

Steel Limited

 Regd. Office: JSW Centre

 Bandra Kurla Complex,

 Bandra (East), Mumbai – 400 051

 CIN
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 Website:
 www.jsw.in

No. JSW/S/CO/2022/842

Date: 30/11/2022

To, The Deputy Director General of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (Eastern Zone), A/3, Chandersekharpur, Bhubaneswar – 751023

Sub: - Submission of Six-monthly EC compliance report in respect of <u>Jajang Iron Ore Mine</u> of M/s JSW Steel Ltd for the period <u>April 2022 to September 2022</u>.

Ref: - 1. Vesting Order dated 29th May 2020 issued by GoO, Steel and Mines Department.
2. Environment Clearance Letter dated 13.03.2015 and amendment dated 09.11.2015 issued by MOEF&CC, GOI.

Dear Sir,

We are submitting herewith six-monthly EC compliance report of Jajang Iron Ore Mine, M/s JSW Steel Ltd. for the period April 2022 to September 2022 as per EIA notification 2006. The same is also attached in Soft copy to your good office on e-mail to <u>roez.bsr-mef@nic.in</u>; for your ready reference.

We trust that the measures taken towards environmental safeguards comply with the stipulated conditions. We look forward to your guidance which shall certainly help us in our endeavor for improving upon our environmental management practices.

Seeking your co-operation as always.

Thanking you,

Yours Faithfully For JSW Steel Ltd

Mulyuyye Mahaketro

Baswaraj M Dalgade (Authorized Signatory)

Encl: As above







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Copy to:

1. The Member Secretary, Central Ground Water Authority, Government of India, Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, Bhujal Bhawan, CGO Complex, NH-IV, Faridabad- 121 001.

2. Zonal Office Kolkata, Central Pollution Control Board, South end Conclave, Block 502, 5th and 6th Floors, 1582 Razidanga Main Road, Kolkata, West Bengal 700107.

3. The Regional Director, Central Ground Water Board, South Eastern Region, Bhujal Bhawan, Khandagiri Square, NH-5, Bhubaneswar, Odisha, Pin- 751001

4. The Member Secretary, State Pollution Control Board, A/118, Nilakantha Nagar, Bhubaneswar, Odisha-751012.

5. The Regional Officer, State Pollution Control Board, Baniapat, DD College Road, Keonjhar, Odisha-758001.



ENVIRONMENT CLEARANCE COMPLIANCE STATUS - JAJANG MINE

Six Monthly Compliance report of Environmental Clearance for Jajang Iron Ore Mine, JSW Steel Ltd. for the period from- April 2022 to Sep 2022.

Reference letter from MoEF&CC, New Delhi- J-11015/96/2012-IA.II(M), Dtd. 13.03.2015 and 09.11.2015.

Capacity- 16.5 MTPA of iron ore (12.8 MTPA ROM by fresh excavation + 3.7 MTPA by rehandling of low grade old dump/ mineral stacks).

Sl. No.	Specific Conditions	Compliance
Ι	The dump height should be maintained upto	Being complied. The active dump height is
	60 meter and overall slope of the dump shall	around 26 meter and well within the limit and as
	be upto 30°.	per approved modified mine plan, ultimate angle
		of repose of 28° will be maintained once the
.		dump stabilized.
l1	The project proponent shall obtain Consent to	Being Complied. CTE and CTO have been
	Establish and Consent to Operate from the	vested to JSW Steel Ltd for 2 years. New CTE
	State Pollution Control Board, Odisha and	Vide letter no 5113/IND-II-CIE-6463 dated
	stimulated therein	CON 247 deted 17.02 2022 have been obtained
		from OSPCB
Iii	Environmental clearance is subject to	No Wild Life Sanctuary/Tiger Reserve/National
m	obtaining clearance under the Wildlife	Park/ Elephant corridor within the core as well
	(Protection) Act. 1972 from the competent	as within the buffer zone of the project. TOR has
	authority, as may be applicable to this	been approved dated 05.02.2021 for new EC and
	project.	EIA report is under progress and will obtain if
		required.
Iv	The project proponent shall obtain prior	NOC from CGWA for 1000 m3/day or 365000
	approval of the competent authorities for	m3/year is already vested to JSW for 2 years and
	drawl of requisite quantity of surface water	valid upto 08/12/2023 vide NOC number
	and ground water for the project before	CGWA/NOC/MIN/REN/2/2020/5639
N/	commencing the mining activity.	
V	No mining activities are allowed in forest	I he present mining operation is restricted within
	area for which the FC is not available.	FC Dt:21.07.2000 over 44.70 ha and E No.8
		1° , D1.21.07.2000 0ver 44.70 ha and 1.10.8- 88/98-FC (Vol) Dt·28 08 2014 over 447 811 ha
		(including 44.70 ha forest land already
		diverted).
		FC Proposal applied for 543.916 ha vide Lr No:
		FP/OR/MIN/50705/2020 dated 09.10.2020 and
		same is under evaluation. Advance NPV has
		already been paid.

A. Specific Conditions

		Existen as non MMDD Amondation Act 2021
		Further, as per MMDR Amendment Act 2021,
		the Forest clearances and other permissions
		continue to be valid even after expiry or
		permission of lease till the minerals exhausted.
		Hence, the Forest Clearance for 447.811 ha
		(including 44.70 ha forest land already diverted)
		will be valid till life of the mine.
Vi	The condition 3(iii)b of the guidelines issued	New FC Proposal applied for 543.916 ha vide Lr
	by the Forest Conservation Division in this	No: FP/OR/MIN/50705/2020 dated 09.10.2020.
	I Ministry vide F. No. 1 1-362/2012-FC dated	Advance NPV has already been paid.
	1st February, 2013 is not being prescribed in	Further, as per MMDR Amendment Act 2021,
	view of Hon'ble Supreme Court order dated	the Forest clearances and other permissions
	27.01.2014 and the EC is subject to the final	continue to be valid even after expiry or
	order of the Supreme Court in the matter.	permission of lease till the minerals exhausted.
		Hence, the Forest Clearance for 447.811 ha
		(including 44.70 ha forest land already diverted)
		will be valid till life of the mine
vii	Traffic density on the route of mineral	Being complied. Iron ore lumps and iron ore
	transportation shall be regularly monitored	fines extracted from the mine is being
	and report shall be submitted along with	transported through railway/road/port to JSW &
	compliance report.	other Steel Plants. There are two nos of railway
	·····	siding namely RMIC-JSW Railway Siding and
		nart of BIL. Siding existing within the ML area
		These sidings are being used for transportation
		of ore of Jajang mine. Commercial notification
		of ISW RMIC Siding has been issued by SER
		Kolkata in favour of M/s ISW Steel Ltd on
		02.11.2020.
Viii	As part of ambient air quality monitoring	Regular monitoring of ambient air quality
	during operational phase of the project, the air	parameters along with mineralogical
	samples shall also be analysed for their	composition being carried out and Monitoring
	mineralogical composition and records	Reports are attached as Annexure 1a. Vendor is
	maintained	a recognized NABET. MoEF & CC accredited
		laboratory.
ix	Mineral handling plant shall be provided with	Dust Suppression System (Dry fog system)
	adequate number of high efficiency dust	being provided at all appropriate places of
	extraction system. Loading and unloading	mineral handling plants (crusher & screening
	areas including all the transfer points should	plant) and other areas. Same are being properly
	also have efficient dust control arrangements.	maintained and operated for proper dust control
	These should be properly maintained and	
	operated	
	operated.	

		DRY FOG SYSTEM
X	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 Pollution Control Board in this regard.	Regular water sprinkling through mobile water sprinkler tankers being carried out on haul roads and nearby mineral dispatch roads (express highway) to avoid generation of dust during movement of vehicles. Fixed auto sprinklers on both sides of major haul road and approach roads are being functioning.
		Regular maintenance of Haul roads is being carried out to avoid generation of dust during movement of vehicles. Regular monitoring of ambient air quality parameters being carried out and data is well within the limit prescribed. AAQ Monitoring reports are attached as Annexure 1a .
xi	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.	Maximum rain water has already been channelized to Mine Pits and same is being utilized in dust suppression and other mining activities.

		Existing Retention wall, Garland drains, Check Dams and setting pits are being maintained. Detailed Hydrology study is under progress, recommendations of the study and consultation with CGWB, additional rain water harvesting measures/structures will be implemented for rainwater harvesting.
		CHECK DAM - 40000 cum CAPACITY
xii	Regular monitoring of ground water level and quality shall be carried out in and around the	Regular monitoring of ground water level and quality being carried out and Monitoring
	mine lease by establishing a network of	Reports of pre monsoon (March-April 2022) and
	during the mining operation. The periodic	attached as Annexure 1b
	monitoring [(at least four times in a year- pre-	Vendor is a recognized NABET. MoEF & CC
	monsoon (April-May), monsoon (August),	accredited laboratory.
	post-monsoon (November) and winter	
	(January); once in each season)] shall be	
	carried out in consultation with the State	
	Authority and the data thus collected may be	
	sent regularly to the Ministry of Environment	
	and Forests and its 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 groundwater table is getting	
	depleted due to the mining activity: necessary	
	corrective measures shall be carried out.	
xiii	The project proponent shall regularly monitor	Being complied and monitoring reports of flow
	the flow rate of the natural water streams	rate of natural water streams are attached as
	Jalpa, Kakrapani Nallah and Baitarni river	Annexure 1b.
	mine lease and maintain the records	
xiv	The reclaimed and rehabilitated area shall	Being Complied. Around 44.62 ha of land has
	be afforested. Monitoring and	been backfilled by ex lessee (M/s Rungta Pvt
	management of rehabilitated areas shall	Ltd). As per approved modified mine plan,

	continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on six monthly basis.	during the plan period an area of 22.56 Ha will be backfilled. Thus the total backfilling area at the end of plan period will be 67.18 ha. It has been planned to reclaim the mined out area by Back-filling and plantation/re-grassing in the conceptual period and compliance status of the same will be submitted to RO, MOEF&CC on six monthly basis.
XV	Dimension of the retaining wall at the toe of temporary over burden dumps and OB benches within the mine to check run-off and siltation shall be based on the rain fall data.	Being Complied. Existing Retention wall being maintained to prevent any direct flow of runoff to nearby water bodies as per requirement. So far, the retaining wall upto a length of 3323 m around the dump, backfilling area etc has been constructed by by erstwhile lessee (M/s Rungta Pvt Ltd) and necessary repair of retaining wall is being undertaken on regular basis. As per approved modified mine plan, back filling site and OB dump area are proposed to be surrounded by retaining wall (1.0m Height) and garland drains (1.0m depth) to prevent any direct flow of runoff to nearby water bodies.
xvi	Plantation shall be raised in a specified area including a 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.	Being Complied. More than 20375 saplings (Yearly Plantation of FY 2021-22and 22-23) have been planted as per approved mine plan in the safety zone, and other areas before monsoon season.
xvii	Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM and RPM such as haul road, loading and unloading point and transfer points. It shall be ensured that the Ambient Air Quality parameters conform to the	Drills equipped with dust extractors/ equipped with water injection system being operated in mine. Controlled blasting is in place. Dust Suppression System (Dry fog system) being provided at all appropriate places of mineral handling plants (crusher & screening

	norms prescribed by the Central Pollution Control Board in this regard.	plant) and other areas. Same are being maintained for proper dust control. Regular water sprinkling through mobile water sprinkler tankers being carried out on haul roads and nearby mineral dispatch roads (express highway) to avoid generation of dust during movement of vehicles.
		MOBILE WATER SPRINKLING
		Regular maintenance of Haul roads is being carried out to avoid generation of dust during movement of vehicles. Regular monitoring of ambient air quality parameters being carried out and data is well within the limit prescribed. AAQ Monitoring reports are attached as Annexure 1a .
xviii	Process water discharge and/or any waste water shall be properly treated to meet the prescribed standards before reuse/discharge. The runoff from temporary OB dumps and other surface run off shall be analyzed for iron and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.	No process water being discharged from the mine. Regular Monitoring of water quality parameters being carried out. Monitoring reports are attached as Annexure 1b .
xix	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.	Not applicable as there is no EC and CTO available for the beneficiation plant.
XX	Regular monitoring of the flow rate of the springs and perennial nallahs shall be carried out and records maintained.	Being complied and monitoring reports of flow rate of springs and perennial nallahs are attached as Annexure 1b .

xxi	Regular monitoring of water quality, upstream and downstream of river shall be carried out and record of monitoring data should be maintained and submitted to Ministry of Environment and Forests, its Regional Office, Bhubaneswar, Central Groundwater Authority, Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board	Regular monitoring of water quality of upstream and downstream being carried out and Monitoring Reports are attached as Annexure 1b . Vendor is a recognized NABET, MoEF & CC accredited laboratory.
xxii	Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, Central Ground Water Board.	Maximum rain water has already been channelized to Mine Pits and same is being utilized in dust suppression and other mining activities. Existing Retention wall, Garland drains, Check Dams and setting pits being maintained. Detailed Hydrology study is under progress, recommendations of the study and consultation with CGWB, additional rain water harvesting measures/structures will be implemented for rainwater harvesting.
xxiii	Vehicular emissions shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral from mine face to the beneficiation plant. The vehicles shall be covered with a tarpaulin and shall not be overloaded.	Mineral carrying trucks are not allowed to go out of the lease area without tarpaulin cover and is being monitored by security personnel at the exit gate. Vehicular emissions being regularly monitored. Also, Security personnel are also do not allow the vehicles to enter into the mines without having valid PUC.
xxiv	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.	Workshop along with ETP/Oil & Grease trap system being provided within lease area. We have taken possession of the colony recently and are in process for revamping of colony along with existing STP in same will be completed phase-wise in time bound manner. Meanwhile the Soak Pits are being used.
XXV	Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.	DGPS Surveyed Mining lease boundary superimposed on High Resolution Satellite image of Jajang Iron Ore Mine duly vetted by M/s ORSAC has been attached as Annexure
xxvi	Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be	Initial Medical Examination & Periodical Medical Examination of the workers engaged in

	corriad out and records maintained. For the	the project are being corried periodically and
	carried out and records maintained. For the	the project are being carried periodically and
	purpose, schedule of health examination of	records are maintained.
	the workers should be drawn and followed	A medical dispensary with full time Doctor has
	accordingly.	been appointed at mine area for the health
		check-up of employees and also the locals.
xxvii	The project proponent shall undertake all the commitments made during the public hearing and effectively address the concerns raised by the locals in the public hearing as well as during consideration of the project, while implementing the project.	Jajang Mining operation was started from 1 st July 2020 and various community development initiatives are under implementation for community upliftment. Need based assessment survey has been completed and action plan is under implementation for the compliance. TOR has been approved on 05.02.2021 for new
		EC. EIA report is under progress, will comply after the new public hearing will conduct.
xxviii	The project proponent shall take all precautionary measures during mining 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. A copy of action plan shall be submitted to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar.	No Wild Life Sanctuary/Tiger Reserve/National Park/ Elephant corridor within the core as well as within the buffer zone of the project. TOR has been approved dated 05.02.2021 for new EC and EIA report is under progress and action plan for conservation of flora and fauna will be prepared if required. The Site Specific Wild life Conservation plan has been approved by PCCF vide letter number 1842/CWLW-FDWC-FD-0116-2021, Bhubaneshwar, dated 25/02/2022.
xxix	A Final Mine Closure Plan 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.	Final Mine Closure plan was approved by erstwhile lessee. After the expiry of the lease on 31.03.2020, the lease was put for auction. After getting the lease through auction, mining plan along with progressive mine closure plan has been approved by IBM. As per Approved Modified Mining Plan, iron ore has not been exhausted within the mining lease area. The same will be submitted 2 years prior the exhaustion of ore as per statutes

B. General Conditions

Sl. No.	General conditions	Compliance
i	No change in Iron Ore Processing/Beneficiation	Not Applicable. There is no EC and CTO
	technology and scope of working should be	available for the beneficiation plant.
	made without prior approval of the Ministry	
	of Environment & Forests.	
11	No change in the calendar plan including	Noted and Being complied as per approved
	processing/Beneficiation of mineral from ore	for the heneficiation plant
111	At least four ambient air quality monitoring	Pegular Ambient air quality monitoring
111	stations should be established in the core zone as	being carried out at four AAO monitoring
	well as in the buffer zone for RSPM (Particulate	stations in core zone and four stations in
	matter with size less than 10 microns i.e., PM10)	buffer zone. AAO monitoring reports are
	and NOx monitoring. Location of the stations	attached as Annexure 1a.
	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	
	Development of the State Dellution Control	
	Board / Central Pollution Control Board once	
	in six months	
iv	Measures should be taken for control of noise	Noise producing equipment's are covered as
	levels below 85 dBA in the work environment.	far as practicable. Workers engaged in
	Workers engaged in operations of HEMM, etc.	Operations are provided with ear plugs /
	should be provided with ear plugs / muffs.	muffs. Besides this, acoustic enclosures are
		provided for all machines operating within
		the mines. Controlled blasting is in place.
		Regular Noise Monitoring being carried out
		and Monitoring reports are attached as
X7	There will be zero waste water discharge from	Annexure ic.
v	the plant	for the beneficiation plant
vi	Personnel working in dusty areas should wear	Personnel working in dusty areas are
	protective respiratory devices and they should	provided with nose mask, safety glass and ear
	also be provided with adequate training and	plug with proper safety training.
	information on safety and health aspects.	Dust Suppression System (Dry fog system)
		being provided at all appropriate places of
		mineral handling plants (crusher & screening

		plant) and other areas. Same are being maintained for proper dust control
		Pre-placement medical examination and
		periodical examination of the workers
		engaged are being conducted & record
		maintained.
vii	Occupational health surveillance program of the	Workers engaged in Operations are provided
	workers should be undertaken periodically to	with PPE's. Besides this, acoustic enclosures
	observe any contractions due to exposure to	are provided for all machines operating
	dust and take corrective measures, if needed.	within the mines. The noise level is being
		monitored by Noise Level Meter; the results
		reveal that the parameter is well within the
		prescribed norms.
		Initial Medical Examination & Periodical
		Medical Examination of the workers
		engaged in the project are being carried
		periodically and records are maintained.
		A medical dispensary with full time Doctor
		has been appointed at mine area for the
		health check-up of employees and also the
		locals. Madical health companyill be organized in
		the nearby villages after the organized in
		19 nandemic over and as per the Guidelines
		of State Government
viii	A separate environmental management cell with	A dedicated Environment Management Cell
	suitable qualified personnel should be set-up	under the leadership of AVP Environment
	under the control of a Senior Executive, who	has been formed and reporting to Mine
	will report directly to the Head of the	Senior Management i.e. Head of Operations
	Organization.	(VP).
ix	The funds earmarked for environmental	We are in process for implementation of
	protection measures should be kept in separate	various measures undertaken for
	account and should not be diverted for other	environment management plan since the
	purpose. Year wise expenditure should be	operation started in July 2020.
	reported to the Ministry and its Regional Office	Details of environmental management
	located at Bhubaneswar.	measures expenditure (nead wise breakup)
v	The project authorities should inform to the	Noted and will be complied
Λ	Regional Office located at Rhubaneswar	noted and will be complied.
	regarding date of financial closures and final	
	approval of the project by the concerned	
	authorities and the date of start of land	
	development work.	
xi	The Regional Office of this Ministry located at	We will extend full co-operation to the
	Bhubaneswar shall monitor compliance of the	officers of the Regional Office during their
	stipulated conditions. The project authorities	

	should extend full cooperation to the officer (s)	visit and furnish the required data,
	of the Regional Office by furnishing the	information and monitoring reports.
	requisite data / information / monitoring reports.	
xii	The project proponent shall submit six monthly	Being complied. Last six monthly
	reports on the status of compliance of the	compliance report along with monitoring
	stipulated environmental clearance conditions	data vide letter no JSW/S/O/2022/357 dated
	including results of monitored data (both in hard	30.05.2022 was submitted to Regional
	copies as well as by e-mail) to the Ministry of	Office, MOEF&CC, Bhubaneswar, Zonal
	Environment and Forests, its Regional Office	Office, CPCB, Kolkata, MS and RO Offices
	Bhubaneswar, the respective Zonal Office of	SPCB, Odisha. EC Compliance report along
	Central Pollution Control Board and the State	with monitoring data being uploaded in
	Pollution Control Board. The proponent shall	company website.
	upload the status of compliance of the	1 2
	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 and Forests,	
	Bhubaneswar, the respective Zonal Officer of	
	Central Pollution Control Board and the State	
	Pollution Control Board.	
xiii	A copy of the clearance letter shall be sent by	Not Applicable
	the proponent to concerned Panchayat, Zila	
	Parisad/ 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.	
xiv	The State Pollution Control Board should	Not Applicable
	display a copy of the clearance letter at the	
	Regional office, District Industry Centre and the	
	Collector's office/ Tehsildar's Office for 30	
	days.	
XV	The environmental statement for each financial	Will be complied within timeline.
	year ending 31st March in Form-V as is	
	mandated to be submitted by the project	
	proponent to the concerned State Pollution	
	Control Board as prescribed under the	
	Environment (Protection) Rules, 1986, as	
	amended subsequently, shall also be put on the	
	website of the company along with the status of	
	compliance of environmental clearance	
	conditions and shall also be sent to the	
	respective Regional Office of the Ministry of	

	Environment and Forests, Bhubaneswar by e-	
	mail.	
xvi	The project authorities should advertise at least	Not Applicable
	in 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 concerned,	
	within 7 days of the issue of the clearance letter	
	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 also at web site	
	of the Ministry of Environment and Forests	
	at http://envfor.nic.in and a copy of the same	
	should be forwarded to the Regional Office of	
	this Ministry located at Bhubaneswar.	



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

TEST REPORT

							FORMAT NO	. ECO/QS/FOR	MAT/07		
NA	ME & ADDRESS OF	Jajang Iron	Ore Mines of	ſ	Test Report No.		ECOLAB/DW/0	593/5161/08/20	VQS/FORMAT/07 161/08/2022 ng ng 022 022 021 0500:2012(Reaff:2018) reserable Permissible 5.00 15.0 grecable Agreeable 1.0 5.5 No Relax. - 500 200 600 200 600 200.0		
CL	JSTOMER:	M/s JSW Ste	eel Ltd.		Issue Date of Test Rej	oort	03.09.2022				
Ty	pe of Sample		Ground W	ater							
Sa	mple Registration No.		593		Name of Location		Dugwell Near Bi	I Siding			
Sa	mpling Method		As per Ret	ference Method	Sample Collected By		Ecomen Lab Tea	m			
Da	te of Sample Collection		08.08.2022	2	Time of Sample Colle	ction	-				
Da	te of Sample Received		15.08.2022	2	Time of Sample Recei	ved	10:45 AM				
Sta	art Date of Analysis		16.08.2022	2	End Date of Analysis		30.08.2022				
La	boratory Environmental (Condition	Temperatu	tre: 25 ± 2 °C	Sample Quantity		As per Requirement				
1.	bor ator y Environmental	condition	Humidity:	65 %	Sample ID Code		ECO/LAB/5161/	08/2022			
SI.	TESTS		Unit	PRO	TOCOL	RESULT	Detection	INDIAN STANI 10500:2012	DARDS as per IS (Reaff:2018)		
NO.							Kange	Desirable	Permissible		
1.	Colour		Hazen	APHA, 23rd Ed. 2017	7, 2120 B	<5.0	5-100	5.00	15.0		
2.	Odour		-	APHA, 23rd Ed. 2017	7, 2150 B	Agreeabl	e Qualitative	Agreeable	Agreeable		
3.	Taste		-	APHA, 23rd Ed. 20	017, A+B	Qualitativ	e Agreeable	Agreeable	Agreeable		
4.	Turbidity as		NTU	APHA, 23rd Ed. 2017	7, 2130-A+B	BDL	1 - 100	1.0	5.0		
5.	pН		-	APHA, 23rd Ed. 2017	7, 4500H+ A+B	6.89	2.0 -12	6.5-8.5	No Relax.		
6.	Total Suspended Solids a	ıs TSS	mg/l	APHA, 23rd Ed. 2017	7, 2540-С	BDL	5 - 5000	-	-		
7.	Total Dissolved Solids as	s TDS	mg/l	APHA, 23rd Ed. 2017	7, 2540-С	112.0	5 - 5000	500	2000		
8.	Total Alkalinity		mg/l	APHA, 23rd Ed. 2017	7, 2320 A+ B	40.0	5-1500	200	600		
9.	Total Hardness as CaCO	3	mg/l	APHA, 23rd Ed. 2017	7, 2340 A+C	48.0	5-1500	200.0	600.0		
10.	Calcium as Ca		mg/l	APHA, 23rd Ed. 2017	7, 3500 Ca A+B	8.0	5 - 1000	75.0	200.0		
11.	Magnesium as Mg		mg/l	APHA, 23rd Ed. 2017	7, 3500 Mg A+B	6.80	5-1000	30.0	100.0		
12.	Sulfate as SO ₄		mg/l	APHA, 23rd Ed. 2017	7, 4500-SO ₄ ²⁻ E	13.2	1.0 -250	200.0	400.0		
13.	Nitrate Nitrogen as NO3		mg/l	APHA, 23rd Ed. 2017	7, 4500-NO ₃ - B	5.66	5.0 - 100	45.0	No Relax.		
14.	Chloride as Cl		mg/l	APHA, 23rd Ed. 2017	7, 4500 Cl A+B	14.0	5-1000	250.0	1000.0		
15.	Fluorides as F		mg/l	APHA, 23rd Ed. 2017	7, 4500-С	0.23	0.05-10	1.0	1.5		
16.	Copper as Cu		mg/l	APHA, 23rd Ed. 2017	7, 3111 A+B	BDL	0.05-5	0.05	1.5		
17.	Iron as Fe		mg/l	APHA, 23rd Ed. 2017	7, 3500 Fe B	0.20	0.02-50	0.3	No Relax.		
18.	Manganese as Mn		mg/l	APHA, 23rd Ed. 2017	7, 3111 A+B	BDL	0.1-5	0.10	0.30		
19.	Arsenic as As		mg/l	APHA, 23rd Ed. 2017	7, 3114 C	BDL	0.01-2	0.01	0.05		
20.	Zinc as Zn		mg/l	APHA, 23rd Ed. 201	7, 3111 A+B	0.14	0.02-50	5.0	15		
21.	Total Chromium as Cr		mg/l	APHA, 23rd Ed. 2017	7, 3111A+B	BDL	0.05-20	0.05	No Relax.		
22.	Phenolic Compounds as	C ₆ H ₅ OH	mg/l	APHA, 23rd Ed. 2017	7, 5530 A+C	BDL	1-10	0.001	0.002		
23.	Free Residual Chlorine		mg/l	APHA, 23rd Ed. 2017	7, 4500-Cl B	BDL	0.5-10	0.20	1.0		
24.	Selenium as Se		mg/l	APHA, 23rd Ed. : 20	17, 3500 Se A+C	BDL	0.02-10	0.01	No Relax		
25.	Aluminum as Al		mg/l	APHA, 23rd Ed. : 20	17, 3500 Al A+B	BDL	0.2-100	0.03	0.2		
26.	Mercury as Hg		mg/l	APHA, 23rd Ed. : 20	17, 3112 A+B	BDL	0.001-1	0.001	No Relax		
27.	Lead as Pb		mg/l	APHA, 23rd Ed. : 20	17, 3111 A+B	BDL	0.01-1	0.01	No Relax		
28.	Cadmium as Cd		mg/l	APHA, 23rd Ed. : 20	17, 3111 A+B	BDL	0.002-2	0.003	No Relax		
29.	Boron as B		mg/l	APHA, 23rd Ed. : 20	17, 4500 B A+C	BDL	0.2-10	0.5	1.0		
30.	Cyanide as CN		mg/l	APHA,23rd Ed.201	7,4500 ,CN A+D	BDL	0.005-5	0.05	No Relax		
31.	Mineral Oil		mg/l	IS 3025 (Part 39) C	Class -6	BDL	0.01-10	0.5	No Relax.		
32.	Anionic detergent as MABS		mg/l	APHA, 23rd Ed. 20	017, 5540 A+C	BDL	0.01-5	0.2	1.0		
33.	Polynuclear aromatic hydroc	carbon as PAH	mg/l	APHA, 23rd Ed. 201	7, 6440 A+B	BDL	0.0001-2	0.0001	No Relax.		
34.	E. Coli		cfu/100 ml	APHA, 23rd Ed. : 20	17,9221 A+E	Absent	1.8	Absent	Absent		

Statement of Conformity: The above tested parameters confirm as per IS-10500-2012 (Reaff.-2018) limits for above tested parameters and the results are related to the sample tested. **Note: -** BDL- Below Detection Limit

Verified By Hikaskyman-Technical Manager

Authorized By Reena

Quality Manager

Ecomen Laboratories Pvt. Ltd. Second Floor Hall, House No. 8-10, Sector-H, Aliganj, Luclaure 226024

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



Second Floor Hall, House No. B-1/8, Sector-H, Aliganj, Lucknow - 226 024

Phone No. : 0522 - 4079201/2746282

E-mail: contactus@ecomen.in, Website: www.ecomen.in, CIN - U74210UP1989PTC010601,GSTIN : 09AAACE6076H1ZI

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

TEST REPORT

N	NAME & ADDDESS OF Laiong Ivon Ove Mines of				N:	T 4 D 4 N		ECO	FORMAT NO. H	2/515(/08/202	A1/07	
	AME & ADDRESS OF USTOMED:	Jajang 1 M/s ISW	ron U V Stool	re M	lines of	I est Report No.		ECC	JLAB/DW/059	3/5150/08/202	2	
T	una of Sampla	11/3 35 11	, suci	Gro	ound Water	Issue Date of Test Kept	Π	05.0	9.2022			
5	mple Registration No.			503		Name of Location		Ka	malnur Village			
Se	mpling Mothod			Δs	ner Reference Method	Sample Collected By		Eco	men Lab Team			
- 52 D	ate of Sample Collection			08	08 2022	Time of Sample Collect	ion	-	Jinen Lab Team			
D	ate of Sample Concettion			15.	08 2022	Time of Sample Conect	od	10.	45 AM			
St	art Data of Analysis			16	08 2022	Fnd Data of Analysis	cu	30	08 2022			
51	art Date of Analysis			Tor	magneture: 25 ± 2 °C	Sample Quantity	As per Requirement			,t		
L	aboratory Environmental (Condition	ŀ	Hu	$mperature. 23 \pm 2$ C	Sample Quantity		AS EC	ECO/LAB/5156/08/2022			
			Unit	IIu	initiaty. 05 70	Sample ID Code		LC	0/LAD/3130/00			
SI.	TESTS		Unit		PROTOC	OI.	RESUL		Detection	10500:2012	ARDS as per IS Reaff:2018)	
No.					indide		RESCE		Range	Desirable	Permissible	
1.	Colour		Hazen		APHA, 23 rd Ed. 2017, 2120 I	3	<5.0		5-100	5.00	15.0	
2.	Odour		-		APHA, 23rd Ed. 2017, 2150 I	3	Agreeab	ole	Qualitative	Agreeable	Agreeable	
3.	Taste		-		APHA, 23rd Ed. 2017, A+E	}	Agreeab	ole	Qualitative	Agreeable	Agreeable	
4.	Turbidity as		NTU		APHA, 23rd Ed. 2017, 2130-	A+B	BDL		1 - 100	1.0	5.0	
5.	pH		-		APHA, 23rd Ed. 2017, 4500H	I+ A+B	6.73		2.0 -12	6.5-8.5	No Relax.	
6.	Total Suspended Solids a	s TSS	mg/l		APHA, 23 rd Ed. 2017, 2540-	С	BDL		5 - 5000	-	-	
7.	Total Dissolved Solids as	TDS	mg/l		APHA, 23rd Ed. 2017, 2540-	С	132.0		5 - 5000	500	2000	
8.	Total Alkalinity		mg/l		APHA, 23 rd Ed. 2017, 2320	A+ B	28.0		5-1500	200	600	
9.	Total Hardness as CaCO3		mg/l		APHA, 23 rd Ed. 2017, 2340	A+C	52.0		5-1500	200.0	600.0	
10.	Calcium as Ca		mg/l		APHA, 23rd Ed. 2017, 3500	Ca A+B	14.4		5 - 1000	75.0	200.0	
11.	Magnesium as Mg		mg/l		APHA, 23 rd Ed. 2017, 3500	Mg A+B	3.88		5-1000	30.0	100.0	
12.	Sulfate as SO ₄		mg/l		APHA, 23rd Ed. 2017, 4500-	SO ₄ ²⁻ E	8.97		1.0 -250	200.0	400.0	
13.	Nitrate Nitrogen as NO3	Nitrate Nitrogen as NO ₃ mg/l APHA, 23 rd Ed. 2017,		APHA, 23rd Ed. 2017, 4500-N	JO ₃ ⁻ B	BDL		5.0 - 100	45.0	No Relax.		
14.	Chloride as Cl		mg/l		APHA, 23rd Ed. 2017, 4500 C	Cl A+B	12.0		5-1000	250.0	1000.0	
15.	Fluorides as F		mg/l		APHA, 23rd Ed. 2017, 4500-	C	0.11		0.05-10	1.0	1.5	
16.	Copper as Cu		mg/l		APHA, 23rd Ed. 2017, 3111 A	A+B	BDL		0.05-5	0.05	1.5	
17.	Iron as Fe	1	mg/l		APHA, 23 rd Ed. 2017, 3500 F	e B	0.07		0.02-50	0.3	No Relax.	
18.	Manganese as Mn		mg/l		APHA, 23 rd Ed. 2017, 3111 A	A+B	BDL		0.1-5	0.10	0.30	
19.	Arsenic as As		mg/l		APHA, 23 rd Ed. 2017, 3114 C		BDL		0.01-2	0.01	0.05	
20.	Zinc as Zn		mg/l		APHA, 23 rd Ed. 2017, 3111 A	4+B	BDL		0.02-50	5.0	15	
21.	Total Chromium as Cr		mg/l		APHA, 23 rd Ed. 2017, 3111A	+B	BDL		0.05-20	0.05	No Relax.	
22.	Phenolic Compounds as C_6H_5OH		mg/l		APHA, 23 rd Ed. 2017, 5530 A	A+C	BDL		1-10	0.001	0.002	
23.	Free Residual Chlorine		mg/l		APHA, 23rd Ed. 2017, 4500-	Cl B	BDL		0.5-10	0.20	1.0	
24.	Selenium as Se		mg/l		APHA, 23rd Ed. : 2017, 350) Se A+C	BDL		0.02-10	0.01	No Relax	
25.	Aluminum as Al		mg/l		APHA, 23rd Ed. : 2017, 350) Al A+B	BDL		0.2-100	0.03	0.2	
26.	Mercury as Hg		mg/l		APHA, 23rd Ed. : 2017, 3112	2 A+B	BDL		0.001-1	0.001	No Relax	
27.	Lead as Pb		mg/l		APHA, 23rd Ed. : 2017, 311	l A+B	BDL		0.01-1	0.01	No Relax	
28.	Cadmium as Cd		mg/l		APHA, 23rd Ed. : 2017, 311	1 A+B	BDL		0.002-2	0.003	No Relax	
29.	Boron as B		mg/l		APHA, 23rd Ed. : 2017, 450) B A+C	BDL		0.2-10	0.5	1.0	
30.	Cyanide as CN		mg/l		APHA,23rd Ed.2017, 4500	CN A+D	BDL		0.005-5	0.05	No Relax	
31.	Mineral Oil		mg/l		IS 3025 (Part 39) Class -6		BDL		0.01-10	0.5	No Relax.	
32.	Anionic detergent as MA	BS	mg/l		APHA, 23rd Ed. 2017, 554) A+C	BDL		0.01-5	0.2	1.0	
33.	Polynuclear aromatic hydrocarbon as PAH		mg/l		APHA, 23rd Ed. 2017, 6440	A+B	BDL		0.0001-2	0.0001	No Relax.	
34.	E. Coli		cfu/100	ml	APHA, 23rd Ed. : 2017, 9221	A+E	Absen	t	1.8	Absent	Absent	

Statement of Conformity: The above tested parameters confirm as per IS-10500-2012 (Reaff.-2018) limits for above tested parameters and the results are related to the sample tested. **Note: -** BDL- Below Detection Limit

-End of Report----

Verified By

Technical Manager

Authorized By

Quality Manager

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

TEST REPORT

NA	NAME & ADDRESS OF Jajang Iron CUSTOMER:		Ore Mines of		Test Report No.		FORMAT NO ECOLAB/DW/05	<u>. ECO/QS/FORM</u> 593/5157/08/20	22	
	STOWER.	M/s JSW Ste	el Ltd.		Issue Date of Test Per	ort	03 00 2022			
Tv	no of Sampla		Ground W	ater	issue Date of Test Rep	Joi t	03.09.2022			
I y So	mple Degistration No		503	ater	Name of Location		Jajang Village			
Sa	mpling Mothod		As per Ref	erence Method	Sample Collected By		Ecomen Lab Tea	m		
De	to of Sample Collection				Time of Semple Colle	ation	Leomen Lao Tea	111		
Da	te of Sample Conection		15.08.2022	2	Time of Sample Cone	vod	- 10:45 AM			
Da	art Data of Analysis		16.08.2022	2	Find Data of Analysis	veu	30.08.2022			
54	art Date of Analysis		Temperatu	re: 25 ± 2 °C	Sample Quantity		As per Requirem	nent		
La	boratory Environmental	Condition	Humidity:	65 %	Sample ID Code		ECO/LAB/5157/	08/2022		
SL.	TESTS		Unit				Detection	INDIAN STANI	DARDS as per IS	
No.	12010			PRO	TOCOL	RESULT	Range	Desirable	Permissible	
1.	Colour		Hazen	APHA, 23rd Ed. 2017	7, 2120 B	<5.0	5-100	5.00	15.0	
2.	Odour		-	APHA, 23rd Ed. 2017	7, 2150 B	Agreeable	e Qualitative	Agreeable	Agreeable	
3.	Taste		-	APHA, 23rd Ed. 20	17, A+B	Agreeable	e Qualitative	Agreeable	Agreeable	
4.	Turbidity as		NTU	APHA, 23rd Ed. 2017	7, 2130-A+B	BDL	1 - 100	1.0	5.0	
5.	pН		-	APHA, 23rd Ed. 2017	7, 4500H+ A+B	7.15	2.0 -12	6.5-8.5	No Relax.	
6.	Total Suspended Solids a	is TSS	mg/l	APHA, 23rd Ed. 2017	7, 2540-С	BDL	5 - 5000	-	-	
7.	Total Dissolved Solids as	s TDS	mg/l	APHA, 23rd Ed. 2017	7, 2540-С	160.0	5 - 5000	500	2000	
8.	Total Alkalinity		mg/l	APHA, 23rd Ed. 2017	7, 2320 A+ B	52.0	5-1500	200	600	
9.	Total Hardness as CaCO	3	mg/l	APHA, 23rd Ed. 2017	7, 2340 A+C	64.0	5-1500	200.0	600.0	
10.	Calcium as Ca		mg/l	APHA, 23rd Ed. 2017	7, 3500 Ca A+B	12.8	5 - 1000	75.0	200.0	
11.	Magnesium as Mg		mg/l	APHA, 23rd Ed. 2017	7, 3500 Mg A+B	7.77	5-1000	30.0	100.0	
12.	Sulfate as SO ₄		mg/l	APHA, 23rd Ed. 2017	7, 4500-SO ₄ ²⁻ E	15.3	1.0 -250	200.0	400.0	
13.	Nitrate Nitrogen as NO3		mg/l	APHA, 23rd Ed. 2017	7, 4500-NO ₃ - B	6.11	5.0 - 100	45.0	No Relax.	
14.	Chloride as Cl		mg/l	APHA, 23rd Ed. 2017	7, 4500 Cl A+B	18.0	5-1000	250.0	1000.0	
15.	Fluorides as F		mg/l	APHA, 23rd Ed. 2017	7, 4500-С	0.33	0.05-10	1.0	1.5	
16.	Copper as Cu		mg/l	APHA, 23rd Ed. 2017	7, 3111 A+B	BDL	0.05-5	0.05	1.5	
17.	Iron as Fe		mg/l	APHA, 23rd Ed. 2017	7, 3500 Fe B	0.12	0.02-50	0.3	No Relax.	
18.	Manganese as Mn		mg/l	APHA, 23rd Ed. 2017	7, 3111 A+B	BDL	0.1-5	0.10	0.30	
19.	Arsenic as As		mg/l	APHA, 23rd Ed. 2017	7, 3114 C	BDL	0.01-2	0.01	0.05	
20.	Zinc as Zn		mg/l	APHA, 23rd Ed. 2017	7, 3111 A+B	0.11	0.02-50	5.0	15	
21.	Total Chromium as Cr		mg/l	APHA, 23 rd Ed. 2017	7, 3111A+B	BDL	0.05-20	0.05	No Relax.	
22.	Phenolic Compounds as	C ₆ H ₅ OH	mg/l	APHA, 23rd Ed. 2017	7, 5530 A+C	BDL	1-10	0.001	0.002	
23.	Free Residual Chlorine		mg/l	APHA, 23rd Ed. 2017	7, 4500-Cl B	BDL	0.5-10	0.20	1.0	
24.	Selenium as Se		mg/l	APHA, 23rd Ed. : 20	17, 3500 Se A+C	BDL	0.02-10	0.01	No Relax	
25.	Aluminum as Al		mg/l	APHA, 23rd Ed. : 20	17, 3500 Al A+B	BDL	0.2-100	0.03	0.2	
26.	Mercury as Hg		mg/l	APHA, 23rd Ed. : 20	17, 3112 A+B	BDL	0.001-1	0.001	No Relax	
27.	Lead as Pb		mg/l	APHA, 23rd Ed. : 20	17, 3111 A+B	BDL	0.01-1	0.01	No Relax	
28.	Cadmium as Cd		mg/l	APHA, 23rd Ed. : 20	17, 3111 A+B	BDL	0.002-2	0.003	No Relax	
29.	Boron as B		mg/l	APHA, 23rd Ed. : 20	17, 4500 B A+C	BDL	0.2-10	0.5	1.0	
30.	Cyanide as CN		mg/l	APHA,23rd Ed.2017	7, 4500 ,CN A+D	BDL	0.005-5	0.05	No Relax	
31.	Mineral Oil		mg/l	IS 3025 (Part 39) C	Class -6	BDL	0.01-10	0.5	No Relax.	
32.	Anionic detergent as MA	BS	mg/l	APHA, 23rd Ed. 20	017, 5540 A+C	BDL	0.01-5	0.2	1.0	
33.	Polynuclear aromatic hyd PAH	lrocarbon as	mg/l	APHA, 23rd Ed. 201	7, 6440 A+B	BDL	0.0001-2	0.0001	No Relax.	
34.	E. Coli		cfu/100 ml	APHA, 23rd Ed. : 20	17, 9221 A+E	Absent	1.8	Absent	Absent	

Statement of Conformity: The above tested parameters confirm as per IS-10500-2012 (Reaff.-2018) limits for above tested parameters and the results are related to the sample tested. **Note: -** BDL- Below Detection Limit

Verified By

Technical Manager

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

Authorized By

Quality Manager

Ecomen Laboratories Pvt. Ltd. Second Floor Hall, House No. 8-18, Sector-H, Aliganj, Lucham-226024



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

TEST REPORT

						FORMAT NO	. ECO/QS/FOR	<u>MAT/07</u>
Ν	AME & ADDRESS OF Ja	ijang Iron O	ore Mines of	Test Report No.		ECOLAB/DW/0	593/5158/08/20	022
C	CUSTOMER: M	/s JSW Steel	Ltd.	Issue Date of Test Rep	port	03.09.2022		
Т	ype of Sample		Ground Water	-				
S	ample Registration No.		593	Name of Location		Jurudi Village		
S	ampling Method		As per Reference Method	Sample Collected By		Ecomen Lab Tea	m	
D	ate of Sample Collection		08.08.2022	Time of Sample Colle	ction	-		
D	ate of Sample Received		15.08.2022	Time of Sample Recei	ved	10:45 AM		
S	tart Date of Analysis		16.08.2022	End Date of Analysis		30.08.2022		
т	abaratary Environmental Con	dition	Temperature: 25 ± 2 °C	Sample Quantity		As per Requirem	ent	
	adoratory Environmental Con	untion	Humidity: 65 %	Sample ID Code		ECO/LAB/5158/08/2022		
		Unit					INDIAN STANDARDS as pe	
SI. No	TESTS		РВОТОС	OL	RESULT	Г Detection Range	10500:2012	(Reaff:2018)
110.						Range	Desirable	Permissible
1.	Colour	Hazen	APHA, 23 rd Ed. 2017, 2120	В	<5.0	5-100	5.00	15.0
2.	Odour	-	APHA, 23 rd Ed. 2017, 2150	В	Agreeable	e Qualitative	Agreeable	Agreeable
3.	Taste	-	APHA, 23rd Ed. 2017, A+I	3	Agreeable	e Qualitative	Agreeable	Agreeable
4.	Turbidity as	NTU	APHA, 23 rd Ed. 2017, 2130-	A+B	BDL	1 - 100	1.0	5.0
5.	pН	-	APHA, 23 rd Ed. 2017, 45001	I+ A+B	7.25	2.0 -12	6.5-8.5	No Relax.
6.	Total Suspended Solids as TS	SS mg/l	APHA, 23 rd Ed. 2017, 2540	-C	BDL	5 - 5000	-	-
7.	Total Dissolved Solids as TD	S mg/l	APHA, 23 rd Ed. 2017, 2540	-C	151.0	5 - 5000	500	2000
8.	Total Alkalinity	mg/l	APHA, 23 rd Ed. 2017, 2320	A+ B	44.0	5-1500	200	600
9.	Total Hardness as CaCO ₃	mg/l	APHA, 23 rd Ed. 2017, 2340	A+C	60.0	5-1500	200.0	600.0
10.	Calcium as Ca	mg/l	APHA, 23 rd Ed. 2017, 3500	Ca A+B	12.8	5 - 1000	75.0	200.0
11.	Magnesium as Mg	mg/l	APHA, 23 rd Ed. 2017, 3500	Mg A+B	6.80	5-1000	30.0	100.0
12.	Sulfate as SO ₄	mg/l	APHA, 23 rd Ed. 2017, 4500-	SO4 ²⁻ E	19.2	1.0 -250	200.0	400.0
13.	Nitrate Nitrogen as NO ₃	mg/l	APHA, 23 rd Ed. 2017, 4500-1	NO ₃ - B	7.2	5.0 - 100	45.0	No Relax.
14.	Chloride as Cl	mg/l	APHA, 23 rd Ed. 2017, 4500 (Cl A+B	14.0	5-1000	250.0	1000.0
15.	Fluorides as F	mg/l	APHA, 23 rd Ed. 2017, 4500-	С	0.20	0.05-10	1.0	1.5
16.	Copper as Cu	mg/l	APHA, 23 rd Ed. 2017, 3111 A	A+B	BDL	0.05-5	0.05	1.5
17.	Iron as Fe	mg/l	APHA, 23 rd Ed. 2017, 3500 H	e B	0.11	0.02-50	0.3	No Relax.
18.	Manganese as Mn	mg/l	APHA, 23 rd Ed. 2017, 3111 A	A+B	BDL	0.1-5	0.10	0.30
19.	Arsenic as As	mg/l	APHA, 23 rd Ed. 2017, 3114 (2	BDL	0.01-2	0.01	0.05
20.	Zinc as Zn	mg/l	APHA, 23 rd Ed. 2017, 3111 A	A+B	0.10	0.02-50	5.0	15
21.	Total Chromium as Cr	mg/l	APHA, 23 rd Ed. 2017, 3111A	+B	BDL	0.05-20	0.05	No Relax.
22.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA, 23 rd Ed. 2017, 5530 A	A+C	BDL	1-10	0.001	0.002
23.	Free Residual Chlorine	mg/l	APHA, 23 rd Ed. 2017, 4500	-Cl B	BDL	0.5-10	0.20	1.0
24.	Selenium as Se	mg/l	APHA, 23rd Ed. : 2017, 350	0 Se A+C	BDL	0.02-10	0.01	No Relax
25.	Aluminum as Al	mg/l	APHA, 23rd Ed. : 2017, 350	0 Al A+B	BDL	0.2-100	0.03	0.2
26.	Mercury as Hg	mg/l	APHA, 23rd Ed. : 2017, 311	2 A+B	BDL	0.001-1	0.001	No Relax
27.	Lead as Pb	mg/l	APHA, 23rd Ed. : 2017, 311	1 A+B	BDL	0.01-1	0.01	No Relax
28.	Cadmium as Cd	mg/l	APHA, 23rd Ed. : 2017, 311	1 A+B	BDL	0.002-2	0.003	No Relax
29.	Boron as B	mg/l	APHA, 23rd Ed. : 2017. 450	0 B A+C	BDL	0.2-10	0.5	1.0
30.	Cyanide as CN	mg/l	APHA,23rd Ed.2017, 4500	,CN A+D	BDL	0.005-5	0.05	No Relax
31.	Mineral Oil	mg/l	IS 3025 (Part 39) Class -6	,	BDL	0.01-10	0.5	No Relax.
32.	Anionic detergent as MABS	mg/l	APHA, 23rd Ed. 2017, 554	0 A+C	BDL	0.01-5	0.2	1.0
33.	Polynuclear aromatic hydrocarbon as PAH	mg/l	APHA, 23rd Ed. 2017, 6440	A+B	BDL	0.0001-2	0.0001	No Relax.
34.	E. Coli	cfu/100	APHA, 23rd Ed. : 2017, 922	A+E	Absent	1.8	Absent	Absent

Statement of Conformity: The above tested parameters confirm as per IS-10500-2012 (Reaff.-2018) limits for above tested parameters and the results are related to the sample tested. **Note: -** BDL- Below Detection Limit

Verified By

Hikaskuman-Technical Manager

Authorized By Reena Quality Manager

Ecomen Laboratories Pvt. Ltd. Second Floor Hall, House No. 8-10. Sector-H, Aliganj, Lucture -225024

----End of Report----



Second Floor Hall, House No. B-1/8, Sector-H, Aliganj, Lucknow - 226 024 Phone No. : 0522 - 4079201/2746282

E-mail: contactus@ecomen.in, Website: www.ecomen.in, CIN - U74210UP1989PTC010601,GSTIN : 09AAACE6076H1ZI

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

TEST REPORT

		<u> </u>					FORMAT NO	. ECO/QS/FOR	MAT/07
NA	ME & ADDRESS OF	Jajang Iron	Ore Mines of	<u></u>	Test Report No.		ECOLAB/DW/05	593/5159/08/20	22
CU	JSTOMER:				Issue Date of Test Re	port	03.09.2022		
Т	no of Sample	M/s JSW St	eel Ltd. Ground W	ater					
1y	pe of Sample		502	atti	Name of Logation		Jalahari Villaca		
Sa	mple Registi attoli 180.		JyJ As par Dat	Ference Method	Sample Collected Pr		Ecomen Lab Taa	m	
5a	mpning Mietiloa				Time of Samula Call	ation	Ecomen Lab Tea	.111	
	te of Sample Collection		15.08.2022	2	Time of Sample Colle	ived	- 10:45 AM		
Da	ne of Sample Received		15.08.202	2	End Data of Anal	iveu	10:43 AIVI 30.08 2022		
Sta	art Date of Analysis		10.08.2022	$2 \frac{1}{2}$	End Date of Analysis		30.08.2022	ont	
La	boratory Environmental	Condition	Humiditer	65.23 ± 2.0	Sample Quantity	Sample Quantity As per requirement Sample ID Code ECO/LAB/5159/08/2022			
	•		numany:	sample iD Code		ECO/LAD/5159/08/2022			
SI. No.	TESTS		Unit	PRO	TOCOL	RESULT	Detection Range	INDIAN STANI 10500:2012	DARDS as per IS (Reaff:2018)
1	0.1		Harry		7 0100 D	-5.0	- 100	Desirable	Permissible
1.	Colour		Hazen	APHA, 23 ^{ra} Ed. 201	/, 2120 B	< 3.0	5-100	5.00	15.0
2.	Odour		-	APHA, 23 ^{ra} Ed. 201	/, 2150 B	Agreeabl	e Qualitative	Agreeable	Agreeable
3.	Taste		-	APHA, 23rd Ed. 20	ЛГ/, А+В	Agreeabl	e Qualitative	Agreeable	Agreeable
4.	I urbidity as		NTU	APHA, 23 rd Ed. 201	/, 2130-A+B	BDL	1 - 100	1.0	5.0
5.	pH	TOO	-	APHA, 23 rd Ed. 201	/, 4500H+ A+B	6.90	2.0 -12	6.5-8.5	No Relax.
6.	I otal Suspended Solids a	is TSS	mg/l	APHA, 23 rd Ed. 201	/, 2540-C	BDL	5 - 5000	-	-
	Total Dissolved Solids as	SIDS	mg/l	APHA, 23 rd Ed. 201	/, 2540-C	130.0	5 - 5000	500	2000
8.	I otal Alkalinity		mg/I	APHA, 23 ^{ra} Ed. 201	/, 2320 A+ B	32.0	5-1500	200	600
9.	I otal Hardness as CaCO	3	mg/l	APHA, 23 rd Ed. 201	/, 2340 A+C	40.0	5-1500	200.0	600.0
10.	Calcium as Ca		mg/l	APHA, 23 rd Ed. 201	/, 3500 Ca A+B	6.4	5 - 1000	75.0	200.0
11.	Magnesium as Mg		mg/I	APHA, 23 rd Ed. 201	/, 3500 Mg A+B	5.83	5-1000	30.0	100.0
12.	Sulfate as SO ₄		mg/l	APHA, 23 rd Ed. 201	/, 4500-SO4 ^{2*} E	8.2	1.0 -250	200.0	400.0
13.	Nitrate Nitrogen as NO ₃		mg/1	APHA, 23 rd Ed. 201	/, 4500-NO ₃ - B	5.1	5.0 - 100	45.0	No Relax.
14.	Chloride as Cl		mg/l	APHA, 23 rd Ed. 201	7, 4500 CI A+B	8.0	5-1000	250.0	1000.0
15.	Fluorides as F		mg/l	APHA, 23 rd Ed. 201	/, 4500-C	0.13	0.05-10	1.0	1.5
16.	Copper as Cu		mg/1	APHA, 23 rd Ed. 201	/, 3111 A+B	BDL	0.05-5	0.05	1.5 N. D. 1
1/.	Iron as Fe		mg/l	APHA, 23 rd Ed. 201	7, 3300 Fe B	0.09	0.02-50	0.3	No Relax.
18.	Ivianganese as Mn		mg/l	APHA, 23 rd Ed. 201	/, 3111 A+B	BDL	0.1-5	0.10	0.30
19.	Arsenic as As		mg/l	APHA, 23 rd Ed. 201	/, 5114 C	BDL	0.01-2	0.01	0.05
20.	Zinc as Zn		mg/l	APHA, 23 rd Ed. 201	/, 3111 A+B 7 2111 A+P	0.04 PD1	0.02-50	5.0	15 No Dol
21.	I otal Unromium as Cr	CILOU	mg/l	APTIA, 23 rd Ed. 201	7,5111ATD	BDL	0.05-20	0.001	No Relax.
22.	Enco Regide at Chiler	C ₆ H ₅ OH	mg/l	APHA, 23 rd Ed. 201	7, 3330 A+C	BDL	1-10	0.001	0.002
23.	Free Kesidual Chlorine		mg/I	APHA, 23 ¹⁴ Ed. 201	7, 4300-CI B	BDL	0.02.10	0.20	1.0 No Polor
24.	A huminum as Se		mg/l	APHA, 23rd Ed. : 20	117, 3500 Se A+C	BDL	0.02-10	0.01	
25.	Aluminum as Al		mg/l	APHA, 23rd Ed. : 20	017, 3500 AI A+B	BDL	0.2-100	0.03	0.2 No Palar
26.	Mercury as Hg		mg/l	APHA, 23rd Ed. : 20	017, 3112 A+B	BDL	0.001-1	0.001	No Relax
27.	Lead as Pb		mg/l	APHA, 23rd Ed. : 20)17, 3111 A+B	BDL	0.002.2	0.002	No Relax
28.	Cadmium as Cd		mg/l	APHA, 23rd Ed. : 20)17, 3111 A+B	BDL	0.002-2	0.003	
29.	Boron as B		mg/l	APHA, 23rd Ed. : 20	117, 4500 B A+C	BDL	0.2-10	0.5	1.0 No D-1
30.	Cyanide as CN		mg/l	APHA,23rd Ed.20	17,4500,CN A+D	BDL	0.005-5	0.05	No Relax
31.	Mineral Oil	Da	mg/l	1S 3025 (Part 39) (Class -6	BDL	0.01-10	0.5	No Relax.
32.	Anionic detergent as MA	LBS	mg/l	APHA, 23rd Ed. 2	017, 5540 A+C	BDL	0.01-5	0.2	1.0
33.	Polynuclear aromatic hyd PAH	irocarbon as	mg/l	APHA, 23rd Ed. 201	7, 6440 A+B	BDL	0.0001-2	0.0001	No Relax.
34.	E. Coli		cfu/100 ml	APHA, 23rd Ed. : 20)17. 9221 A+E	Absent	1.8	Absent	Absent

Statement of Conformity: The above tested parameters confirm as per IS-10500-2012 (Reaff.-2018) limits for above tested parameters and the results are related to the sample tested. **Note: -** BDL- Below Detection Limit

----End of Report----

Verified By

Technical Manager

Authorized By Reena

Quality Manager

Ecomen Laboratories Pvt. Ltd. Second Floor Hall, House No. 8-10, Sector-H, Aliganj, Luclane, 226024



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

TEST REPORT

				FORMAT NO. ECO/QS/FORMAT/07		
NAME & ADDRESS OF	Jajang Iron C	Dre Mines of	Test Report No.	ECOLAB/DW/0593/5160/08/2022		
CUSTOMER:	M/s JSW Stee	l Ltd.	Issue Date of Test Report	03.09.2022		
Type of Sample		Ground Water				
Sample Registration No.		593	Name of Location	Tap Water Near Jajang Mine		
Sampling Method		As per Reference Method	Sample Collected By	Ecomen Lab Team		
Date of Sample Collection		08.08.2022	Time of Sample Collection	-		
Date of Sample Received		15.08.2022	Time of Sample Received	10:45 AM		
Start Date of Analysis		16.08.2022	End Date of Analysis	30.08.2022		
Laboratory Environmental Condition		Temperature: 25 ± 2 °C	Sample Quantity	As per Requirement		
		Humidity: 65 %	Sample ID Code	ECO/LAB/5160/08/2022		

SI.	SI. TESTS No.	Unit	PROTOCOL RESU		Detection	INDIAN STANDARDS as per IS 10500:2012(Reaff:2018)	
No.					Range	Desirable	Permissible
1.	Colour	Hazen	APHA, 23 rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	-	APHA, 23 rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	-	APHA, 23rd Ed. 2017, A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as	NTU	APHA, 23 rd Ed. 2017, 2130-A+B	BDL	1 - 100	1.0	5.0
5.	pH	-	APHA, 23 rd Ed. 2017, 4500H+ A+B	6.72	2.0 -12	6.5-8.5	No Relax.
6.	Total Suspended Solids as TSS	mg/l	APHA, 23 rd Ed. 2017, 2540-C	BDL	5 - 5000	-	-
7.	Total Dissolved Solids as TDS	mg/l	APHA, 23 rd Ed. 2017, 2540-C	113.0	5 - 5000	500	2000
8.	Total Alkalinity	mg/l	APHA, 23 rd Ed. 2017, 2320 A+ B	36.0	5-1500	200	600
9.	Total Hardness as CaCO ₃	mg/l	APHA, 23 rd Ed. 2017, 2340 A+C	52.0	5-1500	200.0	600.0
10.	Calcium as Ca	mg/l	APHA, 23 rd Ed. 2017, 3500 Ca A+B	14.4	5 - 1000	75.0	200.0
11.	Magnesium as Mg	mg/l	APHA, 23 rd Ed. 2017, 3500 Mg A+B	3.88	5-1000	30.0	100.0
12.	Sulfate as SO ₄	mg/l	APHA, 23 rd Ed. 2017, 4500-SO ₄ ²⁻ E	12.1	1.0 -250	200.0	400.0
13.	Nitrate Nitrogen as NO ₃	mg/l	APHA, 23 rd Ed. 2017, 4500-NO ₃ ⁻ B	6.03	5.0 - 100	45.0	No Relax.
14.	Chloride as Cl	mg/l	APHA, 23 rd Ed. 2017, 4500 Cl A+B	14.0	5-1000	250.0	1000.0
15.	Fluorides as F	mg/l	APHA, 23 rd Ed. 2017, 4500-C	0.19	0.05-10	1.0	1.5
16.	Copper as Cu	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
17.	Iron as Fe	mg/l	APHA, 23 rd Ed. 2017, 3500 Fe B	BDL	0.02-50	0.3	No Relax.
18.	Manganese as Mn	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
19.	Arsenic as As	mg/l	APHA, 23 rd Ed. 2017, 3114 C	BDL	0.01-2	0.01	0.05
20.	Zinc as Zn	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.02-50	5.0	15
21.	Total Chromium as Cr	mg/l	APHA, 23 rd Ed. 2017, 3111A+B	BDL	0.05-20	0.05	No Relax.
22.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA, 23 rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
23.	Free Residual Chlorine	mg/l	APHA, 23 rd Ed. 2017, 4500-Cl B	BDL	0.5-10	0.20	1.0
24.	Selenium as Se	mg/l	APHA, 23rd Ed. : 2017, 3500 Se A+C	BDL	0.02-10	0.01	No Relax
25.	Aluminum as Al	mg/l	APHA, 23rd Ed. : 2017, 3500 Al A+B	BDL	0.2-100	0.03	0.2
26.	Mercury as Hg	mg/l	APHA, 23rd Ed. : 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax
27.	Lead as Pb	mg/l	APHA, 23rd Ed. : 2017, 3111 A+B	BDL	0.01-1	0.01	No Relax
28.	Cadmium as Cd	mg/l	APHA, 23rd Ed. : 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
29.	Boron as B	mg/l	APHA, 23rd Ed. : 2017, 4500 B A+C	BDL	0.2-10	0.5	1.0
30.	Cyanide as CN	mg/l	APHA,23rd Ed.2017, 4500 ,CN A+D	BDL	0.005-5	0.05	No Relax
31.	Mineral Oil	mg/l	IS 3025 (Part 39) Class -6	BDL	0.01-10	0.5	No Relax.
32.	Anionic detergent as MABS	mg/l	APHA, 23rd Ed. 2017, 5540 A+C	BDL	0.01-5	0.2	1.0
33.	Polynuclear aromatic hydrocarbon as PAH	mg/l	APHA, 23rd Ed. 2017, 6440 A+B	BDL	0.0001-2	0.0001	No Relax.
34.	E. Coli	cfu/100 ml	APHA, 23rd Ed. : 2017, 9221 A+E	Absent	1.8	Absent	Absent

Statement of Conformity: The above tested parameters confirm as per IS-10500-2012 (Reaff.-2018) limits for above tested parameters and the results are related to the sample tested. **Note: -** BDL- Below Detection Limit.

Verified By

Hikaskuman-

---End of Report----

Authorized By

Quality Manager

Ecomen Laboratories Pvt. Ltd. Second Floor Hall, House No. 8-10, Sector-H, Aliganj, Luciano 226024

SUMMARY

OF

ENVIRONMENTAL MONITORING REPORT (APRIL 2022 TO SEPTEMBER 2022)

FOR

JAJANG IRON ORE MINE

DISTRICT-KEONJHAR, ODISHA

OF



M/S JSW STEEL LIMITED, ODISHA

ENV MONITORING CARRIED OUT

BY



Ecomen Laboratories Pvt. Ltd. (An approved Laboratory from MoEF & CC & NABL) B-1/8, Sector-H, Aliganj, Lucknow 226 024 (U.P.) Phone No.: (91-522) 2746282; Fax No.: (91-522) 2745726 <u>E-mail: contactus@ecomen.in</u>



Environmental Monitoring Report- Jajang Iron Ore Mines of M/s JSW Steel Limited, Odisha during the period (April 2022 to September 2022)

Si.	Location	Month	Concentration	PM10	PM _{2.5}	SO ₂	NO ₂	СО											
No.				$\mu g/m^3$	lug/m ³	lug/m ³	lug/m ³	mg/m ³											
			Maximum	72.4	31.8	15.02	27.5	1											
Si. No.		April'22	Minimum	45.9	17.1	9.8	16.9	0.2											
			Average	61.7	22.3	12.5	23.8	0.7											
			Maximum	68.3	22.8	14.00	24.2	0.71											
		May'22	Minimum	57.3	16.9	9.1	17.4	ug/m³ mg/m³ 27.5 1 16.9 0.2 23.8 0.7 24.2 0.71 17.4 0.55 20.6 0.6 20.9 0.68 15.3 0.45 18.3 0.6 19.9 0.58 14.3 0.38 17.3 0.5 18.8 0.49 15.1 0.4 17.1 0.5 18.9 0.61 15.1 0.48 17.2 0.5 29.46 0.95											
			Average	62.9	20.3	11.9	20.6	0.6											
1.			Maximum	65.4	21.3	13.40	20.9	0.68											
		June'22	Minimum	49.1	15.5	8.2	15.3	0.45											
	Near Mines Office		Average	58.4	18.6	10.9	18.3	0.6											
		L 1 222	Maximum	57.1	19.6	12.70	19.9	0.58											
		July'22	Minimum	44.2	14.7	9.2	20.9 0.68 15.3 0.45 18.3 0.6 19.9 0.58 14.3 0.38 17.3 0.5 18.8 0.49												
			Average	49.5	17.7	11.1	17.3	0.5											
			Maximum	49.6	18.5	13.20	18.8	0.49											
		August'22	August'22	August'22	August'22	August'22	August ²²	August ²²	August'22	August'22	August'22	August'22	August'22	Minimum	42.6	15.2	10.2	15.1	0.4
			Average	46.3	16.5	11.7	17.1	0.5											
			Maximum	56.9	17.7	16.40	18.9	ug/m³ mg/m³ 27.5 1 16.9 0.2 23.8 0.7 24.2 0.71 17.4 0.55 20.6 0.6 20.9 0.68 15.3 0.45 18.3 0.6 19.9 0.58 14.3 0.38 17.3 0.5 18.8 0.49 15.1 0.4 17.1 0.5 18.9 0.61 15.1 0.48 17.2 0.5 29.46 0.95 20.3 0.48											
		September'22	Minimum	51.2	14.7 9.2 14.3 0.38 17.7 11.1 17.3 0.5 18.5 13.20 18.8 0.49 15.2 10.2 15.1 0.4 16.5 11.7 17.1 0.5 17.7 16.40 18.9 0.61 14.1 13.1 15.1 0.48 15.9 14.6 17.2 0.5	0.48													
			Average	54.2	15.9	14.6	17.2	0.5											
			Maximum	73.8	26.6	16.97	29.46	0.95											
		April'22	Minimum	54.8	17.9	10.3	20.3	0.48											
1.			Average	63.4	23.1	13.6	23.3	0.8											

1. Ambient Air Quality Lease Area



Si.	Location	Month	Concentration	PIlio	PM2.5	SO2	NO2	CO
No.				$\mu g/m^3$	lug/m ³	lug/m ³	lug/m ³	mg/m ³
			Maximum	73.8	25.2	22.80	24.1	0.75
		May'22	Minimum	60.3	15.3	10.4	17.4	0.52
			Average	67.0	21.6	15.1	20.7	0.6
			Maximum	69.2	23.9	16.60	22.4	0.69
		June'22	Minimum	42.7	16.1	8.5	16.5	0.45
	Entry And Exit		Average	58.6	20.0	12.5	19.2	0.6
2	Gate		Maximum	55.8	22.9	17.80	21.4	0.56
2.		July'22	Minimum	41.3	15.1	9.2	15.5	0.38
			Average	49.2	18.7	12.8	18.3	0.5
			Maximum	55.8	19.4	13.80	18.9	0.48
		August'22	Minimum	41.3	15.1	10.1	10.1	0.4
			Average	49.2	17.0	11.9	14.2	0.4
			Maximum	56.8	18.2	15.80	18.8	0.59
		September'22	Minimum	51.1	14.3	13.1	15.1	0.49
			Average	53.6	16.1	14.6	17.0	0.5
			Maximum	72.4	25.7	19.14	26.1	0.99
		April'22	Minimum	53.6	18.5	10.3	20.3	0.46
			Average	62.6	22.3	14.3	23.2	0.7
			Maximum	70.7	26.1	17.70	23.5	0.78
		May'22	Minimum	57.9	17.6	10.4	16.8	0.52
3.	Guest House		Average	64.3	21.8	13.6	20.4	0.7
			Maximum	64.4	23.6	14.80	19.4	0.64
		June'22	Minimum	40.8	16.2	9.9	11.5	0.4
			Average	56.1	19.1	12.5	15.0	0.5
			Maximum	55.9	21.6	13.80	18.4	0.58
		July'22	Minimum	42.2	15.2	9.2	10.2	0.39
			Average	48.9	18.0	11.6	13.8	0.5



SI.	T (•			PM ₁₀	PM _{2.5}	SO ₂	NO ₂	СО
No.	Location	Month	Concentration	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	mg/m ³
			Maximum	49.1	18.6	13.40	18.9	0.49
		August'22	Minimum	3.0	15.2	10.2	11.2	0.32
			Average	42.8	16.6	11.7	15.1	0.4
			Maximum	Average42.816.611.715.1Maximum57.518.216.4018.9Minimum51.314.113.215.1Average53.615.614.316.9Maximum86.140.121.4439Minimum48.420.612.520.2Average71.930.616.931.2Maximum82.535.322.2034.3Minimum64.522.814.626.9Average73.929.918.730.8Maximum72.232.727.7033.1Minimum48.819.213.124.5Average63.325.218.028.8Maximum58.921.121.7029.9	0.61			
		September'22	Minimum	51.3	14.1	13.2	15.1	0.48
			Average	53.6	15.6	14.3	16.9	0.5
			Maximum	86.1	40.1	21.44	39	0.92
		April'22	Minimum	48.4	20.6	12.5	20.2	0.28
			Average	71.9	30.6	16.9	31.2	0.7
			Maximum	82.5	35.3	22.20	34.3	0.76
		May'22	Minimum	64.5	22.8	14.6	26.9	0.49
			Average	73.9	29.9	18.7	30.8	0.7
		1 222	Maximum	72.2	32.7	27.70	33.1	0.69
4•	Near Work Shop	June'22	Minimum	48.8	19.2	13.1	24.5	0.44
			Average	63.3	25.2	18.0	28.8	0.6
		July'22	Maximum	58.9	21.1	21.70	29.9	0.59
		July 22	Minimum	52.3	16.7	17.3	19.1	0.5
			Average	58.9	21.1	21.70	29.9	0.59
			Maximum	49.5	18.4	14.40	18.3	0.51
		August'22	Minimum	40.1	10.4	9.8	12.1	0.38
			Average	45.1	15.5	11.6	16.3	0.4
			Maximum	56.6	18.3	16.10	18.8	0.59
		September'22	Minimum	51.2	14.3	13.1	15.1	0.48
			Average	53.6	16.0	14.4	16.9	0.5
			24 Hrly	100	60	80	80	4 (1Hrly)
CPCB Standard			Annual Average	60	40	40	50	



2. Ambient Air Quality Buffer Area

Si.	Location	Month	Concentration	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
No.				$\mu g/m^3$	lug/m ³	lug/m ³	lug/m ³	mg/m ³
			Maximum	89.5	41.4	20.26	28.6	0.72
		April'22	Minimum	76.3	29.6	16.2	22.2	0.49
			Average	83.1	34.4	18.7	25.5	0.6
			Maximum	85.9	35.1	21.80	24.7	0.65
		May'22	Minimum	77.6	28.5	15.8	20.5	0.46
			Average	82.1	32.3	19.4	22.2	0.6
			Maximum	83.8	34.2	20.60	23.7	0.61
		June ² 22	Minimum	75.4	26.1	16.5	19.7	0.49
1.	Jajang Village		Average	79.5	30.3	18.7	21.2	0.6
		Luly???	Maximum	59.5	33.7	19.60	22.7	0.57
		July'22	Minimum	50.2	23.5	15.5	18.7	0.48
			Average	55.1	28.8	18.0	20.2	0.5
			Maximum	48.5	17.4	13.50	18.5	0.51
		August ²²	Minimum	40.1	12.4	10.8	12.1	0.4
			Average	44.8	15.1	11.9	15.6	0.4
		a . 1 . 222	Maximum	57.2	17.8	13.90	18.9	0.59
		September 22	Minimum	52.4	14.3	12.3	15.1	0.51
			Average	54.8	15.7	13.1	17.3	0.6
			Maximum	79.4	33.7	21.90	32.33	0.72
		Aprıl'22	Minimum	56.8	22.4	14.3	23.7	0.47
			Average	69.1	26.1	16.9	26.3	0.6



Si.	Location	Month	Concentration	PIlio	PM2.5	SO2	NO2	CO	
No.				$\mu g/m^3$	lug/m ³	lug/m ³	lug/m ³	mg/m ³	
			Maximum	77.4	30.8	19.10	24.7	0.69	
		May'22	Minimum	65.6	22.3	14.2	20.8	0.5	
			Average	71.0	26.8	16.4	22.4	0.6	
			Maximum	72.5	25.3	17.00	21.2	0.65	
		June'22	Minimum	62.2	20.2	11.1	18.4	0.51	
	Jaribahal Village		Average	67.6	22.6	14.0	19.8	0.6	
2			Maximum	59.5	24.3	15.80	20.2	0.55	
2.		July'22	Minimum	50.6	20.3	11.4	17.4	0.42	
			Average	55.1	22.1	13.2	18.8	0.5	
			Maximum	49.3	18.3	14.20	17.4	0.48	
		August'22	Minimum	41.3	14.2	11.2	18.8 0.5 17.4 0.48 14.5 0.39 16.4 0.4 18.1 0.58		
			Average	46.0	16.5	12.2	16.4	0.4	
			Maximum	56.4	17.8	13.80	18.1	0.58	
		September'22	Minimum	51.5	14.7	12.2	15.2	0.48	
			Average	54.3	16.3	13.0	16.7	0.5	
			Maximum	78.8	36.4	24.68	36.86	0.7	
		April'22	Minimum	62.6	19.9	14.7	24.8	0.28	
			Average	69.8	27.1	19.6	29.8	0.5	
			Maximum	73.2	28.5	21.40	26.4	0.61	
		May'22	Minimum	61.5	18.4	17.9	19.6	0.52	
3.	Bandhabeda		Average	68.8	22.7	19.7	23.1	0.6	
	Village		Maximum	71.0	26.3	20.50	24.2	0.59	
		June'22	Minimum	60.4	16.1	16.5	18.4	0.51	
			Average	66.2	21.5	18.4	21.3	18.8 0.5 17.4 0.48 14.5 0.39 16.4 0.4 18.1 0.58 15.2 0.48 16.7 0.5 36.86 0.7 24.8 0.28 29.8 0.5 26.4 0.61 19.6 0.52 23.1 0.6 24.2 0.59 18.4 0.51 21.3 0.5 23.2 0.53 17.4 0.42 20.3 0.5	
		x 1	Maximum	59.8	25.3	18.40	23.2	0.53	
			July'22	Minimum	50.4	17.8	15.5	17.4	0.42
			Average	54.1	21.3	17.1	20.3	0.5	



Sl.	T /			PM ₁₀	PM _{2.5}	SO ₂	NO ₂	СО
No.	Location	Month	Concentration	μg/m ³	$\mu g/m^3$	μg/m ³	$\mu g/m^3$	mg/m ³
			Maximum	47.8	18.2	13.10	18.2	0.48
		August'22	Minimum	42.4	15.9	10.2	14.4	0.39
			Average	44.6	17.0	11.5	16.6	0.4
			Maximum	56.8	17.7	13.50	18.9	0.6
		September'22	Minimum	52.6	15.1	12.3	15.3	0.49
			Average	54.6	16.6	12.8	17.2	0.5
			Maximum	82.0	35.1	20.14	36.4	0.78
		April'22	Minimum	60.8	21.7	13.7	24.2	0.39
			Average	72.7	28.8	17.2	28.8	0.6
			Maximum	78.1	34.9	21.20	27.1	0.71
		May'22	Minimum	69.2	26.3	16.4	23.2	0.54
			Average	73.6	32.2	18.4	25.7	0.6
			Maximum	74.5	31.3	21.10	25.3	0.69
4•	Kamalpur Village	June'22	Minimum	65.3	25.2	15.5	21.1	0.51
			Average	70.5	28.7	17.9	23.5	0.6
		July'22	Maximum	59.5	29.5	20.10	24.6	0.53
		July'22	Minimum	54.3	26.6	16.9	22.6	0.5
			Average	59.5	29.5	20.10	24.6	0.53
			Maximum	47.9	17.8	14.90	17.3	0.49
		August'22	Minimum	42.1	15.2	11.4	11.4	0.39
			Average	45.7	16.4	13.3	14.3	0.4
			Maximum	56.1	17.9	13.70	18.9	0.57
		September'22	Minimum	51.3	14.2	12.1	15.5	0.48
			Average	53.6	15.9	13.0	17.5	0.5



3. Fugitive Emission Monitoring (µg/m³)

SI. No.	Month	Screen Plant 21 ^o 58' 7.25"N		Waste	Dump	Mines Face Bench		
		21 ^o 58 ³ 85 ^o 23 ³	7.25"N 712.0"E	21° 57' 5 85° 23'	56.21"N 3.51"E	21°58 85°22	'8.65''N 49.65''E	
		Max	Min	Max	Min	Max	Min	
1.	April'22	938	689	925	673	944	683	
2.	May'22	930	784	895	699	934	828	
3.	June'22	879.7	517.6	887.4	512.4	867.9	509.5	
4.	July'22	683.7	503.7	690.6	516.3	681	534.5	
5.	August'22	593.3	528.2	589.7	521.6	596.7	526.6	
6.	September'22	697.2	604	699.5	607.3	699.6	607.9	
	Six Month	700.00			604 -			
	Average	786.98	604.42	/84.82	601.7	/8/.98	603.42	
SI. No.	Month	Crushe	er Plant	Ore storage &	Loading Point	Mines Ha	ulage Road	
		21 ^o 58 85 ^o 23	7.25"N 712.0"E	21 ⁰ 57' 5 85 ⁰ 23'	56.21"N 3.51"E	21°58 85°22'	'8.65''N 49.65''E	
		Max	Min	Max	Min	Max	Min	
1.	April'22	942	676	956	672	924	710	
2.	May'22	928	768	964	798	945	817	



3.	June'22	892.3	501.5	878.4	504.4	861.2	570.9
4.	July'22	691	521.3	692.7	604.5	687.8	554.3
5.	August'22	589.4	531.3	597.2	510.2	593.3	517.3
6.	September'22	695.2	603.7	696.4	611.5	697.8	601.7
	Six Month Average	787.65	602.25	789.98	601.5	784.65	607.92

4. ILLUMINATION MONITORING (Lux)

	April 22		May	22	June22		
LOCATION	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	
Workshop Area	102.0	58.0	140.0	58.0	244.0	130.0	
Screen Plant	125.0	84.0	272.0	80.0	52.0	17.0	
Haul Road	101.0	52.0	60.0	52.0	95.0	74.0	
Loading Point	120.0	68.0	92.0	75.0	17.0	22.0	
Crusher Plant	228.0	179.0	120.0	79.0	58.0	48.0	
Parking Yard	112.0	62.0	65.0	51.0	60.0	22.0	
Permanent Path	71.0	45.0	175.0	93.0	95.0	59.0	
Electric Substation	137.0	78.0	257.0	145.0	170.0	105.0	
Rest Shelter	53.0	35.0	63.0	32.0	45.0	94.0	
Mines Bench Foot Path	45.0	29.0	95.0	72.0	58.0	55.0	
	July	22	Augus	st 22	Septen	nber 22	
LOCATION	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	
Workshop Area	90.0	332.0	110.0	140.0	51.0	195.0	
Screen Plant	71.0	80.0	83.0	97.0	32.0	62.0	
Haul Road	70.0	87.0	74.0	95.0	27.0	40.0	
Loading Point	20.0	31.0	58.0	68.0	48.0	62.0	
Crusher Plant	25.0	30.0	34.0	77.0	98.0	155.0	
Parking Yard	35.0	43.0	91.0	120.0	25.0	39.0	
Permanent Path	47.0	72.0	52.0	78.0	75.0	95.0	
Electric Substation	14.0	25.0	15.0	20.0	45.0	92.0	
Rest Shelter	30.0	35.0	53.0	60.0	19.0	38.0	
Mines Bench Foot Path	30.0	52.0	25.0	38.0	28.0	42.0	



5. Noise Level {dB(A)}

A. Ambient Noise Monitoring

Location	Apr	April-22		May-22		June-22		Standards	
	Leq Day	Leq Night	Leq Day	Leq Night	Leq Day	Leq Night	Leq Day	Leq Night	
GUEST HOUSE AREA	51.39	36.98	52.9	38.4	52.4	40.5	55 dB(A)	45 dB(A)	
EAST BOUNDARY	64.4	52.8	66.3	51.8	67.2	52.9	75 dB(A)	70 dB(A)	
WEST BOUNDARY	60.32	42.3	61.2	44.3	62.5	45.2	75 dB(A)	70 dB(A)	
NORTH BOUNDARY	65.5	60.78	66.5	61.7	66.3	62.8	75 dB(A)	70 dB(A)	
SOUTH BOUNDARY	59.08	59.08 34.94		37.5	62.8	39.7	75 dB(A)	70 dB(A)	
Location	July-22		AUGUST-22		SEPTEMBER-22		Standards		
	Leq Day	Leq Night	Leq Day	Leq Night	Leq Day	Leq Night	Leq Day	Leq Night	
GUEST HOUSE AREA	53.6	42.7	54.8	43.4	53.2	41.6	55 dB(A)	45 dB(A)	
EAST BOUNDARY	68.1	53.8	69.4	51.9	64.2	53.7	75 dB(A)	70 dB(A)	
WEST BOUNDARY	63.7	46.8	68.4	49.5	61.7	52.6	75 dB(A)	70 dB(A)	
NORTH BOUNDARY	67.4	63.9	65.3	62.7	64.7	61.9	75 dB(A)	70 dB(A)	

B. Source Noise Monitoring

CORE ZONE		April-	22		May-22				
_	Week-1	Week-2	Week-3	Week-4	Week-1	Week-2	Week-3	Week-4	
_		Leo	L		Leq				
DUMPER	70.23	65.24	74.18	70.26	72.4	64.4	75.0	71.4	
LOADER	64.69	67.61	73.22	74.20	67.2	66.2	71.3	73.6	
CRUSHER PLANT	73.40	66.62	69.16	68.26	74.2	68.1	66.1	67.3	
SCREEN PLANT	63.03	68.11	72.00	68.06	64.6	67.1	74.7	66.2	
MINES OFFICE	72.90	59.44	68.80	71.28	72.6	60.3	69.1	73.4	
EXCAVOTAR	68.68	70.26	73.49	71.02	67.3	69.1	72.8	72.1	
DOZER	67.98	64.60	65.42	69.72	66.6	63.2	67.1	70.5	



CORE ZONE		June-	22			July	-22		
_	Week-1	Week-2	Week-3	Week-4	Week-1	Week-2	Week-3	Week-4	
		Lec	1		Leq				
DUMPER	73.6	65.3	76.0	72.6	72.5	66.3	75.0	71.6	
LOADER	68.1	67.1	72.3	74.5	69.2	68.1	73.3	73.5	
CRUSHER PLANT	75.5	69.4	67.2	68.2	74.3	70.4	68.2	69.2	
SCREEN PLANT	65.4	68.5	75.7	67.1	66.2	69.5	74.7	68.1	
MINES OFFICE	73.7	61.6	70.3	74.3	71.2	62.6	71.3	73.3	
EXCAVOTAR	68.2	70.7	73.8	73.4	67.4	71.7	72.8	72.4	
DOZER	67.3	64.3	68.4	71.7	68.8	65.3	69.4	70.7	
CORE ZONE		Augus	t-22		September-22				
	Week-1	Week-2	Week-3	Week-4	Week-1	Week-2	Week-3	Week-4	
		Lec	<u>l</u>			<u>Le</u>	<u>q</u>		
DUMPER	70.4	74.6	63.4	71.4	68.8	69.8	72.6	68.5	
LOADER	72.6	70.3	65.2	66.2	72.2	71.1	69.7	71.1	
CRUSHER PLANT	66.3	65.1	67.1	73.2	69.5	72.4	69.6	70.6	
SCREEN PLANT	65.2	73.7	66.1	63.6	71.4	69.4	69.3	68.4	
MINES OFFICE	72.4	68.1	59.3	71.6	69.8	71.2	72.1	68.1	
EXCAVOTAR	71.1	71.8	68.1	66.3	69.3	68.8	72.2	70.5	

6. Surface Water Quality

JAJANG IRON ORE	E MINE							
Baitarini River Up	Stream							
Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Limits for Stream Water Standards
PH	-	6.63	6.74	6.80	6.47	6.91	6.97	6.5-8.5
Total Dissolved Solids	mg/l	142.0	160.0	146.0	214.0	210.0	251.0	1500
Chlorides	mg/l	18.0	17.2	20.0	18.0	16.4	20.2	600
Iron	mg/l	0.14	0.12	0.16	0.12	0.13	0.27	50
Fluorides	mg/l	0.16	0.17	0.18	0.15	0.14	0.19	1.5
BOD	mg/l	5.8	5.6	5.6	5.2	5.8	7.0	3
DO	mg/l	7.0	6.9	6.8	6.4	6.20	6.5	4
Baitarini River Do	wnStrean	n						
Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Limits for Stream Water Standards

JAJANG IRON ORE MINE

РП	-	6.87	6.89	6.94	6.64	6.56	7.44	6.5-8.5
Total Dissolved Solids	mg/l	183.0	182.0	192.0	260.0	272.0	329.0	1500
Chlorides	mg/l	22.0	19.4	24.0	22.0	25.20	34.0	600
Iron	mg/l	0.10	0.17	0.13	0.14	0.12	0.30	50
Fluorides	mg/l	0.17	0.12	0.17	0.18	0.20	0.25	1.5
BOD	mg/l	8.0	8.8	9.8	8.20	9.60	10.0	3
DO	mg/l	7.1	6.4	7.6	7.0	6.0	6.0	4
Suna River Upstre	am	I	1	1		I	L	L
Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Limits for
								Stream
								Water
								Standards
PH	-	6.76	6.52	6.88	6.84	6.78	6.89	6.5-8.5
Total Dissolved Solids	mg/l	132.0	128.0	140.0	184.0	190.0	213.0	1500
Chlorides	mg/l	6.9	14.0	14.0	12.80	14.0	22.0	600
Iron	mg/l	0.10	0.12	0.12	0.10	0.13	0.19	50
Fluorides	mg/l	0.16	0.15	0.15	0.13	0.15	0.48	1.5
BOD	mg/l	6.5	6.4	6.10	6.4	6.0	8.0	3
DO	mg/l	6.9	7.0	6.80	6.60	6.52	6.0	4
Suna River Downs	tream							
Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Limits for
								Water Standards
PH	-	6.86	6.90	6.72	6.78	6.48	7.32	Water Standards 6.5-8.5
PH Total Dissolved Solids	- mg/l	6.86 145.0	6.90 136.0	6.72 156.0	6.78 268.0	6.48 282.0	7.32 254.0	Water Standards 6.5-8.5 1500
PH Total Dissolved Solids Chlorides	- mg/l mg/l	6.86 145.0 24.0	6.90 136.0 18.0	6.72 156.0 23.4	6.78 268.0 19.0	6.48 282.0 20.0	7.32 254.0 28.0	Water Standards 6.5-8.5 1500 600
PH Total Dissolved Solids Chlorides Iron	- mg/l mg/l	6.86 145.0 24.0 0.16	6.90 136.0 18.0 0.13	6.72 156.0 23.4 0.17	6.78 268.0 19.0 0.12	6.48 282.0 20.0 0.15	7.32 254.0 28.0 0.25	Water Standards 6.5-8.5 1500 600 50
PH Total Dissolved Solids Chlorides Iron Fluorides	- mg/l mg/l mg/l	6.86 145.0 24.0 0.16 0.38	6.90 136.0 18.0 0.13 0.18	6.72 156.0 23.4 0.17 0.40	6.78 268.0 19.0 0.12 0.34	6.48 282.0 20.0 0.15 0.32	7.32 254.0 28.0 0.25 0.40	Water Standards 6.5-8.5 1500 600 50 1.5
PH Total Dissolved Solids Chlorides Iron Fluorides BOD	- mg/l mg/l mg/l mg/l	6.86 145.0 24.0 0.16 0.38 9.0	6.90 136.0 18.0 0.13 0.18 8.0	6.72 156.0 23.4 0.17 0.40 10.0	6.78 268.0 19.0 0.12 0.34 15.0	6.48 282.0 20.0 0.15 0.32 14.0	7.32 254.0 28.0 0.25 0.40 12.0	Water Standards 6.5-8.5 1500 600 50 1.5 3
PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO	- mg/l mg/l mg/l mg/l mg/l	6.86 145.0 24.0 0.16 0.38 9.0 6.5	6.90 136.0 18.0 0.13 0.18 8.0 6.4	6.72 156.0 23.4 0.17 0.40 10.0 6.20	6.78 268.0 19.0 0.12 0.34 15.0 5.8	6.48 282.0 20.0 0.15 0.32 14.0 5.6	7.32 254.0 28.0 0.25 0.40 12.0 5.7	Water Standards 6.5-8.5 1500 600 50 1.5 3 4
PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO Kakarpani River U	- mg/l mg/l mg/l mg/l mg/l pStream	6.86 145.0 24.0 0.16 0.38 9.0 6.5	6.90 136.0 18.0 0.13 0.18 8.0 6.4	6.72 156.0 23.4 0.17 0.40 10.0 6.20	6.78 268.0 19.0 0.12 0.34 15.0 5.8	6.48 282.0 20.0 0.15 0.32 14.0 5.6	7.32 254.0 28.0 0.25 0.40 12.0 5.7	Water Standards 6.5-8.5 1500 600 50 1.5 3 4
PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO Kakarpani River U Parameter	- mg/l mg/l mg/l mg/l pStream Units	6.86 145.0 24.0 0.16 0.38 9.0 6.5 April-22	6.90 136.0 18.0 0.13 0.18 8.0 6.4 May-22	6.72 156.0 23.4 0.17 0.40 10.0 6.20	6.78 268.0 19.0 0.12 0.34 15.0 5.8 July-22	6.48 282.0 20.0 0.15 0.32 14.0 5.6 August-22	7.32 254.0 28.0 0.25 0.40 12.0 5.7 September-22	WaterStandards6.5-8.51500600501.534Limits for Stream Water Standards
PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO Kakarpani River U Parameter PH	- mg/l mg/l mg/l mg/l pStream Units	6.86 145.0 24.0 0.16 0.38 9.0 6.5 April-22 6.93	6.90 136.0 18.0 0.13 0.18 8.0 6.4 May-22 6.9	6.72 156.0 23.4 0.17 0.40 10.0 6.20 June-22	6.78 268.0 19.0 0.12 0.34 15.0 5.8 July-22 6.92	6.48 282.0 20.0 0.15 0.32 14.0 5.6 August-22 6.89	7.32 254.0 28.0 0.25 0.40 12.0 5.7 September-22 6.76	Water Standards 6.5-8.5 1500 600 50 1.5 3 4 Limits for Stream Water Standards 6.5-8.5
PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO Kakarpani River U Parameter PH Total Dissolved Solids	- mg/l mg/l mg/l mg/l pStream Units - mg/l	6.86 145.0 24.0 0.16 0.38 9.0 6.5 April-22 6.93 119.0	6.90 136.0 18.0 0.13 0.18 8.0 6.4 May-22 6.9 114.0	6.72 156.0 23.4 0.17 0.40 10.0 6.20 June-22 6.86 126.0	6.78 268.0 19.0 0.12 0.34 15.0 5.8 July-22 6.92 122.0	6.48 282.0 20.0 0.15 0.32 14.0 5.6 August-22 6.89 120.0	7.32 254.0 28.0 0.25 0.40 12.0 5.7 September-22 6.76 143.0	Water Standards 6.5-8.5 1500 600 50 1.5 3 4 Limits for Stream Water Standards 6.5-8.5 1500
PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO Kakarpani River U Parameter PH Total Dissolved Solids Chlorides	- mg/l mg/l mg/l mg/l pStream Units - mg/l mg/l	6.86 145.0 24.0 0.16 0.38 9.0 6.5 April-22 6.93 119.0 20.0	6.90 136.0 18.0 0.13 0.18 8.0 6.4 May-22 6.9 114.0 21.0	6.72 156.0 23.4 0.17 0.40 10.0 6.20 June-22 6.86 126.0 22.0	6.78 268.0 19.0 0.12 0.34 15.0 5.8 July-22 6.92 122.0 16.0	6.48 282.0 20.0 0.15 0.32 14.0 5.6 August-22 6.89 120.0 18.0	7.32 254.0 28.0 0.25 0.40 12.0 5.7 September-22 6.76 143.0 21.4	Water Standards 6.5-8.5 1500 600 50 1.5 3 4 Limits for Stream Water Standards 6.5-8.5 1500
PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO Kakarpani River U Parameter PH Total Dissolved Solids Chlorides Iron	- mg/l mg/l mg/l mg/l pStream Units - mg/l mg/l	6.86 145.0 24.0 0.16 0.38 9.0 6.5 April-22 6.93 119.0 20.0 0.16	6.90 136.0 18.0 0.13 0.18 8.0 6.4 May-22 6.9 114.0 21.0 0.14	6.72 156.0 23.4 0.17 0.40 10.0 6.20 June-22 6.86 126.0 22.0 0.14	6.78 268.0 19.0 0.12 0.34 15.0 5.8 July-22 6.92 122.0 16.0 0.12	6.48 282.0 20.0 0.15 0.32 14.0 5.6 August-22 6.89 120.0 18.0 0.16	7.32 254.0 28.0 0.25 0.40 12.0 5.7 September-22 6.76 143.0 21.4 0.25	Water Standards 6.5-8.5 1500 600 50 1.5 3 4 Limits for Stream Water Standards 6.5-8.5 1500 600 50
PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO Kakarpani River U Parameter PH Total Dissolved Solids Chlorides Iron Fluorides	- mg/l mg/l mg/l mg/l pStream Units - mg/l mg/l mg/l	6.86 145.0 24.0 0.16 0.38 9.0 6.5 April-22 6.93 119.0 20.0 0.16 0.20	6.90 136.0 18.0 0.13 0.18 8.0 6.4 May-22 6.9 114.0 21.0 0.14 0.22	6.72 156.0 23.4 0.17 0.40 10.0 6.20 June-22 6.86 126.0 22.0 0.14 0.22	6.78 268.0 19.0 0.12 0.34 15.0 5.8 July-22 6.92 122.0 16.0 0.12 0.24	6.48 282.0 20.0 0.15 0.32 14.0 5.6 August-22 6.89 120.0 18.0 0.16 0.24	7.32 254.0 28.0 0.25 0.40 12.0 5.7 September-22 6.76 143.0 21.4 0.25 0.32	Water Standards 6.5-8.5 1500 600 50 1.5 3 4 Limits for Stream Water Standards 6.5-8.5 1500 600 50 1.5 3 4 Stream Water Standards 6.5-8.5 1500 50 1.5
PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO Kakarpani River U Parameter PH Total Dissolved Solids Chlorides Iron Fluorides BOD	- mg/l mg/l mg/l mg/l pStream Units - mg/l mg/l mg/l mg/l	6.86 145.0 24.0 0.16 0.38 9.0 6.5 April-22 6.93 119.0 20.0 0.16 0.20 5.6	6.90 136.0 18.0 0.13 0.18 8.0 6.4 May-22 6.9 114.0 21.0 0.14 0.22 6.0	6.72 156.0 23.4 0.17 0.40 10.0 6.20 June-22 6.86 126.0 22.0 0.14 0.22 5.8	6.78 268.0 19.0 0.12 0.34 15.0 5.8 July-22 6.92 122.0 16.0 0.12 0.24 5.60	6.48 282.0 20.0 0.15 0.32 14.0 5.6 August-22 6.89 120.0 18.0 0.16 0.24 6.80	7.32 254.0 28.0 0.25 0.40 12.0 5.7 September-22 6.76 143.0 21.4 0.25 0.32 9.0	Water Standards 6.5-8.5 1500 600 50 1.5 3 4 Limits for Stream Water Standards 6.5-8.5 1500 600 50 1.5 3 4 Stream Water Standards 6.5-8.5 1500 600 50 1.5 3
PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO Kakarpani River U Parameter PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO	- mg/l mg/l mg/l mg/l pStream Units Units	6.86 145.0 24.0 0.16 0.38 9.0 6.5 April-22 6.93 119.0 20.0 0.16 0.20 5.6 6.0	6.90 136.0 18.0 0.13 0.18 8.0 6.4 May-22 6.9 114.0 21.0 0.14 0.22 6.0 5.8	6.72 156.0 23.4 0.17 0.40 10.0 6.20 June-22 6.86 126.0 22.0 0.14 0.22 5.8 6.2	6.78 268.0 19.0 0.12 0.34 15.0 5.8 July-22 6.92 122.0 16.0 0.12 0.24 5.60 6.8	6.48 282.0 20.0 0.15 0.32 14.0 5.6 August-22 6.89 120.0 18.0 0.16 0.24 6.80 6.4	7.32 254.0 28.0 0.25 0.40 12.0 5.7 September-22 6.76 143.0 21.4 0.25 0.32 9.0 6.2	Stream Water Standards 6.5-8.5 1500 600 50 1.5 3 4 Limits for Stream Water Standards 6.5-8.5 1500 600 50 1.5 3 4
PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO Kakarpani River U Parameter PH Total Dissolved Solids Chlorides Iron Fluorides BOD DO Kakarpani River D	- mg/l mg/l mg/l mg/l pStream Units - mg/l mg/l mg/l mg/l mg/l mg/l	6.86 145.0 24.0 0.16 0.38 9.0 6.5 April-22 6.93 119.0 20.0 0.16 0.20 5.6 6.0	6.90 136.0 18.0 0.13 0.18 8.0 6.4 May-22 6.9 114.0 21.0 0.14 0.22 6.0 5.8	6.72 156.0 23.4 0.17 0.40 10.0 6.20 June-22 June-22 6.86 126.0 22.0 0.14 0.22 5.8 6.2	6.78 268.0 19.0 0.12 0.34 15.0 5.8 July-22 6.92 122.0 6.92 122.0 16.0 0.12 0.24 5.60 6.8	6.48 282.0 20.0 0.15 0.32 14.0 5.6 August-22 6.89 120.0 18.0 0.16 0.24 6.80 6.4	7.32 254.0 28.0 0.25 0.40 12.0 5.7 September-22 6.76 143.0 21.4 0.25 0.32 9.0 6.2	Water Standards 6.5-8.5 1500 600 50 1.5 3 4 Limits for Stream Water Standards 6.5-8.5 1500 600 50 1.5 3 4 Standards 6.5-8.5 1500 600 50 1.5 3 4



Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Limits for
								Stream
								Water
								Standards
РН	-	6.61	6.94	6.72	7.60	7.27	6.85	6.5-8.5
Total Dissolved	mg/l	162.0	118.0	136	140.0	132.0	167.0	1500
Solids								
Chlorides	mg/l	16.0	24.0	26.0	24.0	18.60	22.0	600
Iron	mg/l	0.11	0.18	0.16	0.15	0.16	0.29	50
Fluorides	mg/l	0.23	0.20	0.24	0.28	0.20	0.27	1.5
BOD	mg/l	4.5	9.20	12.8	14.0	14.0	11.0	3
DO	mg/l	6.4	6.20	5.40	5.20	5.0	6.0	4
Jalpa River Upstre	eam					-	•	
Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Limits for
								Stream
								Water
								Standards
РН	-	6.82	6.84	6.94	6.85	6.71	6.90	6.5-8.5
Total Dissolved	mg/l	140.0	138.0	144.0	160.0	170.0	187.0	1500
Solids								
Chlorides	mg/l	14.0	15.20	16.0	18.0	14.20	16.0	600
Iron	mg/l	0.10	0.10	0.18	0.12	0.11	0.10	50
Fluorides	mg/l	0.20	0.21	0.22	0.28	0.24	0.27	1.5
BOD	mg/l	3.3	4.2	4.20	5.60	6.40	8.0	3
DO	mg/l	6.8	7.0	6.6	7.20	6.20	5.9	4
Jalpa River Downs	stream							
Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Limits for
		-	-		-		-	Stream
								Water
								Standards
РН	-	6.81	6.91	6.40	6.75	6.38	7.08	6.5-8.5
Total Dissolved	mg/l	155.0	162.0	156.0	184.0	179.8	271.0	1500
Solids								
Chlorides	mg/l	14.0	17.4	24.0	26.0	24.0	28.0	600
Iron	mg/l	0.15	0.14	0.17	0.18	0.14	0.17	50
Fluorides	mg/l	0.20	0.28	0.34	0.32	0.30	0.20	1.5
BOD	mg/l	6.9	5.0	9.80	12.0	14.0	11.0	3
DO	mg/l	6.2	6.7	6.80	6.80	7.60	5.3	4



7. Surface Water Flow Rate

LOCATION NAME	April-21	May-22	June-22	July-22	August-22	September-22
Baitarani River	0.30	1.27	0.73	1.27	1.26	0.58
Kakarpani River	0.38	0.41	0.31	0.41	1.52	0.97
Sona River	0.54	0.88	0.52	0.88	1.04	0.70
Jalpa River	0.43	0.87	0.86	0.87	0.73	0.43

8. Ground Water Quality

				June- 2022									
Sl. No.	TESTS	Units	Dugwell Near Bil Siding	Kamalpur Village	Jajang Village	Jurudi Village	Jalahari Village	Tap Water Near Jajang Mine					
1.	рН	-	6.68	6.75	6.84	6.50	5.97	5.87					
2.	Total Dissolved Solids as TDS	mg/l	236.0	96.0	156.0	108.0	84.0	570.0					
3.	Total Hardness as CaCO3	mg/l	104.0	40.0	68.0	48.0	44.0	128.0					
4.	Chloride as Cl	mg/l	14.0	6.0	14.0	10.0	6.0	16.0					
5.	Fluorides as F	mg/l	0.21	0.25	0.21	0.20	0.18	0.27					
6.	Iron as Fe	mg/l	0.14	0.12	0.10	0.09	0.13	0.19					
					August	2022							
Sl. No.	TESTS	Units	Dugwell Near Bil Siding	Kamalpur Village	Jajang Village	Jurudi Village	Jalahari Village	Tap Water Near Jajang Mine					
1.	рН	-	6.89	6.73	7.15	7.25	6.9	6.72					
2.	Total Dissolved Solids as TDS	mg/l	112	132	160	151	130	113					
3.	Total Hardness as CaCO3	mg/l	48	52	64	60	40	52					
4		m a /l	1.4	10	18		8	14					
ч.	Chloride as Cl	mg/i	14	12	10		0	± 1					
5.	Fluoride as F	mg/l	0.23	0.11	0.33	0.2	0.13	0.19					



Parameter	Units	April-22	May-22	June-22	July-22	August- 22	September- 22	Acceptable Limits	Permissible Limits
									No
PH	-	6.73	6.88	6.95	6.48	6.79	6.67	6.5-8.5	Relaxation
Total									
Hardness	mg/l	68.0	72.08	60.0	52.0	56.80	60.0	200	600
									No
Iron	mg/l	0.10	0.12	0.15	0.13	0.18	0.22	1	Relaxation
Chlorides	mg/l	16.0	12.4	10.0	6.8	7.60	8.0	250	1000
Total									
Dissolved									
Solids	mg/l	124.0	132.0	120.0	108.0	112.0	130.0	500	2000
Sulphates	mg/l	14.3	16.0	7.50	7.50	8.26	11.01	200	400
Fluoride	mg/l	0.23	0.26	0.22	0.20	0.34	0.31	1	1.5

9. Drinking Water Quality

10. STP

S. No.	TESTS	Unit	April-22	May-22	June-22	July-22	August-22	September-22	Detection Range
1.	рН	-			6.29	6.29	6.68	6.77	2.0 -12
2.	Total Suspended Solids as TSS	mg/l	-	-	46.0	46.0	57.20	78.3	5 - 5000
3.	Total Dissolved Solids as TDS	mg/l	-	-	680.0	680.0	638.0	688.0	10-10000
4.	Biochemical Oxygen Demand as BOD 3Days at 27 ⁰ C	mg/l	-	-	24.5	24.5	32.0	35.0	5-10000
5.	Chemical Oxygen Demand as COD	mg/l	-	-	196.0	196.0	218.0	245.0	5-50000
6.	Oil & Grease	mg/l	-	-	6.1	6.1	8.0	7.7	5-600



11.ETP

TESTS	Unit	April-22	May-22	June-22	July-22	August-22	September-22	Detection Range	
	ETP INLET								
Ph	-	7.21	7.19	6.89	6.72	6.56	6.35	2.0 -12	
Total Suspended Solids as TSS	mg/l	26.1	28.0	36.0	46.0	58.0	78.0	5 – 5000	
Total Dissolved Solids as TDS	mg/l	942.0	869.0	564.0	582.0	576.0	672.0	10-10000	
Biochemical Oxygen Demand as BOD 3Days at 270C	mg/l	9.0	10.0	22.0	34.0	36.0	40.0	5-10000	
Chemical Oxygen Demand as COD	mg/l	68.0	72.0	224.0	234.0	252.0	268.0	5-50000	
Oil & Grease	mg/l	4.8	BDL	5.6	5.4	5.8	6.2	5-600	
TESTS	Unit	April-22	May-22	June-22	July-22	August-22	September-22	Detection Range	
				ETP OUTL	.ET				
рН	-	6.90	6.75	6.29	7.24	7.26	7.13	2.0 -12	
Total Suspended Solids as TSS	mg/l	78.2	67.0	24.0	26.0	30.0	35.1	5 - 5000	
Total Dissolved Solids as TDS	mg/l	968.0	1024.0	680.0	696.0	639.0	689.0	10-10000	
Biochemical Oxygen Demand as BOD 3Days at 270C	mg/l	22.0	28.0	18.5	16.0	18.0	17.0	5-10000	
Chemical Oxygen Demand as COD	mg/l	192.0	204.0	196.0	164.0	176.0	160.0	5-50000	
Oil & Grease	mg/l	6.7	6.8	BDL	BDL	BDL	BDL	5-600	



12. Mines Run Off

			Ju	ly-22			Augi	ıst-22		INDIAN
Parameter	Unit	Mine Office	Screen Plant	Crusher Plant	Gate No - 6	Loading Point	Screen Plant	Crusher Plant	Workshop Area	STANDARDS as IS- 2296(C)
Colour	Hazen	34.0	30.0	18.0	15.0	30.0	25.0	15.0	20.0	300
рН	-	7.4	7.13	6.98	7.69	7.48	7.34	6.78	7.52	6.5-8.5
Total Suspended Solids as TSS	mg/l	52,0	35.4	45.8	61.4	46.0	38.0	38.0	57.20	-
Total Dissolved Solids as TDS	mg/l	245.0	218.0	310.0	310.0	234.0	236.0	278.0	296.0	1500
Biochemical Oxygen Demand as BOD	mg/l	14.5	24.0	16.0	20.0	12.8	23.40	13.4	23.0	3.0
Chemical Oxygen Demand as COD	mg/l	78.0	160.0	96.0	136.0	82.0	156.0	86.0	142.0	-
Oil & Grease as O&G	mg/l	BDL	7.1	5.5	6.0	BDL	7.28	6.20	6.80	0.1
Dissolved Oxygen as DO	mg/l	5.5	5.2	4.8	4.3	5.40	5.60	5.60	4.70	4
Chloride as Cl	mg/l	28.0	32.0	28.0	22.0	28.0	38.0	24.20	18.0	600
Sulfate as SO4	mg/l	31.5	20.7	24.7	25.3	28.6	24.62	32.0	24.0	400
Nitrate Nitrogen as NO3	mg/l	7.29	5.59	6.3	7.09	6.40	5.80	5.60	7.40	50
Fluorides as F	mg/l	0.19	0.18	0.21	0.21	0.15	0.12	0.24	0.26	1.5
Iron as Fe	mg/l	0.23	0.22	0.23	0.32	0.22	0.28	0.22	0.19	50.0
Arsenic as As	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.2
Hexavalent Chromium as Cr+6	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.05
Copper as Cu	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.5
Zinc as Zn	mg/l	0.19	0.13	0.09	0.06	0.16	0.20	0.04	0.04	15
Phenolic Compound as C6H5OH	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.005
Anionic Detergent as MBAS	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.0
Selenium as Se	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.05
Cyanide as CN	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.05
Lead as Pb	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Cadmium as	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.01



Cd								
			S	eptember	-22	 June	-22	 INDIAN
Parameter	Unit	Loading Point	Screen Plant	Crusher Plant	Workshop Area	Gate No-6	Haulage Road	STANDARDS as IS- 2296(C)
Colour	Hazen	35.0	20.0	35.0	18.0	190.0	170.0	300
рН	-	7.42	7.19	6.88	7.43	6.5	6.30	6.5-8.5
Total Suspended Solids as TSS	mg/l	42.5	47.2	33.2	48.9	376	339.0	-
Total Dissolved Solids as TDS	mg/l	244.0	256.0	291.0	312.0	1759	1693.0	1500
Biochemical Oxygen Demand as BOD	mg/l	9.0	20.0	10.0	21.0	17.0	16.0	3.0
Chemical Oxygen Demand as COD	mg/l	75.0	172.0	104.0	154.0	468.0	387.0	-
Oil & Grease as O&G	mg/l	BDL	7.01	6.01	6.22	6.4	5.20	0.1
Dissolved Oxygen as DO	mg/l	5.9	5.2	5.5	4.9	2.6	3.0	4
Chloride as Cl	mg/l	24.0	30.0	20.0	26.0	240.0	304.0	600
Sulfate as SO4	mg/l	32.8	27.2	38.0	32.9	297.0	342.0	400
Nitrate Nitrogen as NO3	mg/l	7.65	5.33	6.7	8.07	22.7	BDL	50
Fluorides as F	mg/l	0.33	0.18	0.20	0.29	0.14	0.17	1.5
Iron as Fe	mg/l	0.20	0.23	0.27	0.15	9.98	8.27	50.0
Arsenic as As	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.2
Hexavalent Chromium as Cr+6	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.05
Copper as Cu	mg/l	BDL	BDL	BDL	BDL	0.26	0.21	1.5
Zinc as Zn	mg/l	0.10	0.12	0.09	0.09	0.20	0.33	15
Phenolic Compound as C6H5OH	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.005
Anionic Detergent as MBAS	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	1.0
Selenium as Se	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.05
Cyanide as CN	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.05
Lead as Pb	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Cadmium as Cd	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.01



Vibration Monitoring

Station no.	Station Name	Instrument location	Season (Summer/Winter/Monsoon/ post monsoon	Peak particle velocity	Air Over pressure	Frequency	Remark
1	BLOCK-B ZONE-1 NEAR OLD CANTEEN	NEAR OLD WB IN BIL ROAD(200m away from blasting location)	Summer	5.78 mm/s	109.5 dBL @ 6Hz / .006kPa	7.5 Hz	Within Permissible limits
2	RL-571	CRUSHER PLANT(300m away from blasting location)	Summer	1.28 mm/s	109.9 dBL @ 3.1 Hz/ 0.0062 kPA	39.4 Hz	Within Permissible limits
				96.06 mm/s	81.9 dBL @ 0Hz / .0002kPa	1.3 Hz	
			113.72 mm/s	101.0 dBL @ 11.3Hz / .0022kPa	1.6 Hz		
		HAULAGE ROAD NEAR LOCK-B GATE NO- CONE-2 6(150m RL-510 away from blasting	Monsoon	80.71 mm/s	88.0 dBL @ 0Hz / .0005kPa	1.3 Hz	
				139.48 mm/s	88.0 dBL @ 0Hz / .0005kPa	1.5 Hz	
3	BLOCK-B ZONE-2 RL-510			144.95 mm/s	81.9 dBL @ 0Hz / .0002kPa	1.9 Hz	Within Permissible limits
		location)		139.25 mm/s	81.9 dBL @ 0Hz / .0002kPa	1.6 Hz	
				209.7 mm/s	88.0 dBL @ 0Hz / .0005kPa	2.3 Hz	-
				254.62 mm/s	81.9 dBL @ 0Hz / .0002kPa	2.0 Hz	
				220.79 mm/s	81.9 dBL @ 0Hz /	1.7 Hz	



					.0002kPa		
				184.16 mm/s	102.8 dBL @ 6.8Hz / .0027kPa	1.1 Hz	
				150.19 mm/s	100.0 dBL @ 22.2Hz / .002kPa	1.0 Hz	
				81.45 mm/s	91.5 dBL @ 0Hz / .0007kPa	1.7 Hz	
				48.48 mm/s	91.5 dBL @ 0Hz / .0007kPa	12.5 Hz	
4	Dump Site	Near Dump Site (150m away from blasting location)	Monsoon	2.87 mm/s	105.5 dBL @ 14.6Hz / .0037kPa	6.8Hz	Within Permissible limits
5	BLOCK –C HATIPIT RI610	Hatipit Weigh Bridge (150m away from blasting location)	Monsoon	2.87 mm/s	142.1 dBL @ 15 Hz / .2539kpa	6.8Hz	Within Permissible limits

Verified By

Hikaskuman-

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

Authorized By

Reena Quality Manager

Ecomen Laboratories Pvt. Ltd. Second Floor Hall, House No. 8-10, Sector-H, Aliganj, Luclause 226024 Jajang Environmental Protection Measures Expenditure (head wise breakup) incurred from in FY July 2020-YTD is given below-

Particulars	Approximately Cost incurred (in Crores)		
Dust Suppression (Wet Drilling, Dry Fog System, Mobile Haul road water sprinkling system, etc.)	0.25		
Fixed Water Sprinkling Project	0.20		
Online Environmental Monitoring System (CAAQMS & Digital Display Board)	1.50		
Manual Environment Monitoring	0.15		
ETP/Mechanized Oil Grease Trap System	0.10		
Water Sprinkling on National Highway/nearby village/transportation roads	0.20		
OB Dump & Surface Run-off Management	0.05		
Environment Awareness in MEMC Week 2020-21	0.05		
Grand Total (Rs. in Cr.)	2.50		

