

**HALF YEARLY COMPLIANCE REPORT
ON
ENVIRONMENTAL CLEARANCE CONDITIONS
OF
JINDAL CHROMITE MINES
KALIAPANI, JAJPUR (ODISHA)
OF
M/S JINDAL STAINLESS LIMITED
FOR THE PERIOD
APRIL 2020 TO SEPTEMBER 2020**

F.NO . J-11015/12/2000-IA.II(M), DT.13.02.2001

F.NO. J-11015/369/2009-IA.II(M), DT.24.02.2016

Date: 17 /11 /2020

Letter no: JSL/KLPN/2020/117

To,
The Director (s)
Ministry of Environment, Forest & Climate Change
Eastern Regional Office,A/3, Chandrasekharpur,Bhubaneswar – 751023

Sub: Submission of half yearly compliance report in respect of the Environmental Clearance Conditions of Jindal Chromite Mines, M/s. Jindal Stainless Limited for the period from April-2020 to Sept - 2020 .

Ref.1 : MOEF Letter No. J-11015/12/2000-IA.II(M),dated 13.02.2001 .

Ref.2 : MOEF Letter No. J-11015/369/2009-IA.II(M),dated 24.02.2016 .

Respected Sir,

We are enclosing herewith the half yearly compliance report on the status of the implementation of the conditions stipulated in environmental clearance of our Jindal Chromite Mines, Kaliapani, Jajpur (Orissa) of M/s. Jindal Stainless Limited.

Further our mines is under closure since 21.02.2018 by the direction of MoEF & CC,Newdelhi, vide letter no:J-11015/163/2016-IA.II(M) ,dt 21.02.2018.So there is no activities inside our lease hold area from the above mentioned date.

This is for your kind information and necessary records please.

This is for your kind perusal sir.

Thanking you

Yours faithfully,

For Jindal Stainless Limited


S.P Biswal

Mines Manager

Mines Manager

Jindal Chromite Mines

M/s Jindal Chromite Mines
Encl: Half Yearly Compliance Report for April-2020 to Sept – 2020.

CC : 1.MoEF & CC , New Delhi .

Jindal Stainless Limited
Jindal Chromite Mines

At / PO : Kaliapani - 755 047, Dist. : Jajpur, Odisha, India

T : +91 6726 268545, F : +91 6726 268315, E : jindal_mines@yahoo.com

Registered Office : O.P. Jindal Marg, Hisar - 125 005. (Haryana) India.

Corporate Office : Jindal Centre,12, Bhikaiji Cama Place,New Delhi - 110 066, India

T : +91 11 26188345 - 60, F : +91 11 26170691; 26161271, E : info@jindalsteel.com, Website : www.jindalstainless.com

Ministry of Environment & Forests : Regional Office

BHUBANESWAR

Monitoring Report

Part-I


DATA - SHEET

1	Project type: River-valley / Mining / industry / Thermal / Nuclear / Other (Specify)	:	Mining Industry
2	Name of the Project	:	Jindal Chromite Mines
3	Clearance letter (s) / OM No. & date (Mines)	:	No.-J-11015/12/2000-IA II(M) dated 13.02.2001
	Environment Clearance (COBP)	:	No.-J-11015/369/2009.IA.II(M) dated 24.02.2016
4	Locations:		
	a) Districts(s)	:	Jajpur
	b) State(s)	:	Odisha
	c) Latitudes/Longitudes	:	Survey of India Toposheet No 73 G/16.Latitude - N 21° 01' 04.39824 " to N 21° 02' 03.53184 " & Longitude - E 85° 45' 18.17352" to 86° 46' 31.69704" E
5	Address of correspondence:		
	a. Address of concerned project Chief Engineer (with pincode & telephone/telex/fax numbers)	:	Sakti Prasad Biswal, Mines Manager Jindal Chromite Mines Jindal Stainless limited. Po: Kaliapani, Dist: Jajpur (Orissa), Pin: 755047, Ph: 9777451265
	b. Address of Executive Project Engineer / Manager (with pincode & telephone/telex/fax numbers)	:	Sakti Prasad Biswal, Mines Manager Jindal Chromite Mines Jindal Stainless Limited. Po: Kaliapani, Dist: Jajpur (Orissa), Pin: 755047, Ph: 9777451265
6	Salient Features:		
	a. of the project	:	Fully mechanised mining of 0.1 MTA.
	b. of the environmental management plan	:	It is as per EIA/EMP management plans and environmental clearance conditions.
7	Break up of the Project areas:		
	a. Submergence area (forest & non-forest)	:	Nil
	b. Others	:	Forest- 89.00 ha.(24.24 hal kism forest + 64.76Ha. Sabik kism forest)
8	Break up of the Project affected population, with enumeration of those losing houses / dwelling units only, agricultural land and land less labourers / artisans.	:	NA
	a. SC, ST / Adivasis	:	Nil
	b. Others	:	Nil

S. Prasad Biswal
17/11/2020


Mines Manager
Jindal Chromite Mines
M/s Jindal Stainless

9	Financial Details:	:	
	a. Project cost as originally planned and subsequent revised estimated and the years of price reference.	:	Rs.19.00 Crores
	b. Allocations made for environmental management plans, with item-wise and years-wise break up.	:	Rs.7 Lakh
	c. Benefit cost ratio/internal rate of return and the year of assessment.	:	
	d. Wehter© includes the cost of environmental management as show in (b) above.	:	Yes
	e. Actual expenditure incurred on the project so far	:	
	f. Actual expenditure incurred on the environmental management plans so far.(From 01.04.2020 to 30.09.2020)	:	Rs.3,70,500.00 (Three Lakh Seventy Thousand Five Hundred Only)
10	Forest land requirement:		
	a. the status of approval for a diversion of forest land for non-forestry use.	:	(i)Forest Clearance for 22.80 ha.(Hal Kisam Forest)obtained vide letter no. 8-68/2000-FC/2327(F) dated 05.07.2001 (ii)Diversion proposal for 66.20 ha.(Sabik Kisam Forest) is under process.
	b. the status of compensatory afforestation.	:	Compensatory afforestation done for 22.80ha. against Hal kisam forest.
	c. the status of clear felling	:	
	d. comments on the viability & sustainability of compensatory afforestation programme in the light of actual field experience so far.	:	
11	The status of clear felling in non-forest areas (such as sub-mergency area of reservoir, approach road), if any with quantitative information.	:	NA
12	Status of construction:	:	NA
	a. Date of commencement (actual and/	:	NA
	b. Date of completion (actual and/	:	NA
13	Reasons so far the delay if the project is yet to start.	:	NA



 17/11/2020
 Office Manager
 Jindal Chromite Mines
 Jindal Stainless Limited

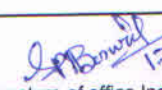
FORMAT FOR PROVIDING PARTICULARS ON GREEN BELT / PLANTATION UNDER F (C) ACT 1980 AND E (P) ACT 1986

1	a) Name of the Organisation	:	Jindal Chromite Mines			
	b) Env't/Forest clearance order No.(Mines)	:	No.-J-11015/12/2000-IA II(M) dated 13.02.01			
	Environment Clearance (COBP)	:	No.-J-11015/369/2009.IA.II(M) dated 24.02.2016			
2	Location, Block / Sub.Divn./Dist/State	:	Tahasil - Sukinda, Dist - Jajpur, State -Orissa			
3	Address for communication	:	Jindal Chromite Mines, M/s. JSL Limited., Kaliapani Jajpur (Orissa)			
4	Existing vegetation in the area/region	:				
	a) Species (trees/shurbs/grasses/climbers)	:	Species like - Akasia, Chakunda, Bela, Chhatiana, krushna chuda ,Radha Chuda etc. are present in this valley.			
	b) Major prevalent species of each type	:				
5	Land coverage by the Project	:	89 Hect.			
	a) Total area under the project	:	89 Hect.			
	b) Area covered for basic infrastructure (roads/building/Factory etc.)	:	4.769 Hect.			
6	Details about natural vegetation	:				
	a) Name and number of tree / species felled.	:	No normal growth of trees within the lease area except some bushes & creepars. 192 nos of trees of species like Sal, Dhaura, Kurum, Jamu etc.were felled during the year 2003 after the clearance of forest			
	b) Name and number of plant species still available in the area.	:	Spice like - Kurum, Dhura, Kasi, Jamu, Asan, Bahada, Simili, Moi, Kusum, Char and Shrubs etc. are present in this valley.			
	c) By protecting the area will indigenous stock come up ?	:	Yes.			
	d) Extent of green belt developed.	:	Green belt developed over 3.12 ha.			
7	Plantations required to be carried out as per	:				
	a) Conditions of Environmental clearance in ha./nos.	:	Per ha. 2000 nos. per annum.			
	b) Conditions of Forest (C) Act clearance in ha./nos.	:	- do -			
	c) Voluntarily in ha./nos.	:	2035 per ha. & 6621 per annum.			


 17/11/2020
 Mines Manager
 Jindal Chromite Mines
 M/s Jindal Stainless Limited

8	Details of plantation					
a) Total area available for plantation in each category.						
	i) Green belt	ii) Dumps	iii) Back filled areas	iv) Road sides	v) Block plantation	
	3.12	12.08	3	Nil	Nil	
	Year of plantation	Species planted	Spacing	Height attained	Total area covered	Area still available
	2002-03	10200	1.5mtr. X 1.5mtr.	1 to 2mtr.	5.6 ha.	
	2003-04	5400	1.5mtr. X 1.5mtr.	1 to 2mtr.	5.6 ha.	
	2004-05	9300	1.5mtr. X 1.5mtr.	1 to 2mtr.	3.5 ha.	
	2005-06	8000	1.5mtr. X 1.5mtr.	1 to 2mtr.	3.5 ha.	
	2006-07	10800	1.5mtr. X 1.5mtr.	1 to 2mtr.	4.05 ha.*	
	2007-08	3500	1.5mtr. X 1.5mtr.	1 to 2mtr.	1.8 ha*	
	2008-09	5500	1.5mtr. X 1.5mtr.	1 to 2mtr.	2.2 ha*	
	2009-10	3500	1.5mtr. X 1.5mtr.	1 to 2mtr.	1.6 ha*	
	2010-11	5000	1.5mtr. X 1.5mtr.	1 to 2mtr.	2.00 ha*	
	2011-12	3000	1.5mtr. X 1.5mtr.	1 to 2mtr.	1.1 ha*	
	2012-13	3500	1.5mtr x 1.5mtr	1 to 2mtr.	1.1 ha*	
	2013-14	8000	1.5mtr x 1.5mtr	1 to 2mtr.	5 ha*	
	2014-15	8000	1.5mtr x 1.5mtr	1 to 2mtr.	5 ha*	
	2015-16	3800	1.5mtr x 1.5mtr	1 to 2mtr.	3.5 ha*	
	2016-17	21000	1.5mtr x 1.5mtr	1.5 mtr to 2 mtr	11.0 ha*	
	2017-18	5000	1.5mtr x 1.5mtr	1 to 2mtr.	2.0 ha*	
	2018-19	5000	1.5mtr x 1.5mtr	1 to 1.5 mtr.	2.5 ha*	
	2019-20	5000	1.5mtr x 1.5mtr	1 to 1.5 mtr.	2.0 ha*	
	2020-21	1500	1.5mtr x 1.5mtr	1 to 1.5 mtr.	1.0 ha*	
* Planted in the previous plantation area.						
c) Survival % of plantation						
	Total plantations (No)	Total No. of plantation		125000		
	Survival (No.)			82725		
	Survival %			66%		
9	Agency carrying out plantation and maintenance		In house / contractor			
Financial details (yearwise) Plantation wise and item wise						
	Sl.No.	Year	Funds allocated	Expenditure made	Average cost of each surviving plant in Rs.	
	1	2002-03	1,200,000.00	10,00,000.00		
	2	2003-04	1,200,000.00	10,00,000.00		
	3	2004-05	1,200,000.00	10,00,000.00		
	4	2005-06	1,200,000.00	10,00,000.00		
	5	2006-07	1,500,000.00	1,500,000.00		
	6	2007-08	2,000,000.00	1,600,000.00		
	7	2008-09	3,850,000.00	3,845,000.00		
	8	2009-10	4,000,000.00	3,850,000.00		
	9	2010-11	2,825,000.00	2,525,000.00		
	10	2011-12	5,130,000.00	4,510,000.00		
	11	2012-13	5,200,000.00	4,770,000.00		
	12	2013-14	4,260,000.00	4,050,000.00		
	13	2014-15	3,840,000.00	3,626,000.00		
	14	2015-16	5,560,000.00	5,514,000.00		
	15	2016-17	1,180,000.00	2,194,212.00		
	16	2017-18	250,000.00	280,000.00		
	17	2018-19	50,000.00	50,000.00		
	18	2019-20	50,000.00	50,000.00		
	19	2020-21	30,000.00	30,000.00		


 19/11/2020
 Mines Manager
 Jindal Chromite Mines
 M/s Jindal Stainless Limited

10	Inspection of plantation by field experts and their comments and follow up action.	Field experts who visited the plantation advised for planting trees by maintaining proper terraces.	
11	Remarks/any other information.		
			 17/11/2020
			Signature of office Incharge

Mines Manager
Dudhgaon Mines
M/s. Jindal Stainless Limited

Annexure-III (Details of Expenses for the period April - 2020 to September - 2020 .

Sl.No	Particulars	Fund allocated (Rs.)	Expenditure made (Rs.)
1	Plant specis & it's plantation	30,000	30,000
2	Water spraying	Nil	Nil
3	Arrangement of water sprinkler in ore plot	Nil	Nil
4	Environmental monitoring	1,05,000	1,05,000
5	Others	2,00,000	2,35,500
	TOTAL	3,35,000	3,70,500


17/11/2020
Mines Manager
Jindal Chromite Mines
M/s Jindal Stainless Limited

**STATUS OF COMPLIANCE OF CONDITIONS STIPULATED BY MoEF IN ENVIRONMENTAL
CLEARANCE VIDE J-11015/12/2000-IA.II (M) DATED 13.02.2001 OF
JINDAL CHROMITE MINES OF M/S JINDAL STAINLESS LIMITED AS ON 30/09/2020.**

COMPLIANCE PERIOD : 1ST APRIL 2020 TO 30TH SEPTEMBER 2020

SL NO	SPECIAL CONDITIONS	COMPLIANCE STATUS
01	A comprehensive environmental impact assessment study should be carried out after getting scope of the study vetted by MOEF. Reports should be submitted to the ministry within 2 years.	Study report on comprehensive environmental impact assessment has already been submitted to MOEF, New Delhi vide our letter no. JSL/KLPN/05-06/196 dated 04.01.2006 with a copy to The Chief Conservator of Forests (Central), MOEF, Eastern Regional Office, Chandrasekharpur, Bhubaneswar.
02	Run-off from the Ob dumps should be analysed for cr+6 and in no case it's concentration is found higher than the permissible limit. The water should be treated using appropriate proven technology before discharge. Priority should be given for utilization of this treated water for plantation and dust suppression.	The total discharge of water is always being treated to keep the presence of hexavalent Chromium within the permissible limit by treating it in E.T.P. Regular testing of the discharge water is being carried out in our laboratory. The treated water is being utilized for plantation and dust suppression. However since the mining activities has been stopped w.e.f April 2013, there is no discharge of mines water to outside of lease area.
03	The nature of the deposit is such that finalisation of mining of deeper portion cannot be decided immediately. The present reclamation plan is therefore only conceptual. The proponent should submit a detailed reclamation plan within 5 years of the start of mining and get the same approved. In case there is change in scope of mining plan including possible underground mining the proponent should approach MOEF for fresh clearance.	A detailed reclamation plan shall be prepared and submitted for approval within 5 years of the start of mining operation. Any change in scope of mining plan including possible underground mining shall be intimated to MOEF and fresh clearance shall be sought.
04	A detailed greenbelt development plan indicating year wise plantation scheme, area to be covered (peripheral, roads, OB dumps, township) and type of nature of plant, species should be submitted to MOEF within 3 months.	A detailed green belt development plan indicating year wise plantation scheme has already been submitted to MOEF, New Delhi vide our letter No. JSL/JK Road/2002/0069 dated 17.05.02, with a copy to MOEF, Eastern Regional Office, Chandrasekharpur, Bhubaneswar.

J.B. Singh
17/11/2020


Mines Manager
Jindal Chromite Mines
M/s Jindal Stainless Limited

05	Top soil should be stacked properly with adequate measures at earmarked site. It should be used for reclamation and rehabilitation of mined out area.	We have collected 8420 m ³ of top soil. However we have already used the total top soil for plantation work.
06	OB dumps should be stacked at earmarked dumpsite(s) only and should not be kept active for longer period .the overall slope of the dump(s) should not exceed 28°.	The overburden dumps are being stacked in earmarked area according to the mining plan. The overall slope is well within the permissible limit.
07	Drills should be operated with dust extractors or only wet drilling should be adopted.	Wet drilling is being adopted in our mines.
08	Controlled blasting should be carried out.	Controlled blasting is being done by muffling and by using delay detonators.
09	Check dam and siltation ponds of appropriate size should be constructed to arrest silts and sediments flows from OB and internal dumps. The water so collected should be utilized for watering mine area,roads,greenbelt etc.The drains should be regularly desilted and maintained properly.	Check dams and siltation ponds of appropriate sizes are constructed around the wastes dumps, mineral dumps (sub grade) & stack yards. The drains are being cleared regularly after monsoon season.
10	While mining operation is on, regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new peizometers.Monitoring should be done four times a year pre- monsoon (April/May), Monsoon (August), Post-Monsoon (November) and Winter (January).data thus collected should be sent at regular intervals to MOEF& Central ground water board.	Quarterly motoring of ground water level & quality are being carried by M/s. MITRA S.K Pvt.ltd. An environmental consultant registered with Orissa State pollution Control Board as a consultant for doing monitoring and analysis. Reports attached in Annexure-I .
11	A detailed mine plan should be submitted in MOEF 5 years in advance of approval.	The copy of Progressive Mining Closure Plan approved by Indian Bureau of Mines is being submitted for your kind reference and approval in Annexure -III .
12	The proponent should obtain permission from other concerned authorities if any.	We have obtained required permission from other statutory authorities for carrying out the mining activities.



Mines Manager
Jindal Chromite Mines
M/s Jindal Stainless Limited

COMPLIANCE OF EC GENERAL CONDITIONS

SL NO	GENERAL CONDITIONS	COMPLIANCE STATUS
01	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and forests.	The mining technology and scope of working is not changed.
02	No change in the calendar plan including excavation, quantum of chrome ore, waste/OB dumps should be made.	Production of acceptable / dispatchable grade of ore is within the permissible limit.
03	Four ambient air quality monitoring stations should be established in the core zone as well as buffer zone for SPM, RPM, SO ₂ , NO _x and CO monitoring. Location of the ambient air quality stations should be decided based on meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.	Ambient Air monitoring is being done establishing four stations both in core & buffer zone. The results of air quality parameter such as RPM, SPM, So ₂ , NO _x and Co of individual stations are enclosed in Annexure-I .
04	Data on ambient air quality should be regularly submitted to the Ministry including it's Regional office at Bhubaneswar and the State Pollution Control Board/Central Pollution Control Board once in six months.	Data on ambient Air quality is being submitted to the ministry including its regional office at Bhubaneswar and the State Pollution Control Board, Orissa once in six months.
05	Adequate measures for control of fugitive emissions should be taken during drilling and blasting operations, loading transportation of minerals etc.	Adequate precautions have been taken at all dust generating points for suppression of dust by water spraying with the help of two water tankers of 20KL & 12KL capacities, on the haul roads, stack yards ,loading & unloading point's dust.
06	Adequate measures should be taken for control of noise levels below 85 db in work environment.	Noise monitoring is being regularly done and found to be well within the permissible limit. The report of the above said is enclosed in the Annexure-I . To control the noise generation, periodical maintenance of all machineries is ensured. The workers engaged in blasting, Drilling operations and operators of HEMM are being provided with earmuff and earplugs.
07	Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and	Nose masks have been provided to all personnel who are working in drills, dumpers and to HEMM operators and spot


 Mines Manager
 Jindal Chromite Mines
 M/s Jindal Stainless Limited

	information on Safety and health aspects. Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures if needed	boys. Adequate training is being imparted to the persons, who are working in dust generating points by the Senior Mine officials. Occupational health surveillance programme of the workers along with initial medical examination has been conducted for all departmental & contractor workers.
08	The funds earmarked for Environmental Protection measures should be kept in separate account and not diverted for other purpose. Year wise expenditure should be reported to the Ministry of Environment and Forests.	The funds earmarked for environmental protection measures are not being diverted for any other purposes, the details of which are being sent to the regional office of MOEF, Chandrasekharpur, Bhubaneswar
09	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated environment safeguards. The project authorities should send one set of EIA/EMP report and mining plan to them and extent full cooperation to the officer(s) of the Regional Office by furnishing the detailed data/information/monitoring reports.	One set of EIA / EMP and Comprehensive EIA/EMP has already been sent to the regional office of the ministry located at Bhubaneswar.
10	The project authority should inform to the Regional Officers located at Bhubaneswar as well as to the Ministry of Environmental & Forests regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	This condition has already been complied with.
11	A copy of clearance letter will be marked to concerned panchayat /local NGO, if any, from whom any suggestion/representation has been received while processing the proposal.	This condition has already been complied with
12	Orissa Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's office/Tahasildar's Office for 30 days.	This condition has already been complied with.
13	The project authorities should advertise at least in two local news paper weekly circulated around the project, one of which shall be in the vernacular language of the locality concerned informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the state pollution control board and may also be seen at web site of the Ministry of Environment & Forests at http://envfor.nic.in	This condition has already been complied with.


 Mines Manager
 Jindal Chromite Mines
 M/s Jindal Stainless Limited

STATUS OF COMPLIANCE OF ENVIRONMENT CLEARANCE CONDITIONS OF COBP-II

Ref: F.No. J-11015/369/2009.IA-II (M)

COMPLIANCE PERIOD : 1ST APRIL 2020 TO 30TH SEPTEMBER 2020

SPECIFIC CONDITIONS:

SL NO	CONDITION	COMPLIANCE STATUS
01	Continuous monitoring of the mine water should be done and reports furnished	Monitoring of Mine water is regularly being carried out and the report is being submitted to SPCB .Last monitoring report is attached as Annexure-I.
02	Continuous monitoring of all the drinking water sources for Cr(VI) of mine water should be done & reports furnished.	Monitoring of hexavalent chromium Cr(VI) in drinking water is regularly carried out and the report is being submitted to SPCB.
03	Morbidity pattern which is a sensitive indicator of ill health with regard to Cr related diseases need to be done.	Periodical health check up of all the employees is being carried out regularly & no sensitive indicator of ill health with regard to Cr related diseases found so far.
04	Mine water discharge and/or any waste water shall be properly treated in an ETP/s for the removal of hexavalent chromium and to meet the prescribed standards before reuse/discharge. The run-off from OB dumps and other surface run-off shall be analyzed for hexavalent chromium and in case it's concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.	The total run-off generated is pumped back to quarry by the surface run-off management plan. However for treatment of mine discharge the effluent Treatment Plant of capacity 250m ³ has completed. The monitoring of quarry water is being regularly carried out and the report is being submitted to SPCB on regular basis.
05	The project proponent shall obtain consent to Establish and consent to Operate from the state pollution control board, Odisha and effectively implement all the conditions stipulated there in.	Consent to Establish from the state pollution control board, Odisha have been obtained on dt 30.11.2011 vide letter No.20031/Ind-II-Noc-5299 and consent to Operate from the state pollution control board, Odisha have been obtained on dt 20.03.2017 vide letter no-4258/IND-I-CON-2562 .
06	Traffic density on the route of mineral transportation shall be regularly monitored and report shall be submitted along with the compliance report.	Monitoring of traffic density conducted by the project proponent. The report is attached as Annexure-II.
07	As part of ambient air quality monitoring during operational phase of the project, the air samples shall also be analysed for the mineralogical compositions and records maintained.	The ambient air quality monitoring is regularly carried out and the report is being submitted to SPCB on regular basis. The report is attached in Annexure-I .
08	Mineral handling plant shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer	Fixed water sprinklers are provided at loading/unloading points, transfer points and at hoppers for control of




Mines Manager
Jindal Chromite Mines
M/s Jindal Stainless Limited

	points should also have efficient dust control arrangements. These should be properly maintained and operated.	fugitive emission.
09	Effective safeguard measures such as conditioning of ore with water, regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and transfer points. It should be ensured that the ambient air quality parameters conform to the norms prescribed by the central	Fixed water sprinklers are provided at loading/unloading points, transfer points and at hoppers for control of fugitive emission. The ambient air quality monitoring is regularly carried out and the report is being submitted to SPCB on regular basis.
10	The project authority shall implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground water board.	We have identified a quarry of dimension 300 m Length x 200 m Width x 70 m Depth for storage of rain water as a conservation measure.
11	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and installing new Peizometers. The periodic monitoring [(at least four times in a year-pre-monsoon(April-May) Monsoon (August), post-monsoon(November) and winter (January), once in each season)] shall be carried out in consultation with the state Ground water Board/Central Ground water Authority and the data thus collected may be sent regularly to the Ministry of Environment, forest & Climate change and it's Regional Office Bhubaneswar, the central Ground water Authority and the Regional Director, Central Ground water Board. If at any stage, it is observed that the ground water table is getting depleted due to the activity; necessary corrective measures shall be carried out.	Regular monitoring of ground water level and quality is being carried out in and around the mine lease on regular basis. 4 Nos of Peizometers have already been installed in consultation with CGWA. Reports are sent to the board in regular intervals.
12	The project proponent shall regularly monitor the flow rate of natural water streams flowing adjacent to the mine lease and maintain the records.	The flow rate of natural water stream flowing adjacent to the mine lease i.e Damsala nallah 2 km away from lease is monitored and the reports are sent to SPCB on quarterly basis.
13	The reclaimed and rehabilitated area shall be afforested. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, forest & Climate change and it's Regional office located at Bhubaneswar on six monthly basis.	Being complied. Reclamation over an area of 8.24 ha is completed and 5000 nos. of plantation has already made over the area up to 2018-19
14	Dimension of retaining wall at the toe of temporary overburden dumps and OB benches within the mine to check run-off and siltation based on the rain fall data.	A length of 1087 m toe wall (boulder masonry), having dimensions- 1m width x 1m height, has been constructed at the toe of over burden benches. 348 mtr boulder has been constructed at the toe of the temporary over burden dumps .
15	Plantation shall be raised in the specified including a	Being complied.

	7.5m wide green belt in the safety zone around the mining lease, backfilled and reclaimed area ,around the higher benches of excavated void to be converted in to water body,roads etc.By planting the native species in consultation with the local DFO /Agriculture Department.The density of the trees should be around 2500 plants per Ha.	Reclamation over an area of 8.24 ha is completed and 5000 nos. of plantation has already made over the area. In green belt area of 5.04 ha, we have planted 11000 Nos . Over the worked out benches we have planted 6000 Nos .
16	Effect safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM & RPM such as haul road, loading point, unloading point & transfer points. It shall be ensured that the ambient air quality parameters conform to the norms prescribed by the central pollution control board in this regard.	Fixed type water sprinklers are provided at loading/unloading points, transfer points and at hoppers for control of fugitive emission. Mobile water tankers are provided for haul roads for control of fugitive emission. Partly the haul roads are covered with fixed type water sprinkler.
17	Process water discharge and/or any water shall be properly treated to meet the prescribed standards before reuse/discharge. The run-off from temporary OB dumps and other surface runoff shall analyzed for iron and in case it's concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.	At present there is no water discharge from the plant operation. Only the process water is recycled/ reused within the plant and tailing pond. The surface run-off generated is pumped back to the quarry-I through the surface run-off arrangement.
18	The decanted water from the beneficiation plant and slime/tailing pond shall be re-circulated within the mine and there shall be zero discharge from the mine.	Noted & agreed. There is no waste water from beneficiation plant, as total water will be re used/ re-circulated within the plant.
19	Regular monitoring of the flow rate of the springs and perennial nallahs shall be carried out and records maintained.	The flow rate of natural water stream flowing adjacent to the mine lease i.e Damsala Nallah 2 km away from lease is monitored and the reports are sent to SPCB on quarterly basis.
20	Regular monitoring of water quality ,upstream and downstream of natural water bodies shall be carried out and record of monitoring data should be maintained and submitted to Ministry of Environment ,forest & Climate change, it's Regional Office, Bhubaneswar, Central Ground water Authority, Regional Director, Central Ground water Board, State pollution control board and central pollution control board.	Regular monitoring of water quality, upstream and downstream of natural water bodies are carried out and record of monitoring data is maintained and submitted .
21	Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with the Regional Director, Central Ground water Board.	We have constructed 300 m ² roof top for rain water harvesting.
22	Vehicular emissions shall be kept under control and regularly monitored .Measures shall be taken for maintenance of vehicles during transportation of mineral from mine face to the beneficiation plant. The vehicles shall be covered with a tarpaulin and shall not be	All the mineral transport vehicles are properly covered with tarpaulin during transportation. The vehicular emissions are found to be within limit .

	overloaded.	
23	Sewage water treatment plant shall be installed for the colony.ETP shall also be provided for workshop and waste water generated during operation.	05 no's of soak pits of dimension (6m Length x 2m Width x 4m Depth) have constructed for work shop and colony purpose.
24	Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for maintaining land use pattern and report submitted to ministry of environment, forest & climate change and it's regional Office, Bhubaneswar.	Digital processing of the entire lease area using remote sensing technique method have conducted in 2016 and reports have been submitted at Regional office,MOEF on 10.11.2016 vide our office letter no.JSL/KLPN/2016/283.
25	Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.	Being complied. All the employees are undergone IME and every year 20% of employees are being covered under medical examination as a part of statutory compliance and records are being maintained.
26	The project proponent shall take all precautionary measures during operation for conservation and protection of endangered fauna spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the state forest and wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. All the safeguard measures brought out in the Wildlife conservation pan so prepared specific to the project site shall be effectively implemented copy of action plan shall be submitted to the Ministry of environment, forest & climate change and it's regional office Bhubaneswar.	Wild life conservation plan has been prepared & approved from PCCF Wildlife, Government of Odisha detailing action plan for flora and fauna with the fund allocation vide letter No.7226/1 WL-SSP-34/2016,dt. 12.09.2016 .
27	A FMCP along with details of corpus fund shall be submitted to the ministry of environment & forests 5 years in advance of final mine closure for approval.	Noted & agreed.
28	The project proponent shall undertake all the commitments made during the public hearing and efficiently address the concerns raised by the locals in the public hearing as well as during consideration of the project, while implementing the project.	Noted & agreed.


Mines Manager
Jindal Chromite Mines
M/s Jindal Stainless Limited

GENERAL CONDITIONS

SL NO	CONDITION	COMPLIANCE STATUS
01	No change in chrome Ore processing/Beneficiation technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	Noted and agreed.
02	No change in the calendar plan including Processing/Beneficiation of mineral / Iron ore and waste should be made.	Noted and agreed.
03	At least four ambient air quality – monitoring stations should be established in the core zone as well as in the buffer zone for RSPM(Particulate matter with size less than 10 micron i.e., PM10) and NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board. The data so recorded should be regularly submitted to the Ministry including its Regional Office located at Bhubaneswar and the State Pollution Control Board /Central Pollution Control Board once in six months.	Being complied. Reports are submitted to the board in every quarter.
04	Measures should be taken for control of noise levels below 85dBA in the work environment. Workers engaged in operations of HEMM, etc. Should be provided with ear plugs/muffs.	Engineering controls and maintenance schedules are followed to keep the noise levels below 85 dBA .All the workers are provided with ear muffs those who are working in operations of HEMM.
05	There will be zero waste discharge from the plant.	Noted and agreed.
06	Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.	Persons those who are working in dusty areas are provided with nose mask and relevant training is imparted to them.
07	Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	Being complied. Every year 20% of employees are being covered under medical examination as a part of statutory compliance and records are being maintained.
08	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 organization.	Separate environmental management cell is operating for mines and is headed by GM(EHS).
09	The Funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the ministry and its Regional Office located at Bhubaneswar.	Funds earmarked for environmental protection measures are spent only for environmental measures. Year wise expenditures are reported to ministry and it's Regional Office.
10	The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by	Noted and agreed.

S. B. Bhowmik

Mines Manager
Jindal Chromite Mines
M/s Jindal Stainless Limited

	the concerned authorities and the date of start of land development work.	
11	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional office by furnishing the requisite date/information/monitoring reports.	Noted and agreed.
12	The project proponent shall submit six monthly reports on the status of results of monitored date(both in hard copies as well as by email) to the Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry Of Environment, forest & Climate Change, Bhubaneswar, the respective zonal officer of Central Pollution Control Board and the State Pollution Control Board.	Complied .Last EC six monthly Compliance submitted on 26.05.2020 vide letter no JSL/KLPN/2020/47.
13	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, ZilaParisad / Municipal Corporation, Urban Local Body and the Local NGO,if any, from whom suggestions/representations, if any ,were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	Complied.
14	The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the Collector's office/Tahasildars office for 30 days.	Complied.
15	The Environmental statement for each financial year ending 31 st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (protection) Rules, 1986,as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to Climate Change, Bhubaneswar by e-mail.	Being Complied. Form-V for the year 2019-20 submitted vide Letter No – JSL/KLPN/2020/77,Date : 29/06/2020 .
16	The project authorities should advertise at least two local newspapers of the District or State in which the project is located and widely circulated, one of which shall be in the vernacular language of the locality	Complied.

concerned, Within 7 days of the issue of the clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at website of the Ministry of Environment, Forest & Climate Change at <http://envfor.nic.in> and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.



Mines Manager
Jindal Chromite Mines
M/s Jindal Stainless Limited

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TC-6950

TEST REPORT

ULR: TC-69502000000490F

Name & Address of the Customer :	Report No.	: C/2020/490
Jindal Stainless Limited,	Date	: 14.02.20
Kaliapani Chromite Mines	Sample No.	: MSK/KOL/2020/411
Jajpur-755028, Odisha	Date of receipt of sample	: 04.02.20
	Date(s) of performance	: 04.02.20-14.02.20
	Ref. No. & Date	: P.O No.: 6200006415 Date: 29.04.19
	Discipline	: Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Ambient Air
3	Date of sampling	: 31.01.2020 to 01.02.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/RDS-03 MSK/BBSR/FIELD/FDS-03
5	Place of sampling	: Saruabali Village
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: 1) Temperature :16-28°C 2) Barometric Pressure: 758 mm of Hg 3) Rain fall : No & Cold Chain Maintained
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

Report prepared by:

Signature : *S. Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation : QA Assistant

Report Verified By

Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : *S. Subyendu Chakraborty*
Name : Dr. Sodmyadeep Mukhopadhyay
Designation : Lab In Charge

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TC-6950

ULR: TC-69502000000490F

Report No. : C/2020/490
Sample No. : MSK/KOL/2020/411

ANALYSIS RESULT

Sl. No.	Name of Pollutants	Unit	Results	Limit *	Test Method
1	Particulate matter (<10 µm)	µg/m ³	96.9	100	IS: 5182 (Part-23)
2	Particulate matter (<2.5µm)	µg/m ³	51.5	60	TPM/MSK/ENV(AP)/01/03
3	Sulphur dioxide as SO ₂	µg/m ³	10.4	80	IS: 5182 (Part-2)
4	Nitrogen dioxide as NO ₂	µg/m ³	30.8	80	IS: 5182 (Part- 6)
5	Carbon monoxide as CO	mg/m ³	0.98	2	IS: 5182 (Part- 10)
6	Ozone (O ₃)	µg/m ³	<20.0	180	TPM/MSK/ENV(AP)/01/07
7	Ammonia (NH ₃)	µg/m ³	20.7	400	TPM/MSK/ENV(AP)/01/08
8	Benzene (C ₆ H ₆)	µg/m ³	<4.2	5	IS 5182: Part. 11
9	Benzo(a) pyrene (BaP)	ng/m ³	<0.5	1	IS 5182: Part. 12
10	Lead (Pb)	µg/m ³	<0.01	1	USEPA IO3.4 by ICP-OES
11	Nickel (Ni)	ng/m ³	8.30	20	USEPA IO3.4 by ICP-OES
12	Arsenic (As)	ng/m ³	<1.0	6	USEPA IO3.4 by ICP-OES

*Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality

End

Report prepared by:
Signature : *S. Chakrabarty*
Name : Mr. Subyendu Chakrabarty
Designation : QA Assistant

Report Verified By
Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory
Signature : *Dr. Soumyadeep Mukhopadhyay*
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

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TC-6950

TEST REPORT

ULR: TC-69502000000458F

Name & Address of the Customer :	Report No.	: C/2020/458
Jindal Stainless Limited,	Date	: 11.02.20
Kaliapani Chromite Mines	Sample No.	: MSK/KOL/2020/388
Jajpur-755028, Odisha	Date of receipt of sample	: 01.02.20
	Date(s) of performance	: 01.02.20-11.02.20
	Ref. No. & Date	: P.O No.: 6200006415 Date: 29.04.19
	Discipline	: Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Ambient Air
3	Date of sampling	: 28.01.2020 to 29.01.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/RDS-03 MSK/BBSR/FIELD/FDS-03
5	Place of sampling	: Near Main Gate
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: 1) Temperature : 17-28°C 2) Barometric Pressure: 758 mm of Hg 3) Rain fall : No & Cold Chain Maintained
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

Report prepared by:

Signature : *S. Chakrabarty*
Name : Mr. Subyendu Chakrabarty
Designation : QA Assistant

Report Verified By

Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : *S. S. Chakrabarty*
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

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Report No. : C/2020/458
 Sample No. : MSK/KOL/2020/388

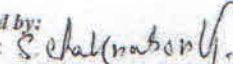
ULR: TC-695020000000458F

ANALYSIS RESULT

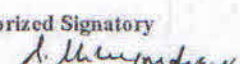
Sl. No.	Name of Pollutants	Unit	Results	Limit *	Test Method
1	Particulate matter (<10 µm)	µg/m ³	78.8	100	IS: 5182 (Part-23)
2	Particulate matter (<2.5µm)	µg/m ³	40.1	60	TPM/MSK/ENV(AP)/01/03
3	Sulphur dioxide as SO ₂	µg/m ³	8.2	80	IS: 5182 (Part-2)
4	Nitrogen dioxide as NO ₂	µg/m ³	30.4	80	IS: 5182 (Part- 6)
5	Carbon monoxide as CO	mg/m ³	0.62	2	IS: 5182 (Part- 10)
6	Ozone (O ₃)	µg/m ³	<20.0	180	TPM/MSK/ENV(AP)/01/07
7	Ammonia (NH ₃)	µg/m ³	24.1	400	TPM/MSK/ENV(AP)/01/08
8	Benzene (C ₆ H ₆)	µg/m ³	<4.2	5	IS 5182: Part. 11
9	Benzo(a) pyrene (BaP)	ng/m ³	<0.5	1	IS 5182: Part. 12
10	Lead (Pb)	µg/m ³	<0.01	1	USEPA IO3.4 by ICP-OES
11	Nickel (Ni)	ng/m ³	<5.0	20	USEPA IO3.4 by ICP-OES
12	Arsenic (As)	ng/m ³	<1.0	6	USEPA IO3.4 by ICP-OES

*Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality

End

Report prepared by:
 Signature : 
 Name : Mr. Subyendu Chakraborty
 Designation : QA Assistant

Report Verified By
 Signature : 
 Name : Ms. Paulami Dutta
 Designation : Executive QA

Report Sign By Authorized Signatory
 Signature : 
 Name : Dr. Soumyadeep Mukhopadhyay
 Designation : Lab In Charge



TC-6950

TEST REPORT

ULR: TC-69502000000459F

Name & Address of the Customer : Jindal Stainless Limited,
Kaliapani Chromite Mines
Jajpur-755028, Odisha

Report No. : C/2020/459
Date : 11.02.20
Sample No. : MSK/KOL/2020/389
Date of receipt of sample : 01.02.20
Date(s) of performance : 01.02.20-11.02.20
Ref. No. & Date : P.O No.: 6200006415 Date: 29.04.19
Discipline : Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Ambient Air
3	Date of sampling	: 28.01.2020 to 29.01.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/RDS-04 MSK/BBSR/FIELD/FDS-04
5	Place of sampling	: COB Plant-1
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: 1) Temperature :17-28°C 2) Barometric Pressure: 758 mm of Hg 3) Rain fall : No & Cold Chain Maintained
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

Report prepared by:

Signature : *S. Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation : QA Assistant

Report Verified By

Signature : *Paulami Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : *Dr. Soumyadeep Mukherjee*
Name : Dr. Soumyadeep Mukherjee
Designation : Lab In Charge

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Report No. : C/2020/459
Sample No. : MSK/KOL/2020/389

ULR: TC-695020000000459F

ANALYSIS RESULT

Sl. No.	Name of Pollutants	Unit	Results	Limit *	Test Method
1	Particulate matter (<10 µm)	µg/m ³	47.8	100	IS: 5182 (Part-23)
2	Particulate matter (<2.5µm)	µg/m ³	23.4	60	TPM/MSK/ENV(AP)/01/03
3	Sulphur dioxide as SO ₂	µg/m ³	7.5	80	IS: 5182 (Part-2)
4	Nitrogen dioxide as NO ₂	µg/m ³	24.6	80	IS: 5182 (Part- 6)
5	Carbon monoxide as CO	mg/m ³	0.48	2	IS: 5182 (Part- 10)
6	Ozone (O ₃)	µg/m ³	<20.0	180	TPM/MSK/ENV(AP)/01/07
7	Ammonia (NH ₃)	µg/m ³	19.6	400	TPM/MSK/ENV(AP)/01/08
8	Benzene (C ₆ H ₆)	µg/m ³	<4.2	5	IS 5182: Part. 11
9	Benzo(a) pyrene (BaP)	ng/m ³	<0.5	1	IS 5182: Part. 12
10	Lead (Pb)	µg/m ³	<0.01	1	USEPA IO3.4 by ICP-OES
11	Nickel (Ni)	ng/m ³	6.45	20	USEPA IO3.4 by ICP-OES
12	Arsenic (As)	ng/m ³	<1.0	6	USEPA IO3.4 by ICP-OES

*Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality

End

Report prepared by:

Signature : *S. Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation : QA Assistant

Report Verified By

Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : *Dr. Soumyadeep Mukhopadhyay*
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge



TEST REPORT

ULR: TC-69502000000466F

Name & Address of the Customer :	Report No.	: C/2020/466
Jindal Stainless Limited,	Date	: 13.02.20
Kaliapani Chromite Mines	Sample No.	: MSK/KOL/2020/392
Jajpur-755028, Odisha	Date of receipt of sample	: 03.02.20
	Date(s) of performance	: 03.02.20-13.02.20
	Ref. No. & Date	: P.O No.: 6200006415 Date: 29.04.19
	Discipline	: Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Ambient Air
3	Date of sampling	: 30.01.2020 to 31.01.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/RDS-04 MSK/BBSR/FIELD/FDS-04
5	Place of sampling	: Sendhasara Village
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: 1) Temperature :17-28°C 2) Barometric Pressure: 758 mm of Hg 3) Rain fall : No & Cold Chain Maintained
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

Report prepared by:	Report Verified By	Report Sign By Authorized Signatory
Signature : <i>S. Chakraborty</i>	Signature : <i>P. Dutta</i>	Signature : <i>Dr. Soumyadeep Mukhopadhyay</i>
Name : Mr. Subyendu Chakraborty	Name : Ms. Paulami Dutta	Name : Dr. Soumyadeep Mukhopadhyay
Designation : QA Assistant	Designation : Executive QA	Designation : Lab In Charge

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Report No. : C/2020/466
Sample No. : MSK/KOL/2020/392

ULR: TC-69502000000466F

ANALYSIS RESULT

Sl. No.	Name of Pollutants	Unit	Results	Limit *	Test Method
1	Particulate matter (<10 µm)	µg/m ³	68.2	100	IS: 5182 (Part-23)
2	Particulate matter (<2.5µm)	µg/m ³	31.5	60	TPM/MSK/ENV(AP)/01/03
3	Sulphur dioxide as SO ₂	µg/m ³	6.3	80	IS: 5182 (Part-2)
4	Nitrogen dioxide as NO ₂	µg/m ³	31.5	80	IS: 5182 (Part- 6)
5	Carbon monoxide as CO	mg/m ³	0.36	2	IS: 5182 (Part- 10)
6	Ozone (O ₃)	µg/m ³	<20.0	180	TPM/MSK/ENV(AP)/01/07
7	Ammonia (NH ₃)	µg/m ³	22.5	400	TPM/MSK/ENV(AP)/01/08
8	Benzene (C ₆ H ₆)	µg/m ³	<4.2	5	IS 5182: Part. 11
9	Benzo(a) pyrene (BaP)	ng/m ³	<0.5	1	IS 5182: Part. 12
10	Lead (Pb)	µg/m ³	<0.01	1	USEPA IO3.4 by ICP-OES
11	Nickel (Ni)	ng/m ³	8.37	20	USEPA IO3.4 by ICP-OES
12	Arsenic (As)	ng/m ³	<1.0	6	USEPA IO3.4 by ICP-OES

*Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality

End

Report prepared by:

Signature : *S. Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation : QA Assistant

Report Verified By

Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : *Dr. Soumyadeep Mukhopadhyay*
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

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TEST REPORT

ULR: TC-69502000000467F

Name & Address of the Customer : Jindal Stainless Limited,
Kaliapani Chromite Mines
Jajpur-755028, Odisha

Report No. : C/2020/467
Date : 13.02.20
Sample No. : MSK/KOL/2020/393
Date of receipt of sample : 03.02.20
Date(s) of performance : 03.02.20-13.02.20
Ref. No. & Date : P.O No.: 620006415 Date: 29.04.19
Discipline : Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Ambient Air
3	Date of sampling	: 30.01.2020 to 31.01.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/RDS-03 MSK/BBSR/FIELD/FDS-03
5	Place of sampling	: Kaliapani Village
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: 1) Temperature :17-28°C 2) Barometric Pressure: 758 mm of Hg 3) Rain fall : No & Cold Chain Maintained
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

Report prepared by:
Signature : *S. Subyendu Chakraborty*
Name : Mr.Subyendu Chakraborty
Designation : QA Assistant

Report Verified By
Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory
Signature : *Dr. Soumya Deep Mukhopadhyay*
Name : Dr. Soumya Deep Mukhopadhyay
Designation : Lab In Charge

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TC-6950

Report No. : C/2020/467
Sample No. : MSK/KOL/2020/393

ULR: TC-695020000000467F

ANALYSIS RESULT

Sl. No.	Name of Pollutants	Unit	Results	Limit *	Test Method
1	Particulate matter (<10 µm)	µg/m ³	51.8	100	IS: 5182 (Part-23)
2	Particulate matter (<2.5µm)	µg/m ³	33.6	60	TPM/MSK/ENV(AP)/01/03
3	Sulphur dioxide as SO ₂	µg/m ³	7.1	80	IS: 5182 (Part-2)
4	Nitrogen dioxide as NO ₂	µg/m ³	27.4	80	IS: 5182 (Part- 6)
5	Carbon monoxide as CO	mg/m ³	0.54	2	IS: 5182 (Part- 10)
6	Ozone (O ₃)	µg/m ³	<20.0	180	TPM/MSK/ENV(AP)/01/07
7	Ammonia (NH ₃)	µg/m ³	18.5	400	TPM/MSK/ENV(AP)/01/08
8	Benzene (C ₆ H ₆)	µg/m ³	<4.2	5	IS 5182: Part. 11
9	Benzo(a) pyrene (BaP)	ng/m ³	<0.5	1	IS 5182: Part. 12
10	Lead (Pb)	µg/m ³	<0.01	1	USEPA IO3.4 by ICP-OES
11	Nickel (Ni)	ng/m ³	7.38	20	USEPA IO3.4 by ICP-OES
12	Arsenic (As)	ng/m ³	<1.0	6	USEPA IO3.4 by ICP-OES

*Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality

End

Report prepared by:

Signature : *S. Subyendu Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation : QA Assistant

Report Verified By

Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : *Dr. Soumyadeep Mukhopadhyay*
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

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Doc No MSK/GEN/19/06



TC-6950

TEST REPORT

ULR: TC-69502000000468F

Name & Address of the Customer :	Report No.	: C/2020/468
Jindal Stainless Limited,	Date	: 13.02.20
Kaliapani Chromite Mines	Sample No.	: MSK/KOL/2020/394
Jajpur-755028, Odisha	Date of receipt of sample	: 03.02.20
	Date(s) of performance	: 03.02.20-13.02.20
	Ref. No. & Date	: P.O No.: 6200006415 Date: 29.04.19
	Discipline	: Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Ambient Air
3	Date of sampling	: 31.01.2020 to 01.02.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/RDS-03 MSK/BBSR/FIELD/FDS-03
5	Place of sampling	: Mining Sub station
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: 1) Temperature :17-27°C 2) Barometric Pressure: 758 mm of Hg 3) Rain fall : Yes & Cold Chain Maintained
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

Report prepared by:

Signature :
Name : Mr. Subyendu Chakraborty
Designation : QA Assistant

Report Verified By

Signature :
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature :
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

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Page 1 of 2



Report No. : C/2020/468
Sample No. : MSK/KOL/2020/394

ULR: TC-69502000000468F

ANALYSIS RESULT

Sl. No.	Name of Pollutants	Unit	Results	Limit *	Test Method
1	Particulate matter (<10 µm)	µg/m ³	62.5	100	IS: 5182 (Part-23)
2	Particulate matter (<2.5µm)	µg/m ³	27.8	60	TPM/MSK/ENV(AP)/01/03
3	Sulphur dioxide as SO ₂	µg/m ³	6.8	80	IS: 5182 (Part-2)
4	Nitrogen dioxide as NO ₂	µg/m ³	34.5	80	IS: 5182 (Part- 6)
5	Carbon monoxide as CO	mg/m ³	0.87	2	IS: 5182 (Part- 10)
6	Ozone (O ₃)	µg/m ³	<20.0	180	TPM/MSK/ENV(AP)/01/07
7	Ammonia (NH ₃)	µg/m ³	21.2	400	TPM/MSK/ENV(AP)/01/08
8	Benzene (C ₆ H ₆)	µg/m ³	<4.2	5	IS 5182: Part. 11
9	Benzo(a) pyrene (BaP)	ng/m ³	<0.5	1	IS 5182: Part. 12
10	Lead (Pb)	µg/m ³	<0.01	1	USEPA IO3.4 by ICP-OES
11	Nickel (Ni)	ng/m ³	<5.0	20	USEPA IO3.4 by ICP-OES
12	Arsenic (As)	ng/m ³	<1.0	6	USEPA IO3.4 by ICP-OES

*Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality

End

Report prepared by:
Signature : *S. Subyendu Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation : QA Assistant

Report Verified By
Signature : *Paulami Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory
Signature : *Dr. Soumyadeep Mukhopadhyay*
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

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TC-6950

TEST REPORT

ULR: TC-69502000000469F

Name & Address of the Customer :	Report No.	: C/2020/469
Jindal Stainless Limited,	Date	: 13.02.20
Kaliapani Chromite Mines	Sample No.	: MSK/KOL/2020/395
Jajpur-755028, Odisha	Date of receipt of sample	: 03.02.20
	Date(s) of performance	: 03.02.20-13.02.20
	Ref. No. & Date	: P.O No.: 6200006415 Date: 29.04.19
	Discipline	: Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Ambient Air
3	Date of sampling	: 31.01.2020 to 01.02.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/RDS-04 MSK/BBSR/FIELD/FDS-04
5	Place of sampling	: Haul Road
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: 1) Temperature : 17-27°C 2) Barometric Pressure: 758 mm of Hg 3) Rain fall : Yes & Cold Chain Maintained
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

Report prepared by:
Signature : *S. Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation : QA Assistant

Report Verified By
Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory
Signature : *Dr. Souryadeep Mukhopadhyay*
Name : Dr. Souryadeep Mukhopadhyay
Designation : Lab In Charge

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Report No. : C/2020/469
Sample No. : MSK/KOL/2020/395

ULR: TC-695020000000469F

ANALYSIS RESULT

Sl. No.	Name of Pollutants	Unit	Results	Limit *	Test Method
1	Particulate matter (<10 µm)	µg/m ³	67.2	100	IS: 5182 (Part-23)
2	Particulate matter (<2.5µm)	µg/m ³	31.7	60	TPM/MSK/ENV(AP)/01/03
3	Sulphur dioxide as SO ₂	µg/m ³	8.3	80	IS: 5182 (Part-2)
4	Nitrogen dioxide as NO ₂	µg/m ³	29.4	80	IS: 5182 (Part- 6)
5	Carbon monoxide as CO	mg/m ³	0.74	2	IS: 5182 (Part- 10)
6	Ozone (O ₃)	µg/m ³	<20.0	180	TPM/MSK/ENV(AP)/01/07
7	Ammonia (NH ₃)	µg/m ³	<10.0	400	TPM/MSK/ENV(AP)/01/08
8	Benzene (C ₆ H ₆)	µg/m ³	<4.2	5	IS 5182: Part. 11
9	Benzo(a) pyrene (BaP)	ng/m ³	<0.5	1	IS 5182: Part. 12
10	Lead (Pb)	µg/m ³	<0.01	1	USEPA 103.4 by ICP-OES
11	Nickel (Ni)	ng/m ³	5.58	20	USEPA 103.4 by ICP-OES
12	Arsenic (As)	ng/m ³	<1.0	6	USEPA 103.4 by ICP-OES

*Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality

End

Report prepared by:

Signature : *S. Subyendu Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation : QA Assistant

Report Verified By

Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : *J. Soumyadeep Mukhopadhyay*
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

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TC-6950

TEST REPORT

ULR: TC-695020000000491F

Name & Address of the Customer :	Report No.	:C/2020/491
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/412
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-14.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample(As declared by customer)	: Fugitive Air
3	Date of sampling	: 01.02.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/RDS -01
5	Place of sampling	: Near Weigh Bridge
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: 1) Temperature: 24-26 °C 2) Barometric Pressure: 758 mm of Hg 3) Rain fall :NIL & Cold Chain Maintained
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

ANALYSIS RESULT

Sl. No.	Name of Pollutants	Unit	Results	Test Method
1	Particulate matter (<10 µm)	µg/m ³	69.2	TPM/MSK/ENV(AP)/04/02
2	Sulphur dioxide as SO ₂	µg/m ³	13.3	TPM/MSK/ENV(AP)/04/04
3	Nitrogen dioxide as NO ₂	µg/m ³	40.2	TPM/MSK/ENV(AP)/04/05

END

Report prepared by:

Signature : *S. Subyendu Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation: QA Assistant

Report Verified By

Signature : *Paulami Dutta*
Name : Ms. Paulami Dutta
Designation: Executive - QA

Report Sign By Authorized Signatory

Signature : *Pradip Bag*
Name : Mr. Pradip Bag
Designation: Technical In Charge

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TC-6950

ULR: TC-695020000000460F

TEST REPORT

Name & Address of the Customer :	Report No.	: C/2020/460
Jindal Stainless Limited,	Date	: 11.02.20
Kaliapani Chromite Mines	Sample No.	: MSK/KOL/2020/390
Jajpur-755028, Odisha.	Date of receipt of sample	: 01.02.20
	Date(s) of performance	: 01.02.20-11.02.20
	Ref. No. & Date	: P.O No.: 6200006415 Date: 29.04.19
	Discipline	: Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample(As declared by customer)	: Fugitive Air
3	Date of sampling	: 29.01.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/RDS -01
5	Place of sampling	: Near Main Gate
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: 1) Temperature: 24-26 °C 2) Barometric Pressure: 758 mm of Hg 3) Rain fall :NIL &
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty Cold Chain Maintained

ANALYSIS RESULT

Sl. No.	Name of Pollutants	Unit	Results	Test Method
1	Particulate matter (<10 µm)	µg/m ³	59.0	TPM/MSK/ENV(AP)/04/02
2	Sulphur dioxide as SO ₂	µg/m ³	8.5	TPM/MSK/ENV(AP)/04/04
3	Nitrogen dioxide as NO ₂	µg/m ³	41.3	TPM/MSK/ENV(AP)/04/05

END

Report prepared by:

Signature : *S. Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation: QA Assistant

Report Verified By:

Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation: Executive - QA

Report Sign By Authorized Signatory

Signature : *P. Bag*
Name : Mr. Pradip Bag
Designation: Technical In Charge

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**TEST REPORT**

TC-6950

ULR: TC-69502000000461F

Name & Address of the Customer :	Report No.	:C/2020/461
Jindal Stainless Limited,	Date	:11.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/391
Jajpur-755028, Odisha.	Date of receipt of sample	:01.02.20
	Date(s) of performance	:01.02.20-11.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample(As declared by customer)	: Fugitive Air
3	Date of sampling	: 29.01.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/RDS -01
5	Place of sampling	: COB Plant-1
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: 1) Temperature: 24-26 °C 2) Barometric Pressure: 758 mm of Hg 3) Rain fall :NIL & Cold Chain Maintained
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

ANALYSIS RESULT

Sl. No.	Name of Pollutants	Unit	Results	Test Method
1	Particulate matter (<10 µm)	µg/m ³	45.6	TPM/MSK/ENV(AP)/04/02
2	Sulphur dioxide as SO ₂	µg/m ³	11.2	TPM/MSK/ENV(AP)/04/04
3	Nitrogen dioxide as NO ₂	µg/m ³	25.6	TPM/MSK/ENV(AP)/04/05

END

Report prepared by:

Signature : *S. Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation: QA Assistant

Report Verified By:

Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation: Executive - QA

Report Sign By Authorized Signatory

Signature : *P. Bag*
Name : Mr. Pradip Bag
Designation: Technical In Charge

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TEST REPORT

ULR: TC-695020000000470F

Name & Address of the Customer :	Report No.	:C/2020/470
Jindal Stainless Limited,	Date	:13.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/396
Jajpur-755028, Odisha.	Date of receipt of sample	:03.02.20
	Date(s) of performance	:03.02.20-13.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample(As declared by customer)	: Noise
3	Date of sampling	: 31.01.2020 to 01.02.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/SLM/01
5	Place of sampling	: Near Main Gate
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: NA
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

ANALYSIS RESULT

SL. No	Parameter(s)	Unit of Measurement	Test Method	Result	Zone	Limits as per CPCB	
						Day Time (6.00 - 22.00)	Night Time (22.00 - 06.00)
1.	Leq Day time (6.00-22.00)	dB(A)	IS:9989	57.8	Industrial	75	70
2.	Leq Night time (22.00 -6.00)			45.1			

END

Report prepared by
Signature : *S. Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation: QA Assistant

Report Verified By
Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation: Executive - QA

Report Sign By Authorized Signatory
Signature : *S. Subyendu Chakraborty*
Name : Dr. Soumyadeep Mukhopadhyay
Designation: Lab In Charge

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- Microbiological sealed pack water sample(s) shall be retained for 15 days & food sample(s) shall be retained for 10 days after analysis

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TC-6950

TEST REPORT

ULR: TC-695020000000471F

Name & Address of the Customer : Jindal Stainless Limited,
Kaliapani Chromite Mines
Jajpur-755028, Odisha.

Report No. : C/2020/471
Date : 13.02.20
Sample No. : MSK/KOL/2020/397
Date of receipt of sample : 03.02.20
Date(s) of performance : 03.02.20-13.02.20
Ref. No. & Date : P.O No.: 6200006415 Date: 29.04.19
Discipline : Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample(As declared by customer)	: Noise
3	Date of sampling	: 31.01.2020 to 01.02.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/SLM/01
5	Place of sampling	: Near Mining Sub Station
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: NA
8	Identification of the personnel performing sampling	: Mr. Akram Khan

ANALYSIS RESULT

SL. No	Parameter(s)	Unit of Measurement	Test Method	Result	Zone	Limits as per CPCB	
						Day Time (6.00 - 22.00)	Night Time (22.00 - 06.00)
1.	Leq Day time (6.00-22.00)	dB(A)	IS:9989	57.1	Industrial	75	70
2.	Leq Night time (22.00 -6.00)			43.0			

END

Report prepared by:

Signature :
Name : Mr. Subyendu Chakraborty
Designation: QA Assistant

Report Verified By:

Signature :
Name : Ms. Paulami Dutta
Designation: Executive - QA

Report Sign By Authorized Signatory

Signature :
Name : Dr. Soumyadeep Mukhopadhyay
Designation: Lab In Charge

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**TEST REPORT**

TC-6950

ULR: TC-69502000000472F

Name & Address of the Customer :	Report No. :	C/2020/472
Jindal Stainless Limited,	Date :	13.02.20
Kaliapani Chromite Mines	Sample No. :	MSK/KOL/2020/398
Jajpur-755028, Odisha.	Date of receipt of sample :	03.02.20
	Date(s) of performance :	03.02.20-13.02.20
	Ref. No. & Date :	P.O No.: 6200006415 Date: 29.04.19
	Discipline :	Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Noise
3	Date of sampling	: 31.01.2020 to 01.02.2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/SLM/01
5	Place of sampling	: Near Admin Building
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: NA
8	Identification of the personnel performing sampling	: Mr. Akram Khan

ANALYSIS RESULT

SL. No	Parameter(s)	Unit of Measurement	Test Method	Result	Zone	Limits as per CPCB	
						Day Time (6.00 - 22.00)	Night Time (22.00 - 06.00)
1.	Leq Day time (6.00-22.00)	dB(A)	IS:9989	57.7	Industrial	75	70
2.	Leq Night time (22.00 -6.00)			45.2			

END

Report prepared by:
Signature : *S. Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation: QA Assistant

Report Verified By:
Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation: Executive - QA

Report Sign By Authorized Signatory
Signature : *S. Soumyadeep*
Name : Dr. Soumyadeep Mukhopadhyay
Designation: Lab In Charge

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TEST REPORT

TC-6950

ULR: TC-695020000000492F

Name & Address of the Customer :	Report No.	:C/2020/492
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/413
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-14.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample(As declared by customer)	: Noise
3	Date of sampling	: 01/02/2020 to 02/02/2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/SLM/01
5	Place of sampling	: Out Side Boundary Wall JSI Main Gate
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: NA
8	Identification of the personnel performing sampling	: Mr. Akram Khan

ANALYSIS RESULT

SL. No	Parameter(s)	Unit of Measurement	Test Method	Result	Zone	Limits as per CPCB	
						Day Time (6.00 - 22.00)	Night Time (22.00 - 06.00)
1.	Leq Day time (6.00-22.00)	dB(A)	IS:9989	59.3	Industrial	75	70
2.	Leq Night time (22.00 -6.00)			49.6			

END

Report prepared by:
Signature : *S. Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation: QA Assistant

Report Verified By
Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation: Executive - QA

Report Sign By Authorized Signatory
Signature : *P. Bag*
Name : Mr. Pradip Bag
Designation: Technical In Charge

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TC-6950

TEST REPORT

ULR: TC-695020000000493F

Name & Address of the Customer :	Report No.	:C/2020/493
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/414
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-14.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample(As declared by customer)	: Noise
3	Date of sampling	: 01/02/2020 to 02/02/2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/SLM/01
5	Place of sampling	: Kaliapani Village
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: NA
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

ANALYSIS RESULT

SL. No	Parameter(s)	Unit of Measurement	Test Method	Result	Zone	Limits as per CPCB	
						Day Time (6.00 - 22.00)	Night Time (22.00 - 06.00)
1.	Leq Day time (6.00-22.00)	dB(A)	IS:9989	52.1	Residential Area	55	45
2.	Leq Night time (22.00 -6.00)			43.5			

END

Report prepared by:	Report Verified By	Report Sign By Authorized Signatory
Signature : <i>C. Subyendu Chakraborty</i>	Signature : <i>P. Dutta</i>	Signature : <i>P. Bag</i>
Name : Mr. Subyendu Chakraborty	Name : Ms. Paulami Dutta	Name : Mr. Pradip Bag
Designation: QA Assistant	Designation: Executive - QA	Designation: Technical In Charge

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TC-6950

ULR: TC-695020000000494F

TEST REPORT

Name & Address of the Customer :	Report No.	:C/2020/494
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/415
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-14.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample(As declared by customer)	: Noise
3	Date of sampling	: 01/02/2020 to 02/02/2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/SLM/01
5	Place of sampling	: Saruabali Village
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: NA
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

ANALYSIS RESULT

SL. No	Parameter(s)	Unit of Measurement	Test Method	Result	Zone	Limits as per CPCB	
						Day Time (6.00 - 22.00)	Night Time (22.00 - 06.00)
1.	Leq Day time (6.00-22.00)	dB(A)	IS:9989	51.3	Residential Area	55	45
2.	Leq Night time (22.00 -6.00)			40.7			

END

Report prepared by:

Signature : *S. Chakraborty*
Name : Mr. Subyendu Chakraborty
Designation: QA Assistant

Report Verified By

Signature : *P. Dutta*
Name : Ms. Paulami Dutta
Designation: Executive - QA

Report Sign By Authorized Signatory

Signature : *P. Bag*
Name : Mr. Pradip Bag
Designation: Technical In Charge

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TC-6950

TEST REPORT

ULR: TC-695020000000498F

Name & Address of the Customer :	Report No.	:C/2020/498
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/419
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-14.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	: Atmospheric Pollution
2	Description of sample (As declared by customer)	: Noise
3	Date of sampling	: 02/02/2020 to 03/02/2020
4	Unique Identification	: Equipment Used: MSK/BBSR/FIELD/SLM/01
5	Place of sampling	: Near COB Plant
6	Sampling Plan & Procedures used	: IS/CPCB Guidelines (Volume-1)
7	Environmental conditions during sampling & Transport Condition	: NA
8	Identification of the personnel performing sampling	: Mr. Biswambar Prusty

ANALYSIS RESULT

SL. No	Parameter(s)	Unit of Measurement	Test Method	Result	Zone	Limits as per CPCB	
						Day Time (6.00 - 22.00)	Night Time (22.00 - 06.00)
1.	Leq Day time (6.00-22.00)	dB(A)	IS:9989	57.4	Industrial	75	70
2.	Leq Night time (22.00 -6.00)			46.1			

END

Report prepared by:
Signature : *S. Chakrabarty*
Name : Mr. Subyendu Chakraborty
Designation: QA Assistant

Report Verified By
Signature : *PSwite*
Name : Ms. Paulami Dutta
Designation: Executive - QA

Report Sign By Authorized Signatory
Signature : *Pradip Bag*
Name : Mr. Pradip Bag
Designation: Technical In Charge

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TEST REPORT


ULR: TC-69502000000499P

Name & Address of the Customer:	Report No.	: C/2020/499
Jindal Stainless Limited,	Date	: 14.02.20
Kaliapani Chromite Mines	Sample No.	: MSK/KOL/2020/420
Jajpur-755028, Odisha.	Date of receipt of sample	: 04.02.20
	Date(s) of performance	: 04.02.20-14.02.20
	Ref. No. & Date	: P.O No.: 6200006415 Date: 29.04.19
	Discipline	: Chemical


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

1	Group	: Pollution & Environment
2	Description of sample (As declared by customer)	: Soil
3	Date of sampling	: 02.02.20
4	Unique Identification	: Dumping Area
5	Place of sampling	: Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	: Soil Chemical Analysis M.L. Jackson
7	Environmental conditions during sampling & Transport Condition	: Maintained
8	Identification of the personnel performing sampling	: Mr.Akram Khan


Report prepared by:

Signature : 
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified by

Signature : 
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign by Authorized Signatory

Signature : 
Name : Dr. Sourydeep Mukhopadhyay
Designation : Lab In-charge

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TC-6950

Report No. : C/2020/499
Sample No. : MSK/KOL/2020/420

ULR: TC-69502000000499P

ANALYSIS RESULT

SL. No.	Test Parameter	Test Method	Result
1	pH (1:2.5) at 25° C	IS:2720(Part-26)	6.02
2	Available Iron as Fe in mg/kg	TPM/MSK/P&E/1/13, issued on- 02/04/2018	<0.05
3	Bulk Density in g/cc	IS:2720(Part-29)	1.25
4	Texture	TPM/MSK/P&E/1/1/36A , issued on- 02/04/2018	Loam
5	Moisture in %	IS:2720(Part-2)	21
6	Total Nitrogen as N in mg/kg	IS: 14684	812
7	Water Holding Capacity in %	TPM/MSK/P&E/1/17, issued on-02/04/2018	46
8	Cation Exchange Capacity in meq/100gm	IS:2720(Part-24)	22
9	Available Phosphorus in mg/kg	TPM/MSK/P&E/1/12, issued on-02/04/2018	<3.0
*10	Manganese as Mn in mg/kg	EPA 6010 D(ICP- OES)	2533.71
11	Mercury as Hg in mg/kg	USEPA 245.5	<0.1
*12	Nickel as Ni in mg/kg	EPA 6010 D(ICP- OES)	2773.12
13	Arsenic as As in mg/kg	EPA 6010 D(ICP- OES)	<0.25
*14	Chromium as Cr in mg/kg	EPA 6010 D(ICP- OES)	6743.27
15	Cobalt as CO in mg/kg	EPA 6010 D(ICP- OES)	103.14

* The result not in our NABL Scope due to out of range (Mn-2 mg/kg to 200 mg/kg, Ni-2 mg/kg to 50 mg/kg, Cr-2 mg/kg to 200 mg/kg,)

END

Report prepared by:

Signature :
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature :
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature :
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In-charge

Mitra S. K. Private Limited

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Web : www.mitrask.com



TC-6950

TEST REPORT


ULR: TC-695020000000500P

Name & Address of the Customer:	Report No.	: C/2020/500
Jindal Stainless Limited,	Date	: 14.02.20
Kaliapani Chromite Mines	Sample No.	: MSK/KOL/2020/421
Jajpur-755028, Odisha.	Date of receipt of sample	: 04.02.20
	Date(s) of performance	: 04.02.20-14.02.20
	Ref. No. & Date	: P.O No.: 6200006415 Date: 29.04.19
	Discipline	: Chemical


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

1	Group	: Pollution & Environment
2	Description of sample (As declared by customer)	: Water
3	Date of sampling	: 02.02.20
4	Unique Identification	: Surface Water (Quarry No-2)
5	Place of sampling	: Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	: APHA 23 rd edition, 2017, 1060B, C
7	Environmental conditions during sampling & Transport Condition	: Maintained
8	Identification of the personnel performing sampling	: Mr. Akram Khan


Report prepared by:

Signature : 
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified by:

Signature : 
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign by Authorized Signatory

Signature : 
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In-charge

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Report No. : C/2020/500
Sample No. : MSK/KOL/2020/421

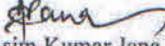
ULR: TC-69502000000500P

ANALYSIS RESULT


SL. No.	Test Parameter	Test Method	Result
1	pH at 25 ⁰ C	APHA 23 rd edition, 4500-H-B	7.65
2	Colour in Hazen	APHA 23 rd edition, 2120B	<1.0
3	Odour	APHA 23 rd edition, 2150B	Agreeable
4	Total Suspended Solid as TSS in mg/l	APHA 23 rd edition, 2540D	<2.5
5	TDS in mg/l	APHA 23 rd edition, 2540C	120
6	Temperature °C	IS 3025 (Part 9)	25
7	Oil & Grease in mg/l	APHA 23 rd edition, 5520B	<1.4
8	Residual Free Chlorine in mg/l	IS:3025(Part-26)	<0.1
9	NH ₃ N in mg/l	APHA 23 rd edition, 4500 NH ₃ - F	<0.1
10	TKN in mg/l	APHA 23 rd edition, 4500 N-org B	<0.3
*11	Free NH ₃ in mg/l	APHA 23 rd edition, 4500 NH ₃ B	<0.1
12	Bio -Chemical Oxygen Demand as BOD in mg/l	APHA 23 rd edition, 5210B	<2.0
13	Chemical Oxygen Demand as COD in mg/l	APHA 23 rd edition, 5220B	8
14	Fluoride as F in mg/l	APHA 23 rd edition, 4500 F-C	<0.1
15	Iron as Fe in mg/l	APHA 23 rd edition, 3500 Fe B	0.14
16	Nitrate as NO ₃ in mg/l	APHA 23 rd edition, 4500NO ₃ E	0.99
17	Hexavalent Chromium as Cr+6 in mg/l	APHA 23 rd edition, 3500 Cr B	<0.01
18	Sulphide as S ⁻² in mg/l	APHA 23 rd edition, 4500 S-D	<0.1
19	Dissolved Phosphate as P in mg/l	APHA 23 rd Edition, 4500P-B,D	<0.05
20	Bio Assay Test	IS 6582 (P-2)	All fish survived in 100% effluent water after 96 hrs (TF=1)

*Parameter not in NABL Scope


Report prepared by:

Signature : 
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature : 
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : 
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In-charge

Mitra S. K. Private Limited

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Email : mitrasklab@yahoo.com
Web : www.mitrask.com



Report No. : C/2020/500
Sample No. : MSK/KOL/2020/421


ULR: TC-69502000000500P

Analysis Result


SL. No.	Test Parameter	Test Method	Result
1.	As in mg/l	APHA 23 rd edition, 3120 B	<0.005
2.	Pb in mg/l	APHA 23 rd edition, 3120 B	<0.05
3.	Cd in mg/l	APHA 23 rd edition, 3120 B	<0.05
4.	Cu in mg/l	APHA 23 rd edition, 3120 B	<0.05
5.	Zn in mg/l	APHA 23 rd edition, 3120 B	<0.05
6.	Se in mg/l	APHA 23 rd edition, 3120 B	<0.005
7.	Ni in mg/l	APHA 23 rd edition, 3120 B	<0.05
8.	Hg in mg/l	IS 3025(Part 48)	<0.001
9.	V in mg/l	APHA 23 rd edition, 3120 B	<0.05
10.	Total Cr in mg/l	APHA 23 rd edition, 3120 B	<0.05
11.	Mn in mg/l	APHA 23 rd edition, 3120 B	<0.05

End

Report prepared by:

Signature : 
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature : 
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : 
Name : Dr. Soumydeep Mukhopadhyay
Designation : Lab In-charge

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TC-6950

TEST REPORT


ULR: TC-695020000000501P

Name & Address of the Customer:	Report No.	: C/2020/501
Jindal Stainless Limited,	Date	: 14.02.20
Kaliapani Chromite Mines	Sample No.	: MSK/KOL/2020/422
Jajpur-755028, Odisha.	Date of receipt of sample	: 04.02.20
	Date(s) of performance	: 04.02.20-14.02.20
	Ref. No. & Date	: P.O No.: 6200006415 Date: 29.04.19
	Discipline	: Chemical

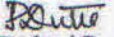
We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1	Group	: Pollution & Environment
2	Description of sample (As declared by customer)	: Water
3	Date of sampling	: 02.02.20
4	Unique Identification	: Surface Water (Damsala River UP Stream)
5	Place of sampling	: Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	: APHA 23 rd edition, 2017, 1060B, C
7	Environmental conditions during sampling & Transport Condition	: Maintained
8	Identification of the personnel performing sampling	: Mr. Akram Khan

Report prepared by:

Signature : 
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified by

Signature : 
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign by Authorized Signatory

Signature : 
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In-charge

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- The reserved part of sample(s), except perishable sample(s), shall be retained for 15 days & 1 year (Air) from the date of issue of the Test Report.
- Microbiological sealed pack water sample(s) shall be retained for 15 days & food sample(s) shall be retained for 10 days after analysis.

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TC-6950

Report No. : C/2020/501
Sample No. : MSK/KOL/2020/422


ULR: TC-69502000000501P

ANALYSIS RESULT


SL. No.	Test Parameter	Test Method	Result
1	pH at 25°C	APHA 23 rd edition, 4500-H-B	7.99
2	Colour in Hazen	APHA 23 rd edition, 2120B	<1.0
3	Odour	APHA 23 rd edition, 2150B	Agreeable
4	Total Suspended Solid as TSS in mg/l	APHA 23 rd edition, 2540D	4.2
5	TDS in mg/l	APHA 23 rd edition, 2540C	410
6	Temperature °C	IS 3025 (Part 9)	25
7	Oil & Grease in mg/l	APHA 23 rd edition, 5520B	<1.4
8	Residual Free Chlorine in mg/l	IS:3025(Part-26)	<0.1
9	NH ₃ N in mg/l	APHA 23 rd edition, 4500 NH ₃ - F	<0.1
10	TKN in mg/l	APHA 23 rd edition, 4500 N _{org} B	<0.3
*11	Free NH ₃ in mg/l	APHA 23 rd edition, 4500 NH ₃ -B	<0.1
12	Bio-Chemical Oxygen Demand as BOD in mg/l	APHA 23 rd edition, 5210B	<2.0
13	Chemical Oxygen Demand as COD in mg/l	APHA 23 rd edition, 5220B	<4.0
14	Fluoride as F in mg/l	APHA 23 rd edition, 4500 F-C	<0.1
15	Iron as Fe in mg/l	APHA 23 rd edition, 3500 Fe B	0.26
16	Nitrate as NO ₃ in mg/l	APHA 23 rd edition, 4500NO ₃ E	1.2
17	Hexavalent Chromium as Cr+6 in mg/l	APHA 23 rd edition, 3500 Cr B	<0.01
18	Sulphide as S ⁻² in mg/l	APHA 23 rd edition, 4500 S ⁻² D	<0.1
19	Dissolved Phosphate as P in mg/l	APHA 23 rd Edition, 4500P-B,D	<0.05
20	Bio Assay Test	IS 6582 (P-2)	All fish survived in 100% effluent water after 96 hrs (TF=1)

*Parameter not in NABL Scope


Report prepared by:

Signature : 
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature : 
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : 
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In-charge

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Web : www.mitrask.com



Report No. : C/2020/501
Sample No. : MSK/KOL/2020/422


ULR: TC-695020000000501P

Analysis Result


SL. No.	Test Parameter	Test Method	Result
1.	As in mg/l	APHA 23 rd edition, 3120 B	<0.005
2.	Pb in mg/l	APHA 23 rd edition, 3120 B	<0.05
3.	Cd in mg/l	APHA 23 rd edition, 3120 B	<0.05
4.	Cu in mg/l	APHA 23 rd edition, 3120 B	<0.05
5.	Zn in mg/l	APHA 23 rd edition, 3120 B	<0.05
6.	Se in mg/l	APHA 23 rd edition, 3120 B	<0.005
7.	Ni in mg/l	APHA 23 rd edition, 3120 B	<0.05
8.	Hg in mg/l	IS 3025(Part 48)	<0.001
9.	V in mg/l	APHA 23 rd edition, 3120 B	<0.05
10.	Total Cr in mg/l	APHA 23 rd edition, 3120 B	<0.05
11.	Mn in mg/l	APHA 23 rd edition, 3120 B	<0.05

End


Report prepared by:

Signature : 
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature : 
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : 
Name : Dr. Soumydeep Mukhopadhyay
Designation : Lab In-charge

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TC-6950

TEST REPORT

ULR: TC-695020000000502P

Name & Address of the Customer:	Report No.	: C/2020/502
Jindal Stainless Limited,	Date	: 14.02.20
Kaliapani Chromite Mines	Sample No.	: MSK/KOL/2020/423
Jajpur-755028, Odisha.	Date of receipt of sample	: 04.02.20
	Date(s) of performance	: 04.02.20-14.02.20
	Ref. No. & Date	: P.O No.: 6200006415 Date: 29.04.19
	Discipline	: Chemical

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

1	Group	: Pollution & Environment
2	Description of sample (As declared by customer)	: Water
3	Date of sampling	: 02.02.20
4	Unique Identification	: Surface Water (Damsala River Down Stream)
5	Place of sampling	: Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	: APHA 23 rd edition, 2017, 1060B, C
7	Environmental conditions during sampling & Transport Condition	: Maintained
8	Identification of the personnel performing sampling	: Mr. Akram Khan

Report prepared by:

Signature : *Asim*
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified by

Signature : *Paulami*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign by Authorized Signatory

Signature : *Dr. Soumydeep Mukhopadhyay*
Name : Dr. Soumydeep Mukhopadhyay
Designation : Lab In-charge

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Doc No MSK/GEN/19/06



TC-6950

Report No. : C/2020/502
Sample No. : MSK/KOL/2020/423

ULR: TC-69502000000502P

ANALYSIS RESULT

SL. No.	Test Parameter	Test Method	Result
1	pH at 25°C	APHA 23 rd edition, 4500-H-B	8.02
2	Colour in Hazen	APHA 23 rd edition, 2120B	<1.0
3	Odour	APHA 23 rd edition, 2150B	Agreable
4	Total Suspended Solid as TSS in mg/l	APHA 23 rd edition, 2540D	21
5	TDS in mg/l	APHA 23 rd edition, 2540C	130
6	Temperature °C	IS 3025 (Part 9)	25
7	Oil & Grease in mg/l	APHA 23 rd edition, 5520B	<1.4
8	Residual Free Chlorine in mg/l	IS:3025(Part-26)	<0.1
9	NH ₃ N in mg/l	APHA 23 rd edition, 4500 NH ₃ - F	<0.1
10	TKN in mg/l	APHA 23 rd edition, 4500 N _{org} B	<0.3
*11	Free NH ₃ in mg/l	APHA 23 rd edition, 4500 NH ₃ . B	<0.1
12	Bio-Chemical Oxygen Demand as BOD in mg/l	APHA 23 rd edition, 5210B	<2.0
13	Chemical Oxygen Demand as COD in mg/l	APHA 23 rd edition, 5220B	8
14	Fluoride as F in mg/l	APHA 23 rd edition, 4500 F-C	<0.1
15	Iron as Fe in mg/l	APHA 23 rd edition, 3500 Fe B	3.0
16	Nitrate as NO ₃ in mg/l	APHA 23 rd edition, 4500NO ₃ E	1.5
17	Hexavalent Chromium as Cr+6 in mg/l	APHA 23 rd edition, 3500 Cr B	<0.01
18	Sulphide as S ⁻² in mg/l	APHA 23 rd edition, 4500 S ⁻²	<0.1
19	Dissolved Phosphate as P in mg/l	APHA 23 rd Edition, 4500P-B, D	<0.05
20	Bio Assay Test	IS 6582 (P-2)	All fish survived in 100% effluent water after 96 hrs (TF=1)

*Parameter not in NABL Scope

Report prepared by:

Signature : *Asim*
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature : *Paulami*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : *Sourydeep*
Name : Dr. Sourydeep Mukhopadhyay
Designation : Lab In-charge

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TC-6950

Report No. : C/2020/502
Sample No. : MSK/KOL/2020/423

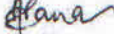
ULR: TC-695020000000502P

Analysis Result


SL. No.	Test Parameter	Test Method	Result
1.	As in mg/l	APHA 23 rd edition, 3120 B	<0.005
2.	Pb in mg/l	APHA 23 rd edition, 3120 B	<0.05
3.	Cd in mg/l	APHA 23 rd edition, 3120 B	<0.05
4.	Cu in mg/l	APHA 23 rd edition, 3120 B	<0.05
5.	Zn in mg/l	APHA 23 rd edition, 3120 B	<0.05
6.	Se in mg/l	APHA 23 rd edition, 3120 B	<0.005
7.	Ni in mg/l	APHA 23 rd edition, 3120 B	<0.05
8.	Hg in mg/l	IS 3025(Part 48)	<0.001
9.	V in mg/l	APHA 23 rd edition, 3120 B	<0.05
10.	Total Cr in mg/l	APHA 23 rd edition, 3120 B	<0.05
11.	Mn in mg/l	APHA 23 rd edition, 3120 B	<0.05

End

Report prepared by:

Signature : 
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature : 
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : 
Name : Dr. Soumydeep Mukhopadhyay
Designation : Lab In-charge

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TC-6950

TEST REPORT

ULR: TC-69502000000503F

Name & Address of the Customer:

Jindal Stainless Limited,
Kaliapani Chromite Mines
Jajpur-755028, Odisha.

Report No.

:C/2020/503

Date

:14.02.20

Sample No.

:MSK/KOL/2020/424

Date of receipt of sample

:04.02.20

Date(s) of performance

:04.02.20-14.02.20

Ref. No. & Date

:P.O No.: 6200006415 Date: 29.04.19

Discipline

:Chemical

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

1	Group	:Pollution & Environment
2	Description of sample(As declared by customer)	:Effluent Water
3	Date of sampling	:02.02.20
4	Unique Identification	:Surface Run-off Quality (ETP Out let)
5	Place of sampling	:Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	:APHA 23 rd edition, 2017, 1060B, C
7	Environmental conditions during sampling & Transport Condition	:Maintained
8	Identification of the personnel performing sampling	:Mr.Akram Khan

ANALYSIS RESULT

Serial No.	Test Parameter	Test Method	Result
1.	pH value at 24°C	APHA 23 rd edition, s 4500-H+B	8.70
2.	Total Suspended Solid as TSS in mg/l	APHA 23 rd edition, 2540D	<2.5
3.	Oil and Grease in mg/l	APHA 23 rd edition, 5520B	<1.4
4.	Iron as Fe in mg/l	APHA 23 rd edition, 3500Fe B	0.14
5.	Total Chromium as Cr in mg/l	APHA 23 rd edition, 3120 B	0.09
6.	Hexavalent Chromium as Cr+6 in mg/l	APHA 23 rd edition, 3500 Cr B	0.06

End

s

Report prepared by:

Signature :
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature :
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature :
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

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Page 1 of 1



TC-6950

TEST REPORT

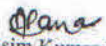
ULR: TC-695020000000507F

Name & Address of the Customer :	Report No.	:C/2020/507
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/428
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-14.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical


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

1	Group	:Water
2	Description of sample(As declared by customer)	:Ground Water
3	Date of sampling	:03.02.20
4	Unique Identification	:Near Store
5	Place of sampling	:Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	:IS:3025(Part-1)1987, RA-2003
7	Environmental conditions during sampling & Transport Condition	:Maintained
8	Identification of the personnel performing sampling	:Mr. Akram Khan

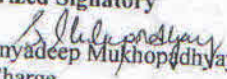
Report prepared by:

Signature : 
Name :Mr. Asim Kumar Jana
Designation :Sr. Office Assistant

Report Verified By

Signature : 
Name :Ms. Paulami Dutta
Designation :Executive QA

Report Sign By Authorized Signatory

Signature : 
Name :Dr. Soumyadeep Mukhopadhyay
Designation :Lab In Charge

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Web : www.mitrask.com



Report No. : C/2020/507
Sample No. : MSK/KOL/2020/428

ULR: TC-69502000000507F

Analysis Result

Table 1: Organoleptic and Physical Parameters as per IS 10500:2012

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1	Colour in Hazen unit	5	15	IS 3025 (Part 4)	BDL(DL:1.0)
2	Odour	Agreeable	Agreeable	IS 3025 (Part 5)	Agreeable
3	pH value at 25°C	6.5-8.5	No Relaxation	IS 3025 (Part 11)	7.27
4	Turbidity in N.T. U	1	5	IS 3025 (Part 10)	BDL(DL:1.0)
5	Total Dissolved Solids in mg/l	500	2000	IS 3025 (Part 16)	148.0

Table 2: General Parameters- Concerning Substances Undesirable in Excessive Amounts as per IS 10500:2012

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1	Ammonia (as total ammonia- N) in mg/l	0.5	No Relaxation	IS 3025 (Part 34)	BDL(DL:0.1)
2	Calcium (as Ca) in mg/l	75	200	IS 3025 (Part 40)	28.0
3	Chloride (as Cl) in mg/l	250	1000	IS 3025 (Part 32)	10.40
4	Fluoride (as F) in mg/l	1.0	1.5	IS 3025 (Part 60)	BDL(DL:0.2)
5	Free Residual Chlorine in mg/l	0.2	1.0	IS 3025 (Part 26)	BDL(DL:0.1)
6	Iron (as Fe) in mg/l	0.3	No Relaxation	IS 3025 (Part 53)	BDL(DL:0.05)
7	Magnesium (as Mg) in mg/l	30	100	IS 3025 (Part 46)	12.00
8	Nitrate (as NO ₃) in mg/l	45	No Relaxation	IS 3025 (Part 34)	2.40
9	Sulphate (as SO ₄) in mg/l	200	400	IS 3025 (Part 24)	4.06
10	Sulphide (as H ₂ S) in mg/l	0.05	No Relaxation	IS 3025 (Part 29)	BDL(DL:0.02)
11	Total Alkalinity (as CaCO ₃) in mg/l	200	600	IS 3025 (Part 23)	102.00
12	Total Hardness (as CaCO ₃) in mg/l	200	600	IS 3025 (Part 21)	120.0

Extra parameter as per Work Order

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible limit in the absence of alternate Source	Method of Test	Result
1	Chromium (as Cr ⁶⁺) in mg/l	-	-	IS 3025 (Part 52)	<0.01

----- END -----

Report prepared by:

Signature :
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature :
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature :
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

Mitra S.K.Private Limited

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Web : www.mitrask.com

Doc No MSK/GEN/19/06



TC-6950

TEST REPORT

ULR: TC-695020000000507F

Name & Address of the Customer :	Report No.	:C/2020/507
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/428
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-14.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	:Residue in Water
2	Description of sample(As declared by customer)	:Ground Water
3	Date of sampling	:03.02.20
4	Unique Identification	:Near Store
5	Place of sampling	:Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	:IS:3025(Part-1)1987, RA-2003
7	Environmental conditions during sampling & Transport Condition	:Maintained
8	Identification of the personnel performing sampling	:Mr. Akram Khan

Report prepared by

Signature :
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature :
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature :
Name : Dr. Devottam Banerjee
Designation : Sr. Executive Chemist

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Email : mitraskiab@yahoo.com
Web : www.mitrask.com



Report No. :C/2020/507
Sample No. :MSK/KOL/2020/428

ULR: TC-695020000000507F

Analysis Result

Table2: General Parameters- Concerning Substances Undesirable in Excessive Amounts as per IS 10500:2012

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1.	Aluminium (as Al) in mg/l	0.03	0.2	IS 3025(Part-2)	BDL(DL:0.01)
2.	Barium (as Ba) in mg/l	0.7	No Relaxation	IS 3025(Part-2)	BDL(DL:0.1)
3.	Boron (as B) in mg/l	0.5	1.0	IS 3025(Part-2)	BDL(DL:0.3)
4.	Copper (as Cu) in mg/l	0.05	1.5	IS 3025(Part-2)	BDL(DL:0.02)
5.	Manganese (as Mn) in mg/l	0.1	0.3	IS 3025(Part-2)	BDL(DL:0.02)
6.	Selenium (as Se) in mg/l	0.01	No Relaxation	IS 3025(Part-2)	BDL(DL:0.005)
7.	Silver (as Ag) in mg/l	0.1	No Relaxation	IS 3025(Part-2)	BDL(DL:0.005)
8.	Zinc(as Zn) in mg/l	5	15	IS 3025(Part-2)	BDL(DL:0.02)

Table 3: Parameters Concerning Toxic Substances as per IS 10500:2012

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1.	Cadmium (as Cd) in mg/l	0.003	No Relaxation	IS 3025(Part-2)	BDL(DL:0.001)
2.	Lead (as Pb) in mg/l	0.01	No Relaxation	IS 3025(Part-2)	BDL(DL:0.005)
3.	Mercury (as Hg) in mg/l	0.001	No Relaxation	IS 3025(Part-48)	BDL(DL:0.0002)
4.	Molybdenum (as Mo) in mg/l	0.07	No Relaxation	IS 3025(Part-2)	BDL(DL:0.05)
5.	Nickel (as Ni)in mg/l	0.02	No Relaxation	IS 3025(Part-2)	BDL(DL:0.01)
6.	Total Arsenic(as As) in mg/l	0.01	0.05	IS 3025(Part-2)	BDL(DL:0.005)
7.	Total Chromium (as Cr) in mg/l	0.05	No Relaxation	IS 3025(Part-2)	BDL(DL:0.01)

----- END -----

Report prepared by

Signature : *Asim*
Name :Mr. Asim Kumar Jana
Designation :Sr. Office Assistant

Report Verified By

Signature : *Paulami*
Name :Ms. Paulami Dutta
Designation :Executive QA

Report Sign By Authorized Signatory

Signature : *Devottam*
Name :Dr. Devottam Banerjee
Designation :Sr. Executive Chemist



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TEST REPORT

ULR: TC-695020000000507F

Name & Address of the Customer :	Report No.	:C/2020/507
	Date	:14.02.20
	Sample No.	:MSK/KOL/2020/428
	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-06.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Biological

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

1	Group	:Water
2	Description of sample(As declared by customer)	:Ground Water
3	Date of sampling	:03.02.20
4	Unique Identification	:Near Store
5	Place of sampling	:Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	:NA
7	Environmental conditions during sampling & Transport Condition	:Maintained
8	Identification of the personnel performing sampling	:Mr. Akram Khan


Analysis Result

Bacteriological Quality of Ground Water as per IS 10500:2012


Sl. No.	Test Parameter	Limit	Method of Test	Result
1.	<i>E. coli</i> /100 ml	Not Detectable	IS 15185:2016	Not Detected
2.	Total Coliform Bacteria/100 ml	Not Detectable	IS 15185:2016	Detected

END


Report prepared by

Signature : 
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature : 
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature : 
Name : Mr. Sukanta Palui
Designation : Executive Microbiologist

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Page 1 of 1

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Doc No MSK/GEN/19/06



TC-6950

TEST REPORT

ULR: TC-69502000000508F

Name & Address of the Customer :	Report No.	:C/2020/508
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/429
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-14.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	:Water
2	Description of sample(As declared by customer)	:Drinking Water
3	Date of sampling	:03.02.20
4	Unique Identification	:Officers Mess
5	Place of sampling	:Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	:IS:3025(Part-1)1987, RA-2003
7	Environmental conditions during sampling & Transport Condition	:Maintained
8	Identification of the personnel performing sampling	:Mr. Akram Khan

Report prepared by:

Signature :
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature :
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature :
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

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Web : www.mitrask.com



Report No. :C/2020/508
Sample No. :MSK/KOL/2020/429

ULR: TC-695020000000508F

Analysis Result

Table 1: Organoleptic and Physical Parameters as per IS 10500:2012

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1	Colour in Hazen unit	5	15	IS 3025 (Part 4)	BDL(DL:1.0)
2	Odour	Agreeable	Agreeable	IS 3025 (Part 5)	Agreeable
3	pH value at 25°C	6.5-8.5	No Relaxation	IS 3025 (Part 11)	6.50
4	Turbidity in N.T. U	1	5	IS 3025 (Part 10)	BDL(DL:1.0)
5	Total Dissolved Solids in mg/l	500	2000	IS 3025 (Part 16)	8.0

Table 2: General Parameters- Concerning Substances Undesirable in Excessive Amounts as per IS 10500:2012

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1	Ammonia (as total ammonia- N) in mg/l	0.5	No Relaxation	IS 3025 (Part 34)	BDL(DL:0.1)
2	Calcium (as Ca) in mg/l	75	200	IS 3025 (Part 40)	BDL(DL:0.4)
3	Chloride (as Cl) in mg/l	250	1000	IS 3025 (Part 32)	4.16
4	Fluoride (as F) in mg/l	1.0	1.5	IS 3025 (Part 60)	BDL(DL:0.2)
5	Free Residual Chlorine in mg/l	0.2	1.0	IS 3025 (Part 26)	BDL(DL:0.1)
6	Iron (as Fe) in mg/l	0.3	No Relaxation	IS 3025 (Part 53)	BDL(DL:0.05)
7	Magnesium (as Mg) in mg/l	30	100	IS 3025 (Part 46)	BDL(DL:0.24)
8	Nitrate (as NO ₃) in mg/l	45	No Relaxation	IS 3025 (Part 34)	BDL(DL:0.4)
9	Nitrate (as NO ₃) in mg/l	200	400	IS 3025 (Part 24)	BDL(DL:1.0)
10	Sulphate (as SO ₄) in mg/l	0.05	No Relaxation	IS 3025 (Part 29)	BDL(DL:0.02)
11	Sulphide (as H ₂ S) in mg/l	200	600	IS 3025 (Part 23)	BDL(DL:2.0)
12	Total Alkalinity (as CaCO ₃) in mg/l	200	600	IS 3025 (Part 21)	BDL(DL:2.0)

Extra parameter as per Work Order

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible limit in the absence of alternate Source	Method of Test	Result
1	Chromium (as Cr ⁺⁶) in mg/l	-	-	IS 3025 (Part 52)	<0.01

----- END -----

Report prepared by:

Signature :
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature :
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature :
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

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TC-6950

TEST REPORT


ULR: TC-69502000000508F

Name & Address of the Customer :	Report No.	:C/2020/508
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/429
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-14.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	:Residue in Water
2	Description of sample(As declared by customer)	:Drinking Water
3	Date of sampling	:03.02.20
4	Unique Identification	:Officers Mess
5	Place of sampling	:Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	:IS:3025(Part-1)1987, RA-2003
7	Environmental conditions during sampling & Transport Condition	:Maintained
8	Identification of the personnel performing sampling	:Mr. Akram Khan

Report prepared by

Signature : 
Name :Mr. Asim Kumar Jana
Designation :Sr. Office Assistant

Report Verified By

Signature : 
Name :Ms. Paulami Dutta
Designation :Executive QA

Report Sign By Authorized Signatory

Signature : 
Name :Dr. Devottam Banerjee
Designation :Sr. Executive Chemist

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- Microbiological sealed pack water sample(s) shall be retained for 15 days & food sample(s) shall be retained for 10 days after analysis

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Report No. :C/2020/508
Sample No. :MSK/KOL/2020/429

ULR: TC-69502000000508F

Analysis Result**Table2: General Parameters- Concerning Substances Undesirable in Excessive Amounts as per IS 10500:2012**

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1.	Aluminium (as Al) in mg/l	0.03	0.2	IS 3025(Part-2)	BDL(DL:0.01)
2.	Barium (as Ba) in mg/l	0.7	No Relaxation	IS 3025(Part-2)	BDL(DL:0.1)
3.	Boron (as B) in mg/l	0.5	1.0	IS 3025(Part-2)	BDL(DL:0.3)
4.	Copper (as Cu) in mg/l	0.05	1.5	IS 3025(Part-2)	BDL(DL:0.02)
5.	Copper (as Cu) in mg/l	0.1	0.3	IS 3025(Part-2)	BDL(DL:0.02)
6.	Manganese (as Mn) in mg/l	0.01	No Relaxation	IS 3025(Part-2)	BDL(DL:0.005)
7.	Selenium (as Se) in mg/l	0.1	No Relaxation	IS 3025(Part-2)	BDL(DL:0.005)
8.	Silver (as Ag) in mg/l	5	15	IS 3025(Part-2)	BDL(DL:0.02)
8.	Zinc(as Zn) in mg/l	5	15	IS 3025(Part-2)	BDL(DL:0.02)

Table 3: Parameters Concerning Toxic Substances as per IS 10500:2012

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1.	Cadmium (as Cd) in mg/l	0.003	No Relaxation	IS 3025(Part-2)	BDL(DL:0.001)
2.	Lead (as Pb) in mg/l	0.01	No Relaxation	IS 3025(Part-2)	BDL(DL:0.005)
3.	Mercury (as Hg) in mg/l	0.001	No Relaxation	IS 3025(Part-48)	BDL(DL:0.0002)
4.	Molybdenum (as Mo) in mg/l	0.07	No Relaxation	IS 3025(Part-2)	BDL(DL:0.05)
5.	Nickel (as Ni)in mg/l	0.02	No Relaxation	IS 3025(Part-2)	BDL(DL:0.01)
6.	Total Arsenic(as As) in mg/l	0.01	0.05	IS 3025(Part-2)	BDL(DL:0.005)
7.	Total Chromium (as Cr) in mg/l	0.05	No Relaxation	IS 3025(Part-2)	BDL(DL:0.01)

----- END -----

Report prepared by

Signature : *Asim*
Name :Mr. Asim Kumar Jana
Designation :Sr. Office Assistant

Report Verified By

Signature : *Paulami*
Name :Ms. Paulami Dutta
Designation :Executive QA

Report Sign By Authorized Signatory

Signature : *Devottam*
Name :Dr. Devottam Banerjee
Designation :Sr. Executive Chemist

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**TEST REPORT**

ULR: TC-69502000000508F

Name & Address of the Customer :	Report No.	:C/2020/508
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/429
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-06.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Biological

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


1	Group	:Water
2	Description of sample(As declared by customer)	:Drinking Water
3	Date of sampling	:03.02.20
4	Unique Identification	:Officers Mess
5	Place of sampling	:Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	:NA
7	Environmental conditions during sampling & Transport Condition	:Maintained
8	Identification of the personnel performing sampling	:Mr. Akram Khan

Analysis Result**Bacteriological Quality of Drinking Water as per IS 10500:2012**


Sl. No.	Test Parameter	Limit	Method of Test	Result
1.	<i>E. coli</i> /100 ml	Not Detectable	IS 15185:2016	Not Detected
2.	Total Coliform Bacteria/100 ml	Not Detectable	IS 15185:2016	Detected

END


Report prepared by

Signature : 
Name :Mr. Asim Kumar Jana
Designation :Sr. Office Assistant

Report Verified By

Signature : 
Name :Ms. Paulami Dutta
Designation :Executive QA

Report Sign By Authorized Signatory

Signature : 
Name :Mr. Sukanta Palui
Designation :Executive Microbiologist

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- Microbiological sealed pack water sample(s) shall be retained for 15 days & food sample(s) shall be retained for 10 days after analysis

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Doc No MSK/GEN/19/06



TC-6950

TEST REPORT

ULR: TC-695020000000509F

Name & Address of the Customer :	Report No.	:C/2020/509
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/430
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-14.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	:Water
2	Description of sample (As declared by customer)	:Drinking Water
3	Date of sampling	:03.02.20
4	Unique Identification	:Near First Aid Station
5	Place of sampling	:Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	:IS:3025(Part-1)1987, RA-2003
7	Environmental conditions during sampling & Transport Condition	:Maintained
8	Identification of the personnel performing sampling	:Mr. Akram Khan

Report prepared by:

Signature :
Name :Mr. Asim Kumar Jana
Designation :Sr. Office Assistant

Report Verified By

Signature :
Name :Ms. Paulami Dutta
Designation :Executive QA

Report Sign By Authorized Signatory

Signature :
Name :Dr. Sounyadeep Mukhopadhyay
Designation :Lab In Charge

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Web : www.mitrask.com



TC-6950

Report No. :C/2020/509
Sample No. :MSK/KOL/2020/430

ULR: TC-69502000000509F

Analysis Result**Table 1: Organoleptic and Physical Parameters as per IS 10500:2012**

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1	Colour in Hazen unit	5	15	IS 3025 (Part 4)	BDL(DL:1.0)
2	Odour	Agreeable	Agreeable	IS 3025 (Part 5)	Agreeable
3	pH value at 25°C	6.5-8.5	No Relaxation	IS 3025 (Part 11)	6.59
4	Turbidity in N.T. U	1	5	IS 3025 (Part 10)	BDL(DL:1.0)
5	Total Dissolved Solids in mg/l	500	2000	IS 3025 (Part 16)	36.0

Table 2: General Parameters- Concerning Substances Undesirable in Excessive Amounts as per IS 10500:2012

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1	Ammonia (as total ammonia- N) in mg/l	0.5	No Relaxation	IS 3025 (Part 34)	BDL(DL:0.1)
2	Calcium (as Ca) in mg/l	75	200	IS 3025 (Part 40)	4.0
3	Chloride (as Cl) in mg/l	250	1000	IS 3025 (Part 32)	10.40
4	Fluoride (as F) in mg/l	1.0	1.5	IS 3025 (Part 60)	BDL(DL:0.2)
5	Free Residual Chlorine in mg/l	0.2	1.0	IS 3025 (Part 26)	BDL(DL:0.1)
6	Iron (as Fe) in mg/l	0.3	No Relaxation	IS 3025 (Part 53)	BDL(DL:0.05)
7	Magnesium (as Mg) in mg/l	30	100	IS 3025 (Part 46)	2.40
8	Nitrate (as NO ₃) in mg/l	45	No Relaxation	IS 3025 (Part 34)	BDL(DL:0.4)
9	Sulphate (as SO ₄) in mg/l	200	400	IS 3025 (Part 24)	BDL(DL:1.0)
10	Sulphide (as H ₂ S) in mg/l	0.05	No Relaxation	IS 3025 (Part 29)	BDL(DL:0.02)
11	Total Alkalinity (as CaCO ₃) in mg/l	200	600	IS 3025 (Part 23)	20.40
12	Total Hardness (as CaCO ₃) in mg/l	200	600	IS 3025 (Part 21)	20.0

Extra parameter as per Work Order

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible limit in the absence of alternate Source	Method of Test	Result
1	Chromium (as Cr ⁺⁶) in mg/l	-	-	IS 3025 (Part 52)	<0.01

-----END-----

Report prepared by:

Signature :
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By

Signature :
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory

Signature :
Name : Dr. Soumyadeep Mukhopadhyay
Designation : Lab In Charge

Mitra S.K.Private Limited

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Web : www.mitrask.com



TC-6950

TEST REPORT

ULR: TC-69502000000509F

Name & Address of the Customer :	Report No.	:C/2020/509
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/430
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-14.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Chemical

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

1	Group	:Residue in Water
2	Description of sample(As declared by customer)	:Drinking Water
3	Date of sampling	:03.02.20
4	Unique Identification	:Near First Aid Station
5	Place of sampling	:Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	:IS:3025(Part-1)1987, RA-2003
7	Environmental conditions during sampling & Transport Condition	:Maintained
8	Identification of the personnel performing sampling	:Mr. Akram Khan

Report prepared by

Signature :
Name :Mr. Asim Kumar Jana
Designation :Sr. Office Assistant

Report Verified By

Signature :
Name :Ms. Paulami Dutta
Designation :Executive QA

Report Sign By Authorized Signatory

Signature :
Name :Dr. Devottam Banerjee
Designation :Sr. Executive Chemist

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Web : www.mitrask.com

Doc No MSK/GEN/19/06



TC-6950

Report No. :C/2020/509
Sample No. :MSK/KOL/2020/430

ULR: TC-695020000000509F

Analysis Result

Table 2: General Parameters- Concerning Substances Undesirable in Excessive Amounts as per IS 10500:2012

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1.	Aluminium (as Al) in mg/l	0.03	0.2	IS 3025(Part-2)	BDL(DL:0.01)
2.	Barium (as Ba) in mg/l	0.7	No Relaxation	IS 3025(Part-2)	BDL(DL:0.1)
3.	Boron (as B) in mg/l	0.5	1.0	IS 3025(Part-2)	BDL(DL:0.3)
4.	Copper (as Cu) in mg/l	0.05	1.5	IS 3025(Part-2)	BDL(DL:0.02)
5.	Manganese (as Mn) in mg/l	0.1	0.3	IS 3025(Part-2)	BDL(DL:0.02)
6.	Selenium (as Se) in mg/l	0.01	No Relaxation	IS 3025(Part-2)	BDL(DL:0.005)
7.	Silver (as Ag) in mg/l	0.1	No Relaxation	IS 3025(Part-2)	BDL(DL:0.005)
8.	Zinc (as Zn) in mg/l	5	15	IS 3025(Part-2)	BDL(DL:0.02)

Table 3: Parameters Concerning Toxic Substances as per IS 10500:2012

Sl. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Result
1.	Cadmium (as Cd) in mg/l	0.003	No Relaxation	IS 3025(Part-2)	BDL(DL:0.001)
2.	Lead (as Pb) in mg/l	0.01	No Relaxation	IS 3025(Part-2)	BDL(DL:0.005)
3.	Mercury (as Hg) in mg/l	0.001	No Relaxation	IS 3025(Part-48)	BDL(DL:0.0002)
4.	Molybdenum (as Mo) in mg/l	0.07	No Relaxation	IS 3025(Part-2)	BDL(DL:0.05)
5.	Nickel (as Ni)in mg/l	0.02	No Relaxation	IS 3025(Part-2)	BDL(DL:0.01)
6.	Total Arsenic(as As) in mg/l	0.01	0.05	IS 3025(Part-2)	BDL(DL:0.005)
7.	Total Chromium (as Cr) in mg/l	0.05	No Relaxation	IS 3025(Part-2)	BDL(DL:0.01)

-----END-----

Report prepared by
Signature : *Asim*
Name : Mr. Asim Kumar Jana
Designation : Sr. Office Assistant

Report Verified By
Signature : *Dutta*
Name : Ms. Paulami Dutta
Designation : Executive QA

Report Sign By Authorized Signatory
Signature : *Devottam Banerjee*
Name : Dr. Devottam Banerjee
Designation : Sr. Executive Chemist

Mitra S.K.Private Limited

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TC-6950

TEST REPORT**ULR: TC-69502000000509F**

Name & Address of the Customer :	Report No.	:C/2020/509
Jindal Stainless Limited,	Date	:14.02.20
Kaliapani Chromite Mines	Sample No.	:MSK/KOL/2020/430
Jajpur-755028, Odisha.	Date of receipt of sample	:04.02.20
	Date(s) of performance	:04.02.20-06.02.20
	Ref. No. & Date	:P.O No.: 6200006415 Date: 29.04.19
	Discipline	:Biological

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

1	Group	:Water
2	Description of sample(As declared by customer)	:Drinking Water
3	Date of sampling	:03.02.20
4	Unique Identification	:Near First Aid Station
5	Place of sampling	:Jindal Stainless Limited, Kaliapani Chromite Mines, Jajpur-755028, Odisha.
6	Sampling Plan & Procedures used	:NA
7	Environmental conditions during sampling & Transport Condition	:Maintained
8	Identification of the personnel performing sampling	:Mr. Akram Khan

Analysis Result**Bacteriological Quality of Drinking Water as per IS 10500:2012**

Sl. No.	Test Parameter	Limit	Method of Test	Result
1.	<i>E. coli</i> /100 ml	Not Detectable	IS 15185:2016	Not Detected
2.	Total Coliform Bacteria/100 ml	Not Detectable	IS 15185:2016	Not Detected

END

Report prepared by

Signature :
Name :Mr. Asim Kumar Jana
Designation :Sr. Office Assistant

Report Verified By

Signature :
Name :Ms. Paulami Dutta
Designation :Executive QA

Report Sign By Authorized Signatory

Signature :
Name :Mr. Sukanta Palui
Designation :Executive Microbiologist

- The results relate only to the item(s) tested.
- This Test Report shall not be reproduced except in full, without the permission of Mitra S.K. Private Limited.
- The reserved part of sample(s), except perishable sample(s), shall be retained for 15 days & 1 year (Air) from the date of issue of the Test Report.
- Microbiological sealed pack water sample(s) shall be retained for 15 days & food sample(s) shall be retained for 10 days after analysis

Mitra S. K. Private Limited

N-5/100, Ground Floor
IRC Village, Nayapalli
Bhubaneswar - 751015
CIN : U51909WB1956PTC023037

T : (0674) 2362916 / 2360917
F : (0674) 2362918



TEST REPORT

Name & Address of the Customer :
Jindal Stainless Limited,
Kaliapani Chromite Mines
Jajpur, Odisha

Report No. : BBS/200
Date : 24.02.2020
Sample No. : MSKGL/ED/2019-20/02/00104

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

1	Description of sample (As declared by customer)	: Dust fall Measurement
2	Sample Mark (if any, given by the customer)	: NA
3	Date of sampling	: 03.02.2020
4	Place of sampling	: Roof of ADM Building, Dtd - 03.02.2020
5	Environmental condition during sampling	: NA
6	Sampling Plan & Procedure used	: NA

Analysis Result

Sl. No	Name of Pollutants	Unit	Test Method	Result
1.	Nickel (as Ni)	mg/m ² -day	ICP-OES	0.030
2.	Arsenic (as As)	ug/m ² -day	USEPA IO-3.4	<0.6
3.	Cobalt (as CO)	mg/m ² -day	USEPA IO-3.4	0.005
4.	Mercury (as Hg)	mg/m ² -day	EPA IO3.2- June,1999	<0.3

Report prepared by:
Signature : *Ananta Kumar Rath*
Name : A.K Rath
Designation : Site Incharge

For Mitra S. K. Private Limited

Signature : *P Pradhani*
Name : P.Pradhani
Designation : Branch Manager



TEST REPORT

Name & Address of the Customer :
Jindal Stainless Limited,
Kaliapani Chromite Mines
Jajpur, Odisha

Report No. : BBS/201
Date : 24.02.2020
Sample No. : MSKGL/ED/2019-20/02/00221

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

1	Description of sample (As declared by customer)	: Ground Water Level Measurement
2	Sample Mark (if any, given by the customer)	: NA
3	Date of sampling	: 02.02.2020
4	Place of sampling	: Quarry No-2, Near COB Plant-1&2 & Colony
5	Environmental condition during sampling	: NA
6	Sampling Plan & Procedure used	: NA

Analysis Result

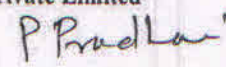
Ground water level measurement reports used by Piezometer

Sl. No	Location	Water Level from GL (m)
1.	Quarry No-2	4.8
2.	Near COB Plant-1	8.6
3.	Near COB Plant-2	8.1
4.	Colony	15.6

Report prepared by:

Signature :
Name : A.K Rath
Designation : Site Incharge

For Mitra S. K. Private Limited

Signature : 
Name : P.Pradhani
Designation : Branch Manager



Jindal Chromite Mines												
Traffic Density Study Report												
Station	Result	Working Day			Non Working Day			Market Day				
		Light Vehicle	Medium Vehicle	Heavy Vehicle	Light Vehicle	Medium Vehicle	Heavy Vehicle	Light Vehicle	Medium Vehicle	Heavy Vehicle		
Mines Main Gate	Total Nos	2715	660	1018	1927	1020	1150	3853	753	741		
	Avg Traffic Load/Hr	113.12	27.5	42.41	80.29	42.5	47.91	160.54	31.37	30.87		
	Passenger Car Unit(PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7		
	PCU/Hr	84.84	55	156.94	60.21	85	177.29	120.4	62.75	114.23		
	Total Nos	6435	1603	2515	2618	2265	2193	7995	2358	2438		
Kalrangiatta	Avg Traffic Load/Hr	268.12	66.79	104.79	109.08	94.37	91.37	333.12	98.25	101.58		
	Passenger Car Unit(PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7		
	PCU/Hr	201.09	133.58	387.72	81.81	188.74	338.06	249.84	196.5	375.85		
	Total Nos	1392	439	1051	2034	803	892	1362	327	933		
	Avg Traffic Load/Hr	58	18.29	43.79	84.75	33.45	37.16	56.75	13.62	38.87		
Kansa	Passenger Car Unit(PCU) Factor	0.75	2	3.7	0.75	2	3.7	0.75	2	3.7		
	PCU/Hr	43.5	36.58	162.02	63.56	66.9	137.51	42.56	27.25	143.83		

13/11/2022

8.3.4 Summary of Year-wise Proposal for Item No 8.3

Items	Details	Cumulative as on date	Proposed (Year)				
			2017-18	2018-19	2019-20	2020-21	2021-22
Dump management	Area afforested (Ha)	21.7 Ha inside ML	Gap plantation	On 1 st year dump	On 2 nd year dump	On 3 rd year dump	On 4 th year dump
	No of saplings planted	112000 (as on 30.09.16)	3000	3500	2500	3000	3000
	Cumulative no of plants	112000	115000	118500	121000	124000	127000
	Cost including watch and care during the year (Lakhs)	212 lakhs	-	-	-	-	-
Management of worked out benches	Area available for rehabilitation (Ha)	8.24 ha	-	-	-	-	-
	Afforestation done(ha)	2.8	-	-	-	-	-
	No of saplings planted in the year	-	500	500	500	500	500
	Cumulative no of plants	5000	5500	6000	6500	7000	7500
	Any other method of rehabilitation (specify)	-	-	-	-	-	-
	Cost including watch and care during the year (L)	-	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
Reclamation and Rehabilitation by backfilling	Void available for Backfilling (L x B x D) pit wise /stope wise	265 x 311 x 93 (8.24 Ha)	-	-	-	-	-
	Void filled by waste /tailings	From 71 mRL to 150 mRL	-	-	-	-	-
	Afforestation on the backfilled area	5000	-	-	-	-	-
	Rehabilitation by making water reservoir	-	-	-	-	-	
	Any other means (specify)	-	-	-	-	-	
Rehabilitation of waste land within lease	Area available (ha)	-	-	-	-	-	
	Area rehabilitated	-	-	-	-	-	
	Method of rehabilitation	-	-	-	-	-	
Others (specify)	Besides, retaining wall, garland drain, settling tank etc have been constructed and shall be re-constructed. Details are as follows.		-	-	-	-	

Particulars	Already Constructed	To be constructed				
		2017-18	2018-19	2019-20	2020-21	2021-22
Retaining wall (m)	633	100	100	Regular maintenance		
Garland drain (m)	2815	Regular de-silting				
Boulder wall (m)	348	Regular maintenance				
Settling Pond	One	Regular de-silting				
Afforestation (Dump, lease boundary, office premises)	21.7 Ha/112,000 nos	3000 (Gap plantation)	3500 (Gap plantation)	2500 (Gap plantation)	3000(Gap plantation)	3000(Gap plantation)
Construction of check Dam (No.)	---	As required				

8.4 Disaster Management and Risk Assessment

Action plan for high risk accidents like landslides, subsidence flood, fire, seismic activities, tailing dam failure etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of lessee to meet such eventualities and the assistance to be required from the local authority are also described.

As far as the nature of deposit and method of mining (opencast) is concerned, there is no possibility of landslide, subsidence, flood, inundation, fire, seismic activity and tailing dam failure etc.

8.4.1 Measures taken for controlling any unforeseen disaster and risk etc

- (i) Ultimate slope of the quarry is kept at $\leq 30^\circ$ and the waste dump at $\leq 30^\circ$.
- (ii) The nearest water body which controls the drainage system and receives the entire rain & run-off water is Damsala nala at a distance of 2 km from the mine towards north. There were no floods in the past & not expected in future too, as the area is located in higher altitudes.
- (iii) Though earthquake is felt several times in Orissa, damage to man & material has not been severe till date.
- (iv) One explosives magazines with total capacity of 600 Kgs have been constructed within the lease area for storage of explosives. Handling of explosives and blasting operations are done by qualified blasters and blaster helpers under the supervision of an Asst. Manager. The Asst. Manger is assisted with a qualified foreman to have effective supervision. To control fly rock fragments during blasting thereby creating problems to nearby men and machinery, precautionary measures are being adopted and shall be continued in future which are as below.