TSL/FAMD/SAR/FY25/1699
Date: 29-11-2024

To,
The Member-Secretary,
State Level Environment Impact Assessment Authority (SEIAA), Odisha,
5RF-2/1, Acharya Vihar, Unit – IX, OPTCL Colony,
Anand Bazar, Bhoi Nagar, Bhubaneswar, Odisha 751022

Subject: Submission of half-yearly compliance report on the stipulated environmental clearance terms and conditions in respect of Saruabil Chromite Block of M/s Tata Steel Limited, for the period April 2024 to Sept 2024 to SEIAA, Odisha, MoEF&CC, & IRO, CPCB & SPCB, Odisha.

Reference:

1) MoEF EC Letter Identification No. EC23B001OR155576, File No. 78946/93-MINB1/07-2022,
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 conditions stipulated in environmental clearance in favor of Saruabil Chromite Block of M/s Tata Steel Limited vide SEIAA EC Letter Identification No. EC23B001OR155576, Dated 06.06.2023, for the period from April 2024 to Sept 2024 for your kind perusal.
This is in reference to the MoEF&CC's notification vide S.O-5845, dt. 28th Nov 2018 and as per the Miscellaneous EC condition number (III), VII) & (IX), the online submitted six-monthly compliance report with required annexures is being submitted through e-mail to @ roez.bsr-mef@nic.in , seiaaodisha@gmail.com and Hard copy to SEIAA, Odisha, MoEF&CC, & IRO, CPCB & SPCB, Odisha.

We believe the above submission is in order.

Thanking You.
Yours faithfully,
f: Tata Steel Limited

Mines Manager,
Saruabil Chromite Block

Copy to:

1. Dy. Director General, Integrated Regional Office, Ministry of Environment and Forest & Climate Change, Eastern Region Office, A/3, Chandrasekharpur, Bhubaneswar-751023
2. The Director, Ministry of Environment, Forests & Climate Change, Indira Paryavaran Bhawan, Aliganj, Jorbagh Road, New Delhi-110 003
3. The Regional Directorate, Central Pollution Control Board, 'South end Conclave' Block-502, 5th & 6th Floor, 1582, Razidanga, Main Road, Kolkata- 700107
4. Member Secretary, State Pollution Control Board, Odisha, Paribesh Bhawan, A/118, Nilakantha Nagar, Bhubaneswar, 751012.

Your (Half Yearly Compliance Report) has been Submitted with following details	
Proposal No	SIA/OR/MIN/78946/2020
Compliance ID	112636803
Compliance Number(For Tracking)	EC/M/COMPLIANCE/112636803/2024
Reporting Year	2024
Reporting Period	01 Dec(01 Apr - 30 Sep)
Submission Date	29-11-2024
RO/SRO Name	ARTATRANA MISHRA
RO/SRO Email	jhk109@ifs.nic.in
State	ODISHA
RO/SRO Office Address	Integrated Regional Offices, Bhubaneswar
Note:- SMS and E-Mail has been sent to ARTATRANA MISHRA, ODISHA with Notification to Project Proponent.	

Half Yearly Compliance Report
2024
01 Dec(01 Apr - 30 Sep)

Acknowledgement

Proposal Name	Saruabil Chromite Block (ML Area: 246.858 Ha) with a production of 1.0 MTPA Chromite Ore (ROM) with maximum excavation of 6.48 Million Cum per Annum through Opencast Mining at villages Saruabil, Kamarda, and Tailangi under Sukinda Tehsil, Jajpur District of Odisha State.
Name of Entity / Corporate Office	Tata Steel Limited
Village(s)	BALIPADA
District	JAJAPUR

Proposal No.	SIA/OR/MIN/78946/2020
Plot / Survey / Khasra No.	
State	ODISHA
MoEF File No.	78946/93-MINB1/07-2022

Category	Non-Coal Mining
Sub-District	Kaliapani
Entity's PAN	*****2803M
Entity name as per PAN	UTSAV KASHYAP

Compliance Reporting Details

Reporting Year 2024

Remarks (if any)

Reporting Period 01 Dec(01 Apr - 30 Sep)

Details of Production and Project Area

Name of Entity / Corporate Office Tata Steel Limited

	Project Area as per EC Granted	Actual Project Area in Possession
Private	0	0
Revenue Land	5.088	5.088
Forest	241.77	241.77
Others	0	0
Total	246.858	246.858

Production Capacity

Sr. no	Product Name	units	Valid Upto	Capacity	Production last year	Capacity as per CTO
1	Chromite Ore (ROM)	Million Tons per Annum (MTPA)	N/A	1	.29	0.35

Conditions

Specific Conditions

Sr.No.	Condition Type	Condition Details
1	Corporate Environmental Responsibility	The budget of Rs. 144.65 Lakhs allocated towards CER/ to be completed within 3 years from the date of start of mining operations as proposed. PP shal1 also comply at I action plans made for public hearing concerns and make regular maintenance and record the progressive activity outcomes. Further, the PP shall at so comply all activities listed in CSR activities, as proposed.
PPs Submission: Being Complied As per the company Annual Business Plan, we have taken year wise targets from April 2024 to complete within 3years. For current year: Bus for High Schools: Complied Ambulance: Complied Health Camp organization: Complied Water conservation and recharge structure: Complied Plantation drive: Complied Amenity Centre for Truck Driver: Complied. Defensive driving training programmes: Complied Establishment of Computer lab in High Schools: Yet to Comply		Date: 29/11/2024
2	Statutory compliance	Grant of CTO after One year shall be subject to transfer of DC for 224.63 Ha in the name of M/s. Tata Steel Mining Ltd. and obtaining fresh FC for 17.14 ha.
PPs Submission: Being Complied As mentioned, we have already applied for the transfer application with requisite fee vide letter No. TSML/MD/2290/FY22, dated 20th Dec 2021 to DFO Cuttack for transfer of stage II FC. The FC application for the remaining forest land i.e 17.14 Ha has been applied to MoEF and CC and it is in process.		Date: 29/11/2024
3	Human Health Environment	The amount proposed under Occupational Health plan head should be kept in a separate bank account and should be audited annually. The PP should annually submit the audited statement and detailed environment monitoring report along with proof of activities viz. photographs (before and after with geo-location date and time), purchase documents, sampling reports, photographs and Geo-location of the infrastructures/facilities developed, details of persons engaged in Environment Management Cell etc. to the Regional Office of MoEFCC, Bhubaneswar and SEIAA, Odisha before 1st July of every year for the activities carried out during previous year.
PPs Submission: Being Complied The amount proposed year wise for Occupational Health plan to be kept in provision. The audited statement for FY25 will be submitted to the Regional Office of MoEFand CC, Bhubaneswar and SEIAA, Odisha before 01-07-2025.		Date: 29/11/2024
4	Statutory compliance	The proponent shall comply all the specific conditions as recommended by CSIR-NEERI in time bound manner as applicable for the project.
PPs Submission: Complied All the specific conditions as recommended by CSIR-NEERI are being complied in time bound manner.		Date: 29/11/2024
5	Statutory compliance	The proposal involves a lease area of 246.858 ha comprising of 241.77 Ha Forest land and 5.088 ha non-forest land. Forest clearance (FC) has been accorded in favor of the previous lessee over an area of 224.63 Ha by MoEFCC on dated 16.01.1997. The application for remaining for forest land i.e. 17. l4 ha is yet to be accorded. The lessee has paid NPV for the entire forest land of area 241.77 ha. This

		EC will be restricted to 229.718 ha (224.63 ha stage-II FC available plus 5.088 Ha an on -forest land)), mining activity will be restricted to non-forest land and the area for which stage-II FC is available.
PPs Submission: Complied Our mining operation is restricted to 229.718 ha (224.63 ha stage-II FC available , 5.088 Ha non-forest land). Application has already been submitted for diversion of balance forest land of 17.14 ha to MoEFCC.		Date: 29/11/2024
6	Statutory compliance	The Forest Clearance (FC) clearance issued in favor of the previous lessee shall have to be transferred in the name of Ms. Tata Steel Mining Ltd. within a period of 1(One) year from the date of EC granted.
PPs Submission: Being Complied Forest Clearance (FC) has been accorded over an area of 224.63 ha by MoEFand CC dated 16.01.1997. The FC application for the remaining forest land i.e 17.14 Ha has been applied to MoEFand CC vide proposal no. FP/OR/MIN/QRY/448403/2023 dated 18.10.2023, submitted and it is progress. We have also paid NPV for the entire forest land of area 241.773ha. We have already applied the FC transfer application with requisite fee vide letter No. TSML/MD/2290/FY22, dated 20th Dec 2021 to DFO, Cuttack.		Date: 29/11/2024
7	Statutory compliance	The mine shall explore implementation of membrane-based technology for removing hexavalent chromium from Surface run off and mine drainage water.
PPs Submission: Complied The demo experiment for removing hexavalent chromium were performed, but the results are not so efficient (only 70 percent of Cr(VI) removal and high maintenance cost) due to high TSS in mine water.		Date: 29/11/2024
8	WATER QUALITY MONITORING AND PRESERVATION	The mine shall take adequate measures to minimize the discharge of treated water to Damsala nallah and take appropriate measures to prevent pollution of the Damsala Nallah in consultation with the SPCB.
PPs Submission: Complied We maximize the use of treated water for sprinkling, Plantation, Irrigation and Domestic use to ensure minimum discharge into Damsala Nallah		Date: 29/11/2024
9	Risk Mitigation and Disaster Management	The project proponent shall monitor analysis of hexavalent chromium in nearby soil and water body periodically and follow mitigation measures, if necessary.
PPs Submission: Complied We are regularly monitoring the hexavalent chromium in nearby water body and soil.		Date: 29/11/2024
10	GREENBELT	The PP shall undertake the adequate plantation in peripheral zone as well as gap plantation with the seedling of 6-8ft height with at least 90 percent survival rate to control the dust at source and should be completed within 3 years from the date of commencement of mining operations. Causalities of the previous year should be replaced other than the saplings proposed to be planted every year.
PPs Submission: Complied 7.5 meters wide safety zone plantation is being maintained all around the mine lease. The adequate plantation in peripheral zone (safety zone) as well as gap plantation with the seedling of 6-8ft height with at least 90 survival rate will be done to control the dust at source. The plantation will be completed within 3 years from the date of commencement of mining operations. Causalities of the		Date: 29/11/2024

previous year will be replaced other than the saplings proposed to be planted		
11	Human Health Environment	The amount (except occupational health) proposed under Environmental Management Plan (EMP) head should be kept in a separate bank account and should be audited annually. The PP should annually submit the audited statement and detailed environment monitoring report along with proof of activities viz. photographs (before and after with geo-location date and time), purchase documents, sampling reports, photographs and Geo-location of the infrastructures/facilities developed, details of persons engaged in Environment Management Cell etc. to the Regional Office of MoEFCC, Bhubaneswar and SEIAA, Odisha before 1st July of every year for the activities carried out during previous year.
PPs Submission: Being Complied The amount proposed year wise for EMP are assigned to designated cost centre and kept separately. The audited statement for FY25 will be submitted to the Regional Office of MoEFand CC, Bhubaneswar and SEIAA, Odisha before 01-07-2025.		Date: 29/11/2024
12	Corporate Environmental Responsibility	The amount proposed under Corporate Environment Responsibility (CER) head should be kept in a separate bank account and should be audited annually. The PP should annually submit the audited statement and details of implementation of CER activities along with proof of activities viz. photographs (before and after with geo-location date and time), purchase documents, photographs and Geo-location of the infrastructures/ facilities developed, etc. to the Regional Office of MoEFCC, Bhubaneswar and SEIAA, Odisha before 1st July of every year for the activities carried out during previous year.
PPs Submission: Being Complied The expenditure towards approved CER activities has been started from 1 April 2024. Funds for CER activities are being tracked. Audited statement for expenditure towards CER activities cried out in FY25 shall be submitted to RO-MoEFCC before 01-07-2025.		Date: 29/11/2024
13	Statutory compliance	The production of Chromite ore - 1.0MTPA from the already diverted forest land (229.718 Ha), subject to the permission from the Indian Bureau of Mines (IBM), for the period of 1(One) year from the date of EC granted.
PPs Submission: Complied The mining activities are being carried out within the diverted and non-forest land i.e. 229.718 ha (224.63 ha stage-II FC available , 5.088 Ha) only. The Mining plan has been approved by Indian Bureau of Mines (IBM) vide letter No. MP/A/19-ORI/BHU/2020-21, dated 10.11.2020 to produce ROM 1.0 MPTA up to 2025. The modified mining plan was also submitted and approved vide letter No No. MCDR-MiFL0CR/10/2023-BBS-IBM RO BBS, Dated 02/04/2024.		Date: 29/11/2024

General Conditions

Sr.No.	Condition Type	Condition Details
1	MISCELLANEOUS	The concerned Regional Office of the MoEFCC shall randomly monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the MoEFCC officer(s) by furnishing the requisite data information / monitoring reports.
PPs Submission: Agreed to Comply Agreed and will be extended full cooperation to- the MoEFand CC officer(s) by furnishing the requisite data information / monitoring reports during inspection.		Date: 29/11/2024

2	MISCELLANEOUS	This Environmental Clearance (EC) is subject to orders/judgment of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, Common Cause Conditions as may be applicable.

PPs Submission: Agreed to Comply Agreed	Date: 29/11/2024

3	MISCELLANEOUS	The proponent shall submit/upload six monthly reports on the status of compliance of the stipulated 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 MoEFCC, Govt. of India, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM, SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the project shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

PPs Submission: Complied We have uploaded six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions, including results of monitored data on our website (www.tatasteel.com) and is being updated periodically.	Date: 29/11/2024

4	Statutory compliance	This Environmental Clearance shall become operational only after receiving formal Forest Clearance (FC) under the provision of Forest Conservation Act, 1980, as applicable to the project.

PPs Submission: Complied Our mining operation is restricted to 229.718 ha (224.63 ha stage-II FC available 5.088 Ha non-forest land). Application has already been submitted for diversion of balance forest land of 17.14 ha to MoEFCC	Date: 29/11/2024

5	Statutory compliance	The Project proponent complies with all the statutory requirements and judgment of Hon ble Supreme Court dated 24 August,2017 in Writ Petition (Civil) No. 114 of 2014 in matter of Common Cause versus Union of India and Ors before commencing the mining operations

PPs Submission: Complied All the statutory permission as necessary for mining operation are either have been obtained or in process.	Date: 29/11/2024

6	Noise Monitoring & Prevention	The Project Proponent shall take measures for control of noise levels below 85 dBA in the work environment. The worker engaged in operations of HEMM, etc. should be provided with ear plugs /muffs. All personnel including laborers working in dusty areas shall be provided with protective respiratory devices along with adequate training, awareness and information on safety and health aspects. The PP shall be held responsible in case it has been found that workers/ personals/ laborers are working without personal protective equipment.

PPs Submission: Complied Ear plug/muffs and respiratory masks are being provided to workers working high noise and dust prone areas. It is a general PPE compliance to the Tata Steel safety rules. Schedule maintenance of the HEMM is being carried out to reduce noise and continuous monitoring is being done.	Date: 29/11/2024

7	MISCELLANEOUS	The SEIAA, Odisha may revoke or suspend the EC, if implementation of any of the above stipulated conditions is not

		satisfactory. The SEIAA, Odisha reserves the right to alter /modify the above conditions or stipulate any further condition in the interest of environment protection.
PPs Submission: Agreed to Comply Agreed		Date: 29/11/2024
8	MISCELLANEOUS	Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.
PPs Submission: Agreed to Comply Agreed		Date: 29/11/2024
9	Statutory compliance	The State Government concerned shall ensure that mining operation shall not be commenced till the entire compensation levied, if any, for illegal mining paid by the Project Proponent through their respective Department of Mining and Geology in strict compliance of Judgment of Hon ble Supreme Court dated 2nd August, 2017 in Writ Petition (Civil) No. 114 of 2014 in matter of Common Cause versus Union of India and Ors.
PPs Submission: Complied Entire compensation is paid and is being paid time to time as per Department of Mining and Geology, Govt of Odisha.		Date: 29/11/2024
10	Statutory compliance	The PP shall adhere to the provision of the Mines Act, 1952, Mines and Mineral (Development and Regulation), Act, 2015 and rules and regulations made there under. PP shall adhere to various circulars issued by Directorate General Mines Safety (DGMS) and Indian Bureau of Mines from time to time.
PPs Submission: Complied All the rules and regulation of Mines Act, 1952, Mines and Mineral (Development and Regulation) Act, 2015 are being complied. We are also complying to various circulars of Directorate General Mines Safety (DGMS) and Indian Bureau of Mines from time to time.		Date: 29/11/2024
11	MISCELLANEOUS	The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act,1991 along with their amendments and rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/ High Court and any other Court of Law relating to the subject matter.
PPs Submission: Agreed to Comply Agreed		Date: 29/11/2024
12	Statutory compliance	This Environmental Clearance (EC) is subject to orders/ judgment of Hon ble Supreme Court of India, Hon ble High Court, Hon ble NGT and any other Court of Law, Common Cause Conditions as may be applicable.
PPs Submission: Agreed to Comply Agreed		Date: 29/11/2024

13	Statutory compliance	This Environmental Clearance shall become operational only after receiving formal NBWL Clearance from MoEFCC subsequent to the recommendations of the Standing Committee of National Board for Wildlife, if applicable to the Project.
PPs Submission: Complied Complied As per the previous stage II forest clearance, The NBWL Clearance is not required for this project. The NOC was obtained by previous lessee and same is attached as Annexure XIV. If required or as per the direction of MoEFand CC, same will be obtained.		Date: 29/11/2024
14	Statutory compliance	A copy of EC letter will be marked to concerned Panchayat / local NGO etc. if any, from whom suggestion / representation has been received while processing the proposal.
PPs Submission: Complied Copy of EC letter was submitted to concerned Panchayat / local administrative body etc., from whom suggestion / representation has been received while processing the proposal.		Date: 29/11/2024
15	WATER QUALITY MONITORING AND PRESERVATION	Industrial wastewater (workshop and waste water from the mine) should be properly collected and treated in an ETP as proposed so as to conform to the notified standards prescribed from time to time, as applicable. The standards shall be prescribed through Consent to Operate (CTO) issued by concerned State Pollution Control Board (SPCB). The workshop effluent shall be treated after its initial passage through Oil and grease trap.
PPs Submission: Complied All the contaminated water is being treated in ETP before discharge. The wastewater from workshop is recycled for washing purpose after treated through oil and sediment separation.		Date: 29/11/2024
16	WATER QUALITY MONITORING AND PRESERVATION	The water balance/water auditing shall be carried out and measure for reducing the consumption of water shall be taken up and reported to the Regional Office of the MoEFCC and State Pollution Control Board.
PPs Submission: Complied Water audit has been conducted by TERI, New Delhi, Implementation of the recommendations are in progress.		Date: 29/11/2024
17	Noise Monitoring & Prevention	The peak particle velocity at 500m distance or within the nearest habitation, whichever is closer shall be monitored periodically as per applicable DGMS guidelines.
PPs Submission: Complied Blast induced vibration and peak particle velocity study has been conducted by NIT, Rourkela and the recommendations are being complied.		Date: 29/11/2024
18	Noise Monitoring & Prevention	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day /night hours.
PPs Submission: Complied Biological clock of the villages is not disturbed with limited night operation and by orienting the floodlights/ masks only in the mining operation areas at night. Schedule maintenance of the HEMM is being carried out to reduce noise and continuous monitoring is being done at night.		Date: 29/11/2024

19	Statutory compliance	The Project Proponent shall obtain consents from all the concerned landowners, before start of mining operations, as per the provisions of MMDR Act, 1957 and rules made there under in respect of lands which are not owned by it.

PPs Submission: Complied All the rules and regulation of Mines Act, 1952, Mines and Mineral (Development and Regulation) Act, 2015 are being complied. We are also complying to various circulars of Directorate General Mines Safety (DGMS) and Indian Bureau of Mines from time to time.	Date: 29/11/2024

20	AIR QUALITY MONITORING AND PRESERVATION	The Project Proponent shall monitor critical parameters, relevant for mining operations, of air pollution viz. PM10, PM2.5, NO2; CO and SOx etc. as per the methodology mentioned in NAAQS Notification No. B-29016/20/90/PCI/I, dated 18.11.2009 covering the aspects of transportation and use of heavy machinery in the impact zone. The ambient air quality shall also be monitored at prominent places like office building, canteen etc. as per the site condition to ascertain the exposure characteristics at specific places. The above data shall be digitally displayed within 03 months in front of the main gate of the mine site.

PPs Submission: Complied Weekly twice, monitoring of critical parameters, relevant for mining operations, of air pollution viz. PM10, PM2.5, NO2; CO and SOx etc. are being monitored as per the methodology mentioned in NAAQS Notification No. B-29016/20/90/PCI/I, dated 18.11.2009 in the impact zone. The data is being submitted to Board and displayed in digital display board in front of the main gate of the mine site. The same is attached here as Annexure III.	Date: 29/11/2024

21	WATER QUALITY MONITORING AND PRESERVATION	In case, immediate mining scheme envisages intersection of ground water table, then Environmental Clearance shall become operational only after receiving formal clearance from CGWA. In case, mining operation involves intersection of ground water table at a later stage, then PP shall ensure that prior approval from CGWA and SEIAA, Odisha is in place before such mining operations. The permission for intersection of ground water table shall essentially be based on detailed hydro-geological study of the area.

PPs Submission: Complied We have obtained the NOC for ground water abstraction with order no. CGWA/NOC/MIN/ORIG/2024/21019 valid up to 25/11/2026.	Date: 29/11/2024

22	Statutory compliance	The Project Proponent shall follow the mitigation measures provided in MoEFCCs Office Memoraridum No. Z-11013/57/2014-IA.II (M), dated 29th October, 2014, titled Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area.

PPs Submission: Being Complied Necessary precaution and best mining practices are being followed to reduce impacts on nearby villagers But there are encroachments within the mine lease area and proper Odisha Rand R policy will be implemented	Date: 29/11/2024

23	WATER QUALITY MONITORING AND PRESERVATION	The project proponent shall construct retaining wall and settling pond within the lease area. Further, check dams shall be constructed at strategic locations in which rainwater passes in rainy season. Finally, the excess supernanted after sedimentation shall be allowed to spill away through stone pitch structure to the nearby valley.

PPs Submission: Complied	Date:

Retaining wall, garland drain, settling pit and check dams are constructed as per approved mining plan for management of dump and surface run-off. The run-off is being guided through concreate drain to the Central Effluent Treatment Plant for treatment and discharge during rainy season.		29/11/2024
24	WATER QUALITY MONITORING AND PRESERVATION	Project Proponent shall plan, develop and implement rainwater harvesting measures on long term basis to augment ground water resources in the area in consultation with Central Ground Water Board/ State Groundwater Department. A report on amount of water recharged needs to be submitted to Integrated Regional Office, MoEFCC as a part of compliance in the six monthly compliance report.
PPs Submission: Complied We have constructed two rooftop rain water harvesting structures with a recharge potential of 600 m3/ year for ground water recharge.		Date: 29/11/2024
25	Statutory compliance	The Project Proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water and from CGWA for withdrawal of groundwater for the project.
PPs Submission: Complied We have obtained the NOC for ground water abstraction with order no. CGWA/NOC/MIN/ORIG/2024/21019 valid up to 25/11/2026		Date: 29/11/2024
26	WATER QUALITY MONITORING AND PRESERVATION	De-silting of agricultural lands in buffer zone and beyond including nearby Nalas/rivers perennially periodically and perpetually caused due to wash up of minerals/OB/dumps shall be done as per SOP submitted. Retaining wall shall be constructed to ensure that no silt after wash up is escaped from the core / buffer zone of the mines.
PPs Submission: Complied No spill over or wash-up material is dumped in nearby nalla/river. The drain is de-silted before monsoon period every year.		Date: 29/11/2024
27	MINING PLAN	The Project Proponent shall adhere to the working parameters of mining plan which was submitted at the time of EC appraisal wherein year-wise plan was mentioned for total excavation i.e. quantum of mineral, waste, over burden, inter burden and top soil etc. No change in basic mining proposal like mining technology, total excavation, mineral and waste production, lease area and scope of working (viz. method of mining, overburden and dump management, O.Band dump mining, mineral transportation mode, ultimate depth of mining etc.) shall not be carried out without prior approval of competent authority which entail adverse environmental impacts, even if it is a part of approved mining plan modified after grant of EC or granted by State Govt. in the form to Short Term Permit (STP), Query license or any other name.
PPs Submission: Complied We have adhered to the working parameters of mining plan which was submitted at the time of EC appraisal wherein year-wise plan was mentioned for total excavation i.e. quantum of mineral, waste, over burden etc. No change in basic mining proposal like mining technology, total excavation, mineral and waste production, lease area and scope of working (viz. method of mining, overburden and dump management, O.B and dump mining, mineral transportation mode, ultimate depth of mining etc.) are same as per the mining plan. If any modification in mining plan will be carried out and same will be approved by IBM, the approved modified mining plan will be submitted, and prior approval will be obtained from Ministry.		Date: 29/11/2024
28	Statutory compliance	State Pollution Control Board shall be responsible for display of

		this EC letter at its Regional office, District Industries Centre and Collectors office/ Tahasildars Office for 30 days.
PPs Submission: Complied We have submitted copy of the EC to State Pollution Control Board and its Regional office, District Industries Centre and Collectors office/ Tahasildars Office for display.		Date: 29/11/2024
29	AIR QUALITY MONITORING AND PRESERVATION	Effective safeguard measures for prevention of dust generation and subsequent suppression (like regular water sprinkling, metalled road construction etc.) shall be carried out in areas prone to air pollution wherein high levels of PM10 and PM2.5 are evident such as haul road, loading and unloading point and transfer points. The Fugitive dust emissions from sources shall be regularly controlled by installation of required equipments/ machineries and preventive maintenance. Use of suitable water-soluble chemical dust suppressing agents may be explored for better effectiveness of dust control system. It shall be ensured that air pollution level conform to the standards prescribed by the MoEFCC/ Central Pollution Control Board.
PPs Submission: Complied Regular water sprinkling is being carried out with water tanker and fixed sprinkling in areas prone to air pollution wherein high levels of PM10 and PM2.5 are evident such as haul road, loading and unloading point and transfer points. 500 mtrs length of fixed sprinkling has already been installed along major haul roads and installation work for another 500 mtrs is in progress. Use of suitable water-soluble chemical dust suppressing agents will be explored for better effectiveness of dust control system. Air pollution level are conforming to the standards prescribed by the MoEFand CC/ Central Pollution Control Board.		Date: 29/11/2024
30	WATER QUALITY MONITORING AND PRESERVATION	Regular monitoring of the flow rate of the springs and perennial nallahs flowing in and around the mine lease shall be carried out and records maintain. The natural water bodies and or streams which are flowing in an 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 Proponent has to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug wall located in village should be incorporated to ascertain the impact of mining over ground water table. The Report on changes in Ground water level and quality shall be submitted on six-monthly basis to the Integrated Regional Office of the Ministry, CGWA and State Groundwater Department/ State Pollution Control Board.
PPs Submission: Complied Regular monitoring of the flow rate of the Damsala nallahs flowing north side of the mine lease is being carried out and records are being maintain. No natural water bodies or streams which are flowing in an around the mine lease are being disturbed. In case of any water scarcity in the area, we provided water to the villagers for their use. Regular monitoring of ground water table is being carried out by installation of piezometers. The Report on changes in Ground water level and quality is being submitted on six-monthly basis to the Integrated Regional Office of the Ministry, CGWA and State Groundwater Department/ State Pollution Control Board. The same is attached as Annexure III.		Date: 29/11/2024
31	WATER QUALITY MONITORING AND PRESERVATION	Project Proponent shall regularly monitor and maintain records w.r.t. ground water level and quality in and around the mine lease by establishing a network of existing wells as well as new piezo-meter installations during the mining operation in consultation with Central Ground Water Authority/ State Ground Water Department. The Report on changes in Ground water level and quality shall be submitted on six-monthly basis to the Integrated Regional Office of the Ministry, CGWA and State Groundwater Department / State

		Pollution Control Board.
PPs Submission: Complied Regular monitoring of ground water table is being carried out by installation of piezometers. The Report on changes in Ground water level and quality is being submitted on six-monthly basis to the Integrated Regional Office of the Ministry and State Pollution Control Board. The same is attached as Annexure III.		Date: 29/11/2024
32	WATER QUALITY MONITORING AND PRESERVATION	Project Proponent shall undertake regular monitoring of natural water course/ water resources/ springs and perennial nallahs existing/ flowing in and around the mine lease and maintain its records. The project proponent shall undertake regular monitoring of water quality upstream and downstream of water bodies passing within and nearby/ mine lease and maintain its records. Sufficient number of gullies shall be provided at appropriate places within the lease for management of water. PP shall carryout regular monitoring w.r.t. pH and included the same in monitoring plan. The parameters to be monitored shall include their water quality vis-a-vis suitability for usage as per CPCB criteria and flow rate. It shall be ensured that no -obstruction and/ or alteration be made to water bodies during mining operations without justification and prior approval of SEIAA, Odisha. The monitoring of water courses/ bodies existing lease area shall be carried out four times in a year viz. pre- monsoon (April-May), mansoon (August), post-monsoon (November) and winter (January) and the record of monitored data be sent regularly to the Integrated Regional Office, Bhubaneswar of MoEFCC, Gol, SEIAA, Odisha, Central Ground Water Authority and Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board. Clearly showing the trend analysis on six-monthly basis.
PPs Submission: Complied Regular monitoring of the flow rate and quality (upstream and downstream) of the Damsala nallahs flowing north side of the mine lease is being carried out and records maintain. The natural water is not disturbed. Regular monitoring of pH and other water quality parameters are being analysed and reported monthly. The trend analysis of water quality parameters is being submitted on six-monthly basis to the Integrated Regional Office of the Ministry, CGWA and State Groundwater Department/ State Pollution Control Board on six-monthly basis.		Date: 29/11/2024
33	WATER QUALITY MONITORING AND PRESERVATION	Quality of polluted water generated from mining operations which include Chemical Oxygen Demand (COD) in mines run-off; acid mine drainage and metal contamination in run-off shall be monitored along with Total Suspended Solids (TDS), Dissolved Oxygen (DO), pH and Total Suspended Solids (TSS). The monitored data shall be uploaded on the website of the company as well as displayed at the project site in public domain, on a display board, at a suitable location near the main gate of the Company. The circular No. J- 20012/1 /2006-IA.II (M) dated 27.05.2009 issued by Ministry of Environment, Forest and Climate Change may also be referred in this regard.
PPs Submission: Complied The water quality parameters such as Chemical Oxygen Demand (COD) in mines run-off; acid mine drainage and metal contamination in run-off shall be monitored along with Total Suspended Solids (TDS), Dissolved Oxygen (DO), pH and Total Suspended Solids (TSS) are being analysed for the effluent generated from mining operations and treated. The monthly average data is being displayed in display board near the main gate and six monthly in website.		Date: 29/11/2024
34	MINING PLAN	The Project Proponent shall get the Final Mine Closure Plan along with Financial Assurance approved from Indian Bureau of Mines/Department of Mining and Geology as required under the Provision of the MMDR Act, 1957 and Rules/ Guidelines made there under. A copy of approved final mine closure plan shall be submitted

		within 2 months of the approval of the same from the competent authority to the concerned Regional Office of the Ministry of Environment, Forest and Climate Change for record and verification.
PPs Submission: Agreed to Comply We will submit the Final Mine Closure Plan along with Financial Assurance approved from Indian Bureau of Mines/Department of Mining and Geology as required under the Provision of the MMDR Act, 1957 and Rules/ Guidelines made there under. A copy of approved final mine closure plan will be submitted within 2 months of the approval of the same from the competent authority to the concerned Regional Office of the Ministry of Environment, Forest and Climate Change for record and verification.		Date: 29/11/2024
35	MINING PLAN	The land-use of the mine lease area at various stages of mining scheme as well as at the end-of-life shall be governed as per the approved Mining Plan. The excavation vis-a-vis backfilling in the mine lease area and corresponding afforestation to be raised in the reclaimed area shall be governed as per approved mining plan. PP shall ensure the monitoring and management of rehabilitated areas until the vegetation becomes self-sustaining. The compliance status shall be submitted half-yearly to the concerned Integrated Regional Office, Bhubaneswar of MoEFCC, GoI.
PPs Submission: Agreed to Comply The land-use of the mine lease area at various stages of mining scheme as well as at the end-of-life is being governed as per the approved Mining Plan. The mature mined out areas will be backfilled, and rehabilitation measures will be taken until the vegetation becomes self-sustaining. Compliance status of the same will be submitted half-yearly to the concerned Integrated Regional Office, Bhubaneswar of MoEF and CC, GoI.		Date: 29/11/2024
36	LAND RECLAMATION	The topsoil, if any, shall temporarily be stored at earmarked site(s) within the mine lease only and should not be kept unutilized for long. The physical parameters of the topsoil dumps like height, width and angle of slope shall be governed as per the approved Mining Plan and as per the guidelines framed by DGMS w.r.t. safety in mining operations shall be strictly adhered to maintain the stability of dumps. The topsoil shall be used for land reclamation and plantation purpose.
PPs Submission: Complied This mine is a brown field mines and no topsoil generated till date. If any topsoil will generate, same will be stored at earmarked area and will be used for land reclamation and plantation purpose		Date: 29/11/2024
37	Statutory compliance	No Transportation of the minerals shall be allowed in case of roads passing through transportation of the minerals leaving an adequate gap (say at least 200 meters) so that the adverse impact of sound and dust along with chances of accidents could be mitigated. All costs resulting from widening and strengthening of existing public road network shall be borne by the PP in consultation with nodal State Govt. Department. Transportation of minerals through road movement in case of existing village/ rural roads shall be allowed in consultation with nodal State Govt. Department only after required strengthening such that the carrying capacity of roads is increased to handle the traffic load. The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly. Vehicular emissions shall be kept under control and regularly monitored. Project should obtain Pollution Under Control (PUC) certificate for all the vehicles from authorized pollution testing centers.
PPs Submission: Being Complied The state highway is passed through the mining lease, and we have applied for diversion of the road		Date: 29/11/2024

to with nodal State Govt. Department with requisite cost for diversion. This road is being used by all other mine owners to transport their material from Sukinda valley. To decrease the pollution load, regular water sprinkling is being done with consultation with Regional officer, SPCB, Kalinganagar. Vehicular emissions are kept under control and regularly monitored. We obtain Pollution Under Control (PUC) certificate for all the vehicles from authorized pollution testing centers, which is a part of our vehicle fitness for mining operations.		
38	Human Health Environment	The Proponent shall carry out Occupational health surveillance which be a part of HRA and include Biological Monitoring where practical and feasible, and the tests and investigations relevant to the exposure (e.g. for Dust a X-Ray chest; For Noise Audiometric; for Lead Exposure Blood Lead, For Welders Full Ophthalmologic Assessment; for Manganese Miners a complete Neurological Assessment by a Certified Neurologist, and Manganese (Mn) estimation in Blood; For Inorganic Chromium-Fortnightly skin inspection of hands and forearms by a responsible person. Except routine tests all tests would be carried out in a Lab accredited by NABH. Records of Health Surveillance must be kept for Physical examination and tests. 30 years, including the results of and the records of The record of exposure due to materials like Asbestos, Hard Rock Mining, Silica, Gold, Kaolin, Aluminium, Iron, Manganese, Chromium, Lead, Uranium need to be handed over to the Mining Department of the State in case the life of the mine is less than 30 years. It would be obligatory for the State Mines Departments to make arrangements for the safe and secure storage of the records including X-Ray. Only conventional X-Ray will be accepted for record purposes and not the digital one). X-Ray must meet ILO criteria (17 xl4 inches and of good quality).
PPs Submission: Complied Wet drilling is a common practice in the mines. Further all dusty areas are being wetted by water sprinkling arrangement. Staffs and Workers exposed to dust prone areas are provided with all PPEs. Regular training is given to all staff at our VT Centre to educate them on safety and health aspects.		Date: 29/11/2024
39	Human Health Environment	Project Proponent shall make provision for the housing for workers/labors or shall construct labor camps within/outside (company owned land) with necessary basic infrastructure/ facilities like fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche for kids etc. The housing may be provided in the form of temporary structures which can be removed after the completion of the project related infrastructure. The domestic wastewater should be treated with STP in order to avoid contamination of underground water.
PPs Submission: Complied Majority of the workers are from local areas. We have constructed temporary residential facility with all facilities for the labour within the lease hold area and provided facilities like toilets, safe drinking water, medical health care and creche for kids.		Date: 29/11/2024
40	LAND RECLAMATION	The reclamation of waste dump sites shall be done in scientific manner as per the Approved Mining Plan cum Progressive Mine Closure Plan.
PPs Submission: Complied The reclamation is being carried out as per scientific manner as per approved Mining Plan cum Progressive Mine Closure Plan.		Date: 29/11/2024
41	GREENBELT	The Project Proponent shall make necessary alternative arrangements for livestock feed by developing grazing land with a view to compensate those areas which are coming within the mine

		lease. The development of such grazing land shall be done in consultation with the State Government. In this regard, Project Proponent should essentially implement the directions of the Hon ble Supreme Court with regard to acquisition of grazing land. The sparse trees on such grazing ground, which provide mid-day shelter from the scorching sun, should be scrupulously guarded/ protected against felling and plantation of such trees should be promoted.
PPs Submission: Agreed to Comply The entire mine area of 246.858Ha is comprises of 241.773.78 Ha of forest land and 5.088Ha non-forest land. No such grazing land have been acquired by the company. In future, if required alternate areas for livestock grazing will be arranged in consultation with the State Government.		Date: 29/11/2024
42	Statutory compliance	The Project Proponent shall provide parking plaza for the heavy vehicles within the lease area as per recommendation of NEERI, if applicable to the project
PPs Submission: Complied We have provided parking plaza cum amenity centre for the divers and transporting vehicles within the lease area as per recommendation of NEERI report.		Date: 29/11/2024
43	GREENBELT	The Project Proponent shall develop greenbelt in 7.5m wide safety zone all along the mine lease boundary as per the guidelines of CPCB in order to arrest pollution emanating from mining operations within the lease. The whole Green belt shall be developed within first 5 years starting from windward side of the active mining area. The development of greenbelt shall be governed as per the EC granted by the Ministry irrespective of the stipulation made in approved mine plan.
PPs Submission: Being Complied About 60 Percent of the 7.5m wide safety zone is being maintained all along the mine lease boundary as per the guidelines of CPCB in order to arrest pollution emanating from mining operations within the lease. Some portion of the safety zone is not maintained due to encroachment of the local people and will be maintained after successful implementation of Odisha State Rand R policy. About 4.12ha of Dump and safety zone plantation is completed in FY 2023 24. About 10800nos of local saplings are planted in dump for more survival rate with tree density of 2500 per hectare.		Date: 29/11/2024
44	Human Health Environment	A commitment in form of an undertaking for periodical occupational health checkup of the employee and the local people shall be done through an occupational health expert as per the detailed action plan submitted with the proposal within 6 months from the date of issue of Environmental Clearance.
PPs Submission: Complied We have established one non-bed dispensary to carried out health check-up program by qualified medical Surgeon Day to day basis and fist-add to any injury. Tata Steel Foundation conduct medical check-up for nearby community in continuous basis.		Date: 29/11/2024
45	Human Health Environment	The Proponent shall maintained a record of performance indicators for workers which includes (a) there should not be a significant decline in their Body Mass Index and it should stay between 18.5 - 24.9, (b) the Final Chest X-Ray compared with the base line X-Ray should not show any capacities,(c) At the end of their leaving job there should be no Diminution in their Lung Functions Forced Expiratory Volume in one second (FEV1),Forced Vital Capacity (F VC), and the ratio) unless they are smokers which has to be adjusted, and the effect of age, (d) their hearing should not be affected. As a proof an Audiogram (first and last need to be presented), (e) they should not have developed any Persistent Back Pain, Neck Pain, and

		the movement of their Hip, Knee and other joints should have normal range of movement, (f) they should not have suffered loss of any body part. The record of the same should be submitted to the Regional Office, MoEFCC annually along with details of the relief and compensation paid to workers having above indications.
PPs Submission: Being Complied Periodic health checkup for all workers is conducted which includes eye test, audiometry, Lung function test, Chest X-ray, ECG and pathological investigations. The annual health checkup report for FY25 will be submitted to RO, MOEFCC.		Date: 29/11/2024
46	AIR QUALITY MONITORING AND PRESERVATION	The Main haulage road within the mine lease should be provided with a permanent water arrangement for dust suppression. Other roads within the mine lease should be wetted regularly with tanker-mounted water sprinkling system. The other areas of dust generation like crushing zone, material transfer points, material yards etc. should invariably be provided with dust suppression arrangements. The air pollution control equipments like bag filters, vacuum suction hoods, dry fogging system etc. shall be installed at Crushers, belt-conveyors and other areas prone to air pollution. The belt conveyor should be fully covered to avoid generation of dust while transportation. PP shall take necessary measures to avoid generation of fugitive dust emissions.
PPs Submission: Complied About 500 mtrs of fixed water sprinkler is installed and the entire haul road will be fitted with fixed water sprinkling in phase wise. However, we have frequently sprinkled water through tanker-mounted water sprinkling system to suppress the dust emission.		Date: 29/11/2024
47	Statutory compliance	Traffic management shall be done as per recommendation of Traffic Management Study Report.
PPs Submission: Being Complied We have applied for diversion of the state highway road to with nodal State Govt. Department with requisite cost for diversion. After diversion, the recommendation of traffic management study report will be implemented.		Date: 29/11/2024
48	Statutory compliance	Project Proponent (PP) shall obtain Consent to Operate after grant of EC and effectively implement all the conditions stipulated therein. The mining activity shall not commence prior to obtaining Consent to Establish / Consent to Operate from the concerned State Pollution Control Board.
PPs Submission: Complied We have obtained the Consent to Establish vide Order No. 10964/IND-II-CTE-6887, dated 12.07.2023 and Consent to Operate Order No. 4418/IND-I-CON-220, dated 29.03.2024 from State Pollution Control Board. All conditions are being complied.		Date: 29/11/2024
49	Statutory compliance	The Project Authorities should widely advertise about the grant of this EC letter by printing the same in at least two local newspapers, one of which shall be in vernacular language of the concerned area. The advertisement shall be done within 7 days of the issue of the clearance letter mentioning that the instant project has been accorded EC and copy of the EC letter is available with the State Pollution Control Board and web site of the Ministry of Environment, Forest and Climate Change (www.parivesh.nic.in). A copy of the advertisement may be forwarded to the concerned MoEFCC Regional Office for compliance and record.
PPs Submission: Complied		Date:

The EC approval was published in two local newspapers, The Pagatibadi (Oriya daily) and The Pioneer, Bhubaneswar (English daily) on 10.11.2023. The advertisements were done mentioning that the instant project has been accorded EC and copy of the EC letter is available with the State Pollution Control Board and web site of the Ministry of Environment, Forest and Climate Change (www.parivesh.nic.in).			29/11/2024
50	Statutory compliance	The Project Proponent shall inform the MoEFCC/SEIAA, Odisha for any change in ownership of the mining lease. In case there is any change in ownership or mining lease is transferred than mining operation shall only be carried out after transfer of EC as per provisions of the para 11 of EIA Notification, 2006 as amended from time to time.	
PPs Submission: Agreed to Comply As per the Scheme of Amalgamation of Tata Steel Mining Limited (TSML CIN No. U27109OR2004PLC009683) into and with Tata Steel Limited (CIN L27100MH1907PLC000260) (Scheme of Amalgamation), and its approval and sanction by the Honorable National Company Law Tribunal, Cuttack Bench vide Order (NCLT Order), in terms of Clause 8.1 read with Clause 9.1(h) of Part I of the Scheme of Amalgamation, the captioned Scheme of Amalgamation of Tata Steel Mining Limited (TSML) into and with Tata Steel Limited has become operative and effective from September 1, 2023 (Effective Date). The name change of the EC letter has been accorded by MoEFand CC.			Date: 29/11/2024
51	Human Health Environment	The Project Proponent must demonstrate commitment to work towards Zero Harm from their mining activities and carry out Health Risk Assessment (HRA) for identification workplace hazards and assess their potential risks to health and determine appropriate control measures to protect the health and wellbeing of workers and nearby community. The proponent shall maintain accurate and systematic records of the HRA. The HRA for neighbourhood has to focus on Public Health Problems like Malaria, Tuberculosis, HIV, Anaemia, Diarrhoea in children under five, respiratory infections due to biomass cooking. The proponent shall also create awareness and educate the nearby community and workers for Sanitation, Personal Hygiene, Hand washing, not to defecate in open, Women Health and Hygiene (Providing Sanitary Napkins), hazard of tobacco and alcohol use. The Proponent shall carryout base line HRA for all the category of workers and thereafter every five years.	
PPs Submission: Being Complied Tata Steel Limited has implemented robust Workplace procedures integrated with safety management standards in its operations for ensuring safe working. An Emergency Management Plan (EMP) is prepared outlining the possible Safety and Health Risk Assessment (HRA) for identification workplace hazards and assess their potential risks to health and determine appropriate control measures to protect the health and wellbeing of workers. Awareness programs on health and sanitation are also regularly conducted.			Date: 29/11/2024
52	LAND RECLAMATION	The Overburden (O.B.) generated during the mining operations shall be stacked at earmarked OB dump site(s) only and it should not be kept active for a long period of time. The physical parameters of the OB dumps like height, width and angle of slope shall be governed as per the approved Mining Plan as per the guidelines/circulars issued by D.G.M.S w.r.t. safety in mining operations shall be strictly adhered to maintain the stability of topsoil/OB dumps. The topsoil shall be used for land reclamation and plantation.	
PPs Submission: Complied The overburden is stacked in earmarked areas as per approved mining plan with proper height and slope. The guidelines/circulars issued by D.G.M.S are strictly followed and complied. Year wise reclamation through plantation is being carried out as per approved mining plan			Date: 29/11/2024

53	LAND RECLAMATION	The reject/waste generated during the mining operations shall be stacked at earmarked waste dump site(s) only. The physical parameters of the waste dumps like height, width and angle of slope shall be governed as per the approved Mining Plan as per the guidelines/circulars issued by DGMS w.r.t. safety in mining operations shall be strictly adhered to maintain the stability of waste dumps.

PPs Submission: Agreed to Comply During mining operation, waste and ROM is produced. Waste as overburden (less than 10 percent chromite) is stacked at earmarked waste dump site(s) only as per approved mining plan. All the safety guidelines are being strictly followed to maintain the stability of waste dumps.	Date: 29/11/2024

54	LAND RECLAMATION	The Project Proponent shall carry out slope stability study in case the dump height is more than 30 meters. The slope stability report shall be submitted to concerned regional office of MoEFCC, Govt. of India, Bhubaneswar as well as SEIAA, Odisha.

PPs Submission: Complied The slope stability study was carried out by CSIR-Central Institute of Mining and Fuel Research (CSIR-CIMFR) and the report is attached as Annexure XI.	Date: 29/11/2024

55	LAND RECLAMATION	Check dams of appropriate size, gradient and length shall be constructed around mine pit and OB dumps to prevent storm run-off and sediment flow into adjoining water bodies. A safety margin of 50 percent shall be kept for designing of sump structures over and above peak rainfall (based on 50 years data) and maximum discharge in the mine and its adjoining area which shall also help in providing adequate retention time period thereby allowing proper settling of sediments/ silt material. The sedimentation pits/ sumps shall be constructed at the comers of the garland drains.

PPs Submission: Complied Check dams of appropriate size, gradient and length is constructed around mine pit and OB dumps to prevent storm run-off and sediment flow into adjoining water bodies as per mining plan. We have kept our non-working quarry as sumps to collect and store the excess water during storm or peak rainfall. However, we have constructed 1200m3/hr CETP to treat the water run-off water before discharge.	Date: 29/11/2024

56	GREENBELT	The Project Proponent shall carryout plantation/ afforestation in backfilled and reclaimed area of mining lease, around water body, along the roadsides, in community areas etc. by planting the native species in consultation with the State Forest Department/ Agriculture Department/ Rural development department/ Tribal Welfare Department/ Gram Panchayat such that only those species be selected which are of use to the local people. The CPCB guidelines in this respect shall also be adhered. The density of the trees should be around 2500 saplings per Hectare. Adequate budgetary provision shall be made for protection and care of trees.

PPs Submission: Complied About 4.12ha of Dump and safety zone plantation is completed in FY 2023-24. About 10800nos of local saplings are planted in dump for more survival rate with tree density of 2500 per hectare. After completion of backfilled in mined out quarries, plantation will be done for reclamation and rehabilitation of the lease area	Date: 29/11/2024

57	GREENBELT	The Project Proponent shall undertake all precautionary measures for conservation and protection of endangered flora and fauna and Schedule-I species during mining operation. A Wildlife Conservation Plan shall be prepared for the same clearly delineating action to be taken for conservation of flora and fauna. The Plan shall be approved

		by Chief Wildlife Warden of the State Govt and implemented in consultation with the State Forest and Wildlife Department. A copy of Wildlife Conservation Plan and its implementation status (annual) shall be submitted to the Regional Office of the Ministry.
PPs Submission: Being Complied Conservation measures for protection of flora and fauna in the core and buffer zone are being carried out as per the direction of the local forest and wildlife department. Previous lessee site-specific wildlife management plan is vested to TSML and same will be managed. We are in process for diversion of 17.14 ha of Sabik Forest land and required conservation measures will be taken.		Date: 29/11/2024
58	Human Health Environment	The Project Proponent shall ensure that 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.
PPs Submission: Being Complied Wet drilling is a common practice in the mines. Further all dusty areas are being wetted by water sprinkling arrangement. Staffs and Workers exposed to dust prone areas are provided with all PPEs. Regular training is given to all staff at our VT Centre to educate them on safety and health aspects.		Date: 29/11/2024
59	LAND RECLAMATION	The slope of dumps shall be vegetated in scientific manner with suitable native species to maintain the slope stability, prevent erosion and surface run off. The selection of local species regulates local climatic parameters and help in adaptation of plant species to the microclimate. The gullies formed on slopes should be adequately taken care of as it impacts the overall stability of dumps. The dump mass should be consolidated with the help of dozer/ compactors thereby ensuring proper filling/ leveling of dump mass. In critical areas, use of geo textiles/ geo-membranes / clay liners / Bentonite etc. shall be undertaken for stabilization of the dump.
PPs Submission: Complied The dumps slopes are vegetated with native saplings to maintain the slope stability, prevent erosion and surface run-off as per the direction of local forest department. Proper drainage arrangement has been constructed to channelize the run-off water without forming any gullies. The dump mass is compacted with the help of dozer for proper filling/ leveling of dump mass. In critical areas, use of geo textiles/ geo-membranes etc. will be carried out for stabilization of the dump.		Date: 29/11/2024
60	LAND RECLAMATION	Catch drains, settling tanks and siltation ponds of appropriate size shall be constructed around the mine working, mineral yards and topsoil / OB / waste dumps to prevent runoff of water and flow of sediments directly into the water bodies (Nallah/ River/ Pond etc.). The collected water should be utilized for watering the mine area, roads, green belt development, plantation etc. The drains/ sedimentation sumps etc. shall be de-silted regularly, particularly after monsoon season, and maintained properly.
PPs Submission: Complied Approximately, 4318 meters of retaining wall, 4343 meters of garland drain and 04 nos. of settling pits are maintained in and around the waste dumps to manage the runoff from OB dumps. The catch drains and siltation ponds of appropriate size is constructed around the mine working, mineral and OB dumps to prevent run off water and flow of sediments directly into the river and other water bodies. The drains and settling pits are regularly de-silted by mechanized means and maintained properly. Desilting of garland drains, channels and sedimentation pits is being carried out and will be carried out before and after monsoon season. As per mining plan 753 mtrs. of retaining wall and 726 mtrs. garland drain with 1 no of settling pond constructed during 2023-24.		Date: 29/11/2024
61	LAND RECLAMATION	The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land

		to a condition which is fit for growth of fodder, flora, fauna etc.
PPs Submission: Agreed to Comply After ceasing mining operations, we will undertake re-grassing the mining area and any other area to restore the land to a condition which is fit for growth of fodder, flora and fauna etc.		Date: 29/11/2024
62	Human Health Environment	The Project Proponent shall appoint an Occupational Health Specialist for Regular as well as Periodical medical examination of the workers engaged in the mining activities, as per the DGMS guidelines. The records shall be maintained properly. PP shall also carryout Occupational health check-ups in respect of workers which are having ailments like BP, diabetes, habitual smoking, etc. The check-ups shall be undertaken once in six months and necessary remedial/ preventive measures be taken. A status report on the same may be sent to MoEFCC Regional Office and DGMS on half-yearly basis.
PPs Submission: Being Complied We have appointed Utkal Poly Clinic, Bhubaneswar (An occupational Health Expert Organisation) for the said Job. The health check-up is being carried out on regular basis. In order to prevent the occupational health hazard, periodical medical examination of workers engaged in the mining activities, as per the DGMS guidelines by the certified Surgeon and it will be continued. M/s TSL has established one non-bed dispensary to carried out health check-up program by qualified medical Surgeon Day to day basis and fist-add to any injury. Our TSF unit has conducted medical camps in nearby community for malaria, Nutrition, Vector Born disease, cataract etc in recent days.		Date: 29/11/2024
63	PUBLIC HEARING	The activities proposed in action plan prepared for addressing the issues raised during the Public Hearing shall be completed as per the budgetary provisions mentioned in the action plan and within the stipulated time frame. The status report on implementation of action plan shall be submitted to the concerned Regional Office of the Ministry along with District Administration. Project Proponent shall keep the funds earmarked for environmental protection measures in a separate account and refrain from diverting the same for other purposes. The Year wise expenditure of such funds should be reported to the IRO, Bhubaneswar, MoEFCC, OSPCB and SEIAA, Odisha.
PPs Submission: Being Complied The activities proposed in action plan prepared for addressing the issues raised during the Public Hearing are being completed. The status report on implementation of action plan will be submitted to the concerned Regional Office of the Ministry along with District Administration. The funds earmarked for environmental protection measures is kept in separate cost centre and will not be diverted for other purposes. The Year wise expenditure of such funds will be reported to the IRO, Bhubaneswar, MoEFand CC, OSPCB and SEIAA, Odisha.		Date: 29/11/2024
64	MISCELLANEOUS	The Project Proponent shall prepare digital map (land use and land cover) of the entire lease area once in five years purpose of monitoring land use pattern and submit a report to concerned Regional Office of the MOEFCC.
PPs Submission: Agreed to Comply The digital map (land use and land cover) of the entire lease area will be submitted after 5yeas to concerned Regional Office of the MOEFand CC.		Date: 29/11/2024
65	MISCELLANEOUS	The Project Authorities should inform to the Regional Office regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.

PPs Submission: Agreed to Comply Already developed project, Final Mine closure to be submitted after approval of FMCP from IBM.		Date: 29/11/2024
66	MISCELLANEOUS	The Project Proponent shall submit six monthly compliance reports on the status of the implementation of the stipulated environmental safeguards to the concerned Integrated Regional Office (IRO), Bhubaneswar of Ministry, SEIAA, Odisha, Central Pollution Control Board and State Pollution Control Board.
PPs Submission: Complied Six monthly compliance reports on the status of the implementation of the stipulated environmental safeguards is being submitted to the concerned Integrated Regional Office (IRO), Bhubaneswar of Ministry, SEIAA, Odisha, Central Pollution Control Board and State Pollution Control Board.		Date: 29/11/2024
67	MISCELLANEOUS	An Environmental Management Plan (EMP) shall be prepared and implemented to ensure compliance with the environmental conditions specified above. A separate Environmental Management Cell with suitable qualified manpower should be set-up under the control of a Senior Executive. The Senior Executive shall directly report to Head of the Organization. Adequate number of qualified Environmental Scientists and Mining Engineers shall be appointed and submit a report to RO, MoEFCC.
PPs Submission: Complied We have established a separate Environmental Management Cell with qualified persons which is headed by top Management. Same is being submitted to RO, MoEFand CC with Six-monthly compliance report.		Date: 29/11/2024
68	MISCELLANEOUS	The project proponent shall augment infrastructure on drinking water, health care and education in nearby villages as per time bound action plan submitted.
PPs Submission: Complied We have augmented the infrastructure on drinking water, health care and education in nearby villages though our Tata Steel Foundation team.		Date: 29/11/2024
69	PUBLIC HEARING	The project proponent shall submit the time-bound action plan to the concerned integrated regional office of the Ministry within 6 months from the date of issuance of environmental clearance for undertaking the activities committed during public hearing by the project proponent and as submitted to SEAC, in terms of the provision of the MoEF CC Office Memorandum No-22-65/2017-1A.111 dated 30" September,2020. The action plan shall be implemented within three years of the commencement of the project.
PPs Submission: Being Complied Some of the proposed activities are already implemented on urgent basis like, Amenity center, Ambulance and defence driving training to local transporting drivers. We have also planted 20000 cashew and apple tree in nearby panchayats, constructed 5 rainwater harvesting structures and 2 health camp has been conducted. The process for installation of street is light is underway. For the establishment of computer lab in schools we will connect with schools in nearby panchayats and take necessary action within next 6 month from Sept 2024		Date: 29/11/2024
70	MISCELLANEOUS	The project proponent shall obtain permission from DGMS under 106(2b) to carry out blasting operation within the lease area.
PPs Submission: Complied We have obtained permission from DGMS under 106(2b) to carry out blasting operation within the		Date: 29/11/2024

lease area vide NOC NO: 180049 SEZ Bhubaneshwar Region Perm 2021 9279, Date: 28/05/2021 valid up to 5years.		
71	MISCELLANEOUS	It shall be mandatory for the project management to submit six (06) monthly compliance reports on post environmental monitoring in respect of the stipulated terms and conditions in this Environmental Clearance to the State Environment Impact Assessment Authority (SEIAA), Odisha, SPCB and Regional Office of the Ministry of Environment and Forest, Odisha in hard and soft copies on 1st June and 1st December of each calendar year. The proponent shall also upload the six monthly compliance report including results of monitored data, as applicable in the website of the Ministry(www.parivesh.nic.in) or monitoring of EC Conditions.
PPs Submission: Complied Six monthly compliance reports on the status of the implementation of the stipulated environmental safeguards is being submitted to the concerned Integrated Regional Office (IRO), Bhubaneswar of Ministry, SEIAA, Odisha, Central Pollution Control Board and State Pollution Control Board in hard copy and through mail. The compliance report is also being uploaded in Ministry website (www.parivesh.nic.in).		Date: 29/11/2024
72	MISCELLANEOUS	The environmental statement for each financial year ending 31 March in Form-V as is mandated to be submitted by the project proponent to the Odisha 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 EC conditions and shall also be sent to the respective to the concerned Integrated Regional Office (IRO), Bhubaneswar of MoEFCC, Gol, Central Pollution Control Board and State Pollution Control Board.
PPs Submission: Complied The environmental statement for financial year ending 31st March in Form-V vide letter No. TSL/FAMD/SAR/FY25/1399 on dated 30.09.2024 was submitted to the Odisha State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986. The Environmental statement is also uploaded our company website along with the status of compliance of EC conditions. The same is also being sent to the Integrated Regional Office (IRO), Bhubaneswar of MoEF and CC, Gol, Central Pollution Control Board and State Pollution Control Board.		Date: 29/11/2024

Visit Remarks

Last Site Visit Report Date:	N/A
Additional Remarks:	

Note: This acknowledgement is as per the details submitted by project proponent. In no way is this document to be considered as conclusion on any action on the compliance of the project. This is strictly for the project proponent's reference purpose.

F. No. 8-81/1996-FC

Government of India

Ministry of Environment & Forests

(FC Division)

Paryavaran Bhawan,
CGO Complex, Lodhi Road,
New Delhi – 110 510.

Dated: 28th March 2008

To

The Principal Secretary (Forests),
Government of Orissa,
Bhubaneshwer.

Sub: Diversion of 87.44 ha. of forest land (including 41.157 ha area already approved by this Ministry's order dated 14.02.97 and 29.08.97) for renewal of Kamarda Chromite mining lease of M/s B.C. Mohanty & Sons (Pvt.) Ltd. in Jajpur district of Orissa.

Sir,

I am directed to refer to State Government's letter No.10.F. (Cons) / 6 / 1999 / 1500 / F&E dated 21.01.1999 on the subject cited above seeking prior approval of the Central Government under the Forest (Conservation) Act, 1980. After careful consideration of the proposal by the Forest Advisory Committee constituted under Section-3 of the said Act, **in-principle approval** for the said Mining Lease was granted vide this Ministry's letter of even number dated 4/7th July, 2003 subject to fulfillment of certain conditions. The State Government has furnished compliance report in respect of the conditions stipulated in the in-principle approval and has requested the Central Government to grant final approval.

2. In this connection, I am directed to say that on the basis of the compliance report furnished by the State Government vide letter No. 10.F. (Cons) / 6 / 1999 / 4479 / F&E dated 14.03.2008, approval of the Central Government is hereby granted under Section-2 of the Forest (Conservation) Act, 1980 for diversion of 87.44 ha of forest land for renewal of Kamarda Chromite Mining Lease of M/s B.C. Mohanty & Sons (Pvt.) Limited in Jajpur district of Orissa subject to fulfillment of the following conditions:

1. Legal status of the diverted forest land shall remain unchanged.

2. (i) Compensatory afforestation shall be raised and maintained by the State Forest Department at the project cost.

   (ii) Fencing, protection and regeneration of the safety zone area (7.5 metres strip all along the outer boundary of the mining lease area) shall be done at the project cost. Besides this, afforestation on degraded forest land, to be selected elsewhere, measuring one and a half times the area under safety zone, shall also be done at the project cost.

   (iii) Wherever possible and technically feasible, the User Agency shall undertake afforestation measures in the blanks within the lease area, as well as along the roads outside the lease area diverted under this approval, in consultation with the State Forest Department at the project cost.

3. Following activities shall be undertaken by the State Forest Department at the project cost:

   (i) Proper mitigative measures to minimize soil erosion and choking of streams shall be prepared and implemented.

(ii) Planting of adequate drought hardy plant species and sowing of seeds to arrest soil erosion.

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

4. The period of diversion under this approval shall be twenty (20) years with effect from date of issue of this letter subject to valid lease by User Agency under the MMDR Act, 1957.

5. (i) The User Agency shall take up planting work on the static dumps during the advance mining operations.

(ii) All the dumps shall be fully reclaimed by afforestation immediately after closure of the mine in the shortest possible period under supervision of the State Forest Department.

6. Any tree felling shall be done only when it is absolutely necessary and unavoidable, and that too under strict supervision of the State Forest Department.

7. No damage to the flora and fauna of the area shall be caused.

8. Reclamation Plan shall be strictly implemented which shall be monitored regularly by the State Forest Department.

9. It shall be ensured that no labour-camps are set up inside the forest area.

10. The mining lease area shall be demarcated on ground at the project cost, using four feet high RCC pillars, with each pillar inscribed with the serial number, forward and backward bearings and distance between two adjacent pillars.

11. The forest land shall not be used for any purpose other than that specified in the proposal.

12. This approval is subject to the Environment Clearance under the Environment (Protection) Act, 1986 and any other clearances required for such project.

13. Any other condition that the CCF (Central), Regional Office, Bhubaneshwar, may impose from time to time for protection and improvement of flora and fauna in the forest area, shall also be applicable.

Yours faithfully,

(C.D. Singh)
Assistant Inspector General of Forests

Copy to :-

1. The Principal Chief Conservation of Forests, Government of Orissa, Bhubaneshwar.
2. The Nodal Officer, O/o the PCCF, Government of Orissa, Bhubaneshwar.
3. The Chief Conservator of Forests (Central), Regional Office, Bhubaneswar.
4. User Agency.
5. Monitoring Cell of FC Section.

(C.D. Singh)
Assistant Inspector General of Forests

By e-mail

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
OFFICE OF THE REGIONAL CONTROLLER OF MINES, BHUBANESHWAR

No. MCDR-MiFL0CR/10/2023-BBS-IBM_RO_BBS Dt : 02/04/2024

Shri/M/s. Tata Steel Limited ,
Bombay House,24 Homi Mody street Fort, Mumbai

SARUABIL CHROMITE MINE (40053002)

Sub : Approval of the Modification of Mining Plan along with Progressive Mine Closure Plan (PMCP) in respect of SARUABIL CHROMITE MINE over an area of 246.858 Ha of M/s Tata Steel Limited, situated in Village-Saruabil, Tahsil- Sukinda, District- Jajpur of Odisha State.

Sir,

In exercise of the powers conferred by clause (b) of sub-section (2) of section 5 of the Mines & Minerals (Development & Regulation) Act, 1957 and clause (3) of Rule 17 of the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 read with Government of India Order No. S.O. 1857(E) dated 18th May, 2016; I hereby **Approve** the Modification of Mining Plan along with Progressive Mine Closure Plan (PMCP) in respect of SARUABIL CHROMITE MINE over an area of 246.858 Ha of M/s Tata Steel Limited, situated in Village- Saruabil, Tahsil- Sukinda, District- Jajpur of Odisha State. This approval is subject to the following conditions:-

A--General Conditions:

1. The Modification of Mining Plan is approved without prejudice to any other law applicable to the mine area from time to time whether made by the Central Government, State Government or any other authority and without prejudice to any order or direction from any court of competent jurisdiction.
2. That this approval of aforesaid Modification of Mining Plan does not in any way imply the approval of the Government in terms of any other provision of Mines & Minerals (Development & Regulation) Act, 1957, or the Mineral Concession Rules, 2016 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986 or the rules made there under and other relevant statutes, order and guidelines as may be applicable to the lease area from time to time
3. The provisions of the Mines Act, 1952 and Rules and Regulations made thereunder including submission of notices of opening, appointment of manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.
4. The execution of Modification of Mining Plan shall be subjected to vacations of prohibitory orders / notices, if any.
5. If anything is found to be concealed as required by the Mines Act in the contents of the mining plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
6. This approval for proposed mining operations and associated activities is restricted to the mining lease area only from this date. The mining lease area is as shown on the statutory plans by the Lessee/QP/Applicant and Indian Bureau of Mines has not undertaken any survey verification of mining lease boundary on the ground.
7. Your attention is invited to the Supreme Court interim order in W.P. (C) No. 202 dated 12.12.1996 for compliance. The approval of above said Mining Plan is therefore, issued without prejudice to and is subject to the said directions of the Supreme Court as applicable.
8. This department does not undertake any responsibility regarding correctness of the boundaries of the lease area shown on the ground.
9. At any stage, if it is observed that the information furnished in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.
10. If this approval conflicts with any other law or court order/ Direction under any statute, it shall be revoked immediately.
11. It shall be mandatory for the project proponent, abstracting ground water, to obtain “No Objection Certificate” from Central Ground Water Authority or, the concerned State/Union Territory Ground Water Authority, as the case may be.
12. Lessee shall ensure grassing/re-grassing of worked out mining lease area in accordance with Hon’ble Supreme Court Order dated 8/1/2020.
13. This approval has been given for mining proposal for the year 2023-24 to 2024-25 and is subject to the validity of lease period.
14. The next Review of Mining Plan for the subsequent period of five years shall become due 180 days before expiry of this document proposal period.
15. The validity period of the performance surety shall be renewed before the expiry of the same and should be submitted to State Government with a copy to this office.
16. The feasibility report considered for reserve/resource estimation as per UNFC is submitted by the preferred bidder / lessee which is prepared based on the current data as reported and it may not establishes the future economic viability of mining project, which may be affected by the market dynamics and other related factors.

17. Disposal of OB/Waste as minor mineral shall be carried out only after obtaining permission under Rule 12(1)(k) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Yours Faithfully

(ARUN KUMAR)

Regional Controller of Mines,

Indian Bureau of Mines, Bhubaneswar

Copy for information to:-

(1) The Controller of Mines (EZ), Indian Bureau of Mines, CP-13, Sector V, Salt Lake City, Kolkata- 700 091, Email. zo.kol@ibm.gov.in

(2) The Director of Mines, Directorate of Mines, Government of Odisha, Heads of the Department Building, Bhubaneswar- 751001, Email. directorateofmines@orissaminerals.gov.in.

(3) Qualified Person.

SARUABIL CHROMITE MINE (40053002)

Report. No: Envlab/24-25/TR-11047 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
AMBIENT AIR QUALITY (CORE ZONE)

Name & Address of the Client : Saruabil Chromite Block,
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

AAQMS1- Office Top												
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
APRIL-24	54.4	28.9	7.3	10.4	0.29	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MAY-24	53.1	28.6	7.2	10.2	0.27	BDL	BDL	BDL	BDL	BDL	BDL	BDL
JUNE-24	51.7	27.1	7.2	9.9	0.27	BDL	BDL	BDL	BDL	BDL	BDL	BDL
JULY-24	42.4	21.7	6.6	8.6	0.24	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AUG-24	44.0	24.3	6.9	8.5	0.21	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SEPT-24	43.4	22.5	6.9	7.9	0.22	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AVERAGE	48.2	25.5	7.0	9.3	0.25	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100.00 (24 hours)	60.00 (24 hours)	80.00 (1hours)	80.00 (1 hour)	4.0 (1hour)	180 (1hour)	400 (24 hours)	5 (Annual)	1 (Annual)	1 (24 hours)	6 (Annual)	20 (Annual)
Method of Testing	IS: 5182, PART-4, 23	IS: 5182, P ART-4, 23	IS: 5182, PART-2	IS: 5182, PART-6	IS: 5182, PART-10	CPCB Guidelines	IS: 5182, PART-22	CPCB Guidelines	IS: 5182, PART-12	IS: 5182, PART-12	IS: 5182, PART-22	IS: 5182, PART-22

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11048 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
AMBIENT AIR QUALITY (CORE ZONE)

Name & Address of the Client : Saruabil Chromite Block,
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

AAQMS2- ETP TOP												
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
APRIL-24	62.3	32.1	6.6	10.4	0.31	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MAY-24	61.5	31.7	6.5	10.2	0.30	BDL	BDL	BDL	BDL	BDL	BDL	BDL
JUNE-24	60.0	30.6	6.4	10.1	0.29	BDL	BDL	BDL	BDL	BDL	BDL	BDL
JULY-24	44.6	22.7	6.1	9.0	0.22	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AUG-24	46.1	25.5	6.3	9.1	0.23	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SEPT-24	47.0	24.2	6.5	8.8	0.23	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AVERAGE	53.6	27.8	6.4	9.6	0.26	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100.00 (24 hours)	60.00 (24 hours)	80.00 (1hours)	80.00 (1 hour)	4.0 (1hour)	180 (1hour)	400 (24 hours)	5 (Annual)	1 (Annual)	1 (24 hours)	6 (Annual)	20 (Annual)
Method of Testing	IS: 5182, PART-4, 23	IS: 5182, P ART-4, 23	IS: 5182, PART-2	IS: 5182, PART-6	IS: 5182, PART-10	CPCB Guidelines	IS: 5182, PART-22	CPCB Guidelines	IS: 5182, PART-12	IS: 5182, PART-12	IS: 5182, PART-22	IS: 5182, PART-22

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11049 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
AMBIENT AIR QUALITY (CORE ZONE)

Name & Address of the Client : Saruabil Chromite Block,
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

AAQMS3- Mechanical Garage												
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
APRIL-24	62.6	32.0	8.4	10.8	0.23	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MAY-24	61.0	31.5	8.0	10.8	0.22	BDL	BDL	BDL	BDL	BDL	BDL	BDL
JUNE-24	59.5	31.0	7.9	10.1	0.22	BDL	BDL	BDL	BDL	BDL	BDL	BDL
JULY-24	43.1	21.3	7.1	9.2	0.19	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AUG-24	45.3	24.2	7.3	9.5	0.20	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SEPT-24	49.0	24.7	7.1	9.1	0.21	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AVERAGE	53.4	27.5	7.6	9.9	0.21	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100.00 (24 hours)	60.00 (24 hours)	80.00 (1hours)	80.00 (1 hour)	4.0 (1hour)	180 (1hour)	400 (24 hours)	5 (Annual)	1 (Annual)	1 (24 hours)	6 (Annual)	20 (Annual)
Method of Testing	IS: 5182, PART-4, 23	IS: 5182, P ART-4, 23	IS: 5182, PART-2	IS: 5182, PART-6	IS: 5182, PART-10	CPCB Guidelines	IS: 5182, PART-22	CPCB Guidelines	IS: 5182, PART-12	IS: 5182, PART-12	IS: 5182, PART-22	IS: 5182, PART-22

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11050 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
AMBIENT AIR QUALITY (CORE ZONE)

Name & Address of the Client : Saruabil Chromite Block,
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

AAQMS4- Old Magazine												
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
APRIL-24	61.6	32.2	8.5	10.5	0.30	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MAY-24	59.7	30.6	8.5	10.9	0.29	BDL	BDL	BDL	BDL	BDL	BDL	BDL
JUNE-24	58.7	30.2	8.1	10.5	0.27	BDL	BDL	BDL	BDL	BDL	BDL	BDL
JULY-24	44.2	21.1	7.6	9.2	0.22	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AUG-24	46.1	24.5	7.6	8.3	0.23	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SEPT-24	50.7	25.8	7.9	9.4	0.24	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AVERAGE	53.5	27.4	8.0	9.8	0.26	BDL	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100.00 (24 hours)	60.00 (24 hours)	80.00 (1hours)	80.00 (1 hour)	4.0 (1hour)	180 (1hour)	400 (24 hours)	5 (Annual)	1 (Annual)	1 (24 hours)	6 (Annual)	20 (Annual)
Method of Testing	IS: 5182, PART-4, 23	IS: 5182, P ART-4, 23	IS: 5182, PART-2	IS: 5182, PART-6	IS: 5182, PART-10	CPCB Guidelines	IS: 5182, PART-22	CPCB Guidelines	IS: 5182, PART-12	IS: 5182, PART-12	IS: 5182, PART-22	IS: 5182, PART-22

Reviewed By: **Approved by:**

Report. No: Envlab/24-25/TR-11051 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
AMBIENT AIR QUALITY (BUFFER ZONE)

Name & Address of the Client : Saruabil Chromite Block,
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

AAQBZ1: Balipura 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
JUNE-24	44.8	23.8	BDL	BDL	BDL	5.2	BDL	BDL	BDL	BDL	BDL	BDL
SEPT-24	45.3	22.8	BDL	BDL	BDL	5.1	BDL	BDL	BDL	BDL	BDL	BDL
AVERAGE	45.05	23.3	BDL	BDL	BDL	5.15	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100.00 (24 hours)	60.00 (24 hours)	80.00 (1hours)	80.00 (1 hour)	4.0 (1hour)	180 (1hour)	400 (24 hours)	5 (Annual)	1 (Annual)	1 (24 hours)	6 (Annual)	20 (Annual)
Method of Testing	IS: 5182, PART-4, 23	IS: 5182, P ART-4, 23	IS: 5182, PART-2	IS: 5182, PART-6	IS: 5182, PART-10	CPCB Guidelines	IS: 5182, PART-22	CPCB Guidelines	IS: 5182, PART-12	IS: 5182, PART-12	IS: 5182, PART-22	IS: 5182, PART-22

AAQBZ2: Sukurangi 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
JUNE-24	46.1	24.1	BDL	BDL	BDL	5.0	BDL	BDL	BDL	BDL	BDL	BDL
SEPT-24	48.1	23.1	BDL	BDL	BDL	4.8	BDL	BDL	BDL	BDL	BDL	BDL
AVERAGE	47.1	23.6	BDL	BDL	BDL	4.9	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100.00 (24 hours)	60.00 (24 hours)	80.00 (1hours)	80.00 (1 hour)	4.0 (1hour)	180 (1hour)	400 (24 hours)	5 (Annual)	1 (Annual)	1 (24 hours)	6 (Annual)	20 (Annual)
Method of Testing	IS: 5182, PART-4, 23	IS: 5182, P ART-4, 23	IS: 5182, PART-2	IS: 5182, PART-6	IS: 5182, PART-10	CPCB Guidelines	IS: 5182, PART-22	CPCB Guidelines	IS: 5182, PART-12	IS: 5182, PART-12	IS: 5182, PART-22	IS: 5182, PART-22

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11052 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
AMBIENT AIR QUALITY (BUFFER ZONE)

Name & Address of the Client : Saruabil Chromite Block,
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

AAQBZ3: Saruabil 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
JUNE-24	43.7	23.6	BDL	BDL	BDL	5.5	BDL	BDL	BDL	BDL	BDL	BDL
SEPT-24	46.3	20.9	BDL	BDL	BDL	5.3	BDL	BDL	BDL	BDL	BDL	BDL
AVERAGE	45.0	22.3	BDL	BDL	BDL	5.4	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100.00 (24 hours)	60.00 (24 hours)	80.00 (1hours)	80.00 (1 hour)	4.0 (1hour)	180 (1hour)	400 (24 hours)	5 (Annual)	1 (Annual)	1 (24 hours)	6 (Annual)	20 (Annual)
Method of Testing	IS: 5182, PART-4, 23	IS: 5182, P ART-4, 23	IS: 5182, PART-2	IS: 5182, PART-6	IS: 5182, PART-10	CPCB Guidelines	IS: 5182, PART-22	CPCB Guidelines	IS: 5182, PART-12	IS: 5182, PART-12	IS: 5182, PART-22	IS: 5182, PART-22

AAQBZ4: Talangi 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
JUNE-24	45.5	24.2	BDL	BDL	BDL	5.4	BDL	BDL	BDL	BDL	BDL	BDL
SEPT-24	44.7	23.4	BDL	BDL	BDL	5.0	BDL	BDL	BDL	BDL	BDL	BDL
AVERAGE	45.1	23.8	BDL	BDL	BDL	5.2	BDL	BDL	BDL	BDL	BDL	BDL
NAAQ Standard	100.00 (24 hours)	60.00 (24 hours)	80.00 (1hours)	80.00 (1 hour)	4.0 (1hour)	180 (1hour)	400 (24 hours)	5 (Annual)	1 (Annual)	1 (24 hours)	6 (Annual)	20 (Annual)
Method of Testing	IS: 5182, PART-4, 23	IS: 5182, P ART-4, 23	IS: 5182, PART-2	IS: 5182, PART-6	IS: 5182, PART-10	CPCB Guidelines	IS: 5182, PART-22	CPCB Guidelines	IS: 5182, PART-12	IS: 5182, PART-12	IS: 5182, PART-22	IS: 5182, PART-22

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11053 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
GROUND WATER QUALITY ANALYSIS REPORT

Name & Address of the Client : Saruabil Chromite Block,
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

GW1: Damsala Nallah Site									
Sl. No	Parameter	Unit of Measurement	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	Colour	Hazen	CL	CL	CL	CL	CL	CL	
2	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	mg/l	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	<1	<1	<1	<1	<1	1.3	<1.0
5	Total Dissolved Solids as TDS	mg/l	184	188	184	192	188	198	189
6	pH at 250C	--	7.25	7.23	7.24	7.26	7.16	7.36	7.25
7	Aluminium (as Al)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8	Ammonia (as total ammonia-N)	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
9	Anionic Detergents	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
10	Calcium as Ca	mg/l	31.9	31.8	32.6	31.6	32.2	32.6	32.1
11	Chloride as Cl	mg/l	30.2	30.9	30.7	30.2	30.9	28.5	30.2
12	Fluoride as F	mg/l	0.24	0.24	0.24	0.22	0.21	0.22	0.23
13	Free Residual Chlorine	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
14	Iron as Fe	mg/l	0.24	0.23	0.24	0.23	0.24	0.23	0.24
15	Magnesium as Mg	mg/l	4.10	3.75	3.80	4.82	2.99	12.6	5.34
16	Manganese as Mn	mg/l	0.28	0.27	0.28	0.29	0.27	0.23	0.27
17	Sulphate as SO4	mg/l	5.9	5.8	6.3	6.2	6.0	10.9	6.85
18	Total alkalinity as CaCO3	mg/l	44.2	44.6	42.9	43.2	40.1	66	47
19	Total Hardness	mg/l	96.3	94.6	96.8	98.5	92.5	132.9	101.9
20	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21	Molybdenum as Mo	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
22	Nickel (as Ni)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	Pesticide	mg/l	Absent	Absent	Absent	Absent	Absent	Absent	Absent
24	Total Chromium as Cr	mg/l	0.016	0.018	0.018	0.017	0.013	0.011	0.016
25	Hexa Chromium as Cr +6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1	Frcal Coli form	MPN/100 ml	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8

Reviewed By: VISIONTEK CONSULTANCY SERVICES PVT. LTD. **Approved By:** P. Pati

Report. No: Envlab/4-25/TR-11054 **Date: 28.10.2024**

GW2: Borewell at DB Plot									
Sl. No	Parameter	Unit of Measurement	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	Colour	Hazen	CL	CL	CL	CL	CL	CL	CL
2	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	mg/l	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	<1	<1	<1	<1	<1	1.2	<1.0
5	Total Dissolved Solids as TDS	mg/l	166	167	162	178	176	164	168.8
6	pH at 250C	--	7.31	7.28	7.31	7.3	7.24	7.22	7.28
7	Aluminium (as Al)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8	Ammonia (as total ammonia-N)	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
9	Anionic Detergents	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
10	Calcium as Ca	mg/l	32.5	32.2	31.8	30.8	31.8	30.8	31.7
11	Chloride as Cl	mg/l	29.5	30.1	30.9	31.2	30.4	25.3	29.6
12	Fluoride as F	mg/l	0.28	0.26	0.26	0.25	0.23	0.18	0.24
13	Free Residual Chlorine	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
14	Iron as Fe	mg/l	0.21	0.21	0.21	0.24	0.26	0.25	0.23
15	Magnesium as Mg	mg/l	2.81	2.58	3.24	4.23	2.58	11.5	4.49
16	Manganese as Mn	mg/l	0.31	0.30	0.31	0.3	0.31	0.021	0.26
17	Sulphate as SO4	mg/l	6.5	6.2	6.7	6.5	6.4	11.2	7.25
18	Total alkalinity as CaCO3	mg/l	40.8	42.7	40.8	41.8	40.8	58.2	44.2
19	Total Hardness	mg/l	92.5	90.8	92.5	94.1	89.8	124.1	97.3
20	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
21	Nickel (as Ni)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
22	Pesticide	mg/l	Absent	Absent	Absent	Absent	Absent	Absent	Absent
23	Total Chromium as Cr	mg/l	0.020	0.021	0.021	0.018	0.015	0.015	0.018
24	Hexa Chromium as Cr +6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
25	Fecal Coli form	MPN/100 ml	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8

Reviewed By: VISIONTEK CONSULTANCY SERVICES PVT. LTD.

Approved By: VISIONTEK CONSULTANCY SERVICES PVT. LTD.

Report. No: Envlab/24-25/TR-11055 **Date: 28.10.2024**

GW3-Borewell of Saruabil Village					
Sl. No	Parameter	Unit of Measurement	JUNE-24	SEPT-24	AVERAGE
1	Colour	Hazen	CL	CL	CL
2	Odour	--	Agreeable	Agreeable	Agreeable
3	Taste	mg/l	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	<1	<1	<1
5	Total Dissolved Solids as TDS	mg/l	179	185	182
6	pH at 25^{0}C	--	7.32	7.36	7.34
7	Aluminium (as Al)	mg/l	<0.01	<0.01	<0.01
8	Ammonia (as total ammonia-N)	mg/l	<0.1	<0.1	<0.1
9	Anionic Detergents	mg/l	<0.2	<0.2	<0.2
10	Calcium as Ca	mg/l	30.5	32.5	31.5
11	Chloride as Cl	mg/l	32.4	30.6	31.5
12	Fluoride as F	mg/l	0.30	0.31	0.31
13	Free Residual Chlorine	mg/l	<0.1	<0.1	<0.1
14	Iron as Fe	mg/l	0.29	2.74	1.52
15	Magnesium as Mg	mg/l	3.63	0.26	1.95
16	Manganese as Mn	mg/l	0.25	7.0	3.63
17	Sulphate as SO4	mg/l	6.6	40.5	23.6
18	Total alkalinity as CaCO3	mg/l	38.6	92.2	65.4
19	Total Hardness	mg/l	90.9	2.74	46.8
20	Mercury as Hg	mg/l	<0.001	<0.001	<0.001
21	Nickel (as Ni)	mg/l	<0.02	<0.02	<0.02
22	Total Chromium as Cr	mg/l	0.018	0.013	0.016
23	Hexa Chromium as Cr +6	mg/l	<0.01	<0.01	<0.01
24	Fecal Coli form	MPN/100 ml	<1.8	<1.8	<1.8

Reviewed By: VISIONTEK CONSULTANCY SERVICES PVT. LTD.

Approved By: VISIONTEK CONSULTANCY SERVICES PVT. LTD.

Report. No: Envlab/24-25/TR-11056 **Date: 28.10.2024**

GW4-Borewell of Talangi Village					
Sl. No	**Parameter**	**Unit of Measurement**	**JUNE-24**	**SEPT-24**	**AVERAGE**
1	Colour	Hazen	CL	CL	CL
2	Odour	--	Agreeable	Agreeable	Agreeable
3	Taste	mg/l	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	<1	<1	<1
5	Total Dissolved Solids as TDS	mg/l	182	206	194
6	pH at 250C	--	7.27	7.21	7.24
7	Aluminium (as Al)	mg/l	<0.01	<0.01	<0.01
8	Ammonia (as total ammonia-N)	mg/l	<0.1	<0.1	<0.1
9	Anionic Detergents	mg/l	<0.2	<0.2	<0.2
10	Calcium as Ca	mg/l	31.4	31.9	31.65
11	Chloride as Cl	mg/l	31.2	28.5	29.85
12	Fluoride as F	mg/l	0.27	5.0	2.64
13	Free Residual Chlorine	mg/l	<0.1	0.25	0.25
14	Iron as Fe	mg/l	0.25	<0.1	0.25
15	Magnesium as Mg	mg/l	3.99	4.63	4.31
16	Manganese as Mn	mg/l	0.26	0.24	0.25
17	Sulphate as SO4	mg/l	5.8	5.9	5.9
18	Sulphide	mg/l	<1.0	41.8	41.8
19	Total alkalinity as CaCO3	mg/l	40.1	98.5	69.3
20	Total Hardness	mg/l	94.6	4.63	50.0
21	Mercury as Hg	mg/l	<0.001	<0.001	<0.001
22	Nickel (as Ni)	mg/l	<0.02	<0.02	<0.02
23	Pesticide	mg/l	Absent	Absent	Absent
24	Total Chromium as Cr	mg/l	0.021	0.016	0.019
25	Hexa Chromium as Cr +6	mg/l	<0.01	<0.01	<0.01
26	Fecall Coli form	MPN/100 ml	<1.8	<1.8	<1.8

Reviewed By: VISIONTEK CONSULTANCY SERVICES PVT. LTD.

VISIONTEK CONSULTANCY SERVICES PVT. LTD. **Approved By:**

Report. No: Envlab/24-25/TR-11057 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
SURFACE WATER QUALITY ANALYSIS REPORT

Name & Address of the Client : Saruabil Chromite Block,
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

SW1: Damsala Nallah Upstream Water									
Sl. No	Parameter	Unit	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	Colour (max)	Hazen	<10	<10	<10	<10	<10	<20	<20
2	pH Value	--	7.23	7.25	7.24	7.25	7.27	7.31	7.29
4	Suspended solids	mg/l	124	128	126	132	129	135	132
5	Dissolved Oxygen (minimum)	mg/l	4.4	4.2	4.4	4.6	4.8	5.0	4.9
6	Turbidity	NTU	13.9	13.8	13.4	14.2	14.9	15.2	15.05
7	Chloride (max)	mg/l	32.2	31.9	32.2	31.9	31.3	33.4	32.35
8	Total Dissolved Solids	mg/l	292	286	286	302	298	302	300
9	BOD (3) days at 270C (max)	mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
10	Arsenic as As	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
11	Lead as Pb(max)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
12	Cadmium as Cd (max)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
13	Hexa Chromium as Cr +6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
14	Copper as Cu (max)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
15	Zinc as Zn(max)	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
16	Selenium as Se (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
17	Cyanide as CN (max)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
18	Fluoride as F (max)	mg/l	0.17	0.15	0.16	0.18	0.19	0.21	0.20
19	Sulphates (SO4) (max)	mg/l	0.31	0.32	0.31	0.33	0.32	0.30	0.31
20	Phenolic Compounds as C6H5OH (max)	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
21	Iron as Fe (max)	mg/l	0.23	0.22	0.23	0.21	0.22	0.23	0.23
22	Nitrate as NO3, (max)	mg/l	4.2	4.4	4.2	4.4	4.6	4.3	4.45
23	Anionic Detergents (max)	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
24	Total Coli form	MPN/ 100 ml	620	580	560	580	560	580	570

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11058 **Date: 28.10.2024**

SW2: Damsala Nallah Downstream Water									
Sl. No	Parameter	Unit	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	Colour (max)	Hazen	<15	<15	<15	<15	<15	<15	<15
2	pH Value	--	7.3	7.32	7.3	7.31	7.32	7.35	7.335
3	Suspended solids	mg/l	110	114	112	124	124	148	136
4	Dissolved Oxygen (minimum)	mg/l	4.8	4.6	4.8	5.0	5.0	5.4	5.2
5	Turbidity	NTU	14.8	14.2	14.9	16.5	16.2	16.8	16.5
6	Chloride (max)	mg/l	33.4	32.5	33.1	32.4	32.2	35.1	33.65
7	Total Dissolved Solids	mg/l	312	310	310	316	310	318	314
8	BOD (3) days at 270C (max)	mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
9	Arsenic as As	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
10	Lead as Pb(max)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
11	Cadmium as Cd (max)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
12	Hexa Chromium as Cr +6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
13	Copper as Cu (max)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
14	Zinc as Zn(max)	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
15	Selenium as Se (max)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Cyanide as CN (max)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
17	Fluoride as F (max)	mg/l	0.20	0.19	0.20	0.21	0.20	0.25	0.23
18	Sulphates (SO4) (max)	mg/l	0.52	0.51	0.48	0.45	0.40	0.38	0.39
19	Phenolic Compounds as C6H5OH (max)	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
20	Iron as Fe (max)	mg/l	0.27	0.25	0.26	0.24	0.25	0.27	0.26
21	Nitrate as NO3, (max)	mg/l	4.8	4.7	4.6	4.7	4.8	4.9	4.85
22	Anionic Detergents (max)	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
23	Fecal Coli form	MPN/ 100 ml	260	260	240	260	240	240	240

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11059 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)

DRINKING WATER QUALITY ANALYSIS REPORT

Name & Address of the Client : Saruabil Chromite Block,
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

DW1- Bore well of COB Plot								
Sl. No	Parameter	Unit	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	AVERAGE
1	Colour	Hazen	CL	CL	CL	CL	CL	CL
2	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	mg/l	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	1.3	1.4	1.3	1.4	1.2	1.32
5	Total Dissolved Solids as TDS	mg/l	186	192	196	196	190	192
6	pH at 250C	--	7.25	7.29	7.26	7.29	7.32	7.28
7	Aluminium (as Al)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8	Ammonia (as total ammonia-N)	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
9	Anionic Detergents	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
10	Barium as Ba	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
11	Boron as B	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
12	Calcium as Ca	mg/l	31.8	32.2	31.9	32.3	31.8	32.0
13	Chloride as Cl	mg/l	28.5	29.5	26.8	27.5	27.2	27.9
14	Copper as Cu	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
15	Fluoride as F	mg/l	0.21	0.23	0.21	0.20	0.23	0.22
16	Free Residual Chlorine	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
17	Iron as Fe	mg/l	0.22	0.21	0.23	0.22	0.24	0.22
18	Magnesium as Mg	mg/l	13.5	14.2	14.8	15.5	15.0	14.6
19	Manganese as Mn	mg/l	0.022	0.021	0.022	0.023	0.022	0.022
20	Mineral Oil	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
21	Nitrate as NO3	mg/l	3.8	3.6	3.7	3.5	3.6	3.6
22	Phenolic Compound	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Silver as Ag	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
25	Sulphate as SO4	mg/l	11.21	11.32	10.7	11.2	11.8	11.2
26	Sulphide	mg/l	3.0	3.2	2.8	2.6	2.4	2.8
27	Total alkalinity as CaCO3	mg/l	62.5	62.8	60.2	61.8	62.6	62.0
28	Total Hardness	mg/l	134.6	138.5	140.3	144.3	140.8	139.7
29	Zinc as Zn	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
30	Cadmium as Cd	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
31	Cyanide as CN	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
32	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
33	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
34	Molybdenum as Mo	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
35	Nickel (as Ni)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
36	Pesticide	µg/l	Absent	Absent	Absent	Absent	Absent	Absent
37	Poly aromatic Hydrocarbon as PAH	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
38	Arsenic as As	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
39	Total Chromium as Cr	mg/l	0.012	0.011	0.011	0.012	0.013	0.012
40	Hexa Chromium as Cr +6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
41	Total Coli form	MPN/ 100 ml	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8

Reviewed By: VISIONTEK CONSULTANCY SERVICES PVT. LTD.

Approved By: P. Pati. VISIONTEK CONSULTANCY SERVICES PVT. LTD.

Report. No: Envlab/24-25/TR-11060 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)

DRINKING WATER QUALITY ANALYSIS REPORT

Name & Address of the Client : Saruabil Chromite Block,
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

DW2- Tubewell at Saruabil Village					
Sl. No	Parameter	Unit	JUNE-24	JULY-24	AVERAGE
1	Colour	Hazen	CL	CL	CL
2	Odour	--	Agreeable	Agreeable	Agreeable
3	Taste	mg/l	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	1.1	1.4	1.25
5	Total Dissolved Solids as TDS	mg/l	142	196	169
6	pH at 250C	--	7.24	7.29	7.27
7	Aluminium (as Al)	mg/l	<0.01	<0.01	<0.01
8	Ammonia (as total ammonia-N)	mg/l	<0.1	<0.1	<0.1
9	Anionic Detergents	mg/l	<0.2	<0.2	<0.2
10	Barium as Ba	mg/l	<0.05	<0.05	<0.05
11	Boron as B	mg/l	<0.1	<0.1	<0.1
12	Calcium as Ca	mg/l	31.2	32.3	31.7
13	Chloride as Cl	mg/l	25.1	27.5	26.3
14	Copper as Cu	mg/l	<0.02	<0.02	<0.02
15	Fluoride as F	mg/l	0.19	0.20	0.19
16	Free Residual Chlorine	mg/l	<0.1	<0.1	<0.1
17	Iron as Fe	mg/l	0.24	0.22	0.23
18	Magnesium as Mg	mg/l	9.9	15.5	12.7
19	Manganese as Mn	mg/l	0.021	0.023	0.022
20	Mineral Oil	mg/l	<0.5	<0.5	<0.5
21	Nitrate as NO3	mg/l	4.0	3.5	3.8
22	Phenolic Compound	mg/l	<0.001	<0.001	<0.001
23	Selenium as Se	mg/l	<0.01	<0.01	<0.01
24	Silver as Ag	mg/l	<0.1	<0.1	<0.1
25	Sulphate as SO4	mg/l	11.6	11.2	11.4
26	Sulphide	mg/l	3.6	2.6	3.1
27	Total alkalinity as CaCO3	mg/l	54.5	61.8	58.2
28	Total Hardness	mg/l	118.4	144.3	131.4
29	Zinc as Zn	mg/l	<0.03	<0.03	<0.03
30	Cadmium as Cd	mg/l	<0.003	<0.003	<0.003
31	Cyanide as CN	mg/l	<0.01	<0.01	<0.01
32	Lead as Pb	mg/l	<0.01	<0.01	<0.01
33	Mercury as Hg	mg/l	<0.001	<0.001	<0.001
34	Molybdenum as Mo	mg/l	<0.05	<0.05	<0.05
35	Nickel (as Ni)	mg/l	<0.02	<0.02	<0.02
36	Pesticide	µg/l	Absent	Absent	Absent
37	Poly aromatic Hydrocarbon as PAH	mg/l	<0.0001	<0.0001	<0.0001
38	Arsenic as As	mg/l	<0.004	<0.004	<0.004
39	Total Chromium as Cr	mg/l	0.011	0.012	0.012
40	Hexa Chromium as Cr +6	mg/l	<0.01	<0.01	<0.01
41	Total Coli form	MPN/ 100 ml	<1.8	<1.8	<1.8

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11061 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)

WASTE WATER QUALITY ANALYSIS REPORT

Name & Address of the Client : Saruabil Chromite Block,
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

WW-1: ETP Inlet									
Sl No	Parameter	Unit	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	pH at 250C	-	7.94	7.48	7.45	7.82	7.78	7.26	7.62
2	Colour	Hazen	<15	<15	<15	<15	<15	<15	<15
3	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Temperature	°C	27.6	27.8	28.2	25.4	24.9	23.9	26.3
5	Suspended Solids	mg/l	42.16	26.69	27.61	73.6	74.5	42.61	47.9
6	Total Residual Chlorine	mg/l	0.16	0.15	0.14	0.12	0.13	0.14	0.14
7	Oil & Grease	mg/l	3.7	3.6	3.8	3.5	3.4	3.6	3.60
8	Biochemical Oxygen Demand as BOD at 270C For 3 Days	mg/l	22	21.0	24	26	28	30	25.2
9	Chemical Oxygen Demand as COD	mg/l	76.0	78.0	80.0	104.0	112.0	108.0	93
10	Amm. Nitrogen (as N)	mg/l	2.16	2.18	2.16	2.19	2.18	2.23	2.18
11	Total Kjeldhal Nitrogen	mg/l	4.3	4.2	4.4	4.1	4.0	4.4	4.23
12	Free Ammonia	mg/l	0.022	0.021	0.022	0.019	0.018	0.022	0.021
13	Nitrate as NO3	mg/l	1.29	1.28	1.26	1.22	1.23	1.26	1.26
14	Diss. Phosphate (as P)	mg/l	0.52	0.50	0.49	0.50	0.49	0.51	0.50
15	Fluoride	mg/l	0.23	0.22	0.21	0.22	0.23	0.24	0.23
16	Sulphide	mg/l	ND	ND	ND	ND	ND	ND	ND
17	Phenolic Compound	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Cyanide (as CN)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Hexavalent Chromium as Cr +6	mg/l	0.49	0.44	0.46	0.65	0.59	0.38	0.50
20	Mercury (as Hg)	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
21	Arsenic	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
22	Lead (as Pb)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	Cadmium (as Cd)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Total Chromium (as Cr)	mg/l	0.66	0.64	0.62	0.82	0.71	0.41	0.64
25	Copper (as Cu)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
26	Zinc (as Zn)	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
27	Selenium (as Se)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Nickel (as Ni)	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
29	Manganese (as Mn)	mg/l	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
30	Iron (as Fe)	mg/l	0.47	0.45	0.44	0.41	0.42	0.41	0.43
31	Vanadium(as V)	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
32	Bio-assay Test	%	92%	91%	92%	91%	92%	90%	91%
33	Particle Size of Suspended Solids	µ	< 850	< 850	< 850	< 850	< 850	< 850	< 850
34	Pesticide	mg/l	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11062 **Date: 28.10.2024**

WW-2: ETP Outlet									
Sl No	Parameter	Unit	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	pH at 250C	-	7.44	7.22	7.24	7.95	7.92	7.75	7.59
2	Colour	Hazen	<5	<5	<5	<5	<5	<5	<5
3	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Temperature	°C	28.5	28.2	28.7	26.2	25.8	24.4	27.0
5	Suspended Solids	mg/l	28.91	28.61	22.53	28.95	26.81	31.11	27.8
6	Total Residual Chlorine	mg/l	0.13	0.13	0.13	0.11	0.10	0.12	0.12
7	Oil & Grease	mg/l	2.4	2.5	2.6	2.9	2.5	2.8	2.62
8	Biochemical Oxygen Demand as BOD at 270C For 3 Days	mg/l	<1	<1	<1	<1	<1	<1	<1
9	Chemical Oxygen Demand as COD	mg/l	<2	<2	<2	<2	<2	<2	<2
10	Amm. Nitrogen (as N)	mg/l	0.57	0.55	0.51	0.53	0.51	0.54	0.54
11	Total Kjeldhal Nitrogen	mg/l	2.9	2.8	2.6	2.9	2.8	2.6	2.77
12	Free Ammonia	mg/l	0.017	0.019	0.020	0.021	0.020	0.019	0.019
13	Nitrate as NO3	mg/l	1.13	1.11	1.08	1.06	1.08	1.1	1.09
14	Diss. Phosphate (as P)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Fluoride	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
16	Sulphide	mg/l	ND	ND	ND	ND	ND	ND	ND
17	Phenolic Compound	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Cyanide (as CN)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Hexavalent Chromium as Cr +6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
20	Mercury (as Hg)	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
21	Arsenic	mg/l	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
22	Lead (as Pb)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	Cadmium (as Cd)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Total Chromium (as Cr)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
25	Copper (as Cu)	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
26	Zinc (as Zn)	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
27	Selenium (as Se)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Nickel (as Ni)	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
29	Manganese (as Mn)	mg/l	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
30	Iron (as Fe)	mg/l	0.35	0.37	0.39	0.40	0.37	0.35	0.37
31	Vanadium(as V)	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
32	Bio-assay Test	%	93%	92%	91%	90%	91%	93%	0.92
33	Particle Size of Suspended Solids	µ	< 850	< 850	< 850	< 850	< 850	< 850	< 850
34	Pesticide	mg/l	Absent	Absent	Absent	Absent	Absent	Absent	Absent

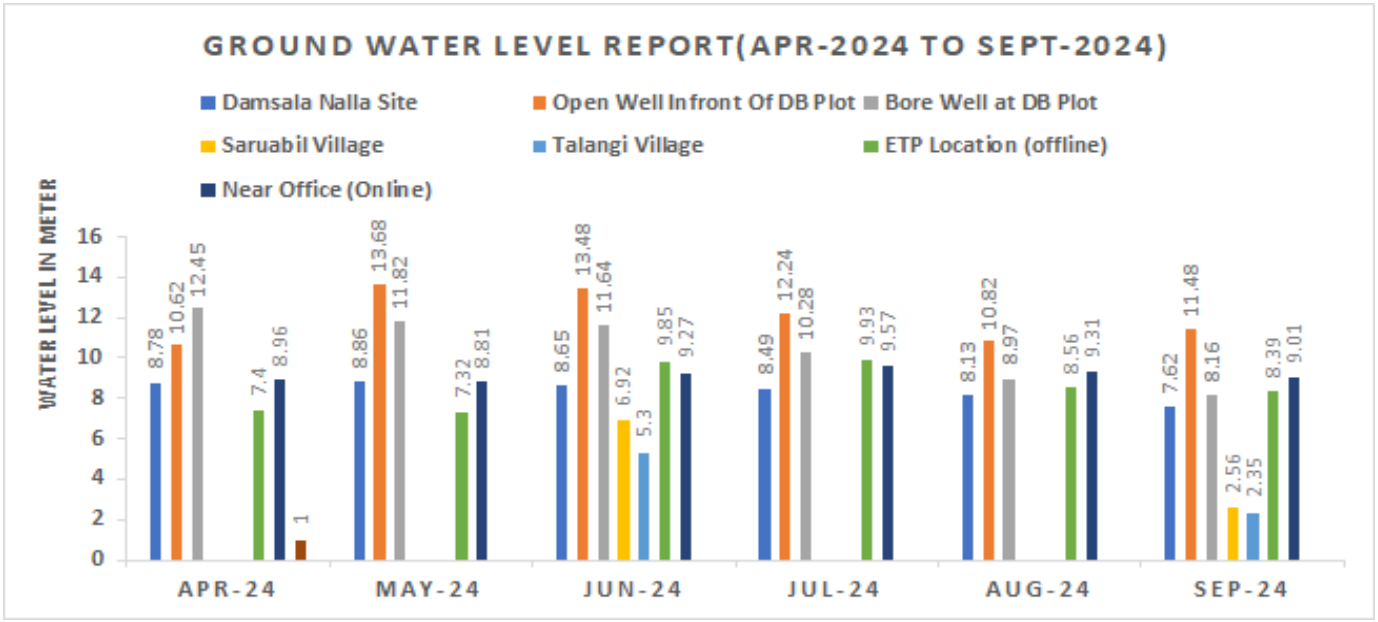
Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11063 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
GROUND WATER LEVEL MONITORING REPORT

Name & Address of the Client : **Saruabil Chromite Block,**
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

Sl. No	Parameter	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	Damsala Nalla Site	8.78	8.86	8.65	8.49	8.13	7.62	8.4
2	Open Well Infront Of DB Plot	10.62	13.68	13.48	12.24	10.82	11.48	12.1
3	Bore Well at DB Plot	12.45	11.82	11.64	10.28	8.97	8.16	10.6
4	Saruabil Village	NA	NA	6.92	NA	NA	2.56	4.7
5	Talangi Village	NA	NA	5.3	NA	NA	2.35	3.8
6	ETP Location (offline)	7.40	7.32	9.85	9.93	8.56	8.39	8.6
7	Near Office (Online)	8.96	8.81	9.27	9.57	9.31	9.01	9.2



Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11064 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
PERSONAL DUST LEVEL MONITORING

Name & Address of the Client : **Saruabil Chromite Block,**
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

Personal Respirable Dust (mg/m^3)								
Sl. No	Monitoring Location	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	MITHUN BEHERA	0.45	0.46	0.44	0.40	0.42	0.45	0.44
2	PHILIPKUMAR SAHOO	0.44	0.43	0.41	0.38	0.40	0.41	0.41
3	MAHAMMAD AZAAD	0.48	0.47	0.43	0.41	0.45	0.46	0.45
4	SURSING DAS	0.45	0.46	0.45	0.42	0.41	0.44	0.44
5	PRAKASH CH. MAHANTA	0.44	0.45	0.43	0.40	0.42	0.45	0.43

Respirable free Silica (%)								
Sl. No	Monitoring Location	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	MITHUN BEHERA	2.4	2.5	2.3	2.0	2.1	2.3	2.27
2	PHILIPKUMAR SAHOO	2.7	2.7	2.5	2.1	2.0	2.0	2.33
3	MAHAMMAD AZAAD	2.3	2.3	2.1	2.0	2.3	1.9	2.15
4	SURSING DAS	3.0	2.9	2.6	2.3	2.0	2.1	2.48
5	PRAKASH CH. MAHANTA	2.8	2.7	2.4	2.2	2.1	2.0	2.37

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11065 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
PERSONAL NOISE LEVEL MONITORING

Name & Address of the Client : **Saruabil Chromite Block,**
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

Day Time (6.00am to 10.00pm) Noise Level in dB(A)								
Sl. No	Monitoring Location	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	MITHUN BEHERA	51.5	51.2	50.4	46.1	46.1	45.2	48.4
2	PHILIPKUMAR SAHOO	52.9	50.9	48.6	45.0	44.7	43.1	47.5
3	MAHAMMAD AZAAD	54.6	53.2	51.2	44.9	46.5	45.9	49.4
4	SURSING DAS	53.5	52.4	52.1	46.3	45.8	44.1	49.0
5	PRAKASH CH. MAHANTA	55.8	54.1	52.9	45.7	45.2	46.3	50.0

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11066 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
AMBIENT NOISE MONITORING REPORT

Name & Address of the Client : **Saruabil Chromite Block,**
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

Noise Level in dB(A), Day Time								
SI. No	Location	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	Mines office	57.2	54.2	53.1	54.3	52.4	51.8	53.8
2	Colony area	50.6	52.7	50.8	50.2	51.6	52.4	51.4
3	Village Saruabil	50.1	47.5	48.2	47.6	45.7	44.5	47.3
4	Village Balipura	50.9	46.8	46.7	47.9	46.1	45.8	47.4

Noise Level in dB(A), Night Time								
SI. No	Location	APRIL-24	MAY-24	JUNE-24	JULY-24	AUG-24	SEPT-24	AVERAGE
1	Mines office	51.9	50.9	50.4	51.5	48.7	47.7	50.2
2	Colony area	48.5	49.3	46.9	47.4	48.5	49.3	48.3
3	Village Saruabil	49.2	43.8	45.5	44.7	42.8	40.8	44.5
4	Village Balipura	45.4	42.5	43.3	43.3	42.4	41.6	43.1

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11067 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
EQUIPTMENT NOISE LEVEL MONITORING

Name & Address of the Client : **Saruabil Chromite Block,**
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

JUNE-2024						
SL. NO.	Mines Div No.	Equipment	Noise level in dB(A)			
			Idle Speed		Maximum	
			Door Open	Door Closed	Door Open	Door Closed
1	DPV-313	VOLVO	78.4	74.1	87.8	82.4
2	DPV-202	VOLVO	76.8	72.3	88.2	83.6
3	DPV-315	VOLVO	75.9	71.7	86.3	83.1
4	BD-14	DROZER	79.2	75.1	85.6	81.3
5	WT-42	WATER TANKER	83.1	79.2	90.5	86.4
6	DPV-310	VOLVO	76.4	72.1	85.7	81.3
7	PC-130	MINI EXCAVATOR	82.7	78.6	89.4	85.5
8	DPV-330	VOLVO	78.6	74.2	86.7	82.3
9	DPV-299	VOLVO	81.4	77.6	87.9	82.4
10	DPV-312	VOLVO	82.1	78.5	88.3	83.8

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11068 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
SOIL QUALITY ANALYSIS REPORT

Name & Address of the Client : **Saruabil Chromite Block,**
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

S-1: Dump No-6 (Inside Lease)						
Sl.No	Parameters	Unit	Analysis Results			
			JULY-24	AUG-24	SEPT-24	AVERAGE
1	pH at 250 C	--	7.06	7.18	7.25	7.16
2	Texture	--	Clay	Clay	Clay	Clay
	Sand	%	41.5	43.5	46.2	43.7
	Silt	%	2.3	2.1	2.8	2.4
	Clay	%	56.2	54.4	51.0	53.9
3	Bulk Density	gm/cc	1.65	1.57	1.36	1.53
4	Water Holding Capacity	%	42.6	41.6	32.9	39.0
5	Electrical Conductivity	µs/cm	69.8	67.5	82.4	73.2
6	Available Nitrogen	mg/kg	16.7	16.3	18.6	17.2
7	Available Potassium as K	mg/kg	13.2	13.1	14.9	13.7
8	Available Phosphorous as p	mg/kg	10.2	10.6	11.2	10.7
9	Chloride as Cl	mg/kg	15.6	16.8	22.30	18.2
10	Iron as Fe	mg/kg	26.4	29.4	30.1	28.6
11	Copper as Cu	mg/kg	10.3	10.8	11.5	10.9
12	Nickel as Ni	mg/kg	20.7	21.2	18.9	20.3
13	Manganese as Mn	mg/kg	26.2	26.9	24.6	25.9
14	Zinc as Zn	mg/kg	30.1	30.6	31.9	30.9
15	Cobalt as Co	mg/kg	4.4	4.3	5.0	4.6
16	Lead as Pb	mg/kg	<1.0	<1.0	<1.0	<1.0
17	Cadmium as Cd	mg/kg	6.9	6.8	6.3	6.7
18	Mercury as Hg	mg/kg	<1.0	<1.0	<1.0	<1.0
19	Chromium as Cr	mg/kg	28.6	29.8	27.5	28.6
20	Arsenic as As	mg/kg	<1.0	<1.0	<1.0	<1.0
21	Hexavalent Chromium as Cr+6	mg/kg	17.4	16.2	20.2	17.9

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11069 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
SOIL QUALITY ANALYSIS REPORT

Name & Address of the Client : **Saruabil Chromite Block,**
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

S-2: Near Shiv Temple (Outside Lease)						
Sl.No	Parameters	Unit	Analysis Results			
			JULY-24	AUG-24	SEPT-24	AVERAGE
1	pH at 250 C	--	6.91	6.89	7.04	6.95
2	Texture	--	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay
	Sand	%	47.5	52.8	49.5	49.9
	Silt	%	2.6	2.3	2.4	2.4
	Clay	%	49.9	44.9	48.1	47.6
3	Bulk Density	gm/cc	1.24	1.34	1.21	1.26
4	Water Holding Capacity	%	38.1	36.8	33.5	36.1
5	Electrical Conductivity	µs/cm	70.2	71.8	79.7	73.9
6	Available Nitrogen	mg/kg	19.5	18.1	21.4	19.7
7	Available Potassium as K	mg/kg	16.7	15.4	17.1	16.4
8	Available Phosphorous as p	mg/kg	11.8	11.4	10.5	11.2
9	Chloride as Cl	mg/kg	18.4	18.8	20.7	19.3
10	Iron as Fe	mg/kg	31.8	30.7	34.1	32.2
11	Copper as Cu	mg/kg	12.8	12.2	13.4	12.8
12	Nickel as Ni	mg/kg	26.2	24.5	22.7	24.5
13	Manganese as Mn	mg/kg	24.1	25.1	25.2	24.8
14	Zinc as Zn	mg/kg	26.5	27.2	25.1	26.3
15	Cobalt as Co	mg/kg	4.7	4.5	4.8	4.7
16	Lead as Pb	mg/kg	<1.0	<1.0	<1.0	<1.0
17	Cadmium as Cd	mg/kg	8.0	7.3	7.0	7.4
18	Mercury as Hg	mg/kg	<1.0	<1.0	<1.0	<1.0
19	Chromium as Cr	mg/kg	25.1	26.5	23.2	24.9
20	Arsenic as As	mg/kg	<1.0	<1.0	<1.0	<1.0
21	Hexavalent Chromium as Cr+6	mg/kg	13.8	14.1	18.4	15.4

Reviewed By: **Approved By:**

Report. No: Envlab/24-25/TR-11070 **Date: 28.10.2024**

SIX MONTHLY COMPLIANCE REPORT (APRIL-24 TO SEPT-24)
STACK EMISSION ANALYSIS REPORT

Name & Address of the Client : **Saruabil Chromite Block,**
M/s TATA Steel Limited, Kalarangiatta, Dist. Jajpur, Odisha

Stack-1 (1010 KVA DG)					
Sl. No.	**Parameters**	**JULY-24**	**AUG-24**	**SEPT-24**	**AVERAGE**
1	Stack Temp °C	187	189	192.0	189.3
2	Stack Velocity m/sec	17.6	16.84	18.41	17.6
3	Particulate Matter (PM), mg/Nm^3	68	63	58	63.0
4	Oxides of Nitrogen (NOx), ppm	60	59	53	57.3
5	Sulphur Dioxide (SO2), ppm	18.4	17.8	17.01	17.7
6	Carbon Monoxide, mg/Nm^3	73	71	69	71.0
7	Non-Methyl Hydro Carbon as C, mg/Nm^3	22.1	22.6	24.1	22.9

Reviewed By: VISIONTEK CONSULTANCY SERVICES PVT. LTD.

VISIONTEK CONSULTANCY SERVICES PVT. LTD. P. Pati **Approved By:**

Annexure – V – Environmental Management Practices

Fully Reclaimed OB Dump

Dump runoff management

Garland drain with settling pin & Check dam

Garland drain with retaining wall cleaned

Mines haul road water sprinkling

Effluent Quality Monitoring System with RT-DAS

Air Monitoring Station

Vehicle washing with Oil & Grease separation pit

Hazardous storage area

Dump Plantation during FY 2022-23 & 23-24


Roof top rainwater harvesting structure


Piezometers installed for Ground water level monitoring

Saruabil Chromite Block

M/S Tata Steel Limited
Details of Plantation

YEAR	Total No. of Saplings	Area (ha)	Species of Plants	Survival Rate
2021-22	5410	2 ha (Dump 6 = 0.1889 ha; Dump2 = 0.8252 ha Safety Zone (Boundary Wall Inside and Outside) = 0.6597 ha Safety Zone (Nala Side) = 0.3217 ha)	Simarua, Teak, KrushnaChuda, Kaju, Bada Chakhunda, Gambhari, Neem, Maha Neem, Arjun, Karanja, Chatiyana,	75 % by March 2022
2022-23	5025	2 Ha in dump 6, Terrace 1	Simarua, Sal, Srishi, Sishu, Neem, Mahaneem, Arjun, Karanja, Katha Badam, Radha Chuda, Bamboo, Amla, Banyan, Peepal, Jamun, Bada Chakhunda,	Freshly planted (95% survival rate)
2023-24	5956	2 Ha in dump 6, Terrace 2 & 3		

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. 4418 / IND-I-CON-220 Dt. 29.03.2024 /

CONSENT ORDER NO. 2952

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. 5376784, dated 24-01-2024 and online reply datedd19-03-2024.

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: **SARUABIL CHROMITE BLOCK OF M/S. TATA STEEL LTD.**

Name of the Occupier & Designation: **SRI T. V. NARENDRAN, MANAGING DIRECTOR**

Address: **AT: SARUABIL, PO: KANSA, DIST: JAJPUR**

This consent order is valid for the period from **01/04/2024 to 31/03/2025.**

Details of Products Manufactured:

Sl. No	Product	Quantity
01.	Chrome ore (ROM)	0.35 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	Prescribed Standard						
				pH	TSS (mg/l)	BOD (mg/l)	COD (mg/l)	Oil & Grease (mg/l)	Cr+6 (mg/l)	Total Chromium (mg/l)
01.	*Septic tank (Domestic effluent)*	*Soak pit*	--	*5.5 to 9.0*	*200*	*100*	--	--	--	--
02.	*Mine drainage water / surface run off/ other wastewater*	*On land / inland surface water body*	*380*	*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 alternation or deviation made in actual practice from the particulars furnished in the application will also be the ground for liable to review/variation/revocation of the consent order under section 27 of the 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 occupier 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 / 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 this consent order without any negligence on his/her 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.
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. 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.
12. 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.
13. 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.
14. 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.
15. 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 impervious.
16. 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.
17. 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.
18. 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 occupier must adopt alternate satisfactory treatment and disposal measures.
19. The sludge from treatment units shall be dried in sludge drying beds and the drained liquid shall be taken to equalization tank.
20. The effluent treatment units and disposal measures shall become operative at the time of commencement of production.
21. 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 Acts or Rules made therein.

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

23. 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.

24. 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.

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

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

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

28. In case of such episodal discharge/emissions the occupier shall take immediate action to bring down the emission within the limits prescribed by the Board and stop the operation of the plant if required. Report of such accidental discharge /emission shall be brought to the notice of the Board within 24 hours of occurrence.

29. The applicant shall keep the premises 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.

30. Any upset condition in any of the plant/plants 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 shall be reported to the Headquarters and Regional Office of the Board by E-mail within 2 hours of its occurrence.

31. The occupier 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 premises. This plantation is stipulated over and above the bulk plantation of trees in that area.

32. 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 shall be disposed off scientifically to the satisfaction of the Board.

33. 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.

34. 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.

35. If due to any technological improvement or otherwise this 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) this 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.

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

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

38. 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.

39. 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.

40. The occupier shall comply to the conditions stipulated in CTE order issued by Odisha State Pollution Control Board and conditions stipulated in Environmental Clearances issued by MoEF&CC, Govt. of India.

41. The occupier shall abide by E(P) Act, 1986 and Rules framed there-under.

GENERAL CONDITIONS FOR UNITS WITH INVESTMENT OF MORE THAN Rs 50 CRORES, AND 17 CATEGORIES OF HIGHLY POLLUTING INDUSTRIES (RED A).

1. The applicant shall analyse the emissions every month for the parameters indicated in TABLE B & C as mentioned in this order and shall furnish the report thereof to the Board by the 10th of the succeeding month.

2. The applicant shall provide and maintain at his own cost three ambient air quality monitoring stations for monitoring Suspended Particulate Matter, Sulphor Dioxide, Oxides of Nitrogen, Hydro-Carbon, Carbon-Monixide and monitor the same once in a day/week/fortnight/month. The data collected shall be maintained in a register and a monthly extract be furnished to the Board.

3. The applicant shall provide and maintain at his own cost a meteorological station to collect the data on wind velocity, direction, temperature, humidity, rainfall, etc. and the daily reading shall be recorded and the extract sent to the Board once in a month.

4. The applicant shall forward the following information to the Member Secretary, State Pollution Control Board, Odisha, Bhubaneswar regularly.
   a. Report of analysis of stack monitoring, ambient air quality monitoring meteorological data as required every month.
   b. Progress on planting of trees quarterly.

5. The applicant shall install mechanical composite sampling equipment and continuous flow measuring / recording devices on the effluent drains of trade as well as domestic effluent. A record of daily discharge shall be maintained.

6. The following information shall be forwarded to the Member Secretary on or before 10th of every month.

   a. Performance / progress of the treatment plant.
   b. Monthly statement of daily discharge of domestic and/or trade effluent.

7. Non-compliance with effluent limitations

   a) If for any reason the applicant does not comply with or is unable to comply with any effluent limitations specified in this consent, the applicant shall immediately notify the consent issuing authority by telephone and provide the consent issuing authority with the following information in writing within 5 days of such notification.

      i) Causes of non-compliance

      ii) A description of the non-compliance discharge including its impact on the receiving waters.

      iii) Anticipated time of continuance of non-compliance if expected to continue or if such condition has been corrected the duration or period of non-compliance.

      iv) Steps taken by the applicant to reduce and eliminate the non-complying discharge and

      v) Steps to be taken by the applicant too prevent the condition of non-compliance.

   b) The applicant shall take all reasonable steps to minimize any adverse impact to natural waters resulting from non-compliance with any effluent limitation specified in this consent including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.

   c) Nothing in this consent shall be construed to relieve the applicant from civil or criminal penalties for non-compliance whether or not such non-compliance is due to factors beyond his control, such as break-down, electric failure, accident or natural disaster.

8. The applicant shall at his own cost get the effluent samples collected both before and after treatment and get them analysed at an approval laboratory every month for the parameters indicated in Part-D and shall submit in duplicate the report thereof to the Board.

9. The addition of various treatment chemicals should be done only with mechanical dosers and proper equipment for regulation of correct dosages determined daily and for proper uniform feeding. Crude practices such as dumping of chemicals in drains or sumps or trickling of acids or alkalies arbitrarily and utilizing poles for stirring etc. should not be resorted to.

10. In the disposal of treated effluent on land for irrigation, the industry shall keep in view of the need for;

    a) Rotation of crops

    b) Change of point of application of effluent on land

    c) A portion of land kept fallow

11. The adoption of these would avoid soil becoming sick or slate, the industry may ensure this in consultation with the Agriculture Department.

12. It is the sole responsibility of the industry to ensure that there are no complaints at any time from the royats in the surrounding areas as a result of discharge of sewage or trade effluent if any.

13. Proper housekeeping shall be maintained by a dedicated team.

14. The industry must constitute a team of responsible and technically qualified personnel who will ensure continuous operation of all pollution control devices round the clock (including night hours) and should be in a position to explain the status of operation of the pollution control measures to the inspecting officers of the Board at any point of time. The name of these persons with their contact telephone numbers shall be intimated to the concerned Regional Officer and Head Office of the Board and in case of any change in the team it shall be intimated to the Board immediately.

E. SPECIAL CONDITIONS:

1. Mining operation is subject to availability of all other statutory clearances required under relevant Acts/Rules.
2. Wet drilling shall be practiced or suitably designed dust extractor shall be provided for dry drilling to prevent generation of dust.
3. Pre-wetting of blasting site and controlled blasting shall be practiced.
4. Water sprinkling through mobile water tankers / fixed sprinklers shall be carried out at the desired intervals on mine haulage roads to keep the roads in wet condition so as to prevent generation of fugitive dust. The vehicles carrying ore for transportation from the mine shall be covered with tarpaulin (both bottom & top).
5. Fixed auto sprinklers shall be provided on both sides of rest part of major haul road of the mine.
6. Regular water sprinkling on mineral transportation roads passing through the habitation area as well as other strategic point on the National Highway shall be done jointly by the mining lessees in consultation with the Regional Officer.
7. All mine haulage roads and other transportation roads shall be maintained properly to avoid creation of ruts and pot holes.
8. Mechanized wheel washing facility for the ore transport vehicles shall be provided at the exit point of the mine. The wheel washing facility shall be integrated with complete recirculation system.
9. Regular monitoring of ambient air quality shall be carried out at the appropriate places (at least three places) and monitoring report shall be furnished to the Board once in six months. The permanent monitoring stations shall be fixed in consultation with the Regional Officer of the Board.
10. Ambient air quality of the mine shall meet the prescribed standards for industrial area.
11. Overburden / waste rock shall be properly stacked in the earmarked areas approved by IBM and shall be suitably terraced and stabilized through vegetative cover or otherwise.
12. Retention wall shall be constructed at the toe of OB dump & mineral stockyard. The existing runoff management facilities shall also be renovated. The runoff from OB, ore stack yard and other areas of the mine shall be diverted to the ETP for necessary treatment before its discharge to outside. There shall not be any discharge of wastewater or runoff water to outside without adequate treatment. Garland drains, channels and sedimentation pits constructed for the purpose shall be desilted as and when required and after monsoon.
13. Mine drainage water shall be discharged into surface water body after adequate treatment in the ETP. The treated wastewater of ETP shall also be utilized for sprinkling activities at various sources of generation of dust.
14. The ETP, online continuous monitoring system at the inlet & outlet of ETP with data transfer facility to SPCB server shall be effectively operated and the quality of treated wastewater shall not exceed the prescribed standards (Part A, Sl. No. 2). The online continuous monitoring system shall be properly maintained and calibrated from time to

time to ensure that spurious data are not transmitted to the SPCB server and correct data shall be transmitted continuously to the SPCB server.

15. The slime generated earlier, from the ore beneficiation plant, shall be disposed of safely as per mining plan and action shall be taken to prevent the contamination of ground water due to its disposal.
16. Domestic effluents shall be treated in a sewage treatment plant (STP) and or shall be discharged to soak pit via septic tank constructed as BIS specification. The treated wastewater quality of STP shall remain within the following standards and shall be used for plantation:

pH	-	6.5 -9.0
TSS	-	<100 mg/l
BOD	-	30 mg/l
Fecal Coliform	-	<1000 MPN/100 ml

17. Oil and grease trap (ETP) with sedimentation pit shall be provided for treatment of workshop effluent and treated effluent shall remain within the prescribed standards. Efforts shall be made to reuse the treated wastewater from the workshop. Till the ETP of workshop is made functional, there shall not be any vehicle washing inside the mine lease area.
18. Seasonal monitoring of ground water level and its quality shall be carried out four times a year and report shall be submitted to the Board.
19. Adequate measures shall be taken for control of noise levels below the following limits.

    (6.00 AM - 9.00 PM) - Leq 75 dB(A)
    (9.00PM - 6.00 AM) - Leq 70 dB(A)

20. The following actions shall be taken for better environmental management as suggested by Regional Officer.

    i. More nos. of fixed sprinklers shall be installed alongside main haul road and ore stockyard for effective dust suppression.

    An action plan in this regard shall be submitted by 15.04.2024 at the Regional Office as well at Head Office of SPCB, Odisha.

21. Ambient Air Quality monitoring data, Noise Monitoring data & Water/Waste Water Quality Monitoring data shall be electronically displayed at the entry point of the mine or at a suitable location of the mine.
22. All DG sets installed before 1.7.2004 shall be scrapped. DG sets complying with either State-I or Stage-II emission norms shall reduce Particulate Matter Emission by 70% by installing RECD without affecting any other emission parameters as per the CPCB guidelines and Board's letter vide No.17927, dated 14.11.2023, in this regard.
23. Plantation of trees shall be undertaken in the colony/ township, over top soil dumps, OB dumps, back filled areas, along the side of haul road and in other areas of the mines not being utilized for mining activities. The mine shall take up avenue plantation

and plantation in nearby village areas in consultation with DFO/Horticulture Department. The plantation details shall be submitted to the Board before end of April every year.

24. A copy of the annual return (annual return submitted to IBM, Govt. of India/ Directorate of Mines, Govt. of Odisha) shall be submitted to the Board every year.
25. The environmental statement report for the financial year ending 31st March shall be submitted to the Board in form-V on or before 30th September every year.
26. The mine shall submit a declaration by 30th April every year that all pollution control systems are in good condition, are operated efficiently and ambient air quality as well as wastewater quality are conforming to the prescribed standards.

MEMBER SECRETARY
STATE POLLUTION CONTROL BOARD, ODISHA

TO,

THE MANAGING DIRECTOR,
SARUABIL CHROMITE BLOCK OF
M/S. TATA STEEL LIMITED,
N-3/24, IRC VILLAGE, NAYAPALLI,
BHUBANESWAR, PIN-751015

Memo No._____/Dt._____/

Copy forwarded to :

i) Regional Officer, State Pollution Control Board, **Kalinganagar.**
ii) District Collector, **Jajpur**
iii) Director of Mines, Govt. of Odisha, Bhubaneswar.
iv) Director, Environment-cum-Special Secretary, F, E & CC, Dept., Govt. of Odisha, Bhubaneswar.
v) D.F.O., **Cuttack**
vi) Deputy Director of Mines, **Jajpur Road**
vii) Chief Env. Scientist, Central Lab. SPCB, Bhubaneswar
viii) Addl. Chief. Env. Engineer (Hazardous Waste Management Cell)
ix) Consent Register

CHIEF ENV. ENGINEER (M)
STATE POLLUTION CONTROL BOARD, ODISHA

GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS

GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART – A : EFFLUENTS

Sl. No.	Parameters	Prescribed Standards			
		Inland surface	Public sewers	Land for irrigation	Marine Costal Areas
		(a)	(b)	(c)	(d)
1.	Colour & odour	Colourless/ Odourless as far as practible	--	See 6 of Annex-1	See 6 of Annex-1
2.	Suspended Solids (mg/l)	100	600	200	a. For process wastewater – 100 b. For cooling water effluent 10% above total suspended matter of influent.
3.	Particular size of SS	Shall pass 850	--	--	--
5.	pH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
6.	Temperature	Shall not exceed 5°C above the receiving water temperature	--	--	Shall not exceed 5°C above the receiving water temperature
7.	Oil & Grease mg/l max.	10	20	10	20
8.	Total residual chlorine	1.0	--	--	1.0
9.	Ammonical nitrogen (as N) mg/l max.	50	50	--	50
10.	Total Kajeldahl nitrogen (as NH_3) mg/1 max.	100	--	--	100
11.	Free ammonia (as NH_3) mg/1 max.	5.0	--	--	5.0
12.	Biochemical Oxygen Demand (5 days at (20°C) mg/1 max.	30	350	100	100
13.	Chemical Oxygen Demand, mg/1 max.	250	--	--	250
14.	Arsenic (as As) mg/1 max.	0.2	0.2	0.2	0.2
15.	Mercury (as Hg) mg/1 max.	0.01	0.01	--	0.001
16.	Lead (as pb) mg/1 max.	01.	1.0	--	2.0
17.	Cardmium (as Cd) mg/1 max.	2.0	1.0	--	2.0

Sl. No.	Parameters	Prescribed Standards			
		Inland surface	Public sewers	Land for irrigation	Marine Costal Areas
		(a)	(b)	(c)	(d)
18.	Hexavalent Chromium (as Cr + 6) mg/l max.	0.1	2.0	--	1.0
19.	Total Chromium (as Cr) mg/l max.	2.0	2.0	--	2.0
20.	Copper (as Cu) mg/l max.	3.0	3.0	--	3.0
21.	Zinc (as Zn) mg/l max.	5.0	15	--	15
22.	Selenium (as Sc) mg/l max.	0.05	0.05	--	0.05
23.	Nickel (as Nil) mg/l max.	3.0	3.0	--	5.0
24.	Cyanide (as CN) mg/l max.	0.2	2.0	0.2	0.02
25.	Fluoride (as F) mg/l max.	2.0	15	--	15
26.	Dissolved Phosphates (as P) mg/l max.	5.0	--	--	--
27.	Sulphide (as S) mg/l max.	2.0	--	--	5.0
28.	Phennolic compounds as (C_6H_5OH) mg/l max.	1.0	5.0	--	5.0
29.	Radioactive materials a. Alpha emitter micro curie/ml. b. Beta emitter micro curie/ml.	10^{-7} 10^{-6}	10^{-7} 10^{-6}	10^{-8} 10^{-7}	10^{-7} 10^{-6}
30.	Bio-assay test	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
31	Manganese (as Mn)	2 mg/l	2 mg/l	--	2 mg/l
32.	Iron (Fe)	3 mg/l	3 mg/l	--	3 mg/l
33.	Vanadium (as V)	0.2 mg/l	0.2 mg/l	--	0.2 mg/l
34.	Nitrate Nitrogen	10 mg/l	--	--	20 mg/l

NATIONAL AMBIENT AIR QUALITY STANDARDS

Sl. No.	Pollutants	Time Weighed Average	Concentrate of Ambient Air		
			Industrial Residential, Rural and other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1.	Sulphur Dioxide (SO_2), $\mu g/m^3$	Annual *	50	20	-Improved west and Gaeke
		24 Hours **	80	80	- Ultraviolet fluorescence
2.	Nitrogen Dioxide (NO_2), $\mu g/m^3$	Annual *	40	30	- Modified Jacob & Hochheiser (Na-Arsenite)
		24 Hours **	80	80	- Chemiluminescence
3.	Particulate Matter (size less than 10µm) or PM_{10} $\mu g/m^3$	Annual *	60	60	-Gravimetric - TOEM
		24 Hours **	100	100	- Beta Attenuation
4.	Particulate Matter (size less than 2.5µm) or $PM_{2.5}$ $\mu g/m^3$	Annual *	40	40	-Gravimetric - TOEM
		24 Hours **	60	60	- Beta Attenuation
5.	Ozone (O_3) $\mu g/m^3$	8 Hours **	100	100	- UV Photometric - Chemiluminescence
		1 Hours **	180	180	- Chemical Method
6.	Lead (Pb) $\mu g/m^3$	Annual *	0.50	0.50	-AAS/ICP method after sampling on EMP 2000 or equivalent filter paper.
		24 Hours **	1.0	1.0	- ED-XRF using Teflon filter
7.	Carbon Monoxide (CO) mg/m^3	8 Hours **	02	02	- Non Dispersive Infra Red (NDIR) Spectroscopy
		1 Hours **	04	04	
8.	Ammonia (NH_3) $\mu g/m^3$	Annual*	100	100	-Chemiluminescence - Indophenol Blue Method
		24 Hours**	400	400	
9.	Benzene (C_6H_6) $\mu g/m^3$	Annul *	05	05	-Gas Chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10.	Benzo (a) Pyrene (BaP)-Particulate phase only, ng/m^3	Annual*	01	01	-Solvent extraction followed by HPLC/GC analysis
11.	Arsenic (As), ng/m^3	Annual*	06	06	-AAS/ICP method after sampling on EMP 2000 or equivalent filter paper
12.	Nickel (Ni),ng/m^3	Annual*	20	20	-AAS/ICP method after sampling on EMP 2000 or equivalent filter paper

* Annual arithmetic mean of minimum 104 measurements in a year at a particular [illegible] taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year, 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Tel : 0674-2564033
E-mail: paribesh1@ospcboard.org
Website: www.ospcboard.org

STATE POLLUTION CONTROL BOARD, ODISHA

[DEPARTMENT OF FOREST, ENVIRONMENT& CLIMATE CHANGE, GOVERNMENT OF ODISHA]
Paribesh Bhawan, A/118, Nilakantha Nagar, Unit – VIII
Bhubaneswar – 751012

No. 10964 / IND-II-CTE-6887 Date: 12.07.2023/

Through online/
By speed post

CONSENT TO ESTABLISH ORDER

In consideration of the online application no. **4639530** for obtaining Consent to Establish for **Saruabil Chromite Block of M/sTata Steel Mining Ltd.,** the State Pollution Control Board is pleased to convey its Consent to Establish under Section 25 of Water (Prevention & Control of Pollution) Act, 1974 and Section 21 of Air (Prevention & Control of Pollution) Act, 1981 for **enhancement of production capacity from 0.35 MTPA to 1.0 MTPA though opencast mining, installation of DG Set of capacity 1x 1010 KVA and Central Effluent Treatment Plant (CETP) of 1200 KL/ Hr to treat the surface run-off and mine pit water of both Saruabil Chromite Mine and Kamarda Chromite Mine at Saruabil Chromite Block, M/s Tata Steel Mining Limited over ML area of 246.858 ha**. At Village-Saruabil, Talangi, and Kamarda, Tahasil-Sukinda in the district of **Jajpur,** Odisha with the following conditions:

GENERAL CONDITIONS:

1. **This Consent to Establish is valid for the product, method of mining and capacity mentioned in the application form. This order is valid for five years, which means the proponent shall commence mining activities for the proposal within a period of five years from the date of issue of this Consent to Establish order. If the proponent fails to commence mining activities for the proposal within five years, then a renewal of this Consent to Establish shall be sought by the proponent.**
2. The mine shall comply to the provisions of Environment Protection Act, 1986 and the rules made there under with their amendments from time to time such as the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, Hazardous Chemical Rules /Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 etc. and amendments there under. The mine shall also comply to the provisions of Public Liability Insurance Act, 1991, if applicable.
3. The mine shall apply for grant of Consent to Operate under section 25/26 of Water(Prevention & Control of Pollution)Act, 1974 & under section 21 of Air (Prevention & Control of Pollution)Act, 1981 at least 3 (three) months before the commencement of production and obtain Consent to Operate from this Board
4. No change in mining technology and scope of working shall be made without prior approval of the Board. **This Consent to Establish is subject to statutory and other clearances from Govt. of Odisha and/or Govt. of India, as and when applicable.**

SPECIAL CONDITIONS:

A. GENERAL:

1. **The Mine shall carry out mining activity as per the Environmental Clearance granted under EIA Notification 2006 and amendment made thereafter by MoEF& CC, Govt. of India Vide EC Identification No- EC23B001OR155576 under File No. 78946/93-MINB1/07-2022 Dtd. 06/06/2023.**
2. The mine shall implement the Pollution Control Measures and safeguards as proposed in the Environment Management Plan (EMP) of Environment Impact Assessment (EIA) report.
3. The unit shall obtain NOC from CGWA for ground water withdrawal & mines dewatering for getting Consent to Operate from State Pollution Control Board, Odisha.
4. The proponent shall obtain requisite permission from the Water Resources Department, Govt. of Odisha for drawl of ground water and surface water.
5. The proponent shall obtain forest clearance for the forest land involved in the lease area.
6. A green belt of adequate width and density preferably with local species along the periphery of the mine, inactive dumps, backfilled area, vacant area, colony and any other vacant area shall be raised so as to provide protection against particulates and noise to ameliorate the environment. A detailed plantation programme in this regard shall be prepared and submitted at the time of making application for Consent to Operate for assessment.
7. The project proponent shall carryout plantation / afforestation in backfilled and reclaimed area of mining lease, around water body, along the roadsides, in community areas etc. by planting the native species in consultation with the State Forest Department / Agriculture Department / Rural development department / Tribal Welfare Department / Gram Panchayat such that only those species be selected which are of use to the local people. The CPCB guidelines in this respect shall also be adhered. The density of the trees shall be around 2500 saplings per hectare. Adequate budgetary provision shall be made for protection and care of trees.
8. The slope of dumps shall be vegetated in scientific manner with suitable native species to maintain the slope stability, prevent erosion and surface runoff. The selection of local species regulates local climatic parameters and help in adaptation of plant species to the microclimate. The gullies formed on slopes shall be adequately taken care of as it impacts the overall stability of dumps. The dump mass shall be consolidated with the help of dozer / compactors thereby ensuring proper filling / leveling of dump mass. In critical areas, use of geo textiles / geo-membranes / clay liners / Bentonite etc. shall be undertaken for stabilization of the dump.
9. A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the organization.

10. The proponent shall comply to the provisions of E-Waste (Management) Rules, 2016 and amendment thereafter and shall handover e-waste to authorized collection centers/ register dismantlers/ recyclers for proper disposal of e-waste.

11. The construction shall be carried out with the fly ash bricks. If the fly ash bricks are not available locally the construction may be carried out with other bricks with prior intimation to the concerned Regional Office of SPC Board. A quarterly statement indicating the use of fly ash bricks during civil construction shall be submitted to the Board for record.

12. The construction and demolition wastes, if any, to be generated from the proposed project shall be disposed of in accordance with the provision under "Construction & Demolition Wastes Management Rules 2016".

13. Good housekeeping practice shall be followed to improve the work environment.

14. The proponent shall comply with the provision made under Plastic Waste Management Rules, 2016 and amendment made thereafter and shall ensure prohibition on use of Single Use Plastics within the premises.

15. All the plastic waste generated from the premises shall be collected and sent for co-processing to the nearby cement kilns and / or registered recyclers under Plastic Waste Management Rules, 2016.

16. Municipal Solid Waste shall be disposed of as per the Solid Waste Management Rules, 2016 and amendment thereafter.

17. The Board may impose further conditions or modify the conditions stipulated in this order during installation and/or at the time of obtaining Consent to Operate and may revoke this clearance in case the stipulated conditions are not implemented.

18. The above conditions shall be enforced, inter-allia, under the provisions of the Water (Prevention & Control of pollution) Act, 1974 and Air (Prevention & Control of Prevention) Act, 1981 and Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rule.

B.WATER POLLUTION:

19. The Mine shall provide mechanized wheel washing system along with effluent treatment and recycling facilities at the exit point of the mine to minimize transfer of mud from unpaved approach roads to main paved and/or public roads.

20. The domestic wastewater generated from the township shall be treated in sewage treatment plant. The treated water shall be reused for gardening and plantation and the surplus water if any shall be discharged to outside after meeting the following prescribed standards as notified by the MoEF&CC, Govt. of India vide G.S.R. 1265 (E), dated 13.10.2017.

Sl. No.	Parameters	Standards
1.	pH	6.5-9.0
2.	BOD(mg/l)	30
3.	TSS(mg/l)	<100
4.	Fecal Coliform (MPN/100ml)	< 1000

21. Wastewater from the mine i.e. pit water, check dams or any other discharge leaving lease boundary of the mine shall be properly collected, treated so as to conform the prescribed standard i.e pH = 5.5 – 9.0, SS = 100 mg/l, & O & G = 10 mg/l, Total Cr=2.0 mg/l, Iron (Fe)=3.0 mg/l and Cr+6= 0.05 mg/l or as amended from time to time.

22. Effluent Treatment Plant comprising of Oil and Grease trap of adequate capacity shall be installed for treatment of wastewater to be generated from HEMM maintenance work shop and the treated water shall be utilised for plantation, gardening purpose.

23. Catch drains of appropriate size shall be constructed to divert the runoff from the OB dump to the siltation pond of appropriate size to arrest silt and sediment flows from soil, OB and mineral dumps. The drains shall be regularly de-silted and maintained properly. The garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide with adequate retention period to allow proper settling of silt material. The collected surface runoff shall be guided to the ETP for necessary treatment before disposal to outside. In no case there shall be any direct discharge of surface runoff water to outside the mine lease area.

24. The proposed Central ETP of capacity 1200 KL/Hr, to be installed at Saruabil mines for removal of Hexavalent Chromium from wastewater from mine pit and surface runoff of Saruabil Chromite Mines and Kamarda Chromite Mines. Separate flowmeters shall be installed at exit point of both mines before entering to the Central ETP in order to assess the water discharge from each mine. Online water monitoring system shall be provided and be connected to SPCB sever for transfer of monitoring of data & flow rate. The treated water from ETP shall confirm to the standard prescribed by the Board i.e. pH = 5.5 – 9.0, SS = 100 mg/l, & O & G = 10 mg/l, Total Cr=2.0 mg/l, Iron (Fe)=3.0 mg/l and Cr+6= 0.05 mg/l.

25. The mine shall install Online Effluent Monitoring System at both inlet and outlet of the ETP for monitoring of flow rate, pH, Suspended Solid and Hexavalent Chromium and connect it to the server of the Board.

26. Regular monitoring of ground water level and quality shall be carried out by establishing a network of existing wells. The monitoring shall be done four times a year in pre-monsoon (April/May), Monsoon (August), Post-monsoon (November) and winter (January) seasons. Data thus collected shall be submitted to the Board quarterly. Following heavy metals need to be monitored at least once during post monsoon period whose values shall not exceed as per following standard.

i)	Cd	-	2.0 mg/l
ii)	Cr+6	-	0.10 mg/l
iii)	Copper	-	3.0 mg/l
iv)	Lead	-	0.10 mg/l
v)	Mercury	-	0.01 mg/l
vi)	Nickel	-	0.50 mg/l
vii)	Zinc	-	5.0 mg/

27. Sedimentation ponds shall be constructed at strategic points in order to guide all surface run-off water containing sediments for settlement of suspended solids and shall be routed to Central ETP for adequate treatment before discharge of water into natural stream/water courses during monsoon.

28. Rainwater harvesting shall be followed by utilizing the rainwater collected from the roof of the administrative buildings for recharging of ground water within the premises as per the concept and practices prescribed by CPCB.

C.AIR POLLUTION:

29. Four Ambient air quality monitoring stations for 24 hours operation shall be established in the core zone as well as in the buffer zone for PM_{10}, $PM_{2.5}$, SO_2, NO_2 and CO monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board (i) Data on ambient air quality (PM_{10}, $PM_{2.5}$,SO_2, NO_2 and CO) shall be regularly submitted to the State Pollution Control Board once in six months.

30. The permanent haulage roads and arterial roads shall be made black topped / concrete with avenue plantation. The speed of dumpers / trucks on haul roads shall be controlled as increased speed increases dust emission. Overloading of transport vehicles shall be avoided. Further, during transportation of ore by trucks through public roads, the truck shall be properly covered with tarpaulin sheets / leak proof coverings and shall ply at safe speed.

31. Dust suppression on mine haul roads, active OB dumps and mine working benches shall be done by spraying water through water sprinklers along with chemical binders/wetting agents at frequent interval in order to reduce water consumption and to improve retention and re-absorption capacity of water. The additive chemicals shall not have any adverse impact on the environment. Water sprinklers of fixed type shall also be provided at the approach roads from mines to prevent the generation of dust to be air borne.

32. The unit shall provide pollution control measures for controlling the fugitive dust emission and the ambient air quality inside the mine premises which shall confirm to the National Ambient Air Quality Standards.

33. To reduce the noise level, the noise producing equipment shall be mounted on anti-vibratory mountings.

D.SOLID & HAZARDOUS WASTE:

34. Boulder wall and garland drain with settling pond shall be provided around all the active dumps.

35. Topsoil shall be stacked properly with proper slope at earmarked site(s) with adequate measures and shall be used for reclamation and rehabilitation of mined out areas.

36. Dimension of the retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data and as per approved

mining plan. The detail specification shall be worked out and submitted to the Board at the time of Consent to Operate application.

37. Garland drain shall be provided all around the storage yard for preventing any entry of rainwater into the area or flow of solids along with surface run off. Run off generated shall be routed through garland drain and treated in Central ETP to meet the prescribed standard before discharge.

38. OB Dump management shall be carried out as per approved mining plan. The OB dumps shall be properly dressed, benched atlow angle. Proper terracing in the slopes and retaining walls / stone barriers at the toe of the dumps with gully plugging etc. to be practiced preventing the solid erosion during monsoon, besides establishing vegetation on dump top as well as its slope surface. Hydro-seedling technique or use of geo-tiles mat embedded with seeds shall be adopted as per requirement.

39. The solid waste shall be suitably disposed off, so that there shall be neither washout of solids during rains nor any dust nuisance due to wind.

40. The hazardous waste generated by the mine shall be disposed of as per the authorization granted under Hazardous and Other Wastes (Management and Trans boundary Movement) Rules, 2016 and amended thereafter. Used Oil / used Lubricants shall be disposed of through authorized re-processors/ recyclers.

41. The proponent shall segregate organic waste and segregated organic waste shall be converted to manure through organic waste converter. The proponent shall store the organic waste in closed shed before use the same in organic waste converter.

42. Regular collection of spilled over raw material from haul roads shall be practiced preventing the generation of dust due to movement of dumpers /truck.

12/7

MEMBER SECRETARY

To

The Managing Director,
Saruabil Chromite Block of M/s Tata Steel Mining Ltd.
N3/24, IRC Village, Nayapalli, Bhubaneswar,
Dist-Khordha, Odisha

Memo No. 10965 **/ Date** 12.07.2023 /

Copy forwarded to:

1. The Director, Directorate of Mines, Govt. of Odisha, Bhubaneswar
2. The Collector & District Magistrate, **Jajpur**
3. The DFO, **Cuttack**
4. Consent to Operate Cell, SPC Board, Bhubaneswar
5. Hazardous Waste Management Cell, SPC Board, Bhubaneswar
6. The Regional Officer, SPC Board, **Kalinganagar**
7. Copy to Guard file

12/7/2023

ADDL.CHIEF ENV. ENGINEER

O/C

TSL/SAR/061/FY24
Date: 04-11-2023

To
The Member Secretary,
Odisha State Pollution Control Board,
Paribesh Bhawan,
A/118, Nilakantha Nagar, Bhubaneswar, 751012

Sub: Intimation of obtaining Environmental Clearance under EIA Notification 2006 in respect of Saruabil Chromite Block of M/s Tata Steel Limited having Mining lease area of 246.858 ha in Jajpur District.

Dear Madam/Sir,

We would like to inform you that State Environment Impact Assessment Authority (SEIAA), Orissa, Ministry of Environment, Forest and Climate Change, Government of India has accorded Environmental Clearance in respect of Saruabil Chromite Block of M/s Tata Steel Mining Limited (now merged with Tata Steel Limited) over Mining Lease Area of 246.858 ha with a production of 1.0 MTPA Chromite Ore (ROM) with maximum excavation of 6.48 Million Cum per Annum through Opencast Mining at villages Saruabil, Kamarda, & Tailangi under Sukinda Tehsil, Jajpur District of Odisha State vide EC identification No. – EC23B001OR155576, File No. – 7894/93-MINB1/07-2022, Dated 06.06.2023#.

We, therefore, request your good self to kindly acknowledge the receipt of the above letter. As per the General Condition xii of the granted EC letter, we are requesting your good self that the EC grant letter may be displayed at both Head Office and Regional Office for public view, and same is also available on web site of the Ministry of Environment, Forest and Climate Change (www.parivesh.nic.in).

Yours faithfully,
f: Tata Steel Limited

Agent & Head Mines,
Saruabil Chromite Block

8/11/23

RECEIVED
08 NOV 2023
S.P.C. BOARD
BHUBANESWAR-12

Enclosure: Copy of EC grant Letter
Copy to: 1. Regional Officer, SPCB, Odisha, At-Dhabalagiri, Po- F.C Project, Jajpur Road, Dist – Jajpur – 755020

#: The granted EC letter was not visible on Project Proponent portal due to technical problem, so there is a delay in intimation & display.

ରସାୟନ ବିଜ୍ଞାନ ବିଭାଗର ସ୍ୱାଗତ ସମାରୋହ

■ ଟିକିଟୀ, ତା ୯।୧୧ (ପିଏନଏସ) ସ୍ଥାନୀୟ ଟିକିଟୀ ମହାବିଦ୍ୟାଳୟ ରସାୟନ ବିଜ୍ଞାନ ବିଭାଗର ସ୍ୱାଗତ ସମାରୋହ ଓ ପାଠଚକ୍ର ଅନୁଷ୍ଠିତ ହୋଇଯାଇଛି । ଅନୁଷ୍ଠାନର ଭାରପ୍ରାପ୍ତ ଅଧ୍ୟକ୍ଷ ସନ୍ତୋଷ କୁମାର ବକ୍ସି ଏଥିରେ ସଭାପତିତ୍ୱ କରିଥିଲେ । ପାଠଚକ୍ରର ରିସୋର୍ସ ପର୍ସନ ଭାବେ ଏସ.ବି. ସି.ଡି ମହାବିଦ୍ୟାଳୟର ଆସିଷ୍ଟାଣ୍ଟ ପ୍ରଫେସର ଡା ସୁନାଶିର ମିଶ୍ର ଯୋଗ ଦେଇଥିଲେ। ସମ୍ମାନିତ ଅତିଥି ଭାବେ ବରିଷ୍ଠ ଅଧ୍ୟାପକ ଶ୍ରୀ ସନାତନ ଗୌଡ଼ ଯୋଗ ଦେଇ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ଉତ୍ସାହ ବୃଦ୍ଧି କରିଥିଲେ । ବିଭାଗୀୟ ମୁଖ୍ୟ ମଧୁସ୍ମିତା ମହାପାତ୍ର ଅତିଥି ପରିଚୟ ପ୍ରଦାନ କରିଥିଲେ । ଅଧ୍ୟାପକ ଶ୍ରୀ ଦିବାକର ପାଣିଗ୍ରାହୀ ପାଠଚକ୍ରର ବିଷୟ ଉପରେ ଆଲୋକପାତ କରିଥିଲେ। ରସାୟନ ବିଜ୍ଞାନ ବିଭାଗର ଛାତ୍ର ବିକାଶ ମହାରଣା, ଆରୋଧନ ବୁଦୁକି ଓ ଶରାଣିଶ ରଥ ପାଠଚକ୍ରରେ ନିଜ ଲେଖା ପାଠ କରିଥିଲେ ।

● ୩ ବର୍ଷିଆ ବଦଳି ନିୟମ ଫେଲ

ଦୁର୍ନୀତି ଖୋର କର୍ମଚାରୀଙ୍କ ବଦଳି ହେଉନି

■ ରଘୁନାଥପୁର, ତା ୯।୧୧(ପିଏନ୍ଏସ୍) ...

... ଓ ମିଉଟେସନ ଭଳି ଗୁରୁତ୍ୱପୂର୍ଣ୍ଣ ଦାୟିତ୍ୱ ପ୍ରଦାନ କରାଯାଇଛି । ତହସିଲ ଅଧିନସ୍ଥ ସମସ୍ତ ବାଲି ଘେରାଡ ଗୁଡିକୁ କିରାଣୀ ଜଣେ ନିଜ ନିୟନ୍ତ୍ରଣରେ ରଖି ନିଲାମ ଧାରୀଙ୍କ ଠାରୁ ପ୍ରଚୁର ଟଙ୍କା ଲୁଟୁଛନ୍ତି । ସରକାର ଦୁର୍ନୀତି ହଟାଇବା ପାଇଁ ବିଭିନ୍ନ ସରକାରୀ କାର୍ଯ୍ୟାଳୟରେ ... ପ୍ରଶାସନ ତାଙ୍କର କାହିଁକି ବଦଳି କରୁନି ପ୍ରଶ୍ନ ଘୋଟାଉଛନ୍ତି । ଏହାପଛରେ ପ୍ରଶାସନର କି ଉଦ୍ଦେଶ୍ୟ ରହିଛି ତାହା ବୁଝାପଡୁ ନାହିଁ । ତୁରନ୍ତ ଏହି ଦୁର୍ନୀତି ଗ୍ରସ୍ତ କିରାଣୀଙ୍କୁ ସାଧାରଣ ନିର୍ବାଚନ ପୂର୍ବରୁ ବଦଳି କରିବା ପାଇଁ ଜିଲ୍ଲାପାଳଙ୍କ ନିକଟରେ ଅଞ୍ଚଳ ପକ୍ଷରୁ ଦାବି ହେଉଛି ।

ସୁନା ଦର (୨୪ କ୍ୟାରଟ)	
୧୦ଗ୍ରାମ	୬୦,୭୬୦ ଟଙ୍କା
ରୂପା(କିଗ୍ରା)	୭୬,୨୦୦ଟଙ୍କା
ତେଲ ଦର (ଲିଟର ପିଛା)	
ପେଟ୍ରୋଲ	୧୦୩.୩୬ ଟଙ୍କା
ଡିଜେଲ	୯୪.୭୬ ଟଙ୍କା
ଅଣ୍ଡା ଓ ଚିକେନ ଦର (ଓପୋଲଫେଡ)	
ଅଣ୍ଡା (୧ଟି)	୭.୦୦ ଟଙ୍କା
ଚିକେନ(କି.ଗ୍ରା)	୨୦୦ ଟଙ୍କା

ପ୍ରଥମ ପୃଷ୍ଠାର ଅବଶିଷ୍ଟାଂଶ...

ମିଲେଟ ମିଶନ...

ନେତାଙ୍କ ମାମଲା...

ଭିଜିଲାନ୍ସ ଜାଲରେ...

ମହୁଆଙ୍କ ସଂସଦରୁ...

ରାସ୍ତା ଶୋଚନୀୟରୁ ଜନଅସନ୍ତୋଷ ଆନ୍ଦୋଳନ ଚେତାବନୀ

ସେବା ସମବାୟ ସମିତି କର୍ମଚାରୀଙ୍କ ୭ ମାସର ଦରମା ମିଳିନି

ଉପଜିଲ୍ଲାପାଳଙ୍କ ନିକଟରେ ଅଭିଯୋଗ

● ନରହନ୍ତା ଦନ୍ତା ମାତିଛି

ଦୁଇ ଦିନରେ ୨ ଜୀବନ ନେଲାଣି

■ ବଡ଼ମ୍ବା, ତା ୯।୧୧ (ପିଏନଏସ) ଦୈନନ୍ଦିନ ଜୀବନକୁ ନେଇ ବଡ଼ମ୍ବା ବ୍ଲକ ଅନ୍ତର୍ଗତ କୁଆଁରିପାଳ ଗ୍ରାମବାସୀ ଅତ୍ୟନ୍ତ ଭୟଭୀତ ଅଛନ୍ତି । ଅଭିମାନପୁର ପଞ୍ଚାୟତ ଅନ୍ତର୍ଗତ ଏହି ଗ୍ରାମ ନିକଟସ୍ଥ ଜଙ୍ଗଲରେ ଥିବା ଏକ ଦନ୍ତାହାତୀ ଆକ୍ରମଣରେ ଶିକାର ହୋଇ ମଙ୍ଗଳବାର ଜଣେ ମହିଳାଙ୍କ ମୃତ୍ୟୁ ହୋଇଥିବା ବେଳେ ଉକ୍ତ ଦିନ ରାତିରେ ସଂପୃକ୍ତ ହାତୀ ହାବୁଡ଼ରେ ପଡ଼ି ଜଣେ ଯୁବକ ପ୍ରାଣ ହରାଇଥିବା ଅଭିଯୋଗ ହୋଇଛି । ଏହି ଘଟଣାକୁ ନେଇ ସ୍ଥାନୀୟ ଅଞ୍ଚଳରେ ଚାଞ୍ଚଲ୍ୟ ଖେଳି ଯାଇଛି । ନରହନ୍ତା ଦନ୍ତାହାତୀର ଦ୍ୱିତୀୟ ଶିକାର ହୋଇଥିବା ଯୁବକ ହେଲେ କୁଆଁରିପାଳ ଗ୍ରାମର କାର୍ତ୍ତିକ ପ୍ରଧାନଙ୍କ ପୁଅ ସଞ୍ଜୟ ପ୍ରଧାନ (୩୬) । ଖବର ପାଇ ମାଣିଆବନ୍ଧ ଥାନା ଅଧିକାରୀ ... ମୃତ ସଞ୍ଜୟଙ୍କ ଅସ୍ୱାଭାବିକ ମୃତ୍ୟୁ ଏବଂ ପାରିପାର୍ଶ୍ୱିକ ସ୍ଥିତିକୁ ନେଇ ସନ୍ଦେହ ପ୍ରକାଶ କରାଯାଉଛି । ଯଦିଓ ପୋଲିସ ଓ ବନ ବିଭାଗ ମିଳିତ ଭାବେ ଘଟଣାର ଛାନଭିନ ତଦନ୍ତ ଜାରି ରଖିଛନ୍ତି ତେବେ ଶବ ବ୍ୟବଚ୍ଛେଦ ରିପୋର୍ଟ ମିଳିବା ପରେ କାରଣ ସ୍ପଷ୍ଟ ହେବ ଏବଂ ତଦନୁଯାୟୀ ପରବର୍ତ୍ତୀ ପଦକ୍ଷେପ ନିଆଯିବ ବୋଲି ବନବିଭାଗ ସୂତ୍ରରୁ ଜଣାପଡ଼ିଛି । ସୂଚନା ଥାଉକି ମଙ୍ଗଳବାର ପ୍ରତ୍ୟୁଷରେ କୁଆଁରିପାଳ ଗ୍ରାମ ନିକଟସ୍ଥ ବିରିଗଡ଼ି ପାହାଡ଼ ତଳ କାଜୁ ଓ ଜଙ୍ଗଲ ଆମ୍ବ ତୋଟାରେ ଏକ ଦନ୍ତାହାତୀ ଥିଲା । ନିକଟସ୍ଥ ଅଭିମାନପୁରର ମଞ୍ଜୁ ସେନାପତି(୫୮) ଉକ୍ତ ସ୍ଥାନକୁ ସକାଳ ବେଳା ଜାଳେଣି ସଂଗ୍ରହ କରିବାକୁ ଯାଇଥିବା ବେଳେ ସଂପୃକ୍ତ ହାତୀଟି ଆକ୍ରମଣ କରି ... ଫେରୁଥିବା ବେଳେ ଛପିଥିବା ସଂପୃକ୍ତ ନରହନ୍ତା ଦନ୍ତା ହାବୁଡ଼ରେ ପଡ଼ିଥିବା କୁହାଯାଉଛି । ଯାହାଫଳରେ ହାତୀଟି ସଞ୍ଜୟଙ୍କୁ ଘଟଣାସ୍ଥଳରେ ଆକ୍ରମଣ କରି ମାରିଦେଇଥିବା ସନ୍ଦେହ ପ୍ରକାଶ ପାଉଛି । ବିଳମ୍ବିତ ରାତିରେ ସଞ୍ଜୟ ଘରକୁ ନ ଫେରିବା କାରଣରୁ ଖୋଜାଖୋଜି କରିବାରେ ଗ୍ରାମ ନିକଟସ୍ଥ ଆମ୍ବ ତୋଟାରେ ତାଙ୍କ ଶବ ମିଳିଥିଲା । ଏହି ପୃଥକ ଘଟଣା ଏବଂ ହାତୀ ଆକ୍ରମଣକୁ ନେଇ କୁଆଁରିପାଳ ଗ୍ରାମ ସମେତ ସମଗ୍ର ଅଭିମାନପୁର ପଞ୍ଚାୟତରେ କୋହଳିଆ ଭୟ ଖେଳି ଯାଇଛି । ତେବେ ସ୍ଥାନୀୟ ବନ ବିଭାଗ କର୍ତ୍ତୃପକ୍ଷ ହାତୀଟିକୁ ଚିହ୍ନିତ କରି ଜଙ୍ଗଲକୁ ଘଉଡ଼ାଇବାକୁ ସକ୍ଷମ ହୋଇଥିବା ବେଳେ ଏବେ ବି ଏହି ଘଟଣାକୁ ନେଇ ଉକ୍ତ ଅଞ୍ଚଳରେ ଉତ୍ତେଜନା ବାତାବରଣ ଲାଗିରହିଥିବା ...

ବ୍ଲକସ୍ତରୀୟ ପ୍ରାକୃତିକ ବିପର୍ଯ୍ୟୟ କର୍ମଶାଳା

ଓରମାସ ପକ୍ଷରୁ ଦୀପ ଷ୍ଟଲ ଉଦଘାଟିତ

NEW ZEALAND BEAT SL, KEEP SEMIFINAL HOPES ALIVE

PTI ■ BENGALURU

Trent Boult's rediscovery of his magic with new ball fuelled New Zealand's frantic five-wicket victory over a wretched Sri Lanka and kept their World Cup semifinals dreams intact here on Thursday.

Daryl Mitchell (43 off 31 balls) milked the sound platform given by openers Devon Conway (45 off 42 balls) and Rachin Ravindra (42 off 34 balls) with their 86-run stand as the Kiwis hunted down the target of 172 in 23.2 overs.

The result helped them to snap a four-match losing streak in the event, and it was also the perfect culmination of the demolition job started by Boult with his outstanding three-wicket burst (3/37).

New Zealand (NRR: +0.743) have 10 points after their league engagements and they will in all likelihood join India, Australia and South Africa in the last four stage, unless Pakistan or Afghanistan, who are on eight points apiece, create some miracle.

In their final league match, Pakistan (NRR: +0.036) will face England on Saturday while Afghanistan (NRR: -0.338) will lock horns with South Africa tomorrow.

In the backdrop of all those calculations, it was important for the Kiwis to win handsomely to stay ahead of the other contenders, and both Conway and Ravindra were aware of it.

They exploited the struggles of Lankan bowlers to find the right line quite mercilessly.

Pacer Dushmantha Chameera occasionally managed to purchase some lift off the pitch but there was nothing really unnegotiable. Ravindra proved that with a six off Chameera himself and a couple of other maximums of spinner De Silva.

However, Conway would repent missing a fifty that was there for the taking after a little shimmy and whack off Chameera ended in the hands of De Silva inside the circle.

Conway has not managed a fifty in eight innings in this tournament after starting off the block with a big hundred against England at Ahmedabad.

Ravindra too could have added another fifty-plus score to his swelling kitty of runs but his almighty cross-batted heave off Maheesh Theekshana could not clear De Silva at mid-on.

At 88 for 2 in the 14th over, New Zealand were not in any trouble but they needed some quick runs to stay ahead in run rate mathematics.

Mitchell did precisely that. The right-hander has been a silent success story for the Black Caps in this showpiece, having amassed over 400 runs averaging 67.33 at a strike-rate of 109.78. Coming in at No. 4, the 32-year-old often worked as the link between top and down the order batters, gluing the innings together.

He performed that task once again with carefully planned stroke-play and Mitchell picking the gaps with precision was a treat to watch.

The Hamilton man also used his feet well against Theekshana never allowing him to settle down, evidenced by that massive six he pummelled over long-off.

But the needless run out of Mark Chapman while the Kiwis were cruising stood as a sore point as he had to sacrifice his wicket for Mitchell, and the former was not entirely chuffed about it either. New Zealand, though, managed to move past the tape from that point without too many hiccups.

But for that smooth win, the Black Caps should thank Boult's riveting show in the room, who was ably assisted by the skilful left-arm spin of Mitchell Santner (2/22).

Afghanistan aim to brighten semis chances

PTI ■ AHMEDABAD

South Africa will look to fix their chasing troubles before the semifinals while Afghanistan will back themselves to beat another top team when the two sides meet in a World Cup game here on Friday.

A lot more is at stake for Afghanistan than South Africa, who have already made the semifinals alongside India and Australia.

With eight points each, Afghanistan are battling for the fourth spot with Pakistan and New Zealand. Only a win over the Proteas will keep them in the hunt.

The Afghans also have an inferior net run rate compared to Pakistan and New Zealand, therefore, they need to win big and hope the other results go their way.

Irrespective of the result on Friday, Afghanistan have earned tremendous respect with their maiden play in the tournament, having racked up four wins from eight games.

They now have the belief to beat the best in the business on any given day. After humbling England and Pakistan, the Hasmatullah Shahidi-led side was on the cusp of a famous win over five-time champions Australia before Glenn Maxwell came up with a superhuman knock.

The improbable defeat left Afghans heartbroken and they now need to pick themselves up to give their best shot at a semifinal berth.

Batting first, South Africa have been the best batting unit in the tournament. Therefore, Shahidi will be hoping to win the toss, put runs on the board and choke South Africa in their chase. South Africa's flamboyance has made way for tentativeness while chasing in the competition. Afghanistan's match-winning spinners will back themselves to exploit that apparent weakness.

Spin has been the team's strength over the years but now it can also expect breakthroughs from the pacers.

With a little help on offer, Naveen Ul Haq and all-rounder Azmatullah Omarzai delivered with the new ball against Australia to rattle the opposition.

Afghanistan batting, which has been its weak link, has come of age in the tournament. Batters like Ibrahim Zadran, Rahmat Shah and captain Shahidi himself know how to play the situations, while batting first or chasing.

The team, however, expects more from opener Rahmanullah Gurbaz, who has not been consistent enough, and veteran Mohammad Nabi, who has not yet made an impact with the bat.

PRESSURE MOUNTING ON TEMBA BAVUMA

While Quinton de Kock has piled on the runs in his swansong, South Africa skipper Temba Bavuma has not led from the front at the top of the order. Bavuma missed two games due to illness and Reeza Hendricks grabbed his opportunity with both hands.

Dropping the skipper in the middle of the tournament is highly unlikely but Bavuma must be feeling the pressure. Before the semifinals, the Afghanistan game is an ideal opportunity for him to get back amongst the runs.

David Miller is among the top finishers in the game but is yet to peak in the World Cup. The southpaw will be looking to get into the groove before the knock-out stage.

Left-arm pacer Marco Jansen has been a valuable addition to the side but needs to improve on his economy rate.

PTI ■ NEW DELHI

AUSTRALIA T20I

Hardik unlikely to be available

Injured T20I captain Hardik Pandya is unlikely to be available for India's upcoming five-match series against Australia starting November 23 as the star all-rounder will require more time to recover from his left-ankle ligament tear.

It is understood that the team for the home T20I series against Australia will be announced only after India's World Cup semifinal, which in all likelihood will be played in Mumbai on November 15.

According to sources in the BCCI, a more practical scenario for Hardik would be to get fit by the time the South Africa T20 series starts from December 10 in Durban. "There is some time before Hardik can be declared fit and available for selection. It would be more practical for him to try and complete his rehabilitation with a possible 'RTP' (Return To Play) during SA series. It will certainly be NCA Sports science team's call," a senior BCCI source privy to the developments told PTI on conditions of anonymity.

It is understood that either Suryakumar Yadav, the designated vice-captain of the T20I side, or Asian Games gold-winning skipper Ruturaj Gaikwad will be leading the side.

While Surya is playing in the ODI World Cup, unlike seniors like Rohit Sharma, Virat Kohli, KL Rahul and the pace unit, which needs to be fresh for the Test series, the Mumbai Indians star is currently being looked at as a two-format white-ball specialists.

It is an accepted norm that white-ball Indian specialists (especially batters) can play 25-30 games per year across two white-ball formats apart from IPL, fitness permitting. Hence, if Surya himself doesn't ask for rest, he is the favourite to lead the side. If not, Ruturaj is the next best choice.

LOOKING AT T20 WORLD CUP IN THE AMERICAS:

The T20 World Cup will be held in the Americas (United States and West Indies) in June and July next year after the IPL and the core team for the Australia series will be formed by all those who played in Ireland and the Asian Games.

"Obviously, during any big event, someone like Jasprit Bumrah will be pressed into the action as he would be nicely warmed up with sufficient game time post the Indian Premier League. Ditto for a Mohammed Siraj," the official said.

The likes of Arshdeep Singh, Avesh Khan, Mukesh Kumar are likely to be picked for the series. For the upcoming Australia series, it is expected that the likes of Sanju Samson, Ishan Kishan, Yuzvendra Chahal are expected to make a comeback to the side apart from those who performed during the Asian Games. If Axar Patel recovers from his hamstring injury, he will be selected as Ravindra Jadeja surely would get rest before the South Africa tour.

WHAT ABOUT BHUVI, PARAG, ABHISHEK?: If one goes by the pattern of Indian team selection over the past few years, the key to success has been consistency in selection.

To be selected in the Indian team, good show in the Syed Mushtaq Ali Trophy (SMAT) is important but it is more important to crack the IPL code year after year.

There are three prominent SMAT performers this time — Abhishek Sharma, Riyan Parag and veteran Bhuvneshwar Kumar — but the question remains where will they be fitted?

Bhuvneshwar had been exceptional in the tournament with 16 wickets from seven games with an economy rate of under six runs per over. The swing is back and, for the domestic batters, he was virtually unplayable. But with an average speed of 128-130 kmph, will he still be effective in international cricket is something Ajit Agarkar and his colleagues need to address.

Buttler keen to continue as white-ball skipper

PTI ■ PUNE

Limited overs skipper Jos Buttler has expressed his desire to continue leading England in both the white-ball formats despite a dismal ODI World Cup campaign.

Defending champions England, who have made an embarrassing early exit from the World Cup, defeated Netherlands by 160 runs to snap their five-match losing streak on Wednesday. They will eye a win over Pakistan in their final league game to seal a qualification spot for Champions Trophy in 2025.

Rob Key, the managing director of England's men's cricket, will join the side in India at the end of the week.

Apart from discussing what went wrong for England, Key will select the squads for next month's white ball tour of West Indies, including three ODIs and five T20Is and decision on Buttler and Matthew Mott's future as captain and coach could also be taken.

"Yeah, I'd like to (captain the side in the white-ball tour next month). I know Rob Key arrives into India today, I think. So, yeah, we can have some good conversations with him and the coach and everyone and make a plan for that tour," Buttler said on Wednesday.

Buttler has been woefully out of form in the ongoing tournament with many believing the England captaincy is weighing him down. He has admitted that it has been frustrating not to score runs.

"You want to lead from the front and do that in your own performance. So, yeah, very frustrated, again, not to contribute, but I'll stick to the stuff that's served me well over a long period of time when I've had these little runs of form and, like I say, hopefully come out the other side of it very soon."

The win against Netherlands would come as relief to Buttler and limited overs coach Mott as the the reigning champions have moved up to the seventh spot on the points table, brightening their chances of making the cut for the 2025 Champions Trophy even if they lose their last match against Pakistan.

But Buttler asserted England want to walk out of the tournament on a high.

"Yeah, vital. It's a huge game for us. We haven't performed the way we wanted to this whole trip, and we'd like to leave India putting in a proper performance. So, yeah, it's a huge game for us."

STOKES HAS HISTORY OF STANDING UP WHEN TEAM IS UNDER PRESSURE

Buttler was lavish in his praise for Ben Stokes, who once again took charge with an attacking century.

"Any time you need someone to stand up with the team under pressure, (Stokes) has had a history of always doing that. We're very lucky to have him in the team and I thought his innings today was exceptional."

After England were knocked out of the tournament, there had been suggestions that Stokes should head back home and prepone his knee surgery so that the Test captain could be fit for the red-ball tour of India early next year.

"No, it's not his style at all. He's here to play in the World Cup. He wants to be here and they say it's important for us to try and qualify for that Champions Trophy and he wants to make sure we try and achieve that."

We want to target Gen Zs and 10-year-olds: ICC

PTI ■ NEW DELHI

Cricket enjoys unmatched popularity in India and governing body ICC, with its unprecedented digital presence in the ongoing ODI World Cup, wants to build on that by attracting the "Gen Zs and 10-year olds" to the game.

As part of its global growth strategy, the International Cricket Council (ICC) wants to directly reach 300 million fans by 2032 and a chunk of that will come from India. It is also hoping a substantial number will come from USA, where the game will break new ground next year when the T20 Word Cup takes place.

The world body sees huge potential in converting a "casual cricket fan" to a passionate one, besides tapping in on a new audience who has no idea about the game.

The youth of India, just like the rest of the world, consumes its content through streaming apps and a world event in the country after seven years has given the ICC an ideal platform to work on its long-term goals.

In collaboration with Meta, the ICC is working with as many as 50 Indian influencers who are creating content in 10 languages. They have been given exclusive access to the players, both behind the scenes and in the field of play with an aim of creating emotional connect with the compulsive social media users.

"The World Cup has always been a big showcase for the game. Traditionally it has been the event that gets people, who are not big cricket fans or casual fans, interested towards the game," Finn Bradshaw, Head of Digital at ICC, told PTI.

"From a digital perspective we see it as a great opportunity to expand the fan base in India. When we talk about increasing fan base, we think a lot about younger people.

"We know the the way people consume media is changing. Young people are using a lot of social media. We want to make sure that we are not just making content in a traditional way. Hopefully there will be more fans of cricket than that were there at the start of the World Cup."

But is there a need for such an aggressive digital strategy in already a cricket crazy nation?

"It is needed but less so compared to other countries. India is the heartbeat of world cricket and engine of cricket in a lot of ways.

"If you look at consumption patterns of young people in India and other parts of the world, they are no longer watching broadcast TV," said Bradshaw, who also has the experience of working with Tennis Australia.

"I would say Gen Zs are the ones we put more time to, to try and understand their way oof consuming content. I would say even the next generation after Gen Z.

"We spend a lot of time thinking about 10-14 year-olds. We are working with the experts to create an interactive experience which targets kids. For us it is of no point doing it if we."

सत्यमेव जयते

File No.:

Government of India

Ministry of Environment, Forest and Climate Change

(Issued by the State Environment Impact Assessment Authority(SEIAA), ODISHA)

****

Dated **02/03/2024**

To,

Devraj Tiwari
Tata Steel Mining Limited
Bombay House, 24 Homy Modi Steet, Fort, MUMBAI, MAHARASHTRA, 400001
ravi.prasoon@tatasteel.com

Subject: Grant of Transfer of EC to the project under the provision of the EIA Notification 2006 and as amended thereof regarding.

Sir/Madam,

This is in reference to your application submitted to SEIAA vide proposal number SIA/OR/MIN/456493/2023 dated 23/12/2023 for grant of transfer of EC to the project under the provision of para 11 of the EIA Notification 2006-and as amended thereof.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC23B0000OR5764649T
(ii) File No.	
(iii) Clearance Type	Transfer of EC
(iv) Category	B1
(v) Schedule No./ Project Activity	1(a) Mining of minerals
(vii) Name of Project	Transfer of EC vested with M/s Tata Steel Mining Limited in the name of M/s Tata Steel Limited in respect of Saruabil Chromite Block (Mining Lease area 246.858 ha)
(viii) Location of Project (District, State)	JAJAPUR, ODISHA
(ix) Issuing Authority	SEIAA
(x) EC Date	02/03/2024
(xi) Details of Transferee	M/S. TATA STEEL LIMITED, Plot No-N3/24, IRC Village, Nayapalli, Bhubaneswar, Odisha.,IRC Village,362,21,251015
(xii) Details of Transferor	Tata Steel Mining Limited, Plot No-N3/24, IRC Village,IRC Village,356,21,751015

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-7 were submitted to the SEIAA under the provision of Para 11 of the EIA notification 2006 and its subsequent amendments. Details in Form 7 can be accessed on PARIVESH portal by scanning the QR Code above.

4. The matter was examined in the State Environment Impact Assessment Authority (SEIAA), Odisha in its 154th meeting held on 05.02.2024. The SEIAA has examined the requisite information / documents required for transfer of EC in accordance with the provisions contained in the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and hereby accords Transfer of EC from M/s Tata Steel Limited to M/s Tata Steel Mining Limited under the provisions of EIA Notification, 2006 and as amended thereof subject to compliance of EC conditions issued vide EC letter dated 23/12/2023.with the following additional specific condition as stipulated below.

5. The Ministry may revoke or suspend the clearance, if implementation of any of the EC conditions is not satisfactory. The Ministry reserves the right to stipulate additional conditions, if found necessary.

6. The PP is under obligation to implement commitments made in the Environment Management Plan, which forms part of the prior EC issued vide dated 23/12/2023.

7. The Project Proponent shall be uploaded/submitted six monthly EC compliance in the PARIVESH Portal of MoEF & CC., Govt. of India only from date of issue of transfer of EC, falling which the EC stands automatically revoked.

8. In case, there is a change in the scope of the project, fresh Environment Clearance shall be obtained.

9. This issue with the approval of the Competent Authority.

Copy To

1. Joint Secretary, MoEF&CC, GoI for information.
2. Additional Chief Secretary, FE&CC, Govt. of Odisha for information.
3. Deputy DG Forest, IRO, MOEF&CC, Bhubaneswar for information.
4. Director of Mines, Steel & Mines Deptt. Govt. of Odisha for information.
5. Collector & DM, Jajpur, Mining Officer, Jajpur, DFO, Jajpur for information.
6. Additional PCCF, RO, MOEF&CC, Govt. of India, for information
7. Member Secretary, SPCB, Odisha for information.

Signature Not Verified

Digitally Signed by : K Murugesan
Member Secretary, SEIAA

Date: 02/03/2024

Annexure – IX- Environmental Management Cell

Environmental Cell
Saruabil Chromite Block
M/s. Tata Steel Limited

Sl. No	Name	Designation	Experience (years)	E-mail	Mobile No.
1	Mr. Sambhu Nath Jha	Chief Mines FAMD	24	jhasn@tatasteel.com	9438887778
2	Mr. Naveen Srivastava	Head Mines & Agent	24	naveen@tatasteel.com	6287090160
3	Mr. Mukesh Kumar Prasad	Head Environment RM	13	mukesh.kr@tatasteel.com	9263636664
4	Mr. Niranjan Kumar	Mines Manager	22	niranjan.kumar@tatasteel.com	9204058109
5.	Mr. Biswaranjan Dhal	Manager, Land & Lease	14	biswaranjan.dhal5@tatasteel. com	8114371713
6.	Debdip Senapati	Sr. Manager, Quality Control	15	debdip.senapati@tatasteel.com	9238087043
5	Mr. Abinash Mishra	Manager, Environment	2	abinash.mishra@tatasteel.com	9153998330

Annexure – X- Environmental Expenditure

Environmental Expenditure Made During April' 2024 to Sept' 2024

Sl. No.	Expenditure	Amount (In Lakh)
1	ETP operation cost	
	a) Manpower	14.00
	b) ETP Electricity cost	6.61
	c) Chemical & maintenance cost	5.48
	d) ETP sludge disposal	0.67
2	Water sprinkling cost for haul road management	30.25
3	Display of Board (Env. Management)	0.32
4	Monitoring & Analysis cost of Air, Water & Noise	26.22
5	Plantation expenditure	3.02
6	EQMS Online Analysis	1.77
7	EQMS Online Data Transmission	0.89
	Total	**89.23**

CSIR-CENTRAL INSTITUTE OF MINING AND FUEL RESEARCH,
BARWA ROAD, DHANBAD

REPORT ON

SCIENTIFIC STUDY FOR OPTIMAL DESIGN AND STABILITY ANALYSIS OF PIT AND OVERBURDEN DUMP AT SARUABIL CHROMITE MINE, TATA STEEL MINING LTD

SPONSORED BY:
Tata Steel Mining Limited

SEPTEMBER 2022
(Part-B of Project No. CNP/5055/2021-22)

CSIR-CENTRAL INSTITUTE OF MINING AND FUEL RESEARCH, BARWA ROAD, DHANBAD
(Council of Scientific and Industrial Research)

Project Title : Scientific study for optimal design and stability analysis of pit and overburden dump at Saruabil chromite mine,Tata Steel Mining Ltd.

Project Number : CNP/5055/2020-21
Project Leader : Jitendra Kumar Singh
Project Co-ordinator : Ajit Kumar
Project Collaborators: : Sanjay Kumar Roy
Ajit Kumar
Rakesh Kumar Singh
Manish Kumar
Prince Kumar
Swapan Mahato

September 2022

Note:

1. The report is meant only for internal use of the sponsor and it should not be published in full or part by the sponsor or any of its staff members. It should not be communicated or circulated to outside parties except concerned Government department. CIMFR reserves the right to publish the results in a general way for the benefit of industry without disclosing the name of the sponsor.
2. Recommendations stipulated in the report should be implemented under the supervision of a competent agency and strictly be followed.

16/09/2022

Project Leader
(Jitendra Kumar Singh)
Chief Scientist & Head of Research Group
Slope Stabilisation and Landslide Management

16/09/2022

Project Coordinator
(Ajit Kumar)
Chief Scientist
Slope Stabilisation and Landslide Management

CSIR-CIMFR Authorised Signatories

16/9/2022

(D. Kumbhakar)
Sr. Principal Scientist & HOS
Project Planning and Monitoring

19/9/2022

(R V K Singh)
Chief Scientist & Coordinator
Project Planning and Industry Interface

SCIENTIFIC STUDY FOR STABILITY ANALYSIS AND OPTIMAL SLOPE DESIGN OF PIT AND DUMP OF SARUABIL CHROMITE MINE, TATA STEEL MINING LIMITED

INTRODUCTION

M/s Tata Steel Mining Limited (TSML) entrusted the work for carrying of Slope Stability Studies of Pit Slope and Dump Slope of Sukinda Chromite Mine located in Odisha to CSIR-Central Institute of Mining and Fuel Research, Dhanbad. Objective of study was to carry out the slope design of pit for ultimate pit depth, and dump design for ultimate dump height and to provide suitable recommendations for ensuring safety of pit and dump slopes.

CSIR-CIMFR took up the work of scientific study and carried out field investigation, geomechanical testing of pit and dump materials, and slope stability analysis. The outcome of scientific study along with appropriate recommendations for ensuring safety and stability of pit and OB dump have been presented in this report.

LOCATION & COMMUNICATION

Saruabil Chromite Mining Block of M/s Tata Steel Mining Limited, over 247 Ha, is located in villages Saruabil, Kamarda & Talangi, Taluka Sukinda, PS Kaliapani, District Jajpur, Odisha. The mining block is a part of Survey of India toposheet No.73 G/16(F45N16) on 1:50,000 scale and is bounded by the latitudes $21^0$02'42.6" & 21^0 3' 49.6"N and longitudes $85^0$48'35.4" & $85^0$49'49.9" E. Latest lease deed of this chromite block is with M/s Tata Steel Mining Limited for an area of 247 Ha since July 2020. Prior to this, mining lease was in favour of Sri Misrilall Jain since 1954, and subsequently in favour of M/s Misrilall Mines Pvt. Ltd (MMPL). The mine is connected with the nearest rail head at Jajpur-Keonjhar Road Railway Station on Howrah–Bhubaneswar–Chennai line of SE railway by an all-weather road of 100 km via Duburi and Tomka. The leasehold area is linked with Daitari-Paradeep Express Highway. State capital at Bhubaneswar and district head quarter at Jajpur is located at road distances of about 144 km and 50 km respectively from leasehold area of Saruabil Chromite Mine.

A location map of Jajpur district of Odisha in which Saruabil Chromite Mine is located is given in Fig. 1.

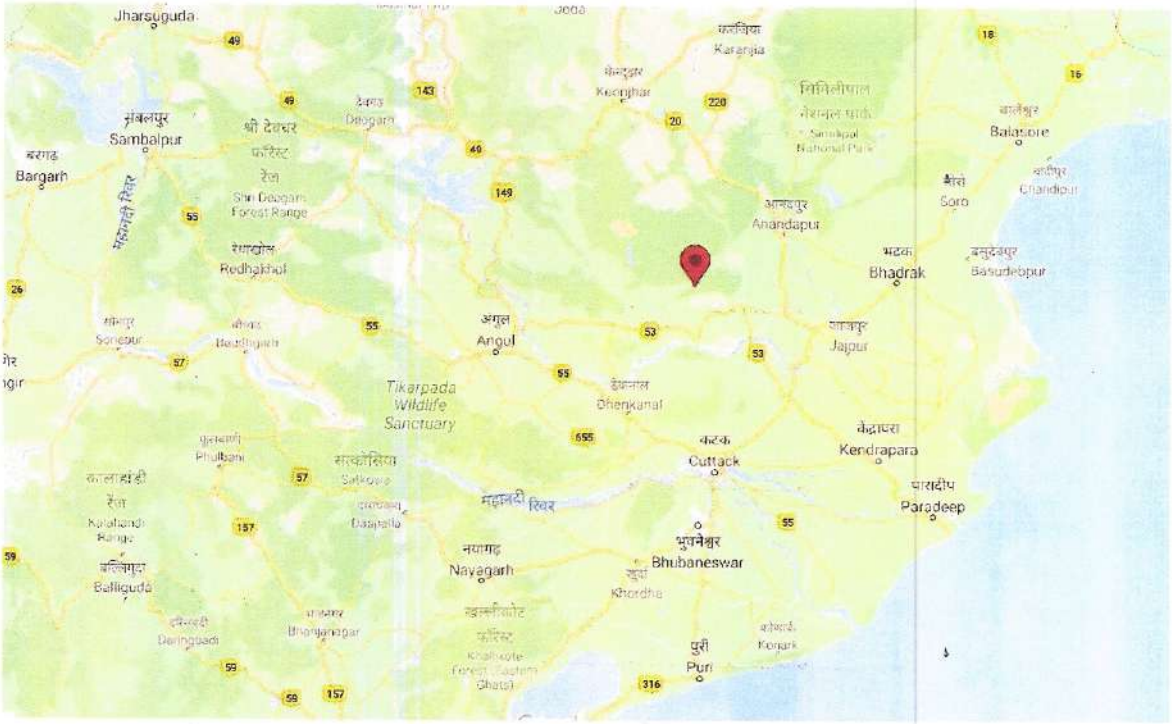


Fig 1: Location of Saruabil Chromite Mine, TSML

PHYSIOGRAPHY, DRAINAGE & VEGETATION

The Sukinda valley area comprises of hilly and undulating terrain. The northern part of the Sukinda Valley is marked by Daitari hill range which rises sharply from about 140 m above mean sea level to more than 600 mRL. There are peaks exceeding 800 mRL in Daitari hill range. At places hills are marked by very steep escarpments. The southern part of the valley is bounded by Mahagiri hill range, which is also very steep and rises to more than 300 mRL.

The mining block represents undulating topography marked by linearly disposed mounds of low relief. Highest elevation of the mining block is at 186.8 mRL on SW side and the lowest elevation is at 129.3 mRL on NW side and slopes from south to north.

Dendritic drainage pattern is observed in the region. Kamarda nala, a seasonal stream flows across the mining block from E to WNW and discharges water in to Damsal nala near northern boundary. Damsal nala which is a tributary of the Bramhani River and controls the drainage system in the region, is perennial in nature and flows towards west along the northern boundary outside the mining block.

Vegetation in the area is dominated by Shorea robusta, Terminlia belerica, Adina cordifolia, Anogeissus latifolia, Madhuca latifolia, Lagerstroernia flosreginae and Holarrhena antidysenterica. A major part of the Chromite Mining Block is degraded due to the development of quarries, dumps, roads etc. The vegetation of shrubs and bushes are seen on the bank of Damsal nala.

CLIMATE & RAINFALL

The climate of the area exhibits tropical to sub-tropical humid climate with rainfall during the month of June to October. This area experiences annual rainfall between 1200 mm to 1800 mm. The daily temperature varies from 15^0C to 32^0C during winter season and in summer temperature rises up to 48^0C. The autumn lasts from mid-October to mid-November, with pleasant weather having temperature between 18^0C to 33^0C. The area is humid during the monsoon, the relative humidity goes up to 93%. However, the annual average humidity is around 77%. The wind speed is generally light to moderate. It is observed that the area experience predominantly wind direction of flow from NE to SE during winter, SW-NW during summer, SW-NE during monsoon and NE during Post monsoon season. The Southwest monsoon lasts from mid-June to mid-September and the area gets more than 75% of the annual rainfall during this period. Average rainfall in the area varies from 1200mm to 1800 mm per year. Natural trees present in the peripheral forest area is Sal, Kendu, Bahada, Harida etc.

REGIONAL GEOLOGY

Saruabil Chromite Mining Block is located in western slope of eastern part in Sukinda valley between quartzite ridges of Mahagiri Hill in the south and Daitari Hill in north. Chromite in this region mainly occurs as bands, lenses and pockets in the ultramafic rocks of serpentinized dunite peridotite. The ultrabasic rocks are of Precambrian age and lie parallel or sub-parallel to major tectonic zones of peninsular India which intrude in to the pre-existing sediments and volcanics, subsequently got regionally metamorphosed and tectonically deformed. Sukinda ultramafic belt as well as igneous complex of Boula-Nuasahi is intrusive into the Precambrian Metamorphites namely the quartzites and quartz muscovite sericite schists in the form of lopoliths. The intrusive has a width of 2-5 kilometers and extends for about 25 kilometers in an ENE-WNW direction from Kansa in the east to Maruabil and beyond in the west. The ultramafic body consists essentially of magnesite-rich dunite-

peridotite with the Chromite bands and subordinate amount of Pyroxenite devoid of Chromite mineralization. There are as many as Six Chromite bands, fairly thick and persistent both along strike direction of the intrusive and with depth as observed in the quarry and bore-hole sections from Saruabil in the east to Bhimtanagar in the west. The Northern five bands are soft, friable brown ore dipping at steep angles to the north. The sixth band close to Mahagiri is of hard and lumpy variety. Further west at Kalrangi, Kathpal, Maruabil - the chrome ore bodies do not exhibit any regular alignment, rather these are exposed in disjointed bands and lenses apparently disrupted by the emplacement of younger granite. The granite is exposed at several places around Maruabil and also encountered in the borehole sections at the western part of TISCO's quarry, Kalrangi and Kathpal mines. Small exposures of diorite are found in Kathpal and Bhimtanagar. Besides, several dolerite dykes have intruded into the ultramafics, quartzites as well as the granites. This happens to be the last stage of igneous activity in this Precambrian terrain. Soil, alluvium and laterite of recent origin overlie ultramafics unconformably. The Chromiferrous ultramafic rocks occupy the cores of folds along the margins of Iron ore group rocks having a general East-West trend of foliation in the area. These have been emplaced in to the present position along deep marginal fractures within the Iron ore group rocks. The lithological constituents are ultramafics intrusives or dunite-Pyroxinite- peridotite and acid differentiates of granite and granophyre. All these rocks are traversed by swarm of dolerite dykes which have not only cut across the rocks but also have displaced the ore bands at many places. In Sukinda, mainly three ultramafic rocks are prominent such as partially/ wholly serpentinised peridotite, partially/ wholly serpentinised dunite and partially altered orthopyroxinite. The chromite deposits of Odisha region mainly occur as bands, lenses and pockets in the serpentinised dunite and peridotite. The ultra-basic rocks are of Precambrian age and lie parallel or sub-parallel to major tectonic zones of peninsular India which intrude into the pre-existing sediments and volcanic, subsequently got regionally metamorphosed and tectonically deformed. The general stratigraphy for the region has been studied by various authors in different times. The region belongs to the Iron Ore Group of rocks described by Sarkar in his stratigraphy of 1979.

Generalized Stratigraphy of Sukinda ultramafic complex is shown in Table 1 as follows:

Table 1: Generalised Stratigraphy of Sukinda Ultramafic Complex

Recent to Pleistocene		Soil, Alluvium, Laterities
Unconformity		
		Dolerite, Granite, Gabbro-diorite
Precambrian	Ultramafics	Pyroxenite, Dunite-peridotite with chrome ore
	Meta-sediments and meta-volcanics	Gritty quartzite Meta-Volcanics
Base not seen		

Small exposures of diorite rocks are found in Kathpal and Bhimtanagar. Besides, several dolerite dykes have intruded into the ultramafics, quartzites as well as the granites. This happens to be the last stage of igneous activity in this Precambrian terrain. Soil, alluvium and laterite of recent origin are overlying the ultramafics unconformably.

GEOLOGY OF LEASE AREA & OREBODY

Saruabil Chromite Block forms a part of famous chromite bearing Sukinda ultramafic complex. The stratigraphy of M.L area as per the surface exposures and lithology intersected by the boreholes is as follows:

- Soil & alluvium
- Laterite (altered ultramafics) with / without yellow ochre
- Nickeliferous limonite with yellow ochre
- Silicified cherty rocks
- Weathered serpentinite / talc
- Quartzite
- Ultrabasics (Serpentinite with chromite)

Plain land of mining lease area is mostly covered by the recent sediments known as soil & alluvium which is lateritic / limonitic in nature. Lateritic soil occurs below the topsoil for about 5m. Colour of lateritic soil ranges from dark brown to blackish brown.

Laterite zone of variable thickness has been encountered below the soil & alluvium and over the ultramafics. Average thickness of laterite encountered in boreholes is around 9m.

Nickeliferous limonite with yellow ochre occurs below the laterite horizon and between the chromite bands. These are mainly of lateritic type resulting from intense weathering and alteration/ limonitisation of the silicified ultramafic rocks. The limonitic rocks are ferruginous and siliceous in nature. These are yellow to orange color, extremely porous, soft rocks. Average thickness of limonite encountered in boreholes is around 7m. On the basis of color and mineralogical or chemical differences, several variants of limonite are differentiated as (a) yellow limonite is rich in silica, (b) brown limonite rich in nickel, (c) dark brown limonite very rich in nickel, (d) coffee brown limonite rich in chromiferrous dissemination with more iron, (e) white limonite rich in talc and (f) green limonite rich in serpentine and chlorite. Slickenside surface is fairly common in the limonitised rock.

Silicified cherty rocks are milky white to dirty brown in colour, hard and compact. These are massive and structure less and appeared to be traversed by lode lets of amorphous silica or quartz. These are uniform except where these engulf with serpentinites and limonitised rocks. These rocks are exposed in the Southern part of the M.L area. These are also exposed in quarries within the limonitised rocks in the form of thin lenticular lenses and termed as silicified cherty rocks. Average thickness of silicified cherty rocks as encountered in boreholes is around 10m.

Weathered serpentinite / talc rocks are exposed in the south-western and south-eastern part of the M.L area. It is pale apple green to milky white colour, schistose and soft. The fine flakes of talc with antigorite are also observed.

Quartzite is exposed in the lower flanks of Mahagiri hill range and falls in southern part of the M.L area. It is fine to medium grained and highly jointed crushed ferruginous in nature belonging to the iron ore group. Average thickness of quartzite as encountered in boreholes is around 10m.

Ultrabasics (Serpentinite) are altered and mainly represented by dunite and peridotite. These dunite and peridotite are extensively serpentinized and recognized as serpentinite. It is mostly enriched with silica and light grey to dark grey in color. Average thickness of ultrabasics encountered in boreholes is around 15m.

Chromite ore bands occurring within the lease are in the form of thick linear stratiform zones in form of bands in association with limonite and serpentinite. Chromite is brown in color and mostly friable in nature. Besides, it is hard & lumpy at times.

METHOD OF MINING

Saruabil Chromite Block was under active operation since 1954 by the previous lessee. Opencast mining method was being adopted by the previous lessee to develop/work in the chromite ore block. Chrome ore beneficiation plant and other auxiliary equipment for development, production, beneficiation / up-gradation of chrome ore were in use. The mine was under Category-A (fully mechanized) mine as per MCDR, 2017. Shovel dumper combination has been in use for mining. Drilling is done by 100/150mm dia drill machine. Existing height of the bench is 6m with width of bench up to a maximum of 12m. Overall slope of the pit is in the range of 27 to 30 degree.

As per latest plan, mining shall be done by open cast fully mechanized (category-A "Fully Mechanized") system of mining by deploying higher capacity of machinery (HEMM) for optimization of mining operation by scientific mining. The deposit shall be worked by adopting a system of bench formation with deep hole blasting keeping in mind the quality, cost, safety and conservation of mineral. Drilling of blast holes shall be done by Pneumatic DTH drill of 150mm dia holes while excavation and transportation of ROM ore and waste materials shall be done through excavators of 1.9 CuM/ 3.5 CuM capacity and dumpers of 35t capacity. Besides, a dozer of appropriate capacity shall be used for construction, leveling and compaction of haul road and waste.

Pit top and bottom RL's (as on 1-7-2020) are as follows:

Existing Pit Top and Bottom Status as on 1-10-2020

Quarry-B & C (merged)

Av. Length: 1298m

Av. Width: 382m

Av. Pit Top MRL : 185m

Av. Pit Bottom MRL: 106m

Av. Pit Depth: 79m

SLOPE STABILITY

The importance of safe, professionally designed and scientifically engineered slopes of the mine and dumps are well known. The benefit of an open pit operation largely depends on the use of the steepest possible slopes for pit and dumps, which should not fail during the intended life. So, the design engineer is faced with the two opposite requirements, stability and steepness, in designing the deep open pit slopes or high and steep overburden dumps. Steepening the slopes of a mine, thereby reducing the amount of material to be excavated, can save a vast sum of money. Similarly steepening and heightening of overburden dumps with adequate precautionary measures permits high quantity of OB material to be accommodated in less land area for dumping. At the same time excessive steepening may result into slope failure leading to loss of production, extra stripping costs to remove failed material, reforming of benches, rerouting of haul roads and production delays. Directorate of Mines Safety may even close the mine or dumping operation on dump in case unsafe conditions are created. Therefore, it is necessary that a balance between economics and safety should be achieved.

The slope stability department of CSIR-CIMFR is rendering its services for optimum and safe slope designs of mines and dumps for different mining companies all over India. During last about 30 years, CIMFR has completed hundreds of slope design and safety monitoring projects in coal and non-coal sectors for pits and dumps.

The stability of the slope primarily depends on the slope geometry and strength properties of the slope materials. Ground water and surface water flow conditions also plays a critical role on the stability of dump and pit slopes. The orientation and other properties of discontinuity planes in rock mass with respect to slope face determines the types of failure possible within that slope. Generally, plane, wedge, circular and toppling types of failure occur in rock slopes as shown in figure 2, 3 and 4, while in soil slopes and weathered / highly fractured rock slopes circular failure is the main type of failure. After identifying kinematically possible failure modes, detailed slope stability analysis is carried out by limit equilibrium method for optimum slope design.

Fig.2: Plane failure

Fig. 3: Wedge Failure

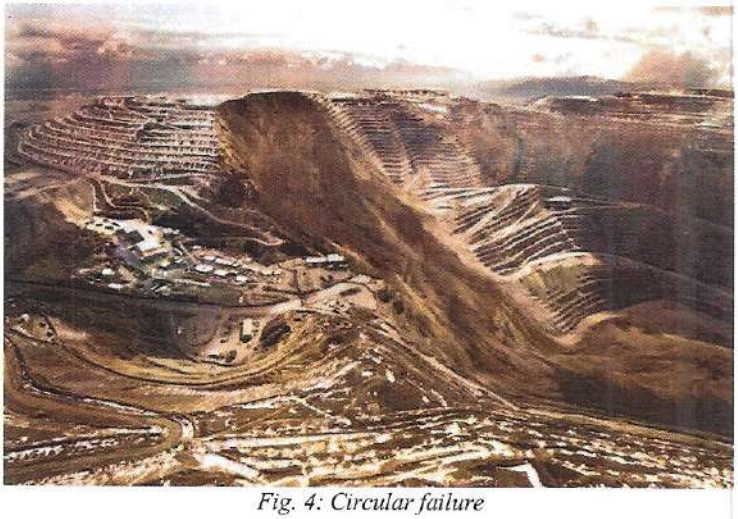


Fig. 4: Circular failure

GEO-TECHNICAL PROPERTIES OF PIT AND DUMP MATERIALS

Engineering properties of materials of OB dump will influence the analysis for slope stability. The average value of relevant strength properties, which were determined in the soil and rock mechanics laboratory of CIMFR and subsequently used for slope stability analyses of the Pit and Dump of Saruabil Chromite Mine of TSML are summarized in Table 2. The properties were determined on the samples collected from the existing benches of pit and OB dump. Properties along with sound engineering judgement was used in the process of analysing and evaluating the stability of OB dump under different geometrical configurations.

Table 2. Geo-Mechanical Properties of Pit and Dump Material

Sr. No.	*Lithology*	*Cohesion (kPa)*	*Friction angle (degree)*	*Density (kN/m^3)*
1.	Laterite with Yellow Ochre	132	28	18.5
2.	Soft Ultrabasic	152	29	20.4
3.	Hard Ultrabasic	248	29.5	25.2
4.	Orebody	122	27.5	26.0
5.	Dump Material	76	28.5	18.9

SLOPE STABILITY ANALYSIS

The limit equilibrium method is widely accepted and commonly used design tool in slope engineering. The failure analysis was done by GALENA software, which is based on limit equilibrium method. In this method, it is assumed that sliding occurs when a limit equilibrium condition is reached, i.e., when the resisting forces balance the driving forces. These methods are the most widely accepted and commonly used design methods and they permit a quantification of slope performance with the variations in all the parameters involved in the slope design. The basic idea behind the limit equilibrium approach is to find a state of stress along the failure surface so that the free body, within the slip surface and the free ground surface, is in static equilibrium. This state of stress is known as the mobilized stress, which may not be necessarily the actual state along this surface. This state of stress is then compared with the available strength, i.e., the stress necessary to cause failure along the slip surface.

Limit equilibrium analysis considers the slope performance only at the equilibrium condition between the resisting and disturbing forces for sliding. To represent the slope performance other than the equilibrium condition, it is necessary to have an index and the

widely used index used to be factor of safety. Factor of safety is calculated as the ratio of shear strength to the available shear stress required for equilibrium, integrated through the whole slide. It is assumed to be constant throughout the potentially sliding mass. Due to scatter of test results and the uncertainty of these input parameters, a cut-off value of 1.3 safety factor is recommended for pit slope stability analysis on the basis of the long-term stability (Hoek and Bray, 1981), however we have kept a safety factor of more than 1.5 keeping in view the DGMS circular no. 03 of 2020, dated 16-01-2020.

Water table within the slope mass and the implementation of different remedial drainage measures and water management measures have been taken into consideration in the process of slope design. It is one of the principles of the open pit design that some localized instability may occur, which will influence a relatively small area especially during monsoon. This is consistent with the mining environment. It should be acknowledged that some clean-up may be required within the pit or dump, particularly after the monsoon season.

The slope stability analyses of ultimate pit and dump slopes have been done on representative cross sections provided by the mine management using GALENA software. The surface plan and locations of sections (such as Quarry-C Sect_CC, DD, FF and GG)) are shown in Fig. 5 to 8. Planned transverse sections (for slopes of Sect_CC, DD, FF and GG) of Saruabil_Band-IV_Quarry-C are shown in Fig. 9 to 12. Deep and steep sections were subjected to slope stability analysis. Result of these slope stability analyses up to planned pit depth up to 54mRL (till 5th year of operation) are shown in Fig. 13 to 16.

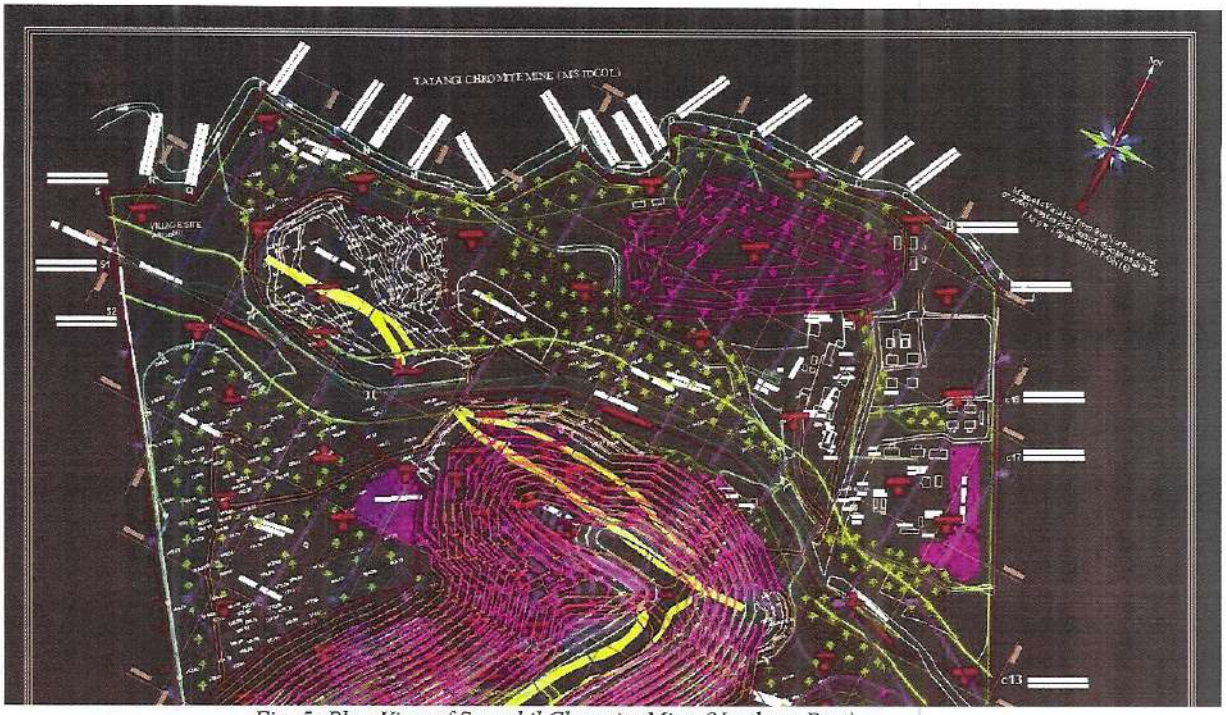


Fig. 5: Plan View of Saruabil Chromite Mine (Northern Part)

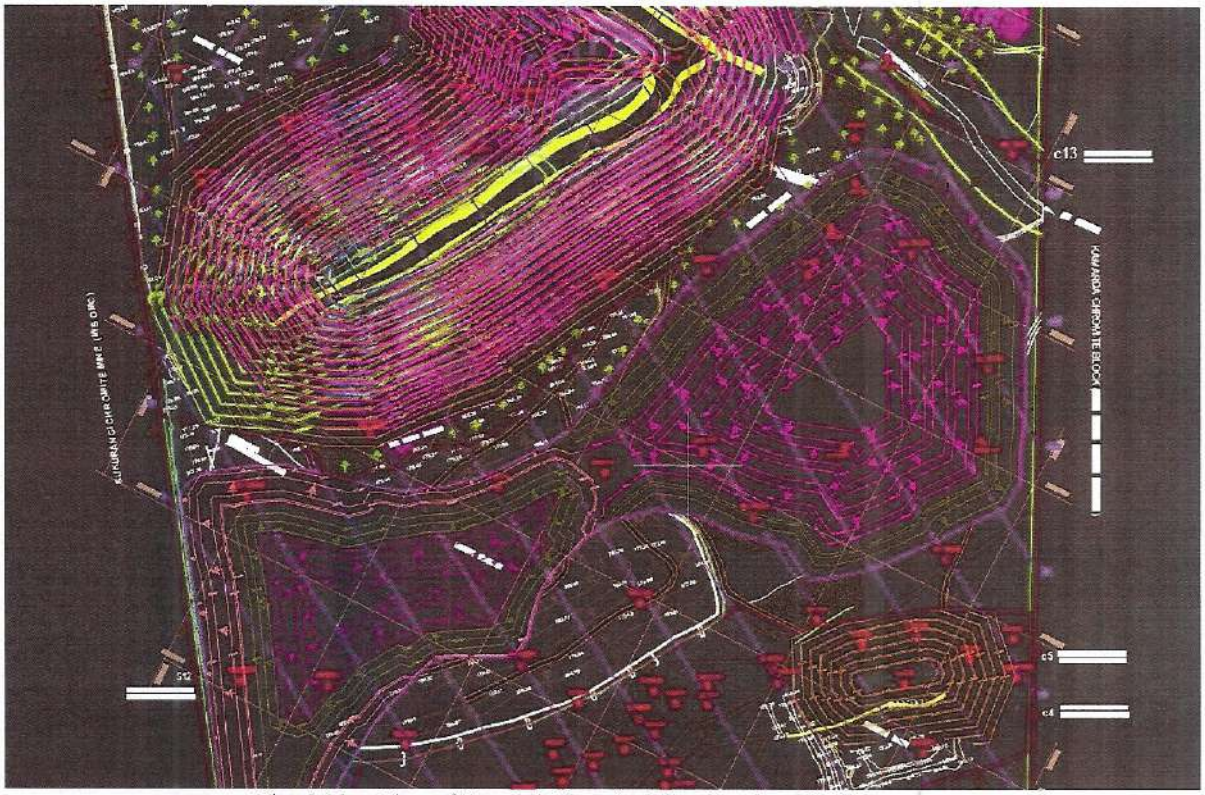


Fig. 6: Plan View of Saruabil Chromite Mine (Southern Part)

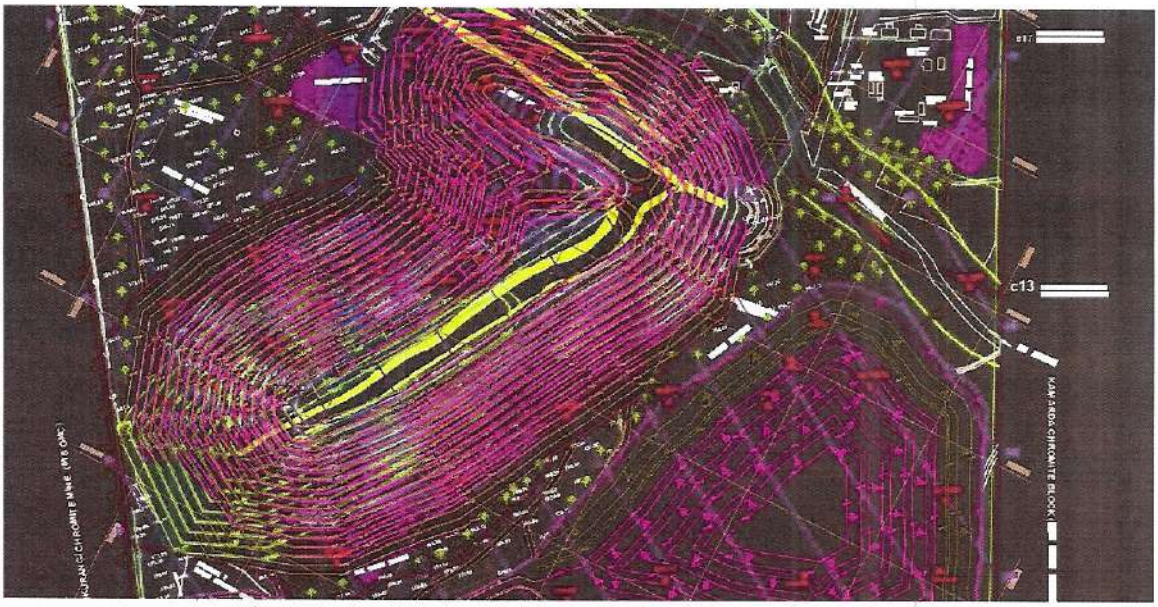


Fig. 7: Section Locations for Quarry-C (Sect_CC, DD, FF etc)

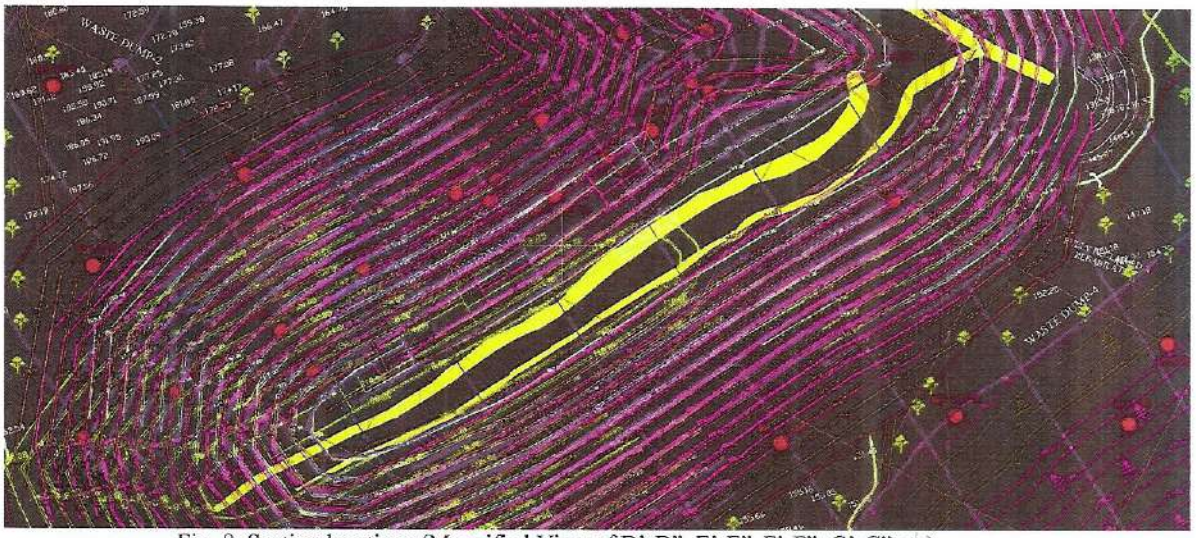


Fig. 8: Section locations (Magnified View of D'-D", E'-E", F'-F", G'-G" etc)

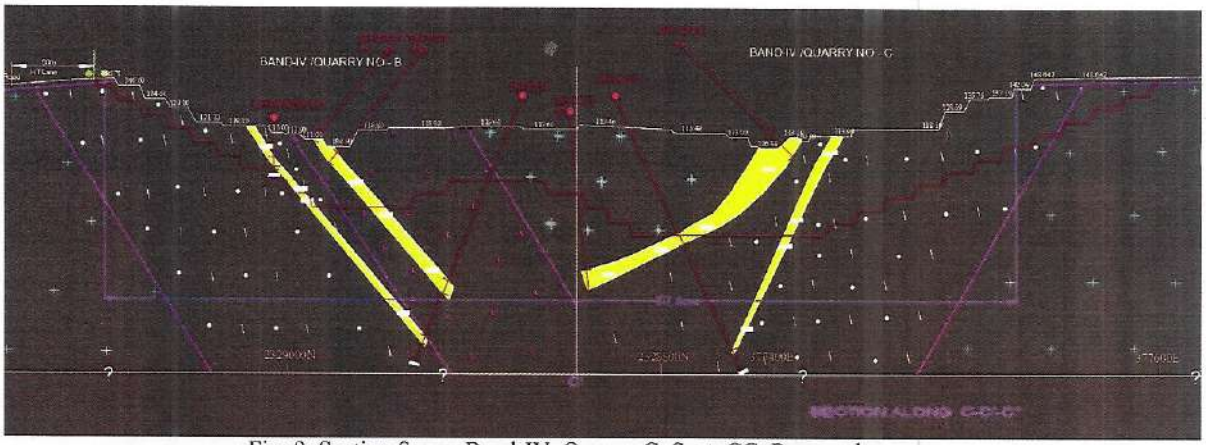


Fig: 9: Section Sarua_Band-IV_Quarry_C_Sect_CC_Proposed

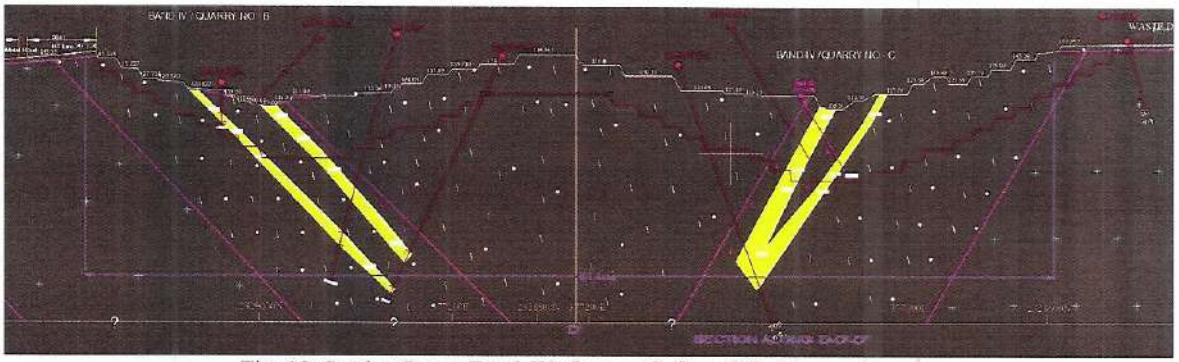


Fig: 10: Section Sarua_Band-IV_Quarry_C_Sect_DD_Proposed

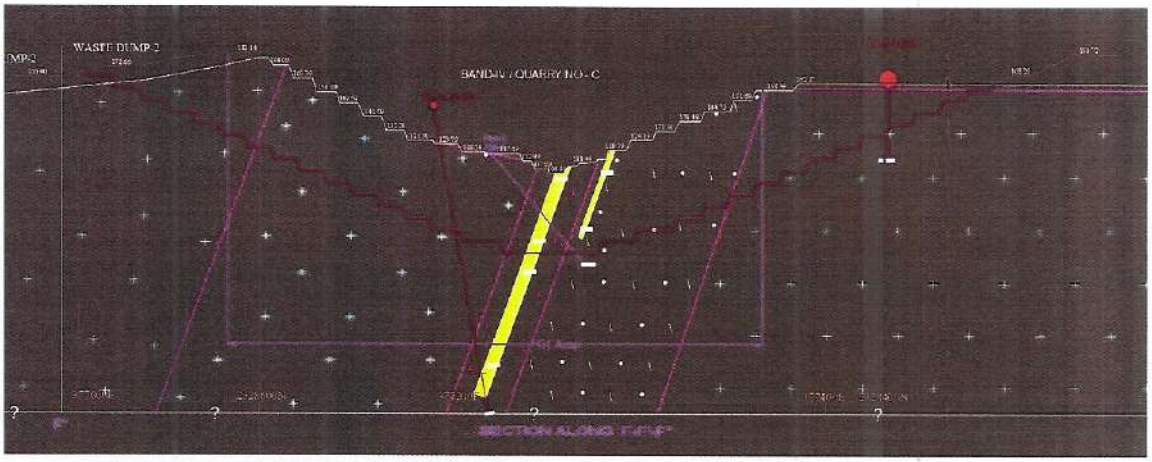


Fig: 11: Section Sarua_Band-IV_Quarry_C_Sect_FF_Proposed

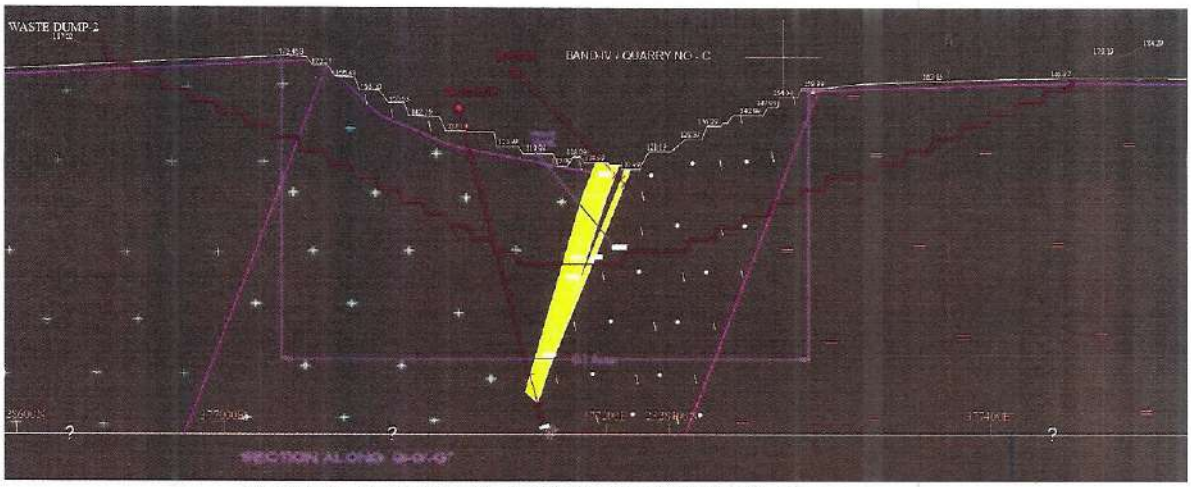


Fig: 12: Section Sarua_Band-IV_Quarry_C_Sect_GG_Proposed

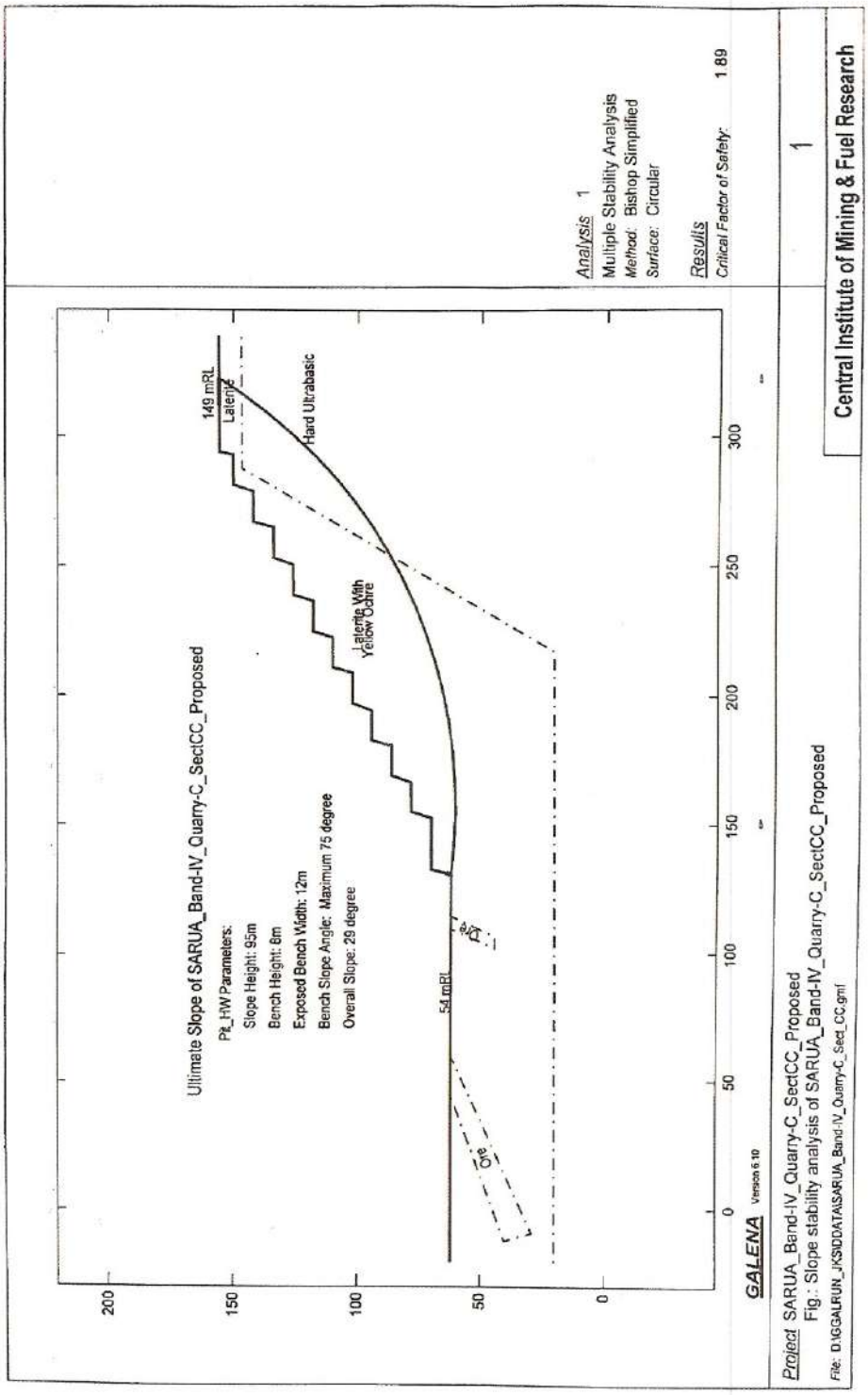


Fig.13: Slope stability analysis of SARUA_Band-IV_Quarry-C_SectCC_Proposed

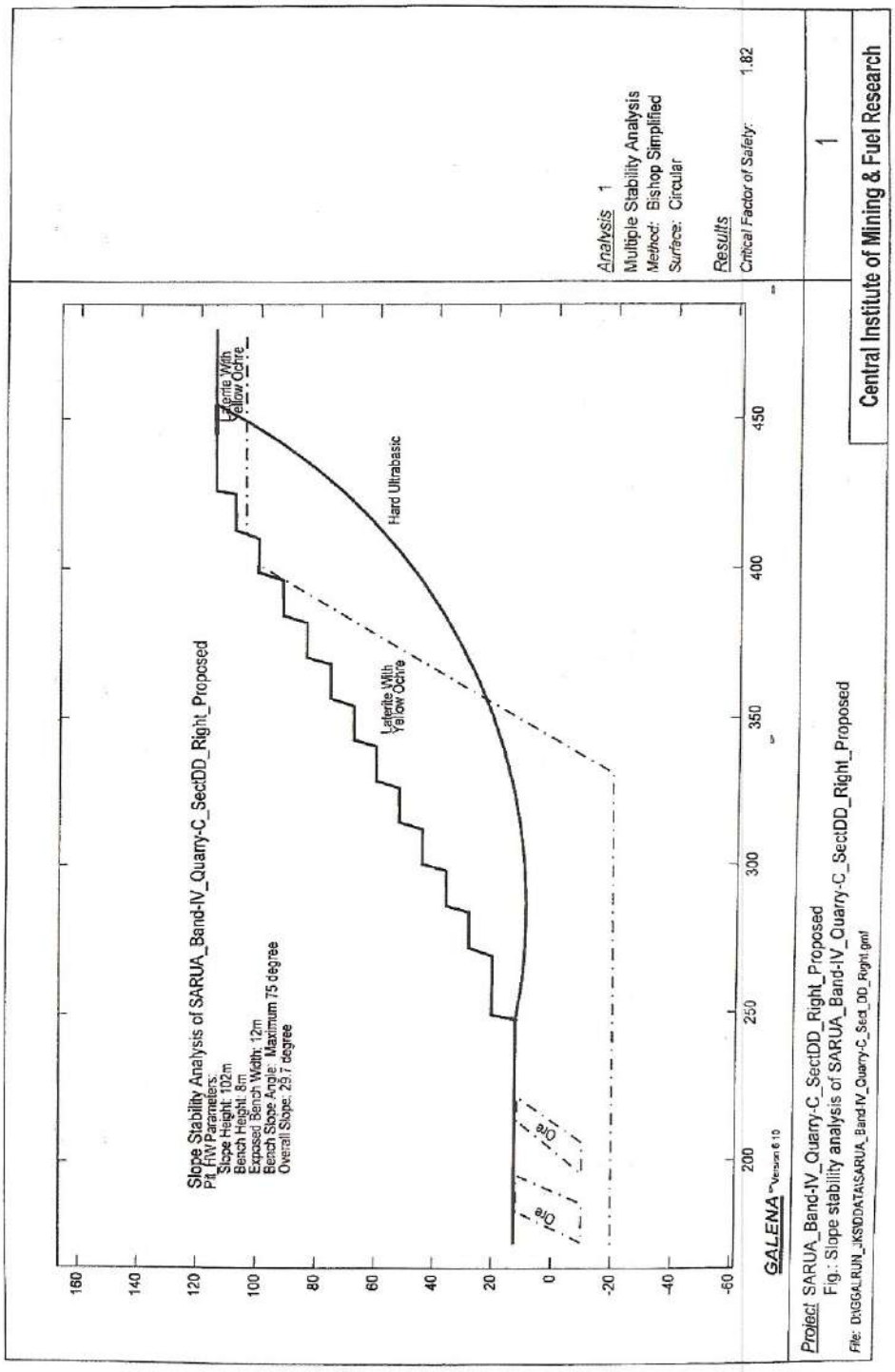


Fig 14: Slope stability analysis of SARUA_Band-IV_Quarry-C_SectDD_Proposed

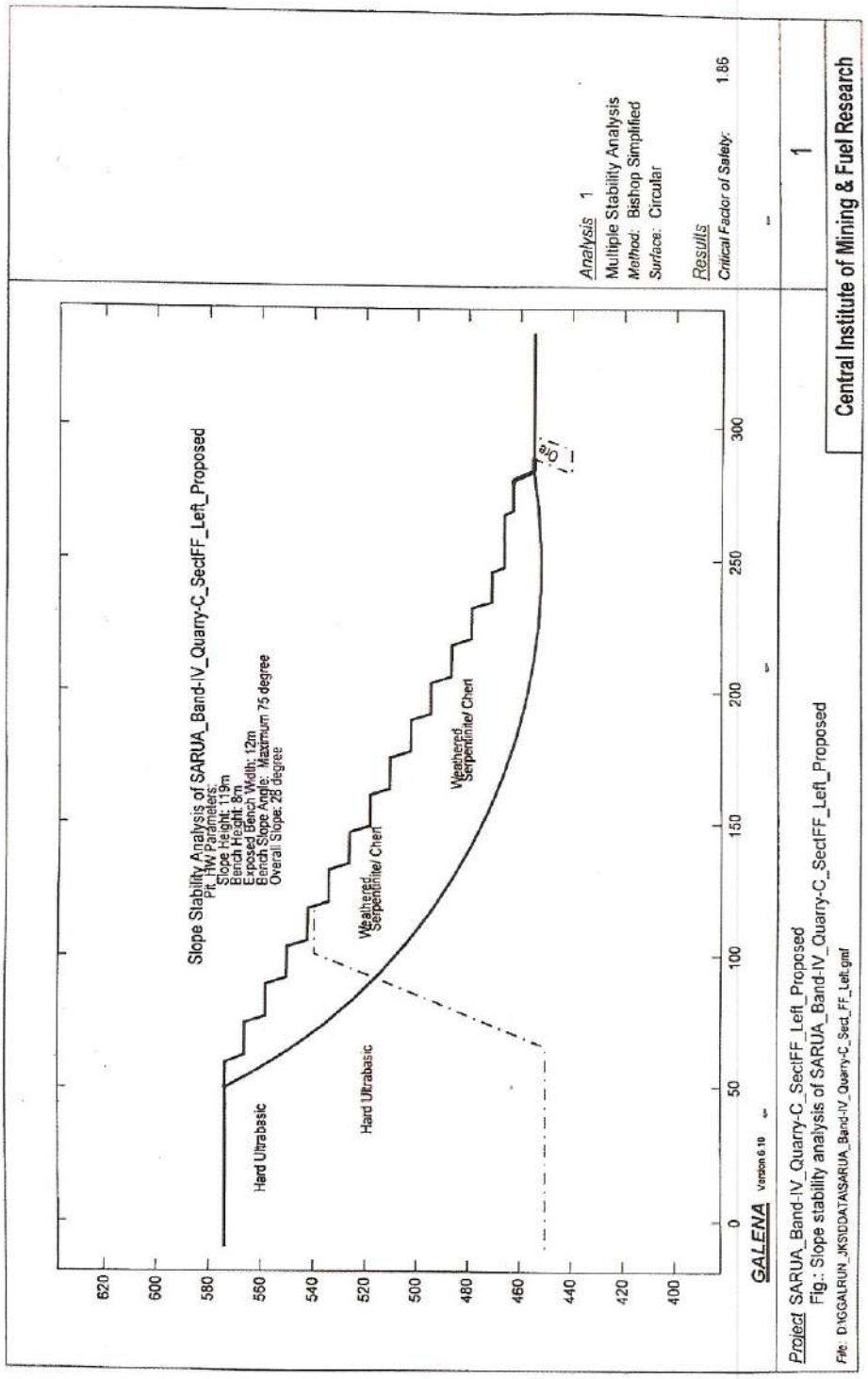


Fig.15: Slope stability analysis of SARUA_Band-IV_Quarry-C_SectFF_Proposed

Fig.: Slope stability analysis of SARUA_Band-IV_Quarry-C_SectFF_Left_Proposed

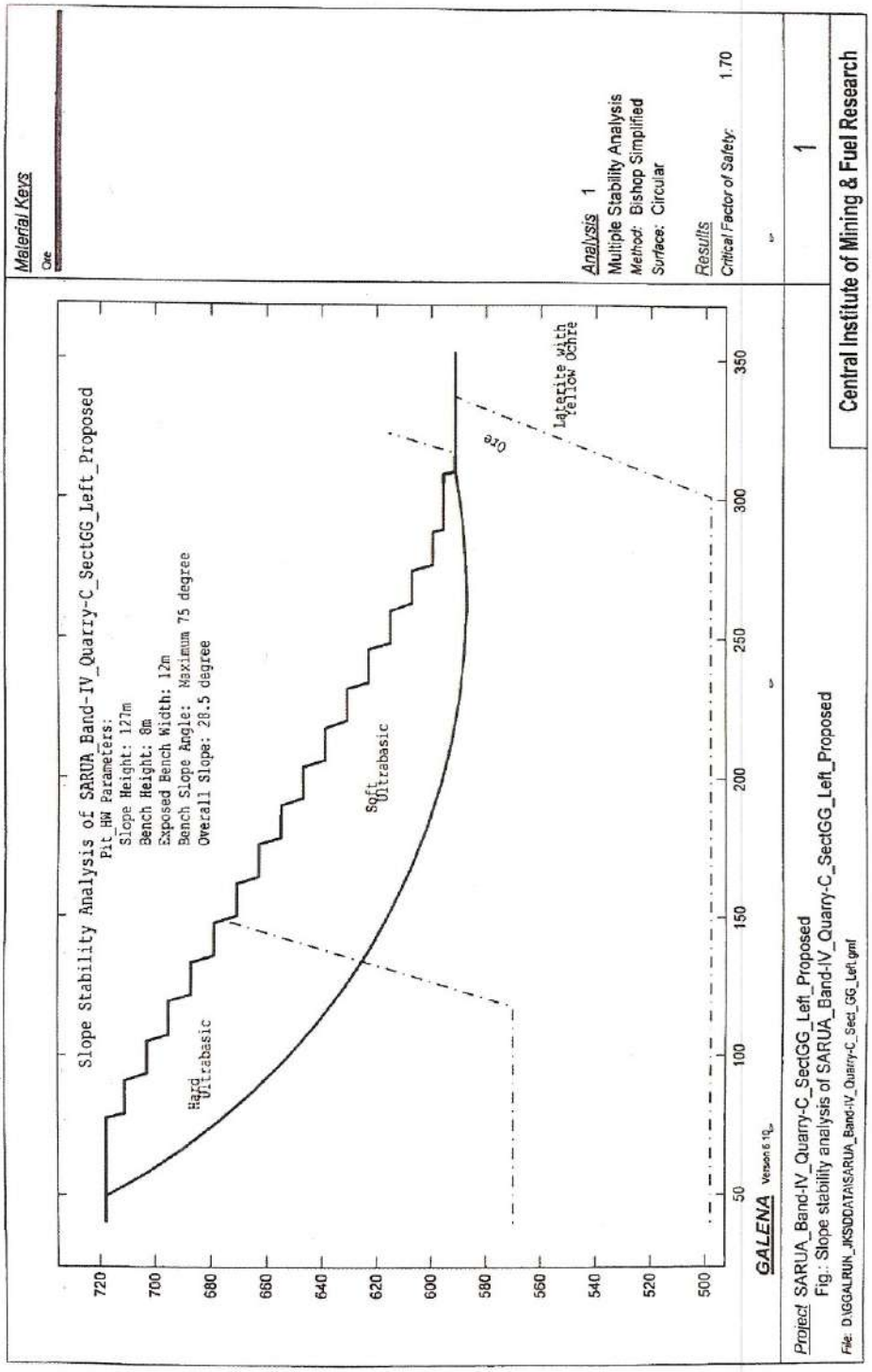


Fig.16: Slope stability analysis of SARUA_Band-IV_Quarry-C_SectGG_Proposed

Fig.: Slope stability analysis of SARUA_Band-IV_Quarry-C_SectGG_Left_Proposed

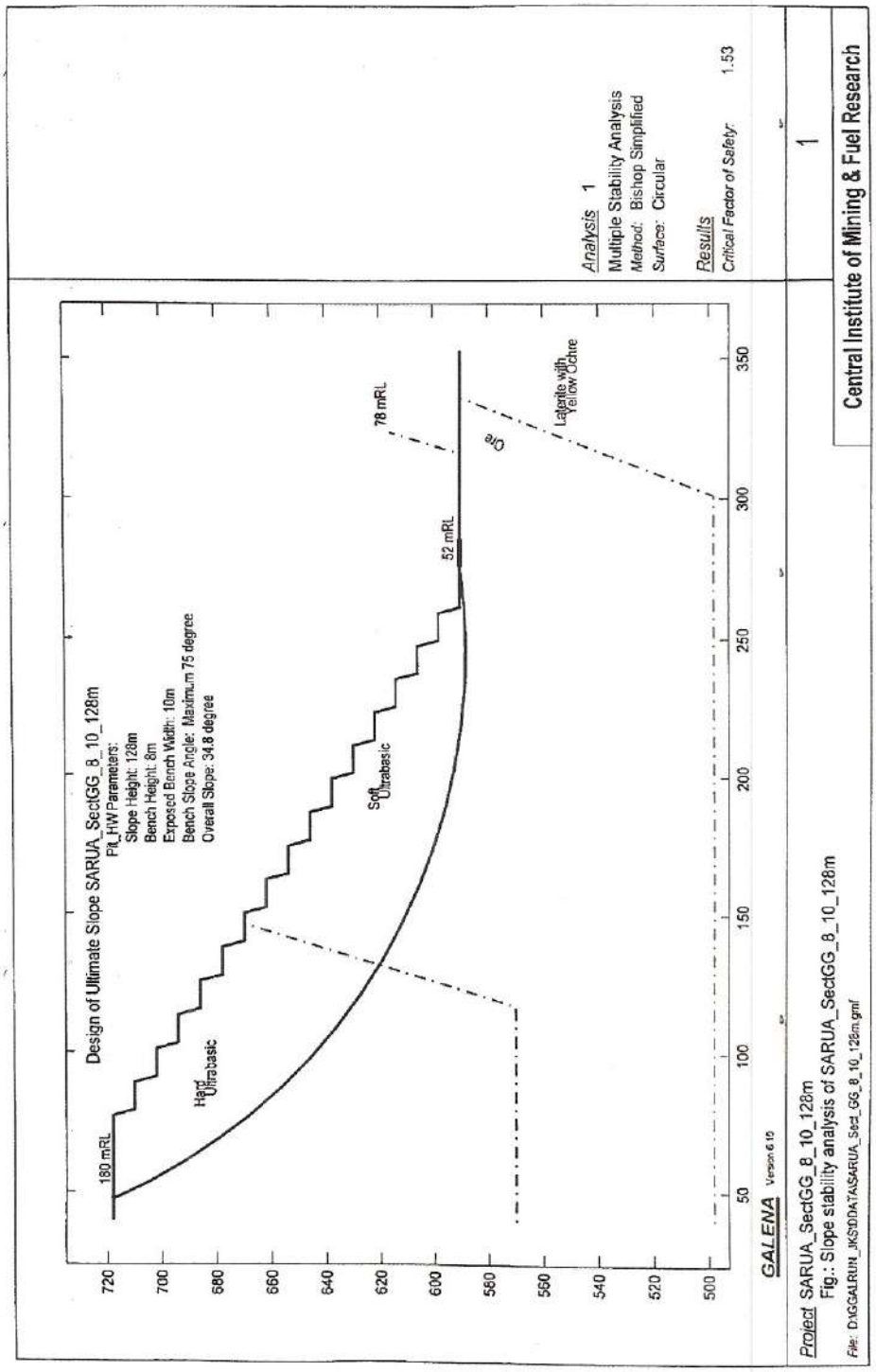


Fig.17: Design of Pit for 128m depth along SARUA_Band-IV_Quarry-C_SectGG

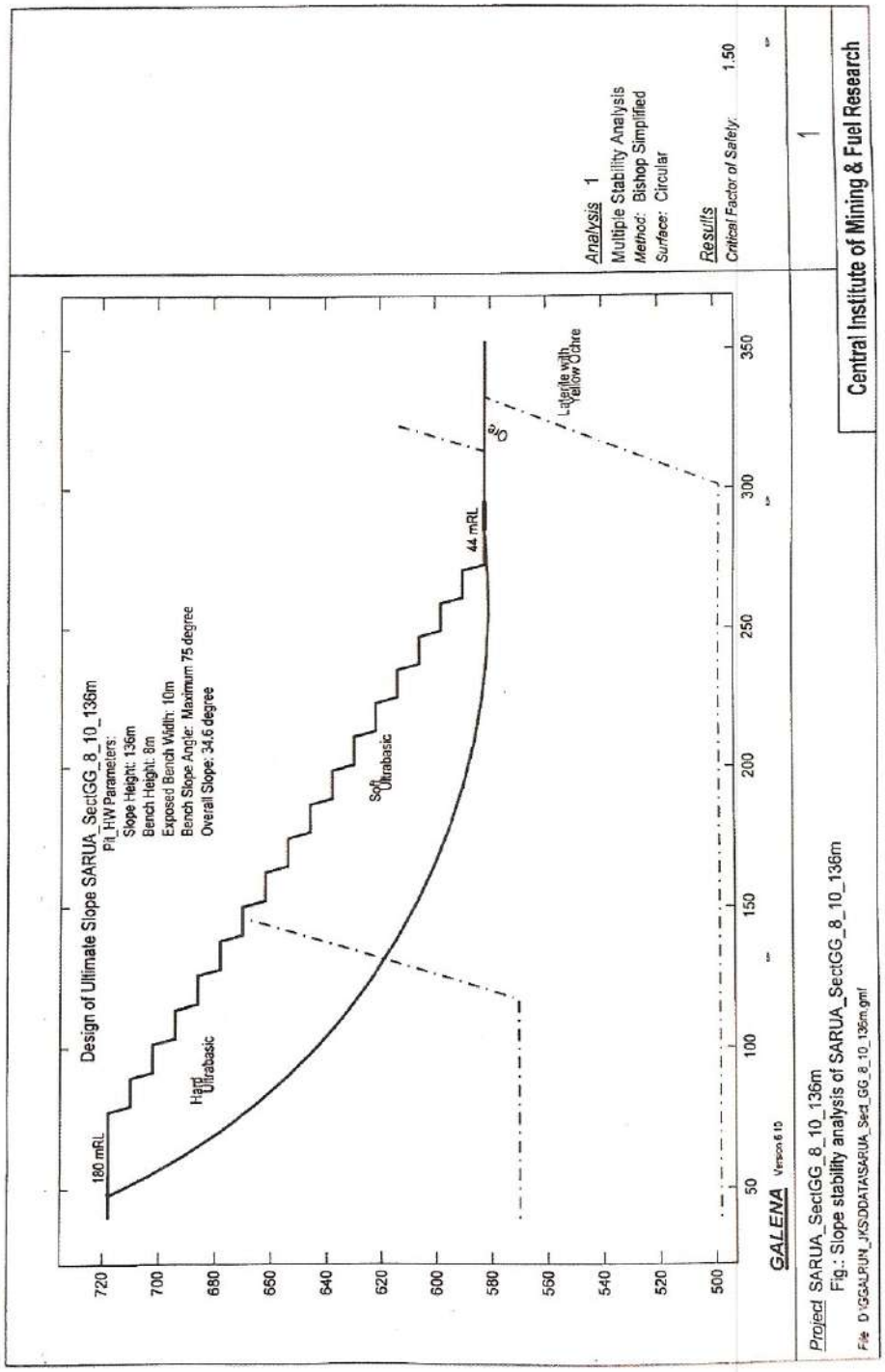


Fig.18: Design of Pit for 136m depth along SARUA_Band-IV_Quarry-C_SectGG

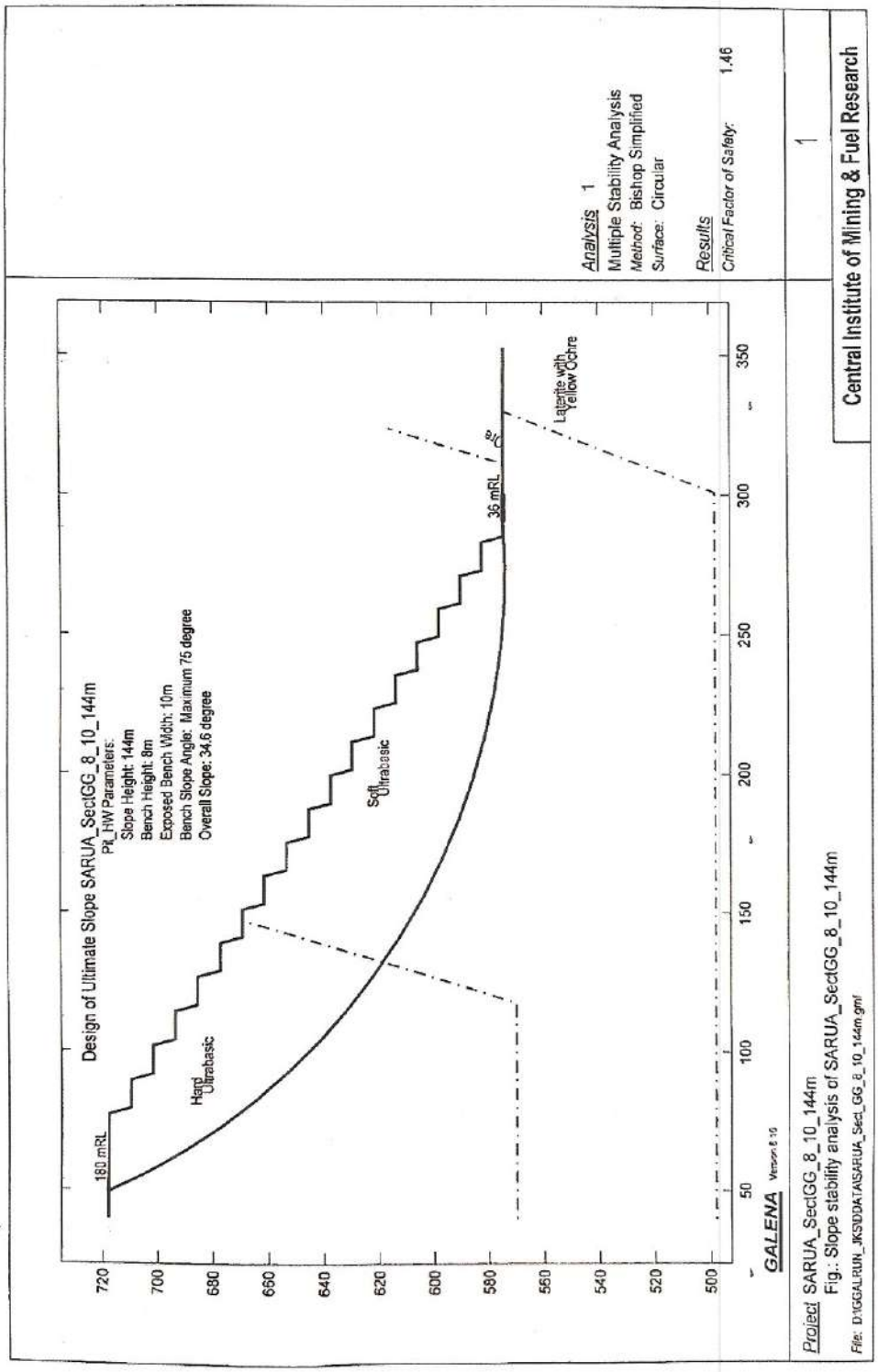


Fig.19: Design of Pit for 144m depth along SARUA_Band-IV_Quarry-C_SectGG

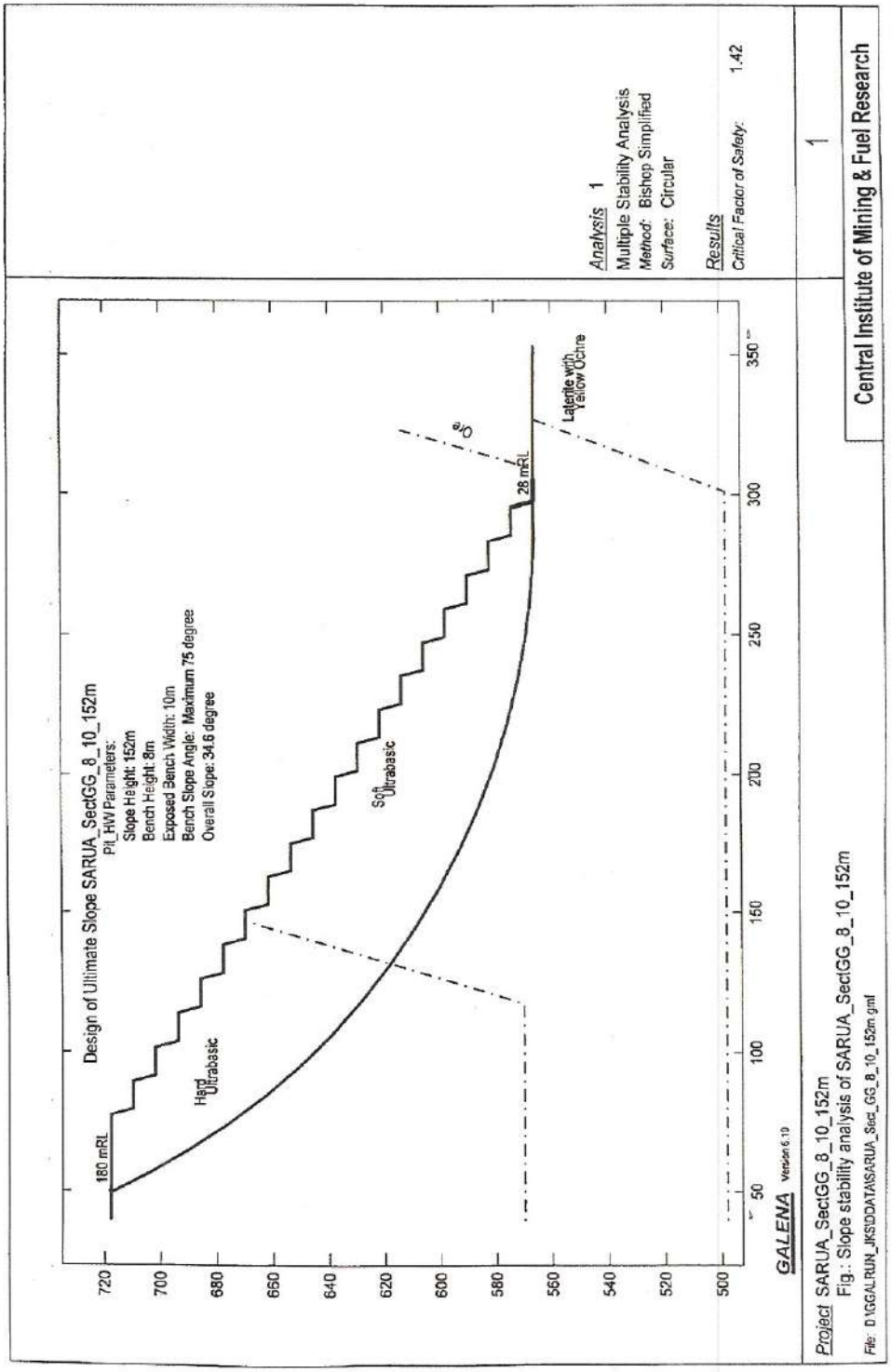


Fig. 20: Design of Pit for 152m depth along SARUA_Band-IV_Quarry-C_SectGG

SLOPE STABILITY ANALYSIS OF OVERBURDEN DUMP

Existing plan of dump is shown in Fig. 21 and dump sections A'A" and B'B" of waste dump WD-4 are shown in Fig 22 and 23. Slope stability analyses of left side and right side of dump profiles for existing dump are shown in Fig 24 and 25. Design of waste dump WD-4 for a dump height of 105m has been shown in Fig. 26. It is seen that the designed dump with 15m terrace height and 12m terrace width for a peak height of 105m has a Factor of Safety higher than 1.50.

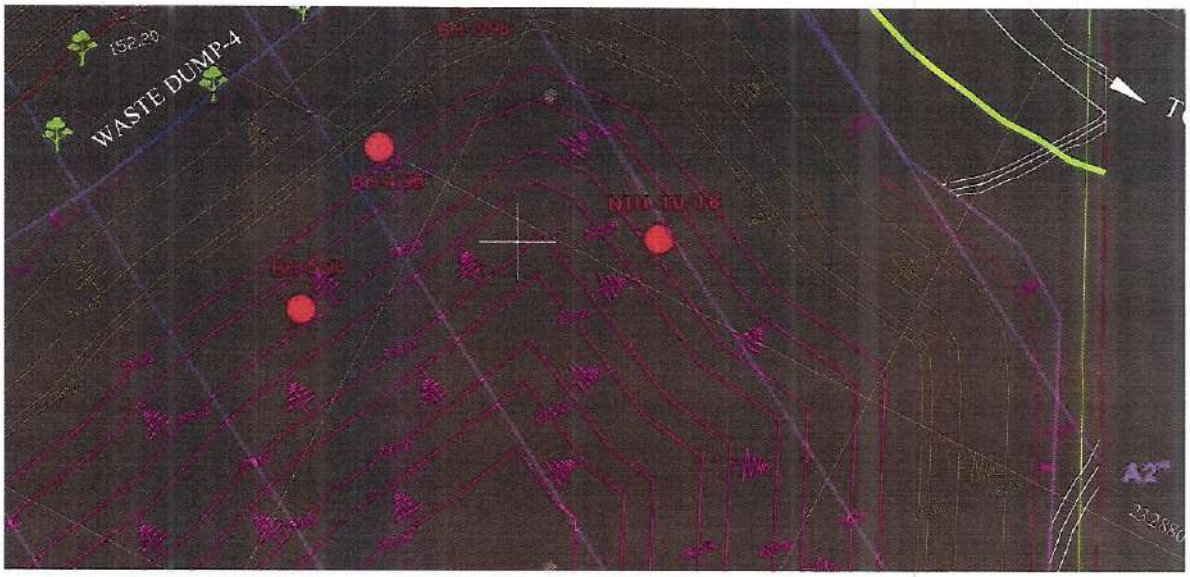


Fig. 21: Plan of Waste Dump WD-4

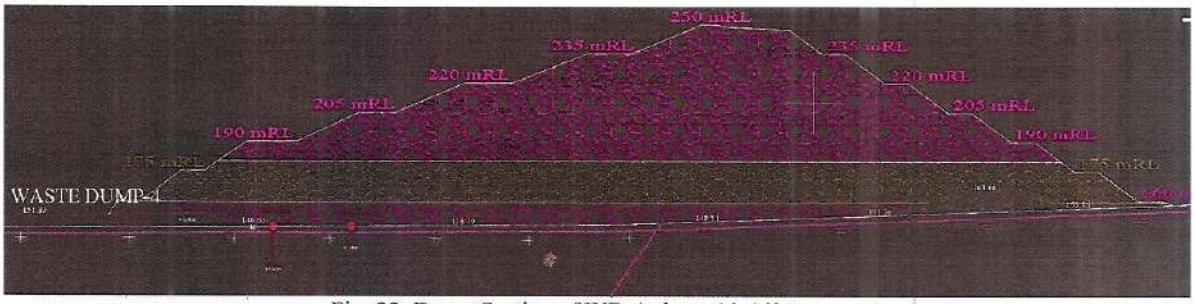


Fig. 22: Dump Section of WD-4 along A'-A''

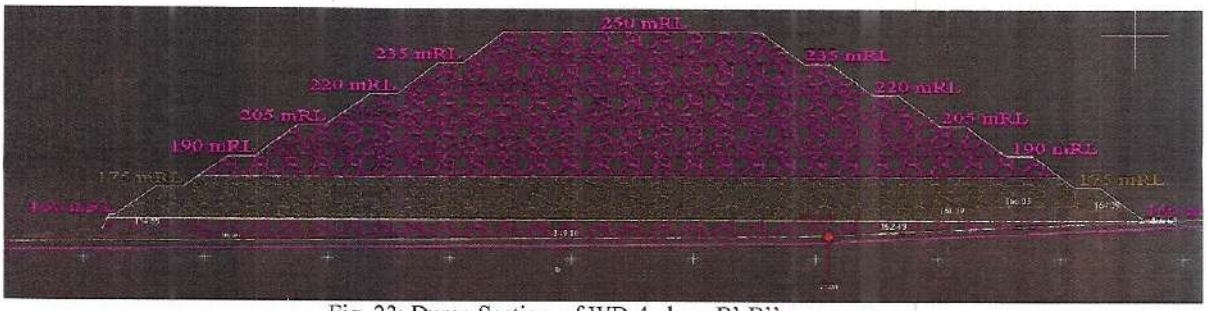


Fig. 23: Dump Section of WD-4 along B'-B''

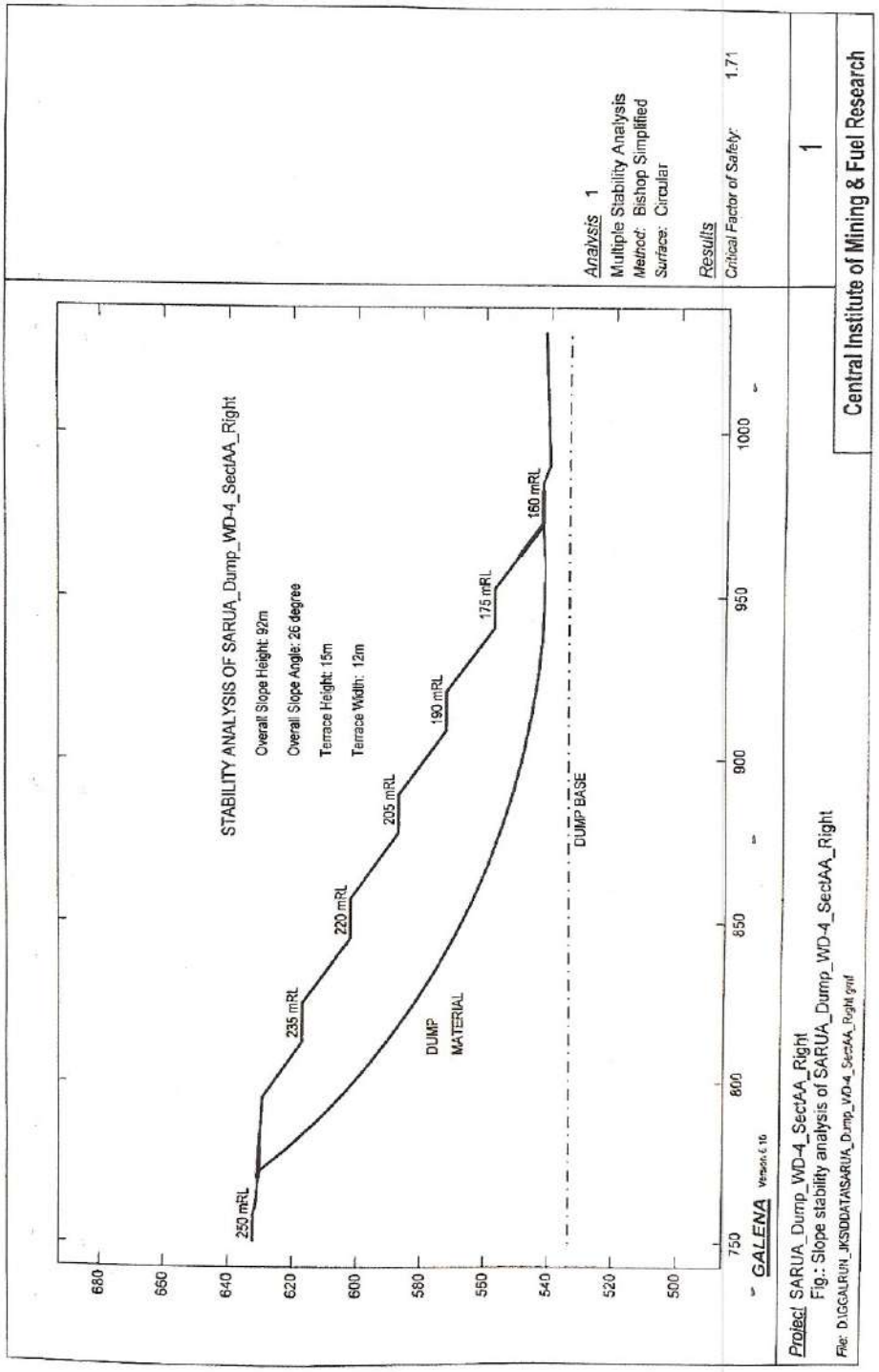


Fig. 24: Slope Stability Analysis of Right Side of Existing Dump WD-4

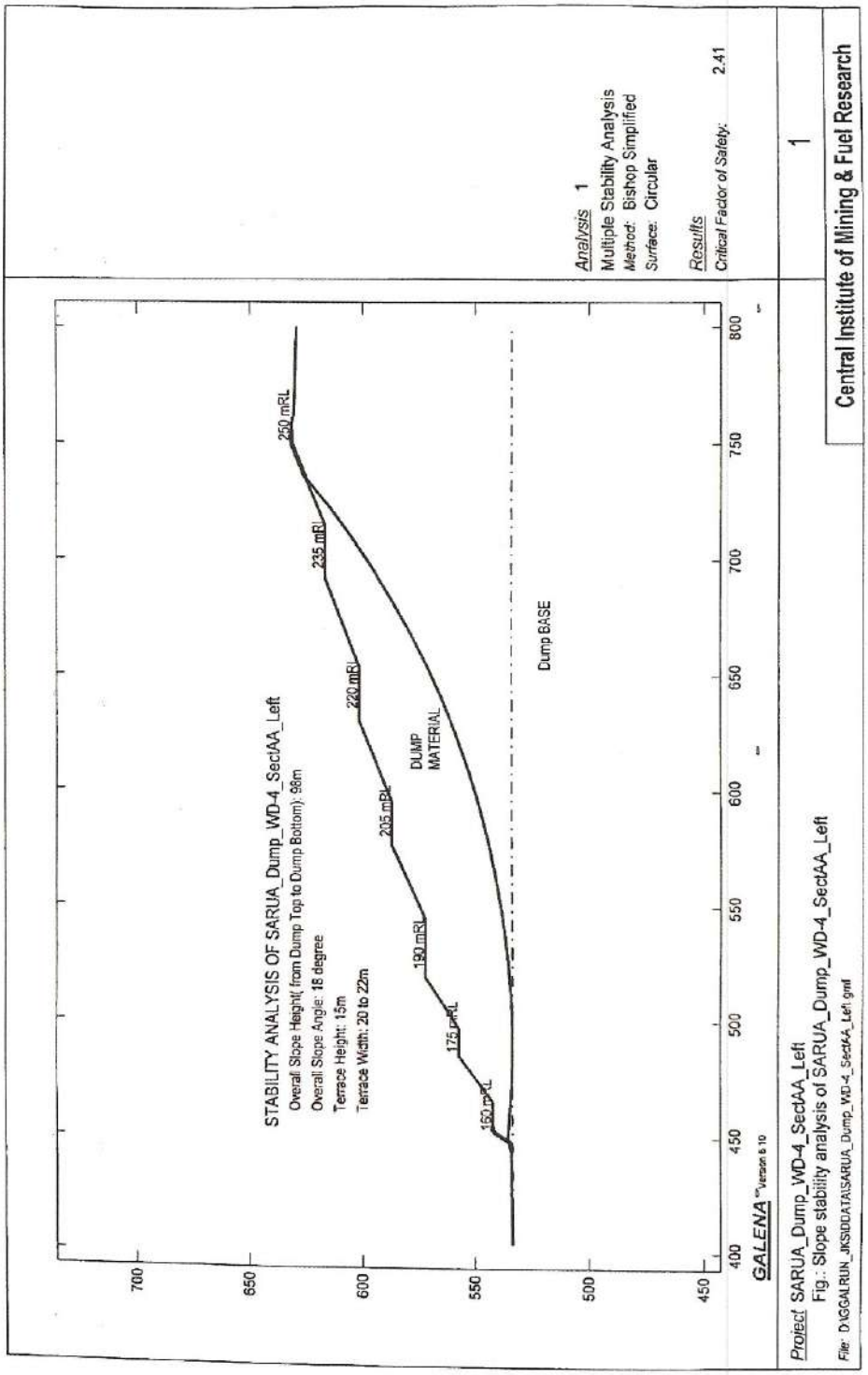


Fig. 25: Slope Stability Analysis of Left Side of Existing Dump WD-4

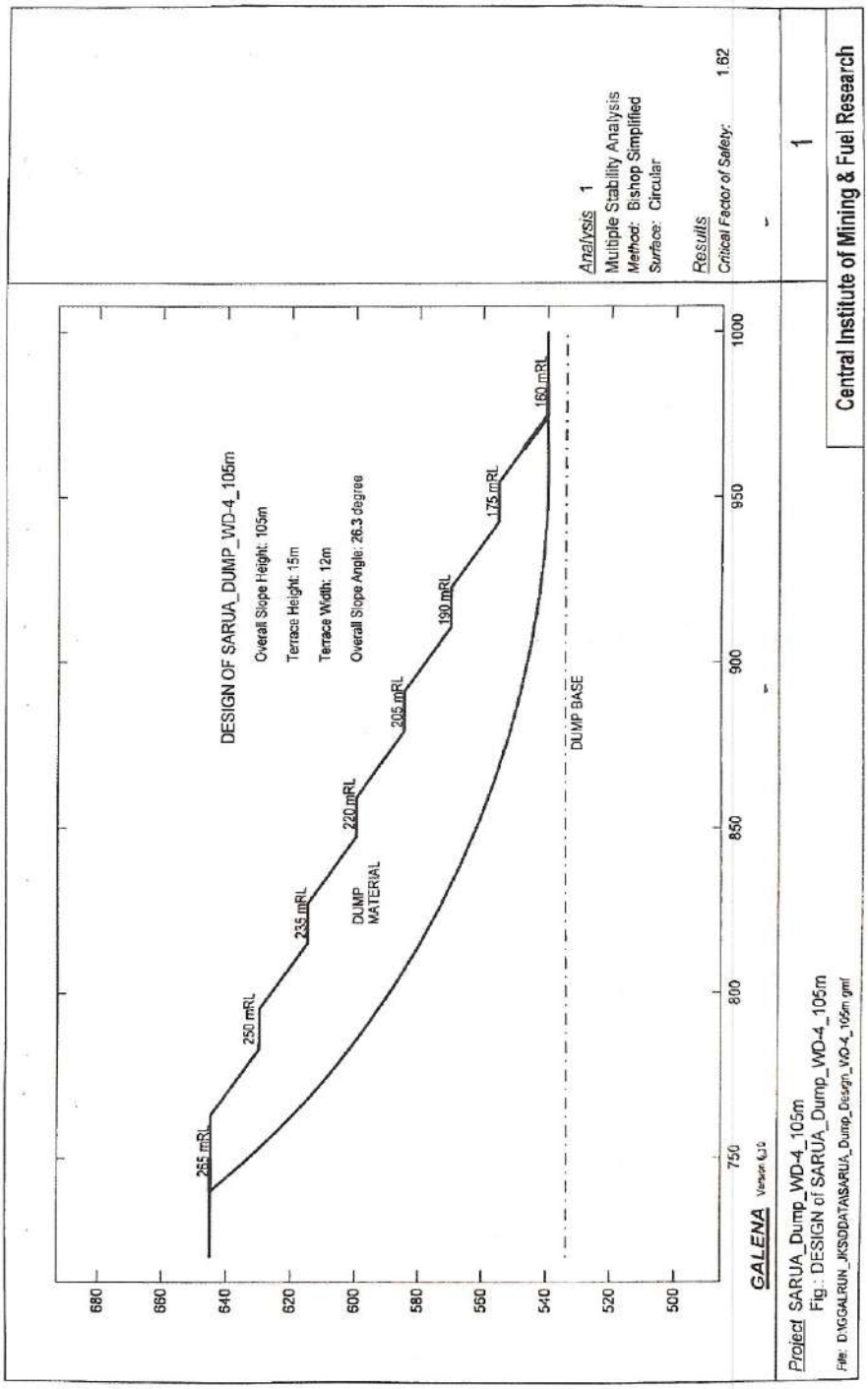


Fig 26: Design of 105m high dump WD-4

The analysed factor of safety of the ultimate planned Pit and Dump along different sections have been summarized in Table 3.

Table 3: Slope Stability Analyses of Ultimate Pit Slope and Dump Slope

Sl No.	Description	FOS	Figure
1	Stability Analysis of SARUA_Band-IV_Quarry-C_SectCC_Proposed	1.89	Fig. 13
2	Stability Analysis of SARUA_Band-IV_Quarry-C_SectDD_Proposed	1.82	Fig. 14
3	Stability Analysis of SARUA_Band-IV_Quarry-C_SectFF_Proposed	1.86	Fig. 15
4	Stability Analysis of SARUA_Band-IV_Quarry-C_SectGG_Proposed	1.70	Fig. 16
5	Design of Pit Slope for 128m depth along SARUA_Band-IV_Quarry-C_Sect_GG	1.53	Fig. 17
6	Design of Pit Slope for 136m depth along SARUA_Band-IV_Quarry-C_Sect_GG	1.50	Fig. 18
7	Design of Pit Slope for 144m depth along SARUA_Band-IV_Quarry-C_Sect_GG	1.46	Fig. 19
8	Design of Pit Slope for 152m depth along SARUA_Band-IV_Quarry-C_Sect_GG	1.42	Fig. 20
9	Stability Analysis of Sarua_Dump_WD-4_SectAA_Right	1.71	Fig. 24
10	Stability Analysis of Sarua_Dump_WD-4_SectAA_Left	2.41	Fig. 25
11	Design of 105m high dump WD-4	1.62	Fig. 26

The analysis shows that the large-scale failure is unlikely for planned pit and dump but small-scale failure cannot be completely ruled out. The main philosophy in slope design is to avoid large-scale failure. Localised bench failure does not cause great concern as it can be arrested on the lower benches, which can be cleaned. So, machinery access on the benches must be maintained.

It may be noted that a few small-scale failures may subsequently cause a big failure. If about three benches are made steeper at any level in any part of the pit then it may initiate failure. Although the overall slope angle may be quite low but the steeper slope angle of three benches may increase the stress at the toe of relatively steeper part of the slope, which may cause failure. Two or three such small failures may cause a big failure. So, benching should be done properly from top to bottom.

Attention must be paid to avoid entry of rainwater in the slopes by providing suitable drainage in and around the mine and dump. The rainwater should not be left to flow in/ along the slopes in an uncontrolled manner. It should be taken up well before the onset of monsoon for existing and the final slopes both.

Table 5: Design of 105m high Dump WD-4 of Saruabil Chromite Mine

Dump Parameters		
Maximum Terrace Height (m)	Minimum Exposed Terrace Width (m)	Angle of repose (deg.) for each terrace
15	12m	37

Salient Designed Parameters are summarized (as per Fig. 26) as:

- Maximum height of dump: 105m
- Maximum height of each terrace: 15m
- Minimum Width of terrace: 12m
- Bench slope angle of one lift: 37 degree (Angle of repose)
- Overall Slope of 105m high OB dump: 26 degree

Table 6: Design of Ultimate Pit Slope of Sukinda Chromite Mine for 128m depth

Salient Designed Parameters of Pit Slope are summarized (as per Fig. 17) as:

- Maximum Bench Height: 8m
- Minimum Exposed Bench Width: 10m
- Bench Slope Angle: not more than 75 degree
- Overall slope height from surface to ultimate depth: 128m
- Overall Pit Slope Angle Recommended: 34.5 degree

If the pit and dump slopes are not kept in drained condition, then the factor of safety would reduce substantially. However, it may be recalled that the most likely condition of the slope was already adjudged to be drained condition due to nature of material of the dump. Under drained condition, dump slopes are likely to be stable with available shear strength of

the dump material. In order to avoid undrained condition, attention must be paid to avoid entry of rain / surface water in the dump mass by providing suitable drainage in and around the dump, failing which the dump slope may become unstable.

Drainage and water management

The rainwater of the adjacent catchments area should not be allowed to enter in to pit in an uncontrolled way. It causes erosion and deep gullies in the weak formations, which in turn may result in failure in due course of time. So, the rainwater of the catchments area should be directed away from the pit or dump. Effective garland drain should be provided around pit and dump.

The influence of water is alarming; hence every attempt should be made to divert the water away from the pit and proper drainage pattern should be effectively maintained. A proper gradient helps for quick run-off of water.

The upper surface of the mine and dump should be properly graded to divert the run-off of rainwater away from the pit and dump. The proper leveling and grading of benches (for about 2 to 3 degrees) should be done for quick run-off of rainwater. During rains, one person should check the flow path of the rainwater to make the existing drainage system more effective. Rainwater of the dump need to be taken down the dump in a controlled manner through effective toe drain on each lift of dump. Such toe drain may be made up of RCC or any impervious material such as geomembrane to channelize the water. HDPE/ PVC pipe may also be used to bring pit and dump water from one level to lower level. Adequate precautions should be taken to avoid clogging of the pipe by sediments of dump material. Horizontal drainage holes with perforated pipe may be required at lowest benches of pit as a measure of slope depressurization wherever the problem of water seepage is prominent. Slope must be be kept as dry as possible to keep the slope stable. Drains / water channels should be cleaned periodically to keep them effective.

Slope Monitoring

The main objective of slope monitoring study is to detect any instability well in advance so that any damage to men and machineries can be avoided. If the failure is unavoidable then it can be brought down in a predictable manner. The instability detected in the early stage can be stabilized by applying a suitable remedial measure. If the instability is detected at a later stage then it will be very difficult to check the instability.

The early identification of movement zones allows steps to be taken to minimize the impact of mining on stability by the implementation of corrective measures and at the same time provides for optimum mineral extraction. The system contrasts strongly with more common 'passive' systems that frequently only record the occurrence of an event for subsequent post-mortem examination. The active monitoring system permits early and confident decision making by management both for safety purposes and for optimum excavation sequencing.

All geotechnical investigations aimed at collecting input design parameters, however complete, involve an inherent risk of inaccuracy. Hence, any attempt of slope stability analyses and evaluation need to be supported by a sound slope monitoring programme in order to ensure the safe and smooth mining operations.

The continuous mining operation, blasting and changes in groundwater conditions continuously disturb the existing stress condition in the field. The whole system tries to come into equilibrium by stress redistribution and adjustment, which results into movement of the slope. Hence, it is advisable to monitor the slopes regularly to detect any movement. DGMS(Tech.) Circular No. 2 of 2020 dated 09.01.2020, mine manager should have a structured team of trained competent persons for slope monitoring headed by a slope monitoring officer with clearly defined duties and responsibilities.

The slope monitoring method allows failures to be predicted for ensuring safe working conditions. Slope monitoring can be used to confirm failure mechanisms. The review of monitoring results, visual inspection and regular briefing of field people help to detect the onset of failure.

The first sign of instability is a tension crack. So, it is important to carry out regular inspection to detect the development of tension cracks on the crest of the slope as well as on benches and to carry out prompt remedial measure. They may develop as a function of high stresses in the slopes. The opening of cracks will tell whether any deep - seated failure can occur or not. Tension cracks should be filled and sealed to prevent the entry of water, which may cause failure.

Monitoring Systems

The slope monitoring techniques vary widely ranging from simple visual observations of signs of potential instability such as slope bulging, surface fretting and the formation of tension cracks to the use of somewhat complex instrumentation. The scale of the mining operation, transport system and the nature and location of the potential slope failure decides the application of a particular technique.

Survey based methods can be used for absolute monitoring, that is determining the movement of a point or points relative to some datum believed to be outside the zone of potential deformation. These include:

(a) Total station – Precise level-based monitoring,

(b) Tension crack monitors.

Other monitoring methods which are used for more critical slopes are:

(c) Robotic Total station Based Monitoring using Fixed Prisms.

(d) 3D- Terrestrial Laser Scanning for Slope Monitoring in periodical or continuous monitoring mode.

(e) Slope stability radar for continuous monitoring.

Whichever is the technique used for slope monitoring, the objective is to predict future slope instability by appropriate interpretation of Displacement - Time data and analyses of failure mechanism.

The slope monitoring based on standard surveying techniques have found wide acceptance because of the ability to remotely monitor a wall following the establishment of

targets. Use of Total Station techniques along with angular measurements have become most popular because of the perceived advantage of only having to monitor from one location.

The latest methods are emerging to monitor pit slopes in open pit mines. These methods are based on various technologies such as:

Automated total station networks (robotics);
Terrestrial Laser Scanning for Slope Monitoring
Slope Stability Radar (SSR);

The large open-pit mines have begun using one or more of these new methods to monitor pit slopes. For example, a network of automated total stations and reflective prisms installed at Codelco's Chuquicamata copper mine in northern Chile assists in monitoring pit slopes continuously. The network provides reliable quantitative information, allowing mine engineers to monitor and reasonably predict the behavior of rock masses and geologic structures on pit slopes.

Slope stability radar technology provides complete slope face coverage from a remote location without need of reflective prisms. This mobile system can easily be moved into a pit to provide high-precision monitoring of a slope face up to 850m away. Customized software processes the radar data to display slope movement and acceleration on a high-resolution CCD camera image. The unit can provide continuous coverage in all weather conditions, including dust and fog, and can be monitored via radio link and the Internet from remote locations.

A slope stability monitoring system based on Terrestrial Laser Scanning technology has been researched and developed at the Colorado School of Mines. Kennecott Energy and 3D-P are funding this program to determine applicability and potential use of inexpensive 3-D Lidar scanners for monitoring high walls in surface coal mines. CSIR-CIMFR is also having one of the most advanced Terrestrial Laser Scanner for slope monitoring, 3D mine surface modeling, and other applications. Terrestrial Laser Scanner (TLS) can be used for slope monitoring in both methods – Periodical Monitoring, and Continuous Monitoring. Current progress indicates that 3-D TLS used with customized software may provide a highly cost-effective means of monitoring with centimeter accuracy in applications that include pit slopes, highwall, waste dumps and stockpiles.

THE SUGGESTED SLOPE MONITORING SCHEME FOR SARUABIL CHROMITE MINE OF TSML:

Slope monitoring of Pit and Dump should be done by installing monitoring stations all around the pit crest and benches. The monitoring stations should be located initially at about 30 m interval. In the zones of mines or dumps which are assessed by mine management as less susceptible zone from instability point of view through visual inspection of instability signs, the spacing between monitoring pillars may be kept as 40m. Monitoring pillars should be installed all along the top-most bench of pit and dump. Similarly, monitoring stations should be installed on alternate benches of pit and dump. Base station should be located at stable ground in opposite side of the monitoring stations. All the monitoring stations should be visible from the base stations. One or more base stations could be erected to cover all the area. The base station and monitoring stations should be so located that inter-visibility should be there. The gap between the stations can be increased or decreased for clear visibility. It is a general guideline, which may be changed to meet the local requirement. As per DGMS(Tech.) Circular No. 2 of 2020 dated 09-01-2020, mine manager should have a structured team of trained competent persons for slope monitoring headed by a slope monitoring officer with clearly defined duties and responsibilities.

The monitoring should be done periodically at least once in a month using total station by mine management and the results of monitoring should be recorded in a bound-paged register or in a tamper proof electronic form. These data should be regularly analysed to detect slope movement or instability well in advance. For proper monitoring system design, periodical data analysis for slope movement trend and failure prediction, help may be taken by mine from any reputed agency having experience and expertise in the area of slope movement monitoring.

In addition to above method, visual observations of Pit and dump slopes for prominent sign of instability should be done by geotechnical person of the mine on fortnightly basis and the observations related to slope stability should be recorded in a bound register for periodical analysis.

Warning level / withdrawal of slope movement is site-specific and can be decided based on analysis of actual monitoring data over a long period only. However, if mine management observes average rate of slope movement of more than 1 mm/ day over a period of at least three months in majority of pillars of a zone of pit or dump, then the mine management should increase the monitoring frequency to weekly and consult scientific/expert agencies expert in the slope stability and slope monitoring for remedial measures or failure predictions and guidance.

Conclusions and Recommendations

- An assessment of the proposed pit and dump plans, sections, engineering geology, strength properties and the related geotechnical controls indicated in reports, the following ultimate pit and dump slopes are recommended for Saruabil Chromite Mine of TSML.

Design of Dump of Saruabil Chromite Mine

Salient Designed Parameters are summarized as:

- Maximum height of dump: 105m
- Maximum height of each terrace: 15m
- Minimum Width of terrace: 12m
- Bench slope angle of one lift: 37 degree (Angle of repose)
- Overall Slope of 105m high OB dump: 26 degree

Design of Ultimate Pit Slope of Saruabil Chromite Mine

Salient Designed Parameters of Pit Slope are summarized as:

- Maximum Bench Height: 8m
- Minimum Exposed Bench Width: 10m
- Bench Slope Angle: not more than 75 degree
- Overall slope height from surface to ultimate depth: 128m
- Overall Pit Slope Angle Recommended: 34.5 degree

- In case the depth of pit to be planned in future is more than 128m or the height of dump is to be more than 105m, then the fresh scientific study would be needed to re-analyse the slope parameters for pit and dump slope design.
- The mine should have an effective garland drain/ bund, all around, to collect/ divert run-off rain-water of the catchment area before it reaches the mine slopes. It is essential that these drains should be kept clear of silt and debris. Effective water management is essential to maximise the stability and safety of pit as well as dump. Water should not be allowed to stagnate on pit and dump surface. They should be diverted or brought down in a controlled manner without damaging the slope surface.
- The mapping of weak zones, faults and bedding planes of pit part should be a regular process by the departmental geologist. The generated data may be used as an input parameter to reanalyze the stability as per requirement.
- Mine management should make a structured team of trained competent persons for slope monitoring headed by a slope monitoring officer with clearly defined duties and responsibilities as per DGMS (Tech.) Circular No. 2 of 2020 dated 09.01.2020. The slope stability monitoring should be done using any type of RADAR for mines. Stability monitoring should additionally be done once in a month using total station and the results of monitoring should be recorded in a bound-paged register or in a temper proof electronic form. These monitoring data should be regularly analyzed to predict the slope movement or instability well in advance. In case of need, help/advice may be sought from expert agencies in the field of slope stability and slope monitoring.

- The open cracks, whenever develop, in the partially consolidated new dump mass should be consolidated with the help of dozer/ compactor followed by proper leveling of the benches so that entry of water in cracks is minimised. It will help to consolidate the dumped material and will minimise infiltration of water inside slopes.
- During the rainy season, an officer should be deputed for regular visual observation around the mine and dump to see the effectiveness of drains. If any blockage is observed, immediately steps should be taken to make it effective. If any deep tension crack is detected in the pit/dump, the entry of water inside the crack should be checked.
- Recommendations stipulated in the report should be implemented in total.

Acknowledgements

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STATUS OF STATUTORY IME/PME , CONDUCTED BY UTKAL POLYCLINIC O&H CENTRE, SUKINDA FROM APRIL 2024 TO SEPT. 2024

KAMARDA CHROMITE MINES, TATA STEEL LTD.

Name of the Mines	Name of the Industry	Contractor Name	IME	PME	TOTAL
KAMARDA CHROMITE MINE	TATA STEEL LTD.	NAYAK ENTERPRISES	1	0	1
KAMARDA CHROMITE MINES	TATA STEEL LTD.	DEMAG ENGINEERS	13	0	13
KAMARDA CHROMITE MINES	TATA STEEL LTD.	DEPARTMENT	2	0	2
KAMARDA CHROMITE MINES	TATA STEEL LTD.	SECURITY & INTELLIGENCE SERVICES INDIA LTD.	4	0	4
KAMARDA CHROMITE MINES	TATA STEEL LTD.	WINTECH ENGINEER	1	0	1
			21	**0**	**21**

SARUABIL CHROMITE MINES, TATA STEEL LTD.

Name of the Mines	Name of the Industry	Contractor Name	IME	PME	TOTAL
SARUABIL CHROMITE MINE	TATA STEEL LTD.	APC DRILLING & CONSTRUCTION PVT. LTD.	13	0	13
SARUABIL CHROMITE MINE	TATA STEEL LTD.	CHROMATIC CONSTRUCTION	10	0	10
SARUABIL CHROMITE MINE	TATA STEEL LTD.	DEPARTMENT	2	0	2
SARUABIL CHROMITE MINE	TATA STEEL LTD.	DHANSAR ENGINEERING CO. PVT. LTD.	1	1	2
SARUABIL CHROMITE MINE	TATA STEEL LTD.	EFFWA INFRA & RESEARCH PVT. LTD.	36	0	36
SARUABIL CHROMITE MINE	TATA STEEL LTD.	NAYAK ENTERPRISES	5	0	5
SARUABIL CHROMITE MINE	TATA STEEL LTD.	POWER ENGINEERING	7	0	7
SARUABIL CHROMITE MINE	TATA STEEL LTD.	RANJAN KUMAR SAHOO	6	0	6
SARUABIL CHROMITE MINE	TATA STEEL LTD.	SECURITY & INTELLIGENCE SERVICES INDIA LTD.	14	0	14
			94	**1**	**95**

SUKINDA CHROMITE MINE, TATA STEEL LTD.

Name of the Mines	Name of the Industry	Contractor Name	IME	PME	TOTAL
SUKINDA CHROMITE MINE	TATA STEEL LTD.	A.K. SAMAL & BROTHERS	1	0	1
SUKINDA CHROMITE MINE	TATA STEEL LTD.	ACCESS COMPUTECH PVT. LTD.	1	0	1
SUKINDA CHROMITE MINE	TATA STEEL LTD.	BHUKTA TRANSPORT	2	0	2

SUKINDA CHROMITE MINE	TATA STEEL LTD.	DEPARTMENT	1	0	1
SUKINDA CHROMITE MINE	TATA STEEL LTD.	DHANSAR ENGINEERING CO. PVT. LTD.	0	7	7
SUKINDA CHROMITE MINE	TATA STEEL LTD.	EXIM INFRASTRUCTURE PVT. LTD.	21	0	21
SUKINDA CHROMITE MINE	TATA STEEL LTD.	NARAYANI SONS INDIA PVT. LTD.	17	0	17
SUKINDA CHROMITE MINE	TATA STEEL LTD.	PERINEL TECHNOLOGY PVT. LTD.	7	0	7
SUKINDA CHROMITE MINE	TATA STEEL LTD.	POWER ENGINEERING	3	0	3
SUKINDA CHROMITE MINE	TATA STEEL LTD.	SAIKRUPA ENTERPRISES	2	2	4
SUKINDA CHROMITE MINE	TATA STEEL LTD.	SATYAJIT PATRA	2	0	2
SUKINDA CHROMITE MINE	TATA STEEL LTD.	SECURITY & INTELLIGENCE SERVICES INDIA LTD.	0	4	4
SUKINDA CHROMITE MINE	TATA STEEL LTD.	TATA STEEL UTILITIES & INFRASTRUCTURE SERVICES	13	1	14
SUKINDA CHROMITE MINE	TATA STEEL LTD.	UNITED INFRACORE LTD.	1	0	1
SUKINDA CHROMITE MINES	TATA STEEL LTD.	ATHARV EYE HOSPITAL PVT. LTD.	4	0	4
SUKINDA CHROMITE MINES	TATA STEEL LTD.	SHIVJIVALJI SHEDS PVT. LTD.	18	0	18
			93	**14**	**107**

Block Programme Management Support Unit
Office of the Superintendent, Sukinda CHC, Jajpur
Health & Family Welfare Department.
Email:moicsukindachc1@gmail.com **Phone: (06726) 244402**

Letter no- 696 **Date:-** 1-7-24

To

The Chief District Medical and Public Health Officer, Jajpur

Sub:- Health Camp at Nagada and its adjacent villages under Sukinda CHC

Sir,

With the subject cited above as per your instruction the following health staffs are directed to conduct regular health check up at Nagada and its adjacent villages for the month of July-2024. The date, time and venue are given below

Name of the SC	Venue	Date & Time	Responsible Person
Saruabil SC	Kamarda Dispensary	5.7.2024, 10:00am	Dr. Jayadev Nanda (MO I/C sukinda CHC)/ Dr. Subhasis Jena(AYUSH MO, RBSK)/Kartik Ch Samal(Pharmacist, Sukinda CHC)/ Antaryami Dhal(MPHSM)/Concerned area CHO, MPHW(M &F) & ASHA
Chingudipal SC	Ragada Dam sahi	12.7.2024 10:00am	Dr. Aiswarya Chand(MO, Duburi)/Niranjan Swain(Pharmacist, Kaliapani PHC)/ Pabitra Kumar Ghadai (MPHSM)/Concerned area CHO, MPHW(M &F) & ASHA
Nuadhi SC	Rankia	19.7.2024, 10:00am	Dr. Bikash Munduri (MO,ATTA)/ Dr. Subhasis Jena(AYUSH MO, RBSK)/Kartik Ch Samal(Pharmacist, Sukinda CHC)/Niranjan Swain(Pharmacist, Kaliapani PHC)/ Antaryami Dhal(MPHSM)/Concerned area CHO, MPHW(M &F) & ASHA
Ransol SC	Mankediasahi	25.7.2024, 10:00am	Dr. Santanu Mishra (MO, Kuhika PHC / Niranjan Swain(Pharmacist, Kaliapani PHC)/ Antaryami Dhal(MPHSM)/Concerned area CHO, MPHW(M &F) & ASHA

This is for favour of your kind information and necessary action.

Yours faithfully,

Superintendent
CHC Sukinda

SUPERINTENDENT
C.H.C. Sukinda
Dist-Jajpur

Report on Outreach Health Camp at KP Nagar Primary School

Date: 25th July 2024 **Location:** KP Nagar Primary School

Medical Team:

- **Dr. Santanu Mishra, Medical Officer, Kuhika PHC**
- **Jyotsna Mahanta, Community Health Officer, Ransol Sub-Centre**

Supportive team:

The camp was conducted with active support from the **TSF Public Health Team**, who facilitated the coordination and logistics.

1. **Services Provided:**
   - General health check-ups and consultations.
   - Distribution of basic medications.
   - Health education and awareness sessions on common illnesses, nutrition, and hygiene practices.
   - Referral services for patients requiring further medical attention.

In collaboration with CHC Sukinda, Tata Steel Foundation (TSF) organized an outreach health camp at KP Nagar Primary School on 25th July 2024. This initiative aimed to provide accessible healthcare services to the local community and strengthen public health engagement.A total of **49 patients** attended the camp, comprising **24 males** and **25 females** from the local community.

The camp successfully addressed immediate healthcare needs while fostering collaboration between CHC Sukinda and TSF. It also served as an opportunity to bridge the gap in healthcare access for the KP Nagar community.

The outreach health camp at KP Nagar Primary School exemplifies the importance of partnerships in delivering essential healthcare services to underserved areas. TSF remains committed to supporting such initiatives, ensuring healthier communities through sustainable healthcare solutions.

Outreach Health Camp at Ragada Anganwadi Centre

Date: 12-07-2024 **Location:** Ragada Anganwadi Centre

Organized by: CHC Sukinda,

Supported by: Tata Steel Foundation, Sukinda Unit.

Medical Team:

- Dr. Aishwarya Chand (Medical Officer, Duburi PHC)
- Dr. Jashobanta Sing (Medical Officer, mPHU, Tata Steel Foundation)
- Subhasree Tripathy (Community Health Officer, Chingudipal SC
- Niranjan Swain (Pharmacist, Kaliapani PHC)
- Mamata Dehury (ANM, Chingudipal SC)

Guests:

- Dr. Jayant Kumar Tripathy, Unit Head Bamnipal & Sukinda, Tata Steel Foundation

Supporting Teams:

- TSF's Public Health Team
- AWC worker and ASHA of Local Area

An outreach health camp was successfully conducted at Ragada Anganwadi Centre, adjacent to Ragada Primary School, organized by CHC Sukinda with support from the Tata Steel Foundation, Sukinda Unit. The camp aimed to provide accessible preventive and curative health check-ups to the local community, focusing on general health assessments, early diagnosis, and health education. Comprehensive examinations were conducted for all attendees to detect and manage common illnesses early. Information sessions on hygiene, nutrition, and preventive healthcare measures were also provided. Attendees received specific medical advice and treatment for chronic conditions.

A total of 127 patients (32 male and 95 female) attended the camp, receiving various health check-ups and consultations, **including 15 children** (below 6 years). The patients benefited from comprehensive medical services provided by the attending doctors and medical staff. 64 patients above 30 yrs. screened for blood pressure and diabetes mellitus, with **7 individuals identified with hypertension and 2 with diabetes mellitus.** Individual counselling done for lifestyle modification and linkage with Govt. health facility for further medical management.

Most of the beneficiaries are from Ragada, Aradapal, Khuntaposi, Gokhata, Chingudipal, Patana, Ragudisahi, Tangarsahi and nearby villages.

The CHC Sukinda staff, the Public Health team from Tata Steel Foundation, and local AWC workers and ASHA supported the camp effectively, ensuring smooth operations and comprehensive care for all attendees. This health camp successfully provided essential medical services to 127 individuals, enhancing community health and awareness.

Ambulance provided at Saruabil Dispensary

Amenity Center for (Kamarda & Saruabil) Chromite Mines

Plantation in Nearby Panchayat

Name of the beneficiries	GP	Village	Category	Seedlings name	No of Plants	Area Covered in Acre	Coordinates
Bhakta Dehury	Kansa	Ostapal	ST	Apple Ber	2250	6	 
Juluka Dehury	Kansa	Ostapal	ST	Apple Ber			
Sankar Dehury	Kansa	Ostapal	ST	Apple Ber			
Tarachand Mohanta	Kansa	Ostapal	OBC	Apple Ber			
Tabi Dehury	Kansa	Ostapal	ST	Apple Ber			
Nilabati Dehury	Kansa	Ostapal	ST	Cashewnut			
Lalit Kumar Dehury	Kansa	Talangi	ST	Cashewnut		12	 
Nilamani Dehuri	Kansa	Talangi	ST	Cashewnut			
Balaram Dehuri	Kansa	Talangi	ST	Cashewnut			
Angad Dehuri	Kansa	Talangi	ST	Cashewnut			
Rangadhar Dehuri	Kansa	Talangi	ST	Cashewnut			

Annexure - IX

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS
(WILDLIFE) & CHIEF WILDLIFE WARDEN, ODISHA
BDA APARTMENT, 5TH FLOOR, PRAKRUTI BHAWAN, NILAKANTHA NAGAR, BBSR-12
Ph. No.0674-2564587, FAX No.0674-2565062
(Website:odishawildlife.org, E. mail: odishawildlife@gmail.com)

Memo No. 10180 /1WL-SSP-55/2016
Dated, Bhubaneswar the 27 Dec, 2016

To

The Divisional Forest Officer,
Cuttack Division

Sub: ***Saruabil Chromite Mines of M/s Misrilall Mines (P) Ltd. in Jajpur District – Authentication of location map regarding***

Ref: ***Your memo No.12385 dt 20.12.2016***

As per the location map provided by you in your memo No. cited above, the proposed tiger corridor in Daitari DPF is at a radial distance of 9.115 km from the above mining lease. No other National Parks/Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger/Elephant Reserves, etc. exist within 10 km of the above mine lease.

In this regard, I am directed to enclose herewith copies of the location map (in duplicate) duly authenticated by the PCCF (WL) & CWLW, Odisha, in compliance to point No.2 of Govt. of India, MoEF&CC letter No.J-11015/72/2010-IA.II(M) dt 27.6.2016.

Encl: As above

26/12/16

Deputy CF (WLM)

Memo No. 10181 /date 27-12-2016

Copy forwarded to the Regional Chief Conservator of Forests, Angul Circle for information with reference to memo No.12386 dt 20.12.2016 of the DFO, Cuttack Division.

26/12/16

Deputy CF (WLM)

P.T.O.

Memo No. 10182 /date 27-12-2016

Copy forwarded to Sri U.K.Sinha, Chief Executive Mines, M/s Misrilall Mines (P) Ltd., Saruabil, PO – Kansa, Dist. – Jajpur, PIN - 755028 for favour of information and necessary action.

26/12/16

Deputy CF (WLM)