDL	0.01-2.0	0.01	No Relax	
28.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.	
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.20	0.02-50	5	15	
22	Total Chromium as Cr (mg/l)	APHA, 23+ Ed. 2017,3111 A+E	BDL	0.05-50	0.05	No Relax	
23,	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax.	

\*The result are related only to item tested.BDL = Below Detection Limit

Analyst

Authorized Signatory

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#### FORMAT NO. ECO/Q6/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF GROUND WATER\*

Name of the Customer Address of the Customer

: M/s Tata Steel Ltd. (Jamadoba Group)

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample Sample ID Code : Jamadoba, Distt, Dhanbad - 828 112 : APHA, 23rd Ed. 2017 : Mr. Virendra Pandey : As per requirement : 10.11.2020 to 12.11.2020 : 18.11.2020 : 18.11.2020 to 02.12.2020 : Kenduadih Basti : ELW-12627

SL.	TESTS	PROTOCOL	RESULT	Detection	INDIAN STAN 15 10500:1990	
No.			19111029511	Range	Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	27.3	10-100	4	
3.	Electrical Conductivity (jambos/cm)	APHA,234 Ed.2017, 2510-A+B	817.0	1-2000	ø	3
£	Dissolved Solids (mg/l)	APHA,22* Ed.2017 (2540B)	433.0	5-10000	27	1.1
5,	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.20	2-12	6.5-8.5	No Relax.
б.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	196.0	5-1500	200	600
7.	Total Hardness as CaCO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	212.0	3-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	49.6	5-1000	75.0	200.0
9.	Magnessum as Mg (mg/l)	APHA, 23 <sup>ad</sup> Ed. 2017, 3500 Mg A+B	21,35	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.26	0.02-50	0.3	No Relax.
12	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	-38.0	5-1000	250.0	1000.0
13.	Sulfate as SO4 (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	36.21	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO3 (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	10.11	5-100	45.0	No Relax.
15.	Finorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.61	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23 <sup>-4</sup> Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.09	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23+ Ed. 2017,3111 A+B	BDL	0.05-50	0.05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax.

\*The result are related only to item tested. BDL = Below Detection Limit

Analyst

Authorized Signatory

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#### FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### **TEST REPORT OF GROUND WATER\***

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt, Dhanbad - 828 112
Sampling Method	: APHA, 23rd Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: 6&7 Pits (Ayodhya Nagar)
Sample ID Code	: ELW-12628

SI.	TESTS	TESTS PROTOCOL	RESULT	Detection	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)		
No.		12.2012.0.545.2011	VED.MERSKY	Range	Desirable	Permissible	
1	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5,0	5-100	5,00	15.0	
2	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	26.5	10-100		220	
3.	Electrical Conductivity (umbos/cm)	APHA,23** Ed.2017, 2510-A+B	796.0	1-2000	- 35		
4	Dissolved Solids (mg/l)	APHA, 29* Ed.2017 (2540B)	524.0	5-10000	121		
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.39	2-12	6.5-8.5	No Relax.	
б.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	220.0	5-1500	200	600	
7,	Total Hardness as CaCO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	264.0	5-1500	200.0	600,0	
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	67.2	5-1000	75.0	200.0	
9,	Magnesium as Mg (mg/l)	APHA, 23 <sup>ei</sup> Ed. 2017, 3500 Mg A+B	23,32	5-1000	30.0	100.0	
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0,05	1.5	
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.16	0.02-50	0.3	No Relax.	
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 CI A+B	58.0	5-1000	250.0	1000.0	
13.	Sulfate as SO4 (mg/i)	APHA, 23rd Ed. 2017, 4500-SO42- E	42.05	1.0-250	200.0	400.0	
14.	Nitrate Nitrogen as NO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	13.95	5-100	45,0	No Relax.	
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.67	0.05-10	1.0	1.5	
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.	
17,	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relay	
18.	Nickel as Ni (mg/l)	APHA, 234 Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relay	
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDI,	0.01-2.0	0.01	No Relax	
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0,01-1.0	0.01	No Belax	
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.22	0.02-50	5	15	
22	Total Chromium as Cr (mg/l)	APHA, 234 Ed. 2017,3111 A+B	BDL	0.05-50	0.05	No Relax	
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BENL	0.02-10	0.05	No Relax	

\*The result are related only to item tested.BDL = Below Detection Limit

Analyst

Authorized Signatory

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Quality Manager

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Sample ID Code

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E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601, GSTIN: 09AAACE6076H12I

An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/SW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF SURFACE WATER

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23rd Ed. 2017
Sample Collected by	: Mr.Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: Damodar River, Up Stream

: ELW-12601

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	19:2296 Class-C
1.	pB	APHA,23-4Ed.2017,4500H+A+B,	7.34	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	11.0	1-100	<u>(4</u>
3.	Total Dissolved Solids as TDS (mg/l)	APHA,23# Ed.2017 (2540C)	635.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA,23* Ed.2017 (4500 A+C)	6.3	2-10	4.0
5,	Biochemical Oxygen Demand as BOD (mg/l)	APHA,234 Ed.2017 (5210A+ B)	HDL	5-10000	3.0
6,	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 CI A+B	50.0	5-1000	9
7.	Finorides as F (mg/l)	APHA,23* Ed.2017 (4500 -C)	0.55	0.05-10	1.5
8.	Sulfate as SO4 (mg/l)	APELA,23 <sup>rd</sup> Ed.2017 (4500 -SOc2 E)	46.2	1,0-250	400.0

\*The result are related only to item tested - The parameters are not included in IS: 2296 Class-C BDL - Below Detection Limit

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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/SW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF SURFACE WATER

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	; APHA, 23rd Ed. 2017
Sample Collected by	: Mr.Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: Damodar River, Down Stream
Sample ID Code	: ELW-12602

				1.	
SI. No.	TEST5	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1,	pH	APHA,294 Ed.2017, 4500H+A+B,	7.67	2-12	85
2.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	14.0	1-100	
3.	Total Dissolved Solids as TDS (mg/l)	APHA,23# Ed.2017 (2540C)	679.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA,234 Ed.2017 (4500 A+C)	5.8	2-10	4.0
5,	Biochemical Oxygen Demand as BOD (mg/l)	APHA,23* Ed.2017 (5210A+ B)	BDL	5-10000	3.0
- 6	Chioride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	60.0	5-1000	
7.	Fluorides as F (mg/l)	APHA,23 <sup>rd</sup> Ed.2017 (4500 - C)	0,55	0.05-10	1.5
8.	Sulfate as SO <sub>1</sub> (mg/l)	APHA,234 Ed.2017 (4500 -SOc2 E)	53.6	1.0-250	400.0

\*The result are related only to item tested - The parameters are not included in IS: 2296 Class-C BDL - Below Detection Limit

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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### **TEST REPORT OF WASTE WATER\***

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
Sampling Method	Distt. Dhanbad - 828 112 : APHA, 23 <sup>rd</sup> Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: 2Pit Jamadoba Colliery
Sample ID Code	: ELW-12609

SL.	TESTS	PROTOCOL	RESULT	Limits of	G.S.R 422(E)
No,		TROTOCOL	RESULT	Detection	Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.76	2-12	5.5.9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 25400	15.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	622.0	10-10,000	
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5529 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	8.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23ed Ed. 2017, 5220 A+B	34.0	5-50000	250.0

"The result are related only to item tested.

BDL = Below Detection Limit

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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF WASTE WATER\*

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23 <sup>rd</sup> Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: 2 Incline Jamadoba Colliery
Sample ID Code	: ELW-12610

SL.	TESTS	PROTOCOL	RESULT	Limits of	G.S.R 422(E)
No.		PROTOCOL	RESULT	Detection	Desirable Limit
I.	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.49	2-12	3.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	13.6	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	591.0	10-10,000	18
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL.	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	.9.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mgT)	APHA, 23rd Ed. 2017, 5220 A+B	20.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF WASTE WATER\*

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
10 100 22.701 C	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23 <sup>rd</sup> Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: 6&7 Pit Colliery
Sample ID Code	: ELW-12611

SL.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
No.					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+8	8.11	2.12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	9.63	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23vd Ed. 2017, 2540C	746,0	10-10,000	
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	6.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+8	28.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2029

#### TEST REPORT OF WASTE WATER\*

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
Sampling Method	Distt. Dhanbad - 828 112 : APHA, 23 <sup>nl</sup> Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: Digwadih Colliery
Sample ID Code	: ELW-12612

SL TESTS No.	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)	
				Desirable Limit	
1	pH	APHA, 25rd Ed. 2017, 4500FF A+B	7.53	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	14.1	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	678.0	10-10,000	
.4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5829 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	7.3	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	24.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### **TEST REPORT OF WASTE WATER\***

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23rd Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: JCPP (Final Settling Pond)
Sample ID Code	: ELW-12613

SL No.	TESTS	PROTOCOL.	RESULT	Limits of Detection
I	Ph	APHA, 23rd Ed. 2017, 4500H' A+B	8.20	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2546D	17.4	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23ed Ed. 2017, 2540C	925.0	10-10.000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	6.53	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	11.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	32.0	5-50000

\*The result are related only to item tested.

BDL = Below Detection Limit

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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF WASTE WATER\*

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad ~ 828 112
Sampling Method	: APHA, 23=1 Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: T.C.H Point -1 (Near Children's Ward)
Sample ID Code	: ELW-12614

SL	TESTS	PROTOCOL.	RESULT	Limits of Detection	G.S.R 422(E)
No.					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.06	2.12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	43.6	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	822.0	10-10,000	87
34	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27%	APHA, 23rd Ed. 2017,5210 A+B	13.9	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	96.0	\$-50000	250.0

"The result are related only to item tested.

BDL = Below Detection Limit

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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### **TEST REPORT OF WASTE WATER\***

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23 <sup>ad</sup> Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: ETP Inlet Jamadoba Canteen
Sample ID Code	: ELW-12634

SL TESTS No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pН	APHA, 23rd Ed. 2017, 4500H: A+B	8.23	2-12	5.5.9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	148.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	933.0	10-10,000	
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27%	APHA, 23rd Ed. 2017,5210 A+B	25.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	158.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF WASTE WATER\*

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23rd Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: ETP Outlet Jamadoba Canteen
Sample ID Code	: ELW-12635

SI. TESTS No.	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)	
	TROTOCOL			Desirable Limit	
3L -	pН	APHA, 23rd Ed. 2017, 4500H A+B	7.59	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	42.2	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	861.0	10-10,000	5+
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27 <sup>4</sup> C	APHA, 23rd Ed. 2017,5210 A+B	14.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	63.0	5-50000	250.0

"The result are related only to item tested.

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### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF WASTE WATER\*

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
Sampling Method Sample Collected by Sample Quantity Date of Sampling	Distt. Dhanbad - 828 112 : APHA, 23 <sup>rd</sup> Ed. 2017 : Mr. Virendra Pandey : As per requirement : 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: ETP Inlet JCPP canteen
Sample ID Code	: ELW-12636

SI. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
Î.	pH	APHA, 23rd Ed. 2017, 4500FF A+B	7.49	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	134.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1124.0	10-10,000
4	Oll & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 275C	APHA, 23rd Ed. 2017,5210 A+8	28.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	160.0	5-50000

"The result are related only to item tested.

BDL = Below Detection Limit

theiskyones Analyst

Authorized Signatory

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Gality Manager



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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF WASTE WATER\*

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23rd Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: ETP Outlet JCPP canteen
Sample ID Code	: ELW-12637

SL No.	TESTS	BROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)	
	1	PROTOCOL			Desirable Limit	
1	pН	APHA, 23rd Ed. 2017, 4500H' A+B	7.05	2.12	5.5-9.0	
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	32.55	5-5000	100.0	
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	756.0	10-10,000		
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10:0	
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd 5d, 2017,5210 A+B	17.0	5-10000	30.0	
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	74.0	5-50000	250,0	

\*The result are related only to item tested.

BDL = Below Detection Limit

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Authorized Signatory

Manager



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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### **TEST REPORT OF WASTE WATER\***

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23rd Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: ETP Inlet TCH
Sample ID Code	: ELW-12638

SL No.	TESTS	PROTOCOL.	RESULT	Limits of Detection
I	pH	APHA, 23rd Ed. 2017, 4500FP A+B	6.90	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	131.4	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	784.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	29:0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	180.0	5-50000

\*The result are related only to item tested.

BDL = Below Detection Limit

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Authorized Signatory Ecomen Laboratories Pvt. Ltd. Flat No.-8, 2nd Floor, Arif Chamber-V Sector-H, Aliganj, Lucknow-226024 Ph.-2746282, Fax:2745726

Manager



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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

## **TEST REPORT OF WASTE WATER\***

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23rt Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: ETP Outlet TCH
Sample ID Code	1 ELW-12639

SL No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E) Desirable Limit
1	pH	APHA, 23rd Ed, 2017, 4500H A+B	7.51	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	34,5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1002.0	10-10,000	ŝ.
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed, 2017, 5520 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	19.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	80.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

HOMES Analyst

Authorized Signatory

Quality Manager



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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF WASTE WATER\*

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23 <sup>nd</sup> Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: ETP Inlet Garage
Sample ID Code	: ELW-12640

SL No,	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.45	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	177.0	.5-5000
з	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	916.0	10-10.000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27 <sup>3</sup> C	APHA, 23rd Ed. 2017,5210 A+B	27.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+8	175.0	5-50000

"The result are related only to item tested.

BDL = Below Detection Limit

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Authorized Signatory

Quality Manager



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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF WASTE WATER\*

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23 <sup>rd</sup> Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: ETP Outlet Garage
Sample ID Code	: ELW-12641

SL No.	TESTS	PROTOCOL.	RESULT	Limits of	G.S.R 422(E)	
				Detection	Desirable Limit	
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.38	2-12	5.5-9.0	
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	30.62	5-5000	100.0	
3:	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1110.0	10-10,000		
枢	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0	
8	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27%	APHA, 23rd Ed. 2017,5210 A+8	21.0	5-10000	30.0	
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	84.0	5-50000	250.0	

\*The result are related only to item tested.

BDL = Below Detection Limit

Analyst

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ty Manager



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#### FORMAT NO. ECO/QS/FORMAT/07

#### TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

#### TEST REPORT OF WASTE WATER\*

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Distt. Dhanbad - 828 112
Sampling Method	: APHA, 23 <sup>nt</sup> Ed. 2017
Sample Collected by	: Mr. Virendra Pandey
Sample Quantity	: As per requirement
Date of Sampling	: 10.11.2020 to 12.11.2020
Date of Sample Receiving	: 18.11.2020
Date of Analysis	: 18.11.2020 to 02.12.2020
Source of Sample	: STP Inlet Railway Colony
Sample ID Code	: ELW-12642

SL. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
10	pH	APHA, 23rd Ed, 2017, 4500H' A+B	8.20	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 25400	149.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23ed Ed. 2017, 2540C	815.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600
5	Blochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	44.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	374.0	5-50000

"The result are related only to item tested.

BDL = Below Detection Limit

Walkupnes Analyst

Authorized Signatory

Manager



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## FORMAT NO. ECO/QS/FORMAT/07

## TEST REPORT NO: ECO LAB/WW/1244/11/20 TEST REPORT ISSUE DATE: 11.12.2020

## TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer Sampling Method Sample Collected by Sample Quantity Date of Sample Receiving Date of Sample Receiving Date of Analysis Source of Sample	<ul> <li>M/s Tata Steel Ltd. (Jamadoba Group)</li> <li>Jamadoba, Distt. Dhanbad - 828 112</li> <li>APHA, 23rd Ed. 2017</li> <li>Mr. Virendra Pandey</li> <li>As per requirement</li> <li>10.11.2020 to 12.11.2020</li> <li>18.11.2020</li> <li>18.11.2020 to 02.12.2020</li> <li>STP Outlet Railway Colony</li> <li>ELW-12643</li> </ul>
Sample ID Code	: ELW-12043

SL	TELETE	(PROVIDE)		Limits of	G.S.R 422(E)
No.	11213	PROTOCOL	RESULT	Detection	Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.35	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	46.3	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/f)	APHA, 23td Ed. 2017, 2540C	796.0	10-10,000	0.00
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27%	APHA, 23rd Ed. 2017,5210 A+B	16,5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	70.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

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ality Manager

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi FORMATNO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-1/02/21

TEST REPORT ISSUE DATE: 09.04.2021

## **TEST REPORT OF AMBIENT AIR\***

Name of the Customer Address of the Customer

Date of Sampling

Sampling Method

Instrument Used

Location

Sample Collected By

: Tata Steel Colliery (Jamadoba Group)

: Jamadoba, Distt. Dhanbad

- Jharkhand
- : 08.02.2021
- : Mr. Arvind Singh
- : IS: 5182
- : RDS & FDS
- : Central Work Shop Area, Jamadoba

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 <sup>th</sup> , 2009
1,	PM2.5 (µg/m³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	44.8	12.5-1000	60
2.	PM10 (µg/m3)	1S:5182 (Part-23)	85.5	12.5-1000	100
3.	$SO_2(\mu g/m^3)$	IS:5182 (Part-2)	20.5	9-200	80
4.	$NO_2(\mu g/m^3)$	1S:5182 (Part-6)	28.5	6-200	80
5.	NH3(μg/m <sup>3</sup> )	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	16.5	2-700	400
6.	O3 (µg/m3)	1S:5182(Part-9)	18.3	2-200	180
7.	CO (mg/m3)	IS:5182 (Part-10)	0.95	0.2-500	04
8.	Pb(µg/m <sup>3</sup> )	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	
10.	Cd (µg/m³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	*
11.	As (ng/m³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m <sup>3</sup> )	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

\*The results is related only to tested item. Note: Below Detection Limit

rchand Analyst

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Quality Manager

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi FORMAT NO. ECO/OS/FORMAT/10

TEST REPORT NO: ECO LAB/AAO-2/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## **TEST REPORT OF AMBIENT AIR\***

Name of the Customer Address of the Customer

- : Tata Steel Colliery (Jamadoba Group)
- : Jamadoba, Distt. Dhanbad

Date of Sampling Sample Collected By Sampling Method Instrument Used Location

: Mr. Arvind Singh : IS: 5182

Jharkhand

: 08.02.2021

: RDS & FDS : Officers Colony, 12 No. Digwadih

SI. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 <sup>th</sup> , 2009
1,	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.28	12.5-1000	60
2,	PM10(µg/m3)	IS:5182 (Part-23)	88.96	12.5-1000	100
3.	SO <sub>2</sub> (µg/m <sup>3</sup> )	IS:5182 (Part-2)	18.70	9-200	80
4,	$NO_2(\mu g/m^3)$	IS:5182 (Part-6)	34.20	6-200	80
5.	NH3(µg/m3)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	22.84	2-700	400
6.	O <sub>3</sub> (μg/m <sup>3</sup> )	1S:5182(Part-9)	21.50	2-200	180
7.	CO (mg/m <sup>3</sup> )	IS:5182 (Part-10)	1.82	0.2-500	04
8.	Pb(µg/m <sup>3</sup> )	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	
10.	Cd (µg/m³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	
11.	As (ng/m³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m³)	SOP NO. A -21, Issue No.1 date 26.07,2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

\*The results is related only to tested item. Note: Below Detection Limit.

Archano Analyst

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-3/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## **TEST REPORT OF AMBIENT AIR\***

Name of the Customer Address of the Customer

- : Tata Steel Colliery (Jamadoba Group)
- : Customer : Jamadoba, Distt. Dhanbad
  - Jharkhand
  - : 09.02.2021 : Mr. Arvind Singh
- Sample Collected By Sampling Method Instrument Used

Date of Sampling

Location

: IS: 5182

; RDS & FDS

: General Manager's Office Area

SI. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 <sup>th</sup> , 2009	
I.	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.85	12.5-1000	60	
2,	PM10 (µg/m3)	IS:5182 (Part-23)	87.28	12.5-1000	100	
3.	$SO_2(\mu g/m^3)$	IS:5182 (Part-2)	21.20	9-200	80	
4.	$NO_2(\mu g/m^3)$	IS:5182 (Part-6)	33.9	6-200	80	
5.	NH3(µg/m <sup>3</sup> )	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	12.7	2-700	400	
6.	O3 (µg/m <sup>3</sup> )	1S:5182(Part-9)	17.4	2-200	180	
7.	CO (mg/m <sup>3</sup> )	IS:5182 (Part-10)	1.70	0.2-500	04	
8.	Pb(µg/m <sup>3</sup> )	IS:5182(Part-22)	BDL	1-100	1.0	
9.	Cr (µg/m³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-	
10.	Cd (µg/m <sup>3</sup> )	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	8.58	
11.	As (ng/m³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06	
12.	Ni (ng/m <sup>3</sup> )	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20	

\*The results is related only to tested item. Note: Below Detection Limit

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Authorized Signatory

Manager

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-4/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## **TEST REPORT OF AMBIENT AIR\***

Name of the Customer Address of the Customer

Date of Sampling

Sampling Method

Instrument Used

Location

Sample Collected By

- : Tata Steel Colliery (Jamadoba Group)
- : Jamadoba, Distt. Dhanbad
- Jharkhand
- : 09.02.2021
- : Mr. Arvind Singh ÷
  - IS: 5182
  - : RDS & FDS
  - : Jamadoba Colliery

SL. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18th, 2009
1.	PM25 (µg/m³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	39.2	12.5-1000	60
2.	PM10 (µg/m3)	18:5182 (Part-23)	81.2	12.5-1000	100
3.	SO2(µg/m3)	IS:5182 (Part-2)	14.5	9-200	80
4.	$NO_2(\mu g/m^3)$	1S:5182 (Part-6)	18.2	6-200	80
5.	NH3(µg/m³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	34.6	2-700	400
6,	O3 (µg/m <sup>3</sup> )	1S:5182(Part-9)	21.2	2-200	180
7.	CO (mg/m <sup>3</sup> )	1S:5182 (Part-10)	1.16	0.2-500	04
8.	Pb(µg/m <sup>3</sup> )	1S:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m³)	SOP NO. A -23, Issue No.1 date 26.07,2016 (CPCB-NAAQM Guideline)	BDL	1-100	
10.	Cd (µg/m³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	•
н.	As (ng/m <sup>3</sup> )	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m <sup>3</sup> )	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

\*The results is related only to tested item. Note: Below Detection Limit.

Archana Analyst

Authorized Signatory Ecomen Laboratories Pvt. Ltd.

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AN/03/21 TEST REPORT ISSUE DATE: 09.04.2021

## TEST REPORT OF AMBIENT NOISE LEVEL

Name of the Customer Address of the Customer : Tata Steel Colliery (Jamadoba Group)

- : Jamadoba, Distt. Dhanbad Jharkhand
- Sample Collected By Instrument Used
- : Mr. Arvind Singh
- : Noise Meter (HTC)

SI.	1 monthanna	Locations Date of		Day Time			Night Time		
No.	Locations	Monitoring	Max.	Min.	Leq.	Max.	Min.	Leq	
4.	Central Work Shop Area Jamadoba	08.02.2021	67.5	55.8	57.4	62.8	47.9	53.2	
2.	Officer's Colony, 12 No. Digwadih	08.02.2021	57.8	52.9	52.5	48.6	44.2	45.1	
3.	General Manager's Office Area	09.02.2021	52.6	48.6	50.2	46.3	40.2	41.3	
4.	Jamadoba Colliery	09.02.2021	71.1	54.2	67.2	66.2	47.3	53.2	

#### Noise (Ambient Standard)

Area Code	Category of area	Limit in dB	(A) Leq
		Day Time	Night Time
A	Industrial Area	75	70
В	Commercial Area	65	55
С	Residential Area	55	45
D	Silence Zone	50	40

#### Note:

Day time is reckoned in between 6:00 AM and 10:00 PM.

Night time is reckoned in between 10:00 PM and 6:00 AM

3. Silence zone is defined as area up to 100m around such premises as hospitals,

Educational institutions & courts. The silence zones are to be declared by a competent authority. 4. Mixed categories of areas should be declared as one of the four above-mentioned

Categories by the competent authority and the corresponding standard shall apply.

Analyst

Authorized Signatory

Manager Quali

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/MCPM/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## MINERALOGICAL COMPOSITION OF PARTICULATE MATTER

Name of the Customer Address of the Customer

: M/s Tata Steel Ltd. (Jamadoba Group)

: Jamadoba,

Distt. Dhanbad - 828 112

Month

: February, 2021

		200	N	lineralogical	Composition (	in %)
S.NO,	Locations	Date of Sampling	Silica (SiO <sub>2</sub> )	Ferrous oxide (FeO)	Alumina (Al <sub>2</sub> O <sub>3</sub> )	Calcium Oxide CaO
1	General Manager's Office Area	09.02.2021	1.72	0.08	1.42	2.96
2	Jamadoba Colliery	09.02.2021	2.80	0.17	1.41	2.89

Analyst

# Authorized Signatory

opna Quality Manager

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt, of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## TEST REPORT OF DRINKING WATER\*

Name of the Customer Address of the Customer

: M/s Tata Steel Ltd. (Jamadoba Group) : Jamadoba,

Distt. Dhanbad - 828 112

- : APHA, 23rd Ed. 2017 Sample Collected by : Mr. Arvind Singh
  - : As per requirement

Sample Quantity Date of Sampling

- Date of Sample Receiving
- Date of Analysis
- Source of Sample

Sampling Method

- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : Jamadoba Canteen

SL Na.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STAND 10500:1991()	
			1 2022402100435		Desirable	Permissible
L	Colour (Hazen unit)	APRA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2	Odear	AP\$1A, 23ed Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taute	AP11A, 23rd Ed. 2017, 2160 A+B	Agreeable	Qualitative	Agrecable	Agreeable
*	Turtidity as (NTU)	APR 1, 23rd Ed. 2017, 2130-A+B	1.53	1-100	1.0	5.0
ñ	pli	APRA, 23rd Ed. 2017, 450081+ A+8	7.24	2-12	65-85	No Relat.
6,	Total Dissolved Selids as TDS (mg/l)	APRA, 23rd Ed. 2017, 2540-C	480,8	5-5000	500	2000
Ť.	Allalinity (mg/l)	APRA, 23rd Ed. 2017, 2320 A+ B	184.0	5-1500	209	600
8	Total Hardness as CaCO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 1340 A+C	196,0	5-1500	200.0	600.0
9	Calcium as Ca (mp?)	AP11A, 23rd Ed. 2017, 3500 Ca A+B	49.60	5-1990	75.0	200.0
10,	Copper as Cu (mg/l)	APIIA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron za Fe (mg/l)	APHA. 23rd Ed. 2017, 3500 Fe B	0.20	0.02-50	6.3	No Relat.
12,	Manganese as Min (rag/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0,1-5	0.10	0.30
U.	Chieride as CI (mp/l)	APIEA, 23rd Ed. 2017, 4500 CI A+B	32.6	5-1000	250.0	1000.0
14,	Sulfate as SO4 (mp/l)	APRA, 23vd Ed. 2017, 4500-SO42- E	45.7	1.0-250	206.0	400.0
15,	Nitrate Nitrogen as NO <sub>3</sub> (ssg/l)	APRIA, 23rd E4, 2017, 4509-NO3- B	9.36	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0,33	0.05-10	1.0	1.5
17,	Mercury as Hg (mg/l)	APILA, 33rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
18,	Cadmium as Cd (mg?)	APRA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	6.003	No Relax
19.	Arsmic as As (mp/l)	APRA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	6,91	No Relax
24.	Lead as Pb (mg/l)	APEA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	6,01	
21	Zine as Zn (mg/l)	AP81A, 23rd E4, 2017, 3111 A+B	0.28	6.02-50	5	No Relax.
22	Aluminium as Al (mg/l)	APRIA, 13rd Ed. 2017, 3500ALA+B	BDL	1-100	6.03	0.2
23.	Chromium at Crité (mgil)	APRA, 33rd Ed. 2017, 3111A+B	BDL	0.05-100	1112	11117700
24.	Cyanide as CN (usg/l)	APILA, 23rd Ed. 2017, 4500CN , APD	BDL	0.02-10	0.05	No Relax.
25.	Free Residual Chlorine (mg/l)	APRA, 23rd Ed. 2017. 4500-C1 8	BDL	0.1-5	0.20	1.0
26.	Phenolic Compounds as CallaOil (mg/l)	AF#A, 23rd Ed. 2017, 5830 A+C	BDL	1-10	0.001	0.002
27	Mineral Oil 6 (ang/l)	APRIA, 23rd Ed. 2017, Class-6 Infrared Partition Method	BDL	0.01-50	4.5	No Relax.
28	Baran as B (mg/l)	APILA, 23rd Ed, 2017, 4500 B A+C	0.26	0.2-10	0.5	1.9
20	Total Coliform (MPN/100ml)	APRIA, 23rd Ed. 2017, 9221 A+B	Absent	1.8	Absent	Aluent

\*The result are related only to item tested.BDL = Below Detection Limit

and Analyst

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## TEST REPORT OF DRINKING WATER\*

Name of the Customer Address of the Customer

: M/s Tata Steel Ltd. (Jamadoba Group)

Date of Sample Receiving

Sampling Method

Sample Quantity

Date of Sampling

Date of Analysis

Source of Sample

Sample Collected by

- Distt. Dhanbad 828 112
- : APHA, 23rd Ed. 2017
- : Mr. Arvind Singh
- : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : Digwadih Club

: Jamadoba,

SL Ne.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STAND 10500:1991(	
L	0.1		-	States.	Desirable	Permissible
2	Colour (Hazen unit)	APRA, 23rd Ed. 2017, 2129 B	<5.0	5-100	5,00	15.0
	Odear	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3	Taste	AP11A, 23rd Ed. 2017, 2160 A+1	Agreeable	Qualitative	Agreeable	Agreeable
4	Turbility as (NTU)	APRA, 23rd Ed. 2017, 2130-A+B	1.24	I-110	1.0	5.0
5.	pli	APILA, 23rd Ed. 2017, 4500H+ A+B	7.32	2-12	6.5-8,5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APRA, 23rd Ed. 2017, 2540-C	502,0	5-5000	500	2009
2	Alialisity (mg/l)	APRA, Did Ed. 2017, 2320 A+ B	180.0	5-1500	200	630
8	Total Hardness as CaCO <sub>2</sub> (mg/l)	APHA, 23cd Ed. 2017, 2340 A+C	200.0	5-1500	209,9	600.0
9.	Caldium as Ca (mg/l)	APILA, 25rd Ed. 2017, 3500 Ca A+B	52.80	5-1000	75.0	200.0
10,	Copper as Cu (mg/l)	APHA, 23rd Ed. 2007, 3111 A+B	BDL.	0.05.5	0.05	1.5
11.	Iron as Fe (rag@)	APRA, 23rd Ed. 2017, 3500 Fe B	0.27	0.02-50	0,3	No Relat.
12.	Manganese as Mo (mg/l)	APRA, 23ed Ed. 2017, 3111 A+B	BDI.	0.1-5	6,10	0.30
12.	Chlaride as Cl (mg/l)	APRA, 23rd Ed. 2017, 4500 CLA+B	38,0	5-1000	256.0	1000.0
14	Sulfate as SO4 (mg/l)	APILA: 73rd Ed. 2017, 4500-SO42- E	43.1	1.0-250	2003.0	409.0
15	Nitrate Nitrogen as NO <sub>2</sub> (mp/l)	APRIA, 13rd Ed. 2017, 4500-NO3- B	13.0	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APITA, 13nd Ed. 2017, 4500-C	0.34	0.05-10	1.0	1.5
17,	Mercury as Hg (mg/l)	APIEA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax
18.	Cadmium as Cd (mg/l)	APRA, 33rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Retax
19.	Arsmic as Ar (mg1)	APRA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	6.01	No Relax
20.	Lead as Pb (mg/l)	APILA, 23rd Ed. 2017, 3111 A+B	BDL.	0.01-1.0	0.01	No Relax.
21	Zine as Zn (mg/l)	APTIA, 25c0 Ed. 2017, 3111 A+B	0.06	0.02-50	5	15
22	Abunisium as Al (mg/l)	APTIA, 23rd Ed. 2011, 3598AL A+B	EDL	1-100	0.03	0.2
13.	Chromium as Cr+6 (mg/l)	AP11A, 33rd Ed. 2017, 3111A+B	BDL.	0.05-100	0.05	No Relax.
14.	Cyanide as CN (rsg/l)	APRA, 23rd Ed. 2017, 45HOCN , A+D	BDL	0.62-10	0.05	No Relax.
15.	Free Residual Chiocine (ug/l)	APHA, 23rd Ed. 2017, 4500-CI B	IDL.	0.1-8	0.20	1.0
M.	Phenolic Compounds as CalleOH (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.662
n	Mineral Oil 6 (aug/t)	APIIA, 23rd Ed. 1917, Class -6 Infrared Partition Method	BDL	0.01-10	0.5	No Relax.
8	Boron as B (ragil)	APTIA, 25rd Ed. 2017, 4500 B A+C	0.24	0.2-10	0.5	1.4
9	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2013, 9221 A+B	Alseal	1.8	Absent	Absent

\*The result are related only to item tested. BDL = Below Detection Limit

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Authonized Signatory

Quality Manager

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt, of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## TEST REPORT OF GROUND WATER\*

Name of the Customer Address of the Customer

- : M/s Tata Steel Ltd. (Jamadoba Group)
- : Jamadoba,
  - Distt. Dhanbad 828 112
  - : APHA, 23rd Ed. 2017
  - : Mr. Arvind Singh : As per requirement
- Sample Quantity Date of Sampling Date of Sample Receiving
- Date of Analysis Source of Sample

Sampling Method

Sample Collected by

- : 10.02.2021 to 13.02.2021 : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : Purnadih (Jorapokhar)

SL No.	TESTS	PROTOCOL	PROTOCOL RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)		
1000			1110000000	Be	Desirable	Permissible	
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0	
2	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	30.5	10-100			
3.	Electrical Conductivity (µmhos/cm)	APHA,23rd Ed,2017, 2510-A+B	946.0	1-2000			
4	Dissolved Solids (mg/l)	APHA,23rd Ed.2017 (2540B)	650.0	5-10000			
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.60	2-12	6.5-8.5	No Relax.	
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	216.0	5-1500	200	600	
7.	Total Hardness as CaCO <sub>3</sub> (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	244.0	3-1500	200.0	600.0	
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	59.2	5-1000	75.0	200.0	
9.	Magnesium as Mg (mg/l)	APHA, 234 Ed. 2017, 3500 Mg A+B	23.32	5-1000	30.0	100.0	
10,	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5	
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.16	0.02-50	0.3	No Relax.	
12,	Chioride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 CI A+B	82.4	5-1000	250.0	1000.0	
13.	Sulfate as SO <sub>1</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	66.2	1.0-250	206.0	400.0	
14.	Nitrate Nitrogen as NOs(mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	10.3	5-100	45.0	No Relax	
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.91	0.05-10	1.0	1.5	
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.	
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax	
18,	Nickel as Ni (mg/l)	APHA, 234 Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax	
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax	
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax	
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.12	0.02-50	5		
22.	Total Chromium as Cr (mg/l)	APRA, 23* Ed. 2017,3111 A+B	BDL	0.05-50	0.05	15 No Relax	
13.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax	

\*The result are related only to item tested.

BDL = Below Detection Limit

rchand Analyst

Authorized Signatory

Quality Manager

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ecoMen

An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## TEST REPORT OF GROUND WATER\*

Name of the Customer Address of the Customer

: M/s Tata Steel Ltd. (Jamadoba Group)

: Jamadoba,

- Distt. Dhanbad 828 112 : APHA, 23rd Ed. 2017
- Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis

Source of Sample

- : Mr. Arvind Singh : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
  - : Digwadih 10 No, F&J

5L No.	TESTS	TESTS PROTOCOL RESULT		Detection Range	INDIAN STAN IS 10500:1991	DARDS as per l(Reaff:2012)
Caucht		7-08/25/07/25/25/25/20	449 S8 (2017-5.)	eange	Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	30.8	10-100		
3.	Electrical Conductivity (µmhos/cm)	APHA,23** Ed.2017, 2510-A+B	786.0	1-2000		
4.	Dissolved Solids (mg/l)	APHA,23** Ed.2017 (2540B)	528.0	5-10000		14
5.	рН	APHA, 23rd Ed. 2017, 4500H+ A+B	7.50	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	188.0	5-1500	200	600
7.	Total Hardness as CaCO <sub>3</sub> (mg/l)	APRA, 23rd Ed. 2017, 2340 A+C	236.0	5-1500	200.0	600.0
8,	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	60.80	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 234 Ed. 2017, 3500 Mg A+B	20.41	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.05	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 CI A+B	72.6	5-1000	250.0	1000.0
13,	Sulfate as SOs (mg/l)	APHA, 23rd Ed. 2017, 4500-5C42- E	56.8	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO2(mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	14.08	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4800-C	0.62	0,05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APRA, 23+ Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/I)	APHA, 23rd Ed. 2017, 3111 A+B	0.16	0.02-50	5	15
22	Total Chromium as Cr (mg/l)	APHA, 234 Ed. 2017,3111 A+8	BDL	0.05-50	0.05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax.

\*The result are related only to item tested.BDL = Below Detection Limit

Analyst

Qualit Aanager

Flat No. 8, 2nd Floor, Arif Chamber-V, Sector H, Aliganj, Lucknow - 226 024 Phone No. : (91-522) 2746282. 2745726 Telefax No.: (91 - 522) 2745726 E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601,GSTIN : 09AAACE6076H121



An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## TEST REPORT OF GROUND WATER\*

Name of the Customer Address of the Customer

Sampling Method

Sample Collected by

: M/s Tata Steel Ltd. (Jamadoba Group) : Jamadoba,

ress of the Customer

- Distt. Dhanbad 828 112
- : APHA, 23rd Ed. 2017
  - Mr. Arvind Singh
     As per requirement

Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : Kalimela Kalimandir

5L No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
			12201312215	Kalege	Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	31.3	10-100		-
3.	Electrical Conductivity (umhos/cm)	APILA,23** Ed.2017, 2510-A+B	816.0	1-2000		
4.	Dissolved Solids (mg/l)	APHA,23 <sup>+4</sup> Ed.2017 (25408)	512.0	5-10000	-	100
5:	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.40	2.12	6.5-8.5	No Relax.
ń.,	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	180.0	5-1500	200	600
7.	Total Hardness as CaCO <sub>5</sub> (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	205.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed, 2017, 3800 Ca A+B	56.0	5-1000	25.0	200,0
9,	Magnesium as Mg (mg/l)	APHA, 23-4 Ed. 2017, 3500 Mg A+B	15.8	5-1000	30.0	108.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	15
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.085	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 CI A+B	52.0	5-1000	250.0	1000.0
13.	Sulfate as SO <sub>4</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	56.0	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO <sub>5</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	10.5	5-100	45.0	No Relax.
15.	Fluorides as F {mg/l}	APHA, 23ed Ed. 2017, 4500-C	0.72	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.002-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23-4 Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	and the second second
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.12	0.02-50		No Relax.
22	Total Chromium as Cr (mg/l)	APHA, 23* Ed. 2017,3111 A+E	BDL	0.02-50	5 0,05	15 No Relax
23,	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax

\*The result are related only to item tested.BDL = Below Detection Limit

and Analyst

Authorized Signatory

Quality Manager

Flat No. 8, 2nd Floor, Arif Chamber-V, Sector H, Aliganj, Lucknow - 226 024 Phone No. : (91-522) 2745282. 2745726 Telefax No. : (91 - 522) 2745726 E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601,GSTIN : 09AAACE6076H121



An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## TEST REPORT OF GROUND WATER\*

Name of the Customer Address of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)

istomer : Jamadoba,

- Distt. Dhanbad 828 112 : APHA, 23rd Ed. 2017
- Sampling Method : APHA, 23rd Ed. 201 Sample Collected by : Mr. Arvind Singh Sample Quantity : As per requirement
  - : 10.02.2021 to 13.02.2021
- Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample
- : 16.02.2021 : 16.02.2021 to 27.02.2021
- : Upper Dungari

SL No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 105001991(Reaff:2012)	
1013210			1.5463666111	Mange	Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	32.5	10-100		× -
3,	Electrical Conductivity (umbos/cm)	APHA,23* Ed.2017, 2510-A+B	1088.0	1-2000		
4.	Dissolved Solids (mg/l)	APHA,23* Ed.2017 (2540B)	698.0	5-10000		
5.	рн	APHA, 23rd Ed. 2017, 4500H+ A+B	7.56	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	205.0	5-1500	200	600
7,	Total Hardness as CaCO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	256.0	5-1500	200.0	600.0
8,	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3800 Ca A+B	68.8	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 234 Ed. 2017, 3500 Mg A+B	20.41	5-1000	30.0	100.0
10,	Copper as Cu (mg/l)	APHA, 23ed Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23ed Ed. 2017, 3500 Fe B	0.10	0.02-50	0.3	No Relax.
12,	Chloride as Cl (mg/l)	APRA, 23rd Ed. 2017, 4500 CI A+B	64.0	5-1000	250.0	1000.0
13,	Sulfate as SO <sub>8</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SC)42- E	48.0	1.0-250	200.0	400.0
14,	Nitrate Nitrogen as NO <sub>5</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	16.8	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.64	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL.	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDI.	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23+ Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.18	0.02-50	5	15
22.	Total Chronsium as Cr (mg/l)	APHA, 23* Ed. 2017,3111 A+B	BDL	0.05-50	0.05	No Relax
23,	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax.

\*The result are related only to item tested.BDL = Below Detection Limit

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## TEST REPORT OF GROUND WATER\*

Name of the Customer Address of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)

t : Jamadoba,

Distt. Dhanbad - 828 112 : APHA, 23rd Ed. 2017

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving

Date of Analysis

Source of Sample

- : Mr. Arvind Singh : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : Kenduadih Basti

\$1. No.	TESTS	FROTOCOL	RESULT	Detection	INDIAN STANDARDS as per IS 105001991(Reaff:2012)	
1. S.			in Mee	Range	Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5,00	15.0
2.	Temperature (0C)	APHA,23rd Ed.2817, [2550 A+B]	30.0	10-100		
3.	Electrical Conductivity (jumhos/cm)	APHA,234 Ed.2017, 2510-A+B	828.0	1-2000	50	
4.	Dissolved Solids (mg/l)	APHA,23- Ed.2017 (2540B)	480.0	5-10000		
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.30	2-12	6.5-8.5	No Relax.
б.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	200.0	5-1500	200	600
7.	Total Hardness as CaCO <sub>1</sub> (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	220.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	56.0	5-1000	75.0	200.0
9,	Magnesium as Mg (mg/l)	APRA, 234 Ed. 2017, 3500 Mg A+B	19.44	3-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APRA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.65	1.5
11.	fron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.13	0.02-50	0.3	No Relax.
12	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 CI A+D	42.0	5-1000	250.0	1000.0
13.	Sulfate as SO4 (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	35.60	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NOs (mg/l)	APHA, 23ed Ed. 2017, 4500-NO3- B	20.0	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.63	0.05-10	1.0	1,5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDI.	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDI,	0.002-2	0.003	No Relax
18	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.92-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.12	0.02-50	5	15
22	Total Chromium as Cr (mg/l)	APHA, 23* Ed. 2017,3111 A+8	BDL	0.05-50	0.05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax.

\*The result are related only to item tested. BDL = Below Detection Limit

ang Analyst

Authorized Signatory

a Quality Manager

Flat No. 8, 2nd Floor, Arlf Chamber-V, Sector H, Aliganj, Lucknow - 226 024 Phone No. : (91-522) 2746282. 2745726 Telefax No.: (91 - 522) 2745726 E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601,GSTIN : 09AAACE6076H1Z1



An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## **TEST REPORT OF GROUND WATER\***

Name of the Customer Address of the Customer

Sampling Method

Sample Collected by

: M/s Tata Steel Ltd. (Jamadoba Group)

- Distt. Dhanbad 828 112
- : APHA, 23rd Ed. 2017

: Jamadoba,

: Mr. Arvind Singh : As per requirement

Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : 6&7 Pits (Ayodhya Nagar)

SL No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
100000				isange	Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	32,4	10-100	8	12
3.	Electrical Conductivity (jumhos/cm)	APHA,234 Ed.2017, 2510-A+B	818.0	1-2000		
4.	Dissolved Solids (mg/l)	APILA,23* Ed.2017 (2540B)	536.0	5-10000		
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.46	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	212.0	5-1500	200	600
7.	Total Hardness as CaCO <sub>2</sub> (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	252.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	64.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 234 Ed. 2017, 3500 Mg A+B	22.35	5-1000	30.0	100.0
10,	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.19	0.02-50	0.3	No Relax.
12	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 CI A+B	62.2	5-1000	250.0	1000.0
13.	Sulfate as SOs (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	43.0	1,0-250	200.0	400.0
14.	Nitrate Nitrogen as NO <sub>5</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	14.26	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.60	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23ed Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23* Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.24	0.02-50	5	15
22	Total Chromium as Cr (mg/l)	APHA, 23" Ed. 2017,3111 A+B	BDL	0.05-50	0.05	No Relax
23	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax.

\*The result are related only to item tested.BDL = Below Detection Limit.

Authorited Signatory

Quality Manager

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eco LABORATORIES PVT LTO

An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/SW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

#### TEST REPORT OF SURFACE WATER

Name of the Customer Address of the Customer

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

- : M/s Tata Steel Ltd. (Jamadoba Group)
- : Jamadoba, Distt. Dhanbad - 828 112
- : APHA, 23rd Ed. 2017
- : Mr. Arvind Singh
- : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : Damodar River, Up Stream

SI. No,	TESTS	PROTOCOL	RESULT	Detection Range	15:2296 Class-C
1.	pH	APHA,23=Ed.2017,4500H+A+B,	7.42	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	12.5	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA,23 <sup>rd</sup> Ed.2017 (2540C)	654.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA,23** Ed.2017 (4500 A+C)	6.8	2-10	4.0
5,	Biochemical Oxygen Demand as BOD (mg/l)	APHA,23* Ed.2017 (5210A+B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 CI A+B	52.0	5-1000	+
7.	Fluorides as F (mg/l)	APHA.23= Ed.2017 (4500 -C)	0.58	0.05-10	1.5
8.	Sulfate as SO4 (mg/l)	APHA.234 Ed.2017 (4500 - SO4 E)	36.0	1.6-250	400.0

\*The result are related only to item tested - The parameters are not included in IS: 2296 Class-C BDL - Below Detection Limit

Analyst

Authorized Signatory

Flat No. 8, 2nd Floor, Arif Chamber-V, Sector H, Aliganj, Lucknow - 226 024 Phone No. : (91-522) 2746282. 2745726 Telefax No.: (91 - 522) 2745726 E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601.GSTIN : 09AAACE6076H121

Sampling Method

Sample Quantity

Date of Sampling

Date of Analysis

Source of Sample

Sample Collected by

Date of Sample Receiving



An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/SW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## TEST REPORT OF SURFACE WATER

Name of the Customer	: M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer	: Jamadoba,
	Dist Dist 1 1 constant

Distt. Dhanbad - 828 112 : APHA, 23rd Ed. 2017

- : Mr. Arvind Singh
- : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : Damodar River, Down Stream

51. No,	TESTS	PROTOCOL	RESULT	Detection Range	18:2296 Class-C
1.	pH	APHA,23 <sup>14</sup> Ed.2017, 4500H+A+B,	7.70	2.12	8.5
2.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	11.0	1-100	
3.	Total Dissolved Solids as TDS (mgA)	APHA.234 Ed.2017 (2540C)	688.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA.234 Ed.2017 (4500 A+C)	5.9	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA,23* Ed.2017 (5210A+ B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 CI A+B	63.2	5-1000	2022
7.	Fluorides as F (mg/l)	APHA,23" Ed.2017 (4500 - C)	0.52	0.05-10	15
8.	Sulfate as SO4 (mg/l)	APHA,23" Ed.2017 (4500 - SO42 E)	46.0	1.0-250	400.0

\*The result are related only to item tested - The parameters are not included in IS: 2296 Class-C BDL - Below Detection Limit

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Authorized Signatory

Quality Manager

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

: M/s Tata Steel Ltd. (Jamadoba Group)

#### TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer

: Jamadoba, Distt. Dhanbad - 828 112

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

- : APHA, 23rd Ed. 2017
- : Mr. Arvind Singh
- : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : 2Pit Jamadoba Colliery
- G.S.R 422(E) Limits of SI. TESTS PROTOCOL RESULT No. Detection Desirable Limit pH APHA, 23rd Ed. 2017, 4500H' A+B 7.72 2-12 5.5-9.0 t Total Suspended Solid as TSS 20.0 5-5000 100.0 2 APHA, 23rd Ed. 2017, 2540D (mg/l) Total Dissolved Solids as TDS 634.0 10-10.000 ÷ 3 APHA, 23rd Ed. 2017, 2540C (mg/l) 10.0 APHA, 23rd Ed. 2017, 5520 (A+D BDL 5-600 Oil & Grease as O & G (mg/l) 4 **Biochemical** Oxygen Demand 30.0 APHA, 23rd Ed. 2017,5210 A+B 9.2 5-10000 5 as BOD (mg/l) 3days at 27<sup>6</sup>C Chemical Oxygen Demand 38.6 5-50000 250.0 APHA, 23rd Ed. 2017, 5220 A+B 6 as COD (mg/l)

\*The result are related only to item tested.

BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04 2021

## **TEST REPORT OF WASTE WATER\***

Name of the Customer Address of the Customer

: M/s Tata Steel Ltd. (Jamadoba Group) : Jamadoba,

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

- Distt. Dhanbad 828 112
- : APHA, 23rd Ed. 2017
- : Mr. Arvind Singh
- : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : 2 Incline Jamadoba Colliery

51.	TESTS	TESTS PROTOCOL	DECKIT	Limits of Detection	G.S.R 422(E)
No.			RESULT		Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.53	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	16.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	508.0	10-10,000	
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27 <sup>6</sup> C	APHA, 23rd Ed. 2017,5210 A+B	12.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	28.0	5-50000	250.0

\*The result are related only to item tested. BDL = Below Detection Limit

and Analyst

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oung Quality Manager

Flat No. 8, 2nd Floor, Arif Chamber-V. Sector H. Aliganj, Lucknow - 226 024 Phone No. : (91-522) 2746282, 2745726 Telefax No.: (91 - 522) 2745726 E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601,GSTIN : 09AAACE6076H121



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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer

: M/s Tata Steel Ltd. (Jamadoba Group)

Jamadoba,
 Distt. Dhanbad – 828 112.

Sampling Method Sample Collected by

: Mr. Arvind Singh

: As per requirement

: APHA, 23rd Ed. 2017

- Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample
- : 10.02.2021 to 13.02.2021 : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : 6&7 Pit Colliery

SI.	TESTS	PROTOCOL	NO2111 P	Limits of	G.S.R 422(E)
No.			RESULT	Detection	Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H' A+8	7.6	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 25rd Ed. 2017, 2540D	10.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 25rd Ed. 2017, 2540C	620.0	10-10,000	
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	8.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	32.0	5-50000	250.0

\*The result are related only to item tested. BDL = Below Detection Limit

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Authorized Signatory Ecomen Laboratories Prit I td. Flat No.-8, 2nd Floot, Arif Chamber-V Sector-H, Aliganj, Lucknow-225024

Ph.-2746282, Fax:2745726

Quality Manager

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

#### TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer M/s Tata Steel Ltd. (Jamadoba Group)
 Jamadoba,

Distt. Dhanbad - 828 112

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving

Date of Analysis

Source of Sample

- : Mr. Arvind Singh
- : As per requirement

: APHA, 23rd Ed. 2017

- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : Digwadih Colliery

SI.	TESTS			Limits of Detection	G.S.R 422(E)
No.		PROTOCOL	RESULT		Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+8	7.50	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	15.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	580.0	10-10,000	
- 4	Oil & Grease as D & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0 +
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	8.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	27.5	5-50000	250.0

\*The result are related only to item tested. BDL = Below Detection Limit

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Flat No. 8, 2nd Floor, Arif Chamber-V, Sector H, Aliganj, Lucknow - 226 024 Phone No. : (91-522) 2746282, 2745726 Telefax No.: (91 - 522) 2745726 E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601,GSTIN : 09AAACE6076H12I



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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04 2021

#### TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving

Date of Analysis

Source of Sample

- : M/s Tata Steel Ltd. (Jamadoba Group)
- : Jamadoba,
  - Distt. Dhanbad 828 112
- : APHA, 23rd Ed. 2017
- : Mr. Arvind Singh
- : As per requirement

: 10.02.2021 to 13.02.2021

- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : JCPP (Final Settling Pond)

SL No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	Ph	APHA, 23rd Ed. 2017, 4500H' A+B	7,25	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 25400	18.5	5-5000
3	Total Dissolved Solids as TDS (mgl)	APHA, 23rd Ed. 2017, 2540C	915.0	10-10,000
4	Oil & Grease as O & G (eng/l)	APHA, 23td Ed. 2017, 5520 (A+D	6.48	5-600
3	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27%	APHA, 23rd Ed. 2017,5210 A+B	12.3	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	38.2	5-50000

\*The result are related only to item tested. BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

#### TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)

- : Jamadoba,
  - Distt. Dhanbad 828 112 : APHA, 23<sup>rd</sup> Ed. 2017
- Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample
- : Mr. Arvind Singh : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : T.C.H Point -1 (Near Children's Ward)

S1.	TESTS		neera T		Limits of	G.S.R 422(E)
No.		PROTOCOL.	RESULT	Detection	Desirable Limit	
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.14	2-12	5.5-9.0	
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	46.2	5-5000	100.0	
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2349C	\$40.0	10-10,000		
.4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0	
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27 <sup>6</sup> C	APHA, 23rd Ed. 2017,5210 A+B	12.0	5-10000	30,0	
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	92.3	5-50000	250.0	

"The result are related only to item tested.

BDL = Below Detection Limit

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Flat No. 8, 2nd Floor, Arif Chamber-V, Sector H, Aliganj, Lucknow - 226 024 Phone No. : (91-522) 2745282, 2745726 Telefax No.: (91 - 522) 2745726 E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010501.GSTIN : 09AAACE6076H12I



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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

: M/s Tata Steel Ltd. (Jamadoba Group)

#### TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer

Jamadoba,
 Distt. Dhanbad – 828 112

- Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample
- : APHA, 23<sup>rd</sup> Ed. 2017 : Mr. Arvind Singh
- : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021 10
- : 10.02.2021
- : 16.02.2021 to 27.02.2021
- : ETP Inlet Jamadoba Canteen

<b>SI.</b>	TESTS	FROTOCOL				RESULT Limits of			Limits of	G.S.R 422(E)
No.		TROTOCOL	RESULT	Detection	Desirable Limit					
1	pН	APHA, 23rd Ed. 2017, 4500H A+B	8.42	2-12	5.5-9.0					
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	154.0	5-5000	100.0					
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	954.0	10-10,000						
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0					
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27%	APHA, 23rd Ed. 2017,5210 A+B	24.2	5-10000	30,0					
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	162.0	5-50000	250.0					

\*The result are related only to item tested. BDL = Below Detection Limit

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Flat No. 8, 2nd Floor, Arif Chamber-V, Sector H, Aliganj, Lucknow - 226 024 Phone No. : (91-522) 2746282, 2745725 Telefax No.: (91 - 522) 2745726 E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010501,GSTIN : 09AAACE5076H12J



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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04 2021

## TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer

: M/s Tata Steel Ltd. (Jamadoba Group)

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

- : Jamadoba,
- Distt. Dhanbad 828 112
- : APHA, 23rd Ed. 2017
- : Mr. Arvind Singh

: As per requirement

- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : ETP Outlet Jamadoba Canteen

SI.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
No.					Desirable Limit
1	рН	APHA, 25rd Ed. 2017, 4500H' A+B	7.60	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	44.3	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	868.0	10-10,000	
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
5.	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 29rd Ed. 2017,5210 A+B	15.2	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+8	68.6	5-50000	250.0

\*The result are related only to item tested. BDL = Below Detection Limit

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Ecomen Laboratories P.t. 1.td. Fha No.-8, 2nd Floor, Arif Chamber-V Sector-H, Aliganj, Lucknow-226024 Ph.-2746282, Fax:2745726

## 0 er Q Manager

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

## TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer M/s Tata Steel Ltd. (Jamadoba Group)
 Jamadoba,

dress of the Customer

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

- Distt. Dhanbad 828 112
- : APHA, 23rd Ed. 2017
- : Mr. Arvind Singh
- : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : ETP Inlet JCPP canteen

SI. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APPLA, 23rd Ed. 2017, 4500H* A+8	7.54	2.12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	142.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1156.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27%C	APHA, 23rd Ed. 2017,5210 A+B	26.8	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	164.3	5-50000

"The result are related only to item tested. BDL = Below Detection Limit

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Authorized Signatory Econten Laboratories Pvt. I td.

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Flat No. 8, 2nd Floor, Arif Chamber-V, Sector H, Aliganj, Lucknow - 226 024 Phone No. : (91-522) 2746282, 2745726 Telefax No.: (91 - 522) 2745726 E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601,GSTIN : 09AAACE6076H12I



An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt, of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

: M/s Tata Steel Ltd. (Jamadoba Group)

## TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer

: Jamadoba, Distt. Dhanbad - 828 112

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

- : APHA, 23<sup>rd</sup> Ed. 2017
- : Mr. Arvind Singh
- : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : ETP Outlet JCPP canteen

SI.	TESTS	TESTS PROTOCOL RESULT		Limits of Detection	G.S.R 422(E)
No.					Desirable Limit
1	pН	APHA, 23rd Ed. 2017, 4500H A+B	7.11	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	34.60	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	764.0	10-10,000	14
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demaad as BOD (mg/l) 3days at 27%	APHA, 25rd Ed. 2017,5210 A+8	19.6	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APH A, 23rd Ed. 2017, 5220 A+B	78.4	5-50000	250.0

\*The result are related only to item tested. BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

: M/s Tata Steel Ltd. (Jamadoba Group)

## TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer

- Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample
- : Jamadoba, Distt. Dhanbad - 828 112
- : APHA, 23nd Ed. 2017
- : Mr. Arvind Singh
- : As per requirement

: 10.02.2021 to 13.02.2021

- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : ETP Inlet TCH

SI. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
L.	pH	APHA, 23rd Ed. 2017, 4500H' A+B	6.82	2-12
2	Total Suspended Solid as TSS (mg5)	APHA, 23rd Ed. 2017, 25400	136.2	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	792.8	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	25.5	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	177.0	5-50000

\*The result are related only to item tested. BDLe= Below Detection Limit

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Authorized Signatory

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Flat No. 8, 2nd Floor, Arif Chamber-V, Sector H, Aliganj, Lucknow - 226 024 LABORATORIES F Phone No. : (91-522) 2746282, 2745726 Telefax No.: (91 - 522) 2745726 E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601,GSTIN : 09AAACE6076H121



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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

: M/s Tata Steel Ltd. (Jamadoba Group)

#### TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer

Jamadoba,
 Distt. Dhanbad - 828 112

- Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample
- : APHA, 23rd Ed. 2017 : Mr. Arvind Singh
- A PARTY AND SUIGH
- : As per requirement : 10.02.2021 to 13.02.2021
- . 16.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : ETP Outlet TCH

SI. No.	TESTS	FROTOCOL.	RESULT	Limits of Detection	G.S.R 422(E) Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.58	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APPLA, 23vd Ed. 2017, 2540D	36.2	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1016.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
\$	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	20.8	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 25rd Ed. 2017, 5220 A+B	83.2	5-50000	250.0

\*The result are related only to item tested. BDL = Below Detection Limit

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

#### TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)

omer : Jamadoba,

iress of the Customer

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

- Distt. Dhanbad 828 112
- : APHA, 23rd Ed. 2017
- : Mr. Arvind Singh

: As per requirement

- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : ETP Inlet Garage

SL No.	TESTS	PROTOCOL.	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.53	2-12
2	Total Suspended Solid as TSS (mg1)	APHA, 23rd Ed. 2017, 2540D	182.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	932.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	28.5	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	181.0	5-50000

\*The result are related only to item tested. BDL = Below Detection Limit

Analyst

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt, of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

#### TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer M/s Tata Steel Ltd. (Jamadoba Group)
 Jamadoba,

Distt. Dhanbad - 828 112

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

: Mr. Arvind Singh : As per requirement

: APHA, 23rd Ed. 2017

: 10.02.2021 to 13.02.2021

- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : ETP Outlet Garage

SL.	TESTS			Limits of Detection	G.S.R 422(E)
No.			RESULT		Desirable Limit
1	pН	APHA, 20ed Ed. 2017, 4500H' A+B	7.43	2-12	5.3-9.0
2:	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	32.80	5-5000	100.0
3	Total Dissolved Solids as TDS (mg1)	APHA, 23rd Ed. 2017, 2540C	1124.0	10-10,000	
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	23.8	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	82.3	5-50000	250.0

\*The result are related only to item tested, BDL = Below Detection Limit

Analyst

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Dethi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

#### TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer

M/s Tata Steel Ltd. (Jamadoba Group)
 Jamadoba,

ddress of the Customer

Sampling Method Sample Collected by Sample Quantity Date of Sampling Date of Sample Receiving Date of Analysis Source of Sample

- Distt. Dhanbad 828 112
- : APHA, 23rd Ed. 2017
- : Mr. Arvind Singh

: As per requirement

- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : STP Inlet Railway Colony

SL. No.	TESTS	PROTOCOL.	RESULT	Limits of Detection
I	pH	API4A, 23rd Ed. 2017, 4500H A+B	8.26	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	153.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	822.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	46.3	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017. 5220 A+B	378.2	5-50000

\*The result are related only to item tested. BDL = Below Detection Limit

Authorized Signatory

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21 TEST REPORT ISSUE DATE: 09.04.2021

#### TEST REPORT OF WASTE WATER\*

Name of the Customer Address of the Customer

M/s Tata Steel Ltd. (Jamadoba Group)
 ier : Jamadoba,

Sampling Method Sample Collected by Sample Quantity Date of Sampling

Date of Sample Receiving

Date of Analysis

Source of Sample

: APHA, 23rd Ed. 2017

Distt. Dhanbad - 828 112

- : Mr. Arvind Singh
- : As per requirement
- : 10.02.2021 to 13.02.2021
- : 16.02.2021
- : 16.02.2021 to 27.02.2021
- : STP Outlet Railway Colony

SI.	TESTS PROTOCOL RESULT		Limits of	G.S.R 422(E)	
No.		PROTOCOL	RESULT	Detection	Desirable Limit
1	pН	APHA, 23rd Ed. 2017, 4500H A+B	7.38	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	48.7	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	806.2	16-10,000	59
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27%	APHA, 25rd Ed. 2017,5210 A+8	18.3	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd 5d. 2017, 5220 A+B	76.3	5-50000	250.0

\*The result are related only to item tested. BDL = Below Detection Limit

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