TSML/SCM/5906/FY24
Date: -30-05-2023

To,
The Additional Director,
Ministry of Environment and Forest & Climate Change,
Eastern Region Office,
A/3, Chandrasekharpur,
Bhubaneswar-751023

Subject: Submission of half-yearly compliance report on the stipulated environmental clearance terms and conditions in respect of Sukinda Chromite Block of M/s Tata Steel Mining Limited, for the period from October'2022 to March'2023.

Reference:

1)MoEF Letter Ref No: J-11015/96/2011-IA. II (M), dated 06.09.2013

2) MoEF&CC's notification vide S.O-5845, dt. 28th Nov 2018

Respected Sir,
We are herewith submitting the six-monthly compliance report on the status of the implementation of the conditions stipulated in environmental clearance vested in favor of Sukinda Chromite Block of M/s Tata Steel Mining Limited vide MoEF Letter Ref No: J-11015/96/2011-IA. II (M), dated 06.09.2013, for the period from October'2022 to March'2023 for your kind perusal.

This is in reference to the MoEF&CC's notification vide S.O-5845, dt. 28th Nov 2018, the six-monthly compliance report is being submitted only in soft copy mode, shared with your good office over e-mail @roez.bsr-mef@nic.in and is being uploaded in Parivesh portal. As per the Vesting order No. 5555 /SM/IV(B)SM-32/2020 dated 29th June'2020 issued by the Office of Nodal Officer, Steel & Mines Department of Government of Odisha, above environmental clearance has been vested to Tata Steel Mining Limited (formerly known as T S Alloys Limited) for 50years (As per MMDR Act, 2021).

We believe the above submission is in order.

Thanking You.

Yours faithfully,
f: Tata Steel Mining Limited

Manager
Sukinda Chromite Block

Copy to: 1. Member Secretary, State Pollution Control Board, Odisha, Paribesh Bhawan, A/118, Nilakantha Nagar, Bhubaneswar, 751012

Half-Yearly Compliance Report

On

Environmental Clearance Conditions

MoEF Letter Ref No: J-11015/96/2011-IA. II (M), dated 06.09.2013

Period: October'22 – March'23

Submitted By:

Sukinda Chromite Block

M/s. Tata Steel Mining Limited

At/Po: Kalarangiatta, Block-Sukinda

District- Jajpur, Odisha -755028

Table of Contents

A. INTRODUCTION: Lease of Sukinda Chromite Block of M/s Tata Steel Mining Limited was executed over leased area of 406.0Ha in the Sukinda Block of Jajpur District in the State of Odisha, which was previously owned by M/s. Tata Steel Limited from 1952 to 2020. As per the Vesting order No. 5555/SM IV(B)SM-32/2020 Dated 29.06.2020 and amended vesting order No. 2357/SM, SM-MC1-MISC-0025-2020 Dated 15.03.2022 issued by the Office of Nodal Officer, Steel & Mines Department of Government of Odisha, Tata Steel Mining Limited (formerly known as T S Alloys Limited) has been vested with following Statutory Clearances/ permissions/ NOCs for 50years (As per MMDR Act, 2021) **(Annexure – I)**. The schematic representation of the site is depicted in the fig.1 and its layout in fig.2 below.

Fig.1: Location of Sukinda Chromite Block (Tata Steel Mining Limited)

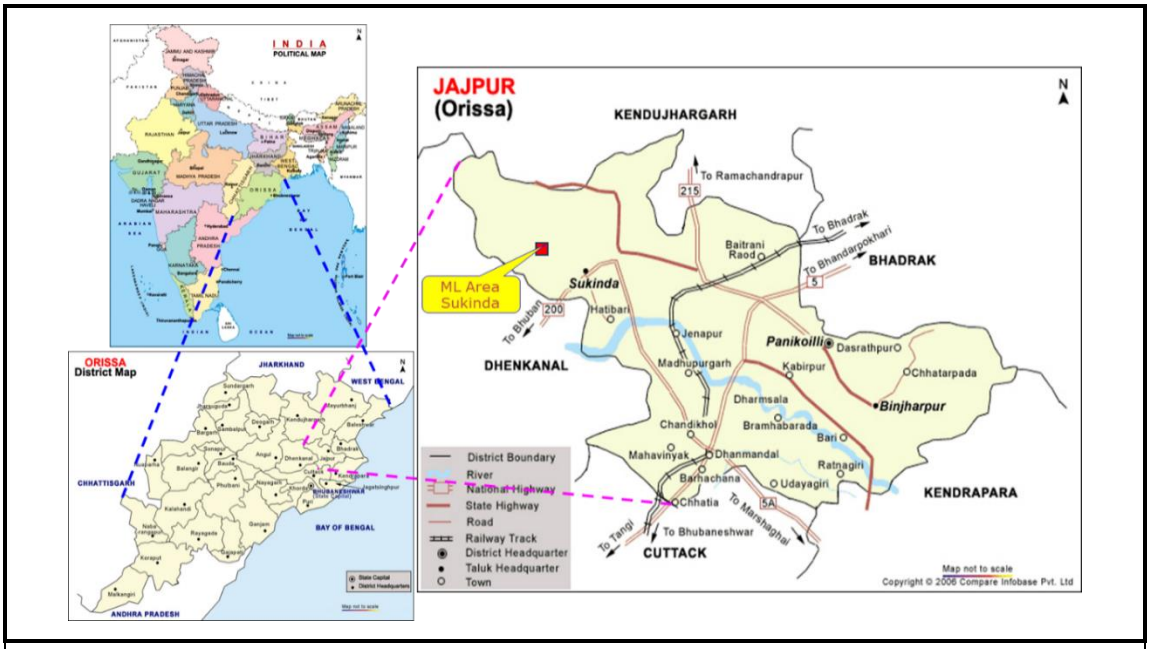
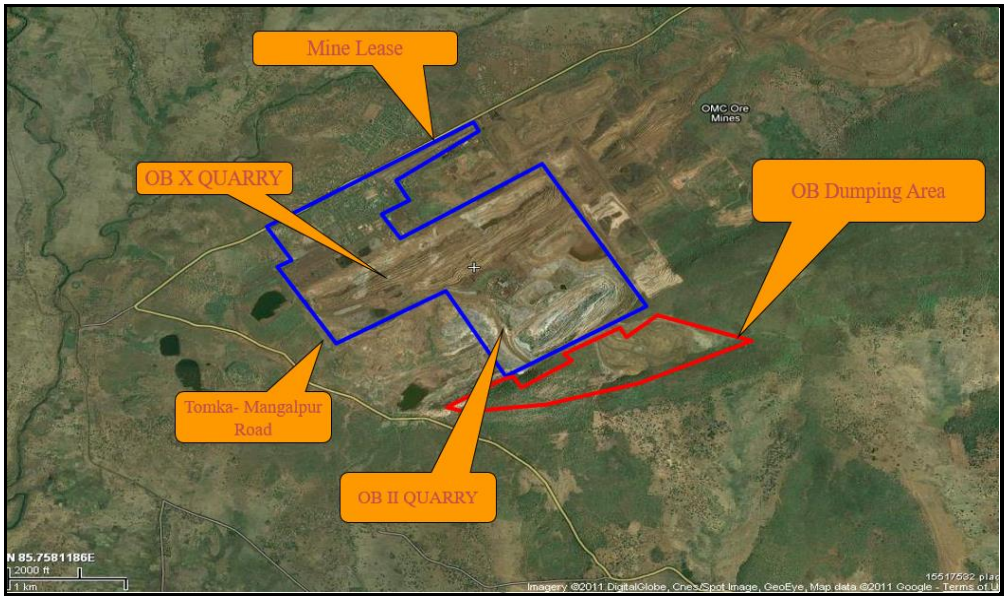


Fig.2 Mine Lay out (Aerial View of Sukinda Chromite Block)



B. Compliance to the Environment Clearance Letter No: J-11015/96/2011-IA. II (M), dated 06.09.2013 in respect of Sukinda Chromite Mine for Mining Lease renewal, increase in production for Chrome Ore (ROM): 2.40 MTPA, Pyroxenite Ore (ROM): 0.50 MTPA, Chrome Concentrate: 0.65 MTPA, change in mining technology to opencast & underground mining, change in beneficiation technology and increase in project area.

A. Specific Condition:

Sl. No	Specific Condition	Compliance Status (October'22 to March'23)
I	No mining activities will be allowed in forest area for which the Forest Clearance is not available.	**Compliance:** The lease of 406.00ha comprised 404.669ha of forest land (73.697 ha as per HAL + 330.972 ha as per SABIK) and 1.331ha of non-forest land. The details of Forest Clearance granted by MoEF&CC are; a) Letter no. 8-78/96-FC dated 27.01.1998 over 73.797 ha. & b) Letter No. 8-15/2016-FC dated 18.05.2018 over 330.972 ha. Mining and allied activities were carried within the lease hold area of 406.0ha within which the entire forest land had been diverted as per FC Act,1980. Tata Steel Mining Limited has already applied for forest diversion of same area. **[Copies of forest clearances enclosed as Annexure-I]**
I	The project proponent will seek and obtain approval under the FC Act, 1980 for diversion of the entire forest land located within the mining lease within a period of two years from 01.02.2013 i.e. the date of issue of guidelines by FC vide their letter-F. No. 11-362/ 2012-FC, failing which the mining lease area will be reduced to the non-forest area plus the forest area for which the project proponent had been able to obtain the FC at the end of this time period. In the case of reduction in mine lease area, the project proponent will need to get a revised mining plan approved from the competent authority for reduced area and enter into a new mining lease as per reduced lease area. The EC will be construed to be available for the mining lease area as per the revised mining lease deed.	**Compliance:** Forest Clearances for the entire prevailing forest land of 404.669Ha out of 406Ha of Mine Lease area had been regularised and the clearance copies are enclosed as **Annexure-I.** Forest clearance is in progress. **[Please refer Annexure-I]**
III	Till all the clearance are obtained for the proposed tailing pond/dam the project would only use existing tailing dam.	**Compliance:** No chrome ore beneficiation plant is operated in present days. Thus, there is no tailing pond/dam.
IV	Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the Standing Committee of National Board for Wildlife, as may be applicable to this project.	**Compliance:** The project area neither fall partly/wholly within any protected areas viz. wildlife sanctuary, national park, biosphere reserves or other eco sensitive zones nor within 10 Kms from the boundaries of such protected areas, thus clearance under the Wildlife (Protection) Act, 1972 from the Standing Committee of National Board for Wildlife is not applicable.
V	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 therein.	**Compliance:** The Consent to Establish had already been obtained from Odisha State Pollution Control Board vide letter no. 17750/IND-II-NOC-5664 dated 30.09.2013 and same has been vested for two years. Consent to Operate vide letter no. 14781/IND-I-CON-226 dated 01.10.2016 has been vested for two years. However, as

Sl. No	Specific Condition	Compliance Status (October'22 to March'23)
		per SPCB, Odisha office Memorandum No. 6181/ IND-I-Con (M)1603, Dated 16.07.2020, it has been stated that the new lessee shall apply for CTO a fresh from Board through the SPCB web portal (www.odocmms.nic.in), for a period not exceeding five years, with the applicable fees as notified in Gazette notification no. 1503 & 1504 dated 30.07.2012, published by Govt. of Odisha. Thus, we have obtained the new CTO as consent order No. 2950 issued vide letter No. 4175/IND-I-CON-226, dt. 20/03/2023, valid till 31.03.2024 in the name of TSML **[Please refer to Annexure-II]**
VI	Environmental Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No. 460 of 2004, as may be applicable to this project.	**Compliance:** Final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No. 460 of 2004, is awaited. The petition status from the website of Supreme court of India read as "***Pending for Motion hearing***"; however, this didn't affect the legal status of environmental clearance since the project area/ lease area neither falls partly/wholly within any protected areas (wildlife sanctuaries, national parks, biosphere reserves or any other sensitive zones) nor within 10kms from the boundaries of such protected areas concerning which the original petition was filed. We have not yet received any instructions from the Ministry of Environment, Forest & Climate Change in this regard. The previous Environmental Clearance is vested for 50 years.
VII	As part of ambient air quality monitoring during operational phase of the project, the air samples shall also be analysed for their mineralogical composition as may be so prescribed or notified by this Ministry and records maintained.	**Compliance:** The ambient air quality is monitored twice a week at six locations within the Core Zone. The air samples are also analysed for their mineralogical composition on quarterly basis. All the stipulated parameters are being analyses and reported in Annexure-III- Extracts on Environmental Monitoring. **[Please refer to Annexure-III]**
VIII	The ores and minerals shall be covered by tarpaulin or by such other means when transported out of the mine by road. The vehicles shall not be overloaded.	**Compliance:** Mineral and ores, transported out of the mine lease boundary to the various destinations are completely covered by tarpaulin and secured in position by plastic straps. Photographs are enclosed as Annexure-IV-Environmental Management Practices. **[Please refer to Annexure-IV]**
IX	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.	**Compliance:** To limit the fugitive emissions, following safeguard measures had been implemented: 1. Water sprinkling on haul road, transfer points, Ore stack yard, etc was ensured on regular basis. 2. Deployment of seven (7) water sprinklers (Four of 20 KL, two of 28KL and one of 15 KL) within mine area for haul road dust suppression and at mineral storage yards. 3. Stationary water sprinklers are installed and in operation on the main/permanent haul roads with permanent concrete bunds and maintenance areas and stack yard. 4. One automatic sprinkler was also installed at the truck parking area. 5. Two Number of mist canon are provided at the ore stackyard area to reduce the ore dust emission. The details of concrete road including provision of fixed water sprinkler are as follows: Table I: Movable and Fixed Water Sprinkler Details

<table>
<tr><th>Sl. No</th><th>Specific Condition</th><th>Compliance Status (October'22 to March'23)</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>Particulars</th><th>Location</th><th>Length(m)</th><th>Width(m)</th></tr>
<tr><td>Stationary Water sprinkling</td><td>Mine Haulage Road</td><td>5000</td><td>15</td></tr>
<tr><td rowspan="2">Fixed water sprinkling system</td><td>Concrete mining road (old & New)</td><td>800 &1050</td><td>-</td></tr>
<tr><td>Workshop</td><td>100</td><td>-</td></tr>
</table>
Ambient air quality is being monitored at six locations within the core zone/lease area as per NAAQS-2009 guidelines.
[Please refer to Annexure-III & IV]</td></tr>
<tr><td>X</td><td>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.</td><td>Compliance: Rainwater harvesting measures in the form of series of harvesting ponds were constructed in coordination with the Tata steel foundation, wing of Tata Steel at peripheral villages.
Presently, a fully functional roof top rainwater harvesting project (water harvesting potential of 1220m3) at the administrative office inaugurated in Oct 2014 is in working condition.
Construction of new rainwater harvesting structures are in progress.
[Please refer to Annexure-IV]</td></tr>
<tr><td>XI</td><td>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 piezometers during the mining operation. 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 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.</td><td>Compliance: Ground water is being monitored on monthly basis by a network of eight (08) piezometers constructed along the mine periphery.
Apart from this, regular monitoring of ground water around nearby villages is also conducted on quarterly basis at approx. ten (10) locations through a network of open wells/ dug wells.

As per the NOC obtained from CGWA three piezometers were fitted with Digital Water Level Recorder and telemetry system the credentials have been submitted to the CGWB and CGWA for remote surveillance.
Ground water monitoring is being carried in both core and buffer zones and reports are attached.

[Please refer to Annexure-III]</td></tr>
<tr><td>XII</td><td>The maximum height of the overburden dumps from its toe to the top of the dump on sloping ground shall not be more than 110 m. The dump slope shall be suitably terraced by leaving berms of adequate width in between lifts such that the overall slope angle (i.e. angle between the line joining the crest to the toe of the dump and across all such lifts with the horizontal) does not exceed 28 degrees.</td><td>Compliance: Overburden generated from mine is used for backfilling of the old quarry in line with the approved mine plan with benches of adequate slope and berm width. The entire OB-II over an area of 39Ha have been rehabilitated by native varieties of forestry saplings.
The dump slope will be suitably terraced by leaving berms of adequate width in between lifts such that the overall slope angle will be maintained <28 degrees.</td></tr>
<tr><td>XIII</td><td>The individual slopes and berms of each lift or bench of the overburden dump when completed shall be provided with adequate drainage arrangements or shall be suitably stabilized by such other means to prevent erosion due to surface run-offs.</td><td>Compliance: Adequate stabilization measures will be implemented for the dump slopes maintained with proper drainage network are outlined as follows:
1. Each tier of dump is provided with garland drains connected via concrete patch path for flow along the benches without creating gullies.</td></tr>
</table>

Sl. No	Specific Condition	Compliance Status (October'22 to March'23)
		2. Practices like coir matting and vetiver plantation on the slopes to prevent wash off and rain cuts on the surface. 3. Garland drains and settling pit will be constructed as per approved mining plan 4. Toe walls supporting the garland drains will be constructed all along the dump periphery. 5. De-siltation activities for the drainage network will ensured before the onset of monsoon and during post monsoon season every year. **[Please refer Annexure-IV]**
XIV	Adequate precautionary measures shall be taken for strengthening the dump foundation. Particularly while dumping over soft ground, the toe region all along the extremities of such dumps shall be suitably buttressed with hard rocky boulders after excavating the topsoil and soft ground. Dumping operations shall commence only after such preparatory work for the dump foundation is completed in order to prevent its failure, which may trigger a slide of the entire dump.	**Compliance:** Dumping is being carried out only after ensuring the preparatory works for the dump foundation and with careful consideration of the stability aspects.
XV	All external over burden dumps at the end of the mine life shall be reclaimed and rehabilitated by afforestation. Monitoring and management of rehabilitated areas shall 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.	**Compliance:** Rehabilitation of OB dumps will be carried out in accordance with the provisions of the approved mine plan and final mine closure plan.
XVI	Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, soil, mineral and OB dump(s) to prevent run off of water and flow of sediments directly into the Damsala Nallah and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly. Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and over burden dump(s) to prevent run off of water and flow of sediments directly into the Damsala Nallah and other water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 20 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and desilted at regular intervals.	**Compliance:** Garland drain and settling pits of appropriate dimensions will be constructed to arrest the silts and sediments during the wash out/runoff from the mine workings/dumps. The adequacy of the surface runoff management is to be assessed and validated while considering the rainfall data of the region. Entire surface runoff from the mine is guided up to the Effluent Treatment Plant of capacity 4500Kl/hr from where the treated effluent is reused/recycled back for greenbelt development & maintenance, dust suppression, drinking and other domestic utilities. Discharge of effluent beyond the mine lease is allowed only after adequate treatment preventing the silt/sediment surging into the adjoining areas/Dumsala Nallah.
XVII	Retaining wall having adequate dimensions shall be constructed at the toe of the over burden dumps to check run-off and siltation.	**Compliance:** Toe wall along with garland drains will be constructed if any new is required as per the mine plan.

Sl. No	Specific Condition	Compliance Status (October'22 to March'23)
		The ruptured retaining wall is boulder pitched & maintained around the periphery of the dump **[Please refer Annexure-IV]**
XVIII	Plantation shall be raised in an area of 384.44 ha 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 etc. after the completion of opencast mining activity 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.	**Compliance:** The plantation programme will be carried out as per the approved Mining Plan & Final Mine Closure Plan. The previous plantation details and proposed plantation programme is attached. **[Please refer Annexure-V]**
XIX	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 norms prescribed by the Central Pollution Control Board in this regard	**Compliance:** To limit the fugitive emissions, following safeguard measures were implemented: 1. Water sprinkling on haul road, transfer points, Ore stack yard, etc was ensured on regular basis. 2. Deployment of four (04) graders haul road maintenance & muck clearance along with water sprinklers for haul road dust suppression and at mineral storage yards. 3. Stationary water sprinklers have been installed and is in operation on the main/permanent haul roads, maintenance areas, stack yard, truck parking area, etc. Ambient air quality is monitored at six locations within the core zone/lease area as per NAAQS-2009 guidelines. **[Please refer Annexure-IV]**
XX	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 chrome and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.	**Compliance:** An Effluent Treatment Plant (ETP) of capacity 4500KL/hr designed with automated dosing system, clari-flocculator, and flash mixture, dry sludge collection system, multi-bed filtration system, etc, was in operation for surface runoff/mine water treatment. $FeSO_4$ is used as the reductant to ensure removal of Cr^{+6}. The effectiveness of the treatment was continuously monitored through real-time online monitoring system with Sensor based analysers for parameters like pH, TSS and Cr^{+6}. Apart from the continuous effluent monitoring system, samples from the Inlet & Outlet are also analysed at our laboratory (inhouse facility) on daily basis for all the operational shifts. Surface water samples are also analysed from the mine pits, runoffs form dumps, etc. by an OSPCB accredited third party on monthly basis and records are being maintained. No discharge of runoff/effluent is allowed without prior treatment and checking it's conformance with the permissible standards. **[Please Refer to Annexure-IV]**
XXI	The decanted water from the beneficiation plant shall be re-circulated within the plant and there shall be zero discharge.	**Compliance:** No Beneficiation pant, hence there will be no waste water generated.
XXII	Regular monitoring of water quality upstream and downstream of Damsala Nallah shall be carried out and record of monitoring data should be maintained and submitted to Ministry of Environment and Forests, its Regional Office, Bhubneswar, Central Groundwater Authority, Regional Director, Central Ground Water Board, State Pollution	**Compliance:** The monitoring of water quality at upstream and downstream of Damsala Nallah is being carried out by an OSPCB empanelled laboratory and the records were maintained and submitted to the State Pollution Control Board on monthly basis. Monitoring results were also submitted along with the compliance report to the MoEF&CC (regional Office) with the abstract of the monitoring results.

Sl. No	Specific Condition	Compliance Status (October'22 to March'23)
	Control Board and Central Pollution Control Board.	
XXIII	Appropriate mitigative measures shall be taken to prevent pollution of Damsala Nallah, if any, in consultation with the State Pollution Control Board.	**Compliance:** Following mitigative measures were implemented to prevent pollution of Damsala Nallah: 1. ETP with capacity of 4500Kl/hr, designed with settling pit, flash mixture, clarri-focculator, automatic dosing system, dry sludge collection system, multi sand filters etc. was in operation. 2. Treated water from the ETP was reused /recycled within the mine for various purposes like greenbelt, dust suppression, drinking water treatment etc. to minimize the discharge load on the Damsala Nallah. 3. No effluent was discharged beyond the mine premises without prior treatment and its conformance with the permissible discharge norms. 4. Effluents discharged from the outlet of ETP, which was monitored on real-time basis with continuous effluent monitoring system for parameters like pH, TSS, flow and Cr+6. 5. We have been utilising the mine effluents for drinking purpose within the camp since May'2018 after two stage treatment processes such as primary treatment at ETP with correction to suspended solids, pH, Hexavalent Chromium and secondary treatment at WTP with disinfection and other subsequent processes.
XXIV	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water for the project.	**Compliance:** The total water requirement is fulfilled from the ETP treated water. No surface water is now withdrawal for industrial use.
XXV	Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, Central Ground Water Board.	**Compliance:** One roof top rain-water harvesting structure had been constructed at Administrative office building which is working effectively. Rainwater harvesting measures were implemented through TSF wing of Tata Steel in the buffer areas. A series of surface impoundments (ponds) were constructed at Kakudia Village along the recharge line of the acquirer.
XXVI	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 not be overloaded.	**Compliance:** Monitoring of vehicular emission done on six monthly basis for the HEMMs deployed in Mining through a third party recognised by state transport authority. Regular conditioning monitoring of the HEMMs will be also carried out to keep the vehicle in good condition.
XXVII	Blasting operation shall be carried out only during the daytime. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	**Compliance:** The blasting operation is carried out during the lean hours of the day and in acceptance with the district administrative authority. In summer season, the timing is around 08:00A.M to 09:00A., whereas in other times the timing resorts to 01:00P.M to 2:0P.M. Practices like pre-wetting of blast, controlled blasting methods like pre-split blasting, use of both SME and NONEL, delay detonators were practiced ensuring ground vibration within permissible limits with improved fragmentation arresting fly rock & boulders and minimal dust generation.
XXVIII	Drills shall either be operated with dust extractors or equipped with water injection system.	**Compliance:** All the drills deployed within mine is equipped with in-built wet drilling facilities to reduce dust generation. Apart from this, the drill operators as well as workmen

Sl. No	Specific Condition	Compliance Status (October'22 to March'23)
		working in the dust prone areas are provided with adequate PPEs.
XXIX	Mineral handling plant shall be provided with either adequate number of high efficiency dust extraction system or water injection system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.	**Compliance:** No mineral handing plant (COB Plant).
XXX	Consent to operate shall be obtained from State Pollution Control Board prior to start of enhanced production from the mine.	**Compliance:** Consent to operate has been vested for two (02) years, however, we have obtained the new CTO as consent order No. 2950 issued vide letter No. 4175/IND-I-CON-226, dt. 20/03/2023, valid till 31.03.2024 in the name of TSML
XXXI	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and waste water generated during mining operation.	**Compliance:** A Sewage Treatment Plant of 1000KLD had been constructed as per BIS standard for domestic effluent/sewerage & the treated effluent is being reused for garden development. An oil and grease trap system fitted with oil skimmers is constructed in the workshop. The effluents free from oil and grease is completely recycled back for vehicle washing purpose. An ETP with capacity of 4500 Kl/hr having the facilities like, settling pit, flash mixture, clarri-flocculator, dry sludge collection system, multi sand filters, etc. had been constructed and in operation for the treatment of mine pit water and surface runoff. **[Please Refer to Annexure-IV]**
XXXII	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.	**Compliance:** Digital processing of the entire lease area using remote sensing technique is carried out for baseline information of land use pattern and the report was submitted to Ministry of Environment, Forests & Climate Change and its Regional Office, Bhubaneswar by previous lessee. After three years, we will submit to your good office.
XXXIII	Regular monitoring of ambient air quality including free silica shall be carried out and records maintained.	**Compliance:** Regular monitoring of ambient air quality is carried out at six locations as per NAAQS-2009 and the free silica in ambient air is monitored by personal dust sampling to assess the workforce's exposure to RPM in ambient air and %free silica content in it. The record is maintained. **[Please Refer to Annexure-III]**
XXXIV	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.	**Compliance:** Pre-Employment/Pre-placement medical examination is mandatorily ensured for employees prior to their joining. Apart from this, periodical medical examination (PME) is conducted for all and the records are maintained. Besides this the company is also undertaking various initiatives for the improvement in the occupational health and removing the safety hazards at industrial workplace.
XXXV	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna such as elephant etc. spotted in the buffer zone of the mine and contribute towards the cost of implementation of the plan and/or Regional Wildlife Management Plan for	**Compliance:** As per the Vesting order No. 5555/SM IV(B)SM-32/2020 Dated 29.06.2020 and amended vesting order No. 2357/SM, SM-MC1-MISC-0025-2020 Dated 15.03.2022 issued by the Office of Nodal Officer, Steel & Mines Department of Government of Odisha, Tata Steel Mining Limited (formerly known as T S Alloys Limited) has been vested with following Statutory Clearances/ permissions/ NOCs for 50years (As per

Sl. No	Specific Condition	Compliance Status (October'22 to March'23)
	conservation of flora and fauna so prepared by the State Forest and Wildlife Department. The amount so contributed shall be included in the project cost. A copy of action plan shall be submitted to the Ministry and its Regional Office, Bhubaneswar within 3 months.	MMDR Act, 2021). Thus, we have applied for same forest clearance in the name of Tata Steel Mining Limited vide letter no- TSML/MD/1221/FY22 dated on 15.09.2021.
XXXVI	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.	**Compliance:** A Final Mine Closure Plan along with details of Corpus Fund will be submitted to the Ministry of Environment, Forests & CC, 5 years in advance of final mine closure for approval.

B. General Conditions of Environmental Clearance

I	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	**Compliance:** There was no change in mining technology and scope of working. Mine is operated within the scope of the vested EC and approved mining plan.
II	The calendar plan quantity of excavation, chrome ore, beneficiated chrome concentrates, pyroxenite ore and waste shall not be exceeded.	**Compliance:** The calendar plan is followed as per approved mining plan.
III	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.	**Compliance:** Six ambient air quality monitoring stations (four in the work zone, one in residential area and one near dispensary) is established for ambient air quality monitoring in line with CPCB guidelines fulfilling the requirements of NAAQS-2009. Apart from this, quarterly monitoring is also done at 10 buffer zone locations in the nearby villages. Parameters monitored are as per NAAQS-2009. **[Please Refer to Annexure-III]**
IV	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.	**Compliance:** Following measures were implemented to control the noise level below 85dB(A) in the work environment. 1. DG sets were provided with acoustic enclosures. 2. The operator's cabin of all the HEMM's were fitted with air conditioner. 3. Use of Earmuffs/ Ear plugs is ensured by putting it in the list of mandatory PPEs for the operational workforce engaged in high noisy areas.
V	There will be zero waste water discharge from the plant.	**Compliance:** No beneficiation plant in existence.
VI	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.	**Compliance:** Persons working in dusty areas were provided with DGMS approved dust masks. Regular training programmes is conducted for the employees for raising awareness on health & safety aspects.
VII	Occupational health surveillance program of the workers should be undertaken periodically	**Compliance:** All the employees have to undergo periodical medical examination (PME) in hospital. To improve the occupational health and removing the safety hazards at

Sl. No	Specific Condition	Compliance Status (October'22 to March'23)
	to observe any contractions due to exposure to dust and take corrective measures, if needed.	industrial workplace, TSML has formulated "Zero harm" policy. Apart from this, persons engaged in mining operations are also tested for their exposure to free silica content in respirable air (RPM) on quarterly basis.
VIII	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.	**Compliance:** The Environmental Management Cell is headed by the Head SHE (Health, Safety & Environment) at the corporate level and is supported by Manager (Environment) and Environmental Monitoring Group at the site. The administrative reporting of the environmental functions is attributed with the Head Safety, Health & Environment who directly reports to the GM and MD. The Environmental Management Cell attached. **[Please Refer to Annexure-VI]**
IX	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.	**Compliance:** Separate budget is allocated for environmental protection measures every year and maintained under a separate cost centre. Actual Expenditure on Environmental Protection Measures will be reported at the end of the fiscal year i.e year ending 31st March 2024. [**Please Refer to Annexure-VII]**
X	The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	**Compliance:** Date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work is informed.
XI	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 data/ information/ monitoring reports.	**Compliance:** The mine management will be always extended full cooperation to officer(s) of Regional office by furnishing the requisite data/ information/ monitoring report as and when required.
XII	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office 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 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.	**Compliance:** Six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data will be submitted to the Ministry of Environment, Forests & Climate Change and it's Regional Office Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board in soft copy. six-monthly compliance from Oct'22 to March' 23 and from April'23 to September'23 will be submitted, a copy of the same will be uploaded in our company's website. www.tatasteelmining.com.
XIII	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad / Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom	**Compliance:** Earlier the Environment Clearance letters has sent to concerned Panchayat, Zila Parisad / Municipal Corporation, Urban Local Body. The same EC has been vested to TSML for 50 years.

Sl. No	Specific Condition	Compliance Status (October'22 to March'23)
	suggestions/representations, if any, where 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 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.	**Compliance:** Copy of the EC clearance letter has already been sent to Odisha State Pollution Control Board, its Regional office, District Industry Centre and the Collector's office/ Tehsildar's Office.
XV	The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned 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.	**Compliance:** The Environment Statement in Form-V is submitted earlier and will be submitted before 30th Sept of every year and the same is also uploaded in the company website. Copy of Environmental Statement will send to the State Pollution Control Board and to the Regional Office of MoEF&CC by e-mail.
XVI	The project authorities should advertise at least 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 had 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.	**Compliance:** The grant of Environmental Clearance is advertised earlier in the Oriya daily **"The Samaja"** (date: 11.09.2013, page-5) and in English daily "**The New Indian Express**" (date: 11.09.2013, page-5). Copy of the above advertisement is also forwarded to the Eastern Regional Office of the MoEF vide letter no. SCM/ ENV/ 012/066/13, dated 18.06.2013. Now the same EC has been vested to Sukinda Chromite Block, M/s. Tata Steel Mining Limited(TSML) for fifty (50) years.

C. Additional Conditions as per MoEFCC Letter No. 106-9/11/EPE dt. 02.12.2014 issued to all Non-Coal Mining Projects.

Sl. No.	Stipulated Condition	Compliance Status (October'22 to March'23)
a.	The project authority shall adopt best mining practices for given conditions in the mining area, adequate number of check dam, retaining wall/ structure, garland drains and settling ponds should be provided to arrest the wash off with rain water in catchment area.	**Compliance:** We are practicing best available mining technologies for given conditions in the mining area. Adequate number of check dam, retaining wall/ structure, garland drains and settling ponds will be provided to arrest the wash off with rain water in catchment area as per approved mining plan.
b.	The natural water bodies and or stream which are flowing in and around the village should not be disturbed. The water table should be nurtured so as not to go down below the pre-mining period. In case of any water scarcity in the area, the project authority has to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug well	**Compliance:** No such water bodies exist within mine lease area. Dumsla Nallah being the only water bodies flowing within the buffer zone of mine whereby mining operation doesn't have any direct intervention w.r.t diversion or alteration to its existence, however, effluents from mine is discharged into the streams of Dumsalla Nallah but only after ensuring

Sl. No.	Stipulated Condition	Compliance Status (October'22 to March'23)
		proper treatment within mine for which an ETP of capacity 4500Kl/hr is in operation. Ground water monitoring was regularly carried out by means of a network of open dug wells at 10 locations in the buffer zone i.e nearby villages on quarterly basis. Water harvesting and water recharge structure like pond will be constructed in nearby villages.
C.	The illumination and sound at night at project sites disturb the village in respect of both human and animal population. Consequent sleeping disorder and stress may affect the health in the village located close to mining operation. Habitations have a right to darkness and minimal noise level at night. The Project Proponents must ensure that the biological clock of the village is not disturbed by orienting the floodlights mask way from the village and keeping the noise levels well within prescribed limits for day/ night hours.	**Compliance:** No such long-range flood lights have been installed within mine. All Lighting masts installed within mine are oriented for optimal illumination within mine lease area. There are no such villages located in closed proximity to the mine other than village Kakudia, which is distantly located from the working pits and is near to OB dumps where mining operation (dumping) is no longer carried out since 2014 and more ever there lies a barrier of natural forest b/w dump and the village. Safety zone all along the lease periphery is maintained with plantation which also acts as a barrier.
d.	The project Authority shall make necessary alternative arrangement, where required, in consultation with state Government to provided alternated areas for livestock grazing. In this case context, the Project Authority should implement the direction of Hon'ble Supreme Court with regard to acquiring grazing land. The sparse tress on such grazing ground, which provides mid-day shelter from the scorching sun, should be scrupulously guarded felling lest the cattle abandon the grazing ground or return home by noon.	**Compliance:** The entire mine area of 406.00ha is of govt lands (404.669ha of forest land and 1.331ha of non-forest land). No such grazing land have been acquired by the company.
e.	Where ever blasting is undertaken as part of mining activity, the Project Authority shall carry out vibration studies well before approaching any such habitats or other building to evaluate the zone of influence and impact of blasting on neighbourhood. Within 500 meters of such sites vulnerable to blasting vibration, avoidance of use of explosives and adoption of alternative means of mineral extraction such as ripper/dozer combination/ rock breakers/ surface mineral etc should be seriously considered and practiced wherever practicable. A provision for monitoring of each blast should be made so that impact of blasting on nearby habitation and dwelling unit could be ascertained. The covenant of lease deed under rule 31 of MCR 1960 provided that no mining operation shall be carried out within 50 meters of public works such as public roads and building or inhabited sites except with prior permission from the competent Authority.	**Compliance:** Vibrations studies have been carried out earlier by CIMFR Dhanbad and recommendations there of are followed. Now the blast vibration study is being conducted by NIT, Rourkela and is in progress. Controlled blasting with the use of SME & NONEL and presplit blast is practiced minimizing ground vibration and Peak Particle velocity is monitored during blasting events. Public works such as public roads and building or inhabited sites are well away from the mine lease.
f.	Main haulage road in the mines should be provided with permanent water sprinkler and other road should be regularly wetted water tanker fitted with sprinkler. Crusher and material transfer points	**Compliance:** To limit the fugitive emissions, following safeguard measures are implemented:

Sl. No.	Stipulated Condition	Compliance Status (October'22 to March'23)
	should be invariably be provided with bag filter and or dry fogging system. Belt conveyor fully covered to avoid air borne dust.	1. Various control measures like Mobile water sprinkling on haul road, transfer points, Ore stack yard, etc is done on regular basis. 2. Mineral is dispatched by means of trucks and which are completely covered with tarpaulins and regulated by system generated transit permits which prevents overloading. 3. We have already installed two (02) numbers of mist canon system at our ore stack yard to minimize the dust pollution. 4. A new fixed water sprinkling system of 1050 mts is also operative to control the dust in the mining haul road. **[Please Refer to Annexure-IV]**
g.	The project Authority shall ensure that productivity of agriculture crops is not affected due to the mining operation. Crop Liability Insurance Policy has to be taken by PP as a precaution to compensate for the crop loss. The impact zone shall be 5 Km from the boundary of mine lease area for insurance policy. In case, several mines are located in cluster mines, formed inter – alia, to sub serve such and objective shall be responsibility for securing such Crop Liability Policy.	**Compliance:** The mine is surrounded by many mines owned by other lessees. So far there is no such potential adverse impact on the agricultural land had been evidence. However, in case of any such scenario is envisaged in future the same will be addressed in desired manner.
h.	In case any village is located within the mining leasehold which is not likely to be affected due to mining activities during the life of mine, the Expert Appraisal Committee (EAC) should consider the proposal of Environmental Clearance (EC) for reduced mining area. The mining lease may be executed for the area for which EC is accorded. The mining plan also accordingly revised and required stipulation under the MMDR Act 1957 and MCR 1969 met.	**Compliance:** There are no villages within the lease hold area of 406.0ha for which EC had been accorded by MoEF&CC.
i.	Transportation of minerals by road passing through the village shall not be allowed. A "bypass" road should be constructed (say leaving a gap of at least 200 m) for the purpose of transportation of minerals so that the impact of sound, dust and accidents could be mitigated. The PP shall bear the cost towards the widening and strengthening of existing public road network in case same is proposed to be used for the project. No road movement should be allowed on existing village road network without appropriately increasing carrying capacity of such road	**Compliance:** Mineral is transported via public Tamka-Mangalpur road maintained by state R&B. Transit of mineral is regulated by valid transit permits issued under Odisha Minerals (prevention of theft, smuggling, illegal mining and regulation of possession, storage trading and transportation) Rules,2007. During the construction phase, M/s. Tata Steel Limited has contributed in the construction of a major segments of the road from Kaliapani up to Kankadapal of 12Kms (approx.) in totality. In future, TSML will construct the road as required.
j.	Likewise, alteration or re-routing of foot paths, pagdandies, cart road and village infrastructure/ public utilities or roads (for purpose of land acquisition for mining) shall be avoided to extent possible and in such case acquisition is inevitable, alternative arrangements shall be made first and the only the area can be acquired. In these types of cases Inspection reports by site visit by expert may be insisted upon which should be done through reputed Institutes.	**Compliance:** Entire lease area of 406.0ha is govt. land (404.669ha of forest land and 1.331ha of non-forest land thus this project is not subjected to land acquisition.
k.	The CSR activates by companies including mining establishment has become mandatory up to 2% their financial turn over, socio Economic Development of	**Compliance:** CSR activities were undertaken by TSF dept. of Tata

Sl. No.	Stipulated Condition	Compliance Status (October'22 to March'23)
	neighborhood. Habitats could also be planned and executed by the PPs more systemically based on need based door to door survey by established Social Institute/ Workers on the lines as required under TOR. " R&R Plan// compensation details for Project Affected People (PAP) should be furnished. While preparing the R&R plant, the relevant State/ national Rehabillitation & Resettlement Policy should be kept in view. In respect of SCs and STs and weaker section of society in study, a need bashed sample survey, family-wise, should be undertaken to assess their requirement, and action programmes prepared and submitted accordingly, integrating the sectoral programs of line department of State Government. It may be clearly brought out whether the village including their R&R and socio-economics aspect should be discussed in EIA report.	Steel in and around the mine. Total expenditure on CSR fonts will be following the 2% obligation as per Companies Act attached in annexure. However, this mine is not subjected to land acquisition because the nature of land involved (govt. land) eliminating the R&R obligations of the company. [**Please Refer to Annexure-VIII]**

Annexure-I Forest Clearance-Sukinda Chromite Mines-Tata Steel

F. No. 8-78/ 1996-FC (pt.-I)
Government of India
Ministry of Environment, Forests and Climate Change
(Forest Conservation Division)

Indira Paryavaran Bhawan
Aliganj, Jorbagh Road
New Delhi –110 003
Dated: 3rd November, 2014

To,

The Principal Secretary (Forests),
Government of Odisha,
Bhubaneswar.

Sub: Diversion of 73.697 hectares of forest land in Sukinda Chromite Mines of M/s. TATA Steel Ltd. In Jajpur district during 3rd Renewal of mining lease (RML) period.

Sir,

I am directed to refer to the Government of Odisha's letter No 10F (Cons) 73/ 2014-8679/ F &E dated 9th May 2014 on the above mentioned subject, seeking prior approval of the Central Government under Section 2 of the Forest (Conservation) Act, 1980, and to say that the said proposal has been examined by the Forest Advisory Committee constituted by the Central Government under section-3 of the aforesaid Act.

2. After careful consideration of the proposal of the State Government of Odisha and on the basis of the recommendations of the Forest Advisory Committee, the Central Government hereby agrees to accord **stage-I approval** for the diversion of 73.697 hectares of forest land in Sukinda Chromite Mines of M/s. TATA Steel Ltd. In Jajpur district during 3rd Renewal of mining lease (RML) period, subject to the following conditions:

(i) Legal status of the diverted forest land shall remain unchanged;

(ii) Following activities shall be undertaken by the user agency at the project cost:

(a) A plan containing appropriate mitigative measures to minimize soil erosion and choking of streams shall be prepared and implemented;

(b) Planting of adequate drought hardy plant species and sowing of seeds in the appropriate area within the mining lease to arrest soil erosion;

(c) Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour;

(d) Stabilize the overburden dumps by appropriate grading/benching so as to ensure that that angles of repose at any given place is less than 28°; and

(e) Strict adherence to the prescribed top soil management.

(iii) State Government shall charge the Net Present Value (NPV) of the forest area diverted under this proposal from the user agency as per the Orders of the Hon'ble

Supreme Court of India dated 28.03.2008, 24.04.2008 and 09.05.2008 in Writ Petition (Civil) No. 202/1995 and the guidelines issued by this Ministry vide its letter No. 5-3/2007-FC dated 05.02.2009 in this regard;

(iv) At the time of payment of the Net Present Value (NPV) at the present rate, the user agency shall furnish an undertaking to pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;

(v) All the funds received from the User Agency under the project shall be transferred to Ad-hoc CAMPA in the concerned Saving Bank Account in Corporation Bank, Lodi Road, New Delhi-110003;

(vi) User agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986;

(vii) User agency shall maintain 7.50 meters wide strip all along the periphery of the mining lease as safety zone. No mining activity shall be undertaken in the safety zone;

(viii) State Government shall ascertain the status, as on 25th October 1980, of the area located in the mining lease which has been treated as 'non-forest' as per the Hal (present) record of rights and intimate the same to the Ministry of Environment and Forests, Government of India within a period of one month from the date of grant of stage-I approval;

(ix) User agency shall prepare a schedule of the surrender of the fully(biologically) reclaimed mined out forest land and submit the same to the Ministry of Environment and Forests before grant to stage-II approval under the FC Act;

(x) The User Agency shall pay the proportionate cost of implementation of Regional Wildlife Management Plan at revised cost; and

(xi) The user agency shall pay towards the cost of site specific conservation plan to be approved by the CWLW, Odisha for its implementation in leasehold as well as surrounding area.

(xii) User agency in consultation with the State Forest Department shall create and maintain alternate habitat/ home for the avifauna, whose nesting trees are to be cleared in this project. Bird nests artificially made out of eco-friendly materials shall be used in the area, including forest area and human settlements, adjoining the forest area being diverted for the project;

(xiii) User agency either himself or through the State Forest Department shall undertake fencing, protection and afforestation of the safety zone area (7.5 meter strip all along the outer boundary of the area identified to undertake mining), at the project cost;

(xiv) User agency either himself or through the State Forest Department shall undertake afforestation on degraded forest land, one and half time in extent to the area used for safety zone;

(xv) Period of diversion of the said forest land under this approval shall be for a period co-terminus with the period of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, and the Rules framed there-under, subject to a maximum period of 20 years;

(xvi) User agency either himself or through the State Forest Department shall undertake gap planting and soil & moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.4), if any, located in the area within 100 meters from outer perimeter of the mining lease;

(xvii) User agency shall undertake de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required;

(xviii) User agency shall undertake mining in a phased manner and take due care for reclamation of the mined over area. The concurrent reclamation plan shall be executed by the User Agency as per the approved mining plan/scheme and an annual report on implementation thereof shall be submitted to the Nodal Officer, Forest (Conservation) Act, 1980, Government of Odisha and the Addl. Principal Chief Conservator of Forests (Central), Ministry of Environment & Forests, Regional Office (Eastern Zone), Bhubaneswar. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the user agency, the Nodal Officer or the Addl. Principal Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities are satisfactorily executed;

(xix) No labour camp shall be established on the forest land;

(xx) User agency shall provide firewood preferably alternate fuel to the labourers and the staff working at the site so as to avoid any damage and pressure on the adjacent forest areas;

(xxi) Boundary of the mining lease and safety zone shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, forward and back bearing and distance from pillar to pillar;

(xxii) Forest land shall not be used for any purpose other than that specified in the proposal;

(xxiii) State Government shall complete settlement of rights, in term of the Scheduled Tribes and Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, if

03/11/2017

any, on the forest land to be diverted and submit the documentary evidence as prescribed by this Ministry in it's letter No. 11-9/1998-FC (pt.) dated 3rd August 2009, in support thereof;

(xxiv) Any other condition that the Regional Office (Eastern Zone), Bhubaneswar of this Ministry, Bhubaneswar may stipulate, from time to time, in the interest of conservation, protection and development of forests & wildlife; and

(xxv) User agency and the State Government shall ensure compliance to provisions of the all Acts, Rules, Regulations and Guidelines, for the time being in force, as applicable to the project.

3. After receipt of the report on compliance to the conditions stipulated in the paragraph-2 above, from the Government of Odisha, final/ stage-II approval for diversion of the said forest under Section-2 of the Forest (Conservation) Act, 1980 will be issued by this Ministry. Transfer of the said forest land to the user agency shall not be affected by the Government of Odisha till final/stage-II approval for its diversion is issued by this Ministry.

4. However, pending receipt of report on compliance to the conditions stipulated in paragraph-2 above and grant of final/stage-II approval under the Forest (Conservation) Act, 1980 for diversion of the said forest land, State Government may allow the user agency to undertake mining, as per the approved mining plan, in the already broken up forest land being diverted for mining purposes (as per the approved land use plan), for a period not exceeding one year from the date of issue of this letter.

5. Stage-I approval and Working Permission for mining over already broken up area is subject to in-principle decision of the authority in the State Government in terms of section 8(3) of the Mines and minerals (Development and Regulation) Act, 1957 that in the interest of mineral development it is necessary to renew the lease.

Yours faithfully,

(H. C. Chaudhary)
Director

Copy to:

1. The Principal Chief Conservator of Forests, Government of Odisha, Bhubaneswar.
2. The Nodal Officer, the Forest (Conservation) Act, 1980, the Government of Odisha, Bhubaneswar.
3. The Addl. Principal Chief Conservator of Forests (Central), Regional Office (Eastern Zone), Bhubaneswar.
4. User Agency.
5. Monitoring Cell, FC Division, MoEF, New Delhi.
6. Guard File.

(H. C. Chaudhary)
Director

No.10F (Con) 51/2018 11885/F&E, Bhubaneswar, dated the 23.05.18

ORDER

Sub: Diversion of balance 330.972 ha. of sabik kisam forest land as on 25.10.1980 in addition to already diverted forest land of 73.697ha. for Chromite mining in their Sukinda Chromite Mine in Jajpur District under Cuttack Forest Division by M/s TATA STEEL LIMITED

WHEREAS, M/s Tata Steel Limited, At/PO Kalarangiatta, Dist. Jajpur, Odisha had applied for diversion of balance 330.972 ha. of sabik kisam forest land as on 25.10.1980 in addition to already diverted forest land of 73.697ha. for Chromite mining in their Sukinda Chromite Mine in Jajpur District under Cuttack Forest Division by them.

And whereas, the Ministry of Environment, Forests and Climate Change (hereinafter referred to as MoEF&CC), Government of India, had accorded 'in-principle' approval for diversion of balance 330.972 ha. of sabik kisam forest land as on 25.10.1980 in addition to already diverted forest land of 73.697ha. for Chromite mining in their Sukinda Chromite Mine in Jajpur District under Cuttack Forest Division by M/s Tata Steel Limited vide its letter F.No. 8-15/2016-FC dt. 4.7.2017 (ANNEXURE-1).

And whereas, the MoEF&CC, Government of India, in consideration of the compliance of the conditions of the 'in-principle' approval, has accorded final approval for diversion of said 330.972ha. of forest land for Chromite mining in their Sukinda Chromite Mine in Jajpur District under Cuttack Forest Division by M/s Tata Steel Limited vide its letter F. No. 8-15/2016-FC dt.18.5.2018 **(Annexure-2)** under Section 2 of the Forest (Conservation) Act, 1980. Detailed land schedule of 330.972ha. of diverted forest land(4 pages) duly authenticated by Tahasildar, Sukinda as received earlier from PCCF, Odisha vide his letter No. 11780 dt 13.6.2016 is appended herewith as **Annexure-3.**

Now therefore, the Government of Odisha, do hereby allow diversion of above mentioned 330.972ha forest land in Cuttack Forest Division of Jajpur district in favour of M/s Tata Steel Limited as per approved land use pattern subject to fulfillment of the conditions of final forest clearance order as stipulated by the MoEF&CC, Government of India.

The Collector of Jajpur district is authorized to handover the diverted forest land to the user agency **subject to having valid lease and compliance of Court's order, if any,** following due procedure of law. Before handing over the diverted forest land to the user

1

agency, it shall be ensured that Net Present Value for forest land for this project as well as for any other projects, belonging to same user agency, is deposited, in full, at applicable rates.

The Divisional Forest Officer of Cuttack Forest Division is also directed to monitor compliance to the conditions stipulated for such diversion in the respective forest/Wildlife clearance order and to report violations, if any, to the Nodal Officer, O/O Pr. CCF, Odisha and to the Forest & Environment Department.

Execution of project activities will be subject to availability of all other statutory clearances required under relevant Act/Rules for this infrastructure project, deposit of requisite funds and compliance of Court's order, if any.

By order of Governor

22/5/18

(Debidutta Biswal)

Special Secretary to Government

Memo No. 11886 /F&E, Dated: 23.05.18

Copy along with the copy of Annexure 1 , Annexure-2 and Annexure-3 above forwarded to the Principal Chief Conservator of Forests, Odisha for kind information and necessary follow up action.

Appropriate instruction to the Divisional Forest Officer of Cuttack Forest Division and user agency may be imparted for required follow up action at his end. It may be ensured by the Divisional Forest Officer that Net Present Value for the forest land involved in this project of user agency as well as for any other projects of the same user agency, is deposited by them in appropriate head of account in Adhoc-CAMPA in full, at applicable rates. The user agency may also be instructed to furnish compliance to the conditions of forest/Wild life clearance pertaining to the project in every quarter to the Divisional Forest Officer of Cuttack Division for facilitating monitoring of compliances.

22/5/18

Special Secretary to Government

Memo No. 11887 /F&E. Dated: 23.05.18

Copy along with the copy of annexures as above forwarded to the Asst. Inspector General of Forests, Government of India, MoEF&CC(FC Division), Indira Paryavaran Bhawan, Jor Bagh ,Aliganj Road, New Delhi, Pin-110003/Addl. Principal Chief Conservator of Forests(Central), MoEF&CC, Government of India, A/3, Chandrasekharpur, Bhubaneswar for kind information and necessary follow up action in compliance to the order of Hon'ble NGT dt. 7.11.2012 in Appeal No. 7/2012 communicated by the MoEF, Government vide their letter F. No.7-23/2012-FC dt. 24.7.2013.

22/5/18

Special Secretary to Government

Memo No. 11888 /F&E, Dated: 23.05.18

Copy along with the copy of annexures as above forwarded to the Pr. CCF(WL)&CWLW, Odisha/Director, Environment, F&E department/ Member Secretary, [illegible] for information and necessary action.

Memo No. 11889 /F&E, Dated: 23.05.18

Copy along with the copy of annexures as above forwarded to the Regional Chief Conservator of Forests, Angul/ Collector, Jajpur /Divisional Forest Officer, Cuttack Forest Division for information and immediate necessary compliance.

It may be ensured by the Divisional Forest Officer that Net Present Value for the forest land involved in this project of user agency as well as for any other projects of the same user agency, shall be deposited by them in full at applicable rates in appropriate head of account in Adhoc-CAMPA before handing over of the forest land to user agency. Besides, funds, if any, due to be deposited by the user agency in this project shall also be deposited by the project proponent before the forest land is handed over to them. The user agency may also be instructed to furnish compliance to the conditions of forest/Wild life clearance pertaining to the project in every quarter to the Divisional Forest Officer concerned for facilitating monitoring of compliances by them.

The Divisional Forest Officer of Cuttack Division is **also instructed to ensure that the direction given to the user agency a re executed immediately.**

23/5/18

Special Secretary to Government

Memo No. 11890 /Dated. 23.05.18

Copy along with the copy of annexures as above forwarded to the Steel & Mines Department /Revenue & Disaster Management Department for information and necessary follow action.

23/5/18

Special Secretary to Government

Memo No. 11891 /Dated. 23.05.17

Copy along with the copy of annexures as above forwarded to the Private Secretary to Minister of Forest & Environment Department for kind information of Hon'ble Minister.

23/5/18

Special Secretary to Government

Memo No. 11892 /Dated. 23.05.18

Copy along with the copy of the enclosures forwarded to M/s Tata Steel Limited, At/PO Kalarangiatta, Dist. Jajpur, Odisha for information and immediate necessary action.

The user agency is asked to take following actions immediately as per orders of Hon'ble National Green Tribunal dt. 7.11.2012 in Appeal No. 7/2012 communicated by the MoEF, Government vide their letter F. No.7-23/2012-FC dt. 24.7.2013.

(i) ***They shall publish the entire forest clearance granted in verbatim along with conditions and safeguards imposed by the Central Government in Stage-I/II forest clearance in two widely circulated daily newspapers, one in vernacular language and the other in English language so as to make people aware of the permission granted to the Project for use of forest land for non-forest purposes.***

(ii) ***They shall submit the copies of forest clearance orders granted by the Central Government/State Government to the Heads of local bodies and Municipal bodies along with the relevant offices of the State Government, who in turn, shall display the same for 30 days from date of receipt.***

(iii) ***Detailed action taken in compliance to the above order of State Government shall be intimated to the DFO, Cuttack/RCCF, Angul/Pr. CCF, Odisha/F&E***

the user agency on account of this project shall also be deposited in Adhoc-CAMPA Account.

The user agency shall furnish compliances to the conditions prescribed in the forest/wildlife clearance order to the Divisional Forest Officer of Cuttack Division in every quarter, for the purpose of monitoring by him.

22/5/18

Special Secretary to Government

Memo No. 11893 Dated- 23.05.18

Copy with copy of enclosure forwarded to the O.I.C., State Portal, N.I.C., I.T., Department, Odisha Secretariat, Bhubaneswar/ M/s Luminous Infoways Pvt. Ltd, Sadhana, N-6/373, Nayapalli, Jayadev Vihar, Bhubaneswar-15 for information and necessary action. They are requested to upload this letter along with enclosed forest clearance order of Government of India, MoEF&CC, in the website of Forest & Environment Department **immediately** for information of all concerned. **This is required in compliance to order of Hon'ble National Green Tribunal dt. 7.11.2012 in Appeal No. 7/2012. Hence this may be done unfailingly.**

22/5/18

Special Secretary to Government.

Memo No. 11894 Dated- 23.05.18

Copy with copy of enclosure forwarded to the Under Secretary to Government, Office Establishment Section, F&E Department for information and necessary action with reference to their letter No.21646/F&E Dt. 22.11.2016.

22/5/18

Special Secretary to Government

Annexure – II: Consent to Operate-Sukinda Chromite Block-Tata Steel Mining Limited

BY REGD. POST WITH AD

STATE POLLUTION CONTROL BOARD, ODISHA

[DEPARTMENT OF FOREST, ENVIRONMENT & CLIMATE CHANGE, GOVERNMENT OF ODISHA]
A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012
Phone-2561909, Fax: 2562822, 2560955 E-mail: paribesh1@ospcboard.org, Website: www.ospcboard.org

CONSENT ORDER

No. 4145 / IND-I-CON-226 Dt. 20.03.2023 /

CONSENT ORDER NO. 2950

Sub: **Consent for discharge of sewage and trade effluent under section 25/26 of Water (PCP) Act, 1974 and for existing / new operation of the plant under section 21 of Air (PCP) Act, 1981.**

Ref: Your online application No. 4628711 dated 08-01-2023 .

Consent to operate is hereby granted under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 and under section 21 of Air (Prevention & Control of Pollution) Act, 1981 and rules framed thereunder to

Name of the Industry: **SUKINDA CHROMITE BLOCK OF M/S. TATA STEEL MINING LTD.**

Name of the Occupier & Designation: **SRI PANKAJ KUMAR SATIJA, MANAGING DIRECTOR**

Address: **AT/PO: KALARANGIATTA, DIST: JAJPUR**

This consent order is valid for the period from **01.04.2023 to 31.03.2024.**

Details of Products Manufactured :

Sl. No	Product	Quantity
01.	Chrome ore(ROM)	0.6 MTPA

This consent order is valid for the specified outlets, discharge quantity and quality, specified chimney/stack, emission quantity and quality of emissions as specified below. This consent is granted subject to the general and special conditions stipulated therein.

A. Discharge permitted through the following outlet subject to the standard

Outlet No.	Description of outlet	Point of discharge	Quantity of discharge KL/hr	Pre-scribed Standard							
				pH	TSS (mg/l)	BOD (mg/l)	COD (mg/l)	Oil & Grease (mg/l)	Cr+6 (mg/l)	Total Chromium (mg/l)	Fecal Coliform (MPN/100ml)
01	Outlet of STP (Domestic effluent)	Reused for plantation	800 KLD	6.5 to 9.0	100	30	--	--	--	--	<1000
02.	Mine drainage water / surface run off/ other wastewater	On land / inland surface water body	19800	5.5 to 9.0	100	--	--	10	0.05	2.0	-

B. Emission permitted through the following stack subject to the prescribed standard

Chimney Stack No.	Description of Stack	Stack height (m)	Quantity of emission	Prescribed Standard				

C. Disposal of solid waste permitted in the following manner

Sl. No.	Type of Solid waste	Quantity generated (TPD)	Quantity to be reused on site(TPD)	Quantity to be reused off site(TPD)	Quantity disposed off (TPD)	Description of disposal site.
01.	Top soil / overburden	As per approved mining plan	--	--	--	As per approved mining plan

.

D. GENERAL CONDITIONS FOR ALL UNITS

1. The consent is given by the Board in consideration of the particulars given in the application. Any change or alteration or deviation made in actual practice from the particulars furnished in the application will also be the ground liable for review/variation/revocation of the consent order under section 27 of the Act of Water (Prevention & Control of Pollution) Act, 1974 and section 21 of Air (Prevention & Control of Pollution) Act, 1981 and to make such variations as deemed fit for the purpose of the Acts.

2. The industry would immediately submit revised application for consent to operate to this Board in the event of any change in the quantity and quality of raw material / and products / manufacturing process or quantity /quality of the effluent rate of emission / air pollution control equipment / system etc.

3. The applicant shall not change or alter either the quality or quantity or the rate of discharge or temperature or the route of discharge without the previous written permission of the Board.

4. The application shall comply with and carry out the directives/orders issued by the Board in the consent order and at all subsequent times without any negligence on his part. In case of non-compliance of any order/directives issued at any time and/or violation of the terms and conditions of this consent order, the applicant shall be liable for legal action as per the provisions of the Law/Act.

5. The applicant shall make an application for grant of fresh consent at least 90 days before the date of expiry of this consent order.

6. The issuance of this consent does not convey any property right in either real or personal property or any exclusive privileges nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State laws or regulation.

7. This consent does not authorize or approve the construction of any physical structure or facilities or the undertaking of any work in any natural water course.

8. The applicant shall display this consent granted to him in a prominent place for perusal of the public and inspecting officers of this Board.

9. An inspection book shall be opened and made available to Board's Officers during the visit to the factory.

10. The applicant shall furnish to the visiting officer of the Board any information regarding the construction, installation or operation of the plant or of effluent treatment system / air pollution control system / stack monitoring system any other particulars as may be pertinent to preventing and controlling pollution of Water / Air.

11. Meters must be affixed at the entrance of the water supply connection so that such meters are easily accessible for inspection and maintenance and for other purposes of the Act provided that the place where it is affixed shall in no case be at a point before which water has been taped by the consumer for utilization for any purposes whatsoever.

12. Separate meters with necessary pipe-line for assessing the quantity of water used for each of the purposes mentioned below:

    a) Industrial cooling, spraying in mine pits or boiler feed.
    b) Domestic purpose.
    c) Process.

13. The applicant shall display suitable caution board at the place where the effluent is entering into any water body or any other place to be indicated by the Board, indicating therein that the area into which the effluents are being discharged is not fit for the domestic use/bathing.

14. Storm water shall not be allowed to mix with the trade and/or domestic effluent on the upstream of the terminal manholes where the flow measuring devices will be installed.

15. The applicant shall maintain good house-keeping both within the factory and the premises. All pipes, valves, sewers and drains shall be leak-proof. Floor washing shall be admitted into the effluent collection system only and shall not be allowed to find their way in storm drains or open areas.

16. The applicant shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems install or used by him to achieve with the term(s) and conditions of the consent.

17. Care should be taken to keep the anaerobic lagoons, if any, biologically active and not utilized as mere stagnation ponds. The anaerobic lagoons should be fed with the required nutrients for effective digestion. Lagoons should be constructed with sides and bottom made impervious.

18. The utilization of treated effluent on factory's own land, if any, should be completed and there should be no possibility of the effluent gaining access into any drainage channel or other water courses either directly or by overflow.

19. The effluent disposal on land, if any, should be done without creating any nuisance to the surroundings or inundation of the lands at any time.

20. If at any time the disposal of treated effluent on land becomes incomplete or unsatisfactory or create any problem or becomes a matter of dispute, the industry must adopt alternate satisfactory treatment and disposal measures.

21. The sludge from treatment units shall be dried in sludge drying beds and the drained liquid shall be taken to equalization tank.

22. The effluent treatment units and disposal measures shall become operative at the time of commencement of production.

23. The applicant shall provide port holes for sampling the emissions and access platform for carrying out stack sampling and provide electrical outlet points and other arrangements for chimneys/stacks and other sources of emissions so as to collect samples of emission by the Board or the applicant at any time in accordance with the provision of the Act or Rules made therein.

24. The applicant shall provide all facilities and render required assistance to the Board staff for collection of samples / stack monitoring / inspection.

25. The applicant shall not change or alter either the quality or quantity or rate of emission or install, replace or alter the air pollution control equipment or change the raw material or manufacturing process resulting in any change in quality and/or quantity of emissions, without the previous written permission of the Board.

26. No control equipments or chimney shall be altered or replaced or as the case may be erected or re-erected except with the previous approval of the Board.

27. The liquid effluent arising out of the operation of the air pollution control equipment shall be treated in the manner and to con ofl standards prescribed by the Board in accordance with the provisions of Water (Prevention and Control of Pollution) Act, 1974 (as amended).

28. The stack monitoring system employed by the applicant shall be opened for inspection to this Board at any time.

29. There shall not be any fugitive or episodal discharge from the premises.

30. In case of such episodal discharge/emissions the industry shall take immediate action to bring down the emission within the limits prescribed by the Board in conditions/stop the operation of the plant. Report of such accidental discharge /emission shall be brought to the notice of the Board within 24 hours of occurrence.

31. The applicant shall keep the premises of the industrial plant and air pollution control equipments clean and make all hoods, pipes, valves, stacks/chimneys leak proof. The air pollution control equipments, location, inspection chambers, sampling port holes shall be made easily accessible at all times.

32. Any upset condition in any of the plants/parts of the factory which is likely to result in increased effluent discharge/emission of air pollutants and / or result in violation of the standards mentioned above shall be reported to the Headquarters and Regional Office of the Board by fax / speed post within 24 hours of its occurrence.

33. The industry has to ensure that minimum three varieties of trees are planted at the density of not less than 1000 trees per acre. The trees may be planted along boundaries of the industries or industrial premises. This plantation is stipulated over and above the bulk plantation of trees in that area.

34. The solid waste such as sweeping, wastage packages, empty containers residues, sludge including that from air pollution control equipments collected within the premises of the industrial plants shall be disposed off scientifically to the satisfaction of the Board, so as no to cause fugitive emission, dust problems through leaching etc., of any kind.

35. All solid wastes arising in the premises shall be properly classified and disposed off to the satisfaction of the Board by :
   i) Land fill in case of inert material, care being taken to ensure that the material does not give rise to leachate which may percolate into ground water or carried away with storm run-off.
   ii) Controlled incineration, wherever possible in case of combustible organic material.
   iii) Composting, in case of bio-degradable material.

36. Any toxic material shall be detoxicated if possible, otherwise be sealed in steel drums and buried in protected areas after obtaining approval of this Board in writing. The detoxication or sealing and burying shall be carried out in the presence of Board's authorized persons only. Letter of authorization shall be obtained for handling and disposal of hazardous wastes.

37. If due to any technological improvement or otherwise the Board is of opinion that all or any of the conditions referred to above requires variation (including the change of any control equipment either in whole or in part) the Board shall after giving the applicant an opportunity of being heard, vary all or any of such condition and thereupon the applicant shall be bound to comply with the conditions so varied.

38. The applicant, his/her/its/legal representatives or assignees shall have no claim whatsoever to the condition or renewal of this consent after the expiry period of this consent.

39. The Board reserves the right to review, impose additional conditions or condition, revoke, change or alter the terms and conditions of this consent.

40. Notwithstanding anything contained in this conditional letter of consent, the Board hereby reserves to it the right and power under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 to review any and/or all the conditions imposed herein above and to make such variations as deemed fit for the purpose of the Act by the Board.

41. The conditions imposed as above shall continue to be in force until revoked under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 and section 21 A of Air (Prevention & Control of Pollution) Act, 1981.

42. In case the consent fee is revised upward during this period, the industry shall pay the differential fees to the Board (for the remaining years) to keep the consent order in force. If they fail to pay the amount within the period stipulated by the Board the consent order will be revoked without prior notice.

43. The Board reserves the right to revoke/refuse consent to operate at any time during period for which consent is granted in case any violation is observed and to modify/ stipulate additional conditions as deemed appropriate.

Annexure-III EXTRACTS OF ENVIRONMENTAL MONITORING

(PERIOD: Oct'2022 to Mar'2023)

1. Air Quality Monitoring: CORE ZONE

01. COB Plant

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Pb µg/m3	Arsenic ng/m3	Nickel ng/m3
Oct'22	60.7	32.5	11	18.4	0.6	9.2	BDL	BDL	BDL	BDL	BDL	BDL
Nov'22	60.8	33	11	18.5	0.6	9.3	BDL	BDL	BDL	BDL	BDL	BDL
Dec'22	60.3	31.2	10.8	18.3	0.6	9.3	BDL	BDL	BDL	BDL	BDL	BDL
Jan'23	61.2	32.8	11	18.2	0.6	9.9	BDL	BDL	BDL	BDL	BDL	BDL
Feb'23	62.2	33.9	11.3	18.7	0.7	10.3	BDL	BDL	BDL	BDL	BDL	BDL
Mar'23	62.6	33.9	11.9	19.1	0.67	10.6	BDL	BDL	BDL	BDL	BDL	BDL

02. VIEW POINT

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Pb µg/m3	Arsenic ng/m3	Nickel ng/m3
Oct'22	60.4	33.2	8.7	16.6	0.5	7.9	BDL	BDL	BDL	BDL	BDL	BDL
Nov'22	60.7	32.3	8.7	16.6	0.5	7.7	BDL	BDL	BDL	BDL	BDL	BDL
Dec'22	60.8	31.3	8.5	16.3	0.5	7.6	BDL	BDL	BDL	BDL	BDL	BDL
Jan'23	61.7	32.9	8.5	16.1	0.5	7.4	BDL	BDL	BDL	BDL	BDL	BDL
Feb'23	62.5	33.9	8.7	16.4	0.5	7.6	BDL	BDL	BDL	BDL	BDL	BDL
Mar'23	63.3	33.9	8.7	16.5	0.55	7.5	BDL	BDL	BDL	BDL	BDL	BDL

03. STACKYARD

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Pb µg/m3	Arsenic ng/m3	Nickel ng/m3
Oct'22	61.8	32.8	11.8	17.6	0.5	8	BDL	BDL	BDL	BDL	BDL	BDL
Nov'22	61.5	32.6	11.8	17.6	0.5	8	BDL	BDL	BDL	BDL	BDL	BDL
Dec'22	61.5	32.3	11.9	17.8	0.5	8.2	BDL	BDL	BDL	BDL	BDL	BDL
Jan'23	62.5	33.4	12.1	17.9	0.5	8.4	BDL	BDL	BDL	BDL	BDL	BDL
Feb'23	63.3	34.4	12.2	18.2	0.5	8.5	BDL	BDL	BDL	BDL	BDL	BDL
Mar'23	63.8	34.5	12.5	18.4	0.5	8.7	BDL	BDL	BDL	BDL	BDL	BDL

04.PARADEEP GATE

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Pb µg/m3	Arsenic ng/m3	Nickel ng/m3
Oct'22	61.7	33.8	10.4	18.5	0.5	9	BDL	BDL	BDL	BDL	BDL	BDL
Nov'22	61	32.2	10.3	18.5	0.5	8.9	BDL	BDL	BDL	BDL	BDL	BDL
Dec'22	61	31.8	10.3	18.5	0.5	9	BDL	BDL	BDL	BDL	BDL	BDL
Jan'23	62	33.3	10.4	18.6	0.5	8.9	BDL	BDL	BDL	BDL	BDL	BDL
Feb'23	62.7	34.2	10.6	19	0.5	9	BDL	BDL	BDL	BDL	BDL	BDL
Mar'23	63.5	34.1	10.6	19.1	0.56	9.3	BDL	BDL	BDL	BDL	BDL	BDL

05. NICKEL GUEST HOUSE

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Pb µg/m3	Arsenic ng/m3	Nickel ng/m3
Oct'22	58.4	31.8	10.4	16.2	0.5	7.4	22.2	BDL	BDL	BDL	BDL	BDL
Nov'22	59.5	31.8	10.4	15.9	0.5	7.4	22	BDL	BDL	BDL	BDL	BDL
Dec'22	59.8	31.8	10.6	16	0.5	7.5	22.1	BDL	BDL	BDL	BDL	BDL
Jan'23	61.2	33	10.9	16.2	0.6	7.9	22.6	BDL	BDL	BDL	BDL	BDL
Feb'23	62	33.8	11.3	16.6	0.6	8.1	23	BDL	BDL	BDL	BDL	BDL
Mar'23	62.7	33.7	11.5	16.8	0.57	8.2	23.3	BDL	BDL	BDL	BDL	BDL
Mar'23	62.7	33.7	11.5	16.8	0.57	8.2	23.3	BDL	BDL	BDL	BDL	BDL

06. LABORATORY TOP

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Pb µg/m3	Arsenic ng/m3	Nickel ng/m3
Oct'22	61.5	32.8	11.7	18.4	0.5	8.9	22.1	BDL	BDL	BDL	BDL	BDL
Nov'22	61.6	31.9	11.7	18.5	0.5	8.7	22.1	BDL	BDL	BDL	BDL	BDL
Dec'22	61.2	31.7	11.8	18.5	0.5	8.8	22.6	BDL	BDL	BDL	BDL	BDL
Jan'23	61.8	33.1	12	18.6	0.5	9.2	23.2	BDL	BDL	BDL	BDL	BDL
Feb'23	62.4	34.2	12.5	19.4	0.5	9.5	24.6	BDL	BDL	BDL	BDL	BDL
Mar'23	63.1	33.8	12.5	19.5	0.53	9.8	24.1	BDL	BDL	BDL	BDL	BDL

2. Air Quality Monitoring: BUFFER ZONE

1. BIRASAL VILLAGE

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	Pb µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Arsenic ng/m3	Nickel ng/m3
Dec'22	65.3	34.1	6	13.5	0.37	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar'22	65.7	35.2	6.1	13.9	0.35	BDL	BDL	BDL	BDL	BDL	BDL	BDL

2. KANHEIPAL VILLAGE

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	Pb µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Arsenic ng/m3	Nickel ng/m3
Dec'22	62.2	31.9	6.5	13.6	0.32	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar'22	62.8	34.1	6.3	14.1	0.33	BDL	BDL	BDL	BDL	BDL	BDL	BDL

3. KHARKHARI VILLAGE

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	Pb µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Arsenic ng/m3	Nickel ng/m3
Dec'22	54.6	32.8	5.9	12.8	0.41	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar'22	63.8	34.2	6.7	14.2	0.37	BDL	BDL	BDL	BDL	BDL	BDL	BDL

5. KAKUDIA VILLAGE

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	Pb µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Arsenic ng/m3	Nickel ng/m3
Dec'22	61.7	32.2	6.2	11.5	0.31	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar'22	62.6	34.1	6.3	13.7	0.33	BDL	BDL	BDL	BDL	BDL	BDL	BDL

6. SENDHESWAR VILLAGE

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	Pb µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Arsenic ng/m3	Nickel ng/m3
Dec'22	64.2	33.9	5.8	10.6	0.38	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar'22	64.9	34.5	6.2	12.3	0.39	BDL	BDL	BDL	BDL	BDL	BDL	BDL

7. LAXMIDHARPUR VILLAGE

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	Pb µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Arsenic ng/m3	Nickel ng/m3
Dec'22	59.8	32.5	6.4	14.8	0.36	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar'22	62.3	33.9	6.5	14.5	0.38	BDL	BDL	BDL	BDL	BDL	BDL	BDL

8. SUKARANGI VILLAGE

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	Pb µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Arsenic ng/m3	Nickel ng/m3
Dec'22	62.8	32.7	6.8	14.5	0.38	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar'22	63.1	34.5	6.6	15.2	0.39	BDL	BDL	BDL	BDL	BDL	BDL	BDL

9. MARUABIL VILLAGE

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	Pb µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Arsenic ng/m3	Nickel ng/m3
Dec'22	61.9	32.6	7.3	14.7	0.35	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar'22	62.5	33.7	7.5	15.1	0.37	BDL	BDL	BDL	BDL	BDL	BDL	BDL

10. KALARANGI VILLAGE

Monthly Average	PM10 µg/m3	PM2.5 µg/m3	SO2 µg/m3	NOx µg/m3	CO mg/m3	O3 µg/m3	Pb µg/m3	NH3 µg/m3	Benzene µg/m3	Benzo(a)Pyrene ng/m3	Arsenic ng/m3	Nickel ng/m3
Dec'22	62.4	32.4	7.2	14.2	0.36	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mar'22	62.2	33.8	7.1	14.4	0.38	BDL	BDL	BDL	BDL	BDL	BDL	BDL

3. DG STACK 1000KVA

DG-1	PARAMETER	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
	Stack Temp 0c	194	195	197	198	195	197
	Stack Velocity in m/sec	18.3	18.2	18.6	19.1	19.3	19.6
	Particulate Matter, PM, (mg/Nm^3)	81	70	71	72	73	72
	Oxides of Nitrogen as NOx (mg/Nm3)	71	66	68	66	68	65
	Carbon Monoxide as (mg/Nm3)	84	80	81	85	83	80
	Non-Methyl Hydro Carbon (as C) (mg/Nm3)	33.8	32.7	31.4	32.6	31.9	31.5

DG-2	PARAMETER	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
	Stack Temp 0c	185	188	185	187	188	193
	Stack Velocity in m/sec	17.6	177	17.9	18.3	18.2	18.5

Particulate Matter, PM, (mg/Nm³)	86	71	73	74	71	70
Oxides of Nitrogen as NOx (mg/Nm3)	68	69	67	68	69	67
Carbon Monoxide as (mg/Nm3)	82	82	83	88	86	84
Non-Methyl Hydro Carbon (as C) (mg/Nm3)	30.6	30.4	30.2	31.8	31.4	31.1

4. AMBIENT NOISE MONITORING

Sl. No	LOCATION	Oct'22 Noise Level in dB(A)		LOCATION Noise Level in dB(A)	Oct'22 Noise level in dB(A)	
		Day Time	Night Time		Day Time	Night Time
1	COB Plant Gate	71.7	65.5	Main Gate	64.5	58.2
2	Canteen	64.5	60.2	Market Complex	62.2	55.5
3	Work shop	73.8	67.8	Security control room	60.6	58.4
4	Stack Yard Office	66.6	60.5	Post office	59.5	53.7
5	DG Shed	70.5	65.2	Study Center	54.3	47.4
6	Mining Gate	69.3	64.7	WTP	62.6	56.8
7	View Point	70.1	65.5	STP	56.8	50.2
8	Paradeep Gate	68.2	63.3	Shishu mandir	57.1	48.2
9	Near ETP	65.8	60.4	Children Park	61.4	54.5
10	DECO Parking Area	73.5	68.2	3 RSF Quarters	58.5	51.8

Sl. No	LOCATION	Nov'22 Noise Level in dB(A)		LOCATION	Nov'22 Noise level in dB(A)	
		Day Time	Night Time		Day Time	Night Time
1	COB Plant Gate	72.5	66.1	Main Gate	65.2	58.8
2	Canteen	63.7	58.8	Market Complex	60.4	54.2
3	Work shop	74.2	66.6	Hospital	62.7	57.5
4	Stack Yard Office	65.8	59.3	Post office	57.5	53.4
5	DG Shed	71.7	66.2	Study Center	52.8	47.8
6	Mining Gate	68.5	62.5	WTP	61.2	55.3
7	View Point	66.3	60.7	STP	58.9	52.7
8	Paradeep Gate	65.8	60.3	Shishu mandir	55.3	49.1
9	Near ETP	68.2	61.9	Children Park	60.8	53.4
10	DECO Parking Area	70.4	68.5	3 RSF Quarters	56.6	50.2

Sl. No	LOCATION	Dec'22 Noise Level in dB(A)		LOCATION	Dec'22 Noise level in dB(A)	
		Day Time	Night Time		Day Time	Night Time
1	COB Plant Gate	70.4	66.8	Main Gate	64.8	58.3
2	Canteen	63.2	57.5	Market Complex	61.5	57.6
3	Work shop	73.5	68.8	Hospital	61.9	56.9
4	Stack Yard Office	66.7	60.4	Post office	58.6	54.4
5	DG Shed	72.2	68.5	Study Center	52.6	48.4
6	Mining Gate	67.3	63.2	WTP	60.8	54.8
7	View Point	65.5	60.8	STP	60.7	55.3
8	Paradeep Gate	66.4	62.4	Shishu mandir	54.4	49.5
9	Near ETP	67.7	61.2	Children Park	61.2	55.2
10	DECO Parking Area	71.2	67.9	3 RSF Quarters	55.7	51.4

Sl. No	LOCATION	Jan'23 Noise Level in dB(A)		LOCATION	Jan'23 Noise level in dB(A)	
		Day Time	Night Time		Day Time	Night Time
1	COB Plant Gate	71.3	67.1	Main Gate	65.7	62.5
2	Canteen	65.1	61.5	Market Complex	60.4	57.8
3	Work shop	71.4	68.5	Hospital	62.3	57.4
4	Stack Yard Office	64.8	60.2	Post office	59.2	56.9
5	DG Shed	71.5	67.2	Study Center	53.5	53.7
6	Mining Gate	65.2	61.4	WTP	62.7	49.5
7	View Point	68.4	64.6	STP	61.8	54.7
8	Paradeep Gate	64.4	60.1	Shishu mandir	53.2	48.4
9	Near ETP	66.8	62.5	Children Park	60.2	53.1
10	DECO Parking Area	70.2	67.9	3 RSF Quarters	56.8	53.4

Sl. No	LOCATION	Feb'23 Noise Level in dB(A)		LOCATION	Feb'23 Noise level in dB(A)	
		Day Time	Night Time		Day Time	Night Time
1	COB Plant Gate	68.9	65.2	Main Gate	66.2	62.1
2	Canteen	63.6	60.1	Market Complex	58.8	53.3
3	Work shop	72.3	68.7	Hospital	61.5	58.4
4	Stack Yard Office	62.5	58.7	Post office	57.6	51.7
5	DG Shed	72.3	68.2	Study Center	54.5	50.1
6	Mining Gate	64.4	60.5	WTP	57.8	55.7
7	View Point	66.8	62.6	STP	60.5	56.4
8	Paradeep Gate	63.5	60.1	Shishu mandir	52.8	49.2
9	Near ETP	65.8	62.3	Children Park	60.5	53.9
10	DECO Parking Area	68.5	65.4	3 RSF Quarters	56.2	52.7

Sl. No	LOCATION	Mar'23 Noise Level in dB(A)		LOCATION	Mar'23 Noise level in dB(A)	
		Day Time	Night Time		Day Time	Night Time
1	COB Plant Gate	67.3	64.5	Main Gate	65.7	60.8
2	Canteen	64.8	61.3	Market Complex	57.2	52.1
3	Work shop	71.7	67.7	Hospital	62.2	57.2
4	Stack Yard Office	64.5	59.8	Post office	58.4	52.4
5	DG Shed	71.2	67.4	Study Center	53.3	51.7
6	Mining Gate	65.1	61.6	WTP	55.6	56.9
7	View Point	67.1	60.8	STP	59.4	55.1
8	Paradeep Gate	62.3	59.2	Shishu mandir	53.5	48.4
9	Near ETP	64.9	61.4	Children Park	61.4	54.5
10	DECO Parking Area	67.8	63.2	3 RSF Quarters	55.8	53.7

5. MINERALOGICAL COMPOSITION (RESULTS IN %)

PARAMETER	VIEW POINT		COB PLANT		PARADEEP GATE		NICKEL GUEST HOUSE	
	Dec'22	Mar'23	Dec'22	Mar'23	Dec'22	Mar'23	Dec'22	Mar'23
Cr2O3	24.2	25.2	25.1	26.1	23.6	24.9	24.1	24.8
Fe2O3	10.1	10.5	11.4	11.7	12.2	12.5	11.1	11.6

MnO2	4.3	4.5	3.9	3.4	4.1	4.2	3.9	4.1
SiO2	28.4	28.5	30.5	30.7	31.1	21.4	29.4	29.6
Al2O3	13.6	13.9	12.4	12.5	13.1	13.4	11.5	12.6
MgO	16.4	16.8	15.9	16.1	16.1	16.5	14.8	15.2
CaO	5.3	5.5	4.8	4.9	5	5.2	4.9	5.1

PARAMETER	Laboratory Top		Stack Yard	
	Dec'22	Mar'23	Dec'22	Mar'23
Cr2O3	22.2	23.5	25.8	26.2
Fe2O3	12.6	13.1	11.9	12.1
MnO2	2.8	3.1	4.3	4.5
SiO2	27.6	28.4	32.3	32.5
Al2O3	14.6	14.4	12.9	13.1
MgO	16.2	16.7	15.7	15.9
CaO	5.6	5.7	5.1	5.3

6. WATER QUALITY MONITORING

1. DRINKING WATER

DW1. WTP-INLET

Sl. No	Parameter	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
1	pH at 250C	7.23	7.21	7.22	7.18	7.17	7.20
2	Colour	<5	<5	<5	<5	<5	<5
3	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Total Hardness	158	163	166	157	158	162
5	Turbidity	7.1	6.8	6.4	2.1	2.3	2.4
6	Total Dissolved Solids	574	498	452	423	432	446
7	Chloride as Cl	41.5	42.4	41.8	38.9	39.8	38.6
8	Dissolve Oxygen	6.8	6.4	6.6	6.2	6.4	6.5
9	Calcium as Ca	52.5	48.9	48.2	46.5	47.6	45.7
10	Magnesium as Mg	19.0	9.9	11.1	9.9	9.5	11.6
11	Sulphate as SO4	9.3	8.9	8.5	8.1	7.8	7.3
12	Fluoride as F	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13	Iron as Fe	0.49	0.48	0.46	0.42	0.41	0.43
14	Total Chromium as Cr	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Hexavalent Chromium as Cr+6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Mercury as Hg	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
17	Pesticide	Absent	Absent	Absent	Absent	Absent	Absent
18	Fecal Coliform	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
19	Nickel (as Ni)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
20	Total alkalinity as CaCO3	92	96	98	92	90	92
21	Manganese as Mn	0.046	0.041	0.038	<0.03	<0.03	<0.03
22	Free Residual Chlorine	ND	ND	ND	ND	ND	ND
23	Anionic Detergents	ND	ND	ND	ND	ND	ND
24	Ammonia (as total ammonia-N)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
25	Aluminium (as Al)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

DW2. WTP-OUTLET

Sl. No	Parameter	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
1	pH at 25 degree C	7.71	7.24	7.23	7.20	7.22	7.24

2	Colour	<5	<5	<5	<5	<5	<5
3	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Total hardness	149	153	158	152	160	166
5	Turbidity	4.5	4.7	4.8	2.3	2.5	2.2
6	Total Dissolved Solids	342	352	361	352	376	385
7	Chloride as Cl	28.4	24.4	24.6	26.1	28.7	29.4
8	Dissolve Oxygen	5.1	5.2	5.3	5.1	5.3	5.6
9	Calcium as Ca	31.6	31.6	31.4	32.2	31.5	32.6
10	Magnesium as Mg	17.0	18.0	19.3	17.4	19.8	20.6
11	Sulphate as SO4	7.4	6.8	6.9	6.6	6.9	6.4
12	Fluoride as F	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13	Iron as Fe	0.24	0.26	0.28	0.26	0.32	0.38
14	Total Chromium as Cr	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Hexavalent Chromium as Cr+	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Mercury as Hg	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
17	Pesticide	Absent	Absent	Absent	Absent	Absent	Absent
18	Fecal Coliform	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
19	Nickel as Ni	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
20	Total Alkalinity as CaCO3	68	72	76	73	76	78
21	Manganese as Mn	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
22	Free Residual Chlorine	ND	ND	ND	ND	ND	ND
23	Anionic Detergents	ND	ND	ND	ND	ND	ND
24	Ammonia as (Total ammonia-N	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
25	Aluminium as Al	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

DW3. Tap water near DECO Canteen

Sl. No	Parameter	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
1	pH at 25 degree C	7.19	7.18	7.17	7.15	7.16	7.19
2	Colour	<5	<5	<5	<5	<5	<5
3	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Total hardness	152	150	152	149	152	158
5	Turbidity	3.7	3.6	3.9	1.9	2.1	2.3
6	Total Dissolved Solids	279	324	331	329	344	367
7	Chloride as Cl	23.5	23.5	23.2	22.1	24.5	25.4
8	Dissolve Oxygen	5.5	5.4	5.6	5.2	5.5	5.8
9	Calcium as Ca	34.5	33.2	32.8	32.6	33.4	36.1
10	Magnesium as Mg	16.0	16.3	17.0	16.4	16.7	16.5
11	Sulphate as SO4	7.9	7.2	7.1	6.9	6.7	6.2
12	Fluoride as F	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13	Iron as Fe	0.29	0.24	0.25	0.28	0.36	0.38
14	Total Chromium as Cr	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Hexavalent Chromium as Cr+	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Mercury as Hg	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004

17	Pesticide	Absent	Absent	Absent	Absent	Absent	Absent
18	Fecal Coliform	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
19	Nickel as Ni	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
20	Total Alkalinity as CaCO3	55	64	66	68	74	76
21	Manganese as Mn	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
22	Free Residual Chlorine	ND	ND	ND	ND	ND	ND
23	Anionic Detergents	ND	ND	ND	ND	ND	ND
24	Ammonia as (Total ammonia-N	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
25	Aluminium as Al	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

DW4.Water near Stack Yard

Sl. No	Parameter	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
1	pH at 25 degree C	7.28	7.29	7.24	7.21	7.20	7.22
2	Colour	<5	<5	<5	<5	<5	<5
3	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Total hardness	155	160	163	158	157	160
5	Total Suspended Solid	3.6	4.5	4.3	2.0	1.9	2.0
6	Total Dissolved Solids	352	348	355	347	352	360
7	Chloride as Cl	32.2	24.8	24.6	22.9	23.6	26.2
8	Dissolve Oxygen	5.8	4.9	4.8	4.6	4.8	5.1
9	Calcium as Ca	34.6	32.9	32.7	32.1	34.2	35.9
10	Magnesium as Mg	16.7	18.9	19.8	18.9	17.4	17.1
11	Sulphate as SO4	8.1	7.4	7.2	7.0	7.1	7.3
12	Fluoride as F	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13	Iron as Fe	0.26	0.22	0.23	0.25	0.29	0.32
14	Total Chromium as Cr	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Hexavalent Chromium as Cr+	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Mercury as Hg	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
17	Pesticide	Absent	Absent	Absent	Absent	Absent	Absent
18	Fecal Coliform				<1.1	<1.1	<1.1
19	Nickel as Ni	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
20	Total Alkalinity as CaCO3	58	74	76	71	73	75
21	Manganese as Mn	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
22	Free Residual Chlorine	ND	ND	ND	ND	ND	ND
23	Anionic Detergents	ND	ND	ND	ND	ND	ND
24	Ammonia as (Total ammonia-N	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
25	Aluminium as Al	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

DW5.Water near Jagannath Temple

Sl. No	Parameter	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
1	pH at 25 degree C	7.75	7.25	7.22	7.19	7.21	7.24

2	Colour	<5	<5	<5	<5	<5	<5
3	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Total hardness	145	155	154	153	155	157
5	Total Suspended Solid	3.8	4.0	4.2	1.7	1.8	1.9
6	Total Dissolved Solids	359	341	372	364	368	372
7	Chloride as Cl	31.6	23.9	23.6	24.5	24.9	25.5
8	Dissolve Oxygen	5.5	5.6	5.3	5.0	5.1	5.3
9	Calcium as Ca	35.9	32.3	31.4	30.8	31.2	33.1
10	Magnesium as Mg	13.5	18.1	18.4	18.5	18.7	18.1
11	Sulphate as SO4	8.2	7.4	7.4	7.2	7.5	7.4
12	Fluoride as F	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13	Iron as Fe	0.25	0.24	0.24	0.23	0.25	0.29
14	Total Chromium as Cr	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Hexavalent Chromium as Cr+	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Mercury as Hg	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
17	Pesticide	Absent	Absent	Absent	Absent	Absent	Absent
18	Fecal Coliform	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
19	Nickel as Ni	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
20	Total Alkalinity as CaCO3	62	67	73	72	75	74
21	Manganese as Mn	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
22	Free Residual Chlorine	ND	ND	ND	ND	ND	ND
23	Anionic Detergents	ND	ND	ND	ND	ND	ND
24	Ammonia as (Total ammonia-N	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
25	Aluminium as Al	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

DW6. Water near COB Plant

Sl. No	Parameter	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
1	pH at 25 degree C	7.34	7.2	7.20	7.18	1.19	7.21
2	Colour	<5	<5	<5	<5	<5	<5
3	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Total hardness	132	151.0	159.0	158.0	157.0	161.0
5	Total Suspended Solid	3.3	4.3	4.1	2.1	2.2	2.1
6	Total Dissolved Solids	321	347	356	335	341	354
7	Chloride as Cl	27.8	24.8	24.7	23.4	24.1	24.9
8	Dissolve Oxygen	5.2	5.5	5.1	4.9	4.9	5.0
9	Calcium as Ca	33.4	31.1	30.6	30.4	31.6	32.8
10	Magnesium as Mg	11.8	17.8	20.1	19.9	19.0	19.2
11	Sulphate as SO4	8.5	6.9	6.5	6.3	6.5	6.2
12	Fluoride as F	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13	Iron as Fe	0.32	0.25	0.23	0.22	0.21	0.24
14	Total Chromium as Cr	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Hexavalent Chromium as Cr+	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

16	Mercury as Hg	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
17	Pesticide	Absent	Absent	Absent	Absent	Absent	Absent
18	Fecal Coliform	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
19	Nickel as Ni	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
20	Total Alkalinity as CaCO3	54	69	71	68	69	72
21	Manganese as Mn	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
22	Free Residual Chlorine	ND	ND	ND	ND	ND	ND
23	Anionic Detergents	ND	ND	ND	ND	ND	ND
24	Ammonia as (Total ammonia-N	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
25	Aluminium as Al	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

DW7- Tap water canteen From TSML Canteen

Sl. No	Parameter	Oct'22	Nov'22	Jan'23	Feb'23	Mar'23
1	pH at 25 degree C	7.23	7.2	7.17	7.18	7.23
2	Colour	<5	<5	<5	<5	<5
3	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Total hardness	138	154.0	148.0	150.0	155.0
5	Total Suspended Solid	3.6	4.5	2.3	2.1	2.2
6	Total Dissolved Solids	347	352	348	350	361
7	Chloride as Cl	26.5	24.1	24.2	24.6	26.1
8	Dissolve Oxygen	4.9	5.0	5.0	5.2	5.5
9	Calcium as Ca	32.8	32.1	31.6	32.8	33.1
10	Magnesium as Mg	13.6	17.9	16.8	16.5	17.6
11	Sulphate as SO4	8.8	6.7	6.6	6.7	6.5
12	Fluoride as F	<0.1	<0.1	<0.1	<0.1	<0.1
13	Iron as Fe	0.35	0.23	0.21	0.23	0.27
14	Total Chromium as Cr	<0.05	<0.05	<0.05	<0.05	<0.05
15	Hexavalent Chromium as Cr+	<0.01	<0.01	<0.01	<0.01	<0.01
16	Mercury as Hg	<0.004	<0.004	<0.004	<0.004	<0.004
17	Pesticide	Absent	Absent	Absent	Absent	Absent
18	Fecal Coliform			<1.1	<1.1	<1.1
19	Nickel as Ni	<0.1	<0.1	<0.1	<0.1	<0.1
20	Total Alkalinity as CaCO3	60	66	66	72	75
21	Manganese as Mn	<0.03	<0.03	<0.03	<0.03	<0.03
22	Free Residual Chlorine	ND	ND	ND	ND	ND
23	Anionic Detergents	ND	ND	ND	ND	ND
24	Ammonia as (Total ammonia-N	<0.1	<0.1	<0.1	<0.1	<0.1
25	Aluminium as Al	<0.1	<0.1	<0.1	<0.1	<0.1
26	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

2. GROUND WATER

A. (GROUND WATER CORE ZONE)

Sl. No	Parameter	Tube well Infront of Main gate	Tube well Near Market Complex	Tube well Infront of Main gate	Tube well Near Market Complex	Tube well Infront of Main gate	Tube well Near Market Complex
		Oct'22		Nov'22		Dec'22	
1	pH at 250C	7.31	7.49	7.33	7.48	7.34	7.45
2	Turbidity	1.5	<1	1.6	<1	1.5	<1
3	Total Hardness	105	120	108	123	110	126
4	Alkalinity	85	86	82	84	85	88
5	Total Dissolved Solids	219	242	213	238	218	241
6	Chloride as Cl	46.5	38.9	45.9	37.4	46.2	38.1
7	Residual free Chlorine	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8	Dissolve Oxygen	6.3	6	6.2	6.1	6.1	6.3
9	Calcium as Ca	39.5	38.5	38.9	38.1	38.4	39.1
10	Magnesium as Mg	1.8	6.6	2.6	6.8	3.43	6.89
11	Sulphate as SO4	16.7	15.7	15.2	15.9	15.1	16.2
12	Fluoride as F	0.23	0.19	0.22	0.18	0.23	0.19
13	Nitrate	1.95	1.93	1.96	1.91	1.94	1.89
14	Hexavalent Chromium as Cr+6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15	Cyanide (as CN)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Arsenic (as As)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
17	Iron as Fe	0.52	0.43	0.55	0.46	0.56	0.44
18	Lead (as Pb)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
19	Zinc (as Zn)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
20	Copper (as Cu)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
21	Manganese (as Mn)	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
22	Mercury as Hg	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
23	Cadmium (as Cd)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Boron (as B)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
25	Selenium (as Se)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26	Mineral Oil	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

B. (GROUND WATER CORE ZONE)

Sl. No	Parameter	Tube well Infront of Main gate	Tube well Near Market Complex	Tube well Infront of Main Gate	Tube well Near Market Complex	Tube well Infront of Main Gate	Tube well Near Market Complex
		Jan'23		Feb'23		Mar'23	
1	pH at 25 degree C	7.25	7.34	7.27	7.31	7.29	7.33
2	Turbidity	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
3	Total Hardness	106	116	112	120	120	124
4	Alkalinity	82	84	84	86	86	89
5	Total Dissolved Solids	211	225	216	231	223	232
6	Chloride as Cl	42.2	36.9	41.2	37.5	42.3	39.8

7	Residual free Chlorine	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8	Dissolve Oxygen	5.4	5.8	5.4	5.8	5.5	5.9
9	Calcium as Ca	36.7	35.2	37.4	36.4	37.9	36.8
10	Magnesium as Mg	3.5	6.8	4.5	7.1	6.2	7.8
11	Sulphate as SO4	13.2	14.6	13.9	15.2	14.2	15.8
12	Fluoride as F	0.18	0.15	0.13	0.11	0.12	0.13
13	Nitrate	1.52	1.74	1.47	1.71	1.45	1.68
14	Hexavalent Chromium as Cr+6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15	Cyanide (as CN)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	Arsenic (as As)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
17	Iron as Fe	0.52	0.39	0.55	0.38	0.52	0.45
18	Lead (as Pb)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
19	Zinc (as Zn)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
20	Copper (as Cu)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
21	Manganese (as Mn)	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
22	Mercury as Hg	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
23	Cadmium (as Cd)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Boron (as B)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
25	Selenium (as Se)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
26	Mineral Oil	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

C. (GROUND WATER BUFFER ZONE)

Sl. No	Parameter	Village Kanheipal	Village Sukarangi	Village Kaliapani	Village Kalarangi	Village Laxmidharpur
		Dec'22				
1	Colour	CL	CL	CL	CL	CL
2	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	<1	<1	<1	<1	<1
5	Total Dissolved Solids as TDS	112	128	131	105	123
6	pH at 250C	7.35	7.68	7.49	7.42	7.74
7	Aluminium (as Al)	<0.1	<0.1	<0.1	<0.1	<0.1
8	Ammonia (as total ammonia-N)	<0.1	<0.1	<0.1	<0.1	<0.1
9	Anionic Detergents	<0.2	ND	ND	ND	ND
10	Barium as Ba	<0.05	<0.05	<0.05	<0.05	<0.05
11	Boron as B	<0.1	<0.1	<0.1	<0.1	<0.1
12	Calcium as Ca	29.8	24.5	26.2	30.8	28.7
13	Chloride as Cl	18.6	24.2	23.1	14.5	18.2
14	Copper as Cu	<0.02	<0.02	<0.02	<0.02	<0.02
15	Fluoride as F	0.21	0.16	0.23	0.18	0.17
16	Free Residual Chlorine	ND	ND	ND	ND	ND
17	Iron as Fe	0.24	0.26	0.18	0.22	0.23
18	Magnesium as Mg	11.6	4.3	6.2	12.3	11.1
19	Manganese as Mn	<0.025	<0.025	<0.025	<0.025	<0.025
20	Mineral Oil	<0.5	<0.5	<0.5	<0.5	<0.5
21	Nitrate as NO3	3.7	5.5	4.1	3.9	3.8
22	Phenolic Compound	<0.05	<0.05	<0.05	<0.05	<0.05
23	Selenium as Se	<0.001	<0.001	<0.001	<0.001	<0.001
24	Silver as Ag	<0.1	<0.1	<0.1	<0.1	<0.1
25	Sulphate as SO4	6.9	9.4	6.2	6.7	5.8
26	Sulphide	<0.05	<0.05	<0.05	<0.05	<0.05
27	Total alkalinity as CaCO3	53	47	61	45	39
28	Total Hardness	94	78	83	87	91
29	Zinc as Zn	<0.03	<0.03	<0.03	<0.03	<0.03

30	Cadmium as Cd	<0.01	<0.01	<0.01	<0.01	<0.01
31	Cyanide as CN	<0.05	<0.05	<0.05	<0.01	<0.01
32	Lead as Pb	<0.02	<0.004	<0.004	<0.02	<0.02
33	Mercury as Hg	<0.004	<0.002	<0.002	<0.004	<0.004
34	Molybdenum as Mo	<0.05	<0.05	<0.05	<0.05	<0.05
35	Nickel (as Ni)	<0.1	<0.1	<0.1	<0.1	<0.1
36	Pesticide	Absent	Absent	Absent	Absent	Absent
37	Poly aromatic Hydrocarbon as PAH	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
38	Arsenic as As	<0.004	<0.004	<0.004	<0.004	<0.004
39	Total Chromium as Cr	<0.01	<0.01	<0.01	<0.1	<0.1
40	Total Coliform	<1.8	<1.8	<1.8	<1.8	<1.8

Sl. No	Parameter	Village Kakudia	Village Maruabil	Village Sandeswar	Village Birasal	Village Kharkhari
		Dec'22				
1	Colour	CL	CL	CL	CL	CL
2	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	<1	<1	<1	<1	<1
5	Total Dissolved Solids as TDS	110	115	97	128	121
6	pH at 250C	7.68	7.24	7.39	7.22	7.87
7	Aluminium (as Al)	<0.1	<0.1	<0.1	<0.1	<0.1
8	Ammonia (as total ammonia-N)	<0.1	<0.1	<0.1	<0.1	<0.1
9	Anionic Detergents	<0.2	<0.2	ND	ND	<0.2
10	Barium as Ba	<0.05	<0.05	<0.05	<0.05	<0.05
11	Boron as B	<0.1	<0.1	<0.1	<0.1	<0.1
12	Calcium as Ca	21.9	26.4	25.8	24.2	23.5
13	Chloride as Cl	15.8	14.7	16.5	22.1	17.4
14	Copper as Cu	<0.02	<0.02	<0.02	<0.02	<0.02
15	Fluoride as F	0.22	0.18	0.23	0.24	0.19
16	Free Residual Chlorine	ND	ND	ND	ND	ND
17	Iron as Fe	0.26	0.24	0.19	0.21	0.2
18	Magnesium as Mg	10.3	11.5	12.8	8.2	9.4
19	Manganese as Mn	<0.025	<0.025	<0.025	<0.025	<0.025
20	Mineral Oil	<0.5	<0.5	<0.5	<0.5	<0.5
21	Nitrate as NO3	3.9	3.2	4.5	3.8	5.2
22	Phenolic Compound	<0.05	<0.05	<0.05	<0.05	<0.05
23	Selenium as Se	<0.001	<0.001	<0.001	<0.001	<0.001
24	Silver as Ag	<0.1	<0.1	<0.1	<0.1	<0.1
25	Sulphate as SO4	6.2	8.1	8.5	4.8	8.3
26	Sulphide	<0.05	<0.05	<0.05	<0.05	<0.05
27	Total alkalinity as CaCO3	44	46	49	41	48
28	Total Hardness	82	84	94	89	82
29	Zinc as Zn	<0.03	<0.03	<0.03	<0.03	<0.03
30	Cadmium as Cd	<0.01	<0.01	<0.01	<0.01	<0.01
31	Cyanide as CN	<0.01	<0.01	<0.05	<0.05	<0.05
32	Lead as Pb	<0.02	<0.02	<0.02	<0.02	<0.02
33	Mercury as Hg	<0.004	<0.004	<0.004	<0.004	<0.004
34	Molybdenum as Mo	<0.05	<0.05	<0.05	<0.05	<0.05
35	Nickel (as Ni)	<0.1	<0.1	<0.1	<0.1	<0.1
36	Pesticide	Absent	Absent	Absent	Absent	Absent
37	Poly aromatic Hydrocarbon as PAH	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
38	Arsenic as As	<0.004	<0.004	<0.004	<0.004	<0.004
39	Total Chromium as Cr	<0.1	<0.1	<0.1	<0.1	<0.01
40	Total Coliform	<1.8	<1.8	<1.8	<1.8	<1.8

D. (GROUND WATER BUFFER ZONE)

Sl. No	Parameter	Village Kanheipal	Village Sukarangi	Village Kaliapani	Village Kalarangi	Village Laxmidharpur
		Mar'23				
1	Colour	CL	CL	CL	CL	CL
2	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	<1	<1	<1	<1	<1
5	Total Dissolved Solids as TDS	110	117	98	124	119
6	pH at 250C	7.51	7.35	7.42	7.29	7.69
7	Aluminium (as Al)	<0.1	<0.1	<0.1	<0.1	<0.1
8	Ammonia (as total ammonia-N)	<0.1	<0.1	<0.1	<0.1	<0.1
9	Anionic Detergents	<0.2	<0.2	<0.2	<0.2	<0.2
10	Barium as Ba	<0.05	<0.05	<0.05	<0.05	<0.05
11	Boron as B	<0.1	<0.1	<0.1	<0.1	<0.1
12	Calcium as Ca	30.4	24.6	25.3	24.9	29.7
13	Chloride as Cl	16.4	15.4	16.2	22.8	18.8
14	Copper as Cu	<0.02	<0.02	<0.02	<0.02	<0.02
15	Fluoride as F	0.20	0.21	0.25	0.23	0.19
16	Free Residual Chlorine	ND	ND	ND	ND	ND
17	Iron as Fe	0.24	0.22	0.18	0.22	0.20
18	Magnesium as Mg	11.2	12.0	12.5	8.04	10.5
19	Manganese as Mn	<0.025	<0.025	<0.025	<0.025	<0.025
20	Mineral Oil	<0.5	<0.5	<0.5	<0.5	<0.5
21	Nitrate as NO3	3.8	3.1	4.3	3.9	3.5
22	Phenolic Compound	<0.05	<0.05	<0.05	<0.05	<0.05
23	Selenium as Se	<0.001	<0.001	<0.001	<0.001	<0.001
24	Silver as Ag	<0.1	<0.1	<0.1	<0.1	<0.1
25	Sulphate as SO4	6.3	7.8	8.2	5.2	5.7
26	Sulphide	<0.05	<0.05	<0.05	<0.05	<0.05
27	Total alkalinity as CaCO3	47	49	50	43	40
28	Total Hardness	87	88	92	90	90
29	Zinc as Zn	<0.03	<0.03	<0.03	<0.03	<0.03
30	Cadmium as Cd	<0.01	<0.01	<0.01	<0.01	<0.01
31	Cyanide as CN	<0.01	<0.01	<0.05	<0.05	<0.01
32	Lead as Pb	<0.02	<0.02	<0.02	<0.02	<0.02
33	Mercury as Hg	<0.004	<0.004	<0.004	<0.004	<0.004
34	Molybdenum as Mo	<0.05	<0.05	<0.05	<0.05	<0.05
35	Nickel (as Ni)	<0.1	<0.1	<0.1	<0.1	<0.1
36	Pesticide	Absent	Absent	Absent	Absent	Absent
37	Poly aromatic Hydrocarbon as PAH	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
38	Arsenic as As	<0.004	<0.004	<0.004	<0.004	<0.004
39	Total Chromium as Cr	<0.1	<0.1	<0.1	<0.1	<0.1
40	Total Coliform	<1.8	<1.8	<1.8	<1.8	<1.8

Sl. No	Parameter	Village Kakudia	Village Kharkhari	Village Maruabil	Village Sandeswar	Village Birasal
		Mar'23				
1	Colour	CL	CL	CL	CL	CL
2	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	<1	<1	<1	<1	<1
5	Total Dissolved Solids as TDS	114	123	118	132	135
6	pH at 250C	7.71	7.82	7.37	7.62	7.46
7	Aluminium (as Al)	<0.1	<0.1	<0.1	<0.1	<0.1
8	Ammonia (as total ammonia-N)	<0.1	<0.1	<0.1	<0.1	<0.1
9	Anionic Detergents	<0.2	<0.2	<0.2	<0.2	<0.2
10	Barium as Ba	<0.05	<0.05	<0.05	<0.05	<0.05
11	Boron as B	<0.1	<0.1	<0.1	<0.1	<0.1
12	Calcium as Ca	22.5	23.7	29.9	25.1	26.6
13	Chloride as Cl	16.1	18.9	19.4	23.1	23.5
14	Copper as Cu	<0.02	<0.02	<0.02	<0.02	<0.02
15	Fluoride as F	0.25	0.21	0.19	0.22	0.25
16	Free Residual Chlorine	ND	ND	ND	ND	ND
17	Iron as Fe	0.24	0.23	0.24	0.27	0.19
18	Magnesium as Mg	10.6	8.70	11.3	6.4	6.6
19	Manganese as Mn	<0.025	<0.025	<0.025	<0.025	<0.025
20	Mineral Oil	<0.5	<0.5	<0.5	<0.5	<0.5
21	Nitrate as NO3	3.6	4.8	3.5	5.1	4.2
22	Phenolic Compound	<0.05	<0.05	<0.05	<0.05	<0.05
23	Selenium as Se	<0.001	<0.001	<0.001	<0.001	<0.001
24	Silver as Ag	<0.1	<0.1	<0.1	<0.1	<0.1
25	Sulphate as SO4	6.1	8.0	6.7	9.1	6.5
26	Sulphide	<0.05	<0.05	<0.05	<0.05	<0.05
27	Total alkalinity as CaCO3	46	50	55	46	62
28	Total Hardness	84	83	95	84	86
29	Zinc as Zn	<0.03	<0.03	<0.03	<0.03	<0.03
30	Cadmium as Cd	<0.01	<0.01	<0.01	<0.01	<0.01
31	Cyanide as CN	<0.01	<0.05	<0.05	<0.05	<0.05
32	Lead as Pb	<0.02	<0.02	<0.02	<0.004	<0.004
33	Mercury as Hg	<0.004	<0.004	<0.004	<0.002	<0.002
34	Molybdenum as Mo	<0.05	<0.05	<0.05	<0.05	<0.05
35	Nickel (as Ni)	<0.1	<0.1	<0.1	<0.1	<0.1
36	Pesticide	Absent	Absent	Absent	Absent	Absent
37	Poly aromatic Hydrocarbon as PAH	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
38	Arsenic as As	<0.004	<0.004	<0.004	<0.004	<0.004
39	Total Chromium as Cr	<0.1	<0.01	<0.01	<0.01	<0.01
40	Total Coliform	<1.8	<1.8	<1.8	<1.8	<1.8

C. SURFACE WATER QUALITY

1. Damsala River Upstream

Sl. No	Parameter	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
1	Colour (max)	<15	<15	<15	<15	<15	<15

2	pH Value at 250C	7.48	7.45	7.39	7.29	7.26	7.31
3	Suspended solids	82	80	81	78	76	81
4	Dissolved Oxygen (minimum)	6	6.1	6.2	5.8	5.9	5.6
5	Turbidity	12.5	12.7	12.6	10.2	10.5	10.9
6	Chloride (max)	15.8	15.7	15.5	14.3	14.5	15.4
7	Total Dissolved Solids	192	191	193	188	191	196
8	BOD (3) days at 270C (max)	<1	<1	<1	<1	<1	<1
9	Arsenic as As	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
10	Lead as Pb(max)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
11	Cadmium as Cd (max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
12	Hexa Chromium as Cr +6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
13	Copper as Cu (max)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
14	Zinc as Zn(max)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
15	Selenium as Se (max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Cyanide as CN (max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
17	Fluoride as F (max)	0.45	0.46	0.44	0.38	0.36	0.37
18	Sulphates (SO4) (max)	1.24	1.23	1.22	1.18	1.19	1.23
19	Phenolic Compounds as C6H5OH (max)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Iron as Fe (max)	0.48	0.47	0.46	0.42	0.41	0.43
21	Nitrate as NO3, (max)	3.4	3.5	3.6	3.2	3.3	3.2
22	Anionic Detergents (max)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
23	Total Coli form	1200	1400	1200	1100	960	980

2. Damsala River Downstream

Sl. No	Parameter	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
1	Colour (max)	<15	<15	<15	<10	<10	<10
2	pH Value at 250C	7.29	7.27	7.26	7.22	7.21	7.25
3	Suspended solids	86	85	84	80	82	88
4	Dissolved Oxygen (minimum)	6.2	6.3	6.5	5.6	5.4	5.1
5	Turbidity	11.6	11.8	11.7	9.9	9.7	9.9
6	Chloride (max)	15.8	15.9	15.8	15.4	15.7	16.2
7	Total Dissolved Solids	189	186	192	176	179	182
8	BOD (3) days at 270C (max)	<1	<1	<1	<1	<1	<1
9	Arsenic as As	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
10	Lead as Pb(max)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
11	Cadmium as Cd (max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
12	Hexa Chromium as Cr +6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
13	Copper as Cu (max)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
14	Zinc as Zn(max)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
15	Selenium as Se (max)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Cyanide as CN (max)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
17	Fluoride as F (max)	0.47	0.49	0.48	0.4	0.41	0.42
18	Sulphates (SO4) (max)	1.2	1.26	1.25	1.2	1.23	1.31
19	Phenolic Compounds as C6H5OH (max)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Iron as Fe (max)	0.43	0.44	0.42	0.36	0.39	0.37
21	Nitrate as NO3, (max)	3.8	3.7	3.9	3.6	3.5	3.4
22	Anionic Detergents (max)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
23	Total Coli form	1100	1200	1100	940	840	860

D. WASTE WATER

1. ETP INLET (WW-1)

SL.No	LOCATION	ETP INLET (WW-1)						
	PARAMETERS	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23	Average
1	pH	7.75	7.71	7.65	7.76	7.76	7.03	7.61

2	**Colour**	<15	<15	<15	<15	<15	<15	<15
3	**Odour**	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	**Temperature**	28.4	28.1	27.9	28.5	29.5	28.9	28.55
5	**Suspended Solids**	145	143	146	138	63.2	153	131.37
6	**Total Residual chlorine**	0.32	0.35	0.36	0.31	0.33	0.31	0.33
7	**Oil & Grease**	5.5	5.3	5.5	5.2	5.1	5.3	5.32
8	**BOD (3) days at 270c.**	16	18	17	15	13	14	15.5
9	**COD**	68	66	64	62	58	56	62.33
10	**Amm.Nitrogen**	2.36	2.34	2.31	2.24	2.22	2.08	2.26
11	**Total Kjeldahl Nitrogen**	5.5	5.3	5.6	5.1	5.3	5.5	5.38
12	**Free Ammonia**	0.054	0.052	0.051	0.048	0.047	0.045	0.05
13	**Nitrate as NO3**	1.52	1.5	1.53	1.39	1.36	1.34	1.44
14	**Diss. Phosphate as P**	0.74	0.72	0.75	0.72	0.75	0.72	0.73
15	**Fluoride as F**	0.52	0.54	0.53	0.48	0.49	0.46	0.50
16	**Sulphide as S**	ND	ND	ND	ND	ND	ND	ND
17	**Phenolic Compounds as C6H5OH**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	**Cyanide as CN**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	**Hexavalent chromium as Cr+6**	0.26	0.15	0.64	0.25	0.63	0.22	0.36
20	**Mercury as Hg**	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
21	**Arsenic**	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
22	**Lead as Pb**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	**Cardmium as Cd**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	**Total Chromium as Cr**	0.49	0.5	0.46	0.42	0.42	0.45	0.46
25	**Cupper as Cu**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
26	**Zinc as Zn**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
27	**Selenium as Se**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	**Nickel as Ni**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
29	**Manganese as Mn**	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
30	**Iron as Fe**	0.39	0.37	0.36	0.35	0.35	0.34	0.36
31	**Vanadium as V**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
32	**Bio-assay Test**	93%	96%	95%	93%	95%	96%	97%
33	**Particle size of Suspended Solides**	< 850	< 850	< 850	< 850	< 850	< 850	< 850
34	**Pesticide**	Absent	Absent	Absent	Absent	Absent	Absent	Absent

1. **ETP OUTLET (WW-2)**

SL.No	LOCATION	ETP OUTLET (WW-2)						
	PARAMETERS	**Oct'22**	**Nov'22**	**Dec'22**	**Jan'23**	**Feb'23**	**Mar'23**	**Average**
1	**pH**	7.28	7.31	7.33	7.41	6.69	6.81	7.14
2	**Colour**	<5	<5	<5	<5	<5	<5	<5
3	**Odour**	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	**Temperature**	26.3	25.9	26.2	26.3	27.8	28.4	26.82
5	**Suspended Solids**	52	55	58	62	28.6	52.8	51.40

6	**Total Residual chlorine**	0.23	0.25	0.26	0.15	0.13	0.15	0.20
7	**Oil & Grease**	1.2	1.3	1.7	1.7	1.9	2.1	1.65
8	**BOD (3) days at 270c.**	<1	<1	<1	<1	<1	<1	<1
9	**COD**	<4	<4	<4	<4	<4	<4	<4
10	**Amm.Nitrogen**	0.76	0.74	0.81	0.76	0.79	0.76	0.77
11	**Total Kjeldahl Nitrogen**	4.1	4.2	4.3	3.9	3.8	3.6	3.98
12	**Free Ammonia**	0.01	0.011	0.015	0.05	0.053	0.050	0.03
13	**Nitrate as NO3**	0.73	0.75	0.76	0.68	0.67	0.62	0.70
14	**Diss. Phosphate as P**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	**Fluoride as F**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
16	**Sulphide as S**	ND	ND	ND	ND	ND	ND	ND
17	**Phenolic Compounds as C6H5OH**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	**Cyanide as CN**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	**Hexavalent chromium as Cr+6**	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
20	**Mercury as Hg**	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
21	**Arsenic**	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
22	**Lead as Pb**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	**Cardmium as Cd**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	**Total Chromium as Cr**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
25	**Cupper as Cu**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
26	**Zinc as Zn**	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
27	**Selenium as Se**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	**Nickel as Ni**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
29	**Manganese as Mn**	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
30	**Iron as Fe**	0.15	0.16	0.19	0.18	0.18	0.21	0.18
31	**Vanadium as V**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
32	**Bio-assay Test**	95%	95%	97%	95%	97%	98%	99%
33	**Particle size of Suspended Solides**	< 850	< 850	< 850	< 850	< 850	< 850	< 850
34	**Pesticide**	Absent	Absent	Absent	Absent	Absent	Absent	Absent

3. OIL SEPARATION PIT INLET (WW-3)

SL. No	LOCATION	OIL SEPARATION PIT INLET (WW-3)						
	PARAMETERS	**Oct'22**	**Nov'22**	**Dec'22**	**Jan'23**	**Feb'23**	**Mar'23**	**Average**
1	**pH at 250C**	6.26	7.30	7.29	7.32	7.32	7.24	7.12
2	**Colour**	<20	<20	<20	<20	<20	<20	<20
3	**Odour**	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	**Temperature**	25.8	26.2	26.8	26.4	27.1	29.2	26.92
5	**Suspended Solids**	170	172	168	166	169	172	169.50
6	**Total Residual Chlorine**	0.45	0.42	0.41	0.36	0.32	0.29	0.38
7	**Oil & Grease**	18.8	17.8	16.3	14.5	13.7	12.5	15.60
8	**Biochemical Oxygen Demand as BOD**	10	12	13	14	11	12	12.00
9	**Chemical Oxygen Demand as COD**	55	58	57	54	49	50	53.83

SL. No	LOCATION	OIL SEPARATION PIT INLET (WW-3)						
	PARAMETERS	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23	Average
10	Ammoniacal. Nitrogen (as NH4 N)	1.45	1.42	1.34	1.96	1.94	1.89	1.67
11	Total Kjeldahl Nitrogen	4.3	4.5	4.6	4.2	4.1	4.4	4.35
12	Free Ammonia	0.0059	0.0052	0.0045	0.0041	0.0043	0.0041	0.00
13	Nitrate as NO3	1.28	1.31	1.29	1.26	1.24	1.26	1.27
14	Diss. Phosphate (as P)	0.6	0.62	0.64	0.66	0.63	0.61	0.63
15	Fluoride	0.35	0.36	0.34	0.32	0.35	0.38	0.35
16	Sulphide	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
17	Phenolic Compound	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Cyanide (as CN)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Hexavalent Chromium as Cr +6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
20	Mercury (as Hg)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
21	Arsenic	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
22	Lead (as Pb)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	Cadmium (as Cd)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Total Chromium (as Cr)	0.23	0.26	0.29	0.27	0.29	0.28	0.27
25	Copper (as Cu)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
26	Zinc (as Zn)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
27	Selenium (as Se)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Nickel (as Ni)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
29	Manganese (as Mn)	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
30	Iron (as Fe)	0.65	0.59	0.51	0.52	0.55	0.51	0.47
31	Vanadium (as V)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
32	Bio-assay Test	74%	90%	93%	91%	92%	94%	96%
33	Particle Size of Suspended Solids	<850	<850	<850	<850	<850	<850	<850
34	Pesticide	Absent	Absent	Absent	Absent	Absent	Absent	Absent

4.OIL SEPARATION PIT OUTLET (WW-4)

SL.No	LOCATION	OIL SEPARATION PIT OUTLET (WW-4)						
	PARAMETERS	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23	Average
1	pH at 250C	7.22	7.23	7.22	7.18	7.18	7.17	7.2
2	Colour	<5	<5	<5	<5	<5	<5	<5
3	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Temperature	26.8	27.2	26.9	25.5	26.5	27.1	26.67
5	Suspended Solids	35	36	35	42	35.7	33.1	36.13
6	Total Residual Chlorine	ND	ND	ND	ND	ND	ND	ND
7	Oil & Grease	ND	ND	ND	1.2	1.1	1.8	1.37
8	Biochemical Oxygen Demand as BOD	<1	<1	<1	<1	<1	<1	<1
9	Chemical Oxygen Demand as COD	<4	<4	<4	<4	<4	<4	<4
10	Ammonical. Nitrogen (as NH4 N)	1.1	1.03	1.08	0.96	0.93	0.91	1.0

SL.No	LOCATION	OIL SEPARATION PIT OUTLET (WW-4)						
	PARAMETERS	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23	Average
11	Total Kjeldahl Nitrogen	3.6	3.8	3.9	3.3	3.2	3.1	3.5
12	Free Ammonia	0.0032	0.0031	0.0032	0.0029	0.0028	0.0027	0.0
13	Nitrate as NO3	0.64	0.68	0.66	0.61	0.63	0.66	0.6
14	Diss. Phosphate (as P)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Fluoride	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
16	Sulphide	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
17	Phenolic Compound	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Cyanide (as CN)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Hexavalent Chromium as Cr +6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
20	Mercury (as Hg)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
21	Arsenic	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
22	Lead (as Pb)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	Cadmium (as Cd)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Total Chromium (as Cr)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
25	Copper (as Cu)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
26	Zinc (as Zn)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
27	Selenium (as Se)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Nickel (as Ni)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
29	Manganese (as Mn)	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
30	Iron (as Fe)	0.63	0.64	0.67	0.61	0.59	0.57	0.62
31	Vanadium (as V)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
32	Bio-assay Test	95%	97%	98%	96%	98%	99%	100%
33	Particle Size of Suspended Solids	<850	<850	<850	<850	<850	<850	<850
34	Pesticide	Absent	Absent	Absent	Absent	Absent	Absent	Absent

5. STP INLET

SL.No	LOCATION	STP INLET (WW-5)						
	PARAMETERS	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23	Average
1	pH	7.26	7.29	7.26	7.23	7.27	6.98	7.22
2	Suspended Solids	145	142	146	68.8	58.5	46.25	101.09
3	Oil & Grease	18.7	18.5	18.2	16.5	15.9	16.2	17.33
4	BOD	16.4	16.2	16.4	14.2	13.9	12.8	14.98
5	COD	85	87	89	72	71	70	79.00
6	Hexavalent Chromium as Cr +6	0.43	0.2	0.67	0.25	0.16	0.66	0.40
7	Total Chromium (as Cr)	0.69	0.66	0.68	0.58	0.56	0.52	0.62
8	Faecal Coliform	122	125	120	110	120	140	122.83

6.STP OUTLET

SL.No	LOCATION	STP (WW-6)						
	PARAMETERS	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23	Average
1	pH	7.31	7.32	7.31	7.30	7.32	7.02	7.26
2	Suspended Solids	8.5	8.3	7.8	2.3	2.3	1.16	5.06
3	Oil & Grease	ND	ND	ND	ND	ND	ND	ND
4	BOD	4.2	4.4	4.6	3.6	3.4	3.1	3.9
5	COD	25	26	28	22	23	25	24.8
6	Hexavalent Chromium as Cr +6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7	Total Chromium (as Cr)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8	Faecal Coliform	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8

7. Ground Water Level-Core Zone

Sl. No	Monitoring Location	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
		Result (mtr)	Result, (mtr)	Result, (mtr)	Result, (mtr)	Result, (mtr)	Result, (mtr)
1	SCM/PZ/18	33.17	34.38	34.98	33.82	38.27	39.50
2	SCM/PZ/01	17.2	18.16	18.82	17.75	0	0
3	SCM/PZ/19	72.72	73.25	74.07	72.94	79.08	81.30
4	SCM/PZ/17	30.15	31.12	31.92	30.76	32.80	34.30
5	SCM/PZ/21	88.86	89.94	90.78	88.97	92.20	90.50

8.Ground Water Level (Buffer Zone)

Sl. No	Village name	Dec'22	Mar'23
		Result, mtr	Result, mtr
1	Kharkhari	5.52	6.45
2	Maruabil	3.2	4.72
3	Sendheswar	2.98	3.04
4	Birasal	4.2	6.52
5	Kakudia	3.79	7.34
6	Kanheipal	2.74	3.65
7	Sukarangi	2.34	2.6
8	Kaliapani	5.48	6.48
9	Kalarangi	3.16	5.34
10	Laxmidharpur	3.65	4.57

Annexure – IV: ENVIRONMENTAL MANAGEMENT PRACTICES-SUKINDA CHROMITE MINE

COVERING OF LOADED TRUCK BY TARPAULIN

CONCERETE PATH:

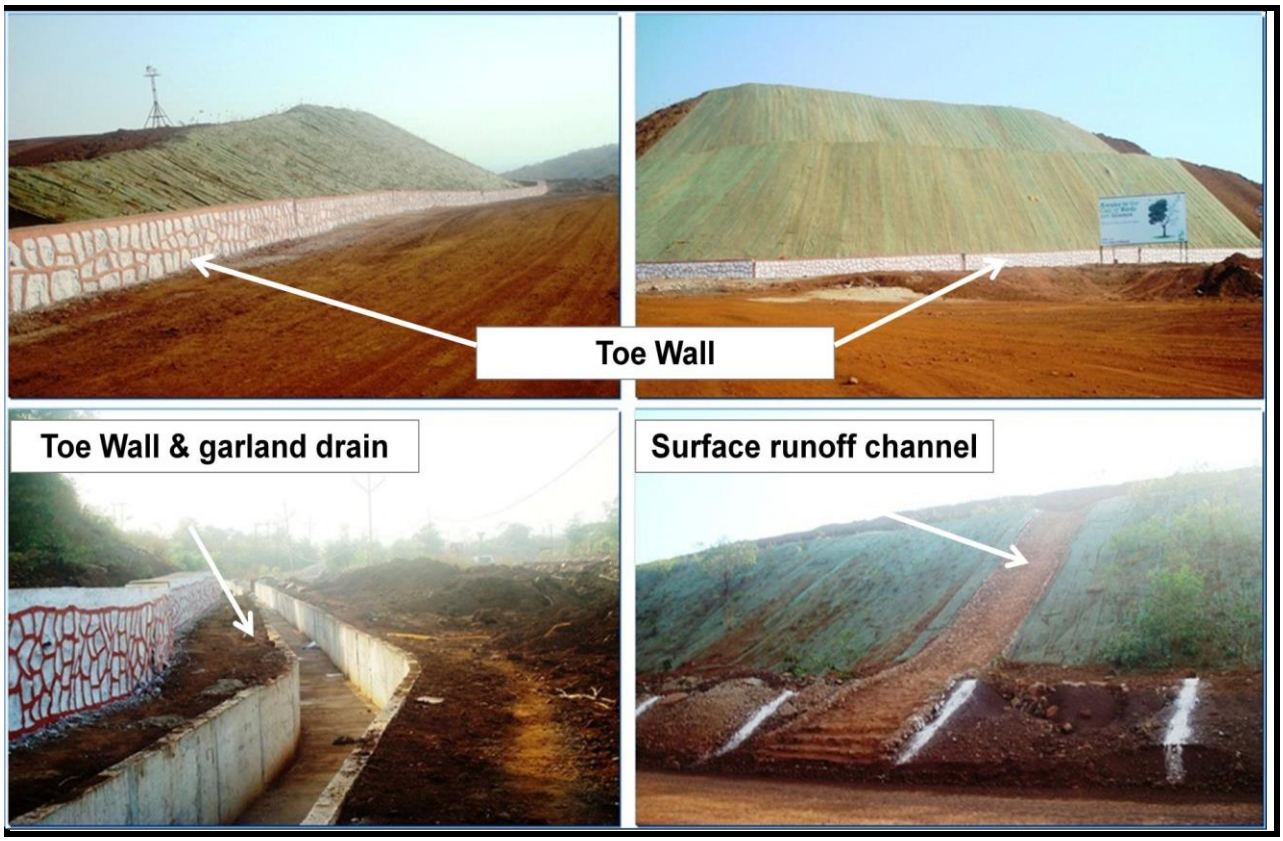
DUST CONTROLING MAEASURES

HAUL ROAD DUST SUPPRESSION SYSTEM:

CONCRETE STACK WITH TRAUPLIN

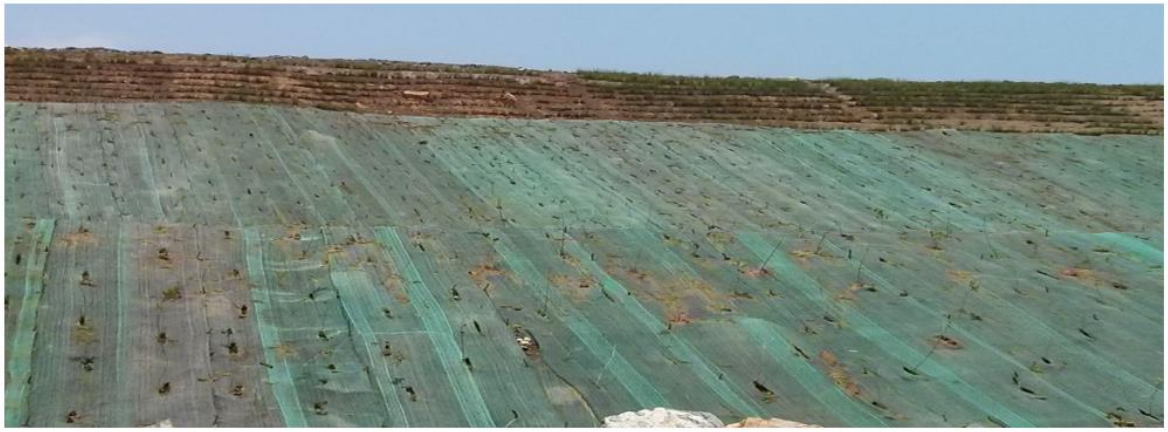
RAIN WATER HARVESTING STRUCTURE:

Toe wall, Garland Drain and Surface Runoff Channel



VERTIBER PLANTATION & GEONET APPROACH-DUMP SLOPE:





EFFLUENT TREATMENT PLANT:



OIL-WATER SEPARATION PIT

ANNEXURE-V Plantation Details

Detail Plantation of Sukinda Chromite Mines

Details of Afforestation/ Greenbelt Plantation Carried Out				
Year	Inside Mining lease (Within 406 ha.)		Outside Mining Lease (Within 100 ha)	
	Numbers	Area (ha)	Numbers	Area (ha)
1998-99	4000	1.7		
1999-00	18000	4		
2000-01	28342	2		
2001-02	15000	0.5		
2002-03	22000	1.5		
2003-04	45500	1.5		
2004-05	48000	1		
2005-06	75000	2.5	Additional Area (100ha) obtained	
2006-07	129500	5.75		
2007-08	94000	4.42		
2008-09	85250	2.94	36750	1.76
2009-10	28000	3.9	56000	5.6
2010-11	25000	2	60000	6.5
2011-12	45000	4.5	35000	3.5
2012-13	5700	1.83	40000	6.5
2013-14	3700	1.32	54326	5.6
2014-15	4050	1.2	50100	5.1
2015-16	8500	1	64357	8
2016-17	7000	2.8	26000	6.7
2017-18	15000	5	44000	6
2018-19	14233	4.4	47577	8.07
2019-20	113320	45.03	13650	0
2020-21	0	0	0	0
2021-22	5011	2	0	0
2022-23	5015	2	0	0
TOTAL	**844175**	**104.79**	**527760**	**63.33**

ANNEXURE-VI: Environmental Management Cell

Environmental Cell
Sukinda Chromite
Block
M/s. Tata Steel Mining Limited

Sl.No	Name	Designation	Experience (years)	E-mail	Mobile No.
1	Mr. Sushanta Kumar Mishra	Sr. GM & Agent	26	sushanta.mishra@tatasteelmining.com	9838087051
2	Mr. Sambhu Nath Jha	Mines Manager	23	jhasn@tatasteelmining.com	9438887778
3	Mr. Devraj Tiwari	AGM, Ext. Affairs & Sustainability	12	devraj.tiwari@tatasteelmining.com	8092000271
4	Mr. Thakur Ajay Kumar Vishwambharnath	AGM, SHE	20	Ajaykr.thakur@tatasteelmining.com	9238306143
5	Dr. Biswaranjan Dhal	Manager, Environment	13	biswaranjan.dhal@tatasteelmining.com	8114371713
6	Ms Soumya Subhrata Nayak	Deputy Manager, Environment	5	Soumya.nayak@tatasteelmining.com	8093053911
7	Swapnendu Soumyaranjan Panda	ADM, Mine planning	12	swapnendu.panda@tatasteelmining.com	8093033848
8	Mr. Debdip Senapati	Sr. Manager QC	14	debdip.senapati@tatasteelmining.com	9238087043
9	Mr. Mohammad Mujaheed	Manager, Safety	6	mohammad.mujaheed@tatasteelmining.com	8093033836

ANNEXURE-VII

Environment Expenditure made during (Oct' 2022 – March' 2023)

SL NO.	Expenditure	Amount (in Lakhs)
1	ETP operation cost	
	a) Manpower	22.56
	b) ETP Electricity cost	21.59
	c) Chemical & maintenance cost	112.32
	d) ETP sludge disposal	8.28
2	Water sprinkling cost for haul road management	86.41
3	EQMS Online Analysis	1.77
4	EQMS Online Data Transmission	0.47
5	Monitoring & Analysis cost of Air, Water & Noise	18.44
6	Plantation	7.51
7	Display board	0.32
8	Ground Water Level Measurement & Data Transmission	0.28
	Total	**279.95**

ANNEXURE-VIII: CSR Expenditure (Sukinda, Saruabil, Kamarda) for FY 23

TSF/ACC/ 22 /2023
Date: 24.04.2023

Utilization of funds

Fund received from Tata Steel Mining Limited

The Partner	Tata Steel Mining Limited (TSML)
The Project	TSML Projects
Financial Year	2022-23
Reporting Period	1st April 2022 to 31st March 2023

Details of The Project Expenses:

			Figures in INR
Particulars	**Budget**	**Expenditure**	**Balance to Spent**
Health	4,122,000	4,004,943	117,057
Drinking Water	2,643,000	2,632,055	10,945
Livelihood	6,041,000	5,597,812	443,188
Infrastructure	5,430,000	5,416,416	13,584
Sports	1,246,000	1,231,775	14,225
Disaster Relief Management	118,000	37,000	81,000
Administrative exp.	400,000	399,999	1
Grand Total	**20,000,000**	**19,320,000**	**680,000**

This is to certify that funds received from Tata Steel Mining Limited for 'TSML Projects amounting to Rs.19,320,000/- has been utilized fully as per above mentioned details.

CSR1 Registration No. - CSR00001142

Chief Financial Officer
TATA STEEL FOUNDATION

(R S Ramesh)
Chief Financial Officer

TATA STEEL FOUNDATION
Registered Office: 3rd Floor, One Forbes No. 1, Dr. V. B. Gandhi Marg, Fort, Mumbai – 400 001 India
Tel 91 22 6665 7297 Fax 91 22 66657724
Corporate Identity Number U85300MH2016NPL284815

ANNEXURE-IX IME-PME Details

SUKINDA CHROMITE MINE, TSML

NAME OF MINES	NAME OF INDUSTRY	CONTRACTOR NAME	IME	PME	TOTAL
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	DEPARTMENT	68	4	072
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	DHANSAR ENGINEERING CO. PVT. LTD.	74	3	077
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	TATA STEEL UTILITIES & INFRASTRUCTURE SERVICES	44	0	044
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	SBL ENTERPRISES	8	0	008
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	SECURITY & INTELLIGENCE SERVICES INDIA LTD.	46	0	046
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	POWER ENGINEERING	20	0	020
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	MITRA SK PVT. LTD.	6	0	006
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	KANDOI TRANSPORT LTD.	1	0	001
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	EXIM LOGISTICS PVT. LTD.	4	0	004
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	BHUKTA TRANSPORT	3	0	003
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	INTERFINATE TECHNOLOGY PVT. LTD.	9	0	009
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	CYBERTECH	5	0	005
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	SHRADHA ENTERPRISES	2	0	002
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	MAA SARALA ENTERPRISES	5	0	005
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	A.K. SAMAL & BROTHERS	0	0	000
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	NAYAK ENTERPRISES	21	0	021
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	DEBUG SENSE	1	0	001
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	ANU ENGINEERING	10	0	010
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	QUESS CORPORATION LTD.	4	0	004
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	AKAMAI WATER PROOFING SOULTIONS	2	0	002
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	UTKAL COMPUTER CARE PVT. LTD.	3	0	003
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	SHIVJIVALJI SHEDS PVT. LTD.	23	0	023
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	M.N. DASTUR & CO. PVT. LTD.	8	0	008
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	CHINAR STEEL SEGMENT CENTRE PVT. LTD.	186	0	186
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	MODUS CREATIVE & PROJECTS PVT. LTD.	10	0	010
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	SUJIYOTI INDIA PVT. LTD.	1	0	001
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	AMPMESH LAB PVT. LTD.	2	0	002
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	GEOID RESOURCES PVT. LTD.	4	0	004
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	FRE8WISE	2	0	002
SUKINDA CHROMITE MINE	TATA STEEL MINING LTD.	PRASANNA KUMAR NATH	21	0	021
		TOTAL	593	7	600
		GRAND TOTAL	993	13	1006