

COMPLIANCE REPORT FOR THE ENVIRONMENT CLEARANCE ACCORDED VIDE LETTER NO.9672/SEIAA, DATED 23.11.2020 IN RESPECT OF RAIKELA IRON ORE MINES OF M/S. GEETARANI MOHANTY IN THE DISTRICT OF SUNDARGARH, ODISHA.

For the production of 2.99 MTPA

(I) Statutory compliance

Sl. No.	Conditions	Compliance
(i)	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.	There is no case/s pending before any court of law.
(ii)	The Project proponent complies with all the statutory requirements and 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 & Ors before commencing the mining operations	We have obtained all the statutory clearances from the concerned statutory authority for undertaking mining operation.
(iii)	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 & 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 & Ors.	Necessary permission accorded from State Government for undertaking mining operation after paying of compensation amount as demanded from the respective department in compliance to the Judgment of Hon'ble Supreme Court in W.P(c) No.114 of 2014, dated 02.08.2017. A copy of the order is enclosed herewith as Annexure-I .
(iv)	This Environmental Clearance shall become operational only after receiving formal NBWL Clearance from MoEF&CC subsequent to the recommendations of the Standing Committee of National Board for Wildlife, if applicable to the Project	The statutory clearance from NBWL is not applicable for this Project.

(v)	This Environmental Clearance shall become operational only after receiving formal Forest Clearance (FC) under the provision of Forest Conservation Act, 1980, if applicable to the project.	Out of the 67.586Ha of total Mining Lease area, forest land under DLC category is 66.671Ha and 0.915Ha is non-forest land. Ministry of Environment and Forest, Govt of India has accorded the Stage-II Forest Clearance over an area of 66.671Ha vide letter No. F No.8-37/2007-FC dated 22.10.2014. The copy of the Forest clearance is enclosed as Annexure-II.
(vi)	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.	The consent to operate has been obtained vide Ir No. 875/IND-I-CON-2572 dt 19.01.2021 after grant of EC and the conditions stipulated in the CTO are effectively implemented. Copy of the Consent to Operate order is enclosed as Annexure -III. The project proponent has obtained Consent to Establish vide Ir No. 8918/IND-II-CTE-6420 Dated 18.09.2020 from State Pollution Control Board, Odisha for production of iron ore of 2.99 MTPA. The copy of the order is enclosed as Annexure-IV.
(vii)	The PP shall adhere to the provision of the Mines Act, 1952, Mines and Mineral (Development & Regulation), Act, 2015 and rules & 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	The project proponent is adhering all the Rules & Regulations and the various circular issued by the respective statutory authorities from time to time.
(viii)	The Project Proponent shall obtain consents from all the concerned land owners, before start of mining operations, as per the provisions of MMDR Act, 1957 and rules made thereunder in respect of lands which are not owned by it	Not Applicable as the project area does not falls under any tenant land.

(ix)	The Project Proponent shall follow the mitigation measures provided in MoEF & CC's Office Memorandum 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".	There is no habitation within the Mining Lease area. However, the project proponent is adopting all types of environmental mitigation measures related to Mining and shall be continued as the Habitations and villages are surrounded by the mine lease area. Further, we shall abide by the MoEF & CC's Office Memorandum No. Z-11013/57/2014-IA.II(M), dated 29th October, 2014, titled "Impact of mining activities on Habitations
(x)	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 ground water for the project	Necessary permission (NoC) has been accorded by CGWA for withdrawal of 180cum/day of ground water vide letter no CGWA/NOC/MIN/ORIG/20-21/10588 dated 31.01.2021. Copy of the permission letter is enclosed herewith as Annexure-V
(xi)	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	The EC letter has been intimated to local Gram Panchayat, Municipality, Zila Parishad, etc. and a copy has been uploaded in the company's website i.e. www.grmmine.in
(xii)	State Pollution Control Board shall be responsible for display of this EC letter at its Regional office, District Industries Centre and Collector's office/ Tehsildar's Office for 30 days	Complied.
(xiii)	The Project Authorities should widely advertise about the grant of this EC letter by printing the same 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.environmentclearance.nic.in). A copy of the advertisement may be	Paper advertisement about grant of EC has been published in Odia newspaper "The Samaja" on 29.11.2020 and national daily "The New Indian Express" on 29.11.2020. A copy of the same is enclosed as Annexure-VI .

	forwarded to the concerned MoEF&CC Regional Office for compliance and record	
(xiv)	The Project Proponent shall inform the MoEF&CC/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.	Shall be communicated if there is any change in ownership of the mining lease as per the provisions of the para 11 of EIA notification, 2006 as amended from time to time.

(II) Air Quality monitoring and preservation

Sl. No.	CONDITIONS	COMPLIANCES
(i)	The Project Proponent shall install a minimum of 3 (three) online Ambient Air Quality Monitoring Stations with 1 (one) in upwind and 2 (two) in downwind direction based on long term climatological data about wind direction such that an angle of 120° is made between the monitoring locations to monitor critical parameters, relevant for mining operations, of air pollution viz. PM10, PM2.5, NO2; CO and SO2 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.	We have already installed 3 nos. of online monitoring stations for air pollution viz. PM10, PM2.5, NO2; CO and SO2 etc. with 1 (one) in upwind and 2 (two) in downwind direction at an angle of 120° 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 as per the conditions stipulated. The photograph of online continuous ambient air monitoring is attached herewith. And as Annexure XIX At present we are carrying out AAQ monitoring in buffer area through NABL Accredited Lab. The monitoring report is attached as Annexure VII



Installation of continuous ambient air quality monitoring station

(ii)	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 PM_{2.5} are evident such as haul road, loading and unloading point and transfer points. The Fugitive dust emissions from all sources shall be regularly controlled by installation of required equipment/ 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 MoEF&CC/ Central Pollution Control Board	Effective safeguard measures for prevention of dust generation and subsequent suppression like regular water sprinkling; metaled road construction etc. is being carried out in areas prone to air pollution wherein high levels of PM₁₀ and PM_{2.5} are evident such as haul road, loading and unloading point and transfer points. The Fugitive dust emission is being regularly monitored by NABL Accredited Lab and controlled by installation of required equipment/ machineries and preventive maintenance. Dry fog system is working in ore processing plants and drill rigs. The monitoring result is enclosed as Annexure VII
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(Arrangement of dry fog system at Crusher)



(Water Sprinkling on Haul Road)



(Arrangement of dry fog system at crusher)

(III) Water quality monitoring and preservation

Sl. No.	CONDITIONS	COMPLIANCES
(i)	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 MoEF&CC is in place before such mining operations. The permission for intersection of ground water table shall essentially be based on detailed	As per the information from the approved Mining Plan, the minimum depth of working at present is at 638m.RL. During plan period, it is planned to work up to 620m.RL. Hence, ground water intersection will not be taken place as the water table is at 610m.RL. As and when ground water intersection takes place, the project proponent will take prior approval from CGWA and MoEF&CC before mining operations.

	hydro-geological study of the area.	
(ii)	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 well 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 Regional Office of the Ministry, CGWA and State Groundwater Department / State Pollution Control Board	☐ No perennial nalla is flowing within the lease area. However, Karo Nallah is flowing at a distance of 2km from the lease area. The flow rate of Karo nalla is being monitored on a regular basis and the records of flow rate is being maintained. As per the record the flow rate of Karo nala varies from 0.35m³/sec to 1.20m³/sec. ☐ The Karo nalla is not being disturbed due to mining activity. ☐ For nurturing water table PP has constructed roof top rain water harvesting structure within the office premises so as not to go down below the pre-mining period. ☐ The PP is supplying water through pipe line nearby villagers as well as by water tanker. ☐ Provision of piezometer for regular monitoring of water table has been made at the bore well located in the lease area to ascertain the impact of mining over ground water table. As per the result there are no changes in ground water level and quality.
(iii)	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 Regional Office of the Ministry, CGWA and State Groundwater Department / State Pollution Control Board	Monitoring of the ground water quality at 3 locations namely Mines office, Tensa Tube Well & Tentuldhi dug well village has been undertaken and the records are maintained. The results are within the permissible limit. Piezo-meter has already been installed in consultation with Central Ground Water Authority in the lease area of mines in 627 m RL. The depth of water level is 610 m RL.

(iv)	The 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/ adjacent to the 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 MoEF&CC / SEIAA, Odisha. The monitoring of water courses/ bodies existing in lease area shall be carried out four times in a year viz. pre- monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the record of monitored data be sent regularly to Ministry of Environment, Forest and Climate Change and its Regional Office, 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	There is no natural water course/ water resources/ springs and perennial nallahs existing/ flowing within the ML area. However, monitoring of surface water flowing within the buffer zone is being carried out as per the norms in Karo Nallah at the upstream and downstream and record of monitoring data is maintained and submitted to Ministry of Environment, Forests and Climate Change, its Regional Office, Bhubaneswar, Central Ground Water Board, State Pollution Control Board, Odisha. A copy of the Ground water and Surface water quality monitoring report is attached as Annexure-VIII.
(v)	Quality of polluted water generated from mining operations which	The waste water from the various activities is treated in ETP and is reused in mining activities. The runoff from

	include Chemical Oxygen Demand (COD) in mines run-off; acid mine drainage and metal contamination in runoff 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.	mine is treated in settling pond and then routed to natural water course. There is no natural water course/ water resources/ springs and perennial nallahs existing/ flowing within the ML area. However, monitoring is being carried out as per CPCB norms from Karo Nallah at the upstream and downstream and record of monitoring data is maintained and submitted to MoEFCC, its Regional Office, Bhubaneswar, Central Ground Water Board, State Pollution Control Board, Odisha. A copy of the Ground water and Surface water quality monitoring report is attached as Annexure-VIII. The monitored data is being 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 MoEFCC may also be referred in this regard.
(vi)	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 rain water passes in rainy season. Finally, the excess supernatant after sedimentation shall be allowed to spill away through stone pitch structure to the nearby valley.	The project proponent has constructed retaining wall and garland drain with settling pond to retain the wash offs of dump materials. A total of 1942m of retaining wall, 1635m garland drain and 3nos of settling pond has been constructed at strategic locations to retain the wash offs of dump materials. As per the approved mining plan, it is planned to construct retaining wall of 1830m, garland drain of 2485m and 5 nos of settling ponds and one RWH pond at different locations during plan period. Further, 2 nos of check dams have been constructed at strategic locations to slow down the flow of water during rainy season.



(View of Retaining wall around SG Dump)



(View of Retaining wall around OB Dump)



(View of Settling pond)

(vii)	De-silting of agricultural lands in buffer zone and beyond including nearby Nalas/rivers perennially periodically and perpetually caused due to wash up of inerts/OB/dumps shall be done as per SOP submitted when required. In this regard, a legal affidavit is submitted as Annexure-IX.	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 when required. In this regard, a legal affidavit is submitted as Annexure-IX .
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(viii)	Detail design of the existing retaining wall and the proposed for the expansion from a chartered Civil Engineer shall be submitted within 6 months from the date of issue of Environmental Clearance to ensure that no silt after wash up is escaped from the core / buffer zone of the mines.	The design of the existing retaining wall certified by a chartered Civil Engineer is submitted herewith as Annexure-X .
(ix)	An area of 3.40Ha shall be kept for public use as pond and road. Hence, remaining 52.956Ha shall be planted during life of the mine in a phased manner i.e. within a period of 20 years	An area of 3.40 ha is being kept for public usage such as road and pond. The remaining 52.956 ha shall be planted during life the mine in a phased manner within a period of 20years.
(x)	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 Regional Office, MoEF & CC annually.	For implementation of suitable Rain water harvesting measures, a detail study has been undertaken by CIMFR, Dhanbad. As per the provision the suitable Rain water Harvesting measures along with Roof Top Rain Water Harvesting structures is implemented.



(View of Roof Top rain water harvesting str)

(xi)	Industrial waste water (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. 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.	Industrial waste water from workshop and waste water from the mine are properly collected and treated in an ETP as proposed. In this regard the PP has constructed 12KLD capacity ETP. The standards are as per Consent to Operate (CTO) issued by concerned State Pollution Control Board (SPCB). The workshop effluents are being treated after its initial passage through Oil and grease trap.
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(xii)	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 MoEF & CC and State Pollution Control Board.	The project proponent has already undertaken water audit to explore the possibility to reduce the consumption of water and subsequently through FICCI. Work order to FICCI is enclosed as Annexure-XI .
(xiii)	The Project Proponent shall install STP of capacity 60 KLD for colony and ETP of adequate capacity making it operational within a time period of six months and status reports to be submitted along with six monthly compliance reports on regular basis	The project proponent has already commissioned 60KLD STP for treatment of domestic waste and 12KLD ETP for treatment of industrial waste water.



(View of 60 KLD STP)

Noise and vibration monitoring and prevention

Sl. No.	Conditions	Compliances
(i)	The peak particle velocity at 500m distance or within the nearest habitation, whichever is closer shall be monitored periodically as per applicable DGMS guidelines.	Blasting vibration study has been carried out by CMRI, Dhanbad. As per the study, the peak particle velocity at 500m distance or within the nearest habitation will be monitored periodically as per applicable DGMS guidelines
(ii)	The illumination and sound at night at project sites disturb the villagers 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	Is being followed.
(iii)	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/	The worker engaged in operations of HEMM, etc. is provided with ear plugs/muffs. All measures for control of noise levels are being implemented. Noise level monitoring (4nos stations in core zone and 4 nos in buffer zone) is being carried out regularly. Copy of the Noise level monitoring results is attached as Annexure XII . All personnel including laborers working in dusty areas is provided

(V)	laborers are working without personal protective equipment. <u>Mining Plan</u>	with protective respiratory devices along with adequate training, awareness and information on safety and health aspects.
Sl. No.	Conditions	Compliances
(i)	The Project Proponent shall adhere to the working parameters of mining plan which was submitted at the time of EC appraisal where in 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 & waste production, lease area and scope of working (viz. method of mining, overburden & dump management, O.B & dump mining, mineral transportation mode, ultimate depth of mining etc.) shall not be carried out without prior approval of the Ministry of Environment, Forest and Climate Change, 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.	The latest mining plan has been approved by IBM vide letter no MRMP/A/32-ORI/BHU/2021-22 dated 06.01.2022. Copy of the approval letter is enclosed as Annexure XIII The project proponent is implementing the system of operation as proposed in the approved mining plan. No change in basic mining proposal like mining technology, total excavation, mineral & waste production, lease area and scope of working (viz. method of mining, overburden & dump management, O.B & dump mining, mineral transportation mode, ultimate depth of mining etc.) shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change.
(ii)	The Project Proponent shall get the Final Mine Closure Plan along with Financial Assurance approved from Indian Bureau of Mines/Department of Mining & 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.	The Project Proponent will get the Final Mine Closure Plan along with Financial Assurance approved from Indian Bureau of Mines as required under the Provision of the MMDR Act, 1957 and Rules/Guidelines made there under before exhaust of iron ore within the Mining Lease area. 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 Regional Office of MoEF & CC.

(iii)	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 MoEF&CC and its concerned Regional Office / SEIAA, Odisha.	The land-use of the mine lease area at various stages of mining plan/scheme as well as at the end-of- life is being governed as per the approved Mining Plan and will be continued till the end of the life of the mine. The excavation vis-a-vis backfilling in the mine lease area and corresponding afforestation will be raised in the reclaimed area time to time as per approved mining plan. The monitoring and management of rehabilitated areas will be done until the vegetation becomes self- sustaining. The compliance status is being submitted half-yearly to the MoEF&CC and its concerned Regional Office / SEIAA, Odisha.
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Land Reclamation

Sl. No.	Conditions	Compliances
(i)	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 top soil/OB dumps. The topsoil shall be used for land reclamation and plantation	The over burden dumping is being carried as per the approved mining plan. The physical parameters of the OB dumps like height, width and angle of slope is being undertaken as per approved Mining Plan based on the guidelines/circulars issued by D.G.M.S w.r.t. safety in mining operations. The topsoil will be used for land reclamation and plantation.
(ii)	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	The reject/waste generated during the mining operations is being carried out as per the approved mining plan. The physical parameters of the OB dumps like height, width and angle of

	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.	slope is being undertaken as per approved Mining Plan based on the guidelines/circulars issued by D.G.M.S w.r.t. safety in mining operations.
(iii)	The reclamation of waste dump sites shall be done in scientific manner as per the Approved Mining Plan cum Progressive Mine Closure Plan	The reclamation of waste dump sites is being done in scientific manner and will be continued as per the Approved Mining Plan cum Progressive Mine Closure Plan.
(iv)	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 helps 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	The slope of dumps is already been vegetated in scientific manner with suitable native species to maintain the slope stability, prevent erosion and surface runoff. Proper maintenance of dump slope is being undertaken to avoid formation of gullies for better stability of dump.



(View of Dump photo with plantation)

(v)	The Project Proponent shall carry out slope stability study in case the dump	The existing dump has not attended the height of 30m. However, slope
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	height is more than 30 meters. The slope stability report shall be submitted to concerned regional office of MoEF&CC, Govt. of India, Bhubaneswar as well as SEIAA, Odisha	stability study has already been undertaken by CIMFR, Dhanbad. The copy of the report has already been submitted to SEIAA, Odisha as well as MoEF & CC.
(vi)	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	The project proponent has constructed retaining wall and garland drain with settling pond to retain the wash offs of dump materials. A total of 1942m of retaining wall, 1635m garland drain and 3nos of settling pond has been constructed at strategic locations to retain the wash offs of dump materials. As per the approved mining plan, it is planned to construct retaining wall of 1830m, garland drain of 2485m and 5 nos of settling ponds and one RWH pond at different locations during plan period. Further, 2nos of check dams have been constructed at strategic locations to slow down the flow of water during rainy season.
(vii)	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% 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	Check dams of 33m is already constructed around mine pit and OB dumps to prevent storm run-off and sediment flow into adjoining water bodies. A safety margin of 50% is being kept for designing of sump structures over and above peak rainfall and maximum discharge in the mine and its adjoining area which shall also help inproviding adequate retention time period thereby allowing proper settling of sediments/ silt material. The sedimentation pits/ sumps are being constructed atthe comers of the garland drains



(View of check dam)

(viii)	The top soil, 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 top soil 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	As per the approved Mining Plan, there is no top soil stack within the lease area since generation of top soil is nil.
(ix)	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.	A additional Supplementary Lease deed has been executed with state government to take up, after ceasing mining operations, undertake re- grassing the mining area 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.

(VII) Transportation

Sl. No.	Conditions	Compliances
(i)	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	We are taking necessary measures to monitor that the vehicles carrying minerals from the mines are having vehicular emission under

	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	control.
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(Mineral transportation in covered vehicles)

(ii)	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	Fixed water sprinkler has already been installed in main haulage roads. The photographs of fixed water sprinkler is attached as Annexure – XIV
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	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 equipment 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	However, dust suppression is being carried out regularly by deploying water tankers at haulage roads and operation of dry fog systems at crushing areas.
(iii)	Traffic management shall be done as per recommendation of Traffic Management Study Report	Traffic Study has been undertaken by CRRI, New Delhi. Based on the suggestion, Traffic Management is being carried out.
(iv)	The Project Proponent shall provide parking plaza for the heavy vehicles within the lease area as recommendation of NEERI.	As per the NEERI recommendation, Parking Plaza for the heavy vehicles has been provided for this project.

(VIII) Green Belt

Sl. No.	CONDITIONS	COMPLIANCES
(i)	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, backfilled area, quarry benches, roads etc. The development of greenbelt shall be governed as per the EC granted by the Ministry irrespective of the stipulation made in approved mine plan.	Green belt has been developed in 7.5 m 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 Project Proponent has already undertaken plantation over lease area at Safety Zone, Waste dump, Bench Planation etc and outside the lease area covering 13.74 ha@2500 saplings per ha.

(ii)	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 around 2500 saplings per Hectare. Adequate budgetary provision shall be made for protection and care of trees	None of the area has been reclaimed till date. Plantation over back-filled area is not applicable at present. However, project proponent has carried out plantation all along the safety zone, toe of the waste dump. Plantation of local species has been carried out at the said locations @ 2500nos of saplings per hectare. The details of plantation area as follows: Area covered: 13.74 Ha (over safety zone, waste dump area along the dry seasonal nala). The detailed future budgetary expenditure is enclosed as Annexure XV
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(iii)	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	There is no grazing land within the lease area. Hence, no alternative arrangement for livestock feed by developing grazing land is required for this project.
(iv)	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 Wild Life Warden of the State Govt.	The Site Specific Wildlife Conservation Plan got prepared in consultation with state forest department an estimated cost of Rs. 100 lakhs of which Rs. 28.00 lakhs has been earmarked for implementation of Site Specific Wildlife Conservation Plan within the Mining Lease area and Rs. 72.00 Lakh has been earmarked for implementation for the purpose in the buffer zone i.e. within the zone of influence and its approved by Pr. Chief Conservator of Forests and Chief Wildlife Warden, Bhubaneswar vide letter No.5582-1/WL-C-SSP-212/ 10 dated 07.08.2010. Copy of the approval letter of site specific wild life conservation plan is attached as Annexure XVI. All types of precautionary measures are being adopted by PP for conservation and protection of endangered flora and fauna and Schedule-I species during mining operation as per the conditions

		stipulated in the Site Specific Conservation Plan.
(v)	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.	Site Specific Wild life conservation plan is approved vide letter No.5582-1/WL-C-SSP-212/ 10 dated 07.08.2010. Copy of the approval letter of site specific wild life conservation plan is attached as Annexure XVI . The status of implementation is being submitted to the Regional Office of the Ministry.

(IX) Public Hearing and Human health issues:

Sl. No.	CONDITIONS	COMPLIANCES
(i)	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 MoEF & CC Regional Office and DGMS on half-yearly basis.	Initial Medical Examination & Periodical Medical Examination of the workers engaged in the project is being undertaken periodically for permanent and outsider employees as per the DGMS guidelines through EZMA. The records of Health status of permanent and outsider employees is being maintained properly. PP is carrying out occupational health check-ups in respect of workers which are having ailments like BP, diabetes, habitual smoking, etc. The health check-ups are being undertaken once in six months. The PP has already established a dispensary nearby the lease area for regular health monitoring of workers and villagers as a preventive measures. The copy of the status report is attached as Annexure-XVII
(ii)	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	Initial Medical Examination & Periodical Medical Examination of the workers engaged in the project is being undertaken periodically for permanent and outsider employees as per the DGMS guidelines through EZMA. However, an undertaking is attached as an Annexure-XVII for carrying out periodical occupational health checkup of the

		employee and local people through EZMA.
(iii)	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 neighborhood has to focus on Public Health Problems like Malaria, Tuberculosis, HIV, Anaemia, Diarrhoea in children under five, respiratory infections due to bio mass cooking. The proponent shall also create awareness and educate the nearby community and workers for Sanitation, Personal Hygiene, Hand washing, notto 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	The PP is regularly monitoring the health status of the workers and the villagers. A regular pharmacist has been appointed and a dispensary is functioning and the health records of the workers and the villagers have been maintained.
(iv)	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	The project proponent has already conducted health camp during 2022. The villagers from the nearby villages of Raikela, Dengula, Kurla, Bandal and Rengua have attended the Health camp. The Occupational health surveillance of employee has carried out, where no major health related hazard was observed. Copy of the results attached as Annexure-XVII

	person. Except routine tests all tests would be carried out in a Lab accredited by NABH. Records of Health Surveillance must be kept for 30 years, including the results of and the records of Physical examination and tests. The record of exposure due to materials like Asbestos, Hard Rock Mining, Silica, Gold, Kaolin, Aluminum, 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 x 14 inches and of good quality)	
(v)	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 (FVC), 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	M/s Geetarani Mohanty is conducting occupational health examination regular interval and maintaining a record of performance indicators for workers through EZMA. The record is attached as Annexure XVII (A).

	should not have suffered loss of any body part. The record of the same should be submitted to the Regional Office, MoEF&CC annually along with details of the relief and compensation paid to workers having above indications.	
(vi)	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.	Personnel working in dust prone areas have been provided with dust mask for proper respiration and are being trained in Vocational Training Center about information on safety and health aspects. The company has earmarked Rs.2.5 lakhs per annum for expenditure against occupational health management under heads like Safety instruments, equipment's etc, Up-gradation of Dispensary and carrying out health monitoring.
(vii)	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, crèche 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 waste water should be treated with STP in order to avoid contamination of underground water	The accommodation facilities for the employees have been provided with necessary basic infrastructure/ facilities like fuel for cooking, toilets, STP, safe drinking water, dispensary for medical health care etc. The domestic effluents are being treated through STP of 60 KLD capacity.
(viii)	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.	Implementation of action plan for issues raised during the public hearing is enclosed as Annexure- XVIII .

(ix)	Issues raised and recorded in proceedings of public hearing w.r.t environment/ pollution/ CER shall be complied by the Mining Authority as per OMF No. 22-65/2017-IA.III, dated 30.09.2020 of MoEF & CC, Govt. of India.	Compliance of Public hearing proceeding and CER is under process. The status of the compliance is attached as Annexure-XVIII
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(X) Corporate Environment Responsibility (CER)

Sl. No.	CONDITIONS	COMPLIANCES
(i)	The activities and budget earmarked for Corporate Environmental Responsibility (CER) as per Ministry's O.M No 22-65/2017-IA. II (M) dated 01.05.2018 or as proposed by SEAC should be kept in a separate bank account. The activities proposed for CER shall be implemented in a time bound manner and annual report of implementation of the same along with documentary proof viz. photographs, purchase documents, latitude & longitude of infrastructure developed & road constructed needs to be submitted to Regional Office MoEF&CC annually along with audited statement.	The activities and budget earmarked for Corporate Environmental Responsibility (CER) as per Ministry's O.M No 22-65/2017-IA. II (M) dated 01.05.2018 or as proposed by SEAC is kept in a separate bank account. The activities proposed for CER is being implemented in a time bound manner and annual report of implementation of the same along with documentary proof viz. photographs, purchase documents, is being submitted to Regional Office MoEF & CC annually along with audited statement.
(ii)	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 MoEF&CC and its concerned Regional Office / SEIAA, Odisha	The funds earmarked for environment protection is being utilized for the Environment protection measures. Year wise expenditure will be reported to the Ministry and its Regional Office located at Bhubaneswar after completion of financial year.

(XI) Miscellaneous:

Sl. No.	CONDITIONS	COMPLIANCES
(i)	The Project Proponent shall prepare digital map (land use & 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 MoEF&CC	Digital map showing existing land use & land cover of the lease area will be prepared and submitted to the Regional office.
(ii)	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 MoEF&CC and its concerned Regional Office / SEIAA, Odisha	The project proponent has already opened a separate account in which funds has been earmarked for protection measures and not a single penny will be diverted for other purpose. The Year wise expenditure of such funds will be reported to the MoEF & CC and its concerned Regional Office / SEIAA, Odisha in due course of time.
(iii)	The project proponent shall establish a solar power plant with 30KVA capacity within the lease area as proposed.	The project proponent has already commissioned 30 KVA solar power plant and is in operation within the lease hold area. The photographs of solar plant is attached as Annexure- XX .
(iv)	The Project Proponent shall submit six monthly compliance reports on the status of the implementation of the stipulated environmental safeguards to the MoEF&CC & its concerned Regional Office, SEIAA, Odisha, Central Pollution Control Board and State Pollution Control Board	The Project is uploading the last six monthly EC Compliance reports in the website bearing address www.grmmine.in on regular basis.
(v)	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, MoEF & CC	An Environment Cell has been established under Corporate Environment policy with suitable qualified personnel under the control of a Senior Executive, who is reporting directly to the Head of the Organization. Copy of the organizational chart is enclosed as Annexure-XXI .

(vi)	The proponent shall comply all the specific conditions as recommended by CSIR-NEERI on carrying capacity study (as applicable) in time bound manner as proposed	The proponent has already commissioned wheel wash system, 300M long concrete road, within the lease area. Further, regular monitoring work is being carried out as per the conditions of CSIR-NEERI. Regarding online monitoring system, vacuum cleaner, the PP has already installed the same. Photographs are attached as Annexure- VII & XXII respectively. The proponent shall comply all the specific conditions as recommended by CSIR-NEERI on carrying capacity study as applicable for this project in time bound manner as proposed
(vii)	Pursuant to MoEF & CC, O.M No 22-34/2018-1A.1/1 dated 16.01.2020 to comply with the direction made by Hon'ble Supreme Court on 08.01.2020 in W.P (C) No. 114/2014 in the matter Common Cause vs Union of India, 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.	An additional Supplementary Lease deed has been executed with state government in pursuant to MoEF & CC O.M No 22-34/2018-1A.1/1 dated 16.01.2020 to comply with the direction made by Hon'ble Supreme Court on 08.01.2020 in W.P (C) No. 114/2014 in the matter Common Cause vs Union of India. The Project proponent will take up re-grassing the mining area, after ceasing mining operations or 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.
(viii)	The project proponent shall augment infrastructure on drinking water, health care and education in nearby villages as per time bound action plan submitted	The project proponent is already in action for augmentation of infrastructure on drinking water, health care and education in nearby villages as per time bound action plan submitted
(ix)	The project proponent shall obtain permission from DGMS under 106(2b) to carry out blasting operation within the lease area	Necessary permission has been accorded from DGMS to carry out blasting operation within the lease hold area under 106(2b). A copy of

		the permission letter is enclosed herewith as Annexure-XXIII .
(x)	It shall be mandatory for the project management to submit quarterly compliance reports on the status of implementation of the above stipulated environmental safeguards to the SEIAA, Odisha/SPCB, Odisha/Regional Office of the MoEF & CC, Bhubaneswar, in hard copy and soft copies on 1 st June and 1 st December of each calendar year, failing which EC is liable to be revoked. It is required to monitor all the parameters by MoEF & CC/NABL accredited laboratory and the monitoring reports to be submitted along with six monthly compliance reports	The half yearly EC compliance report is being regularly submitted on 1 st June and 1 st December of every year. The half yearly EC compliance report for the period from September 2021, to March, 2022 is already submitted in due time.
(xi)	The concerned Regional Office of the MoEF&CC shall randomly monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the MoEF&CC officer(s) by furnishing the requisite data / information / monitoring reports	We will extend all our cooperation during any such inspections by the Authority.
(xii)	The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & 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 any other Court of Law relating to the subject matter	The PP will abide by all the Rules and Regulations framed under the provisions of the Water Act, 1974, the Air 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 any other Court of Law relating to the subject matter.
	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.	If any appeal against this environmental clearance come shall lie with the NGT, it will be resolved within a period of 30 days as prescribed under section 16 of the National Green Tribunal Act, 2010

M/s. GEETARAM MOHANTY

 MANAGER PARTNER

ITEM NO.10

COURT NO.3
S U P R E M E C O U R T O F I N D I A
RECORD OF PROCEEDINGS

SECTION PIL-W

Writ Petition(s)(Civil) No(s). 114/2014

COMMON CAUSE

Petitioner(s)

VERSUS

UNION OF INDIA & ORS.

Respondent(s)

WITH IA NO. 110418/2018 (APPLN. FOR CONDONATION OF DELAY ON B/O M/S GEETA RANI MOHANTY, A PARTNERSHIP FIRM)

IA NO. 137873/2018 (APPLN. FOR DIRECTIONS ON B/O SMT. GEETA RANI MOHANTY IN IA NO. 110418/2018)

IA NO. 130079/2018 AND 130083/2018 (APPLNS. FOR DIRECTIONS AND CONDONATION OF DELAY ON B/O MRUNAL DAS)

IA NO. 113096/2018 (APPLN. FOR DIRECTIONS B/O STATE OF ORISSA)

IA NOS. 172486 AND 172493/2018 (APPLNS. FOR INTERVENTION AND DIRECTION ON B/O M/S NATIONAL ENTERPRISES)

IA NOS. 153571 AND 153579/2018 (APPLNS. FOR IMPLEADMENT AND DIRECTION ON B/O M/S MANORANJAN DAS)

IA NO. 180945/2018 (APPLN. FOR EXTENSION OF TIME FOR FRAMING NEW NATIONAL MINERAL POLICY)

Date : 16-01-2019 This petition was called on for hearing today.
CORAM :

HON'BLE MR. JUSTICE S.A. BOBDE

HON'BLE MR. JUSTICE DEEPAK GUPTA

For Petitioner(s) Mr. Prashant Bhushan, AOR

Mr. A.D.N. Rao, Adv. (A.C.)

Mr. Sudipto Sircar, Adv.

Mr. Harish N. Salve, Sr. Adv. (AC) (N.P.)

Mr. Siddhartha Chowdhury, Adv. (A.C.)

Ms. Aparajita Singh, Adv. (A.C.)

For Respondent(s)/
Applicant(s)

Mr. Mukul Rohatgi, Sr. Adv.

Mr. Neeraj Kishan Kaul, Sr. Adv.

Mr. Naveen Kumar, AOR

Mrs. Nandini Gore, Adv.

Ms. Khushboo Bari, Adv.

Ms. Tahira Karanjawala, Adv.

Ms. Natasha Sahrawat, Adv.

Mr. Anand Varma, Adv.

Mr. Prabhat Kumar, Adv.

Mr. Mandeep Kalra, Adv.

Ms. Uttara Babbar, Adv.
Ms. Bhavana Duhoon, Adv.

Mr. Bhavanishankar V. Gadnis, Adv.
Mr. Vishwanath B. Gadnis, Adv.
Mr. Naveen Kumar, AOR
Ms. Radni Vishwanath Gadnis, Adv.

Mr. Preshit Surshe, Adv.

Mr. Dhananjaya Mishra, Adv.
Mr. Dilip Das, Adv.
Mr. Arnav Dash, Adv.

Mr. Shibashish Misra, AOR
Mr. Chandan Kumar Mandal, Adv.
Mr. Ashish Kumar Sinha, Adv.
Mr. Ompal Singh, Adv.

Mr. Rakesh Dwivedi, Sr. Adv.
Ms. Kirti R. Mishra, Adv.
Ms. Sansriti Pathak, Adv.
Ms. Apurva Upmanyu, Adv.

Mr. Raju Ramchandran, Sr. Adv.
Mr. Ashok Parija, Sr. Adv.
Mr. Anand Varma, AOR
Ms. Shubhagni Jain, Adv.
Ms. Hansani, Adv.

Mr. R.R. Rajesh, Adv.
Mr. Raj Bahadur, Adv.
Mr. Arun Kr., Adv.

Mr. Ashok Kumar Panda, Sr. Adv.
Ms. V. Mohana, Sr. Adv.
Mr. P.K. Mallick, Adv.
Mr. Atulesh Kumar, Adv.
Mr. Balendu Shanker, Adv.
Mr. G.S. Makker, AOR

Mr. Ashok Kumar Panda, Sr. Adv.
Mr. Tejaswi Kumar Pradhan, Adv.
Mr. Satyabrata Panda, Adv.
Mr. Manoranjan Paikaray, Adv.
Mr. Aniruddha Purushotham, Adv.

Mr. Ashok Parija, Sr. Adv.
Mr. Mahesh Agarwal, Adv.
Mr. Anand Varma, Adv.
Mr. Naveen Kumar, Adv.
Mr. Dhananjaya Mishra, Adv.
Mr. Gaurav Khanna, Adv.

Ms. Nishit Agarwal, Adv.
Ms. Devika Mohan, Adv.
Mr. E.C. Agrawala, Adv.

Ms. Ruchi Kohli, AOR

Mr. Sunil Kumar Jain, AOR

Mr. Raj Kumar Mehta, AOR

Mr. Balaji Srinivasan, AOR

Mr. Mukul Kumar, AOR

Mr. Himinder Lal, AOR

Mr. Ramendra Mohan Patnaik, AOR

M/S. Khaitan & Co., AOR

Mr. Abhishek Sharma, AOR

Mr. Gaurav Kejriwal, AOR

Mr. Lakshmi Raman Singh, AOR

M/S. Aura & Co., AOR

Ms. Movita, AOR

Mr. Rameshwar Prasad Goyal, AOR

Mr. Ashok Panigrahi, AOR

Mr. Hitendra Nath Rath, AOR

Mr. Anand Varma, AOR

Mr. Dhananjaya Mishra, AOR

UPON hearing the counsel the Court made the following
O R D E R

I.A. NO.110418/2018 in W.P.(C) No.114/2014
(APPLN. FOR CONDONATION OF DELAY ON B/O M/S GEETA RANI MOHANTY, A
PARTNERSHIP FIRM)

Mr. Rakesh Dwivedi, learned Senior Counsel appearing for the
respondent-State of Orissa, affirms that all payments due from M/s
Geeta Rani Mohanty (firm) have been received.

Accordingly, the instant application for condonation of delay in depositing the amount of compensation is allowed.

Necessary steps may be taken by the State of Orissa so that mining operations may be resumed, subject to compliance of all mandatory requirements.

I.A. NO.137873/2018 in I.A. NO.110418/2018 in W.P.(C) No.114/2014
(APPLN. FOR DIRECTIONS ON B/O SMT. GEETA RANI MOHANTY IN IA NO. 110418/2018)

Learned counsel appearing for the applicant prays for and is granted four weeks' time to file rejoinder affidavit.

I.A. NOS.130079/2018 and 130083/2018
(APPLNS. FOR DIRECTIONS AND CONDONATION OF DELAY ON B/O MRUNAL DAS)

Learned counsel appearing for the applicant prays for and is granted four weeks' time to file rejoinder affidavit.

I.A. NO.113096/2018 (APPLN. FOR DIRECTIONS B/O STATE OF ORISSA)

Ms. Kirti R. Mishra, learned counsel appearing for the applicant prays for and is granted four weeks' time to file rejoinder affidavit.

I.A. NOS.172486 and 172493/2018
(APPLNS. FOR INTERVENTION AND DIRECTION ON B/O M/S NATIONAL ENTERPRISES)

Application for intervention is allowed only for the purpose of application for directions.

Mr. Rakesh Dwivedi, learned Senior Counsel appearing for the respondent-State of Orissa, confirms that all payments due from M/s National Enterprises have been received.

Accordingly, the application for direction is allowed and delay in making the payment is condoned.

Necessary steps may be taken by the State of Orissa so that mining operations may be resumed, subject to compliance of all mandatory requirements.

I.A. NOS.153571 and 153579/2018

(APPLNS. FOR IMPLEADMENT AND DIRECTION ON B/O M/S MANORANJAN DAS)

Application for impleadment is allowed only for the purpose of application for directions.

Since the applicant has not deposited the entire amount, the application for direction is dismissed.

I.A. NO.180945/2018 (APPLN.(S) FOR EXTENSION OF TIME FOR FRAMING NEW NATIONAL MINERAL POLICY)

For the reasons stated, the time, as prayed for, is further extended upto 30th April, 2019 to complete the task of reviewing the National Mineral Policy, 2008 and announce a new National Mineral Policy.

Hence, I.A. No.180945/2018 is disposed of.

Writ Petition (C) No.114/2014

In the course of hearing, the issue of deleterious effect of mining of vegetation in the area came up before us. In particular, it is well known that mining results in a complete elimination of grass in the area which results in denial of fodder to herbivores. We are informed that re-grassing technology is in existence today.

Mr. Mukul Rohatgi, learned Senior Counsel appearing for the applicant - Mining Lease Holder, fairly states that the mine owners would be willing to bear the cost of re-grassing upon termination of mining activities in the area since it is in the larger interest of the environment.

We request Mr. Rakesh Dwivedi, learned Senior Counsel appearing for the respondent-State of Orissa, to look into the matter and make appropriate suggestions for implementing this proposal of re-grassing after termination of mining activities.

Mr. Ashok Kumar Panda, learned Senior Counsel appearing for the respondent-Union of India, states that this will also be included as a part of the National Mining Policy 2019 which is being formulated by them.

Mr. Prashant Bhushan, learned counsel appearing for the petitioner, states that the report of the Committee comprising Hon'ble Mr. G.S. Singhvi and Hon'ble Mr. Anil R. Dave JJ, former Judges of this Court, is awaited.

The Registry of this Court is directed to find out the time period within which the aforesaid report is expected to come and apprise this Court of the same thereafter.

Put up after four weeks.

(SANJAY KUMAR-II)
COURT MASTER (SH)

(INDU KUMARI POKHRIYAL)
ASSISTANT REGISTRAR

Annexure II

F. No. 8-37/2007-FC
Government of India
Ministry of Environment, Forests and Climate Change
(Forest Conservation Division)

Indira Paryavaran Bhawan
Aliganj, Jorbagh Road
New Delhi -110 003
Dated: 22nd October, 2014

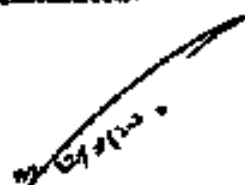
To,
The Principal Secretary (Forests)
Government of Odisha
Bhubaneswar.

Sub: Diversion of 64.148 hectares of forest land for Iron Ore Mining in Village Raikela by Geetarani Mohanty of Borai Forest Division in the district of Sundargarh, Odisha.

Sir,

I am directed to refer to the Government of Odisha's letter No 10F (Cons) 38/ 2013-7190/ F & E dated 22nd April 2014 on the above-mentioned subject, wherein prior approval of the Central Government for diversion of (i) 64.148 hectares of forest land for Iron Ore Mining in village Raikela by M/s. Geetarani Mohanty of Borai Forest Division in the district of Sundargarh, Odisha during the original Mining lease period which has already expired on 1.7.2011 and (ii) the entire forest land of 66.671 hectares including 2.523 hectares of forest land within the safety zone within the ML area of 67.586 hectares during 1st RML for a period, co-terminus with lease period to be granted by the State Government, not exceeding twenty years *w.e.f.* 02.07/2011, was sought, in accordance with section-2 of the Forest (Conservation) Act, 1980. After careful consideration of the proposal by the Forest Advisory Committee constituted by the Central Government under section 3 of the said Act, in-principle approval for the said diversion was granted vide this Ministry's letter of even number dated 29th August 2014, 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 Government of Odisha vide letter No. 10F (Cons)-38/2013-18032/ F & E dated 29th September 2014, approval of the Central Government is hereby granted under section 2 of the Forest (Conservation) Act, 1980 for diversion of (i) 64.148 hectares of forest land for Iron Ore Mining in village Raikela by M/s. Geetarani Mohanty of Borai Forest Division in the district of Sundargarh, Odisha during the original Mining lease period which has already expired on 1.7.2011 and (ii) for entire forest land of 66.671 hectares including 2.523 hectares of forest land within the safety zone within the ML area of 67.586 hectares during 1st RML for a period, co-terminus with lease period to be granted by the State Government, not exceeding twenty years *w.e.f.* 02.07.2011, subject to fulfillment of the following conditions:



- (i) Legal status of the diverted forest land shall remain unchanged;
- (ii) State Government shall create and maintain from funds already realised the user agency, compensatory afforestation over non-forest land equal in extent to 64.148 hectares of forest land diverted in favour of the user agency for mining and allied activities, transferred and mutated in favour of the State Forest Department;
- (iii) State Government shall undertake, from funds already realised from the user agency, fencing, protection and regeneration of the safety zone area (7.5 metre strip all along the outer boundary of the mining lease area). Besides this, State Government shall also undertake, from funds already realised from the user agency, afforestation on degraded forest land, to be selected elsewhere, measuring one and a half times the area under safety zone;
- (iv) User agency shall undertake appropriate measures as per the plan duly approved by the Divisional Forest Officer, Bonai Forest Division to prevent pollution of tanks, rivers and *nalas*, etc. and de-silting of adjoining villages located within 5 kilometers from the project site;
- (v) Following activities shall be undertaken by the State Forest Department from funds already realised from the user agency as per the Plan duly approved by the Regional Chief Conservator of Forests, Rourkela:
 - (a) Proper mitigative measures to minimize soil erosion and choking of stream;
 - (b) Planting of adequate drought hardy plant species and sowing of seeds to arrest soil erosion; and
 - (c) Construction of check dams, retention/toe walls to arrest sliding down of the excavated material along the contour.
- (vi) Wherever possible and technically feasible, the user agency shall undertake by involving local community, afforestation measures, as per the plan duly approved by the DFO, Bonai Forest Division, in the blanks within the lease area, as well as along the roads outside the lease area diverted under this approval;
- (vii) The State Government shall realise from the user agency additional NPV, if so determined as per the final decision of Hon'ble Supreme Court of India and transfer the same to the Ad-hoc CAMPA;
- (viii) State Government shall create and maintain from funds already realised from the user agency, penal compensatory afforestation over degraded forest land equal in extent to the 43.056 hectares of DLC forest land utilised for mining and allied activities without obtaining requisite approval under the Forest (Conservation) Act, 1980;

22/1/2017

- (ix) The lease will remain in the name of M/s Geeta Rari Mohanty. For transfer of the said lease to any other firm or person prior approval of Central Government under the Forest (Conservation) Act, 1980 shall be obtained;
- (x) User agency shall surrender from the mining lease, as per the schedule submitted to this Ministry, the fully (biologically) reclaimed mined out forest land. The summary of the said schedule is as below:

(in hectares)

Phase/ Financial year	Mined out area at the beginning	Addl. Area	Total Area	Area to be reclaimed and rehabilitated	Year of reclamation	Mined out land at the end of the phase	Schedule of surrender
1 st Phase 2011- 2016	29.893	7.00	36.893	Nil	—	36.893	—
2 nd Phase 2016- 2021	36.893	3.00	39.993	Nil	—	39.993	—
3 rd Phase 2021- 2026	39.993	3.00	42.893	10.000	0 th Year	32.893	10 th Year 2031-2036
4 th Phase 2026- 2031	32.893	3.00	35.893	10.000	5 th Year	25.893	10 th Year 2036-2041
5 th Phase 2031- 2036	25.893	3.00	28.893	10.000	10 th Year	18.893	10 th Year 2041-2046
6 th Phase 2036-2041	18.893	2.00	20.893	10.000	15 th Year	10.893	10 th Year 2046-2051
7 th Phase 2041- 2046	10.893	Nil	10.983	10.893	20 th Year	Nil	10 th Year 2051-2056

- (xi) Any other condition that the concerned Regional Office of this Ministry of the State Forest Department may impose from time to time for protection and improvement of flora and fauna in the forest area;

2017/10/10

- (xii) User agency shall submit annual report on compliance to conditions stipulated in this approval to the State Forest Department and the concerned Regional office of this Ministry; and
- (xiii) User agency and the State Government shall comply with all other conditions, as applicable to this project, under different rules, regulations and regulations including environmental clearance.

Yours faithfully,

(H. C. Chaudhary)
Director

Copy to:

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

(H. C. Chaudhary)
Director



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. 4063 /

IND-I-CON- 2572

Dt. 16.03.2022

CONSENT ORDER NO. 1586

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.3848237 Dated 30-11-2021 & online reply dated 11.01.2022.

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: RAIKELA IRON ORE MINE OF M/S. GEETARANI MOHANTY.

Name of the Occupier & Designation: SRI SRINIBASH SAHOO, MANAGING PARTNER

Address: AT: RAIKELA, PO: DENGULA, DIST: SUNDARGARH.

This consent order is valid for the period up to 31.03.2023.

This consent order supersedes the earlier consent order issued vide letter No.875 dated 19.01.2021.

Details of Products Manufactured

Sl. No	Product	Quantity
01.	Iron Ore	2.99 MTPA

Details of Mineral Handling Plants /Units

01	Mobile crushing plant of capacity 2x400 TPH
02.	Mobile screening plant of capacity 2x300 TPH & 2x400 TPH

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 KLD or KL/hr	Pre-scribed Standard				
				pH	TSS (mg/l)	BOD (mg/l)	Oil & Grease (mg/l)	Fecal Coliform (MPN/100 ml)
01	Outlet of STP (Domestic effluent)	Used for plantation	60 KLD	6.5-9.0	<100	30	--	<1000
02	Outlet of ETP of workshop	Re-used in vehicle washing	0.25	6.5-8.5	50	--	10	--
03	Mine drainage water/ surface runoff/ other wastewater	On land /inland surface water body.	7078	5.5-9.0	100 (Rainy days) 50 (Non-rainy days)	-	10	--

B. Fugitive Emission Standards

Particulate Matter	1200 µg/m ³
Note : Fugitive emission shall be monitored in the predominant downwind direction at a distance 25.0 ± 2.0 metres from the source of fugitive emission as per following :	
Area	Monitoring Location
Mine face / Benches	Drilling, excavation and loading applicable for operating benches above water table
Haul Roads/ Service Roads	Haul roads to ore processing plant, waste dumps and loading areas and service road.
Crushing plant	Run-off mine unloading at hopper, crushing areas, screens and transfer points.
Screening plant	Screens, conveying and transportation of ore discharge points.
Ore storage and loading	Intermediate stock bin / pile areas, ore stock bin / pile areas, wagon / truck loading areas.
Waste dump	Active waste / reject dumps

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/ over burden	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 liable for review/variation/revocation of the consent order under section 27 of the Act of Water (Prevention & Control of Pollution) Act, 1974 and section 21 of Air (Prevention & Control of Pollution) Act, 1981 and to make such variations as deemed fit for the purpose of the Acts.
2. The industry would immediately submit revised application for consent to operate to this Board in the event of any change in the quantity and quality of raw material / and products / manufacturing process or quantity /quality of the effluent rate of omission / 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 and at all subsequent times without any negligence on his part. In case of non-compliance of any order/directives issued at any time and/or violation of the terms and conditions of this consent order, the applicant shall be liable for legal action as per the provisions of the Law/Act.
5. The applicant shall make an application for grant of fresh consent at least 90 days before the date of expiry of this consent order.
6. The issuance of this consent does not convey any property right in either real or personal property or any exclusive privileges nor does it authorise any injury to private property or any invasion of personal rights, nor any infringement of Central, State laws or regulation.
7. This consent does not authorize or approve the construction of any physical structure or facilities or the undertaking of any work in any natural water course.
8. The applicant shall display this consent granted to him in a prominent place for perusal of the public and inspecting officers of this Board.
9. An inspection book shall be opened and made available to Board's Officers during the visit to the factory.
10. The applicant shall furnish to the visiting officer of the Board any information regarding the construction, installation or operation of the plant or of effluent treatment system / air pollution control system / stack monitoring system any other particulars as may be pertinent to preventing and controlling pollution of Water / Air.
11. Meters must be affixed at the entrance of the water supply connection so that such meters are easily accessible for inspection and maintenance and for other purposes of the Act provided that the place where it is affixed shall in no case be at a point before which water has been tapped by the consumer for utilization for any purposes whatsoever.
12. Separate meters with necessary pipe-line for assessing the quantity of water used for each of the purposes mentioned below:
 - a) industrial cooling, spraying in mine pits or boiler feed,
 - b) Domestic purpose
 - c) Process
13. The applicant shall display suitable caution board at the place where the effluent is entering into any water-body or any other place to be indicated by the Board, indicating therein that the area into which the effluents are being discharged is not fit for the domestic use/bathing.
14. Storm water shall not be allowed to mix with the trade and/or domestic effluent on the upstream of the terminal manholes where the flow measuring devices will be installed.
15. The applicant shall maintain good house-keeping both within the factory and the premises. All pipes, valves, sewers and drains shall be leak-proof. Floor washing shall be admitted into the effluent collection system only and shall not be allowed to find their way in storm drains or open areas.
16. The applicant shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by him to achieve with the term(s) and conditions of the consent.
17. Care should be taken to keep the anaerobic lagoons, if any, biologically active and not utilized as mere stagnation ponds. The anaerobic lagoons should be fed with the required nutrients for effective digestion. Lagoons should be constructed with sides and bottom made impervious.
18. The utilization of treated effluent on factory's own land, if any, should be completed and there should be no possibility of the effluent gaining access into any drainage channel or other water courses either directly or by overflow.
19. The effluent disposal on land, if any, should be done without creating any nuisance to the surroundings or inundation of the lands at any time.
20. If at any time the disposal of treated effluent on land becomes incomplete or unsatisfactory or create any problem or becomes a matter of dispute, the industry must adopt alternate satisfactory treatment and disposal measures.
21. The sludge from treatment units shall be dried in sludge drying beds and the drained liquid shall be taken to equalization tank.
22. The effluent treatment units and disposal measures shall become operative at the time of commencement of production.
23. The applicant shall provide port holes for sampling the emissions and access platform for carrying out stack sampling and provide electrical outlet points and other arrangements for chimneys/stacks and other sources of emissions so as to collect samples of emission by the Board or the applicant at any time in accordance with the provision of the Act or Rules made therein.



CONSENT ORDER
RAIKELA IRON ORE MINE OF M/S. GEETARANI MOHANTY.

Page 4 of 12

24. The applicant shall provide all facilities and render required assistance to the Board staff for collection of samples / stack monitoring / inspection.
 25. The applicant shall not change or alter either the quality or quantity or rate of emission or install, replace or alter the air pollution control equipment or change the raw material or manufacturing process resulting in any change in quality and/or quantity of emissions, without the previous written permission of the Board.
 26. No control equipments or chimney shall be altered or replaced or as the case may be erected or re-erected except with the previous approval of the Board.
 27. The liquid effluent arising out of the operation of the air pollution control equipment shall be treated in the manner and to ion of standards prescribed by the Board in accordance with the provisions of Water (Prevention and Control of Pollution) Act, 1974 (as amended).
 28. The stack monitoring system employed by the applicant shall be opened for inspection to this Board at any time.
 29. There shall not be any fugitive or episodal discharge from the premises.
 30. In case of such episodal discharge/emissions the industry shall take immediate action to bring down the emission within the limits prescribed by the Board in conditions/stop the operation of this plant. Report of such accidental discharge /emission shall be brought to the notice of the Board within 24 hours of occurrence.
 31. The applicant shall keep the premises of the industrial plant and air pollution control equipments clean and make all hoods, pipes, valves, stacks/chimneys leak proof. The air pollution control equipments, location, inspection chambers, sampling port holes shall be made easily accessible at all times.
 32. Any upset condition in any of the 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 above shall be reported to the Headquarters and Regional Office of the Board by fax / speed post within 24 hours of its occurrence.
 33. The industry has to ensure that minimum three varieties of trees are planted at the density of not less than 1000 trees per acre. The trees may be planted along boundaries of the industries or industrial premises. This plantation is stipulated over and above the bulk plantation of trees in that area.
 34. The solid waste such as sweeping, wastage packages, empty containers residues, sludge including that from air pollution control equipments collected within the premises of the industrial plants shall be disposed off scientifically to the satisfaction of the Board, so as not to cause fugitive emission, dust problems through leaching etc., of any kind.
 35. All solid wastes arising in the premises shall be properly classified and disposed off to the satisfaction of the Board by :
 - i) Land fill in case of inert material, care being taken to ensure that the material does not give rise to leachate which may percolate into ground water or carried away with storm run-off.
 - ii) Controlled incineration, wherever possible in case of combustible organic material.
 - iii) Composting, in case of bio-degradable material.
 36. Any toxic material shall be detoxicated if possible, otherwise be sealed in steel drums and buried in protected areas after obtaining approval of this Board in writing. The detoxication or sealing and burying shall be carried out in the presence of Board's authorized persons only. Letter of authorization shall be obtained for handling and disposal of hazardous wastes.
 37. If due to any technological improvement or otherwise 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.
 38. 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.
 39. The Board reserves the right to review, impose additional conditions or condition, revoke change or alter the terms and conditions of this consent.
 40. Notwithstanding anything contained in this conditional letter of consent, the Board hereby reserves to it the right and power under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 to review any and/or all the conditions imposed herein above and to make such variations as deemed fit for the purpose of the Act by the Board.
 41. The conditions imposed as above shall continue to be in force until revoked under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 and section 21 A of Air (Prevention & Control of Pollution) Act, 1981.
 42. In case the consent fee is revised upward during this period, the industry shall pay the differential fees to the Board (for the remaining years) to keep the consent order in force. If they fail to pay the amount within the period stipulated by the Board the consent order will be revoked without prior notice.
 43. The Board reserves the right to revoke/refuse consent to operate at any time during period for which consent is granted in case any violation is observed and to modify/ stipulate additional conditions as deemed appropriate.
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CONSENT ORDER
RAIKELA IRON ORE MINE OF M/S. GEETARANI MOHANTY.

Page 5 of 12

**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, Sulphur Dioxide, Oxides of Nitrogen, Hydro-Carbon, Carbon-Monoxide 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 escalated 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 approved 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 alkalis 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;
 - Rotation of crops
 - Change of point of application of effluent on land
 - A portion of land kept fallow.
11. The adoption of these would avoid soil becoming sick or stale, 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 ryots 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) This consent order is subject to compliance of orders of the Hon'ble Supreme Court of India in the matter of W. P. (Civil) 114/2014.
 - 2) This consent order is subject to permission from Steel and Mines Department, Government of Odisha for continuing of mining operation.
 - 3) Mining operation is subject to availability of all other statutory clearances.
 - 4) Drills shall either be operated with dust extractors or equipped with water injection system to minimize dust generation in the work environment.
 - 5) Controlled blasting shall be practiced to minimize generation of dust and fly rocks.
 - 6) Regular water sprinkling shall be carried out in critical areas prone to air pollution such as around crushing and screening plant, haul roads, approach road, active OB dumps and mine benches at frequent interval so that it should always remain in wet condition.
 - 7) Effort shall be made to use chemical binders/wetting agents along with sprinkled water in order to reduce water consumption and to improve retention and re-absorption capacity of water.
 - 8) Haulage roads shall be devoid of ruts and potholes and shall be maintained properly to avoid generation of dust during movement of vehicles.
 - 9) Dust suppression measures (preferably dry fog system) shall be provided at all appropriate places of mineral handling plants (crusher & screening plant). Loading and unloading areas including all the transfer points shall also have efficient dust suppression arrangements (dry fog system). These shall be properly maintained and operated.
 - 10) 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.
 - 11) The vehicles carrying ore for transportation from the mine shall be covered with tarpaulin (both bottom & top).
 - 12) 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.
-



- 13) Four Ambient Air Quality Monitoring Stations shall be established in core zone and buffer zone for monitoring of ambient air quality at the locations of the stations as decided in consultation with the Regional Officer, State Pollution Control Board based on the metrological data, topographical features and environmentally and ecologically sensitive targets.
 - 14) Fugitive Dust Emission Monitoring shall be carried out at the places as stated in Part-B of this order. The monitoring of ambient air quality and fugitive dust shall be carried out twice in a week (24 hourly) at a particular site and the consolidated data shall be submitted to the State Pollution Control Board, once in a year.
 - 15) The top soil generated shall be stored at earmarked site (s) only and stabilized with plantation or shall be used for land reclamation and plantation.
 - 16) The over burden generated during the course of mining shall be stacked at earmarked dump site (s) and stabilized with plantation or used for reclamation of excavated land followed by plantation.
 - 17) The project proponent shall ensure that no natural watercourse and / or water resources are obstructed due to any mining operations. In case of diversion of natural watercourse, this shall be done with prior permission of the competent authority.
 - 18) Check dams and check weirs shall be constructed at appropriate places of the mine lease area to prevent direct flow of runoff to nearby water bodies. The surface run off water from the existing runoff management system shall meet the prescribed standards as stated in Part A (SI No. 3) of the consent order.
 - 19) Retention wall shall be constructed at the toe of topsoil dump and OB dump. Garland drain shall be constructed around topsoil dumps, over burden dumps and mineral stack yards terminating at settling pit to prevent direct disposal of runoff to nearby water bodies.
 - 20) Garland drain and sedimentation pit shall be de-silted after monsoon or as and when required. The runoff discharge quality from runoff management system shall meet the prescribed standards as stated in Part A (SI No. 3) of the consent order.
-



- 21) Domestic effluents shall be treated in a sewage treatment plant (STP). The quality of the treated wastewater from STP shall conform to the prescribed standard. (Part-A, Sl. No.1).
 - 22) ETP shall be operated at all time for workshop and wastewater generated during mining operation. The quality of the treated wastewater shall conform to the prescribed standard (Part-A, Sl. No.2) and shall be completely reused for vehicle and floor washing.
 - 23) Regular monitoring of water quality of upstream and downstream of surface water bodies existed if any within 5 Km shall be carried out once in every month and record shall be maintained and submitted to the State Pollution Control Board once in every year. Monitoring shall be carried out through MoEF & CC accredited laboratory.
 - 24) Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells. The monitoring should be done four times a year in pre-monsoon (April/May), monsoon (August), post-monsoon (November) and winter (January) seasons. Data thus collected should be submitted to the Board quarterly.
 - 25) The mine shall take necessary action for compliance with the air and water quality standards as stipulated in Part-A and Part-B of this order.
 - 26) Adequate measures shall be taken for control of noise levels in the work environment of mine area so that noise levels at the boundary line of mining lease area shall not exceed 75 dB(A) during day time (6.00 AM to 9.00 PM) and 70 dB(A) during night time (9.00 PM to 6 AM).
 - 27) Adequate noise barriers shall be provided surrounding the crushing and screening plants to control noise pollution and avoid impact on wildlife due to operation of crushing and screening plants during night hours.
 - 28) Online noise monitoring system shall be installed to monitor noise level during night hours.
 - 29) Protective barriers shall be provided for the lights to prevent illumination towards the forest area during night hours.
-



- 30) Ambient air quality monitoring data, noise monitoring data and water / wastewater quality monitoring data shall be electronically displayed at the entry point of the mine or at a suitable location of the mine.
- 31) Plantation of trees shall be undertaken in the colony/ township, over top soil dumps, OB dumps, 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.
- 32) A copy of the annual return (annual return submitted to IBM, Govt. of India/ Directorate of Mines, Govt. of Odisha) shall be submitted to this Board every year.
- 33) 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.

MEMBER SECRETARY
STATE POLLUTION CONTROL BOARD, ODISHA

To,

**THE MANAGING PARTNER,
RAIKELA IRON ORE MINE OF M/S. GEETARANI MOHANTY,
STATION ROAD, BARBIL,
DIST: KEONJHAR, PIN-758035**

Memo No. _____/Dt. _____/

Copy forwarded to :

- i) Regional Officer, State Pollution Control Board, Rourkela.
- ii) District Collector, Sundargarh
- iii) Director of Mines, Govt. of Odisha, Bhubaneswar
- iv) Director, Environment -cum-Special Secretary, F & E. Deptt. Govt. of Odisha, Bhubaneswar.
- v) D.F.O, Bonai, Sundargarh
- vi) Deputy Director of Mines, Koira, Sundargarh.
- vii) Addl. Chief Env. Engineer (Hazardous Waste Management Cell)
- viii) Sr. Env. Scientist, Central Lab. SPCB, Bhubaneswar
- 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	Standards			
		Inland surface	Public sewers	Land for irrigation	Marine Costal Areas
		(a)	(b)	(c)	(d)
1.	Colour & odour	Colourless/Odourless as far as practicable	-----	See 6 of Annex-1	See 6 of Annex-1
2.	Suspended Solids (mg/l)	100	600	200	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 Kjeldahl nitrogen (as NH ₃) mg/l max.	100	----	-----	100
11.	Free ammonia (as NH ₃) mg/l max.	5.0	----	-----	5.0
12.	Biochemical Oxygen Demand (5 days at (20°C) mg/l max.	30	350	100	100
13.	Chemical Oxygen Demand, mg/l max.	250	----	-----	250
14.	Arsenic (as As) mg/l max.	0.2	0.2	0.2	0.2
15.	Mercury (as Hg) mg/l max.	0.01	0.01	-----	0.001
16.	Lead (as Pb) mg/l max.	01.	1.0	-----	2.0



CONSENT ORDER
RAIKELA IRON ORE MINE OF M/S. GEETARANI MOHANTY.

Page 12 of 12

17.	Cadmium (as Cd) mg/l max.	2.0	1.0	-----	2.0
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 Se) mg/l max.	0.05	0.05	-----	0.05
23.	Nickel (as Ni) 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.	Phenolic compounds as (C ₆ H ₅ OH) 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



**OFFICE OF THE
STATE POLLUTION CONTROL BOARD, ODISHA**
[DEPARTMENT OF FOREST & ENVIRONMENT, GOVERNMENT OF ODISHA]
Paribesh Bhawan, A/118, Nilakantha Nagar, Unit - VIII
Bhubaneswar - 751 012, INDIA

By Speed Post /
Through online

No. 8918 /IND-II-CTE - 6420

Date 18.09.2020 /

AMENDED CONSENT TO ESTABLISH ORDER

In consideration of the online application no. 3006576 for obtaining Consent to Establish for **Raikela Iron Ore Mines of M/s Geetarani Mohanty**, 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 under Section 21 of Air (Prevention & Control of Pollution) Act, 1981 for enhancement of Iron Ore production from 0.864 MTPA to 2.99 MTPA along with installation of following Crushing and Screening Plants

Sl. No.	Type of the mineral processing unit	Existing (Capacity in TPH)	Additional Proposed (Capacity in TPH)	Total Capacity (TPH) after expansion	Remark
1.	Mobile Crushing Plant	1X50 1x100	2X400	2X400	The existing crushing plant will be removed
2.	Mobile Screening Plant	1x100 1x200	2X300 & 2x400	2X300 & 2x400	The existing Screening plant will be removed

inside the mining lease area of 67.586 ha., At - Raikela, Po - Dengula in the district of Sundargarh with the following conditions. This Consent to Establish order supersedes earlier Consent to Establish Order issued vide No. 8419, dated 09.09.2020.

GENERAL CONDITIONS:

1. This Consent to Establish is valid for the raw materials, product, manufacturing process and capacity mentioned in the application form. This order is valid for five years, which means the proponent shall commence construction of the project within a period of five years from the date of issue of earlier Consent to Establish order i.e. 09.09.2020. If the proponent fails to do substantial physical progress of the project within five years then a renewal of this Consent to Establish order shall be sought by the proponent.
2. 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.
3. No change in mining technology and scope of working shall be made without prior approval of the Board.

Amharana

Am



4. This Consent to Establish is subject to statutory and other clearances from Govt. of Odisha and/or Govt. of India, as and when applicable.

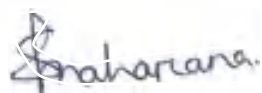
SPECIAL CONDITIONS:

GENERAL:

1. The proponent shall obtain Environmental Clearance as per EIA Notification, 2006 and amendment thereafter for the proposal. The mining activity for the proposal shall be commenced after obtaining Environmental Clearance.
2. The existing crushing and screening plants shall be removed / dismantled before operation of the proposed screening and crushing plants.
3. The mine shall implement the Pollution Control Measures and safeguards as proposed in the Environment Management Plan (EMP) of Environment Impact Assessment (EIA) report.
4. The proponent shall submit six monthly progress report every year (i.e. June and December) of mining activity of the project to the Board (at Head Office and Regional Office) for record and verification.
5. The unit shall obtain NOC from CGWA for using of ground water as prerequisite for getting Consent to Operate of State Pollution Control Board, Odisha.
6. The proponent shall obtain requisite permission from the Water Resources Department, Govt. of Odisha for drawal of water.
7. 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.
8. A separate environmental management cell with suitable qualified personnel should be set up under the control of a Senior Executive, who will report directly to the Head of the organization.
9. 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.
10. The above conditions will be enforced, inter-alia, 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.

WATER POLLUTION:

11. The domestic wastewater generated from the industry shall be treated in sewage treatment plant to meet the following standards as notified by the MoEF&CC, Govt. of India vide G.S.R. 1265 (E), dated 13.10.2017. The treated water shall be reused for gardening and plantation. Under no circumstances there shall be any discharge of treated waste water to outside the factory premises.







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

12. Garland drains along with settling pit shall be provided around the iron ore fines stock yard to control washout of fines from the stockyard along with surface runoff.
13. Surface run-off from OB dump area, mineral stock yard, top soil storage area and rain water to be pumped from quarry shall be routed through adequate settling pond (designed maximum hourly rain fall basis) to meet prescribed standard of SS - 100 mg/l and Oil & Grease-10 mg/l before discharge into natural stream/water courses during monsoon.
14. At stockpile and loading plant area, a network of drains shall be constructed at a depth of 1.5 meter below the lowest level on the sites parallel to the stockpile area with interconnected box culverts. The sloping of surface shall be given inward to the stockpiles so that surface water will only infiltrate in to the drain.

AIR POLLUTION:

15. Drill shall be wet operated or with dust extractors and controlled blasting shall be practices. Pre-wetting of blasting site shall be practiced.
16. The proponent shall abide by the stipulations made in MoEF&CC, Govt. of India notification No. G.S.R. 809 (E), dated 4.10.2010 (copy enclosed as **Annexure – I**).
17. The primary crusher, screen and secondary crusher shall be placed in covered shed. All the conveyor shall be covered with corrugated GI Sheets.
18. Both dust suppression (dry fog) and extraction (bag filter) system shall be provided at all dust generating source such as crushing, screening & material transfer points etc. such that, particulate matter concentration in ambient air shall not be more than $1200 \mu\text{g}/\text{m}^3$ at a distance of 25.0 ± 2.0 m from the source of fugitive emission in the predominant down wind direction as per MoEF&CC, Govt. of India notification No. G.S.R. 809(E), dated 04.10.2010 (copy enclosed as **Annexure – I**).
19. The suction points of dust extraction system shall be provided at primary crusher discharge chute, screen, all transfer points, secondary crusher discharge chutes and any other dust generating sources. This system shall be connected to bag filters so that particulate matter emission from the stack shall not exceed $100 \text{ mg}/\text{Nm}^3$ as per MoEF&CC, Govt. of India Notification no-GSR.-809(E) dated 4th October 2010 (copy enclosed as **Annexure-I**). Stack height for de-dusting unit shall be calculated as per above notification of MoEF&CC, Govt. of India i.e. $H = 74 Q^{0.27}$ where H and Q are stack height in meter and particulate matter (PM) emission in ton/hr respectively.
20. All the product conveyor of the screens shall discharge the product into a hopper and chute arrangement fitted with dust extraction and bag filter system. Chute shall be maximum 3 meter height from the ground level. Fixed auto sprinklers shall be provided in the stock yard of product.
21. The mine shall make provision to collect the fine products in hopper instead of heaping by free falling to avoid the dust nuisance. The ore fines shall be stacked properly and systematically with retaining wall at the toe to avoid washings during rain. Ore fine transportation shall be done in covered truck.

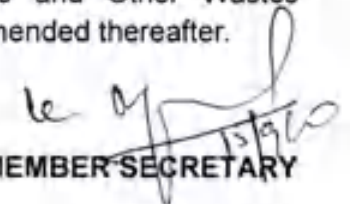


22. Fixed auto sprinklers shall be provided in the stock yard of product.
23. Dust suppression on mine haul roads, active OB dumps and mine working benches shall be done by spraying water through water sprinklers along with chemical binders/wetting agents at frequent interval in order to reduce water consumption and to improve retention and re-absorption capacity of water. Water sprinklers of fixed type shall also be provided at the mine HEMM maintenance shop, other service centers and approach roads from mines to raw material handling & product handling area to prevent the generation of dust to be air borne.
24. Adequate measures shall be taken for control of noise levels in the work environment of mine area so that noise levels at the boundary line of mining lease area shall not exceed 75 dB (A) during day time (06:00 AM to 09:00 PM) and 70 dB(A) during night time (09:00 PM to 06:00 AM).
25. Three Ambient Air Quality Monitoring Stations for 24 hours operation should be established in the core zone as well as in the buffer zone for PM₁₀, PM_{2.5}, SO₂, NO_x and CO monitoring. Location of the stations should be decided in consultation with the State Pollution Control Board. Data on ambient air quality (PM₁₀, PM_{2.5}, SO₂, NO_x and CO) should be submitted to the State Pollution Control Board once in six months.
26. The proponent shall install one Online Continuous Ambient Air Quality Monitoring Station (CAAQMS) in transportation route inside the mining lease area to monitor PM₁₀, PM_{2.5}, SO₂, NO_x, CO and other important parameters for online real time data transmission through GPRS system to SPCB RTDAS server and also upload data to CPCB.

SOLID AND HAZARDOUS WASTE:

27. Top soil should be stacked separately with proper slope at earmarked site (s) with adequate measures and shall be used for reclamation and rehabilitation of mined out areas.
28. At stockpile and loading plant area, a network of drains shall be constructed at a depth of 1.5 meter below the lowest level on the sites parallel to the stockpile area with interconnected box culverts. The sloping of surface shall be given inward to the stockpiles so that surface water will only infiltrate in to the drain.
29. The OB/waste dumps shall be properly dressed benched stopped at low angle (30°) with terracing and bamboo barricades in the slopes making retaining walls stone barriers at the toe of the dumps gully plugging etc. to prevent the solid erosion during monsoon, besides establishing vegetation on dump top as well as its slope surface. In difficult cases, hydro-seedling technique or use of geo-tiles mat embedded with seeds shall be adopted.
30. The proponent shall comply to the provisions of Hazardous and Other Wastes (Management and Trans boundary Movement) Rules, 2016 and amended thereafter.

Encl: As above


MEMBER SECRETARY

To,

**The Managing Partner,
Raikela Iron Ore Mines of M/s Geetarani Mohanty,
At – Station Road, Barbil, Dist. – Keonjhar.**

P.T.O...







Memo No. 8919 /Date 18.09.2020

Copy forwarded to:

1. The Secretary Steels & Mines, Govt. of Odisha, Bhubaneswar
2. The Collector & District Magistrate, **Sundargarh**.
3. The Director, Directorate of Mines, Govt. of Odisha, Bhubaneswar
4. The Regional Officer, SPC Board, **Rourkela**.
5. The DFO, **Sundargarh**.
6. Copy to HSM Cell, SPC Board, Bhubaneswar
7. Consent to Operate Section, SPC Board, Bhubaneswar.
8. Copy to Guard file


CHIEF ENV. ENGINEER

o/c





MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 4th October, 2010

G.S.R. 809(E).—In exercise of the powers conferred by Sections 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following Rules further to amend the Environment (Protection) Rules, 1986, namely:—

1. (1) These rules may be called the Environment (Protection) (Sixth Amendment) Rules, 2010.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Environment (Protection) Rules, 1986, in schedule I, after serial number 17 and the existing entries relating thereto, the following serial number and entries shall be inserted, namely:—

S. No.	Industry	Parameter	Standard
(1)	(2)	(3)	(4)
18	Iron Ore Mining and Ore Processing	A. Emission Standards for Stack for De-dusting Unit	
		Particulate matter	100 mg/ Nm ³
		Stack height **	15.0 m
		** Stack height for De-dusting unit shall be calculated as $H=74 Q^{0.37}$, where H and Q are stack height in metre and particulate matter (PMD) emission in tonne/hr respectively, i.e.	
		Q (kg/hr)	H (metre)
		up to 2.71	15
		2.72 - 7.86	20
		7.87 - 17.86	25
		17.87 - 35.29	30
		Note:- Stack attached to De-dusting unit shall have minimum height of 15.0 metres and would be atleast 2.50 metres above the top-most point of the nearby building/shed or plant in the mine.	
		B. Fugitive Emission Standards	
		Particulate matter	1200 µg/m ³
		Note:- Fugitive emission shall be monitored in the predominant downwind direction at a distance 25.0±2.0 metres from the source of fugitive emission as per following:	

1	2	3	4
		Area	Monitoring location
		Mine face/ Benches	Drilling, excavation and loading applicable for operating benches above water table
		Haul Roads/ Service Roads	Haul roads to ore processing plant, waste dumps and loading areas and service road
		Crushing plant	Run-off mine unloading at hopper, crushing areas, screens and transfer points
		Screening Plant	Screens, conveying and transportation of ore discharge points
		Ore Storage & Loading	Intermediate stock bin/pile areas, ore stock bin/pile areas, wagon/truck loading areas
		Waste dump	Active waste/reject dumps
		C. Effluent Standards	
		pH	5.5-8.0
		Suspended solids (non-rainy day)	50 mg/l
		Suspended solids (rainy day)	100 mg/l
		Oil & grease	10 mg/l
		Notes:- (i) All efforts shall be made to reuse and re-circulate the treated effluent. (ii) The aforesaid effluent standards shall be complied with for sewage, service water, beneficiation of ore washwater and surface run-off put together.	

[F. No. Q-15017/21/2007-CPW]

RAJNEESH OUBE, Jt. Secy.

Note : The principal rules were published in the Gazette of India vide number S.O. 844 (E) 19th November, 1968; and subsequently amended vide S.O. 433 (E) dated 18th April 1987; S.O. 84 (E), dated the 18th January 1988 and recently amended vide G.S.R. 97(E), dated the 18th February, 2008; G.S.R. 149 (E), dated the 4th March, 2009; G.S.R. 512(E), dated the 9th July, 2009; G.S.R. 543 (E), dated the 22nd July, 2009; G.S.R. 595(E), dated the 21st August, 2009; G.S.R. 794 (E), dated the 4th November, 2009; G.S.R. 828 (E), dated the 15th November, 2009; G.S.R. 01 (E), dated the 01st January, 2010; G.S.R. 81 (E), dated the 5th February, 2010; GSR 485(E), dated the 9th June, 2010; GSR 608 (E), dated the 21st July, 2010 and GSR 736 (E), dated, the 9th September, 2010.



Annexure V

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केन्द्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

(भूजल निकासी हेतु अनापत्ति प्रमाण पत्र)

NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER ABSTRACTION

Project Name:	Raikela Iron Ore Mine		
Project Address:	Village-raikela		
Village:	Raikela	Block:	Koida
District:	Sundargarh	State:	Odisha
Pin Code:			
Communication Address:	Bomikhal, Plot No 380, Rasulgarh, Bhubaneswar, Bhubaneswar, Khordha, Odisha - 751010		
Address of CGWB Regional Office :	Central Ground Water Board South Eastern Region, Bhujal Bhawan, Khandagiri Square, Nh-5, Bhubaneswar, Khordha, Odisha - 750001		

1.	NOC No.:	CGWA/NOC/MIN/ORIG/2021/10588													
2.	Application No.:	21-4/2466/OR/MIN/2020					3.	Category: (GWRE 2017)			Safe				
4.	Project Status:	Existing Project					5.	NOC Type:			New				
6.	Valid from:	31/01/2021					7.	Valid up to:			30/01/2023				
8.	Ground Water Abstraction Permitted:														
Fresh Water		Saline Water				Dewatering				Total					
m³/day		m³/year		m³/day		m³/year		m³/day		m³/year		m³/day		m³/year	
180.00		55592.50													
9.	Details of ground water abstraction /Dewatering structures														
Total Existing No.:2							Total Proposed No.:0								
		DW	DCB	BW	TW	MP	MPu	DW	DCB	BW	TW	MP	MPu		
Abstraction Structure*		0	0	2	0	0	0	0	0	0	0	0	0		
*DW- Dug Well; DCB-Dug-cum-Bore Well; BW-Bore Well; TW-Tube Well; MP-Mine Pit;MPu-Mine Pumps															
10.	Ground Water Abstraction/Restoration Charges paid (Rs.):							111185.00							
11.	Number of Piezometers(Observation wells) to be constructed/ monitored & Monitoring mechanism.					No. of Piezometers		Monitoring Mechanism							
Manual								DWLR**		DWLR With Telemetry					
**DWLR - Digital Water Level Recorder						1		0		1		0			

(Compliance Conditions given overleaf)

This is an auto generated document & need not to be signed.

18/11, जामनगर हाउस, मानसिंह रोड, नई दिल्ली - 110011 / 18/11, Jamnagar House, Mansingh Road, New Delhi-110011

Phone: (011) 23383561 Fax: 23382051, 23386743

Website: cgwa-noc.gov.in

पानी बचाये - जीवन बचाये
SAVE WATER - SAVE LIFE

Validity of this NOC shall be subject to compliance of the following conditions:

Mandatory conditions:

- 1) Installation of digital water flow meter (conforming to BIS/ IS standards) having telemetry system in the abstraction structure(s) shall be mandatory for all users seeking No Objection Certificate and intimation regarding their installation shall be communicated to the CGWA within 30 days of grant of No Objection Certificate through the web-portal.
- 2) Proponents shall mandatorily get water flow meter calibrated from an authorized agency once in a year.
- 3) Construction of purpose-built observation wells (piezometers) for ground water level monitoring shall be mandatory as per Section 14 of Guidelines . Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in Annexure-II.
- 4) Proponents shall monitor quality of ground water from the abstraction structure(s) once in a year. Water samples from bore wells/ tube wells / dug wells shall be collected during April/May every year and analysed in NABL accredited laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. Water quality data shall be made available to CGWA through the web portal.
- 5) In case of mining projects, additional key wells shall be established in consultation with the Regional Director, CGWB for ground water level monitoring four (4) times a year (January, May, August and November) in core as well as buffer zones of the mine.
- 6) In case of mining project the firm shall submit water quality report of mine discharge/ seepage from Govt. approved/ NABL accredited lab.
- 7) The firm shall report compliance of the NOC conditions online in the website (www.cgwa-noc.gov.in) within one year from the date of issue of this NOC.
- 8) The firm shall submit the water audit report in case of water requirement is in excess of 100 m3/day through certified auditors within three months of completion of the same to CGWA.
- 9) Application for renewal can be submitted online from 90 days before the expiry of NOC. Ground water withdrawal, if any, after expiry of NOC shall be illegal & liable for legal action as per provisions of Environment (Protection) Act, 1986.
- 10) This NOC is subject to prevailing Central/State Government rules/laws/norms or Court orders related to construction of tube well/ground water abstraction structure / recharge or conservation structure/discharge of effluents or any such matter as applicable.

General conditions:

- 11) No additional ground water abstraction and/or de-watering structures shall be constructed for this purpose without prior approval of the Central Ground Water Authority (CGWA).
- 12) The proponent shall seek prior permission from CGWA for any increase in quantum of groundwater abstraction (more than that permitted in NOC for specific period).
- 13) Proponents shall install roof top rain water harvesting in the premise as per the existing building bye laws in the premise.
- 14) The project proponent shall take all necessary measures to prevent contamination of ground water in the premises failing which the firm shall be responsible for any consequences arising thereupon.
- 15) In case of industries that are likely to contaminate the ground water, no recharge measures shall be taken up by the firm inside the plant premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the firm.
- 16) Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated waste water.
- 17) Wherever the NOC is for abstraction of saline water and the existing wells (s) is /are yielding fresh water, the same shall be sealed and new tubewell(s) tapping saline water zone shall be constructed within 3 months of the issuance of NOC. The firm shall also ensure safe disposal of saline residue, if any.
- 18) Unexpected variations in inflow of ground water into the mine pit, if any, shall be reported to the concerned Regional Director, Central Ground Water Board.
- 19) In case of violation of any NOC conditions, the applicant shall be liable to pay the penalties as per Section 16 of Guidelines.
- 20) This NOC does not absolve the proponents of their obligation / requirement to obtain other statutory and administrative clearances from appropriate authorities.
- 21) The issue of this NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and take decisions independently of the NOC.
- 22) In case of change of ownership, new owner of the industry will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 60 days of taking over possession of the premises.
- 23) This NOC is being issued without any prejudice to the directions of the Hon'ble NGT/court orders in cases related to ground water or any other related matters.

(Non-compliance of the conditions mentioned above is likely to result in the cancellation of NOC and legal action against the proponent.)

Two more held in IIFL loot case

Cuttack: Commissionerate Police on Saturday arrested two jewellery shop owners from Mangalabag and Alamchand Bazaar for their alleged involvement in the recent broad daylight robbery at India Infoline Finance Ltd (IIFL) in Nayasarak.

They are Saroj Prusty (45), owner of Renuka Jewellers at Mangalabag, and Lalit Soni (25) who owns Jasoda Jewellers at Alamchand. Police said both Prusty and Soni were the associates of Lala Amrit Ray, the mastermind of the multi crore gold heist. With the new arrests, the total number of persons arrested in the case has gone up to 10 on Saturday.



WINTER JOYS

As the temperature dips, children sit near a bonfire to keep themselves warm in Bhubaneswar on Saturday | EXPRESS

Govt to extend radio schooling till December-end

EXPRESS NEWS SERVICE
@ Bhubaneswar

With closure of schools till December-end, the State government has decided to offer digital learning to younger students through radio and television for another month. The programme aims to ensure that the learning process doesn't stop for the children.

The Odisha State School Education Programme Authority (OSEPA) has decided to extend the 'Radio Pathshala' programme offered to students of Class I to VIII till December 31. The duration of the programme has also been increased from one to two hours. It will be broadcast from 10 am to 12 noon, said OSEPA joint director Sanatan Panda.

While fresh contents will be aired for one hour, programmes already broadcast since September 28 will be repeated for one more hour. The programme will run for five days from Monday to Friday, he said.

Similarly, the government has decided to continue its 'Siksha Darpan' programme on Doordarshan (DD) Odia till

December-end. Three programmes offered to Odia medium students of Class IX, X and Plus II will continue on DD for five days. It will cover subjects of Class X for an hour at 10 am, Class XII at 11 am and IX at 3.30 pm. The e-content for telecast will be provided by the Directorate of Secondary Education and Higher Secondary Education.

Woman, son attempt self-immolation in City

She took the step accusing police inaction in alleged murder of her son

EXPRESS NEWS SERVICE
@ Bhubaneswar/Jagatsinghpur

IN yet another suicide bid outside the State Assembly, a woman along with her son allegedly attempted to set themselves ablaze near the high security zone on Saturday.

The woman from Jagatsinghpur district's Kujang block took the step accusing police inaction in the alleged murder of her elder son a year ago. She and her younger son attempted to pour kerosene on themselves but were prevented by the police. Both were then whisked them away from the spot.

"My son was killed by 10 to 12 people. But the district police is shielding the murderers as the father of one of the accused is an ex-serviceman. Police did not carry out an impartial probe," the woman told mediapersons. She

My son was killed by 10 to 12 people. But the district police is shielding the murderers as the father of one of the accused is an ex-serviceman. Police did not carry out an impartial probe

Victim woman

claimed that police officers were misbehaving with them and insisted that her son, an engineer, had lost his life in a road accident.

This is the third incident of self-immolation bid near the State Assembly this week, but no injuries have been reported. Capital police has registered a case against the mother-son duo under various sections of the IPC including 309, 332, 120B, among others.

While the woman alleged that her son Amruta Kumar Dash (24) had been murdered,

SP Prakash R said Amruta was returning home with his friend Arun Pattnaik on July 20 last year when their motorcycle was hit by a truck on Cuttack-Paradeep road. Though both were rushed to CHC Manijanga for treatment, Amruta was declared brought dead and Arun, who had sustained critical injuries in the mishap, was shifted to SCB Medical College and Hospital, Cuttack.

During inquest, Amruta's father Ramakanta Dash and his brother Subrat were present. Ramakanta then sought relief from tehsildar of Tirtol following which ₹10,000 was released from Red Cross for Amruta's cremation.

As Ramakanta filed a case, an investigation was launched and it was found that the mishap occurred after Amruta's motorcycle was hit by an unknown vehicle, the SP said.

LEOPARD POACHING

RCCFs asked to make spot inquiry and report

EXPRESS NEWS SERVICE @ Bhubaneswar

AMID growing backlash over its shoddy wildlife protection measures, the Forest and Environment department has asked the Regional Chief Conservator of Forests (RCCFs) to make field visits to find out the reasons behind rising number of leopard poaching cases and submit a report.

Principal Chief Conservator of Forest (Wildlife) HS Upadhyay said all six RCCFs have been asked to visits spots where incidents of poaching or smuggling of leopard skins have been reported. The officer added that the Forest department is working in close coordination with the Special Task Force of State Crime Branch and Wildlife Crime Control Bureau to prevent leopard poaching. The protection measures will be strengthened on the basis of field inputs by the RCCFs.

In the last eight months, three leopard deaths have been reported and 12 leopard skins seized across the State, raising questions on the conservation measures in place for the big cats. While lack of enforcement measures is considered to be the major cause behind the surge in leopard poaching and smuggling of



their skins, wildlife officials said the desperation for easy money, particularly during the lockdown, could be another reason.

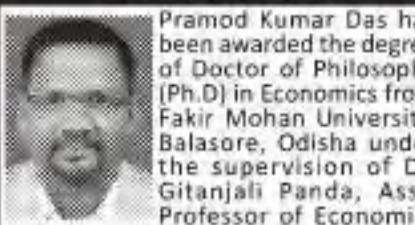
Wildlife conservationists, however, questioned the patrolling measures in forest divisions. "The kind of massacre these seizures are revealing is extremely alarming. Leopard poaching at this scale is unprecedented anywhere in the country and the fact that forest department is not giving enough attention to it is extremely worrying and raises serious questions on the level of protection in the forest divisions of the State," said wildlife conservationist Aditya Panda. He said that the RCCFs during their field visit must address the lacunas and the government should take action against officials responsible for it.

Sradhanjali



Dr. Sarat Ch. Mohapatra
(27.11.1936-21.11.2020)
Founder Director of DPR, Hyderabad & Retired Director, CARI, Izzatnagar (UP)
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Ph.D Awarded in Economics



Pramod Kumar Das has been awarded the degree of Doctor of Philosophy (Ph.D) in Economics from Fakir Mohan University, Balasore, Odisha under the supervision of Dr. Gitanjali Panda, Asst. Professor of Economics and co-supervision of Dr. Sanjib Kumar Majhi, Asst. Professor of Economics of P.G. Dept. of Social Science, Fakir Mohan University, Balasore, Odisha. The topic of his research thesis entitled "Problems and Prospects of Rice Marketing - A Case Study of Balasore District in Odisha" has been examined and highly praised by Dr. Narayan Chandra Nayak, Professor and Head, Dept. of Humanities and Social Sciences (HSS), Indian Institute of Technology (IIT), Kharagpur, West Bengal and Dr. Pravat Kumar Kuri, Professor and Head, Dept. of Economics, The University of Burdwan, West Bengal. Dr. Das is working as a lecturer in Economics in Baba Bhairabananda (Autonomous) Mahavidyalaya, Chandikhole, Jajpur, Odisha. He is the eldest son of Mr. Chakradhar Das and Mrs. Koushik Das and also son-in-law of Mr. Biswanath Muduli (Retired Head Master) and Pramila Muduli. He has expressed his deep sense of gratitude to his guide and co-guide, parents, father-in-law and mother-in-law, the Principal (Dr. Birendra Kumar Mishra) and all the colleagues and well-wishers for this achievement. He has also expressed his special thanks to his beloved wife (Subhalaxmi) for her constant support.

WADIA INSTITUTE OF HIMALAYAN GEOLOGY
(An Autonomous Institution under Department of Science & Technology, Govt. of India)
33, GENERAL MAHADEO SINGH ROAD DEHRADUN - 248001
No.: Gen. Rec./WHMG/2019-20/Estt. Dated: 27.11.2020
NOTICE
The written examination for various **Group-C posts** in Wadia Institute of Himalayan Geology, Dehradun scheduled on **05th & 06th December, 2020 (Saturday & Sunday)** at St. Jude's School, West Canal Road, Dehradun is hereby cancelled due to unavoidable reason. The next date will be intimated to the candidates in due course. Inconvenience is regretted.
REGISTRAR

INSTITUTE OF FOREST GENETICS AND TREE BREEDING
(Indian Council of Forestry Research and Education)
(An Autonomous body of Ministry of Environment & Forests, Govt. of India)
R.S.Puram, Coimbatore-641 002, Tamil Nadu. Tel.:0422-2484174 / 2484168
Walk-in-Interview (Advt. No.01/2020)
It is proposed to conduct a Walk-in-Interview on **17.12.2020 at 9.00 a.m.** to recruit Senior Project Fellows / Junior Research/Project Fellows / Project Assistants / Technical Assistants / Field Assistants on purely temporary basis for various research projects at Institute of Forest Genetics & Tree Breeding, Coimbatore. Interested and eligible candidates are invited to attend the walk-in-interview. For details kindly visit <http://ifgtb.icfre.gov.in>
(Director)

NOTICE
It is here by informed to all concerned that Raikela Iron Ore Mines of M/s Geetarani Mohanty over an area of 67.586 Hects at village Raikela in the district of Sundargarh has been granted Environment clearance from State Level Environment Impact Assessment Authority, Odisha vide letter no. SEIAA File No. 41890/08-MINB1/09-2019, Dt. 23.11.2020. The proposal of enhancement of production from 0.864 Million TPA to 2.99 Million TPA has been approved. The detail of environmental clearance is available in the website of Ministry of Environment and Forest at www.environmentclearance.nic.in
In this regard, we are very much grateful to all the members of State Level Environment Impact Assessment Authority, Odisha & State Pollution Control Board, Odisha.
Sd/-
Srinibash Sahoo
Managing Partner
M/s Geetarani Mohanty

UJVN LIMITED
(An Uttarakhand Govt. Enterprise)
H-6, "SUNSHINE", Meerut Road, Uttarakhand, India. Tel: 0135-275559, 275560, Fax: 0135-275557, website: www.ujvn.com
Tender No 782 e-Tender Notice Date : 25.11.2020
Office of the Executive Engineer, Project Civil Maintenance- Dakpathar, UJVN Ltd., Dakpathar (Dehradun) invites online bids from interested parties. Brief summary of tender is given below:
Tender No 12/EE/PCM-DKP/TN/2020-21
Name of work : Slope protection work on the hill above the main entrance of Chibro Power House at Chibro, District-Dehradun.
Estimated cost : ₹4,79,41,727.75 (GST Extra)
Date of availability of bid document on website : From 17.00 hrs of 27.11.2020
Last date for submission of bids on website: Upto 17.00 hrs of 19.12.2020
For fuller & further details, kindly visit e-procurement portal <http://uktenders.gov.in>
Executive Engineer (PCM)
"Avoid wasteful use of Electricity"

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OFFICE OF THE JATANI MUNICIPAL COUNCIL

No.3539 "e" Procurement Notice Date: 26.11.2020

Bid Documents consisting of Work, Estimated Cost. Cost of Tender Paper. EMD), time of completion. Class of contractors and the set of terms and conditions of contract and other necessary documents can be seen in Govt. website i.e. www.tendersorissa.gov.in.

- | | | |
|---|---|--|
| 1. Tender Reference No | : | EO/JMC/ 050/2020.21 |
| 2. Tender ID No | : | 2020_ORULB_64130_1 to 26 |
| 3. Name of the Work | : | Civil Construction works as mentioned in website |
| 4. No. of works | : | 26 nos. |
| 5. Estimated Cost | : | Rs. 2,15,000.00 to 41,97,742.00 |
| 6. Period of Completion | : | 90 days |
| 7. Date & Time of Bidding | : | 1/12/ 2020 to 10/12/2020 up to 5PM |
| 8. Last date & time for receipt of bids in the portal | : | 10/12/2020 up to 5 PM |
| 9. Bids received online shall be opened on | : | 14/12/2020 at 11.30 AM |
| 10. Name and address of the Officer inviting Bid | : | Executive Officer, Jatni Municipality |

Sd/-
Executive Officer
Jatni Municipality

CLP LEADER ASKS BJP TO ALLOW DISCUSSION

EXPRESS NEWS SERVICE @ Bhubaneswar

BJP members are disrupting proceedings for the last two days only to protect the government as many corrupt practices will be raised by the Congress during discussion

Narasingha Mishra, CLP leader

AS the State government agreed to a High Court monitored SIT probe into the Nayagarh minor girl murder case, the Congress on Saturday called upon the BJP to participate in the discussion on Appropriation Bill on Sunday so that many other issues can be raised in the House to corner the government.

Had there been discussion in the House during the last two days many issues of corruption and irregularities could have been raised against the government, leader of the Congress Legislature Party (CLP) Narasingha Mishra told mediapersons here. Discussion on the demand for grants of the Home, General Administration and Panchayatiraj departments could not be held as BJP members disrupted the proceedings of the House even after the government agreed for a court monitored SIT to probe the minor girl murder incident.

Alleging that the BJD and BJP are hand in glove and two sides of the same coin, Mishra alleged that BJP members are disrupting proceedings for the last two days only to protect the government as many corrupt practices will be raised by the Congress during discussion. Mishra said the government has agreed to Congress demand of court monitored SIT probe into the minor girl murder case and there will be impartial and independent investigation. There is no point in disrupting the proceedings on the same issue after that, he said.

Nayagarh minor murder: BJP to take fight for justice to Delhi

EXPRESS NEWS SERVICE @ Bhubaneswar

NATIONAL spokesperson of BJP Sambit Patra on Saturday said that his party will take the fight of the minor girl from Nayagarh to the national Capital to ensure justice to the family of the deceased.

Taking to his Twitter handle, the BJP leader said the fight will continue till the killers were punished. "This fight between the good and the evil that started from a lane in Nayagarh will go to Delhi," Patra tweeted.

Accusing Minister Arun Sahoo of shielding the main accused Babuli, he said the police should put both of them behind the bars.

Coming down heavily on Nayagarh police, Patra said the five-year-old girl of Jadupur under Nayagarh Assembly segment of Puri Parliamentary constituency was kidnapped on July 14.

Ten days later, only a few bones of the girl were traced to the backyard of her home. It is surprising that the police investigating the case has done nothing, Patra said.

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ବଜ୍ଞାପନ

ଏଡ଼ଭ୍ୱାରା ସର୍ବସାଧାରଣଙ୍କ ଅବଗତ ନିମନ୍ତେ ଜଣାଇ ଦିଆଯାଉଅଛି ଯେ ସୁଦରବଡ଼ ଜିଲ୍ଲାର ରାଜକେଲା ଗ୍ରାମରେ ୬୭ ୫୮ ୬ ହେକ୍ଟର ଜମିରେ ଅବସ୍ଥିତ ମେସର୍ସ ଗୀତାରାଣୀ ମହାନ୍ତି କମ୍ପାନୀର "ରାଜକେଲା ଲୁହା ପଥର ଖଣି" ନାମିତ ଲୁହାପଥର ଖଣି ପାଇଁ ଓଡ଼ିଶା ସରକାରଙ୍କ ରାଜ୍ୟ ସ୍ତରୀୟ ପରିବେଶ ପ୍ରଭାବ ମୂଲ୍ୟାଙ୍କନ, ପ୍ରାଧିକରଣ ପକ୍ଷରୁ ଚିଠି ନମ୍ବର, **SEIAA File N. 41890/08-MINB/09-2019**, ତାରିଖ ୨୩ ୧୧ ୨୦୨୦ରେ ପରିବେଶୀୟ ଅନୁମୋଦନ ଲାଭ କରିଅଛି । ଏହା ମନ୍ତ୍ରାଳୟର ବୈତସାରିକ www.environmentclearance.nic.inରେ ଉପଲବ୍ଧ । ଏଡ଼ାଭ୍ୱାରା ଖଣି କଟୁପକ୍ଷ ବାର୍ଷିକ **2.99 Million TPA** ଲୁହା ପଥର ଉତ୍ତୋଳନ କରିପାରିବେ । ଏଥିପାଇଁ ଆମେ ଓଡ଼ିଶା ସରକାରଙ୍କ ରାଜ୍ୟ ସ୍ତରୀୟ ପରିବେଶ ପ୍ରଭାବ ମୂଲ୍ୟାଙ୍କନ ପ୍ରାଧିକରଣ ତଥା ରାଜ୍ୟ ପ୍ରତ୍ୟକ୍ଷ ନିୟନ୍ତ୍ରଣ, ଓଡ଼ିଶାର ସମସ୍ତ କମିଶନାଟୁ ଆନ୍ତରିକ ଧନ୍ୟବାଦ ଜଣାଇଅଛୁ ।

Sd/- Srinibash Sahoo
(Managing Partner)

M/S. Geetarani Mohanty



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ANNEXURE VII A

GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC1010122000000098P

Report No. : GTEEPL/04/22/ENV/98A

Issue Date: 07.05.2022

TC-10101

Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty,
Sundargarh, Odisha

Period : April-2022

Sampling Location : Near Mine Office (Core Zone)

Identification of Sample : Ambient Air Quality Monitoring

No of Samples : 30 Nos.

Sampling procedure : GTEEPL/LSOP/08

SL. NO.	Date	Lab ID	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01-04-2022	KLPL/22-23/G/A1874	78.6	35.5	8.8	24.6	0.330
2	02-04-2022	KLPL/22-23/G/A1878	80.4	36.3	9.0	25.2	0.338
3	03-04-2022	KLPL/22-23/G/A1882	75.6	34.2	8.5	23.7	0.318
4	04-04-2022	KLPL/22-23/G/A1886	80.5	36.4	9.0	25.2	0.338
5	05-04-2022	KLPL/22-23/G/A1890	80.4	36.3	9.0	25.2	0.338
6	06-04-2022	KLPL/22-23/G/A1894	77.8	35.1	8.7	24.4	0.327
7	07-04-2022	KLPL/22-23/G/A1898	80.9	36.6	9.1	25.4	0.340
8	08-04-2022	KLPL/22-23/G/A1902	78.2	35.3	8.8	24.5	0.329
9	09-04-2022	KLPL/22-23/G/A1906	80.4	36.3	9.0	25.2	0.338
10	10-04-2022	KLPL/22-23/G/A1910	77.5	35.0	8.7	24.3	0.326
11	11-04-2022	KLPL/22-23/G/A1914	76.4	34.5	8.6	23.9	0.321
12	12-04-2022	KLPL/22-23/G/A1918	74.5	33.7	8.3	23.3	0.313
13	13-04-2022	KLPL/22-23/G/A1922	79.2	35.8	8.9	24.8	0.333
14	14-04-2022	KLPL/22-23/G/A1926	80.2	36.2	9.0	25.1	0.337
15	15-04-2022	KLPL/22-23/G/A1930	81.6	36.9	9.1	25.6	0.343
16	16-04-2022	KLPL/22-23/G/A1934	80.1	36.2	9.0	25.1	0.337
17	17-04-2022	KLPL/22-23/G/A1938	70.7	31.9	7.9	22.2	0.297
18	18-04-2022	KLPL/22-23/G/A1942	79.4	35.9	8.9	24.9	0.334
19	19-04-2022	KLPL/22-23/G/A1946	77.8	35.1	8.7	24.4	0.327
20	20-04-2022	KLPL/22-23/G/A1950	79.2	35.8	8.9	24.8	0.333
21	21-04-2022	KLPL/22-23/G/A1954	56.2	25.4	6.3	17.6	0.236
22	22-04-2022	KLPL/22-23/G/A1958	65.2	29.5	7.3	20.4	0.274
23	23-04-2022	KLPL/22-23/G/A1962	69.2	31.3	7.7	21.7	0.291
24	24-04-2022	KLPL/22-23/G/A1966	57.4	25.9	6.4	18.0	0.241
25	25-04-2022	KLPL/22-23/G/A1970	70.1	31.7	7.8	22.0	0.295
26	26-04-2022	KLPL/22-23/G/A1974	73.4	33.2	8.2	23.0	0.308
27	27-04-2022	KLPL/22-23/G/A1978	76.9	34.7	8.6	24.1	0.323
28	28-04-2022	KLPL/22-23/G/A1982	78.8	35.6	8.8	24.7	0.331
29	29-04-2022	KLPL/22-23/G/A1986	79.2	35.8	8.9	24.8	0.333
30	30-04-2022	KLPL/22-23/G/A1990	80.1	36.2	9.0	25.1	0.337
AAQ Standard 2009			100	60	80	80	4
Protocols			IS-5182 (Part-23) 2006	IS 5182 (Part 24): 2019	IS-5182 (Part-2) 2001, West & Gacke	IS-5182 (Part-6) 2006, Jacob & Hiencher	IS 5182 (Part-10):1999

-END OF REPORT-

Authorized Signatory
Global Tech Enviro Experts Pvt. Ltd.

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GTEEPL/LQR/53

TEST REPORT

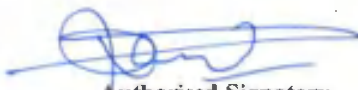
NABL ULR NO : TC1010122000000098P
Report No. : GTEEPL/04/22/ENV/98B **Issue Date:** 07.05.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty,
Address : Sundargarh, Odisha
Period : April-2022
Sampling Location : Near QC Lab (Core Zone)
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 30 Nos.
Sampling procedure : GTEEPL/LSOP/08



TC-10101

SL. NO.	Date	Lab ID	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01-04-2022	KLPL/22-23/G/A1875	82.1	37.1	9.9	24.4	0.345
2	02-04-2022	KLPL/22-23/G/A1879	83.9	37.9	10.1	25.0	0.353
3	04-04-2022	KLPL/22-23/G/A1883	78.9	35.7	9.5	23.5	0.332
4	04-04-2022	KLPL/22-23/G/A1887	84.0	38.0	10.1	25.0	0.353
5	05-04-2022	KLPL/22-23/G/A1891	83.9	37.9	10.1	25.0	0.353
6	06-04-2022	KLPL/22-23/G/A1895	81.2	36.7	9.8	24.2	0.342
7	07-04-2022	KLPL/22-23/G/A1899	84.5	38.2	10.2	25.2	0.355
8	08-04-2022	KLPL/22-23/G/A1903	81.6	36.9	9.9	24.3	0.343
9	09-04-2022	KLPL/22-23/G/A1907	83.9	37.9	10.1	25.0	0.353
10	10-04-2022	KLPL/22-23/G/A1911	80.9	36.6	9.8	24.1	0.340
11	11-04-2022	KLPL/22-23/G/A1915	79.8	36.0	9.6	23.8	0.335
12	12-04-2022	KLPL/22-23/G/A1919	77.8	35.1	9.4	23.2	0.327
13	13-04-2022	KLPL/22-23/G/A1923	82.7	37.4	10.0	24.6	0.348
14	14-04-2022	KLPL/22-23/G/A1927	83.7	37.8	10.1	24.9	0.352
15	15-04-2022	KLPL/22-23/G/A1931	85.2	38.5	10.3	25.4	0.358
16	16-04-2022	KLPL/22-23/G/A1935	83.6	37.8	10.1	24.9	0.352
17	17-04-2022	KLPL/22-23/G/A1939	73.8	33.3	8.9	22.0	0.310
18	18-04-2022	KLPL/22-23/G/A1943	82.9	37.5	10.0	24.7	0.349
19	19-04-2022	KLPL/22-23/G/A1947	81.2	36.7	9.8	24.2	0.342
20	20-04-2022	KLPL/22-23/G/A1951	82.7	37.4	10.0	24.6	0.348
21	21-04-2022	KLPL/22-23/G/A1955	58.7	26.5	7.1	17.5	0.247
22	22-04-2022	KLPL/22-23/G/A1959	68.1	30.8	8.2	20.3	0.286
23	23-04-2022	KLPL/22-23/G/A1963	72.2	32.6	8.7	21.5	0.304
24	24-04-2022	KLPL/22-23/G/A1967	59.9	27.1	7.2	17.9	0.252
25	25-04-2022	KLPL/22-23/G/A1971	73.2	33.1	8.8	21.8	0.308
26	26-04-2022	KLPL/22-23/G/A1975	76.6	34.6	9.2	22.8	0.322
27	27-04-2022	KLPL/22-23/G/A1979	80.3	36.3	9.7	23.9	0.338
28	28-04-2022	KLPL/22-23/G/A1983	82.3	37.2	9.9	24.5	0.346
29	29-04-2022	KLPL/22-23/G/A1987	82.7	37.4	10.0	24.6	0.348
30	30-04-2022	KLPL/22-23/G/A1991	83.6	37.8	10.1	24.9	0.352
AAQ Standard 2009			100	60	80	80	4
Protocols			IS-5182 (Part-23) 2006, Gravimetric	KLPL/SOP/AIR-02	IS-5182 (Part-2) 2001, West & Gaeke	IS-5182 (Part-6) 2006, Jacob & Hieocher	CPCB Guideline of Ambient Air Pollutants Volume-I & II

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GTEEPL/LQR/53

TEST REPORT



NABL ULR NO : TC101012200000098P
Report No. : GTEEPL/04/22/ENV/98C **Issue Date:** 07.05.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty,
Address : Sundargarh, Odisha
Period : April-2022
Sampling Location : Near Quarry (Core Zone)
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 30 Nos.
Sampling procedure : GTEEPL/LSOP/08

SL. NO.	Date	Lab ID	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01-04-2022	KLPL/22-23/G/A1876	80.6	36.4	9.2	25.2	0.341
2	02-04-2022	KLPL/22-23/G/A1880	82.4	37.2	9.4	25.8	0.348
3	04-04-2022	KLPL/22-23/G/A1884	77.5	35.0	8.9	24.3	0.328
4	04-04-2022	KLPL/22-23/G/A1888	82.5	37.3	9.4	25.9	0.349
5	05-04-2022	KLPL/22-23/G/A1892	82.4	37.2	9.4	25.8	0.348
6	06-04-2022	KLPL/22-23/G/A1896	79.7	36.0	9.1	25.0	0.337
7	07-04-2022	KLPL/22-23/G/A1900	82.9	37.5	9.5	26.0	0.351
8	08-04-2022	KLPL/22-23/G/A1904	80.2	36.2	9.2	25.1	0.339
9	09-04-2022	KLPL/22-23/G/A1908	82.4	37.2	9.4	25.8	0.348
10	10-04-2022	KLPL/22-23/G/A1912	79.4	35.9	9.1	24.9	0.336
11	11-04-2022	KLPL/22-23/G/A1916	78.3	35.4	9.0	24.5	0.331
12	12-04-2022	KLPL/22-23/G/A1920	76.4	34.5	8.7	23.9	0.323
13	13-04-2022	KLPL/22-23/G/A1924	81.2	36.7	9.3	25.4	0.343
14	14-04-2022	KLPL/22-23/G/A1928	82.2	37.1	9.4	25.8	0.348
15	15-04-2022	KLPL/22-23/G/A1932	83.6	37.8	9.6	26.2	0.354
16	16-04-2022	KLPL/22-23/G/A1936	82.1	37.1	9.4	25.7	0.347
17	17-04-2022	KLPL/22-23/G/A1940	72.5	32.7	8.3	22.7	0.306
18	18-04-2022	KLPL/22-23/G/A1944	81.4	36.8	9.3	25.5	0.344
19	19-04-2022	KLPL/22-23/G/A1948	79.7	36.0	9.1	25.0	0.337
20	20-04-2022	KLPL/22-23/G/A1952	81.2	36.7	9.3	25.4	0.343
21	21-04-2022	KLPL/22-23/G/A1956	57.6	26.0	6.6	18.1	0.244
22	22-04-2022	KLPL/22-23/G/A1960	66.8	30.2	7.6	20.9	0.283
23	23-04-2022	KLPL/22-23/G/A1964	70.9	32.0	8.1	22.2	0.300
24	24-04-2022	KLPL/22-23/G/A1968	58.8	26.6	6.7	18.4	0.249
25	25-04-2022	KLPL/22-23/G/A1972	71.9	32.5	8.2	22.5	0.304
26	26-04-2022	KLPL/22-23/G/A1976	75.2	34.0	8.6	23.6	0.318
27	27-04-2022	KLPL/22-23/G/A1980	78.8	35.6	9.0	24.7	0.333
28	28-04-2022	KLPL/22-23/G/A1984	80.8	36.5	9.2	25.3	0.342
29	29-04-2022	KLPL/22-23/G/A1988	81.2	36.7	9.3	25.4	0.343
30	30-04-2022	KLPL/22-23/G/A1992	82.1	37.1	9.4	25.7	0.347
AAQ Standard 2009			100	60	80	80	4
Protocols			IS-5182 (Part-2) 2006, Gravimetric	KLPL/SOP/AIR-02	IS-5182 (Part-2) 2001, West & Gaeke	IS-5182 (Part-6) 2006, Jacob & Hieocher	CPCB Guideline of Ambient Air Pollutants Volume-I & II

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TC-10101

GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC101012200000098P
Report No. : GTEEPL/04/22/ENV/98D **Issue Date:** 07.05.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty,
Address : Sundargarh, Odisha
Period : April-2022
Sampling Location : Near OB Dump (Core Zone)
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 30 Nos.
Sampling procedure : GTEEPL/LSOP/08

SL. NO.	Date	Lah ID	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01-04-2022	KLPL/22-23/G/A1877	81.4	36.8	9.1	25.5	0.344
2	02-04-2022	KLPL/22-23/G/A1881	83.2	37.6	9.3	26.1	0.352
3	04-04-2022	KLPL/22-23/G/A1885	78.2	35.4	8.8	24.5	0.331
4	04-04-2022	KLPL/22-23/G/A1889	83.3	37.6	9.3	26.1	0.352
5	05-04-2022	KLPL/22-23/G/A1893	83.2	37.6	9.3	26.1	0.352
6	06-04-2022	KLPL/22-23/G/A1897	80.5	36.4	9.0	25.2	0.341
7	07-04-2022	KLPL/22-23/G/A1901	83.7	37.8	9.4	26.2	0.354
8	08-04-2022	KLPL/22-23/G/A1905	80.9	36.6	9.1	25.4	0.342
9	09-04-2022	KLPL/22-23/G/A1909	83.2	37.6	9.3	26.1	0.352
10	10-04-2022	KLPL/22-23/G/A1913	80.2	36.2	9.0	25.1	0.339
11	11-04-2022	KLPL/22-23/G/A1917	79.1	35.7	8.9	24.8	0.334
12	12-04-2022	KLPL/22-23/G/A1921	77.1	34.8	8.6	24.2	0.326
13	13-04-2022	KLPL/22-23/G/A1925	82.0	37.0	9.2	25.7	0.347
14	14-04-2022	KLPL/22-23/G/A1929	83.0	37.5	9.3	26.0	0.351
15	15-04-2022	KLPL/22-23/G/A1933	84.5	38.2	9.5	26.5	0.357
16	16-04-2022	KLPL/22-23/G/A1937	82.9	37.5	9.3	26.0	0.351
17	17-04-2022	KLPL/22-23/G/A1941	73.2	33.1	8.2	22.9	0.309
18	18-04-2022	KLPL/22-23/G/A1945	82.2	37.1	9.2	25.8	0.348
19	19-04-2022	KLPL/22-23/G/A1949	80.5	36.4	9.0	25.2	0.341
20	20-04-2022	KLPL/22-23/G/A1953	82.0	37.0	9.2	25.7	0.347
21	21-04-2022	KLPL/22-23/G/A1957	58.2	26.3	6.5	18.2	0.246
22	22-04-2022	KLPL/22-23/G/A1961	67.5	30.5	7.6	21.1	0.285
23	23-04-2022	KLPL/22-23/G/A1965	71.6	32.4	8.0	22.4	0.303
24	24-04-2022	KLPL/22-23/G/A1969	59.4	26.8	6.7	18.6	0.251
25	25-04-2022	KLPL/22-23/G/A1973	72.6	32.8	8.1	22.7	0.307
26	26-04-2022	KLPL/22-23/G/A1977	76.0	34.3	8.5	23.8	0.321
27	27-04-2022	KLPL/22-23/G/A1981	79.6	36.0	8.9	24.9	0.337
28	28-04-2022	KLPL/22-23/G/A1985	81.6	36.8	9.1	25.6	0.345
29	29-04-2022	KLPL/22-23/G/A1989	82.0	37.0	9.2	25.7	0.347
30	30-04-2022	KLPL/22-23/G/A1993	82.9	37.5	9.3	26.0	0.351
AAQ Standard 2009			100	60	80	80	4
Protocols			IS-5182 (Part-23) 2006, Gravimetric	KLPL/SOP/AIR-02	IS-5182 (Part-2) 2001, West & Gaeke	IS-5182 (Part-6) 2006, Jacob & Hieocher	CPCB Guideline of Ambient Air Pollutants Volume-I & II

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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC101012200000098P
Report No. : GTEEPL/04/22/ENV/98E
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Babamba (Buffer Zone)
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 8 Nos.
Sampling procedure : GTEEPL/LSOP/08

SL. NO.	Date	Lab ID	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02.04.2022	KLPL/22-23/G/A1670	68.9	31.1	7.7	21.6	0.289
2	06.04.2022	KLPL/22-23/G/A1674	70.4	31.8	7.9	22.1	0.296
3	09.04.2022	KLPL/22-23/G/A1678	68.5	31.0	7.7	21.5	0.288
4	13.04.2022	KLPL/22-23/G/A1682	65.3	29.5	7.3	20.5	0.274
5	16.04.2022	KLPL/22-23/G/A1686	71.5	32.3	8.0	22.4	0.300
6	20.04.2022	KLPL/22-23/G/A1690	68.2	30.8	7.6	21.4	0.286
7	23.04.2022	KLPL/22-23/G/A1694	57.1	25.8	6.4	17.9	0.240
8	27.04.2022	KLPL/22-23/G/A1698	64.3	29.1	7.2	20.2	0.270
AAQ Standard 2009			100	60	80	80	4
Protocols			IS-5182 (Part-23) 2006, Gravimetric	IS 5182 (Part 24): 2018	IS-5182 (Part-2) 2001, West & Gaeke	IS-5182 (Part-6) 2006, Jacob & Hieocher	IS 5182 (Part-10):1888

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GTEEPL/LQR/53

TEST REPORT

TC-10101

NABL ULR NO : TC101012200000098P
 Report No. : GTEEPL/04/22/ENV/98F
 Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
 Address : Sundargarh Odisha
 Period : April-2022
 Sampling Location : Tantara (Buffer Zone)
 Identification of Sample : Ambient Air Quality Monitoring
 No of Samples : 8 Nos.
 Sampling procedure : GTEEPL/LSOP/08

SL. NO.	Date	Lab ID	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NOx in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02.04.2022	KLPL/22-23/G/A1671	72.5	32.7	8.7	21.6	0.305
2	06.04.2022	KLPL/22-23/G/A1675	74.1	33.5	8.9	22.1	0.312
3	09.04.2022	KLPL/22-23/G/A1679	72.1	32.6	8.7	21.5	0.303
4	13.04.2022	KLPL/22-23/G/A1683	68.7	31.0	8.3	20.5	0.289
5	16.04.2022	KLPL/22-23/G/A1687	75.2	34.0	9.1	22.4	0.316
6	20.04.2022	KLPL/22-23/G/A1691	71.7	32.4	8.7	21.4	0.302
7	23.04.2022	KLPL/22-23/G/A1695	60.1	27.2	7.3	17.9	0.253
8	27.04.2022	KLPL/22-23/G/A1699	67.7	30.6	8.2	20.2	0.285
AAQ Standard 2009			100	60	80	80	4
Protocols			IS-5182 (Part-23) 2006, Gravimetric	IS 5182 (Part 24): 2018	IS-5182 (Part-2) 2001, West & Gaeke	IS-5182 (Part-6) 2006, Jacob & Hiocber	IS 5182 (Part-10):1888

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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC101012200000098P
Report No. : GTEEPL/04/22/ENV/98G
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Raikela
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 8 Nos.
Sampling procedure : GTEEPL/LSOP/08

SL. NO.	Date	Lab ID	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NOx in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	04.04.2022	KLPL/22-23/G/A1673	73.4	33.2	8.4	23.0	0.310
2	07.04.2022	KLPL/22-23/G/A1676	75.1	33.9	8.6	23.5	0.318
3	11.04.2022	KLPL/22-23/G/A1680	73.0	33.0	8.4	22.9	0.309
4	14.04.2022	KLPL/22-23/G/A1684	69.6	31.4	8.0	21.8	0.294
5	18.04.2022	KLPL/22-23/G/A1688	76.2	34.4	8.7	23.9	0.322
6	21.04.2022	KLPL/22-23/G/A1692	72.7	32.8	8.3	22.8	0.307
7	25.04.2022	KLPL/22-23/G/A1696	60.9	27.5	7.0	19.1	0.258
8	29.04.2022	KLPL/22-23/G/A1700	68.6	31.0	7.8	21.5	0.290
AAQ Standard 2009			100	60	80	80	4
Protocols			IS-5182 (Part-23) 2006, Gravimetric	IS 5182 (Part 24): 2018	IS-5182 (Part-2) 2001, West & Gaeke	IS-5182 (Part-6) 2006, Jacob & Hieocher	IS 5182 (Part-10):1888

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GTEEPL/LQR/53

TEST REPORT

TC-10401

NABL ULR NO : TC101012200000098P
Report No. : GTEEPL/04/22/ENV/98H
Name of the Client : Raikela Iron Ore mines of M/s Gectarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Tensa
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 8 Nos.
Sampling procedure : GTEEPL/LSOP/08

SL. NO.	Date	Lab ID	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02.04.2022	KLPL/22-23/G/A1673	74.9	33.8	8.4	23.5	0.317
2	06.04.2022	KLPL/22-23/G/A1677	76.6	34.6	8.6	24.0	0.324
3	09.04.2022	KLPL/22-23/G/A1681	74.5	33.7	8.3	23.3	0.315
4	13.04.2022	KLPL/22-23/G/A1685	71.0	32.1	7.9	22.2	0.300
5	16.04.2022	KLPL/22-23/G/A1689	77.7	35.1	8.7	24.4	0.329
6	20.04.2022	KLPL/22-23/G/A1693	74.1	33.5	8.3	23.2	0.313
7	23.04.2022	KLPL/22-23/G/A1697	62.1	28.1	7.0	19.5	0.263
8	27.04.2022	KLPL/22-23/G/A1701	69.9	31.6	7.8	21.9	0.296
AAQ Standard 2009			100	60	80	80	4
Protocols			IS-5182 (Part-23) 2006, Gravimetric	IS 5182 (Part 24): 2018	IS-5182 (Part-2) 2001, West & Gaeke	IS-5182 (Part-6) 2006, Jacob & Hieocher	IS 5182 (Part-10):1888

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GTEEPL/LQR/53

TEST REPORT



NABL ULR NO : TC1010122000000137P
Report No. : GTEEPL/05/22/ENV/137A
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : May-2022
Sampling Location : Nuagaon
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 8 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date: 07.06.2022 TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02-05-2022	60.8	27.5	6.8	19.0	0.255
2	05-05-2022	57.5	26.0	6.4	18.0	0.242
3	09-05-2022	59.1	26.7	6.6	18.5	0.248
4	12-05-2022	61.2	27.7	6.9	19.2	0.257
5	16-05-2022	58.2	26.3	6.5	18.2	0.244
6	19-05-2022	56.6	25.5	6.3	17.7	0.238
7	23-05-2022	53.5	24.2	6.0	16.8	0.225
8	26-05-2022	51.4	23.2	5.8	16.1	0.216
9	30-05-2022	57.3	25.9	6.4	17.9	0.241
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24): 2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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GTEEPL/LQR/53

TEST REPORT



NABL ULR NO : TC1010122000000137P
Report No. : GTEEPL/05/22/ENV/137B
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : May-2022
Sampling Location : Tentulidihi
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 8 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date: 07.06.2022 TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02-05-2022	62.5	28.2	7.5	18.6	0.263
2	05-05-2022	59.2	26.7	7.1	17.6	0.249
3	09-05-2022	60.8	27.5	7.3	18.1	0.256
4	12-05-2022	63.0	28.5	7.6	18.8	0.265
5	16-05-2022	59.8	27.0	7.2	17.8	0.252
6	19-05-2022	58.2	26.3	7.0	17.3	0.245
7	23-05-2022	55.0	24.9	6.6	16.4	0.231
8	26-05-2022	52.9	23.9	6.4	15.8	0.223
9	30-05-2022	58.9	26.6	7.1	17.6	0.248
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24): 2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000137P
Report No. : GTEEPL/05/22/ENV/137C
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : May-2022
Sampling Location : Dengula
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 8 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date:07.06.2022

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02-05-2022	67.8	30.6	7.8	21.2	0.287
2	05-05-2022	64.2	29.0	7.3	20.1	0.271
3	09-05-2022	65.9	29.8	7.5	20.7	0.279
4	12-05-2022	68.3	30.9	7.8	21.4	0.289
5	16-05-2022	64.9	29.3	7.4	20.3	0.274
6	19-05-2022	63.1	28.5	7.2	19.8	0.267
7	23-05-2022	59.7	27.0	6.8	18.7	0.252
8	26-05-2022	57.4	25.9	6.6	18.0	0.243
9	30-05-2022	63.9	28.9	7.3	20.0	0.270
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24):2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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globalexerts@gmail.com
www.globaltechenviroxpvt.com

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TEST REPORT

NABL ULR NO : TC101012200000137P
Report No. : GTEEPL/05/22/ENV/137D
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : May-2022
Sampling Location : Office
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 8 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date: 07.06.2022 TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02-05-2022	69.2	31.2	7.7	21.7	0.292
2	05-05-2022	65.5	29.6	7.3	20.5	0.277
3	09-05-2022	67.2	30.4	7.5	21.1	0.284
4	12-05-2022	69.7	31.5	7.8	21.8	0.295
5	16-05-2022	66.2	29.9	7.4	20.7	0.280
6	19-05-2022	64.4	29.1	7.2	20.2	0.272
7	23-05-2022	60.9	27.5	6.8	19.1	0.258
8	26-05-2022	58.5	26.5	6.6	18.3	0.248
9	30-05-2022	65.2	29.4	7.3	20.4	0.276
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24): 2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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TEST REPORT

NABL ULR NO : TC1010122000000145P
Report No. : GTEEPL/06/22/ENV/145A
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : June-2022
Sampling Location : Nuagaon
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date:07.07.2022

TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02.06.2022	65.0	29.4	7.3	20.4	0.273
2	06.06.2022	63.5	28.7	7.1	19.9	0.267
3	09.06.2022	66.1	29.9	7.4	20.7	0.278
4	13.06.2022	64.9	29.3	7.3	20.3	0.273
5	16.06.2022	57.5	26.0	6.4	18.0	0.242
6	20.06.2022	63.1	28.5	7.1	19.8	0.265
7	23.06.2022	52.5	23.7	5.9	16.5	0.221
8	27.06.2022	61.3	27.7	6.9	19.2	0.258
9	30.06.2022	63.8	28.8	7.1	20.0	0.268
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24):2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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TEST REPORT

NABL ULR NO : TC1010122000000145P
Report No. : GTEEPL/06/22/ENV/145B
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : June-2022
Sampling Location : Tentulidihi
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date:07.07.2022

TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02.06.2022	66.8	30.2	8.1	19.9	0.281
2	06.06.2022	65.4	29.5	7.9	19.5	0.275
3	09.06.2022	68.0	30.7	8.2	20.3	0.286
4	13.06.2022	66.8	30.2	8.1	19.9	0.281
5	16.06.2022	59.2	26.7	7.1	17.6	0.249
6	20.06.2022	64.9	29.3	7.8	19.3	0.273
7	23.06.2022	54.0	24.4	6.5	16.1	0.227
8	27.06.2022	63.1	28.5	7.6	18.8	0.265
9	30.06.2022	65.6	29.7	7.9	19.6	0.276
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24):2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10):1999

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TEST REPORT

NABL ULR NO : TC1010122000000145P
Report No. : GTEEPL/06/22/ENV/145C
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : June-2022
Sampling Location : Dengula
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/SOP/08

Issue Date:07.07.2022



TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02.06.2022	67.8	30.6	7.8	21.2	0.287
2	06.06.2022	64.2	29.0	7.3	20.1	0.271
3	09.06.2022	65.9	29.8	7.5	20.7	0.279
4	13.06.2022	68.3	30.9	7.8	21.4	0.289
5	16.06.2022	64.9	29.3	7.4	20.3	0.274
6	20.06.2022	63.1	28.5	7.2	19.8	0.267
7	23.06.2022	59.7	27.0	6.8	18.7	0.252
8	27.06.2022	57.4	25.9	6.6	18.0	0.243
9	30.06.2022	63.9	28.9	7.3	20.0	0.270
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24):2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999



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TEST REPORT

NABL ULR NO : TC1010122000000145P
Report No. : GTEEPL/06/22/ENV/145D
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : June-2022
Sampling Location : Office
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date: 07.07.2022 TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02.06.2022	69.2	31.2	7.7	21.7	0.292
2	06.06.2022	65.5	29.6	7.3	20.5	0.277
3	09.06.2022	67.2	30.4	7.5	21.1	0.284
4	13.06.2022	69.7	31.5	7.8	21.8	0.295
5	16.06.2022	66.2	29.9	7.4	20.7	0.280
6	20.06.2022	64.4	29.1	7.2	20.2	0.272
7	23.06.2022	60.9	27.5	6.8	19.1	0.258
8	27.06.2022	58.5	26.5	6.6	18.3	0.248
9	30.06.2022	65.2	29.4	7.3	20.4	0.276
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24): 2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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TEST REPORT

NABL ULR NO : TC1010122000000159P
Report No. : GTEEPL/07/22/ENV/159A
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : July-2022
Sampling Location : Nuagaon
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date:07.08.2022

TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01.07.2022	57.8	26.1	6.5	18.1	0.243
2	04.07.2022	51.4	23.2	5.8	16.1	0.216
3	08.07.2022	47.2	21.3	5.3	14.8	0.198
4	11.07.2022	53.6	24.2	6.0	16.8	0.225
5	15.07.2022	46.1	20.8	5.2	14.4	0.194
6	18.07.2022	47.3	21.4	5.3	14.8	0.199
7	22.07.2022	43.7	19.8	4.9	13.7	0.184
8	25.07.2022	40.8	18.4	4.6	12.8	0.171
9	29.07.2022	48.3	21.8	5.4	15.1	0.203
Average		48.5	21.9	5.4	15.2	0.204
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24):2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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TEST REPORT

NABL ULR NO : TC1010122000000159P
Report No. : GTEEPL/07/22/ENV/159B
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : July-2022
Sampling Location : Tentulidihi
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date:07.08.2022 TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01.07.2022	59.5	26.9	7.2	17.7	0.250
2	04.07.2022	52.8	23.9	6.4	15.7	0.222
3	08.07.2022	48.6	22.0	5.9	14.5	0.204
4	11.07.2022	55.1	24.9	6.7	16.4	0.232
5	15.07.2022	47.4	21.4	5.7	14.1	0.199
6	18.07.2022	48.7	22.0	5.9	14.5	0.205
7	22.07.2022	45.0	20.3	5.4	13.4	0.189
8	25.07.2022	42.0	19.0	5.1	12.5	0.176
9	29.07.2022	49.7	22.5	6.0	14.8	0.209
Average		49.9	22.5	6.0	14.9	0.210
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24):2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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TEST REPORT



NABL ULR NO : TC1010122000000159P
Report No. : GTEEPL/07/22/ENV/159C
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : July-2022
Sampling Location : Dengula
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date: 07.08.2022 TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01.07.2022	57.0	25.8	6.5	17.9	0.241
2	04.07.2022	50.7	22.9	5.8	15.9	0.214
3	08.07.2022	46.6	21.0	5.3	14.6	0.197
4	11.07.2022	52.9	23.9	6.0	16.6	0.224
5	15.07.2022	45.4	20.5	5.2	14.2	0.192
6	18.07.2022	46.7	21.1	5.3	14.6	0.197
7	22.07.2022	43.1	19.5	4.9	13.5	0.182
8	25.07.2022	40.2	18.2	4.6	12.6	0.170
9	29.07.2022	47.6	21.5	5.5	14.9	0.201
Average		47.8	21.6	5.5	15.0	0.202
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24): 2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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An ISO-9001:2008 Certified Company

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GTEEPL/LQR/53

TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000159P
Report No. : GTEEPL/07/22/ENV/159D
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : July-2022
Sampling Location : Office
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date:07.08.2022

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01.07.2022	64.5	29.1	7.2	20.2	0.273
2	04.07.2022	57.3	25.9	6.4	18.0	0.242
3	08.07.2022	52.7	23.8	5.9	16.5	0.223
4	11.07.2022	59.8	27.0	6.7	18.7	0.253
5	15.07.2022	51.4	23.2	5.8	16.1	0.217
6	18.07.2022	52.8	23.9	5.9	16.5	0.223
7	22.07.2022	48.8	22.0	5.5	15.3	0.206
8	25.07.2022	45.5	20.6	5.1	14.3	0.192
9	29.07.2022	53.9	24.4	6.0	16.9	0.228
Average		54.1	24.4	6.1	16.9	0.229
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24):2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

Authorised Signatory
Global Tech Enviro Experts Pvt. Ltd.



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 - ② Liability for return of sample ceases after 15 days from the date of Test certificate.
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GTEEPL/LQR/53

TEST REPORT



NABL ULR NO : TC1010122000000177P
Report No. : GTEEPL/08/22/ENV/177A
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : August-2022
Sampling Location : Nuagaon
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

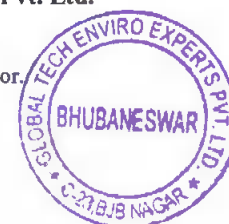
Issue Date: 07.09.2022

TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01-08-2022	54.0	24.4	6.1	16.9	0.227
2	04-08-2022	57.5	26.0	6.4	18.0	0.242
3	08-08-2022	58.5	26.4	6.6	18.3	0.246
4	12-08-2022	39.9	18.0	4.5	12.5	0.168
5	16-08-2022	47.0	21.2	5.3	14.7	0.197
6	19-08-2022	38.4	17.3	4.3	12.0	0.161
7	22-08-2022	48.9	22.1	5.5	15.3	0.206
8	26-08-2022	54.1	24.5	6.1	17.0	0.227
9	30-08-2022	56.1	25.3	6.3	17.6	0.236
Average		50.5	22.8	5.7	15.8	0.212
AAQ Standard 2009		100	60	80	80	4
Protocols	IS 5182 (Part 23): 2006	IS 5182 (Part 24): 2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999	

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GTEEPL/LQR/53

TEST REPORT



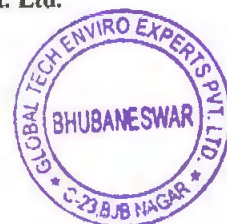
NABL ULR NO : TC1010122000000177P
Report No. : GTEEPL/08/22/ENV/177B
Name of the Client : Raikela Iron Ore mines of M/s Gectarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : August-2022
Sampling Location : Tentulidihi
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date: 07.09.2022 TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01-08-2022	55.6	25.1	6.7	16.6	0.234
2	04-08-2022	59.2	26.7	7.1	17.6	0.249
3	08-08-2022	60.2	27.2	7.3	17.9	0.253
4	12-08-2022	41.0	18.5	5.0	12.2	0.173
5	16-08-2022	48.3	21.8	5.8	14.4	0.203
6	19-08-2022	39.5	17.8	4.8	11.8	0.166
7	22-08-2022	50.3	22.7	6.1	15.0	0.212
8	26-08-2022	55.7	25.2	6.7	16.6	0.234
9	30-08-2022	57.7	26.1	7.0	17.2	0.243
Average		51.9	23.5	6.3	15.5	0.218
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24): 2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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GTEEPL/LQR/53

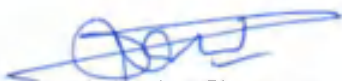
TEST REPORT



NABL ULR NO : TC1010122000000177P
Report No. : GTEEPL/08/22/ENV/177C
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : August-2022
Sampling Location : Dengula
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date: 07.09.2022 TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01-08-2022	53.3	24.1	6.1	16.7	0.225
2	04-08-2022	56.8	25.6	6.5	17.8	0.240
3	08-08-2022	57.7	26.1	6.6	18.1	0.244
4	12-08-2022	39.3	17.8	4.5	12.3	0.166
5	16-08-2022	46.3	20.9	5.3	14.5	0.196
6	19-08-2022	37.8	17.1	4.3	11.9	0.160
7	22-08-2022	48.3	21.8	5.5	15.1	0.204
8	26-08-2022	53.4	24.1	6.1	16.7	0.226
9	30-08-2022	55.3	25.0	6.3	17.3	0.234
Average		49.8	22.5	5.7	15.6	0.211
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24): 2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999


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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000177P
Report No. : GTEEPL/08/22/ENV/177D
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : August-2022
Sampling Location : Office
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date:07.09.2022

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	01-08-2022	60.3	27.2	6.8	18.9	0.255
2	04-08-2022	64.2	29.0	7.2	20.1	0.271
3	08-08-2022	65.3	29.5	7.3	20.5	0.276
4	12-08-2022	44.5	20.1	5.0	13.9	0.188
5	16-08-2022	52.4	23.7	5.9	16.4	0.222
6	19-08-2022	42.8	19.3	4.8	13.4	0.181
7	22-08-2022	54.6	24.7	6.1	17.1	0.231
8	26-08-2022	60.4	27.3	6.8	18.9	0.255
9	30-08-2022	62.6	28.3	7.0	19.6	0.265
Average		56.3	25.5	6.3	17.7	0.238
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24):2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC1010122000000200P
Report No. : GTEEPL/09/22/ENV/200A
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : September-2022
Sampling Location : Nuagaon
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date:07.10.2022

TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02-09-2022	59.3	26.8	6.6	18.6	0.249
2	05-09-2022	57.9	26.1	6.5	18.1	0.243
3	09-09-2022	61.3	27.7	6.9	19.2	0.258
4	12-09-2022	54.0	24.3	6.0	16.9	0.227
5	16-09-2022	56.1	25.3	6.3	17.6	0.236
6	19-09-2022	38.7	17.7	4.3	12.1	0.163
7	23-09-2022	47.9	21.4	5.4	15.0	0.201
8	26-09-2022	52.2	23.6	5.9	16.4	0.220
9	30-09-2022	53.9	24.3	6.0	16.9	0.226
Average		53.5	24.1	6.0	16.8	0.225
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24):2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999



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GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC1010122000000200P
Report No. : GTEEPL/09/22/ENV/200B
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : September-2022
Sampling Location : Tentulidihi
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date: 07.10.2022 TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02-09-2022	61.0	27.6	7.4	18.2	0.257
2	05-09-2022	59.6	26.8	7.2	17.7	0.250
3	09-09-2022	63.1	28.5	7.6	18.8	0.265
4	12-09-2022	55.5	25.2	6.7	16.5	0.233
5	16-09-2022	57.7	25.9	7.0	17.2	0.243
6	19-09-2022	39.8	18.0	4.8	11.9	0.167
7	23-09-2022	49.2	22.2	5.9	14.7	0.207
8	26-09-2022	53.8	24.3	6.5	16.0	0.226
9	30-09-2022	55.4	25.0	6.7	16.5	0.233
Average		55.0	24.8	6.6	16.4	0.231
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24): 2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999


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GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC1010122000000200P
Report No. : GTEEPL/09/22/ENV/200C
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : September-2022
Sampling Location : Dengula
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date:07.10.2022

TC-10101

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02-09-2022	58.5	26.4	6.7	18.3	0.247
2	05-09-2022	57.1	26.0	6.5	17.9	0.241
3	09-09-2022	60.5	27.4	6.9	18.9	0.256
4	12-09-2022	53.2	23.9	6.1	16.7	0.225
5	16-09-2022	55.3	24.8	6.3	17.3	0.234
6	19-09-2022	38.2	17.2	4.4	12.0	0.161
7	23-09-2022	47.2	21.5	5.4	14.8	0.200
8	26-09-2022	51.5	23.3	5.9	16.2	0.218
9	30-09-2022	53.1	24.0	6.1	16.6	0.225
Average		52.7	23.8	6.0	16.5	0.223
AAQ Standard 2009		100	60	80	80	.4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24):2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999

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GTEEPL/LQR/53

TEST REPORT

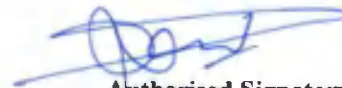


TC-10101

NABL ULR NO : TC1010122000000200P
Report No. : GTEEPL/09/22/ENV/200D
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : September-2022
Sampling Location : Office
Identification of Sample : Ambient Air Quality Monitoring
No of Samples : 9 Nos.
Sampling procedure : GTEEPL/LSOP/08

Issue Date:07.10.2022

SL. NO.	Date	PM ₁₀ in (µg/m ³)	PM _{2.5} in (µg/m ³)	SO ₂ in (µg/m ³)	NO _x in (µg/m ³)	Carbon monoxide (CO) in mg/m ³
1	02-09-2022	66.2	29.8	7.4	20.7	0.280
2	05-09-2022	64.6	29.3	7.2	20.2	0.273
3	09-09-2022	68.4	30.7	7.7	21.4	0.289
4	12-09-2022	60.2	27.3	6.7	18.9	0.255
5	16-09-2022	62.6	28.1	7.0	19.6	0.265
6	19-09-2022	43.2	19.3	4.8	13.5	0.183
7	23-09-2022	53.4	24.0	6.0	16.7	0.226
8	26-09-2022	58.3	26.3	6.5	18.3	0.247
9	30-09-2022	60.1	27.2	6.7	18.8	0.254
Average		59.7	26.9	6.7	18.7	0.252
AAQ Standard 2009		100	60	80	80	4
Protocols		IS 5182 (Part 23): 2006	IS 5182 (Part 24):2019	IS 5182 (Part 2): 2001	IS 5182 (Part 6): 2006	IS 5182 (Part 10): 1999


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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC101012200000099P
Report No. : GTEEPL/04/22/ENV/99A Issue Date: 07.05.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Mines Face
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/04/FUG/2022/F1-1 to 30

SL. NO.	Date	Lab ID	Result in $\mu\text{g}/\text{m}^3$
1	01-04-2022	KLPL/22-23/G/F2942	778
2	02-04-2022	KLPL/22-23/G/F2948	796
3	03-04-2022	KLPL/22-23/G/F2954	748
4	04-04-2022	KLPL/22-23/G/F2960	797
5	05-04-2022	KLPL/22-23/G/F2966	796
6	06-04-2022	KLPL/22-23/G/F2972	770
7	07-04-2022	KLPL/22-23/G/F2978	801
8	08-04-2022	KLPL/22-23/G/F2984	774
9	09-04-2022	KLPL/22-23/G/F2990	796
10	10-04-2022	KLPL/22-23/G/F2996	767
11	11-04-2022	KLPL/22-23/G/F3002	756
12	12-04-2022	KLPL/22-23/G/F3008	738
13	13-04-2022	KLPL/22-23/G/F3014	784
14	14-04-2022	KLPL/22-23/G/F3020	794
15	15-04-2022	KLPL/22-23/G/F3026	808
16	16-04-2022	KLPL/22-23/G/F3032	793
17	17-04-2022	KLPL/22-23/G/F3038	700
18	18-04-2022	KLPL/22-23/G/F3044	786
19	19-04-2022	KLPL/22-23/G/F3050	770
20	20-04-2022	KLPL/22-23/G/F3056	784
21	21-04-2022	KLPL/22-23/G/F3062	556
22	22-04-2022	KLPL/22-23/G/F3068	645
23	23-04-2022	KLPL/22-23/G/F3074	685
24	24-04-2022	KLPL/22-23/G/F3080	568
25	25-04-2022	KLPL/22-23/G/F3086	694
26	26-04-2022	KLPL/22-23/G/F3092	727
27	27-04-2022	KLPL/22-23/G/F3098	761
28	28-04-2022	KLPL/22-23/G/F3104	780
29	29-04-2022	KLPL/22-23/G/F3110	784
30	30-04-2022	KLPL/22-23/G/F3116	793
Standard			1200
Protocols			IS: 5182 (Part 4):1999

-END OF REPORT-


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GTEEPL/LQR/53

TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000099P
Report No. : GTEEPL/04/22/ENV/99B Issue Date: 07.05.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Haul Road
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/04/FUG/2022/F1-1 to 30

SL. NO.	Date	Lab ID	Result in $\mu\text{g}/\text{m}^3$
1	01-04-2022	KLPL/22-23/G/F2943	833
2	02-04-2022	KLPL/22-23/G/F2949	852
3	03-04-2022	KLPL/22-23/G/F2955	801
4	04-04-2022	KLPL/22-23/G/F2961	853
5	05-04-2022	KLPL/22-23/G/F2967	852
6	06-04-2022	KLPL/22-23/G/F2973	825
7	07-04-2022	KLPL/22-23/G/F2979	858
8	08-04-2022	KLPL/22-23/G/F2985	829
9	09-04-2022	KLPL/22-23/G/F2991	852
10	10-04-2022	KLPL/22-23/G/F2997	822
11	11-04-2022	KLPL/22-23/G/F3003	810
12	12-04-2022	KLPL/22-23/G/F3009	790
13	13-04-2022	KLPL/22-23/G/F3015	840
14	14-04-2022	KLPL/22-23/G/F3021	850
15	15-04-2022	KLPL/22-23/G/F3027	865
16	16-04-2022	KLPL/22-23/G/F3033	849
17	17-04-2022	KLPL/22-23/G/F3039	749
18	18-04-2022	KLPL/22-23/G/F3045	842
19	19-04-2022	KLPL/22-23/G/F3051	825
20	20-04-2022	KLPL/22-23/G/F3057	840
21	21-04-2022	KLPL/22-23/G/F3063	596
22	22-04-2022	KLPL/22-23/G/F3069	691
23	23-04-2022	KLPL/22-23/G/F3075	734
24	24-04-2022	KLPL/22-23/G/F3081	608
25	25-04-2022	KLPL/22-23/G/F3087	743
26	26-04-2022	KLPL/22-23/G/F3093	778
27	27-04-2022	KLPL/22-23/G/F3099	815
28	28-04-2022	KLPL/22-23/G/F3105	835
29	29-04-2022	KLPL/22-23/G/F3111	840
30	30-04-2022	KLPL/22-23/G/F3117	849
Standard			1200
Protocols			IS: 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC1010122000000099P
Report No. : GTEEPL/04/22/ENV/99C
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Crushing Plant
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/04/FUG/2022/F1-1 to 30

Issue Date: 07.05.2022



TC-10101

SL. NO.	Date	Lab ID	Result in $\mu\text{g}/\text{m}^3$
1	01-04-2022	KLPL/22-23/G/F2944	723
2	02-04-2022	KLPL/22-23/G/F2950	740
3	03-04-2022	KLPL/22-23/G/F2956	696
4	04-04-2022	KLPL/22-23/G/F2962	741
5	05-04-2022	KLPL/22-23/G/F2968	740
6	06-04-2022	KLPL/22-23/G/F2974	716
7	07-04-2022	KLPL/22-23/G/F2980	744
8	08-04-2022	KLPL/22-23/G/F2986	719
9	09-04-2022	KLPL/22-23/G/F2992	740
10	10-04-2022	KLPL/22-23/G/F2998	713
11	11-04-2022	KLPL/22-23/G/F3004	703
12	12-04-2022	KLPL/22-23/G/F3010	685
13	13-04-2022	KLPL/22-23/G/F3016	729
14	14-04-2022	KLPL/22-23/G/F3022	738
15	15-04-2022	KLPL/22-23/G/F3028	751
16	16-04-2022	KLPL/22-23/G/F3034	737
17	17-04-2022	KLPL/22-23/G/F3040	650
18	18-04-2022	KLPL/22-23/G/F3046	730
19	19-04-2022	KLPL/22-23/G/F3052	716
20	20-04-2022	KLPL/22-23/G/F3058	729
21	21-04-2022	KLPL/22-23/G/F3064	517
22	22-04-2022	KLPL/22-23/G/F3070	600
23	23-04-2022	KLPL/22-23/G/F3076	637
24	24-04-2022	KLPL/22-23/G/F3082	528
25	25-04-2022	KLPL/22-23/G/F3088	645
26	26-04-2022	KLPL/22-23/G/F3094	675
27	27-04-2022	KLPL/22-23/G/F3100	707
28	28-04-2022	KLPL/22-23/G/F3106	725
29	29-04-2022	KLPL/22-23/G/F3112	729
30	30-04-2022	KLPL/22-23/G/F3118	737
Standard			1200
Protocols			IS: 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000099P
Report No. : GTEEPL/04/22/ENV/99D Issue Date: 07.05.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Screening Plant
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/04/FUG/2022/F1-1 to 30

SL. NO.	Date	Lab ID	Result in $\mu\text{g}/\text{m}^3$
1	01-04-2022	KLPL/22-23/G/F2945	700
2	02-04-2022	KLPL/22-23/G/F2951	716
3	03-04-2022	KLPL/22-23/G/F2957	673
4	04-04-2022	KLPL/22-23/G/F2963	716
5	05-04-2022	KLPL/22-23/G/F2969	716
6	06-04-2022	KLPL/22-23/G/F2975	692
7	07-04-2022	KLPL/22-23/G/F2981	720
8	08-04-2022	KLPL/22-23/G/F2987	696
9	09-04-2022	KLPL/22-23/G/F2993	716
10	10-04-2022	KLPL/22-23/G/F2999	690
11	11-04-2022	KLPL/22-23/G/F3005	680
12	12-04-2022	KLPL/22-23/G/F3011	663
13	13-04-2022	KLPL/22-23/G/F3017	705
14	14-04-2022	KLPL/22-23/G/F3023	714
15	15-04-2022	KLPL/22-23/G/F3029	726
16	16-04-2022	KLPL/22-23/G/F3035	713
17	17-04-2022	KLPL/22-23/G/F3041	629
18	18-04-2022	KLPL/22-23/G/F3047	707
19	19-04-2022	KLPL/22-23/G/F3053	692
20	20-04-2022	KLPL/22-23/G/F3059	705
21	21-04-2022	KLPL/22-23/G/F3065	500
22	22-04-2022	KLPL/22-23/G/F3071	580
23	23-04-2022	KLPL/22-23/G/F3077	616
24	24-04-2022	KLPL/22-23/G/F3083	511
25	25-04-2022	KLPL/22-23/G/F3089	624
26	26-04-2022	KLPL/22-23/G/F3095	653
27	27-04-2022	KLPL/22-23/G/F3101	684
28	28-04-2022	KLPL/22-23/G/F3107	701
29	29-04-2022	KLPL/22-23/G/F3113	705
30	30-04-2022	KLPL/22-23/G/F3119	713
Standard			1200
Protocols			IS: 5182 (Part 4):1999

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TEST REPORT



TC-10101

NABL ULR NO : TC101012200000099P
Report No. : GTEEPL/04/22/ENV/99E Issue Date: 07.05.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Ore Storage
Identification of Sample : Fugitive Dnst Monitoring
No of Samples : GTEEPL/04/FUG/2022/F1-1 to 30

SL. NO.	Date	Lah ID	Result in $\mu\text{g}/\text{m}^3$
1	01-04-2022	KLPL/22-23/G/F2946	645
2	02-04-2022	KLPL/22-23/G/F2952	659
3	03-04-2022	KLPL/22-23/G/F2958	620
4	04-04-2022	KLPL/22-23/G/F2964	660
5	05-04-2022	KLPL/22-23/G/F2970	659
6	06-04-2022	KLPL/22-23/G/F2976	638
7	07-04-2022	KLPL/22-23/G/F2982	663
8	08-04-2022	KLPL/22-23/G/F2988	641
9	09-04-2022	KLPL/22-23/G/F2994	659
10	10-04-2022	KLPL/22-23/G/F3000	636
11	11-04-2022	KLPL/22-23/G/F3006	626
12	12-04-2022	KLPL/22-23/G/F3012	611
13	13-04-2022	KLPL/22-23/G/F3018	649
14	14-04-2022	KLPL/22-23/G/F3024	658
15	15-04-2022	KLPL/22-23/G/F3030	669
16	16-04-2022	KLPL/22-23/G/F3036	657
17	17-04-2022	KLPL/22-23/G/F3042	580
18	18-04-2022	KLPL/22-23/G/F3048	651
19	19-04-2022	KLPL/22-23/G/F3054	638
20	20-04-2022	KLPL/22-23/G/F3060	649
21	21-04-2022	KLPL/22-23/G/F3066	461
22	22-04-2022	KLPL/22-23/G/F3072	535
23	23-04-2022	KLPL/22-23/G/F3078	567
24	24-04-2022	KLPL/22-23/G/F3084	471
25	25-04-2022	KLPL/22-23/G/F3090	575
26	26-04-2022	KLPL/22-23/G/F3096	602
27	27-04-2022	KLPL/22-23/G/F3102	631
28	28-04-2022	KLPL/22-23/G/F3108	646
29	29-04-2022	KLPL/22-23/G/F3114	649
30	30-04-2022	KLPL/22-23/G/F3120	657
Standard			1200
Protocols			IS: 5182 (Part 4):1999

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TEST REPORT



TC-10101

NABL ULR NO : TC101012200000099P
Report No. : GTEEPL/04/22/ENV/99F Issue Date: 07.05.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Waste Dump
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/04/FUG/2022/F1-1 to 30

SL. NO.	Date	Lab ID	Result in $\mu\text{g}/\text{m}^3$
1	01-04-2022	KLPL/22-23/G/F2947	668
2	02-04-2022	KLPL/22-23/G/F2953	683
3	03-04-2022	KLPL/22-23/G/F2959	643
4	04-04-2022	KLPL/22-23/G/F2965	684
5	05-04-2022	KLPL/22-23/G/F2971	683
6	06-04-2022	KLPL/22-23/G/F2977	661
7	07-04-2022	KLPL/22-23/G/F2983	688
8	08-04-2022	KLPL/22-23/G/F2989	665
9	09-04-2022	KLPL/22-23/G/F2995	683
10	10-04-2022	KLPL/22-23/G/F3001	659
11	11-04-2022	KLPL/22-23/G/F3007	649
12	12-04-2022	KLPL/22-23/G/F3013	633
13	13-04-2022	KLPL/22-23/G/F3019	673
14	14-04-2022	KLPL/22-23/G/F3025	682
15	15-04-2022	KLPL/22-23/G/F3031	694
16	16-04-2022	KLPL/22-23/G/F3037	681
17	17-04-2022	KLPL/22-23/G/F3043	601
18	18-04-2022	KLPL/22-23/G/F3049	675
19	19-04-2022	KLPL/22-23/G/F3055	661
20	20-04-2022	KLPL/22-23/G/F3061	673
21	21-04-2022	KLPL/22-23/G/F3067	478
22	22-04-2022	KLPL/22-23/G/F3073	554
23	23-04-2022	KLPL/22-23/G/F3079	588
24	24-04-2022	KLPL/22-23/G/F3085	488
25	25-04-2022	KLPL/22-23/G/F3091	596
26	26-04-2022	KLPL/22-23/G/F3097	624
27	27-04-2022	KLPL/22-23/G/F3103	654
28	28-04-2022	KLPL/22-23/G/F3109	670
29	29-04-2022	KLPL/22-23/G/F3115	673
30	30-04-2022	KLPL/22-23/G/F3121	681
Standard			1200
Protocols			IS: 5182 (Part 4):1999

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Authorised Signatory

Global Tech Enviro Experts Pvt. Ltd.

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GTEEPL/LQR/53**TEST REPORT**

NABL ULR NO : TC1010122000000138P
Report No. : GTEEPL/05/22/ENV/ 138A
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : May-2022
Sampling Location : Mines Face
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/05/FUG/2022/F1-1 to 30

Issue Date:07.06.2022**TC-10101**

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-05-2022	686
2	02-05-2022	670
3	03-05-2022	536
4	04-05-2022	562
5	05-05-2022	597
6	06-05-2022	633
7	07-05-2022	674
8	08-05-2022	697
9	09-05-2022	686
10	10-05-2022	707
11	11-05-2022	699
12	12-05-2022	687
13	13-05-2022	641
14	14-05-2022	654
15	15-05-2022	611
16	16-05-2022	662
17	17-05-2022	674
18	18-05-2022	644
19	19-05-2022	676
20	20-05-2022	693
21	21-05-2022	198
22	22-05-2022	149
23	23-05-2022	467
24	24-05-2022	425
25	25-05-2022	482
26	26-05-2022	432
27	27-05-2022	466
28	28-05-2022	496
29	29-05-2022	512
30	30-05-2022	517
31	31-05-2022	489
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC1010122000000138P
Report No. : GTEEPL/05/22/ENV/138B
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : May-2022
Sampling Location : Mines Gate
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/05/FUG/2022/F1-1 to 30

Issue Date: 07.06.2022

TC-10101

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-05-2022	617
2	02-05-2022	603
3	03-05-2022	481
4	04-05-2022	506
5	05-05-2022	537
6	06-05-2022	569
7	07-05-2022	606
8	08-05-2022	627
9	09-05-2022	617
10	10-05-2022	635
11	11-05-2022	628
12	12-05-2022	618
13	13-05-2022	576
14	14-05-2022	588
15	15-05-2022	549
16	16-05-2022	595
17	17-05-2022	606
18	18-05-2022	579
19	19-05-2022	608
20	20-05-2022	623
21	21-05-2022	178
22	22-05-2022	134
23	23-05-2022	420
24	24-05-2022	382
25	25-05-2022	433
26	26-05-2022	388
27	27-05-2022	419
28	28-05-2022	446
29	29-05-2022	460
30	30-05-2022	465
31	31-05-2022	440
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000138P
Report No. : GTEEPL/05/22/ENV/138C
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : May-2022
Sampling Location : Haul Road
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/05/FUG/2022/F1-1 to 30

Issue Date:07.06.2022

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-05-2022	735
2	02-05-2022	718
3	03-05-2022	573
4	04-05-2022	602
5	05-05-2022	639
6	06-05-2022	677
7	07-05-2022	722
8	08-05-2022	746
9	09-05-2022	735
10	10-05-2022	757
11	11-05-2022	748
12	12-05-2022	736
13	13-05-2022	686
14	14-05-2022	701
15	15-05-2022	654
16	16-05-2022	709
17	17-05-2022	722
18	18-05-2022	690
19	19-05-2022	724
20	20-05-2022	742
21	21-05-2022	212
22	22-05-2022	159
23	23-05-2022	500
24	24-05-2022	455
25	25-05-2022	516
26	26-05-2022	462
27	27-05-2022	499
28	28-05-2022	531
29	29-05-2022	548
30	30-05-2022	553
31	31-05-2022	524
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC1010122000000138P
Report No. : GTEEPL/05/22/ENV/138D
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : May-2022
Sampling Location : Crushing & Screening Plant
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/05/FUG/2022/F1-1 to 30

Issue Date:07.06.2022



TC-10101

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-05-2022	638
2	02-05-2022	623
3	03-05-2022	498
4	04-05-2022	523
5	05-05-2022	555
6	06-05-2022	588
7	07-05-2022	627
8	08-05-2022	648
9	09-05-2022	638
10	10-05-2022	657
11	11-05-2022	650
12	12-05-2022	638
13	13-05-2022	595
14	14-05-2022	608
15	15-05-2022	568
16	16-05-2022	615
17	17-05-2022	627
18	18-05-2022	599
19	19-05-2022	628
20	20-05-2022	644
21	21-05-2022	184
22	22-05-2022	138
23	23-05-2022	434
24	24-05-2022	395
25	25-05-2022	448
26	26-05-2022	401
27	27-05-2022	433
28	28-05-2022	461
29	29-05-2022	476
30	30-05-2022	480
31	31-05-2022	454
Standard		1200
Protocols		IS 5182 (Part 4):1999

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TEST REPORT

TC-10101

NABL ULR NO : TC101012200000138P
Report No. : GTEEPL/05/22/ENV/138E
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : May-2022
Sampling Location : Ore storage & Loading
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/05/FUG/2022/F1-1 to 30

Issue Date: 07.06.2022

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-05-2022	707
2	02-05-2022	691
3	03-05-2022	552
4	04-05-2022	579
5	05-05-2022	615
6	06-05-2022	652
7	07-05-2022	695
8	08-05-2022	718
9	09-05-2022	707
10	10-05-2022	728
11	11-05-2022	720
12	12-05-2022	708
13	13-05-2022	660
14	14-05-2022	674
15	15-05-2022	629
16	16-05-2022	682
17	17-05-2022	695
18	18-05-2022	664
19	19-05-2022	697
20	20-05-2022	714
21	21-05-2022	204
22	22-05-2022	153
23	23-05-2022	481
24	24-05-2022	438
25	25-05-2022	497
26	26-05-2022	445
27	27-05-2022	480
28	28-05-2022	511
29	29-05-2022	527
30	30-05-2022	532
31	31-05-2022	504
Standard		1200
Protocols		IS 5182 (Part 4):1999

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TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000138P
Report No. : GTEEPL/05/22/ENV/138F **Issue Date:** 07.06.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : May-2022
Sampling Location : Waste Dump
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/05/FUG/2022/F1-1 to 30

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-05-2022	603
2	02-05-2022	589
3	03-05-2022	471
4	04-05-2022	494
5	05-05-2022	525
6	06-05-2022	556
7	07-05-2022	592
8	08-05-2022	612
9	09-05-2022	603
10	10-05-2022	621
11	11-05-2022	614
12	12-05-2022	604
13	13-05-2022	563
14	14-05-2022	575
15	15-05-2022	537
16	16-05-2022	582
17	17-05-2022	592
18	18-05-2022	566
19	19-05-2022	594
20	20-05-2022	609
21	21-05-2022	174
22	22-05-2022	131
23	23-05-2022	411
24	24-05-2022	373
25	25-05-2022	424
26	26-05-2022	379
27	27-05-2022	410
28	28-05-2022	436
29	29-05-2022	450
30	30-05-2022	454
31	31-05-2022	430
Standard		1200
Protocols		IS 5182 (Part 4):1999

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TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000146P
Report No. : GTEEPL/06/22/ENV/ 146A Issue Date:07.07.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : June-2022
Sampling Location : Mines Face
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/06/FUG/2022/F1-1 to 30

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01.06.2022	788
2	02.06.2022	744
3	03.06.2022	804
4	04.06.2022	767
5	05.06.2022	788
6	06.06.2022	760
7	07.06.2022	817
8	08.06.2022	765
9	09.06.2022	738
10	10.06.2022	776
11	11.06.2022	699
12	12.06.2022	785
13	13.06.2022	827
14	14.06.2022	746
15	15.06.2022	804
16	16.06.2022	685
17	17.06.2022	672
18	18.06.2022	697
19	19.06.2022	795
20	20.06.2022	693
21	21.06.2022	754
22	22.06.2022	797
23	23.06.2022	735
24	24.06.2022	760
25	25.06.2022	708
26	26.06.2022	808
27	27.06.2022	647
28	28.06.2022	643
29	29.06.2022	621
30	30.06.2022	707
Standard		1200
Protocols		IS 5182 (Part 4):1999

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TEST REPORT

NABL ULR NO : TC1010122000000146P
 Report No. : GTEEPL/06/22/ENV/ 146B
 Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
 Address : Raikela, Koira, Sundargarh, Odisha
 Period : June-2022
 Sampling Location : Mines Gate
 Identification of Sample : Fugitive Dust Monitoring
 No of Samples : GTEEPL/06/FUG/2022/F1-1 to 30

Issue Date:07.07.2022

TC-10101

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01.06.2022	708
2	02.06.2022	669
3	03.06.2022	723
4	04.06.2022	690
5	05.06.2022	708
6	06.06.2022	684
7	07.06.2022	734
8	08.06.2022	688
9	09.06.2022	663
10	10.06.2022	698
11	11.06.2022	628
12	12.06.2022	706
13	13.06.2022	743
14	14.06.2022	671
15	15.06.2022	723
16	16.06.2022	616
17	17.06.2022	604
18	18.06.2022	627
19	19.06.2022	715
20	20.06.2022	623
21	21.06.2022	678
22	22.06.2022	716
23	23.06.2022	660
24	24.06.2022	684
25	25.06.2022	636
26	26.06.2022	726
27	27.06.2022	582
28	28.06.2022	578
29	29.06.2022	558
30	30.06.2022	635
Standard		1200
Protocols		IS 5182 (Part 4):1999

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TC-10101

NABL ULR NO : TC1010122000000146P
Report No. : GTEEPL/06/22/ENV/ 146C Issue Date:07.07.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : June-2022
Sampling Location : Haul Road
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/06/FUG/2022/F1-1 to 30

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01.06.2022	844
2	02.06.2022	797
3	03.06.2022	861
4	04.06.2022	822
5	05.06.2022	844
6	06.06.2022	814
7	07.06.2022	875
8	08.06.2022	819
9	09.06.2022	790
10	10.06.2022	831
11	11.06.2022	748
12	12.06.2022	841
13	13.06.2022	885
14	14.06.2022	799
15	15.06.2022	861
16	16.06.2022	734
17	17.06.2022	720
18	18.06.2022	746
19	19.06.2022	851
20	20.06.2022	742
21	21.06.2022	808
22	22.06.2022	853
23	23.06.2022	787
24	24.06.2022	814
25	25.06.2022	758
26	26.06.2022	865
27	27.06.2022	693
28	28.06.2022	688
29	29.06.2022	665
30	30.06.2022	757
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000146P
Report No. : GTEEPL/06/22/ENV/ 146D Issue Date: 07.07.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : June-2022
Sampling Location : Crushing & Screening Plant
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/06/FUG/2022/F1-1 to 30

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01.06.2022	732
2	02.06.2022	692
3	03.06.2022	747
4	04.06.2022	713
5	05.06.2022	732
6	06.06.2022	707
7	07.06.2022	759
8	08.06.2022	711
9	09.06.2022	685
10	10.06.2022	721
11	11.06.2022	650
12	12.06.2022	730
13	13.06.2022	768
14	14.06.2022	694
15	15.06.2022	747
16	16.06.2022	637
17	17.06.2022	625
18	18.06.2022	648
19	19.06.2022	739
20	20.06.2022	644
21	21.06.2022	701
22	22.06.2022	741
23	23.06.2022	683
24	24.06.2022	707
25	25.06.2022	658
26	26.06.2022	751
27	27.06.2022	602
28	28.06.2022	597
29	29.06.2022	577
30	30.06.2022	657
Standard		1200
Protocols		IS 5182 (Part 4):1999

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TEST REPORT

NABL ULR NO : TC1010122000000146P
 Report No. : GTEEPL/06/22/ENV/ 146E Issue Date: 07.07.2022
 Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
 Address : Raikela, Koira, Sundargarh, Odisha
 Period : June-2022
 Sampling Location : Ore storage & Loading
 Identification of Sample : Fugitive Dust Monitoring
 No of Samples : GTEEPL/06/FUG/2022/F1-1 to 30

TC-10101

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01.06.2022	892
2	02.06.2022	842
3	03.06.2022	909
4	04.06.2022	868
5	05.06.2022	892
6	06.06.2022	860
7	07.06.2022	924
8	08.06.2022	866
9	09.06.2022	834
10	10.06.2022	878
11	11.06.2022	791
12	12.06.2022	888
13	13.06.2022	935
14	14.06.2022	844
15	15.06.2022	909
16	16.06.2022	775
17	17.06.2022	760
18	18.06.2022	788
19	19.06.2022	899
20	20.06.2022	784
21	21.06.2022	853
22	22.06.2022	902
23	23.06.2022	831
24	24.06.2022	860
25	25.06.2022	801
26	26.06.2022	914
27	27.06.2022	732
28	28.06.2022	727
29	29.06.2022	702
30	30.06.2022	800
Standard		1200
Protocols		IS 5182 (Part 4):1999

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TEST REPORT

TC-10101

NABL ULR NO : TC101012200000146P
Report No. : GTEEPL/06/22/ENV/ 146F Issue Date:07.07.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : June-2022
Sampling Location : Waste Dump
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/06/FUG/2022/F1-1 to 30

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01.06.2022	836
2	02.06.2022	790
3	03.06.2022	853
4	04.06.2022	814
5	05.06.2022	836
6	06.06.2022	806
7	07.06.2022	866
8	08.06.2022	812
9	09.06.2022	782
10	10.06.2022	823
11	11.06.2022	741
12	12.06.2022	833
13	13.06.2022	877
14	14.06.2022	792
15	15.06.2022	853
16	16.06.2022	727
17	17.06.2022	713
18	18.06.2022	739
19	19.06.2022	843
20	20.06.2022	735
21	21.06.2022	800
22	22.06.2022	845
23	23.06.2022	779
24	24.06.2022	806
25	25.06.2022	751
26	26.06.2022	857
27	27.06.2022	687
28	28.06.2022	681
29	29.06.2022	658
30	30.06.2022	750
Standard		1200
Protocols		IS 5182 (Part 4):1999

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TEST REPORT

NABL ULR NO : TC1010122000000160P
Report No. : GTEEPL/07/22/ENV/ 160A
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarb, Odisha
Period : July-2022
Sampling Location : Mines Face
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/07/FUG/2022/F1-1 to 30

Issue Date:07.08.2022



TC-10101

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01.07.2022	642
2	02.07.2022	596
3	03.07.2022	534
4	04.07.2022	536
5	05.07.2022	499
6	06.07.2022	517
7	07.07.2022	536
8	08.07.2022	487
9	09.07.2022	461
10	10.07.2022	425
11	11.07.2022	498
12	12.07.2022	442
13	13.07.2022	427
14	14.07.2022	447
15	15.07.2022	403
16	16.07.2022	414
17	17.07.2022	395
18	18.07.2022	401
19	19.07.2022	385
20	20.07.2022	424
21	21.07.2022	446
22	22.07.2022	375
23	23.07.2022	459
24	24.07.2022	423
25	25.07.2022	388
26	26.07.2022	415
27	27.07.2022	474
28	28.07.2022	459
29	29.07.2022	484
30	30.07.2022	502
31	31.07.2022	518
Average		449
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000160P
Report No. : GTEEPL/07/22/ENV/ 160B Issue Date:07.08.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mobanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : July-2022
Sampling Location : Mines Gate
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/07/FUG/2022/F1-1 to 30

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	577	577
2	536	536
3	480	480
4	481	481
5	449	449
6	465	465
7	481	481
8	438	438
9	415	415
10	382	382
11	448	448
12	397	397
13	384	384
14	402	402
15	362	362
16	372	372
17	355	355
18	360	360
19	346	346
20	381	381
21	401	401
22	337	337
23	413	413
24	380	380
25	349	349
26	373	373
27	426	426
28	413	413
29	435	435
30	451	451
31	465	465
Average		404
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC1010122000000160P
Report No. : GTEEPL/07/22/ENV/ 160C
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : July-2022
Sampling Location : Haul Road
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/07/FUG/2022/F1-1 to 30

Issue Date:07.08.2022



TC-10101

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01.07.2022	687
2	02.07.2022	638
3	03.07.2022	571
4	04.07.2022	573
5	05.07.2022	534
6	06.07.2022	553
7	07.07.2022	573
8	08.07.2022	522
9	09.07.2022	494
10	10.07.2022	455
11	11.07.2022	533
12	12.07.2022	473
13	13.07.2022	457
14	14.07.2022	479
15	15.07.2022	431
16	16.07.2022	443
17	17.07.2022	423
18	18.07.2022	429
19	19.07.2022	412
20	20.07.2022	454
21	21.07.2022	478
22	22.07.2022	402
23	23.07.2022	492
24	24.07.2022	453
25	25.07.2022	416
26	26.07.2022	444
27	27.07.2022	508
28	28.07.2022	492
29	29.07.2022	518
30	30.07.2022	537
31	31.07.2022	554
Average		481
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000160P
Report No. : GTEEPL/07/22/ENV/ 160D
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : July-2022
Sampling Location : Crushing & Screening Plant
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/07/FUG/2022/F1-1 to 30

Issue Date:07.08.2022

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01.07.2022	596
2	02.07.2022	554
3	03.07.2022	496
4	04.07.2022	498
5	05.07.2022	464
6	06.07.2022	480
7	07.07.2022	498
8	08.07.2022	453
9	09.07.2022	429
10	10.07.2022	395
11	11.07.2022	463
12	12.07.2022	410
13	13.07.2022	397
14	14.07.2022	416
15	15.07.2022	374
16	16.07.2022	385
17	17.07.2022	367
18	18.07.2022	373
19	19.07.2022	358
20	20.07.2022	394
21	21.07.2022	415
22	22.07.2022	349
23	23.07.2022	427
24	24.07.2022	393
25	25.07.2022	361
26	26.07.2022	385
27	27.07.2022	441
28	28.07.2022	427
29	29.07.2022	450
30	30.07.2022	466
31	31.07.2022	481
Average		417
Standard		1200
Protocols		IS 5182 (Part 4):1999

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TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000160P
Report No. : GTEEPL/07/22/ENV/ 160E
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : July-2022
Sampling Location : Ore Storage & Loading
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/07/FUG/2022/F1-1 to 30

Issue Date:07.08.2022

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01.07.2022	616
2	02.07.2022	572
3	03.07.2022	512
4	04.07.2022	514
5	05.07.2022	479
6	06.07.2022	496
7	07.07.2022	514
8	08.07.2022	467
9	09.07.2022	443
10	10.07.2022	408
11	11.07.2022	478
12	12.07.2022	424
13	13.07.2022	409
14	14.07.2022	429
15	15.07.2022	387
16	16.07.2022	397
17	17.07.2022	379
18	18.07.2022	385
19	19.07.2022	370
20	20.07.2022	407
21	21.07.2022	428
22	22.07.2022	360
23	23.07.2022	441
24	24.07.2022	406
25	25.07.2022	372
26	26.07.2022	398
27	27.07.2022	455
28	28.07.2022	441
29	29.07.2022	465
30	30.07.2022	482
31	31.07.2022	497
Average		431
Standard		1200
Protocols		IS 5182 (Part 4):1999

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TEST REPORT



NABL ULR NO : TC1010122000000160P
Report No. : GTEEPL/07/22/ENV/ 160F Issue Date:07.08.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : July-2022
Sampling Location : Waste Dump
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/07/FUG/2022/F1-1 to 30

TC-10101

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01.07.2022	629
2	02.07.2022	584
3	03.07.2022	523
4	04.07.2022	525
5	05.07.2022	489
6	06.07.2022	506
7	07.07.2022	525
8	08.07.2022	477
9	09.07.2022	452
10	10.07.2022	416
11	11.07.2022	488
12	12.07.2022	433
13	13.07.2022	418
14	14.07.2022	438
15	15.07.2022	395
16	16.07.2022	405
17	17.07.2022	387
18	18.07.2022	393
19	19.07.2022	377
20	20.07.2022	415
21	21.07.2022	437
22	22.07.2022	368
23	23.07.2022	450
24	24.07.2022	414
25	25.07.2022	380
26	26.07.2022	406
27	27.07.2022	465
28	28.07.2022	450
29	29.07.2022	474
30	30.07.2022	492
31	31.07.2022	507
Average		440
Standard		1200
Protocols		IS 5182 (Part 4):1999

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TEST REPORT

NABL ULR NO : TC1010122000000178P
Report No. : GTEEPL/08/22/ENV/ 178A
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : August-2022
Sampling Location : Mines Face
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/08/FUG/2022/F1-1 to 30

Issue Date:07.09.2022



TC-10101

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-08-2022	479
2	02-08-2022	509
3	03-08-2022	518
4	04-08-2022	575
5	05-08-2022	590
6	06-08-2022	566
7	07-08-2022	536
8	08-08-2022	596
9	09-08-2022	420
10	10-08-2022	397
11	11-08-2022	298
12	12-08-2022	286
13	13-08-2022	298
14	14-08-2022	281
15	15-08-2022	360
16	16-08-2022	457
17	17-08-2022	477
18	18-08-2022	401
19	19-08-2022	306
20	20-08-2022	278
21	21-08-2022	358
22	22-08-2022	518
23	23-08-2022	532
24	24-08-2022	471
25	25-08-2022	521
26	26-08-2022	540
27	27-08-2022	577
28	28-08-2022	459
29	29-08-2022	541
30	30-08-2022	556
31	31-08-2022	576
Average		452
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

TC-10101

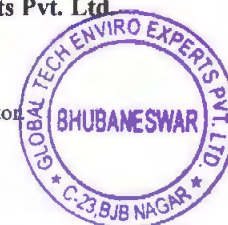
NABL ULR NO : TC1010122000000178P
Report No. : GTEEPL/08/22/ENV/178B Issue Date: 07.09.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : August-2022
Sampling Location : Mines Gate
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/08/FUG/2022/F1-1 to 30

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-08-2022	431
2	02-08-2022	457
3	03-08-2022	465
4	04-08-2022	517
5	05-08-2022	530
6	06-08-2022	509
7	07-08-2022	481
8	08-08-2022	536
9	09-08-2022	377
10	10-08-2022	357
11	11-08-2022	268
12	12-08-2022	257
13	13-08-2022	268
14	14-08-2022	253
15	15-08-2022	324
16	16-08-2022	411
17	17-08-2022	429
18	18-08-2022	360
19	19-08-2022	275
20	20-08-2022	250
21	21-08-2022	322
22	22-08-2022	465
23	23-08-2022	478
24	24-08-2022	424
25	25-08-2022	468
26	26-08-2022	485
27	27-08-2022	519
28	28-08-2022	413
29	29-08-2022	486
30	30-08-2022	500
31	31-08-2022	518
Average		406
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000178P
Report No. : GTEEPL/08/22/ENV/ 178C
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : August-2022
Sampling Location : Haul Road
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/08/FUG/2022/F1-1 to 30

Issue Date:07.09.2022

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-08-2022	513
2	02-08-2022	545
3	03-08-2022	554
4	04-08-2022	616
5	05-08-2022	632
6	06-08-2022	606
7	07-08-2022	573
8	08-08-2022	638
9	09-08-2022	449
10	10-08-2022	425
11	11-08-2022	319
12	12-08-2022	306
13	13-08-2022	319
14	14-08-2022	301
15	15-08-2022	386
16	16-08-2022	490
17	17-08-2022	511
18	18-08-2022	429
19	19-08-2022	328
20	20-08-2022	298
21	21-08-2022	384
22	22-08-2022	554
23	23-08-2022	569
24	24-08-2022	505
25	25-08-2022	558
26	26-08-2022	578
27	27-08-2022	618
28	28-08-2022	492
29	29-08-2022	579
30	30-08-2022	596
31	31-08-2022	617
Average		484
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000178P
Report No. : GTEEPL/08/22/ENV/ 178D
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : August-2022
Sampling Location : Crushing & Screening Plant
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/08/FUG/2022/F1-1 to 30

Issue Date:07.09.2022

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-08-2022	445
2	02-08-2022	473
3	03-08-2022	481
4	04-08-2022	535
5	05-08-2022	548
6	06-08-2022	526
7	07-08-2022	498
8	08-08-2022	554
9	09-08-2022	390
10	10-08-2022	369
11	11-08-2022	277
12	12-08-2022	266
13	13-08-2022	277
14	14-08-2022	261
15	15-08-2022	335
16	16-08-2022	425
17	17-08-2022	443
18	18-08-2022	373
19	19-08-2022	284
20	20-08-2022	259
21	21-08-2022	333
22	22-08-2022	481
23	23-08-2022	494
24	24-08-2022	438
25	25-08-2022	484
26	26-08-2022	501
27	27-08-2022	536
28	28-08-2022	427
29	29-08-2022	502
30	30-08-2022	517
31	31-08-2022	535
Average		420
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC101012200000178P
Report No. : GTEEPL/08/22/ENV/178E
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : August-2022
Sampling Location : Ore storage & Loading
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/08/PUG/2022/F1-1 to 30

Issue Date:07.09.2022

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-08-2022	616
2	02-08-2022	572
3	03-08-2022	512
4	04-08-2022	514
5	05-08-2022	479
6	06-08-2022	496
7	07-08-2022	514
8	08-08-2022	467
9	09-08-2022	443
10	10-08-2022	408
11	11-08-2022	478
12	12-08-2022	424
13	13-08-2022	409
14	14-08-2022	429
15	15-08-2022	387
16	16-08-2022	397
17	17-08-2022	379
18	18-08-2022	385
19	19-08-2022	370
20	20-08-2022	407
21	21-08-2022	428
22	22-08-2022	360
23	23-08-2022	441
24	24-08-2022	406
25	25-08-2022	372
26	26-08-2022	398
27	27-08-2022	455
28	28-08-2022	441
29	29-08-2022	465
30	30-08-2022	482
31	31-08-2022	497
Average		431
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000178P
Report No. : GTEEPL/08/22/ENV/178F
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : August-2022
Sampling Location : Waste Dump
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/08/FUG/2022/F1-1 to 30

Issue Date:07.09.2022

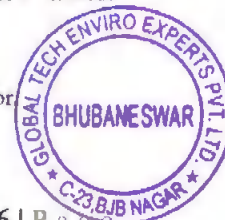
SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-08-2022	629
2	02-08-2022	584
3	03-08-2022	523
4	04-08-2022	525
5	05-08-2022	489
6	06-08-2022	506
7	07-08-2022	525
8	08-08-2022	477
9	09-08-2022	452
10	10-08-2022	416
11	11-08-2022	488
12	12-08-2022	433
13	13-08-2022	418
14	14-08-2022	438
15	15-08-2022	395
16	16-08-2022	405
17	17-08-2022	387
18	18-08-2022	393
19	19-08-2022	377
20	20-08-2022	415
21	21-08-2022	437
22	22-08-2022	368
23	23-08-2022	450
24	24-08-2022	414
25	25-08-2022	380
26	26-08-2022	406
27	27-08-2022	465
28	28-08-2022	450
29	29-08-2022	474
30	30-08-2022	492
31	31-08-2022	507
Average		440
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC1010122000000201P
Report No. : GTEEPL/09/22/ENV/ 201A
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : September-2022
Sampling Location : Mines Face
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/09/FUG/2022/FI-1 to 30

Issue Date:07.10.2022



SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-09-2022	556
2	02-09-2022	578
3	03-09-2022	590
4	04-09-2022	596
5	05-09-2022	612
6	06-09-2022	617
7	07-09-2022	598
8	08-09-2022	570
9	09-09-2022	578
10	10-09-2022	420
11	11-09-2022	404
12	12-09-2022	377
13	13-09-2022	463
14	14-09-2022	497
15	15-09-2022	457
16	16-09-2022	499
17	17-09-2022	459
18	18-09-2022	364
19	19-09-2022	279
20	20-09-2022	290
21	21-09-2022	378
22	22-09-2022	323
23	23-09-2022	447
24	24-09-2022	434
25	25-09-2022	418
26	26-09-2022	529
27	27-09-2022	566
28	28-09-2022	450
29	29-09-2022	530
30	30-09-2022	545
Average		470
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000201P
Report No. : GTEEPL/09/22/ENV/ 201B
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Snddargarh, Odisha
Period : September-2022
Sampling Location : Mines Gate
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/09/FUG/2022/F1-1 to 30

Issue Date:07.10.2022

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-09-2022	500
2	02-09-2022	520
3	03-09-2022	530
4	04-09-2022	536
5	05-09-2022	550
6	06-09-2022	554
7	07-09-2022	538
8	08-09-2022	513
9	09-09-2022	520
10	10-09-2022	377
11	11-09-2022	363
12	12-09-2022	339
13	13-09-2022	417
14	14-09-2022	447
15	15-09-2022	411
16	16-09-2022	449
17	17-09-2022	413
18	18-09-2022	328
19	19-09-2022	251
20	20-09-2022	261
21	21-09-2022	340
22	22-09-2022	290
23	23-09-2022	402
24	24-09-2022	390
25	25-09-2022	376
26	26-09-2022	475
27	27-09-2022	508
28	28-09-2022	405
29	29-09-2022	476
30	30-09-2022	490
Average		423
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC1010122000000201P
Report No. : GTEEPL/09/22/ENV/ 201C
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : September-2022
Sampling Location : Haul Road
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/09/FUG/2022/F1-1 to 30

Issue Date:07.10.2022



TC-10101

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-09-2022	596
2	02-09-2022	619
3	03-09-2022	632
4	04-09-2022	638
5	05-09-2022	655
6	06-09-2022	660
7	07-09-2022	640
8	08-09-2022	611
9	09-09-2022	619
10	10-09-2022	449
11	11-09-2022	432
12	12-09-2022	404
13	13-09-2022	496
14	14-09-2022	532
15	15-09-2022	490
16	16-09-2022	534
17	17-09-2022	492
18	18-09-2022	390
19	19-09-2022	299
20	20-09-2022	311
21	21-09-2022	405
22	22-09-2022	346
23	23-09-2022	479
24	24-09-2022	464
25	25-09-2022	447
26	26-09-2022	566
27	27-09-2022	606
28	28-09-2022	482
29	29-09-2022	567
30	30-09-2022	584
Average		504
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000201P
 Report No. : GTEEPL/09/22/ENV/ 201D
 Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
 Address : Raikela, Koira, Sundargarh, Odisha
 Period : September-2022
 Sampling Location : Crushing & Screening Plant
 Identification of Sample : Fugitive Dust Monitoring
 No of Samples : GTEEPL/09/FUG/2022/F1-1 to 30

Issue Date:07.10.2022

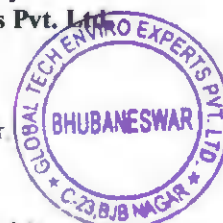
SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-09-2022	517
2	02-09-2022	537
3	03-09-2022	548
4	04-09-2022	554
5	05-09-2022	569
6	06-09-2022	573
7	07-09-2022	556
8	08-09-2022	530
9	09-09-2022	537
10	10-09-2022	390
11	11-09-2022	375
12	12-09-2022	351
13	13-09-2022	431
14	14-09-2022	462
15	15-09-2022	425
16	16-09-2022	464
17	17-09-2022	427
18	18-09-2022	339
19	19-09-2022	259
20	20-09-2022	270
21	21-09-2022	351
22	22-09-2022	300
23	23-09-2022	416
24	24-09-2022	403
25	25-09-2022	388
26	26-09-2022	491
27	27-09-2022	526
28	28-09-2022	418
29	29-09-2022	492
30	30-09-2022	507
Average		437
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000201P
Report No. : GTEEPL/09/22/ENV/ 201E Issue Date:07.10.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : September-2022
Sampling Location : Ore storage & Loading
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/09/FUG/2022/F1-1 to 30

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-09-2022	534
2	02-09-2022	555
3	03-09-2022	566
4	04-09-2022	572
5	05-09-2022	587
6	06-09-2022	592
7	07-09-2022	574
8	08-09-2022	547
9	09-09-2022	555
10	10-09-2022	403
11	11-09-2022	388
12	12-09-2022	362
13	13-09-2022	445
14	14-09-2022	477
15	15-09-2022	439
16	16-09-2022	479
17	17-09-2022	441
18	18-09-2022	350
19	19-09-2022	268
20	20-09-2022	278
21	21-09-2022	363
22	22-09-2022	310
23	23-09-2022	429
24	24-09-2022	416
25	25-09-2022	401
26	26-09-2022	507
27	27-09-2022	543
28	28-09-2022	432
29	29-09-2022	508
30	30-09-2022	523
Average		451
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/53

TEST REPORT

NABL ULR NO : TC1010122000000201P
Report No. : GTEEPL/09/22/ENV/ 201F
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : September-2022
Sampling Location : Waste Dump
Identification of Sample : Fugitive Dust Monitoring
No of Samples : GTEEPL/09/FUG/2022/F1-1 to 30

Issue Date:07.10.2022

TC-10101

SL. NO.	Date	Result in $\mu\text{g}/\text{m}^3$
1	01-09-2022	545
2	02-09-2022	566
3	03-09-2022	578
4	04-09-2022	584
5	05-09-2022	599
6	06-09-2022	604
7	07-09-2022	586
8	08-09-2022	559
9	09-09-2022	566
10	10-09-2022	411
11	11-09-2022	396
12	12-09-2022	370
13	13-09-2022	454
14	14-09-2022	487
15	15-09-2022	448
16	16-09-2022	489
17	17-09-2022	450
18	18-09-2022	357
19	19-09-2022	274
20	20-09-2022	284
21	21-09-2022	371
22	22-09-2022	316
23	23-09-2022	438
24	24-09-2022	425
25	25-09-2022	409
26	26-09-2022	518
27	27-09-2022	554
28	28-09-2022	441
29	29-09-2022	519
30	30-09-2022	534
Average		461
Standard		1200
Protocols		IS 5182 (Part 4):1999

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GTEEPL/LQR/56
TEST REPORT


NABL ULR NO : TC1010122000000148P
 Report No. : GTEEPL/06/22/GW/148E
 Name of the Client : Raikela Iron Ore Mines of M/s Geetarani Mohanty
 Address : Raikela, Koira, Snnadargarh, Odisha,
 Date of Sampling : 16.06.2022
 Date of Testing : 18.06.2022 to 24.06.2022
 Sampling Location : Office Bore Well (Inside Mines Office)
 Identification of Sample : Ground Water
 Quantity of Sample : 1LTR X 2
 Sampling procedure : GTEEPL/SOP/09

Issue Date: 07.07.2022

TC-10101

Date of Receiving: 17.06.2022

SL No.	Parameters	Unit	Testing Method	Requirement as per IS 10500:2012RA 2018	Analysis Result
Physical Parameters					
1	pH	.....	IS 3025(Part-11)1983 RA 2017	6.5 to 8.5	6.80
2	Odour	....	IS 3025(Part 5) 2018	Agreeable	Agreeable
3	Colour	Hazen	IS 3025(Part 4) 2021	5(max)	<1.0
4	Electrical Conductivity	µs/cm	IS 3025(Part-14) :2021	.....	160
5	Total Dissolved solids	mg/l	IS 3025(Part-16)1984 RA 2017	500 (max)	98
6	Total Suspended Solids	mg/l	IS 3025(Part-17):1984 RA 2017	.....	<1.0
7	Turbidity	NTU	IS 3025(Part-10)1984 RA 2017	1.0(max)	<0.5
Chemical Parameters					
8	Total Hardness as CaCO ₃	mg/l	IS 3025(Part-21)2009 RA 2019	200(max)	48
9	Calcium Hardness as CaCO ₃	mg/l	IS 3025(Part-40)1991 RA 2019	---	30
10	Magnesium Hardness as CaCO ₃	mg/l	IS 3025(Part-46)1994 RA 2003	-----	18
11	Total Alkalinity as CaCO ₃	mg/l	IS 3025(Part-23) 1986 RA 2019	200(max)	32
12	Calcium as Ca	mg/l	IS 3025 (Part-40) 1991 RA 2019	75(max)	12.0
13	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	4.37
14	Chloride as Cl	mg/l	IS 3025(Part-32)1988 RA 2019	250(max)	8.0
15	Sulphate as SO ₄	mg/l	IS 3025(Part-24)1986 RA 2019	200(max)	3.8
16	Fluoride as F	mg/l	APHA F 4500 C-D	1.0(max)	0.31
17	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ -B	45(max)	1.1
18	Total Ammonia	mg/l	IS 3025(Part-34)1988RA2019	0.5(max)	<0.3
19	Free Residual Chlorine	mg/l	IS 3025: (Part-26) 2021	0.2(min)	<0.1
20	Mineral Oil	mg/l	IS 3025(Part-39) 2021	0.5(max)	<0.4
21	Iron as Fe	mg/l	IS 3025(Part-53)2003 RA 2019	1.0(max)	0.28
22	Hexavalent Chromium as Cr ⁺⁶	mg/l	IS 3025(Part-52)2003 RA 2019	----	<0.01



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Report No: GTEEPL/06/22/GW/I48E

23	Phosphate as PO ₄	mg/l	APHA 23 rd Ed (4500-P-D): 2017	----	<0.1
24	Silica	mg/l	APHA 23 rd Ed (4500-SiO ₂ -C): 2017	-----	<0.4
25	Sodium as Na	mg/l	IS 3025: (Part-45) 1993 RA 2019	-----	9.8
26	Potassium as K	mg/l	IS 3025: (Part-45) 1993 RA 2019	-----	2.1
27	Total Chromium as	mg/l	IS 3025(Part-52) 2003 RA 2009	0.05(max)	<0.01
28	Phenolic Compounds as C ₆ H ₅ OH	mg/l	IS 3025(Part-43)1992 RA 2019	0.001 (max)	<0.001
29	Sulphide as H ₂ S	mg/l	IS 3025(Part-29)1986 RA 2019	0.05(max)	<0.05
30	Aluminium as Al	mg/l	IS 3025(Part-55)2003 RA 2019	0.03 (max)	<0.02
31	Boron as B	mg/l	IS 3025(Part-57)2005 RA 2017	0.5 (max)	<0.1
32	Cyanide as CN	mg/l	IS 3025(Part-27)1986 RA 2019	0.05(max.)	<0.01
33	Arsenic as As	mg/l	IS 3025(Part-37)1988 RA 2019	0.01(max)	<0.01
34	Copper as Cu	mg/l	IS 3025(Part-42)1992 RA 2019	0.05(max)	<0.01
35	Manganese as Mn	mg/l	IS 3025(Part-59)2006 RA 2017	0.1(max)	<0.05
36	Lead as Pb	mg/l	IS 3025(Part-47)1994 RA 2019	0.01(max)	<0.01
37	Selenium as Se	mg/l	IS 3025(Part-56)2003 RA 2019	0.01(max)	<0.001
38	Nickel	mg/l	IS 3025(Part-54)2003 RA 2019	0.02(max)	<0.01
39	Zinc as Zn	mg/l	IS 3025(Part-49)1994 RA 2019	5 (max)	<0.05
40	Cadmium as Cd	mg/l	IS 3025(Part-41)1992 RA 2019	0.003(max)	0.001
41	Mercury as Hg	mg/l	IS 3025(Part 48) 1994 RA 2009	0.001(max)	<0.001
42	Anionic detergent as MBAS	mg/l	Annex K of IS 13428	0.2(max)	<0.2
Bacteriological Quality					
43	Total Coliform Bacteria	MPN/100ml	IS 1622:1981 RA 2019	Shall not be detected in any 100 ml sample	< 2

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GTEEPL/LQR/56

TEST REPORT

NABL ULR NO : TC1010122000000148P
Report No. : GTEEPL/06/22/GW/148F
Name of the Client : Raikela Iron Ore Mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha.
Date of Sampling : 16.06.2022
Date of Testing : 18.06.2022 to 24.06.2022
Sampling Location : Tensa Tuhe Well
Identification of Sample : Ground Water
Quantity of Sample : 1LTR X 2
Sampling procedure : GTEEPL/LSOP/09

Issue Date: 07.07.2022 TC-10101

Date of Receiving: 17.06.2022

Sl. No.	Parameters	Unit	Testing Method	Requirement as per IS 10500:2012RA 2018	Analysis Result
Physical Parameters					
1	pH	.....	IS 3025(Part-11)1983 RA 2017	6.5 to 8.5	7.07
2	Odour	.....	IS 3025(Part 5) 2018	Agreeable	Agreeable
3	Colour	Hazen	IS 3025(Part 4) 2021	5(max)	<1.0
4	Electrical Conductivity	µs/cm	IS 3025(Part-14) :2021	.....	142
5	Total Dissolved solids	mg/l	IS 3025(Part-16)1984 RA 2017	500 (max)	91
6	Total Suspended Solids	mg/l	IS 3025(Part-17):1984 RA 2017	.....	<1.0
7	Turbidity	NTU	IS 3025(Part-10)1984 RA 2017	1.0(max)	<0.5
Chemical Parameters					
8	Total Hardness as CaCO ₃	mg/l	IS 3025(Part-21)2009 RA 2019	200(max)	52
9	Calcium Hardness as CaCO ₃	mg/l	IS 3025(Part-40)1991 RA 2019	---	34.9
10	Magnesium Hardness as CaCO ₃	mg/l	IS 3025(Part-46)1994 RA 2003	-----	17.1
11	Total Alkalinity as CaCO ₃	mg/l	IS 3025(Part-23) 1986 RA 2019	200(max)	37
12	Calcium as Ca	mg/l	IS 3025 (Part-40) 1991 RA 2019	75(max)	14
13	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	4.15
14	Chloride as Cl	mg/l	IS 3025(Part-32)1988 RA 2019	250(max)	14
15	Sulphate as SO ₄	mg/l	IS 3025(Part-24)1986 RA 2019	200(max)	10.2
16	Fluoride as F	mg/l	APHA F 4500 C-D	1.0(max)	0.24
17	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ -B	45(max)	2.8
18	Total Ammonia	mg/l	IS 3025(Part-34)1988RA2019	0.5(max)	<0.3
19	Free Residual Chlorine	mg/l	IS 3025: (Part-26) 2021	0.2(min)	<0.1
20	Mineral Oil	mg/l	IS 3025(Part-39) 2021	0.5(max)	<0.4
21	Iron as Fe	mg/l	IS 3025(Part-53)2003 RA 2019	1.0(max)	0.22
22	Hexavalent Chromium as Cr ⁺⁶	mg/l	IS 3025(Part-52)2003 RA 2019	----	<0.01



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Report No: GTEEPL/06/22/GW/148F

23	Phosphate as PO ₄	mg/l	APHA 23 rd Ed (4500-P-D): 2017	----	<0.1
24	Silica	mg/l	APHA 23 rd Ed (4500-SiO ₂ -C): 2017	-----	<0.4
25	Sodium as Na	mg/l	IS 3025: (Part-45) 1993 RA 2019	-----	13.6
26	Potassium as K	mg/l	IS 3025: (Part-45) 1993 RA 2019	-----	3.7
27	Total Chromium as	mg/l	IS 3025(Part-52) 2003 RA 2009	0.05(max)	<0.01
28	Phenolic Compounds as C ₆ H ₅ OH	mg/l	IS 3025(Part-43)1992 RA 2019	0.001 (max)	<0.001
29	Sulphide as H ₂ S	mg/l	IS 3025(Part-29)1986 RA 2019	0.05(max)	<0.05
30	Aluminium as Al	mg/l	IS 3025(Part-55)2003 RA 2019	0.03 (max)	<0.02
31	Boron as B	mg/l	IS 3025(Part-57)2005 RA 2017	0.5 (max)	<0.1
32	Cyanide as CN	mg/l	IS 3025(Part-27)1986 RA 2019	0.05(max.)	<0.01
33	Arsenic as As	mg/l	IS 3025(Part-37)1988 RA 2019	0.01(max)	<0.01
34	Copper as Cu	mg/l	IS 3025(Part-42)1992 RA 2019	0.05(max)	<0.01
35	Manganese as Mn	mg/l	IS 3025(Part-59)2006 RA 2017	0.1(max)	<0.05
36	Lead as Pb	mg/l	IS 3025(Part-47)1994 RA 2019	0.01(max)	<0.01
37	Selenium as Se	mg/l	IS 3025(Part-56)2003 RA 2019	0.01(max)	<0.001
38	Nickel	mg/l	IS 3025(Part-54)2003 RA 2019	0.02(max)	<0.01
39	Zinc as Zn	mg/l	IS 3025(Part-49)1994 RA 2019	5 (max)	<0.05
40	Cadmium as Cd	mg/l	IS 3025(Part-41)1992 RA 2019	0.003(max)	0.001
41	Mercury as Hg	mg/l	IS 3025(Part 48) 1994 RA 2009	0.001(max)	<0.001
42	Anionic detergent as MBAS	mg/l	Annex K of IS 13428	0.2(max)	<0.2
Bacteriological Quality					
43	Total Coliform Bacteria	MPN/100ml	IS 1622:1981 RA 2019	Shall not be detected in any 100 ml sample	< 2

-END OF REPORT-


Authorised Signatory
Global Tech Enviro Experts Pvt. Ltd

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GTEEPL/LQR/56
TEST REPORT


NABL ULR NO : TC101012200000148P
Report No. : GTEEPL/06/22/GW/148G
Name of the Client : Raikela Iron Ore Mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha.
Date of Sampling : 16.06.2022
Date of Testing : 18.06.2022 to 24.06.2022
Sampling Location : Tentulidihi Dug Well
Identification of Sample : Ground Water
Quantity of Sample : 1LTR X 2
Sampling procedure : GTEEPL/LSOP/09

Issnc Date: 07.07.2022 TC-10101

Date of Receiving: 17.06.2022

Sl. No.	Parameters	Unit	Testing Method	Requirement as per IS 10500:2012RA 2018	Analysis Result
Physical Parameters					
1	pH	.....	IS 3025(Part-11)1983 RA 2017	6.5 to 8.5	6.58
2	Odour	....	IS 3025(Part 5) 2018	Agreeable	Agreeable
3	Colour	Hazen	IS 3025(Part 4) 2021	5(max)	<1.0
4	Electrical Conductivity	µs/cm	IS 3025(Part-14) :2021	.....	84
5	Total Dissolved solids	mg/l	IS 3025(Part-16)1984 RA 2017	500 (max)	52
6	Total Suspended Solids	mg/l	IS 3025(Part-17):1984 RA 2017	.....	<1.0
7	Turbidity	NTU	IS 3025(Part-10)1984 RA 2017	1.0(max)	<0.5
Chemical Parameters					
8	Total Hardness as CaCO ₃	mg/l	IS 3025(Part-21)2009 RA 2019	200(max)	52
9	Calcium Hardness as CaCO ₃	mg/l	IS 3025(Part-40)1991 RA 2019	---	31.2
10	Magnesium Hardness as CaCO ₃	mg/l	IS 3025(Part-46)1994 RA 2003	-----	20.8
11	Total Alkalinity as CaCO ₃	mg/l	IS 3025(Part-23) 1986 RA 2019	200(max)	32
12	Calcium as Ca	mg/l	IS 3025 (Part-40) 1991 RA 2019 *	75(max)	12.51
13	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	5.05
14	Chloride as Cl	mg/l	IS 3025(Part-32)1988 RA 2019	250(max)	12
15	Sulphate as SO ₄	mg/l	IS 3025(Part-24)1986 RA 2019	200(max)	19.2
16	Fluoride as F	mg/l	APHA F 4500 C-D	1.0(max)	0.26
17	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ -B	45(max)	2.6
18	Total Ammonia	mg/l	IS 3025(Part-34)1988RA2019	0.5(max)	<0.3
19	Free Residual Chlorine	mg/l	IS 3025: (Part-26) 2021	0.2(min)	<0.1
20	Mineral Oil	mg/l	IS 3025(Part-39) 2021	0.5(max)	0.3
21	Iron as Fe	mg/l	IS 3025(Part-53)2003 RA 2019	1.0(max)	0.25
22	Hexavalent Chromium as Cr ⁺⁶	mg/l	IS 3025(Part-52)2003 RA 2019	----	<0.01



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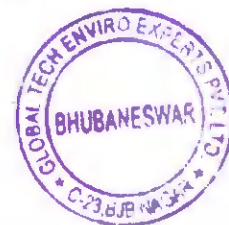
Report No: GTEEPL/06/22/GW/148G

23	Phosphate as PO ₄	mg/l	APHA 23 rd Ed (4500-P-D): 2017	----	<0.1
24	Silica	mg/l	APHA 23 rd Ed (4500-SiO ₂ -C): 2017	-----	<0.4
25	Sodium as Na	mg/l	IS 3025: (Part-45) 1993 RA 2019	-----	10.1
26	Potassium as K	mg/l	IS 3025: (Part-45) 1993 RA 2019	-----	4.1
27	Total Chromium as	mg/l	IS 3025(Part-52) 2003 RA 2009	0.05(max)	<0.01
28	Phenolic Compounds as C ₆ H ₅ OH	mg/l	IS 3025(Part-43)1992 RA 2019	0.001 (max)	<0.001
29	Sulphide as H ₂ S	mg/l	IS 3025(Part-29)1986 RA 2019	0.05(max)	<0.05
30	Aluminium as Al	mg/l	IS 3025(Part-55)2003 RA 2019	0.03 (max)	<0.02
31	Boron as B	mg/l	IS 3025(Part-57)2005 RA 2017	0.5 (max)	<0.1
32	Cyanide as CN	mg/l	IS 3025(Part-27)1986 RA 2019	0.05(max.)	<0.01
33	Arsenic as As	mg/l	IS 3025(Part-37)1988 RA 2019	0.01(max)	<0.01
34	Copper as Cu	mg/l	IS 3025(Part-42)1992 RA 2019	0.05(max)	<0.01
35	Manganese as Mn	mg/l	IS 3025(Part-59)2006 RA 2017	0.1(max)	<0.05
36	Lead as Pb	mg/l	IS 3025(Part-47)1994 RA 2019	0.01(max)	<0.01
37	Selenium as Se	mg/l	IS 3025(Part-56)2003 RA 2019	0.01(max)	<0.001
38	Nickel	mg/l	IS 3025(Part-54)2003 RA 2019	0.02(max)	<0.01
39	Zinc as Zn	mg/l	IS 3025(Part-49)1994 RA 2019	5 (max)	0.05
40	Cadmium as Cd	mg/l	IS 3025(Part-41)1992 RA 2019	0.003(max)	0.001
41	Mercury as Hg	mg/l	IS 3025(Part 48) 1994 RA 2009	0.001(max)	<0.001
42	Anionic detergent as MBAS	mg/l	Annex K of IS 13428	0.2(max)	<0.2
Bacteriological Quality					
43	Total Coliform Bacteria	MPN/100ml	IS 1622:1981 RA 2019	Shall not be detected in any 100 ml sample	< 2

-END OF REPORT-

Authorised Signatory
Global Tech Enviro Experts Pvt. Ltd

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GTEEPL/LQR/56

TEST REPORT



NABL ULR NO : TC1010122000000203P
Report No. : GTEEPL/09/22/GW/203F
Name of the Client : Raikela Iron Ore Mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha,
Date of Sampling : 06.09.2022
Date of Testing : 08.09.2022 to 14.09.2022
Sampling Location : Office Bore Well (Inside Mines Office)
Identification of Sample : Ground Water
Quantity of Sample : 1LTR X 2
Sampling procedure : GTEEPL/LSOP/09

Issue Date: 07.10.2022

TC-10101

Date of Receiving: 07.09.2022

Sl. No.	Parameters	Unit	Testing Method	Requirement as per IS 10500:2012RA 2018	Analysis Result
Physical Parameters					
1	pH	.....	IS 3025(Part-11)1983 RA 2017	6.5 to 8.5	6.57
2	Odour	....	IS 3025(Part 5) 2018	Agreeable	Agreeable
3	Colour	Hazen	IS 3025(Part 4) 2021	5(max)	<1.0
4	Electrical Conductivity	µs/cm	IS 3025(Part-14) :2021	.....	190
5	Total Dissolved solids	mg/l	IS 3025(Part-16)1984 RA 2017	500 (max)	113
6	Total Suspended Solids	mg/l	IS 3025(Part-17):1984 RA 2017	.....	<1.0
7	Turbidity	NTU	IS 3025(Part-10)1984 RA 2017	1.0(max)	<0.5
Chemical Parameters					
8	Total Hardness as CaCO ₃	mg/l	IS 3025(Part-21)2009 RA 2019	200(max)	62.8
9	Calcium Hardness as CaCO ₃	mg/l	IS 3025(Part-40)1991 RA 2019	---	40.2
10	Magnesium Hardness as CaCO ₃	mg/l	IS 3025(Part-46)1994 RA 2003	-----	22.6
11	Total Alkalinity as CaCO ₃	mg/l	IS 3025(Part-23) 1986 RA 2019	200(max)	46.4
12	Calcium as Ca	mg/l	IS 3025 (Part-40) 1991 RA 2019	75(max)	16.12
13	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	5.49
14	Chloride as Cl	mg/l	IS 3025(Part-32)1988 RA 2019	250(max)	9.8
15	Sulphate as SO ₄	mg/l	IS 3025(Part-24)1986 RA 2019	200(max)	2.1
16	Fluoride as F	mg/l	APHA F 4500 C-D	1.0(max)	0.34
17	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ -B	45(max)	1.4
18	Total Ammonia	mg/l	IS 3025(Part-34)1988RA2019	0.5(max)	<0.3
19	Free Residual Chlorine	mg/l	IS 3025: (Part-26) 2021	0.2(min)	<0.1
20	Mineral Oil	mg/l	IS 3025(Part-39) 2021	0.5(max)	<0.4
21	Iron as Fe	mg/l	IS 3025(Part-53)2003 RA 2019	1.0(max)	0.45
22	Hexavalent Chromium as Cr ⁶⁺	mg/l	IS 3025(Part-52)2003 RA 2019	---	<0.01



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Report No: GTEEPL/0/22/GW/203F

23	Phosphate as PO ₄	mg/l	APHA 23 rd Ed (4500-P-D): 2017	---	<0.05
24	Silica	mg/l	APHA 23 rd Ed (4500-SiO ₂ -C): 2017	----	0.3
25	Sodium as Na	mg/l	IS 3025: (Part-45) 1993 RA 2019	----	18.6
26	Potassium as K	mg/l	IS 3025: (Part-45) 1993 RA 2019	-----	4.9
27	Total Chromium as	mg/l	IS 3025(Part-52) 2003 RA 2009	0.05(max)	<0.01
28	Phenolic Compounds as C ₆ H ₅ OH	mg/l	IS 3025(Part-43)1992 RA 2019	0.001 (max)	<0.001
29	Sulphide as H ₂ S	mg/l	IS 3025(Part-29)1986 RA 2019	0.05(max)	<0.05
30	Aluminium as Al	mg/l	IS 3025(Part-55)2003 RA 2019	0.03 (max)	<0.02
31	Boron as B	mg/l	IS 3025(Part-57)2005 RA 2017	0.5 (max)	<0.1
32	Cyanide as CN	mg/l	IS 3025(Part-27)1986 RA 2019	0.05(max.)	<0.01
33	Arsenic as As	mg/l	IS 3025(Part-37)1988 RA 2019	0.01(max)	<0.01
34	Copper as Cu	mg/l	IS 3025(Part-42)1992 RA 2019	0.05(max)	<0.01
35	Manganese as Mn	mg/l	IS 3025(Part-59)2006 RA 2017	0.1(max)	<0.05
36	Lead as Pb	mg/l	IS 3025(Part-47)1994 RA 2019	0.01(max)	<0.01
37	Selenium as Se	mg/l	IS 3025(Part-56)2003 RA 2019	0.01(max)	<0.001
38	Nickel	mg/l	IS 3025(Part-54)2003 RA 2019	0.02(max)	<0.01
39	Zinc as Zn	mg/l	IS 3025(Part-49)1994 RA 2019	5 (max)	0.06
40	Cadmium as Cd	mg/l	IS 3025(Part-41)1992 RA 2019	0.003(max)	0.001
41	Mercury as Hg	mg/l	IS 3025(Part 48) 1994 RA 2009	0.001(max)	<0.001
42	Anionic detergent as MBAS	mg/l	Annex K of IS 13428	0.2(max)	<0.2
Bacteriological Quality					
43	Total Coliform Bacteria	MPN/100ml	IS 1622:1981 RA 2019	Shall not be detected in any 100 ml sample	< 2

-END OF REPORT-

Authorised Signatory
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GTEEPL/LQR/56

TEST REPORT



NABL ULR NO : TC1010122000000203P
Report No. : GTEEPL/09/22/GW/203G
Name of the Client : Raikela Iron Ore Mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha,
Date of Sampling : 06.09.2022
Date of Testing : 08.09.2022 to 14.09.2022
Sampling Location : Tensa Tube Well
Identification of Sample : Ground Water
Quantity of Sample : 1LTR X 2
Sampling procedure : GTEEPL/LSOP/09

Issue Date: 07.10.2022 TC-10101

Date of Receiving: 07.09.2022

Sl. No.	Parameters	Unit	Testing Method	Requirement as per IS 10500:2012 RA 2018	Analysis Result
Physical Parameters					
1	pH	.....	IS 3025(Part-11)1983 RA 2017	6.5 to 8.5	6.81
2	Odour	.....	IS 3025(Part 5) 2018	Agreeable	Agreeable
3	Colour	Hazen	IS 3025(Part 4) 2021	5(max)	<1.0
4	Electrical Conductivity	µs/cm	IS 3025(Part-14) :2021	.....	178
5	Total Dissolved solids	mg/l	IS 3025(Part-16)1984 RA 2017	500 (max)	104
6	Total Suspended Solids	mg/l	IS 3025(Part-17):1984 RA 2017	.....	<1.0
7	Turbidity	NTU	IS 3025(Part-10)1984 RA 2017	1.0(max)	<0.5
Chemical Parameters					
8	Total Hardness as CaCO ₃	mg/l	IS 3025(Part-21)2009 RA 2019	200(max)	54.6
9	Calcium Hardness as CaCO ₃	mg/l	IS 3025(Part-40)1991 RA 2019	---	36.7
10	Magnesium Hardness as CaCO ₃	mg/l	IS 3025(Part-46)1994 RA 2003	-----	17.9
11	Total Alkalinity as CaCO ₃	mg/l	IS 3025(Part-23) 1986 RA 2019	200(max)	41.8
12	Calcium as Ca	mg/l	IS 3025 (Part-40) 1991 RA 2019	75(max)	14.72
13	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	4.35
14	Chloride as Cl	mg/l	IS 3025(Part-32)1988 RA 2019	250(max)	22.2
15	Sulphate as SO ₄	mg/l	IS 3025(Part-24)1986 RA 2019	200(max)	16.8
16	Fluoride as F	mg/l	APHA F 4500 C-D	1.0(max)	0.39
17	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ -B	45(max)	3.7
18	Total Ammonia	mg/l	IS 3025(Part-34)1988RA2019	0.5(max)	<0.3
19	Free Residual Chlorine	mg/l	IS 3025: (Part-26) 2021	0.2(min).	<0.1
20	Mineral Oil	mg/l	IS 3025(Part-39) 2021	0.5(max)	<0.4
21	Iron as Fe	mg/l	IS 3025(Part-53)2003 RA 2019	1.0(max)	0.58
22	Hexavalent Chromium as Cr ⁺⁶	mg/l	IS 3025(Part-52)2003 RA 2019	----	<0.01



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Report No: GTEEPL/09/22/GW/203G

23	Phosphate as PO ₄	mg/l	APHA 23 rd Ed (4500-P-D): 2017	---	<0.1
24	Silica	mg/l	APHA 23 rd Ed (4500-SiO ₂ -C): 2017	-----	<0.4
25	Sodium as Na	mg/l	IS 3025: (Part-45) 1993 RA 2019	-----	18.6
26	Potassium as K	mg/l	IS 3025: (Part-45) 1993 RA 2019	-----	6.2
27	Total Chromium as	mg/l	IS 3025(Part-52) 2003 RA 2009	0.05(max)	<0.01
28	Phenolic Compounds as C ₆ H ₅ OH	mg/l	IS 3025(Part-43)1992 RA 2019	0.001 (max)	<0.001
29	Sulphide as H ₂ S	mg/l	IS 3025(Part-29)1986 RA 2019	0.05(max)	<0.05
30	Aluminium as Al	mg/l	IS 3025(Part-55)2003 RA 2019	0.03 (max)	<0.02
31	Boron as B	mg/l	IS 3025(Part-57)2005 RA 2017	0.5 (max)	<0.1
32	Cyanide as CN	mg/l	IS 3025(Part-27)1986 RA 2019	0.05(max.)	<0.01
33	Arsenic as As	mg/l	IS 3025(Part-37)1988 RA 2019	0.01(max)	<0.01
34	Copper as Cu	mg/l	IS 3025(Part-42)1992 RA 2019	0.05(max)	<0.01
35	Manganese as Mn	mg/l	IS 3025(Part-59)2006 RA 2017	0.1(max)	<0.05
36	Lead as Pb	mg/l	IS 3025(Part-47)1994 RA 2019	0.01(max)	<0.01
37	Selenium as Se	mg/l	IS 3025(Part-56)2003 RA 2019	0.01(max)	<0.001
38	Nickel	mg/l	IS 3025(Part-54)2003 RA 2019	0.02(max)	<0.01
39	Zinc as Zn	mg/l	IS 3025(Part-49)1994 RA 2019	5 (max)	0.05
40	Cadmium as Cd	mg/l	IS 3025(Part-41)1992 RA 2019	0.003(max)	0.001
41	Mercury as Hg	mg/l	IS 3025(Part 48) 1994 RA 2009	0.001(max)	<0.001
42	Anionic detergent as MBAS	mg/l	Annex K of IS 13428	0.2(max)	<0.2

Bacteriological Quality

43	Total Coliform Bacteria	MPN/100ml	IS 1622:1981 RA 2019	Shall not be detected in any 100 ml sample	< 2
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-END OF REPORT-


Authorized Signatory
Global Tech Enviro Experts Pvt. Ltd

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GTEEPL/LQR/56

TEST REPORT



NABL ULR NO : TC1010122000000203P
Report No. : GTEEPL/09/22/GW/203H
Name of the Client : Raikela Iron Ore Mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarb, Odisha,
Date of Sampling : 06.09.2022
Date of Testing : 08.09.2022 to 14.09.2022
Sampling Location : Tentulidibi Dug Well
Identification of Sample : Ground Water
Quantity of Sample : 1LTR X 2
Sampling procedure : GTEEPL/LSOP/09

Issue Date: 07.10.2022

TC-10101

Date of Receiving: 07.09.2022

Sl. No.	Parameters	Unit	Testing Method	Requirement as per IS 10500:2012RA 2018	Analysis Result
Physical Parameters					
1	pH	.....	IS 3025(Part-11)1983 RA 2017	6.5 to 8.5	6.58
2	Odour	....	IS 3025(Part 5) 2018	Agreeable	Agreeable
3	Colour	Hazen	IS 3025(Part 4) 2021	5(max)	<1.0
4	Electrical Conductivity	µs/cm	IS 3025(Part-14) :2021	.....	95
5	Total Dissolved solids	mg/l	IS 3025(Part-16)1984 RA 2017	500 (max)	57
6	Total Suspended Solids	mg/l	IS 3025(Part-17):1984 RA 2017	.....	<1.0
7	Turbidity	NTU	IS 3025(Part-10)1984 RA 2017	1.0(max)	<0.5
Chemical Parameters					
8	Total Hardness as CaCO ₃	mg/l	IS 3025(Part-21)2009 RA 2019	200(max)	45.6
9	Calcium Hardness as CaCO ₃	mg/l	IS 3025(Part-40)1991 RA 2019	---	29.6
10	Magnesium Hardness as CaCO ₃	mg/l	IS 3025(Part-46)1994 RA 2003	----	15
11	Total Alkalinity as CaCO ₃	mg/l	IS 3025(Part-23) 1986 RA 2019	200(max)	28.4
12	Calcium as Ca	mg/l	IS 3025 (Part-40) 1991 RA 2019	75(max)	11.87
13	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	3.65
14	Chloride as Cl	mg/l	IS 3025(Part-32)1988 RA 2019	250(max)	11.9
15	Sulphate as SO ₄	mg/l	IS 3025(Part-24)1986 RA 2019	200(max)	26.2
16	Fluoride as F	mg/l	APHA F 4500 C-D	1.0(max)	0.17
17	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ -B	45(max)	4.5
18	Total Ammonia	mg/l	IS 3025(Part-34)1988RA2019	0.5(max).	<0.3
19	Free Residual Chlorine	mg/l	IS 3025: (Part-26) 2021	0.2(min)	<0.1
20	Mineral Oil	mg/l	IS 3025(Part-39) 2021	0.5(max)	0.3
21	Iron as Fe	mg/l	IS 3025(Part-53)2003 RA 2019	1.0(max)	0.21
22	Hexavalent Chromium as Cr ⁺⁶	mg/l	IS 3025(Part-52)2003 RA 2019	---	<0.01



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Report No: GTEEPL/09/22/GW/203H

23	Phosphate as PO ₄	mg/l	APHA 23 rd Ed (4500-P-D): 2017	----	0.05
24	Silica	mg/l	APHA 23 rd Ed (4500-SiO ₂ -C): 2017	-----	<0.4
25	Sodium as Na	mg/l	IS 3025: (Part-45) 1993 RA 2019	----	13.7
26	Potassium as K	mg/l	IS 3025: (Part-45) 1993 RA 2019	-----	3.8
27	Total Chromium as	mg/l	IS 3025(Part-52) 2003 RA 2009	0.05(max)	<0.01
28	Phenolic Compounds as C ₆ H ₅ OH	mg/l	IS 3025(Part-43)1992 RA 2019	0.001 (max)	<0.001
29	Sulphide as H ₂ S	mg/l	IS 3025(Part-29)1986 RA 2019	0.05(max)	<0.05
30	Aluminium as Al	mg/l	IS 3025(Part-55)2003 RA 2019	0.03 (max)	<0.02
31	Boron as B	mg/l	IS 3025(Part-57)2005 RA 2017	0.5 (max)	<0.1
32	Cyanide as CN	mg/l	IS 3025(Part-27)1986 RA 2019	0.05(max.)	<0.01
33	Arsenic as As	mg/l	IS 3025(Part-37)1988 RA 2019	0.01(max)	<0.01
34	Copper as Cu	mg/l	IS 3025(Part-42)1992 RA 2019	0.05(max)	<0.01
35	Manganese as Mn	mg/l	IS 3025(Part-59)2006 RA 2017	0.1(max)	<0.05
36	Lead as Pb	mg/l	IS 3025(Part-47)1994 RA 2019	0.01(max)	<0.01
37	Selenium as Se	mg/l	IS 3025(Part-56)2003 RA 2019	0.01(max)	<0.001
38	Nickel	mg/l	IS 3025(Part-54)2003 RA 2019	0.02(max)	<0.01*
39	Zinc as Zn	mg/l	IS 3025(Part-49)1994 RA 2019	5 (max)	<0.05
40	Cadmium as Cd	mg/l	IS 3025(Part-41)1992 RA 2019	0.003(max)	0.001
41	Mercury as Hg	mg/l	IS 3025(Part 48) 1994 RA 2009	0.001(max)	<0.001
42	Anionic detergent as MBAS	mg/l	Annex K of IS 13428	0.2(max)	<0.2
Bacteriological Quality					
43	Total Coliform Bacteria	MPN/100ml	IS 1622:1981 RA 2019	Shall not be detected in any 100 ml sample	< 2

-END OF REPORT-



Authorised Signatory
Global Tech Enviro Experts Pvt. Ltd

- N.B.:
- ① The results relate to the sample received in respect to the Parameters tested.
 - ② Liability for return of sample ceases after 15 days from the date of Test certificate.
 - ③ The report cannot be reproduced either in full or in part, without prior written consent of Director.
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ଓଡ଼ିଶା ଗୌରୀ ଓଡ଼ିଶା

Regd. No.-7731/2009
Mob:-9881006174

50AA 503244

AFFIDAVIT

I, Srinibash Sahoo, S/o Sri Duhsahsan Sahoo, aged about 60 years, presently the Managing Partner of M/s. Geetarani Mohanty, Raikela Iron Ore Mines, a partnership firm duly registered under the Indian Partnership Act, 1932 having its registered office at Station Road Barbil, do hereby solemnly affirm and state as under:

1. That M/s. Geetarani Mohanty is the Lessee of the Mining Lease bearing ML No. 666 for Iron Ore over an area of 67.586 Ha. in the Village Raikela, Taluka - Koira in the district of Sundergarh, Orissa with a production capacity of 0.864 Metric Tonnes per Annum [in short MTPA] .
2. That M/s. Geetarani Mohanty has submitted a proposal before the competent authority for grant of Environment Clearance for enhancement of iron ore production capacity from 0.864 MTPA to 2.99 MTPA along with crushing and screening facility over the mining lease hold area [Hereinafter the Project Proponent].



(Signature)

20803
11.9.20

M/S Geetarani Mahur

Station Road

Darbaj

Kaeribh



CDS

J. BARAL
STAMP VENDOR
S.R. Khandagiri, BBSR

Chaturbhuja Palei

Jagyneshwar Acharya
Notary, Govt. Of India
Odisha, BBSR, Dist-Khorda
Regd. No-7791/2009
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3. That as per the recommendation of the State Expert Appraisal Committee, Odisha, the Project Proponent has to submit a standard operating procedure [in short 'SOP'] for de-silting at buffer zone and beyond including nearby nala/river perennially periodically and perpetually caused to wash up off mineral/OB/Dumps through an Affidavit.
4. That the SOP as drawn by the Project Proponent is Annexed herewith and the same to be read as part and parcel of this Affidavit.
5. That all the facts, figures and informations as stated in the said SOP is true to the best of my knowledge and belief and are based on records.

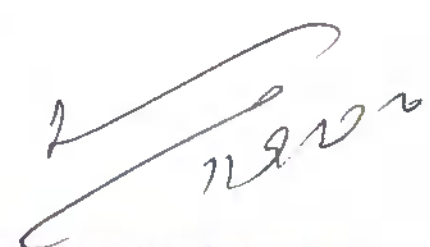

DEPONENT

identified By:

IDENTIFIED BY ME


ADVOCATE BBSR
ADVOCATE




Jagyneshwar Acharya
Notary, Govt. Of India
Odisha, BBSR, Dist-Khorda
Regd. No-7791/2009
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STANDARD OPERATING PROCEDURE FOR DE-SILTING WORK AT BUFFER ZONE AND BEYOND INCLUDING NEARBY NALA/RIVER PERENNIALY PERIODICALLY AND PERPETUALLY CAUSED TO WASH UP OFF MINERALS/OB/DUMPS THROUGH A LEGAL AFFIDAVIT.

Introduction

In Raikela hill ranges 6nos of mines existing and out of which four mines are in operation.

The details of Leases in this region are furnished below:

1. Raikela Iron ore Mine, M/s Geetarani Mohanty
2. Raikela Iron ore Mine, M/s Penguin Trading Agency.
3. Raikela and Tantra Iron ore Mine, M/s Jindal Steel and Power Ltd.
4. Raikela Iron ore Mine, M/s National Enterprises.
5. Raikela Iron ore Mine, C.P.Sharma.
6. Raikela Iron ore Mines, S.N.Mohanty.

Out of which, 1st four mines are operating. Topographically, the mines are at higher elevation and in the North eastern part of the leases there is existence of Agricultural field of local villagers.

The location of the Agricultural field from the ML boundary is furnished below:

Most of the agricultural fields are located in the north eastern part of the lease area. These fields are located in the buffer zone at a distance of 2.5 km from the lease area.

There is no perennial nala within the core zone. In the Buffer zone Sarkunda Nala, Kuradhi Nala and Karo Nala are flowing. **The location of Nalas with respect to the ML boundary area as follows:**

Sarkunda Nala	-	4.2 km in South
Kuradhi Nadi	-	8.0 km in North West
Karo Nala	-	6.8 km in the North

Precautionary Measures

During flow of rain water, it may carry silts, clay or lateritic soil towards downhill side. Therefore, it's very much necessary to prevent these wash offs from these mines from spreading over the agricultural field. Wash off / runoff of mine workings, waste dumps, ore stock piles, during monsoon may carry the silt / ore residues and pollute the nearby nallah / streams, lands if it is let-out as such. To prevent such siltation effect, effective surfaces runoff management scheme are being devised and implemented.

Responsibility for effective run off Management

As explained above, it is the prime responsibility of the all the mine owners to make effective run off management to control the wash offs from each mines. Along with



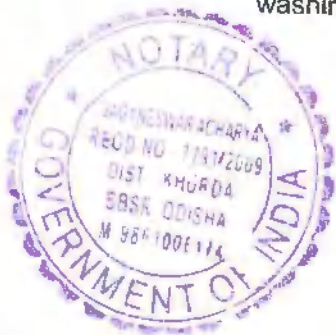
other mine owner, M/s Geetarani Mohanty is also doing all the precautionary measures to prevent wash offs from the mines to buffer zone. Further, M/s Geetarani Mohanty, is committed to make necessary arrangement to prevent the wash offs by creating retaining wall followed by garland drain with settling ponds at strategic location. Garland drains & retaining walls have been constructed all around the dumps and plantation of native species has been carried out on the dump slopes to minimize erosion. A settling pond has been constructed to arrest silt and sediment flows from mining operations and the water so collected is being utilized for the mine area, roads, green belt development etc. The drains are regularly de-silted and maintained. M/s Geetarani Mohanty is and will be committed to do the de-silting work at regular interval.

Details of existing surface runoff management structures within core zone

Location	Retaining wall			Garland drain			Settling pond			
	L(m)	W(m)	H(m)	L(m)	W(m)	H(m)	Nos	L(m)	W(m)	H(m)
Waste dump	300	1.0	2.0	435	1.0	1.5	1	10	8	2
Existing Stack	130	1.0	2.0	362	1.0	1.5	-	-	-	-
Proposed Stack-I	465	1.0	2.0	464	1.0	1.5	1	10	8	2
Proposed Stack-II	285	1.0	2.0	284	1.0	1.5	1	10	8	2
Proposed Stack-III	-	-	-	525	1.0	1.5	1	10	8	2
Total	1180	1.0	2.0	2070	1.0	1.5	4	10	8	2

The following mitigative measures are and will be implemented to prevent run-off of water & flow of sediments directly into the nearby water bodies, land and control water environment in the area.

- Dozing and levelling of inactive waste dumps.
- Providing dump tops with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion arising out of uncontrolled descent of water.
- Proper terracing of the OB dumps and covering with Geo textile mat.
- Planting native tree species on the dump tops and slopes with grasses and shrubs to arrest and prevent erosion.
- Construction of garland drains of suitable size around mine area and dump with proper gradients to prevent rain water descent into active mine area.
- Settling ponds are & will be made to prevent flow of fine particles from OB / Waste dumps, check dams, parapet/retaining walls & garlanded drains.
- The garland drains connected to settling tank to collect surface runoff, mine water and arrest siltation.
- Usage of stored water in the settling ponds for watering of haul roads, vehicle washing and green belt development etc.



- De-silting of the garland drains & settling ponds are being & will be carried out at regular intervals. *
- Maintenance of all the runoff management structures

Procedure for Desilting in agricultural field and Nala

M/s Geetarani Mohanty will adopt a Standard Procedure to make de-silting work both in core zone and buffer zone (agricultural field) as well as nala within the buffer zone by using environmentally sound practices that are cost effective and safe for desilting and dredging the fields. The details of standard operating procedure for the de-silting work at buffer zone especially at Agricultural field will be as follows:

(1) Objective/purpose

The main objective of the desilting work in the agricultural field is that to remove the silts, clay other non-fertile material came from the mines, waste dump, mineral stack so that the productivity of agricultural land will be more which will help directly to the surrounding local farmers. In the similar way, de-silting of nala will be undertaken once in a year.

(2) Scope

Engagement of machine/excavator and manpower for dredging the spread silts, clay and other non-fertile material over the agricultural field. The dredged material will be transported to the Waste dump through Tractor. De-silting of nala within buffer zone will be undertaken by engaging high capacity excavator. The material from nala will be sent for making bund both side of nala. Grass patching will be done both side of nala.

(3) Responsibility

Overall responsibility lies on owner. But in the field the Mines Manager will take care the job by out sourcing the agency for dredging the wash offs.

4) Procedure to be adopted for removal of silts in the buffer zone from agricultural field and nala:

- (a) Measurement of thickness of material (silt/clay/lateritic soil) spread over the agricultural field and nala.
- (b) If the thickness is more then, small size excavator will be utilised for digging.
- (c) After digging of the deleterious material from the field and nala the said material will be transported through tractors/tippers and disposed of at a purchased valley area or can be utilised for road construction or making bund.
- (d) The project proponent will purchase compost, cow dung and farmyard manures to the cleaned up agricultural land with an aim to enhance the organic content thereby facilitating better agricultural production. The same will be provided to the farmers for spreading over the agricultural field. The project proponent will help the farmers for spreading the same.



Costing

Sl No	Particulars	Cost(in Rs) per annum
1	Deployment of Excavator	1,00,000
2	Deployment of Tractors/tippers	50,000
3	Purchase of manures	50,000
4	Engagement of Labour	30,000
5	Miscellaneous Expenditure	20,000
Total		2,50,000

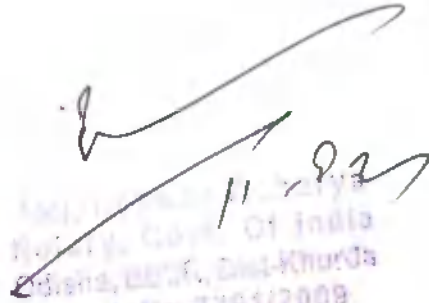
Conclusion

M/s Geetarani Mohanty do the de-silting of nata and agricultural field along with other Mine owner for the benefit of surrounding villagers. Necessary arrangement for development of agriculture will be done continually within the surrounding villagers as a part of CSR activity.

M/s Geetarani Mohanty

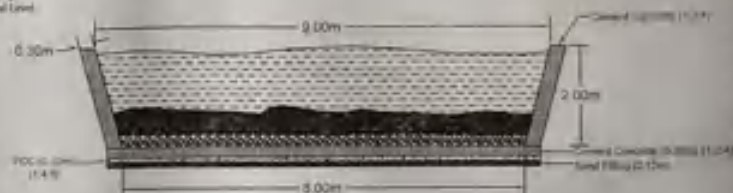
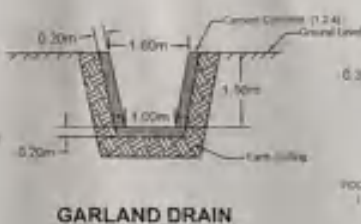
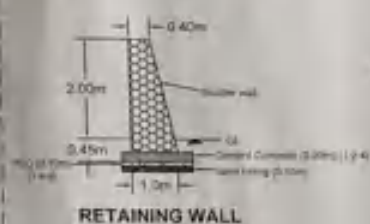
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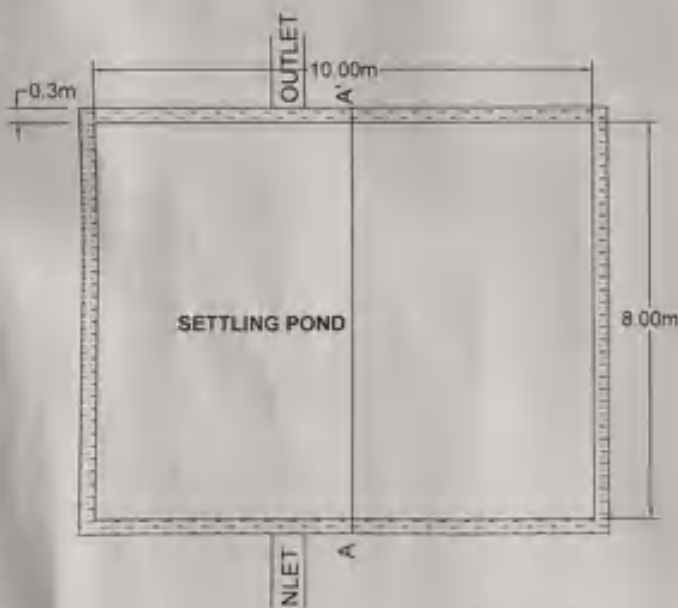

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ANNEXIRE X

RAIKELA IRON ORE MINES OF M/S GEETARANI MOHANTY DETAIL DESIGN OF RETAINING WALL, GARLAND DRAIN AND SETTLING POND SCALE:- 1:100



SETTLING POND SECTION ALONG AA'



INDEX

- Boulder Wall
- Cement Concrete
- PCC
- Sand filling
- Boulder
- Silt
- Water



STRUCTURAL ENGINEER
N K. PARIDA

SIGNATURE

REPORT

On

Water Audit Study

At

**M/S GEETARANI MOHANTY RAIKELA
MINES**

Odisha

by



Resource Conservation & Management Division
Federation of Indian Chambers of Commerce and Industry
Federation House, Tansen Marg, New Delhi – 110 001

(December 2021)



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ACKNOWLEDGEMENT

Federation of Indian Chambers of Commerce & Industry (FICCI) places on record its sincere thanks to **M/S GEETARANI MOHANTY RAIKELA MINES**, ODISHA for entrusting the task of conducting Resource Audit for “Water Audit Study” as per CGWA guidelines at M/S GEETARANI MOHANTY RAIKELA MINES Odisha during October 2021.

‘We hereby express our sincere thanks to **Mr Srinibash Sahoo , Mr Ajit Ratha., Miss Sonal Sahoo, Mr Sunit Patel. Mr B.B Sahoo and Mr Pradeept Mohapatra**, of **M/S GEETARANI MOHANTY RAIKELA MINES Odisha** , for their proactive support and courtesy extended to the FICCI team during field study. We also thank other officials from **M/S GEETARANI MOHANTY RAIKELA MINES Odisha** for their cooperation and support provided during data collection. We are also grateful to all those we interacted with during the audit who gave us some operational insights.

MA Patil

Sr. Director

RCM Group, FICCI

New Delhi

PROJECT TEAM MEMBERS

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- ❖ **Karishma Bist, Additional Director**
- ❖ **Pushpendra Nayak, Joint Director**
- ❖ **Pankaj Dhote, Sr. Associate**
- ❖ **Mandar Agnihotri, Sr. Associate**

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ABBREVIATIONS

ETP	:	Effluent Treatment Plant
kW	:	Kilo Watt
kWh	:	Kilo Watt hour
lpcd	:	litres per capita per day
lpm	:	litres per minute
OHT	:	Overhead Tank
RWH	:	Rainwater Harvesting
RO	:	Reverse Osmosis
SWC	:	Specific Water Consumption

EXECUTIVE SUMMARY

FICCI has conducted a detailed Water Audit Study of the M/S GEETARANI MOHANTY RAIKELA MINES Odisha during October 2021. The study estimated that the total Water use by the mines is about 288 m³/day out of which about 48 % is fresh water and 11 % is recycled water. The main source of freshwater is supplied from groundwater by bore well. The plant consumes about 185m³ of groundwater as per 2020-21. The main water sources and their uses are given in Table below.

Table A: Details of Water Sourcing

S.No.	Source of Water	m ³ /day
1	Bore well Water	180.0
2	Rain water harvesting pond	88.0
2	STP Treated water	13.7
3	ETP Water	6.1
		288.0

The water is mainly used for Road Sprinkling for dust separation, Canteen domestic, Horticulture, Vehicle washing etc. The main water uses area are given in

The total wastewater generation in the plant is about 19.8m³/day, out of which about 11% (7.2m³/day) wastewater generated from Domestic and 4% (19m³/day) wastewater generated from vehicle wash. The breakup of wastewater generation from different sections is provided in below table. The detailed Water balance is discussed in the subsequent chapter.

Table C: Major Wastewater generating areas

S. No.	Major Sections	Wastewater discharged (m ³ /day)	Recycled/Discharge	(m ³ /day)
1	Domestic Use	19.5	Reused in Green Belt	8.2
2	Vehicle Wash	7.2	Reuse in dust suppression	11.5
	Total	26.7		19.7

Water Management Summary

Table 1 : Fact File of Raikela Iron ore mines of M/S GEETARANI MOHANTY

Plant Name and Location	Raikela Iron ore mines of M/S GEETARANI MOHANTY
Plant zone	Safe Zone
Depth of ground water table	91 meter
Type of products	Ore Extraction/Mining
No. of working days/year	300
Annual Production (2020 - Feb 2021)	-
Major Water Usage Area in the Plant	Road Sprinkling for dust separation, Canteen domestic, Horticulture, Vehicle washing etc.
Main Source of Freshwater and sourcing cost (Rs/m3)	Bore well- 180 m3/day & water cost rate Rs 1.00 /m3
Total annual Fresh Water consumption (2020-Feb21)	Bore well: 64010 m3/year
Total Water Use (Fresh water, Recycled RO Reject Water, CETP Treated Water) for Plant	❖ Fresh Bore well water – 120 m3/day ❖ Recycled use of treated water STP – 24 m3/day
Cost of Water at various water use areas	❖ Average Rate of abstraction of bore well water- Rs 1/ m3 ❖ Cost of water used for domestic use – Rs1/ m3 ❖ Cost of STP Treated water- Rs 3.55/ m3 ❖ Cost of ETP treated water- Rs 1.03/ m3
Annual water & wastewater management cost	Rs. 2.16 Lakhs/year
Average Effluent Generation in the STP and ETP generated and Reuse (m3/day)	15 m3/day in the STP & 19 m3/day in the ETP is treated
Power Supply Cost (2020-Jan21)	Rs. 6.50 kWh
Average Specific Water Consumption in M/S of Fresh water Use (2020-Jan 21)	

The water audit study of the plant has identified various water & cost saving opportunities which are discussed in the report. The summary of recommendations is given in table below. **It is estimated that by implementing FICCI suggested low & medium cost schemes; the plant can reduce its freshwater consumption.**

SUMMARY OF RECOMMENDATIONS

Sr. No	Section/Area	Recommendations
1.	Regularly calibrate & maintain existing water flow meters	It was observed that the existing bore well meter are installed and calibrated
2	Maintain logbook of daily ground water abstraction	It was observed that the plant is maintaining data of daily groundwater abstraction
3	Regular ground water quality monitoring and submission of data to CGWA:	The plant regularly checks the water quality of the Groundwater and submitting the reports to CGWA
4	Training and Awareness of the Employees at all Levels and Placing 'Water Saving' Posters/Slogans at various Locations	Mines is regularly conducting Training and Awareness of the Employees, events to promote water conservation like celebration of world water day, world environment day" and Placing 'Water Saving' Posters/Slogans at various Locations
5	Periodically conduct 'Water & Wastewater Audit'	Plant has formed a cell for assessment of potential for water & wastewater management in the plant for water saving & wastewater management.
6	Regular payment of applicable groundwater abstraction charges	The mines need to pay applicable ground water abstraction charges as per CGWA notification.
7	Ensure to comply with the NOC conditions to avoid any penalty	It is suggested that the mines should comply with the applicable NOC conditions to avoid any penalty.
8	Water Savings in the Buildings for Domestic Use	It is suggested to install following water efficient fixtures in the buildings to save domestic water consumption. Overall, 15-20% domestic water consumption
9	Install Drip Irrigation in the garden/horticulture area for efficient water use in landscaping/gardening	It is suggested that the plant should install Drip Irrigation system which is water efficient for gardening/ horticulture. The drip irrigation system will save 30-50% of water.

CHAPTER -1: INTRODUCTION

1. About the Plant: General Plant Details

Raikela iron ore mine over an area of 67.586Ha in village Raikela under Bonai Sub-Division of Sundargarh district was initially executed for a period of 20 years w.e.f. 02.07.1991 in favour of Smt. Geetarani Mohanty. The copy of the lease deed is attached as Annexure-I. On 03.02.1992 Smt. Geetarani Mohanty applied to the Government of Orissa for transfer of the mining lease in favour of the registered partnership firm i.e. M/s. Geetarani Mohanty. Government of Orissa, vide its proceeding dated 17/10/1992 accorded permission for transfer of the mining lease in favour of the partnership firm namely M/s. Geetarani Mohanty with previous approval of Govt. of India in terms of Rule 37 of the MC Rules, 1960. Transfer of Mining Lease Deed was executed on 13/01/1993 in statutory form 'O' under Rule 37 (A) of the MC Rules, 1960 by Smt. Geetarani Mohanty (individual Lessee) as Transferor with the State Govt, represented by Collector, Sundargarh, and the transferee M/s. Geetarani Mohanty, the Partnership Firm, represented by its Managing Partner Sri Srinibash Sahoo. As per the covenants of the transfer deed, after the transfer of the mining lease to the transferee, i.e., the partnership firm, the transferee became the lessee as if the lease had been granted to the transferee as the lessee there under and he had originally executed it such. (It is worth mentioning here that Smt. Geetarani Mohanty resigned from the partnership firm by tendering her resignation letter, acknowledging settlement of her books of accounts and executing a deed of retirement, thereby severing herself from all the activities of the partnership firm M/s. Geetarani Mohanty (hereinafter the lessee). The partnership firm, M/s. Geetarani Mohanty was reconstituted by induction of two new partners with the consent of Smt. Geetarani Mohanty. Since then the reconstituted partnership firm as lessee is carrying out mining operation over the lease hold area w.e.f. 01.04.1993.

The original term of mining lease was expired on 01.07.2011. Therefore, the lessee firm has filed the application on dated 20.05.2010 under Rule 24(A) (6) of M.C. Rules, 1960 before the State Government for its 1st Renewal of the Mining Lease for a period of 20 years w.e.f. 02.07.2011. (The copy of the RML application in form-J along with the Form-D is attached as Annexure-II. However, the 1st Renewal of mining lease application was pending before the State Government. In the meantime, the Mines and Minerals (Development and Regulation) Act, 1957 (in short MMDR Act, 1957) was amended by MMDR Amendment Act, 2015. It is pertinent to mention here that under section 8A(3) of the Amendment Act, 2015 the State Government in department of Steel & Mines has been pleased to extend the validity period of the mining lease up to 01.07.2041 being 50 years from the date of original mining lease i.e. from 02.07.1991 to 01.07.2041. A Copy of the said extension order dated 17.08.2015 is enclosed herewith for your kind perusal and reference as Annexure- III. It may be mentioned here that as per the order of Hon'ble Supreme Court of India in W.P (C) No. 114/2014 dated 16.05.2014 this mines was coming among the 102 non-working mining leases as Annexure R-2. As per the para 3 of the order of the Hon'ble Court. However, Hon'ble Supreme Court of India in I.A no. 110418 of 2018 filed by the lessee firm in W.P (c) No. 114 of 2014 allowed to resume the mining operation subject to compliance of all mandatory requirements vide its order dated 16.01.2019. (A copy of the order dated 16.01.2019 is enclosed herewith for your kind perusal and reference as Annexure-IV). In pursuant to the order from Hon'ble Supreme Court of State Government in department of Steel & Mines, allowed the lessee firm for resumption of mining operation subject to execution of

Supplementary Lease Deed vide no. 1763/SM, dated 08.03.2019 (A copy of the order dated 08.03.2109 is enclosed herewith for your kind perusal and reference as Annexure-V). Collector sundargarh given demand notice to lessee for stamp duty vide letter no. 112/XII-B-118/18, Dt.20.03.2019 and refer as Annexure-VI. Subsequent to the order from State Government, the Supplementary Lease Deed was executed and registered in favor of lessee vide regd. No1721900263 on dated 27.05.2019. (A copy of the Registered Supplementary Lease Deed is enclosed herewith for your kind perusal and reference as Annexure-VII). As per the Supplementary lease deed, the validity of the lease period is now extended up to 01.07.2041. Subsequently, the lessee has got the working permission from the state govt to run the Mines and the lessee has re-open the mines on 19.06.2019.

Statutory clearances

The lessee has obtained all the statutory clearances like Mining Plan approval from IBM, Forest and Environment Clearance from MoEF, Consent to Operate from SPCB. The details of statutory clearances are furnished below:

❖ Surface right obtained

Land details:

Area (hectares)	:	67.586 Ha
Details of forest land	:	66.671 Ha area is under forest as per the DLC record. 0.915 Ha is non-forest.
Ownership occupancy	:	Govt. of Odisha. Mining Lessee – M/s Geetarani Mohanty, Barbil

Out of the total ML area over 67.586Ha, surface Right over an area of 57.50Ha has been granted by the District Magistrate, Sundargarh.

❖ Forest clearance:

Out of the 67.586Ha of Mining Lease area, forest land under DLC category is 66.671Ha and 0.915Ha is non-forest land. Out of the 66.671Ha, DLC Forest land, 43.033Ha had been broken prior to 12.12.1996 and mining operation in this area was being continued. Ministry of Environment and Forest, Govt of India has accorded the Stage-II Forest Clearance over an area of 66.671Ha vide letter No. F No.8-37/2007-FC dated 22.10.2014.

❖ Environmental clearance

The State Level Environment Impact Assessment Authority, Odisha, Bhubaneswar has granted the Environmental Clearance for the production capacity of 2.99MTPA capacity vides SEIAA File No. 41890/08-MINB1/09-2019 dated 23.11.2020. The copy of the Environmental Clearance is enclosed as Annexure-XI. Further the lessee will obtain the Environmental Clearance @ of 4.99MTPA to operate the mines in the said capacity.

❖ Consent to Established form SPCB

The lessee has obtained the consent to established order under section 25 of the water (PCP) Act 1974 and under section 21 of Air (PCP) Act 1981 for the Production of 2.99MTPA (ROM) along with installation crushing and screening plant vide letter No. 8918/IND-II-CTE-6420 Dated 18.09.2020.

❖ Consent to operate from SPCB

The lessee has obtained the consent to operate under section 25/26 of the water (PCP) Act 1974 and under section 21 of Air (PCP) Act 1981 for the production capacity of 2.99MTPA vide the letter No. 875/IND-I-CON-2572 Dated 19.01.2021 and were valid up to 31.03.2022.

1. Water Conservation Initiatives taken by Plant

FICCI took up a detailed Water Audit Study at M/S GEETARANI MOHANTY RAIKELA MINES Odisha,

Table 2: Water Conservation Initiatives taken up by plant

Sr. No.	Water Conservation/Saving Measure Undertaken
❖	Installed Sewage Treatment plant for domestic water recycling
❖	Installed Effluent Treatment plant for Vehicle washing water Recycling
❖	Constructed Rain water harvesting system and reuse of water
❖	Wheel washing system
❖	Water Sprinkling System for roads

During the field study conducted by FICCI, many other water saving options were identified for Raikela Iron ore mines of M/S GEETARANI MOHANTY, Odisha which, if implemented, can lead to substantial water savings. FICCI is pleased to offer its services for conducting Water Audit Study Raikela Iron ore mines of M/S GEETARANI MOHANTY as per CGPA guidelines. FICCI's expertise in Water audit & conservation will complement the in-house efforts of Mines in conserving water, reducing wastewater generation as well as reducing operational costs.

CHAPTER -2: SCOPE OF WORK

1. Scope of Water Audit Study

The main objective of the study is to identify the water uses & water saving opportunities. Scope of work of the study includes the following:

- ❖ On-site training and discussion with facility manager and personnel
- ❖ Water system analysis and Quantification of baseline water map
- ❖ Water use Monitoring and measurements using pressure and flow meters and various other devices
- ❖ Quantification of inefficiencies and leaks in the water system
- ❖ Quantification of water quality loads and discharges
- ❖ Quantification of variability in flows and quality parameters
- ❖ Strategies for water treatment and reuse or direct use
- ❖ Development of detailed water circuit diagram and water balance of the facility
- ❖ Mapping of water quality requirement to develop 'recycle' and 'reuse' opportunities
- ❖ Developing Water consumption and wastewater generation pattern
- ❖ Estimating Specific water use and conservation potential
- ❖ Develop & Maintain monthly MIS on water extracted from borewells, water level, water quality etc.
- ❖ Calculation of Rainwater Harvesting Potential for the site and assessment of the existing structures
- ❖ Evolving Water saving opportunities with method of implementing the proposal with
- ❖ Description and figures related to water management schemes
- ❖ Investment required for water saving schemes/Cost Benefit Analysis
- ❖ Submission of water audit report & its presentation at site (if required)
- ❖ Following opportunities would also be assessed for Industries for water conservation:
 - ❖ Setting up of for water budgeting
 - ❖ Modernization of industrial process to reduce water consumption
 - ❖ Recycling water with a re-circulating cooling system
 - ❖ Ozonation cooling water approach which can result in fivefold reduction in blow down when compared to traditional chemical treatment
 - ❖ Reduction in reuse of de-ionized water by eliminating some plenum flushes, converting from a continuous flow to an intermittent flow system and improving control on the use
 - ❖ Use of wastewater for gardening
 - ❖ Proper processing of effluents to adhere to the nor M/S of disposal

CHAPTER -3: METHODOLOGY OF THE WATER AUDIT STUDY

1. Methodology followed for conducting water audit study

Step 1: Reconnaissance or Walk-through survey

- ❖ Understanding of existing water sourcing, storage and distribution facility.
- ❖ Assessing the water demand and water consumption areas/processes.
- ❖ Preparation of detailed water circuit diagram.

Step 2: Secondary Data Collection through the Discussion with mines executives, past records, Available technical literature/specifications

- ❖ Analyse historic water use and wastewater generation
- ❖ Field measurements for estimating current water use
- ❖ Metered & unmetered supplies.
- ❖ understanding of “base” flow and usage trend at site
- ❖ Past Water Bills
- ❖ Wastewater Treatment scheme & costs etc.

Step 3: Site Water Audit Planning (based on site operations and practices)

- ❖ Preparation of water flow measurement plan to quantify water use at various locations
- ❖ Wastewater flow measurement and sampling plan
- ❖ Instruments availability like Ultrasonic Water Flow Meter, Doppler type Flow meter, Stop Watch, measuring cylinders, Power Analyser etc.

Step 4: Conduction of Detailed Water Audit & Measurements

- ❖ Conduction of field measurements to Quantify water/wastewater stream/S
- ❖ Power Measurement of Pumps/Motors
- ❖ Measurement of suction & discharge pressure at various pumps
- ❖ Wastewater sampling & analysis
- ❖ Preparation of Water Balance Diagram
- ❖ Establishing Water Consumption Pattern
- ❖ Evolving value added “cost of water” at various locations
- ❖ Detection of potential leaks & water losses in the system
- ❖ Assessment of productive and unproductive usage of water
- ❖ Determine key opportunities for water consumption reduction, reuse & recycle with paybacks

Step 5: Preparation of Water Audit Report with Sustainable Water Management Plan

- ❖ Documentation of collected & analysed Water Balancing and Measurement details
- ❖ Projects and procedures to maximize water savings and minimize/eliminate water losses
- ❖ Water Metering and Accounting System
- ❖ Opportunities for Water Conservation based on Reduce/ Recycle/ Reuse/ Regeneration/ Recharge options with Cost Benefit Analysis

Step 6: Water Audit Report Finalization and Submission

- ❖ Incorporation of required changes based on discussions with plant executives
- ❖ Preparation & submission of final report.

❖ Methodology Adopted for Performance Evaluation of Pumps

The Plant has installed number of pumps in various sections to transfer/ circulate the water for different applications. During the audit, flow measurements were conducted at various pumps and performance evaluation of all the major pumps were conducted to estimate their present operating efficiency & cost of pumping. The estimated efficiency is based on operating head, measured flow rate & power consumption of the pumps.

❖ Water Flow Measurement

The water flow measurement was conducted using transit time ultrasonic flow meter at the discharge side of the pumps or any suitable location. The step wise methodology is given below,

- ❖ A suitable location for measurement of flow rate was identified on discharge pipeline of the pump and initial pipe preparation was done by cleaning and filing of pipe at measurement location
- ❖ The circumference of pipe for calculating the external diameter was measured by inch tape and the pipe thickness was measured by digital thickness gauge or by measurement of spare pipe.
- ❖ The parameter like pipe diameter, type of pipe, water temperature, pipe thickness, roughness etc are input in the ultrasonic flow meter
- ❖ Based on above input values, the flow meter reflects the distance between the traducers to be positioned on the pipe while measuring the flow
- ❖ The traducers are placed on the surface of the pipe (filed surface) at the same distance given by flow meter
- ❖ The ultrasonic flow meter displays instantaneous values of water flow rate in m^3/hr . The average of these values may be considered as flow rate of water.

❖ Electrical Power Measurement

The instantaneous electrical power consumption of pumps was measured from the corresponding electrical panel by portable Fluke Make Power analyser by measurement of electrical parameters like voltage, current, power factor, power etc.

❖ Head Measurement

The discharge head of the pump was determined by noting installed pressure gauges at the pump discharge while the suction head was estimated by physical measurement of horizontal and vertical length of suction pipeline. The total operating head was calculated by addition of suction and discharge head.

❖ Efficiency Calculation

The operating efficiency of the pumps was based on measured flow, head & power drawn by pumps is calculated with the help of following formula:

$$\text{Efficiency, \%} = \frac{Q \text{ (m}^3\text{/Hr.)} \times H \text{ (m)} \times 9.81 \times \rho \text{ (kg/m}^3\text{)}}{1000 \times 3600 \times \text{Motor Input Power (kW)}}$$

Where,

Efficiency % = Efficiency of pump set i.e. (Combined efficiency of pump & motor)

Q = Measured Water Flow rate in m³/hr

P = density of water i.e., 1000 kg/m³

H = Total Head developed (m of water column), Discharge + Suction

kW = Actual power measured at motor input.

CHAPTER -4: ASSESSMENT OF PRESENT WATER USAGE

1. Water sourcing and major water use areas

Details of Source of Water: The main source of freshwater for the plant is 2 no. of bore well. The plant sources about 120 m³/day of freshwater from bore wells. The freshwater is mainly used for. Another source is recycled water from STP plant of about 15 m³/day & ETP plant of about 19 m³/day

No. of Borewells and location: The bore well is located near Truck Entry Gate and Wheel washing system the plant. The rated yield is 8 & 20 m³/hr. which concurred with the measurements done by FICCI team using ultrasonic flow meter. The water abstraction limit for bore well is 180 m³/day. The bore well have mechanical meter installed from which reading were taken manual and maintained in logbook.

Table 3: Details of bore well

Bore wells	Location of Bore-wells	Depth of Bore-well	Type of Pump (mono-block/ Submersible etc.)	Pump Rated Capacity (HP)	Rated yield (m ³ /hr)
Bore well 1	21°52'14.35" 85°11'02.85"	91mtr	submersible	2.0	8.0
Bore well 2	21°52'02.68" 85°10'51.88"	New Borewell			

The BGL of pre-monsoon and post-monsoon peizometric reading taken is given in the table given below:

Pre-monsoon readin in the month of May 2020

DATA	TIME	Ground Water Level (m)
01/05/2021	06.00 AM	28.59
	12.00 PM	28.92
	06.00 PM	27.35
	00.00 AM	28.89
02/05/2021	06.00 AM	27.88
	12.00 PM	28.79

	06.00 PM	28.35
	00.00 AM	28.86
03/05/2021	06.00 AM	28.89
	12.00 PM	28.96
	06.00 PM	27.98
	00.00 AM	27.45
04/05/2021	06.00 AM	27.83
	12.00 PM	28.41
	06.00 PM	28.61
	00.00 AM	27.50
05/05/2021	06.00 AM	27.99
	12.00 PM	27.2
	06.00 PM	28.17
	00.00 AM	27.12
06/05/2021	06.00 AM	27.40
	12.00 PM	28.05
	06.00 PM	27.10
	00.00 AM	28.35
07/05/2021	06.00 AM	27.88
	12.00 PM	28.72
	06.00 PM	28.37
	00.00 AM	27.84
08/05/2021	06.00 AM	28.37
	12.00 PM	27.13
	06.00 PM	27.45
	00.00 AM	28.11
09/05/2021	06.00 AM	28.25
	12.00 PM	28.40
	06.00 PM	28.14
	00.00 AM	28.82
10/05/2021	06.00 AM	28.16
	12.00 PM	27.63
	06.00 PM	27.84
	00.00 AM	28.92
11/05/2021	06.00 AM	28.01
	12.00 PM	27.19
	06.00 PM	28.17

	00.00 AM	27.92
12/05/2021	06.00 AM	27.65
	12.00 PM	28.98
	06.00 PM	27.32
	00.00 AM	28.86
13/05/2021	06.00 AM	28.12
	12.00 PM	28.33
	06.00 PM	27.43
	00.00 AM	28.65
14/05/2021	06.00 AM	27.78
	12.00 PM	28.43
	06.00 PM	28.92
	00.00 AM	28.54
15/05/2021	06.00 AM	28.65
	12.00 PM	28.45
	06.00 PM	28.76
	00.00 AM	28.34
16/05/2021	06.00 AM	27.88
	12.00 PM	28.72
	06.00 PM	28.37
	00.00 AM	28.84
17/05/2021	06.00 AM	27.55
	12.00 PM	27.79
	06.00 PM	27.82
	00.00 AM	28.72
18/05/2021	06.00 AM	27.88
	12.00 PM	27.73
	06.00 PM	27.52
	00.00 AM	28.15
19/05/2021	06.00 AM	28.29
	12.00 PM	28.17
	06.00 PM	28.33
	00.00 AM	27.48
20/05/2021	06.00 AM	27.66
	12.00 PM	28.23
	06.00 PM	28.99
	00.00 AM	27.65

21/05/2021	06.00 AM	27.61
	12.00 PM	28.20
	06.00 PM	28.76
	00.00 AM	27.58
22/05/2021	06.00 AM	27.53
	12.00 PM	28.97
	06.00 PM	28.79
	00.00 AM	27.59
23/05/2021	06.00 AM	27.01
	12.00 PM	28.30
	06.00 PM	27.21
	00.00 AM	28.01
24/05/2021	06.00 AM	27.10
	12.00 PM	28.20
	06.00 PM	28.95
	00.00 AM	27.75
25/05/2021	06.00 AM	28.29
	12.00 PM	28.17
	06.00 PM	28.33
	00.00 AM	28.48
26/05/2021	06.00 AM	27.76
	12.00 PM	28.54
	06.00 PM	28.42
	00.00 AM	27.12
27/05/2021	06.00 AM	27.42
	12.00 PM	28.91
	06.00 PM	28.54
	00.00 AM	27.49
28/05/2021	06.00 AM	27.31
	12.00 PM	28.94
	06.00 PM	28.54
	00.00 AM	27.89
29/05/2021	06.00 AM	28.25
	12.00 PM	28.40
	06.00 PM	28.14
	00.00 AM	28.82
29/05/2021	06.00 AM	28.19

	12.00 PM	28.17
	06.00 PM	28.19
	00.00 AM	28.11
30/05/2021	06.00 AM	28.02
	12.00 PM	27.81
	06.00 PM	27.67
	00.00 AM	28.26
31/05/2021	06.00 AM	28.22
	12.00 PM	28.01
	06.00 PM	28.03
	00.00 AM	28.11

Post-monsoon reading for the month of October 2020

DATA	TIME	Ground Water Level (m)
01/10/2021	06.00 AM	5.21
	12.00 PM	5.34
	06.00 PM	5.21
	00.00 AM	5.26
02/10/2021	06.00 AM	5.23
	12.00 PM	5.09
	06.00 PM	5.08
	00.00 AM	5.07
03/10/2021	06.00 AM	5.04
	12.00 PM	5.02
	06.00 PM	4.99
	00.00 AM	4.97
04/10/2021	06.00 AM	4.95
	12.00 PM	4.90
	06.00 PM	4.88
	00.00 AM	4.76
05/10/2021	06.00 AM	4.74
	12.00 PM	4.69
	06.00 PM	4.64
	00.00 AM	4.59

06/10/2021	06.00 AM	4.45
	12.00 PM	4.42
	06.00 PM	4.38
	00.00 AM	4.34
07/10/2021	06.00 AM	4.23
	12.00 PM	4.15
	06.00 PM	4.21
	00.00 AM	4.23
08/10/2021	06.00 AM	4.25
	12.00 PM	4.24
	06.00 PM	4.32
	00.00 AM	4.24
09/10/2021	06.00 AM	4.31
	12.00 PM	4.45
	06.00 PM	4.46
	00.00 AM	4.65
10/10/2021	06.00 AM	4.78
	12.00 PM	4.24
	06.00 PM	4.68
	00.00 AM	4.78
11/10/2021	06.00 AM	4.43
	12.00 PM	4.76
	06.00 PM	4.56
	00.00 AM	4.32
12/10/2021	06.00 AM	4.19
	12.00 PM	4.15
	06.00 PM	4.26
	00.00 AM	4.25
13/10/2021	06.00 AM	5.06
	12.00 PM	5.12
	06.00 PM	5.15
	00.00 AM	5.23
14/10/2021	06.00 AM	5.21
	12.00 PM	5.24
	06.00 PM	5.26
	00.00 AM	5.21
15/10/2021	06.00 AM	5.43
	12.00 PM	5.34

	06.00 PM	5.23
	00.00 AM	4.21
16/10/2021	06.00 AM	5.25
	12.00 PM	4.43
	06.00 PM	4.41
	00.00 AM	4.41
17/10/2021	06.00 AM	4.32
	12.00 PM	4.87
	06.00 PM	4.21
	00.00 AM	4.45
18/10/2021	06.00 AM	4.24
	12.00 PM	4.28
	06.00 PM	4.21
	00.00 AM	4.98
19/10/2021	06.00 AM	4.21
	12.00 PM	5.06
	06.00 PM	5.12
	00.00 AM	5.15
20/10/2021	06.00 AM	5.23
	12.00 PM	5.21
	06.00 PM	5.24
	00.00 AM	5.26
21/10/2021	06.00 AM	5.21
	12.00 PM	5.43
	06.00 PM	5.34
	00.00 AM	5.23
22/10/2021	06.00 AM	4.21
	12.00 PM	4.19
	06.00 PM	4.26
	00.00 AM	4.31
23/10/2021	06.00 AM	4.89
	12.00 PM	4.99
	06.00 PM	5.03
	00.00 AM	4.97
	06.00 AM	4.95
24/10/2021	12.00 PM	5.01
	06.00 PM	5.02
	00.00 AM	4.99

25/10/2021	06.00 AM	4.97
	12.00 PM	5.02
	06.00 PM	4.98
	00.00 AM	4.98
26/10/2021	06.00 AM	4.94
	12.00 PM	5.01
	06.00 PM	4.99
	00.00 AM	4.94
27/10/2021	06.00 AM	4.95
	12.00 PM	5.01
	06.00 PM	4.99
	00.00 AM	4.94
28/10/2021	06.00 AM	4.42
	12.00 PM	4.98
	06.00 PM	4.94
	00.00 AM	4.92
29/10/2021	06.00 AM	4.90
	12.00 PM	4.96
	06.00 PM	4.96
	00.00 AM	4.95
30/10/2021	06.00 AM	4.93
	12.00 PM	4.99
	06.00 PM	5.03
	00.00 AM	4.93
31/10/2021	06.00 AM	4.92
	12.00 PM	5.07
	06.00 PM	4.23
	00.00 AM	4.95

Picture 1: Photos of Bore well

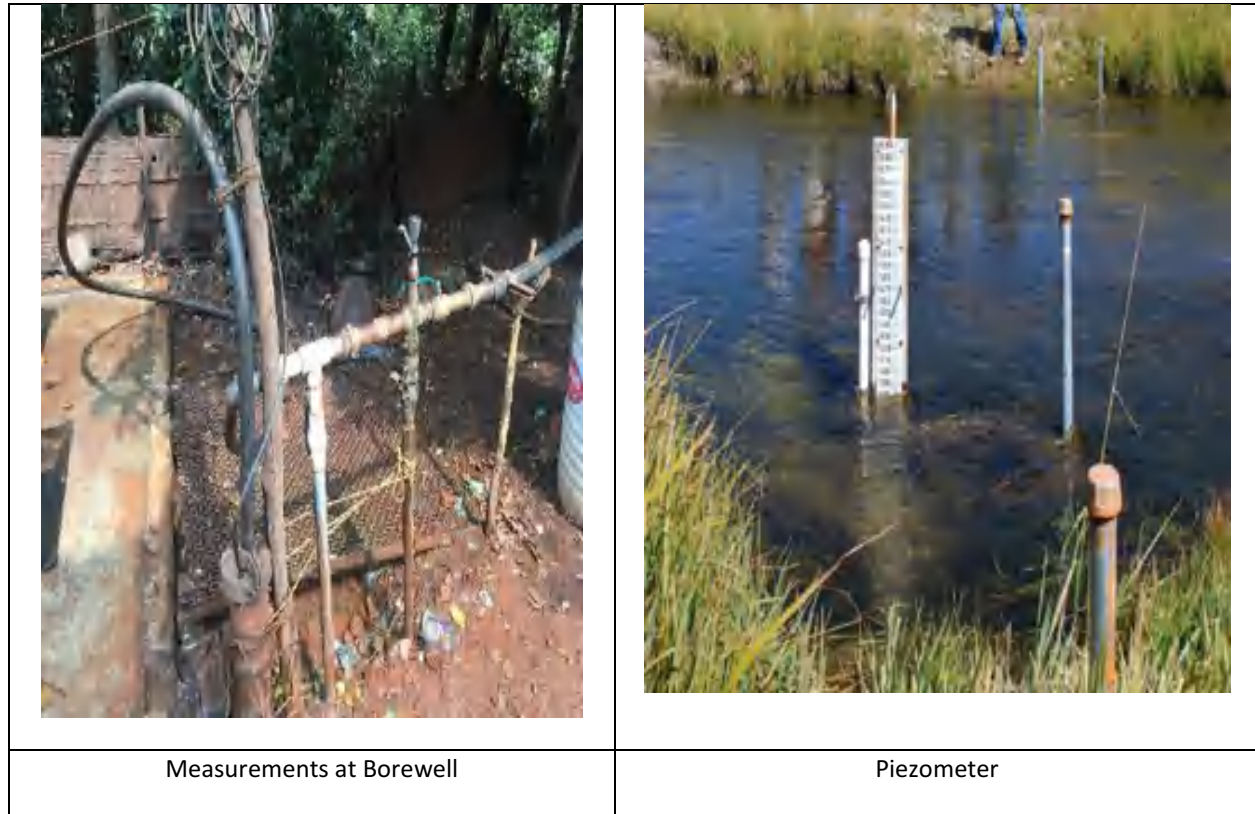


The Piezometer is used to measure pressure via the rise of fluid column. It is m deep and at a distance of more than m from the bore well.

Table 4: Details of piezometer wells (observation well)

Piezometer	Location of piezometer	Depth of piezometer	Distance from the existing bore well (meter)
1	21°52'16.70" 85°11'05.89"	20mtr	1.0mtr

Picture 2: Picture taken during measurements at bore well and picture of Piezometer



Apart from freshwater, the plant also uses STP treated water for horticulture and vehicle washing. Therefore, the total estimated water requirement of the mines is about 294.7 m³/day (freshwater, treated, and recycled water) in various sections of the mines as shown Below.

Table 5: Sources of water at the Mines

S.No.	Source of Water	m ³ /day	Water Quality
1	Bore well Water	180.0	Fresh water
2	Rain water harvesting pond	88.0	Fresh water
2	STP Treated water	13.7	Recycled
3	ETP Water	6.1	Recycled
		287.80	

Figure 1 : Sources of Water (Freshwater, treated water and recycled water)

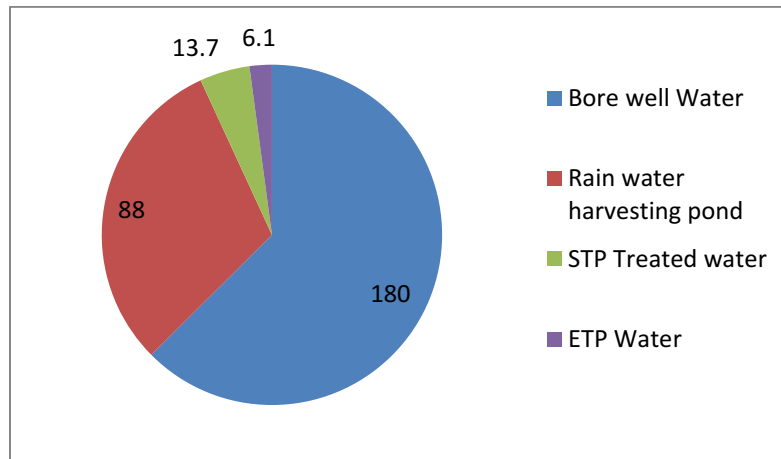
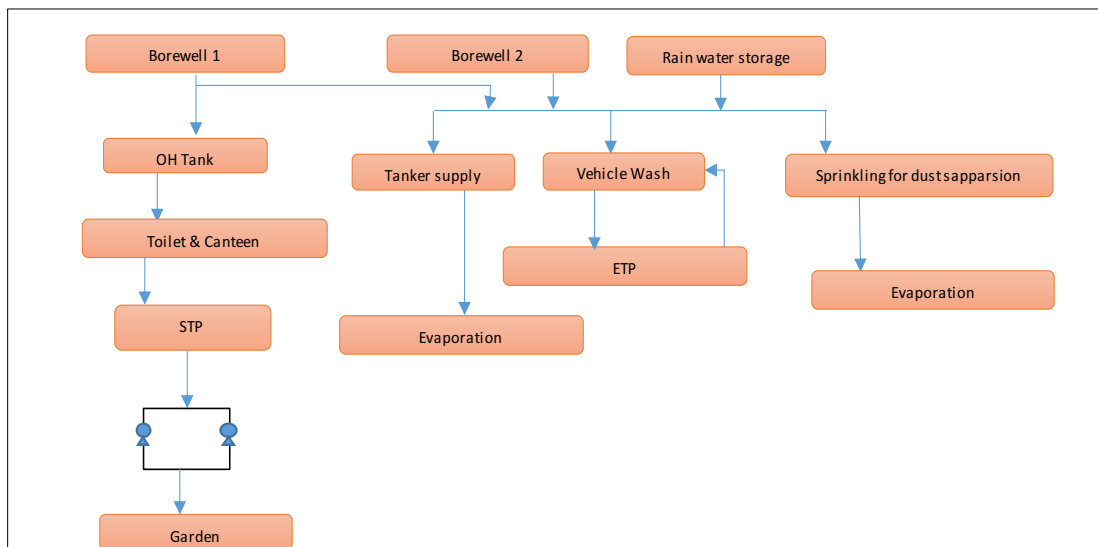


Table 6: Percentages of Freshwater and recycled water

S. No.	Major Sections	Wastewater discharged (m ³ /day)	Recycled/Discharge	M3/day
1	Domestic Use	24.50	Reused in Green Belt	8.2
2	Vehicle Wash	8.20	Reuse of Vehicle washing	0
	Total	32.70		8.2

Figure 2: Existing water circuit diagram of the plant



2. Bore well Water Quality

The plant regularly checks the water quality of the Groundwater.

Table 7: Groundwater quality report

Parameters for bore well water	Unit	Date of sample 07.04.2021	Date of sample 08.06.2021
TDS	mg/l	36	44
Iron	mg/l	<0.05	<0.05
Calcium	mg/l	6.4	8
Alkalinity	mg/l	31	34
Suspended Solids	mg/l	<0.4	<0.4
Fuloride	mg/l	<0.05	<0.05
Arsenic	mg/l	<0.001	<0.001

3. Water Distribution and water balance

During the opening meeting, On-site training and discussion with facility manager was conducted to explain to the plant officials about effective management of groundwater, purpose of water audit and basic guidelines of the CGWA notification.

As per the measurements conducted by FICCI team, water distribution and water balance were prepared for the plant.

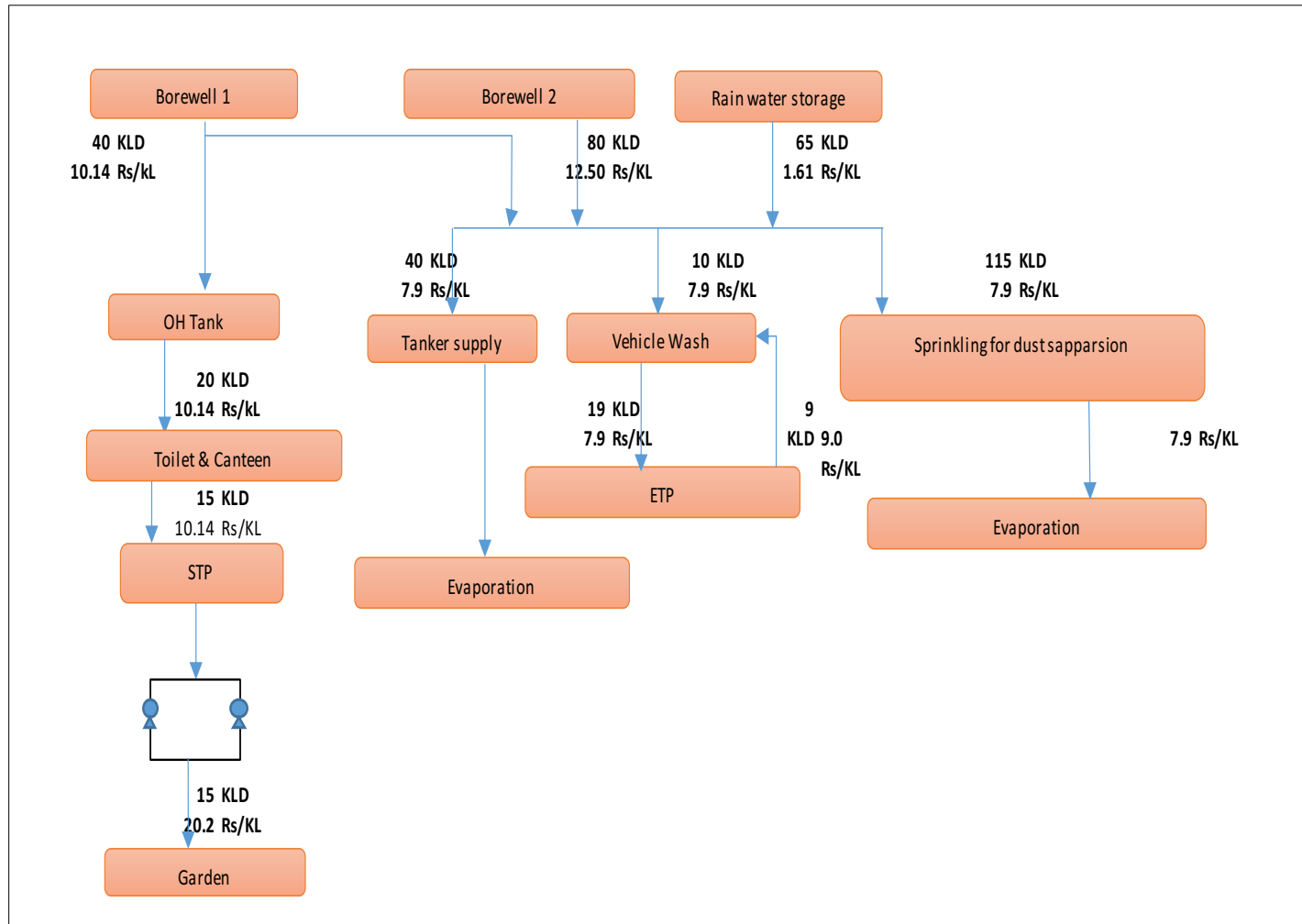
The plant abstracts about 120 m³/day of groundwater from 2 no. of bore wells. Instantaneous water flow was measured using ultrasonic flow meters. The measured flow of bore well is 8 & 20 m³/hr. The bore well has 3 HP motor that runs for about 5 & 4 hours daily. Abstracted bore well water is pumped to KL tank. The water from KL tank is pumped to water storage tank

Table 8: Water Storage Tanks in the Mines

Location	Storage Capacity
Near office	5000l

Raw water is pumped from bore well to KL tank. About total of 11 m³/day ground water is daily pumped into the system. Out of 180 m³/day of total water, 20m³/day is used for domestic applications like hand washing, drinking etc., 8.20 m³/day is used for Vehicle Washing, 211 m³/day of water is used in dust separation, 15m³/day is used for horticulture. All the wastewater from vehicle washing is drained to ETP. After treatment in ETP, treated water is stored and used for vehicle washing. Details of Storage tanks in different units of plant are mentioned in Figure 2.

Figure 2: depicts the existing water and wastewater balance diagram of Mines.



4. Water Metering System

There is one meters in the plant. All meters are mechanical flow meter. The meter readings are recorded regularly. Details of the meter are mentioned in the Table 9 below.

Table 9: Location of Identified Water Meters

Sr. No.	Meter Location	Type of Meter	Regularly recorded (Yes/No)	Calibrated (Yes/No)
2105400633	21°52'14.35" 85°11'02.85"	Digital Flow rate Indicator Totalizer	Yes	Yes

5. Water Use Baseline Data as provided by the Plant

The month-wise meter readings were provided by the plant for the quantity of water drawn from the bore wells. Table 10 below depicts the Total groundwater intakes for FY 2020-2021

Table 10: Monthly water abstraction from bore wells (FY 2020-21)

(m ³ /month)	Bore well Water withdrawn
20-Apr	5400
20-May	5580
20-Jun	5400
20-Jul	4495
20-Aug	4495
20-Sep	5400
20-Oct	5580
20-Nov	5400
20-Dec	5580
21-Jan	5580
21-Feb	5520
21-Mar	5580

6. Water Costing

Water and wastewater cost at plant includes water cess, cost of pumping, cost of raw water treatment, cost of STPR and Cost of ETP. **The actual weighted average cost of abstraction bore well water is estimated to be Rs 1 /m³, cost of Bore well Pumping water supply is Rs 1.86/m³, and the cost of STP is estimated to be about Rs 3.55/m³ and the cost of ETP treatment is about Rs 6.10/m³, as discussed below.** The water and wastewater costing for various user points is shown in Figure 3.

1. Cost of abstraction of Bore well Water

Rates of ground water abstraction charges for other industries and infrastructure projects in safe, semi-critical and critical assessment units is given in table below. Since the M/S GEETARANI MOHANTY RAIKELA MINES Odisha , is in and NOC limit for water abstraction is $180 \text{ m}^3/\text{day}$, which is under range of $< 200 \text{ m}^3/\text{day}$, therefore the cost of groundwater abstraction is **Rs 1/ m^3 as per Table 11** .

Table 11: Cost of bore well water abstraction

S. No.	Category of area ↓ Ground water use →	Quantum of ground water withdrawal			
		$< 200 \text{ m}^3/\text{day}$	200 to $<1000 \text{ m}^3/\text{day}$	1000 to $<5000 \text{ m}^3/\text{day}$	$5000 \text{ m}^3/\text{day}$ and above
1.	Safe	1.00	2.00	3.00	5.00
2.	Semi-critical	2.00	3.00	5.00	8.00
3.	Critical	4.00	6.00	8.00	10.00

2. Pumping cost-energy

Flow measurements were made during the field study. The Transit time ultrasonic flow meter was used for water flow measurements. Table 12 below summarises the water flow measurements at Pump discharge line. Apart from pump discharges, power measurements including voltage, current and power factor etc were taken. Using the measured data for the pumps, the actual pumping costs are calculated for various pumps. Total cost of pumping is Rs 192990/Annum.

Table 12: Cost of pumping system at M/S GEETARANI MOHANTY RAIKELA MINES

S. No	Pump name	Total Flow	Power Consumption	Sp. Power	Cost of Pumping	Daily Run hours	Daily flow	Daily Pumping Cost	Total Annual Cost
				Consumption					
	Electricity Charges @ 6.50 Rs/kWh	m ³ /h	kW	kWh/m ³	Rs/m ³	h/day	m ³ /day	Rs/day	Rs/yr
1	Bore well Pump no.1	8.00	1.10	0.14	0.86	5.0	40.00	34	10725
2	Bore well Pump no.2	20.00	8.00	0.40	2.50	4.0	80.00	200	62400
3	STP Pump and Blower	2.50	2.40	0.96	6.00	6	15.00	90	34164
4	Rain water Harvesting Pump	12.40	3.20	0.26	1.61	6	68.20	110	41756
								434	149045

3. Cost of Treatment

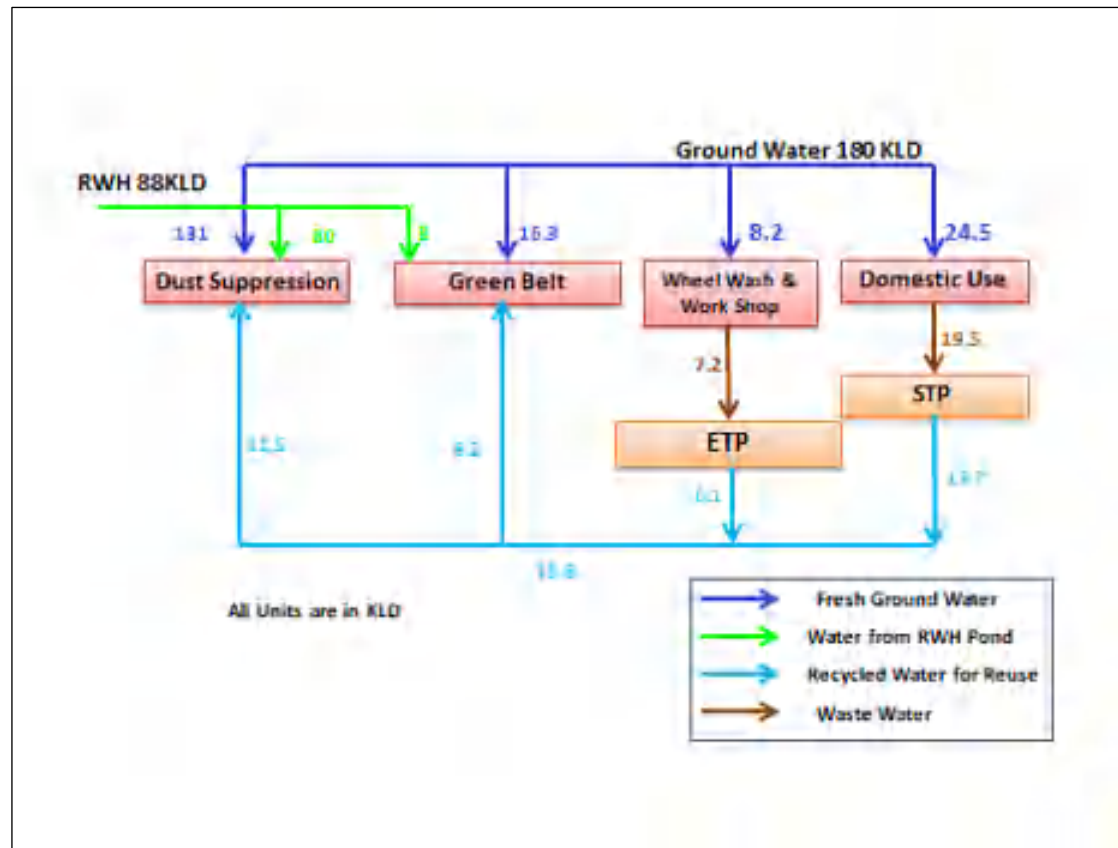
Cost of STP Treated Water

About 15 m³/year water is treated daily at the Effluent treatment Plant. The cost of chemical treatment at ETP is Rs 3.55/m³ and Electrical Cost is Rs 6.50/m³. The total cost of ETP Treated water is Rs 10.05/m³ as shown in table below

Table 13: Cost of STP treated water

	STP			
Average Quantity of treated water (m ³ /day)	15			
Chemical Cost				
Name of Chemical/s	Quantity kg/month	Rate Rs/Kg	Rs/month	Rs/day
Chlorine	45	18	810	29
Total Chemical Cost (Rs/Day)				53
Total Cost of chemical treatment (Rs/m³)				3.55
Electricity Cost				
Power Consumption (Units/day)				15.0
Specific Power Consumption (kWh/m ³)				1.00
Cost per unit (Rs/kWh)				6.5
Electrical cost (Rs/day)				98
Electrical cost (Rs/m ³)				6.50
Total Cost of treatment (Rs/m³)				10.05
Total Cost of treatment (Rs/day)				151

Figure 3: Existing water cost at user location accounting water pumping and treatment cost at Mines



7. Annual Water & Wastewater Management Cost of the Plant

The total annual water and wastewater cost is calculated by the sum of Total Water abstracted, Total Pumping cost and Total Water and Wastewater Treatment cost as mentioned in the previous part. The total annual water cost for plant as shown below in Table 14.

Table 14: Total Annual Water Cost of M/S GEETARANI MOHANTY RAIKELA MINES

S. No.			Total cost	Total Annual Cost	Water Consumption
		Rs/m ³	(Rs/day)	(Rs/year)	(m ³ /day)
1	Cost of Bore well abstraction	1.00	120	39600	120.0
2	Pumping Cost			114881	
	Energy	1.86	344	114881	185
4	Wastewater Treatment			62116	
	STP				
	Cost of chemical treatment at STP	3.55	53	19411	
	Cost of Electrical treatment at STP	6.50	98	35588	15
	ETP				
	Cost of Electrical Treatment	1.03	20	7118	19
	Total Water Cost			2,16,597	

CHAPTER -5: WATER & WASTEWATER TREATMENT & RECYCLING PRACTICES

The plant has installed the following water and wastewater treatment systems for treating the incoming freshwater:

❖ STP

STP Plant- SEWAGE WATER TREATMENT

Plant treats Domestic Sewage in well-designed existing sewage treatment plants (Total Capacity 15 KLD).

In STP there are three major input from plant labour Toilet etc. as per data observation. Average operation of 15 KLD water is treated and bank to gardening. The Description installed STP is given below.

The term treatment means separation of solids and stabilisation of pollutants. In turn stabilisation means the degradation of organic matter until the point at which chemical or biological reactions stop. COD (Chemical Oxygen Demand) is said to be the most general parameter to measure organic pollution. COD describes how much oxygen is required to oxidise all organic and inorganic matter found in the wastewater sample. BOD (Biological Oxygen Demand) describes what can be oxidised biologically, with the help of bacteria and is always a fraction of COD. Usually, BOD is measured as BOD meaning that it describes the amount of oxygen consumed over a five-day measurement period. It is a direct measurement of the amount of oxygen consumed by organisms removing the organic matter in the waste. SS (Suspended Solids) describes how much of the organic or inorganic matter is not dissolved in water and contains settle able solids that sink to the bottom in a short time and non-settle able suspended solids. It is an important parameter because SS causes turbidity in the water causing clogging of filters.

Input –Output Parameters Details of Sewage Treatment

Parameters for STP outlet water	Unit	Date of sample 08.06.2021
COD	mg/l	40
BOD	mg/l	10
TSS	mg/l	28
Oil & Grease	mg/l	<0.1
pH	mg/l	6.7
TDS	mg/l	380

ETP Plant - Effluent Treatment Plant

The ETP consists of primary treatment, physio-chemical treatment , tertiary treatment further description is bar screen chamber, oil and grease trap, collection cum equalization tank, effluent lift pumps, reaction, coagulation and flocculation tank, chemical dosing for reaction tank and flocculation, primary tube settler, aeration tank, membrane bio reactor, centrifuge and centrifuge feed pump. During manufacturing process of EO/EG, effluent gets generated from the process in the Plant.

Effluent Characteristics:

S.NO	PARAMETERS	CHARACTERISTICS	UNITS
1.	pH	6.5 – 8.5	-
2.	BOD 5	<10	mg/l
3.	COD	<50	mg/l
4.	TSS	<5	mg/l
5.	Oil & Grease	Nil	mg/l
6.	TDS	<1300	mg/l

EFFLUENT TREATMENT PLANT The term treatment means separation of solids and stabilization of pollutants. In turn stabilization means the degradation of organic matter until the point at which chemical or biological reactions stop. COD (Chemical Oxygen Demand) is said to be the most general parameter to measure organic pollution. COD describes how much oxygen is required to oxidize all organic and inorganic matter found in the wastewater sample. BOD (Biological Oxygen Demand) describes what can be oxidized biologically, with the help of bacteria and is always a fraction of COD. Usually BOD is measured as BOD5 meaning that it describes the amount of oxygen consumed over a five-day measurement period. It is a direct measurement of the amount of oxygen consumed by organisms removing the organic matter in the waste. SS (Suspended Solids) describes how much of the organic or inorganic matter is not dissolved in water and contains settle able solids that sink to the bottom in a short time and non-settle able suspended solids. It is an important parameter because SS causes turbidity in the water causing clogging of filters.

CLASSIFICATION OF EFFLUENT WATER TREATMENT

Effluent treatment options may be classified into groups of processes according to the function they perform and their complexity:

Primary Treatment – includes simple processes that deal with debris and solid material. The purpose of preliminary treatment is to remove the big size particles. This is usually performed by screening (usually by bar screens) and grit removal. Their removal is important in order to increase the effectiveness of the later treatment processes and prevent damages to the pipes, pumps and fittings.

Physio-chemical Treatment– In Physio-chemical Treatment, first increase the pH up to 9 by lime dosing then add Ferric Chloride & poly electrolyte into Reaction Tank, Coagulation Tank & Flocculation has been

generate by slow mixing into Flocculator. Outlet of Flocculator feed to Primary Tube Settling Tank to remove suspended solids.

Tertiary treatment – is the polishing process whereby treated effluent is further purified to acceptable levels for discharge. It is usually for the removal of specific pollutants e.g. remaining suspended solid, colour and order for the Effluent. Tertiary treatment processes are generally specialized processes.

UNIT DESCRIPTION

BAR SCREEN CHAMBER

The function of the bar screen is to prevent entry of solid particles above a certain size: such as plastic cups, paper dishes, polythene bags, ETC into the ETP. (If these items are allowed to enter the ETP, they clog and damage the ETP pumps, and cause stoppage of the plant.) The screening is achieved by placing a screen made out of vertical bars, placed across the Effluent flow. The gaps between the bars may vary between 10 and 25 mm. ETPs may have two screens: A coarse bar screen with larger gaps between bars, followed by a fine bar screen with smaller gaps between bars. If this unit is left unattended for long periods of time, it will generate a significant amount of odour: it will also result in backing of Effluent in the incoming pipelines and chambers.

OIL AND GREASE TRAP

The oil and grease trap is placed before EQT to arrest solid and fatty matter at source or it is placed after screen chamber so as prevent the fatty matter to enter Equalization chamber. The wastewater output from this unit is taken to the equalization tank. The solids and fats that are separated in this unit are disposed off along with other biodegradable waste, and can be used as feed for piggeries.

COLLECTION CUM EQUALIZATION TANK

The EFFLUENT from the bar screen chamber and oil, grease and grit trap comes to the equalization tank. The equalization tank is the first collection tank in an ETP. Its main function is to act as buffer: To collect the incoming raw Effluent that comes at widely. Equalization tank is used only for buffering the daily fluctuations in the Effluent flow quantity. The equalization tank must be of sufficient capacity to hold the peak time inflow volumes. Equalization tank with a capacity to hold 4-6 hours of average hourly flow should be adequate.

EFFLUENT LIFT PUMPS

EFFLUENT transfer pump is use to lift Effluent from equalization tank to anoxic chamber. It typical pair of pumps (working and standby). The pumping rate can be set at a calibrated uniform flow, so that downstream units are not affected by fluctuating flows. These pumps are submersible pump submersed into the equalization tank.

REACTION, COAGULATION AND FLOCCULATION TANK

It is a chemical water treatment technique typically applied prior to sedimentation and filtration (e.g. rapid sand filtration) to enhance the ability of a treatment process to remove particles. Coagulation is a process used to neutralize charges and form a gelatinous mass to trap (or bridge) particles thus forming a mass large enough to settle or be trapped in the filter. Flocculation is gentle stirring or agitation to encourage the particles thus formed to agglomerate into masses large enough to settle or be filtered from solution.

CHEMICAL DOSING FOR REACTION TANK AND FLOCCULATION

Chemical dosing of Lime, Ferric Chloride & Poly in Reaction, Coagulation and flocculation tank are generally for the chemical treatment. Lime is used to increase the pH in the ETP for the further process and post coagulation and for clarity of water. Ferric Chloride is used as coagulant for much industrial and sanitary waste water treatment application. Due to its high efficiency, effectiveness in clarification, and utility as a sludge dewatering agent. The chemical leaves no residual colour, offers very good turbidity removal. Poly-aluminium chloride is used as a flocculent by which fine particulates are caused to clump together into a floc & increase the sludge water separation. The floc may then float to the top of the liquid (creaming), settle to the bottom of the liquid (sedimentation), or be readily filtered from the liquid.

PRIMARY TUBE SETTLER

Primary tube settler is incorporated before the biological process to settle down the agglomerate form after coagulation and flocculation process purpose and function of the clarifier is threefold: Allow settling of biomass solids in the Mixed Liquor coming out of the flocculation, to the bottom of the clarifier to thicken the settled biomass, in order to produce a thick underflow To produce clear supernatant water, in the overflow from the clarifier feed to Aeration Tank. All the above actions occur due to gravity. The thick biomass is re-circulated back to the aeration tank.

AERATION TANK

Aeration brings water and air in close contact in order to remove dissolved gases (such as carbon dioxide) and oxidizes dissolved metals such as iron, hydrogen sulphide, and volatile organic chemicals (VOCs). Aeration is often the first major process at the treatment plant. During aeration, constituents are removed or modified before they can interfere with the treatment processes.

Aeration brings water and air in close contact by exposing drops or thin sheets of water to the air or by introducing small bubbles of air (the smaller the bubble, the better) and letting them rise through the water. The scrubbing process caused by the turbulence of aeration physically removes dissolved gases from solution and allows them to escape into the surrounding air. Aeration also helps remove dissolved metals through oxidation, the chemical combination of oxygen from the air with certain undesirable

metals in the water. Once oxidized, these chemicals fall out of solution and become particles in the water and can be removed by filtration or flotation.

MEMBRANE BIO REACTOR

The Membrane Bio Reactor Technology is the most advanced development in the field of biological treatment providing treated wastewater for recycling in smaller footprint and under stringent discharge norms.

Tertiary treatment consists of Membrane Bioreactor. The Sewage after the Collection Sump enters into the Anoxic Chamber where it overflow further to Aeration tank for biological Treatment and further over flow to MBR basin. Hollow Fiber membranes are introduced to mixed liquor to separate treated sewage from mixed liquor. Membrane being the absolute physical barriers ensures complete removal of suspended impurities. MBR applications include even retrofits of existing systems as well as installation of new systems, for both meeting the most stringent discharge norms and reuse. Treated wastewater from MBR can be even reused for cooling tower make-up, to generate high purity water through Reverse Osmosis and other non-potable applications. This process can help environment protection by treating wastewater and making it suitable for variety of application and thus conserve precious drinking water. Biological system designed for MBR process operates at higher MLVSS concentration with higher sludge retention time thus produces a low quantum of biological sludge thus reducing the sludge dewatering cost.

MBR technology combines the skills of our membrane specialists to deliver integrated treatment solutions with firm process guarantees such as BOD and TSS less than 5 mg/l and also removal of nutrient (nitrogen & phosphorous) and coliforms etc.

Biological process fluid (mixed liquor) is pumped/Overflow to the Membrane Operating System ("MOS"). The mixed liquor is introduced to membrane, along with air, evenly across the bottom of the tank through a unique two-phase jet system. This mixed liquor fills the membrane tank and flows upward through the membrane sub modules, creating cross-flow dynamics across the membrane surface. This cross- flow continuously scours the membrane surface and prevents solids dehydration at the membrane surface. Applying a low-pressure vacuum to the inside of the membrane fiber pulls water through the membranes and pumps the filtered water to the next process step. Solids, including organics, bacteria, and most viruses, are rejected by the membrane system and retained in the mixed liquor, which overflows the MOS back to the aeration tank.

The Membrane Operating System is an assembly with integral membrane modules arranged in rack assemblies, inserted into the membrane tank.

MOS Mixed Liquor Distribution & Recirculation Jets are designed to distribute the air scour and mixed liquor flow evenly across the membrane sub modules. This feature eliminates potential polarization

(concentration) of suspended solids around the membrane fibers which could be main cause for the failure and damage of individual fibers thus sub modules. Additionally, this feature provides even distribution of mixed liquor solids to each membrane unit, critical so that all membranes see the same process conditions. The return recirculation of mixed liquor ensures influent comes in intimate contact with the concentrated biomass, offering better organism selection and added flexibility in the anoxic cycle for advanced nitrogen removal, when required. This same jet system also acts as an integral part of the membrane cleaning system, providing an efficient scouring of the membranes with chlorine cleaning solution. The integrated cleaning system allows the sub modules to be quickly cleaned in place. Additionally, the clean and efficient procedure eliminates the need for membrane removal from process tanks that can damage membranes and present risks to plant-operators. Relaxation, Maintenance and in site CIP are exclusive features of this MBR Process to ensure consistent water quality and complete membrane life. The entire operation is PLC controlled.

CENTRIFUGE AND CENTRIFUGE FEED PUMP

Biological treatment of wastewater performs produces excess biological solids due to the growth and multiplication of bacteria and other microorganisms in the system. The excess biomass thus produced needs to be bled out of the system, and disposed off efficiently. This is a five-step process: sludge removal, storage, conditioning, dewatering and disposal. Sludge is removed (“bled”) from the system from the sludge recirculation pipeline (through a branch). The sludge is in the form of thick slurry. It is taken into a sludge-holding tank, and kept under aeration (to prevent the living organisms from putrefying) until dewatering operations can be carried out. Before dewatering, polymer or other chemicals may be added for conditioning the sludge, to facilitate the process. Sludge is then dewatered in a Centrifuge.

It consists of three to four parts: Sludge-holding tank with aeration. Centrifuge Feed Pump are used to feed sludge from the sludge holding tank to Centrifuge to dewatering the sludge and convert it into the dry sludge cake.

CHAPTER -6: DATA ANALYSIS & RESULTS

1. Water Consumptive Units and Waste water Mapping

Water consumption pattern

The water consumption pattern shows that out of total water (287.80 m³/day). The water utilization areas are mentioned below in Table 15

Table 15: Water Utilization Scenario at the plant

Key Water Usage Section	Quantity Used (m ³ /day)
Domestic Use	24.50
Vehicle Washing	8.20
Dust separation	211
Horticulture	24.50
Total	287.80

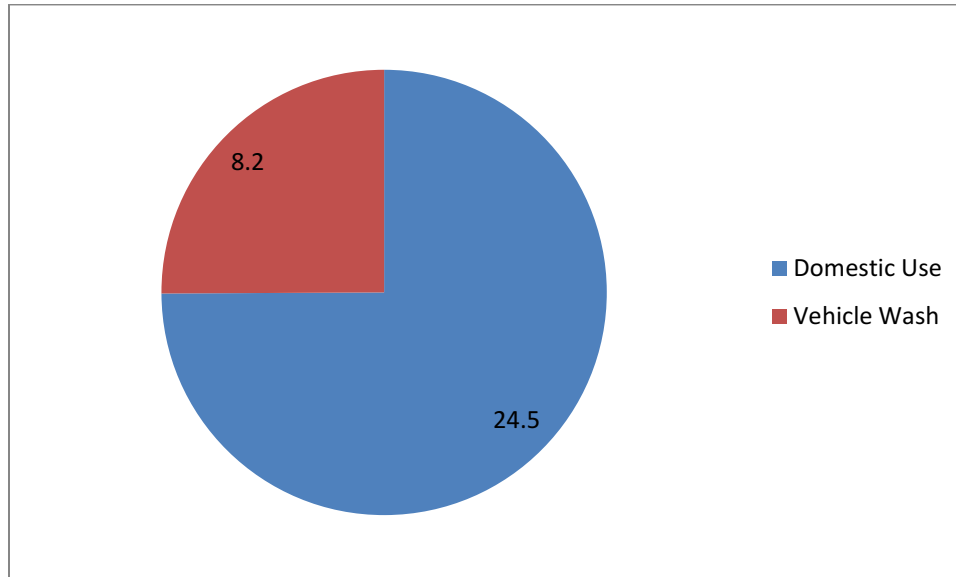
1. Wastewater generation and mapping

The total wastewater generation in the plant is about 34 m³/day, out of which about 44% is generated by domestic use; 56% is generated by process use as given in Table 16 and

Table 16 : Major Wastewater generating areas

S. No.	Major Sections	Wastewater discharged (m ³ /day)	Recycled/Discharge	M3/day
1	Domestic Use	24.50	Reused in Green Belt	8.2
2	Vehicle Wash	8.20	Reuse of Vehicle washing	0
	Total	32.70		8.2

Figure 4: Percentage of wastewater generation



2. Specific Water Consumption in term of Water Use Ratio (WUR) of the Mines

Table 17: Specific Water Consumption - FY 2020-21

Annual Production	Annual Fresh Water Usage	Specific Water Consumption (M3 water/ Ton of product)
3587988	64010	17.84

CHAPTER -7: WATER CONSERVATION OPPORTUNITIES WITH COST BENEFIT ANALYSIS

1. Regularly calibrate & maintain existing water flow meters

The plant has installed water meters at various important locations including bore wells. It is suggested to periodically calibrate the meters and maintain them.

Table 18: List of piezo meters installed in the Raikela Iron ore Mines, M/S GEETARANI MOHANTY

Sr. No.	Meter Location	Type of Meter	Regularly recorded (Yes/No)	Calibrated (Yes/No)
1	21°52'14.35" 85°11'02.85"	Piezometer	Yes	Yes

2. Maintain logbook of daily groundwater abstraction

The plant is suggested to record the water abstraction data, maintain logbook of daily groundwater abstraction and submit the data to CGWA periodically. The following format may be used for maintaining and recording the meter data on daily basis:

Table 19: logbook for water meters

The BGL of pre-monsoon and post-monsoon peizometric reading taken is given in the table given below:

Pre-monsoon readin in the month of May 2020

DATA	TIME	Ground Water Level (m)
01/05/2021	06.00 AM	28.59
	12.00 PM	28.92
	06.00 PM	27.35
	00.00 AM	28.89
02/05/2021	06.00 AM	27.88
	12.00 PM	28.79
	06.00 PM	28.35
	00.00 AM	28.86
03/05/2021	06.00 AM	28.89
	12.00 PM	28.96
	06.00 PM	27.98
	00.00 AM	27.45
04/05/2021	06.00 AM	27.83
	12.00 PM	28.41

	06.00 PM	28.61
	00.00 AM	27.50
05/05/2021	06.00 AM	27.99
	12.00 PM	27.2
	06.00 PM	28.17
	00.00 AM	27.12
06/05/2021	06.00 AM	27.40
	12.00 PM	28.05
	06.00 PM	27.10
	00.00 AM	28.35
07/05/2021	06.00 AM	27.88
	12.00 PM	28.72
	06.00 PM	28.37
	00.00 AM	27.84
08/05/2021	06.00 AM	28.37
	12.00 PM	27.13
	06.00 PM	27.45
	00.00 AM	28.11
09/05/2021	06.00 AM	28.25
	12.00 PM	28.40
	06.00 PM	28.14
	00.00 AM	28.82
10/05/2021	06.00 AM	28.16
	12.00 PM	27.63
	06.00 PM	27.84
	00.00 AM	28.92
11/05/2021	06.00 AM	28.01
	12.00 PM	27.19
	06.00 PM	28.17
	00.00 AM	27.92
12/05/2021	06.00 AM	27.65
	12.00 PM	28.98
	06.00 PM	27.32
	00.00 AM	28.86
13/05/2021	06.00 AM	28.12
	12.00 PM	28.33
	06.00 PM	27.43

	00.00 AM	28.65
14/05/2021	06.00 AM	27.78
	12.00 PM	28.43
	06.00 PM	28.92
	00.00 AM	28.54
	06.00 AM	28.65
15/05/2021	12.00 PM	28.45
	06.00 PM	28.76
	00.00 AM	28.34
	06.00 AM	27.88
16/05/2021	12.00 PM	28.72
	06.00 PM	28.37
	00.00 AM	28.84
	06.00 AM	27.55
17/05/2021	12.00 PM	27.79
	06.00 PM	27.82
	00.00 AM	28.72
	06.00 AM	27.88
18/05/2021	12.00 PM	27.73
	06.00 PM	27.52
	00.00 AM	28.15
	06.00 AM	28.29
19/05/2021	12.00 PM	28.17
	06.00 PM	28.33
	00.00 AM	27.48
	06.00 AM	27.66
20/05/2021	12.00 PM	28.23
	06.00 PM	28.99
	00.00 AM	27.65
	06.00 AM	27.61
21/05/2021	12.00 PM	28.20
	06.00 PM	28.76
	00.00 AM	27.58
	06.00 AM	27.53
22/05/2021	12.00 PM	28.97
	06.00 PM	28.79
	00.00 AM	27.59
	06.00 AM	

23/05/2021	06.00 AM	27.01
	12.00 PM	28.30
	06.00 PM	27.21
	00.00 AM	28.01
24/05/2021	06.00 AM	27.10
	12.00 PM	28.20
	06.00 PM	28.95
	00.00 AM	27.75
25/05/2021	06.00 AM	28.29
	12.00 PM	28.17
	06.00 PM	28.33
	00.00 AM	28.48
26/05/2021	06.00 AM	27.76
	12.00 PM	28.54
	06.00 PM	28.42
	00.00 AM	27.12
27/05/2021	06.00 AM	27.42
	12.00 PM	28.91
	06.00 PM	28.54
	00.00 AM	27.49
28/05/2021	06.00 AM	27.31
	12.00 PM	28.94
	06.00 PM	28.54
	00.00 AM	27.89
29/05/2021	06.00 AM	28.25
	12.00 PM	28.40
	06.00 PM	28.14
	00.00 AM	28.82
29/05/2021	06.00 AM	28.19
	12.00 PM	28.17
	06.00 PM	28.19
	00.00 AM	28.11
30/05/2021	06.00 AM	28.02
	12.00 PM	27.81
	06.00 PM	27.67
	00.00 AM	28.26
31/05/2021	06.00 AM	28.22
	12.00 PM	28.01
	06.00 PM	28.03
	00.00 AM	28.11

Post-monsoon reading for the month of October 2020

DATA	TIME	Ground Water Level (m)
01/10/2021	06.00 AM	5.21
	12.00 PM	5.34
	06.00 PM	5.21
	00.00 AM	5.26
02/10/2021	06.00 AM	5.23
	12.00 PM	5.09
	06.00 PM	5.08
	00.00 AM	5.07
03/10/2021	06.00 AM	5.04
	12.00 PM	5.02
	06.00 PM	4.99
	00.00 AM	4.97
04/10/2021	06.00 AM	4.95
	12.00 PM	4.90
	06.00 PM	4.88
	00.00 AM	4.76
05/10/2021	06.00 AM	4.74
	12.00 PM	4.69
	06.00 PM	4.64
	00.00 AM	4.59
06/10/2021	06.00 AM	4.45
	12.00 PM	4.42
	06.00 PM	4.38
	00.00 AM	4.34
07/10/2021	06.00 AM	4.23
	12.00 PM	4.15
	06.00 PM	4.21
	00.00 AM	4.23
08/10/2021	06.00 AM	4.25
	12.00 PM	4.24
	06.00 PM	4.32
	00.00 AM	4.24

09/10/2021	06.00 AM	4.31
	12.00 PM	4.45
	06.00 PM	4.46
	00.00 AM	4.65
10/10/2021	06.00 AM	4.78
	12.00 PM	4.24
	06.00 PM	4.68
	00.00 AM	4.78
11/10/2021	06.00 AM	4.43
	12.00 PM	4.76
	06.00 PM	4.56
	00.00 AM	4.32
12/10/2021	06.00 AM	4.19
	12.00 PM	4.15
	06.00 PM	4.26
	00.00 AM	4.25
13/10/2021	06.00 AM	5.06
	12.00 PM	5.12
	06.00 PM	5.15
	00.00 AM	5.23
14/10/2021	06.00 AM	5.21
	12.00 PM	5.24
	06.00 PM	5.26
	00.00 AM	5.21
15/10/2021	06.00 AM	5.43
	12.00 PM	5.34
	06.00 PM	5.23
	00.00 AM	4.21
16/10/2021	06.00 AM	5.25
	12.00 PM	4.43
	06.00 PM	4.41
	00.00 AM	4.41
17/10/2021	06.00 AM	4.32
	12.00 PM	4.87
	06.00 PM	4.21
	00.00 AM	4.45
18/10/2021	06.00 AM	4.24
	12.00 PM	4.28

	06.00 PM	4.21
	00.00 AM	4,98
19/10/2021	06.00 AM	4.21
	12.00 PM	5.06
	06.00 PM	5.12
	00.00 AM	5.15
20/10/2021	06.00 AM	5.23
	12.00 PM	5.21
	06.00 PM	5.24
	00.00 AM	5.26
21/10/2021	06.00 AM	5.21
	12.00 PM	5.43
	06.00 PM	5.34
	00.00 AM	5.23
22/10/2021	06.00 AM	4.21
	12.00 PM	4.19
	06.00 PM	4.26
	00.00 AM	4.31
23/10/2021	06.00 AM	4.89
	12.00 PM	4.99
	06.00 PM	5.03
	00.00 AM	4.97
	06.00 AM	4.95
24/10/2021	12.00 PM	5.01
	06.00 PM	5.02
	00.00 AM	4.99
25/10/2021	06.00 AM	4.97
	12.00 PM	5.02
	06.00 PM	4.98
	00.00 AM	4.98
26/10/2021	06.00 AM	4.94
	12.00 PM	5.01
	06.00 PM	4.99
	00.00 AM	4.94
27/10/2021	06.00 AM	4.95
	12.00 PM	5.01
	06.00 PM	4.99
	00.00 AM	4.94

28/10/2021	06.00 AM	4.42
	12.00 PM	4.98
	06.00 PM	4.94
	00.00 AM	4.92
29/10/2021	06.00 AM	4.90
	12.00 PM	4.96
	06.00 PM	4.96
	00.00 AM	4.95
30/10/2021	06.00 AM	4.93
	12.00 PM	4.99
	06.00 PM	5.03
	00.00 AM	4.93
31/10/2021	06.00 AM	4.92
	12.00 PM	5.07
	06.00 PM	4.23
	00.00 AM	4.95

3. Regular ground water quality monitoring and submission of data to CGWA:

The plant is regularly monitoring the groundwater quality of existing bore wells from a NABL accredited laboratory or Govt. approved laboratory. It is required that the plant shall monitor quality of ground water from the abstraction structure(s) once in a year. Water samples from bore wells shall be collected during April/May every year and analysed in NABL accredited laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. It is also suggested that the Water quality data shall be made available to CGWA through the web portal.

4. Training and awareness of the employees at all levels and placing 'water saving' posters/slogans at various locations:

It is suggested that the plant employees at all levels should be made aware and trained on 'Water Saving & Conservation' and 'Good Housekeeping Practices'. Therefore, it is recommended to periodically organize Awareness Program for office employees including shop floor workers on Water Conservation. It is also suggested that prominent water saving labels/posters should be placed/located in the plant at noticeable locations like process area; near hand washing taps; washroom, reception office etc. This will create awareness & sense of responsibility among staff/employees/visitors.

5. Periodically conduct 'water & wastewater audit'

The plant should periodically conduct 'Water & Wastewater Audits' to assess the efficiency of water usage in processes; reduce water losses in the system and optimize costs & energy consumption. A detailed 'Water & Wastewater Audit' should be done at least once in 2-3 year or as per requirement by

an experienced Audit Team. The plant can create its own internal Audit team for conducting regular comprehensive 'Water & Wastewater Audit' after providing requisite training to the concerned officials.

6. Regular payment of applicable groundwater abstraction charges

The plant needs to pay applicable groundwater abstraction charges as per CGWA notification. The applicable Rates of Ground Water abstraction charges for the plant are Rs 1 per m³ as per the table given below:

Table 20: Rates of Ground Water abstraction charges for other industries & infrastructure projects (Rs per m³)

S. No.	Category of area ↓ Ground water use →	Quantum of ground water withdrawal			
		< 200 m ³ /day	200 to <1000 m ³ /day	1000 to <5000 m ³ /day	5000 m ³ /day and above
1.	Safe	1.00	2.00	3.00	5.00
2.	Semi-critical	2.00	3.00	5.00	8.00
3.	Critical	4.00	6.00	8.00	10.00

7. Ensure to comply with the NOC conditions to avoid any penalty

It is suggested that the plant should comply with the applicable NOC conditions to avoid any penalty. The penalty provisions for non-compliance of NOC are given below:

Table 21: Penalty provision for non-Compliance of No Objection Certificate conditions

S. No.	Item/S	Charges in Rs.
1	Non installation/faulty Digital water Flow meter with telemetry system.	200000
2	Non-disclosure/ construction of additional groundwater abstraction structures ❖ Non-functional Structures. ❖ Defunct/Abandoned Note: Given rates are for unit non-functional/defunct/abandoned structures. This shall be multiplied with total such structures to arrive at consolidated penalty.	200000 100000
3	Reporting of freshwater zones as Brackish / Saline zones in application.	200000
4	Non-Installation of Piezometer.	200000
5	Non-Installation/faulty DWLR/Telemetry system	100000
6	Non-Construction/Inadequate capacity of Recharge / Water conservation structures.	500000

S. No.	Item/S	Charges in Rs.
7	Non maintenance of Recharge structures.	200000
8	Injection of treated/untreated water into the aquifer system. Note: In addition to penalty, the proponent shall bear the cost of aquifer remediation as per the provisions of Environment (Protection) Act, 1986.	1000000
9	Non-Submission of Water level/Water quality Data.	50000
10	Non-maintenance of logbook of daily withdrawal/non submission of Groundwater abstraction data.	50000
11	Non submission of photograph of recharge structure(s).	50000
12	Non-Submission of Self Compliance report.	100000
13	Construction of groundwater abstraction structures by unauthorized/unregistered Drilling Rigs (per structures).	100000
14	Nonregistration of water supply tankers.	500000
15	Submission of false information/ undertaking.	100000

1. Water Savings in the Buildings for Domestic Use

To optimize water use in the buildings for domestic purpose, the following observations and suggestions are made based on the building survey during the water audit:

- ❖ **Optimise water flow in handwashing and other taps:** Water flow rates in hand washing taps vary from 2-10 lpm .It is suggested to install flow restrictors in the hand washing taps of the plant area to reduce the excess flow in hand wash taps to 5 lpm. Generally, the water efficient handwashing taps use 3-5 lpm only.
- ❖ **Reduce water flow in urinals by optimizing the flushing time:** The flush time in the urinals varies from 2.2 seconds/use – 80 seconds/use. It is suggested to optimize the timer for the urinal flushing.
- ❖ **Flush tank capacities are about 6-10 liters/flush –** Use tank bank in existing flush tanks to reduce 2-3 liters water per flush or install water efficient cistern/flush tank with capacity 3/6 liters per flush.

Recommendations: It is suggested to install following water efficient fixtures in the buildings to save domestic water consumption. Overall, 15-20% domestic water consumption will be reduced by installing and maintaining suggested fixtures:

- ❖ **Retrofit flow restrictors in handwashing taps and other taps:** Retrofit high flowrate handwashing taps with ‘aerators and flow restrictors’ so as to have 3-5 lpm flow rate in hand washing taps & other taps in the plant.



- ❖ **Stop use of raw water, instead use recycled, treated wastewater.** It is suggested to use low quality water for flushing instead of good quality filtered water.
- ❖ **Install 'Tank Bank (For Flush Tanks)' or install with Water efficient flushes with dual flush Cistern 3-6 litres capacity flush tanks** – In toilets groundwater is used for flushing and about 7-10 litres of freshwater is flushed per flush. To reduce the flushing water per flush, it is suggested to install scientifically designed easy to install 'Tank-Bank' in the existing flush tanks. By just placing tank bank in the flush tank, we displace and save water equal to the space occupied by the tank bank for every flush. This will save about 20% of flush water in toilets. However, the existing 7-10 litres flush tanks can also be replaced by Water efficient flushes with dual flush Cistern 3-6 litres capacity flush tanks to save water. This will save about 40% of the flush water in toilets.

Table 22: Potential water savings per person per day by replacing Conventional Cistern with Slim dual flush Cistern / Using Flush Tank Bank

Estimated Flush usage per person per day	Conventional Cistern	Slim Dual Flush Cistern		Using Flush Tank Bank
Handle Type	Conventional	Small	Large	
Usage per day per person (Numbers)	5	4	1	5
Cistern Capacity (Litres)	7-10	3	6	6
Water Consumption (Litres)	35-50	12	6	30
Total Water Consumption (Litres/ Person/day)	42.5	18		30
Water Saving (Litres/person/day)		42.5-18 =24.5		42.5-30=12.5
		Reduction in 57% of water use in flushing activity		Reduction in 30% of water use in flushing activity

Picture 3: Tank Bank (For Picture 4: Dual flush Cistern 3-6 liters



Flush Tanks)

1. Install Drip Irrigation in the garden/horticulture area for efficient water use in landscaping/gardening

Existing Scenario: The plant has total area of 675860 meter square out of which about 24770 sq. m is Green Belt. The plant uses a total water for irrigation/landscaping/horticulture.

Recommendation: It is suggested that the plant should install Drip Irrigation system which is water efficient for gardening/horticulture. **The drip irrigation system will save 30-50% of water.** By installing drip irrigation system, the requirement of water for greenbelt (horticulture) could be met from available recycled / treated wastewater. The benefits of the drip irrigation system are given below:

Benefits of a Drip Irrigation System:

- ❖ **Saves Water:** Studies show that drip irrigation systems use 30 – 50% less water than conventional watering methods, such as Nuvoco Vistas Corporation Limited inklers or using open ended hose pipes.
- ❖ **Improves Growth:** Smaller amounts of water applied over a longer amount of time provide ideal growing conditions. Drip irrigation extends watering times for plants, & prevents soil erosion and nutrient runoff. Also, because the flow is continuous, water penetrates deeply into the soil to get well down into the root zone.
- ❖ **Discourages Weeds:** Water is only delivered where it's needed.
- ❖ **Saves Time:** Setting and moving Nuvoco Vistas Corporation Limited inklers is not required. A timer can be added to the system for automatic watering.
- ❖ **Helps control fungal diseases,** which grow quickly under moist conditions. Also, wet foliage can Nuvoco Vistas Corporation Limited disease.
- ❖ **Adaptable:** A drip irrigation system can be modified easily to adjust to the changing needs of a garden or lawn.

CHAPTER 8: IMPLEMENTATION PLAN

Sr. No	Section/Area	Recommendations
1.	Regularly calibrate & maintain existing water flow meters	It was observed that the existing bore well meter are installed and calibrated
2	Maintain logbook of daily groundwater abstraction	It was observed that the plant is maintaining data of daily groundwater abstraction
3	Regular ground water quality monitoring and submission of data to CGWA:	The plant regularly checks the water quality of the Groundwater and submitting the reports to CGWA
4	Training and Awareness of the Employees at all Levels and Placing 'Water Saving' Posters/Slogans at various Locations	Plant is regularly conducting Training and Awareness of the Employees, events to promote water conservation like celebration of world water day, world environment day" and Placing 'Water Saving' Posters/Slogans at various Locations
5	Periodically conduct 'Water & Wastewater Audit'	Plant has formed a cell for assessment of potential for water & wastewater management in the plant for water saving & waste water management.
6	Regular payment of applicable groundwater abstraction charges	The plant needs to pay applicable groundwater abstraction charges as per CGWA notification.
7	Ensure to comply with the NOC conditions to avoid any penalty	It is suggested that the plant should comply with the applicable NOC conditions to avoid any penalty.
8	Water Savings in the Buildings for Domestic Use	It is suggested to install following water efficient fixtures in the buildings to save domestic water consumption. Overall, 15-20% domestic water consumption

Sr. No	Section/Area	Recommendations
9	Install Drip Irrigation in the garden/horticulture area for efficient water use in landscaping/gardening	It is suggested that the plant should install Drip Irrigation system which is water efficient for gardening/horticulture. The drip irrigation system will save 30-50% of water.

ANNEXURES (MEASURED DATA)

Annexure I: Pump Efficiency and other measurements

❖ Pumping Cost

Table 23: Pumping Cost

S. No	Pump name	Total Flow	Power Consumption	Sp. Power	Cost of Pumping	Daily Run hours	Daily flow	Daily Pumping Cost	Total Annual Cost
				Consumption					
	Electricity Charges @ 6.50 Rs/kWh	m ³ /h	kW	kWh/m ³	Rs/m ³	h/day	m ³ /day	Rs/day	Rs/yr
1	Borewell Pump no.1	8.00	1.10	0.14	0.86	5.0	40.00	34	10725
2	Borewell Pump no.2	20.00	8.00	0.40	2.50	4.0	80.00	200	62400
3	STP Pump and Blower	2.50	2.40	0.96	6.00	6	0.00	0	34164
4	Rain water Harvesting Pump	12.40	3.20	0.26	1.61	6	68.20	110	41756
							188.20	344	149045

Annexure:

Fresh Water Details

(m ³ /month)	Bore well Water	Domestic water use	Industrial water use	Others Green Belt
	Withdrawn			
18-Apr	1935	251.55	1490.0	193.5
18-May	1999	259.87	1539.2	199.9
18-Jun	1935	251.55	1490.0	193.5
18-Jul	930	120.9	716.1	93
18-Aug	930	120.9	716.1	93
18-Sep	1550	201.5	1193.5	155
18-Oct	1999	259.87	1539.2	199.9
18-Nov	1935	251.55	1490.0	193.5
18-Dec	1999	259.87	1539.2	199.9
19-Jan	1999	259.87	1539.2	199.9
19-Feb	1806	234.78	1390.6	180.6
19-Mar	1999	259.87	1539.2	199.9

(m ³ /month)	Bore well Water Withdrawn	Domestic water use	Industrial water use	Others
19-Apr	1935	251.55	1489.95	193.5
19-May	1999	259.87	1539.23	199.9
19-Jun	1935	251.55	1489.95	193.5
19-Jul	930	120.9	716.1	93
19-Aug	930	120.9	716.1	93
19-Sep	1550	201.5	1193.5	155
19-Oct	1999	259.87	1539.23	199.9
19-Nov	1935	251.55	1489.95	193.5
19-Dec	1999	259.87	1539.23	199.9
20-Jan	1999	259.87	1539.23	199.9
20-Feb	1806	234.78	1390.62	180.6
20-Mar	1999	259.87	1539.23	199.9

(m ³ /month)	Bore well Water withdrawn	Domestic water use	Industrial water use	others
20-Apr	5400	702.0	4158.0	540.0
20-May	5580	725.4	4296.6	558.0
20-Jun	5400	702.0	4158.0	540.0
20-Jul	4495	584.4	3461.2	449.5
20-Aug	4495	584.4	3461.2	449.5
20-Sep	5400	702.0	4158.0	540.0
20-Oct	5580	725.4	4296.6	558.0
20-Nov	5400	702.0	4158.0	540.0
20-Dec	5580	725.4	4296.6	558.0
21-Jan	5580	725.4	4296.6	558.0
21-Feb	5520	717.6	4250.4	552.0
21-Mar	5580	725.4	4296.6	558.0

Waste water Details

(m ³ /month)	STP Treated water	ETP Treated Water
20-Apr	273.78	282.744
20-May	282.906	292.1688
20-Jun	273.78	282.744
20-Jul	227.8965	235.3582
20-Aug	227.8965	235.3582
20-Sep	273.78	282.744
20-Oct	282.906	292.1688
20-Nov	273.78	282.744
20-Dec	282.906	292.1688
21-Jan	282.906	292.1688
21-Feb	279.864	289.0272
21-Mar	282.906	292.1688

Total No. of buildings						
Building name	No. of employees in building	No. of floors in building	Total no. of washrooms on each floor	No. of taps	No. of urinals	No. of showers
Office	16	2	4	4	4	3
Bachelor accommodation	12	1	6	6	6	-
Driver and operator accommodation	24	2	4	5	4	-

Canteen/ Kitchen Name/Location	Services (Breakfast/ Lunch/ Dinner/ others)	Total no. of visitors per day	Total No. of Taps		
			Drinking water	Utensil Washing	Others
Office canteen	Breakfast, Lunch, Dinner	35	1	1	1

Details of ETP

Effluent Treatment Plant		
Installed Capacity (m ³ /hr)		0.66
Average Quantity of treated wastewater (m ³ /day)		8.2
Chemical Details		
Name of Chemical/s	Quantity kg/month or litres/month	Price (Rs/Kg or Rs/litres)
Power Consumption (Units/day)		
Is treated effluent reused or discharged?		Reused
If reused, provide area of its application & reused quantity (m ³ /day)		Green Belt, Dust Suppression, Wheel wash & toilet flush.
If discharged, provide disposal media like sewerage line, water body, land etc.		

**Please provide Effluent Treatment Scheme and Water Quality data of the Inlet & Outlet of the ETP.*

❖ Details of STP

Sewage Treatment Plant		
Installed Capacity (m ³ /hr)		3.33
Average Quantity of treated sewage (m ³ /day)		14.7
Chemical Details		
Name of Chemical/s	Quantity kg/month or litres/month	Price (Rs/Kg or Rs/litres)
Power Consumption (Units/day)		893
Is treated sewage reused or discharged?		Reused in dust suppression & Green Belt

Total Area under gardening/irrigation (meter square)	24770
Approximate water requirement for the gardening (cubic meter/day)	12
Type of water used in irrigation/gardening (Fresh water/treated wastewater/other)	Recycled/Fresh
Frequency of Gardening per day (once/twice/thrice)	once
Hour of Gardening per day	
Equipment used for gardening (hose pipe/sprinkle/micro-irrigation/other)	hose pipe
Type of irrigation- Drip, Sprinkle, Flood	Flood

❖ Details of Rainwater Harvesting system if implemented:

Total area in meter square:	675860
Green area in meter square:	24770
Rooftop area in meter square:	15000
Open area in meter square:	598100



GTEEPL/LQR/55

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000100P
Report No. : GTEEPL/04/22/ENV/100A
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Bahamba (Buffer Zone)
Identification of Sample : Noise Monitoring Report
No of Samples : 8 Nos.

Issue Date:07.05.2022

Sl. No.	Date	Leq dB(A) Day Time	Leq dB(A) Night Time	Average dB(A)
1	01.04.2022	51.7	43.4	50.2
2	05.04.2022	53.6	40.2	51.9
3	08.04.2022	50.7	45.1	49.5
4	12.04.2022	52.8	41.8	51.2
5	15.04.2022	54.6	43.6	53.0
6	19.04.2022	53.7	44.2	52.2
7	22.04.2022	52.2	45.3	50.9
8	27.04.2022	51.8	44.2	50.4
Standard		75	70	Industrial Area
		65	55	Commercial Area
		55	45	Residential Area
		50	40	Sensitive Area

-END OF REPORT-


Authorized Signatory
Global Tech Enviro Experts Pvt. Ltd.

- N.B:
- ① The results relate to the sample received in respect to the Parameters tested.
 - ① Liability for return of sample ceases after 15 days from the date of Test certificate.
 - ① The report cannot be reproduced either in full or in part, without prior written consent of Director.
 - ① In case of any complaint, Please mail us globalexerts@rediffmail.com





TC-10101

GTEEPL/LQR/55

TEST REPORT

NABL ULR NO : TC101012200000100P
Report No. : GTEEPL/04/22/ENV/100 Issue Date: 07.05.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Tantara (Buffer Zone)
Identification of Sample : Noise Monitoring Report
No of Samples : 8 Nos.

Sl. No.	Date	Leq dB(A) Day Time	Leq dB(A) Night Time	Average dB(A)
I	01.04.2022	51.2	42.3	49.7
2	05.04.2022	50.6	41.7	49.1
3	08.04.2022	53.7	39.0	52.0
4	12.04.2022	49.8	40.1	48.3
5	15.04.2022	54.2	42.8	52.6
6	19.04.2022	53.9	43.9	52.4
7	22.04.2022	52.7	41.7	51.1
8	27.04.2022	54.1	44.2	52.6
Standard		75	70	Industrial Area
		65	55	Commercial Area
		55	45	Residential Area
		50	40	Sensitive Area

-END OF REPORT-

Authorised Signatory
Global Tech Enviro Experts Pvt. Ltd.

N.R.: ① The results relate to the sample received in respect to the Parameters tested.
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GTEEPL/LQR/55

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000100P
Report No. : GTEEPL/04/22/ENV/100C Issue Date: 07.05.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Raikela (Buffer Zone)
Identification of Sample : Noise Monitoring Report
No of Samples : 8 Nos.

Sl. No.	Date	Leq dB(A) Day Time	Leq dB(A) Night Time	Average dB(A)
1	02.04.2022	52.3	40.2	50.7
2	06.04.2022	54.2	43.2	52.6
3	09.04.2022	53.9	42.8	52.3
4	13.04.2022	52.7	40.9	51.1
5	16.04.2022	50.6	45.6	49.5
6	20.04.2022	52.5	47.2	51.3
7	23.04.2022	54.1	44.9	52.6
8	28.04.2022	53.6	42.3	52.0
Standard		75	70	Industrial Area
		65	55	Commercial Area
		55	45	Residential Area
		50	40	Sensitive Area

--END OF REPORT--

Authorised Signatory
Global Tech Enviro Experts Pvt. Ltd.

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www.globaltechenviroexperts.com

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GTEEPL/LQR/55

TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000100P
Report No. : GTEEPL/04/22/ENV/100D
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Tensa (Buffer Zone)
Identification of Sample : Noise Monitoring Report
No of Samples : 8 Nos.

Issue Date:07.05.2022

Sl. No.	Date	Leq dB(A) Day Time	Leq dB(A) Night Time	Average dB(A)
1	01.04.2022	61.3	53.4	59.9
2	05.04.2022	63.8	56.7	62.4
3	08.04.2022	64.2	55.9	62.7
4	12.04.2022	62.8	54.2	61.3
5	15.04.2022	64.7	59.3	63.5
6	19.04.2022	63.8	57.1	62.5
7	22.04.2022	62.7	55.2	61.3
8	27.04.2022	61.9	58.6	61.1
Standard		75	70	Industrial Area
		65	55	Commercial Area
		55	45	Residential Area
		50	40	Sensitive Area

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TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000100P
Report No. : GTEEPL/04/22/ENV/100E
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Near Mine Office (Core Zone)
Identification of Sample : Noise Monitoring Report
No of Samples : 8 Nos.

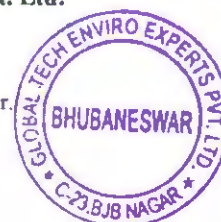
Issue Date:07.05.2022

Sl. No.	Date	Leq dB(A) Day Time	Leq dB(A) Night Time	Average dB(A)
1	04.04.2022	64.2	53.4	62.6
2	07.04.2022	63.6	56.8	62.3
3	11.04.2022	60.9	54.2	59.6
4	14.04.2022	63.4	62.3	63.1
5	18.04.2022	62.8	56.8	61.6
6	21.04.2022	64.5	58.2	63.2
7	25.04.2022	65.1	59.1	63.9
8	30.04.2022	64.8	57.2	63.4
Standard		75	70	Industrial Area
		65	55	Commercial Area
		55	45	Residential Area
		50	40	Sensitive Area

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GTEEPL/LQR/55

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000100P
Report No. : GTEEPL/04/22/ENV/100F **Issue Date:** 07.05.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Near QC lab (Core Zone)
Identification of Sample : Noise Monitoring Report
No of Samples : 8 Nos.

Sl. No.	Date	Leq dB(A) Day Time	Leq dB(A) Night Time	Average dR(A)
1	04.04.2022	72.5	65.3	71.1
2	07.04.2022	74.8	68.4	73.5
3	11.04.2022	73.6	69.2	72.6
4	14.04.2022	72.5	67.1	71.3
5	18.04.2022	71.8	68.5	71.0
6	21.04.2022	74.5	66.2	73.0
7	25.04.2022	73.9	67.2	72.6
8	30.04.2022	72.4	65.8	71.1
Standard		75	70	Industrial Area
		65	55	Commercial Area
		55	45	Residential Area
		50	40	Sensitive Area

-END OF REPORT-


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GTEEPL/LQR/55

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000100P
Report No. : GTEEPL/04/22/ENV/100G
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Near Quarry (Core Zone)
Identification of Sample : Noise Monitoring Report
No of Samples : 8 Nos.

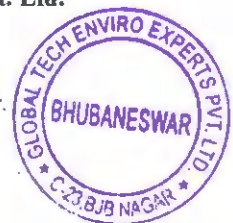
Issue Date:07.05.2022

Sl. No.	Date	Leq dB(A) Day Time	Leq dB(A) Night Time	Average dB(A)
1	04.04.2022	72.3	69.2	71.5
2	07.04.2022	74.6	64.5	73.0
3	11.04.2022	73.9	62.7	72.3
4	14.04.2022	72.5	63.8	71.0
5	18.04.2022	74.2	61.4	72.6
6	21.04.2022	71.6	63.9	70.2
7	25.04.2022	72.9	67.2	71.7
8	30.04.2022	73.4	68.9	72.3
Standard		75	70	Industrial Area
		65	55	Commercial Area
		55	45	Residential Area
		50	40	Sensitive Area

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GTEEPL/LQR/55

TEST REPORT

TC-10101

NABL ULR NO : TC101012200000100P
Report No. : GTEEPL/04/22/ENV/100H
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Sundargarh Odisha
Period : April-2022
Sampling Location : Near OB Dump (Core Zone)
Identification of Sample : Noise Monitoring Report
No of Samples : 6 Nos.

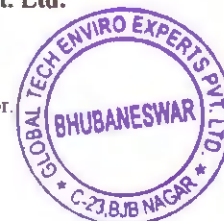
Issue Date: 07.05.2022

Si. No.	Date	Leq dB(A) Day Time	Leq dB(A) Night Time	Average dB(A)
i	04.04.2022	72.3	69.1	71.5
2	07.04.2022	71.6	68.2	70.7
3	11.04.2022	74.8	67.4	73.4
4	14.04.2022	73.4	65.2	72.0
5	18.04.2022	70.8	67.3	69.9
6	21.04.2022	72.5	68.9	71.6
7	25.04.2022	74.7	69.5	73.5
8	30.04.2022	72.9	68.4	71.8
Standard		75	70	Industrial Area
		65	55	Commercial Area
		55	45	Residential Area
		50	40	Sensitive Area

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GTEEPL/LQR/55

TEST REPORT

TC-10101

NABL ULR NO : TC1010122000000139P
Report No. : GTEEPL/05/22/ENV/ 139 Issue Date:07.06.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : May-2022
Identification of Sample : Noise Monitoring Report
No of Samples : 8 Nos.

Sl. No.	Location	Date of Monitoring	Day Time dB(A) Leq (6Am to 10Pm)			Night Time dB(A) Leq (10Pm to 6Am)		
			Max.	Min.	Avg.	Max.	Min.	Avg.
1	Nuagaon	02.05.2022	52.8	44.2	51.3	43.2	37.3	42.0
2	Tentulidihi	05.05.2022	53.1	52.3	52.8	41.5	36.6	40.4
3	Dengula	09.05.2022	54.7	42.7	53.1	40.1	33.9	38.8
4	Office	12.05.2022	51.1	48.6	50.4	44.7	35.1	43.2

Noise Standard in dB(A) Leq		
Category of Area	Day Time	Night Time
Industrial Area	75	70
Commercial Area	65	55
Residential Area	55	45
Sensitive Area	50	40

-END OF REPORT-


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GTEEPL/LQR/55

TEST REPORT

NABL ULR NO : TC1010122000000147P
Report No. : GTEEPL/06/22/ENV/ 147
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : June-2022
Identification of Sample : Noise Monitoring Report
No of Samples : 8 Nos.

Issue Date: 07.07.2022 **TC-10101**

Sl. No.	Location	Date of Monitoring	Day Time dB(A) Leq (6Am to 10Pm)			Night Time dB(A) Leq (10Pm to 6Am)		
			Max.	Min.	Avg.	Max.	Min.	Avg.
1	Nuagaon	02.06.2022	55.6	51.3	54.6	43.6	39.6	42.6
2	Tentulidihi	06.06.2022	53.9	49.9	52.9	47.2	42.5	46.1
3	Dengula	09.06.2022	52.9	46.3	51.6	42.8	38.3	41.7
4	Office	13.06.2022	50.2	48.6	49.7	40.2	37.2	39.4
5	North Boundary	16.06.2022	54.7	51.2	53.8	45.6	40.7	44.5
6	South Boundary	20.06.2022	53.4	49.6	52.5	43.7	39.9	42.8
7	East Boundary	23.06.2022	56.1	53.2	55.3	44.9	41.3	44.0
8	West Boundary	27.06.2022	52.6	48.9	51.7	40.4	36.7	39.5

Noise Standard in dB(A) Leq		
Category of Area	Day Time	Night Time
Industrial Area	75	70
Commercial Area	65	55
Residential Area	55	45
Sensitive Area	50	40

-END OF REPORT-


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GTEEPL/LQR/55

TEST REPORT

NABL ULR NO : TC1010122000000161P

Report No. : GTEEPL/07/22/ENV/ 161

Issue Date:07.08.2022

TC-10101

Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty

Address : Raikela, Koira, Sundargarh, Odisha

Period : July-2022

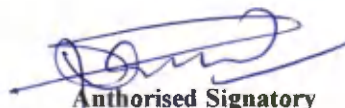
Identification of Sample : Noise Monitoring Report

No of Samples : 8 Nos.

Sl. No.	Location	Date of Monitoring	Day Time dB(A) Leq (6Am to 10Pm)			Night Time dB(A) Leq (10Pm to 6Am)		
			Max.	Min.	Avg.	Max.	Min.	Avg.
1	Nuagaon	01.07.2022	53.2	49.9	52.4	47.2	36.2	45.6
2	Tentulidihi	04.07.2022	51.4	48.7	50.7	44.7	34.9	43.2
3	Dengula	08.07.2022	50.7	45.7	49.6	41.8	33.1	40.3
4	Office	11.07.2022	54.9	50.1	53.8	45.9	32.8	44.2
5	North Boundary	15.07.2022	50.8	46.7	49.8	42.7	35.2	41.3
6	South Boundary	18.07.2022	51.2	47.1	50.2	40.6	32.9	39.2
7	East Boundary	22.07.2022	50.9	46.2	49.8	41.3	33.7	39.9
8	West Boundary	25.07.2022	51.7	47.6	50.7	40.3	35.1	39.1

Noise Standard in dB(A) Leq		
Category of Area	Day Time	Night Time
Industrial Area	75	70
Commercial Area	65	55
Residential Area	55	45
Sensitive Area	50	40

-END OF REPORT-



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GTEEPL/LQR/55

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000179P
Report No. : GTEEPL/08/22/ENV/179 Issue Date: 07.09.2022
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : August-2022
Identification of Sample : Noise Monitoring Report
No of Samples : 8 Nos.

Sl. No.	Location	Date of Monitoring	Day Time dB(A) Leq (6Am to 10Pm)			Night Time dB(A) Leq (10Pm to 6Am)		
			Max.	Mio.	Avg.	Max.	Min.	Avg.
1	Nuagaon	01.08.2022	51.4	47.4	50.4	45.6	35.4	44.0
2	Tentulidihi	05.08.2022	52.1	47.2	51.0	44.6	34.2	43.0
3	Dengula	08.08.2022	51.2	44.6	49.9	41.6	32.9	40.1
4	Office	12.08.2022	53.2	49.6	52.3	45.2	33.6	43.6
5	North Boundary	16.08.2022	50.1	47.8	49.5	44.2	36.4	42.8
6	South Boundary	20.08.2022	52.6	48.5	51.6	41.9	33.8	40.5
7	East Boundary	24.08.2022	51.7	48.2	50.8	44.2	32.8	42.6
8	West Boundary	29.08.2022	50.2	47.1	49.4	41.2	36.1	40.1

Noise Standard in dB(A) Leq		
Category of Area	Day Time	Night Time
Industrial Area	75	70
Commercial Area	65	55
Residential Area	55	45
Sensitive Area	50	40

-END OF REPORT-


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GTEEPL/LQR/55

TEST REPORT



TC-10101

NABL ULR NO : TC1010122000000202P
Report No. : GTEEPL/09/22/ENV/ 202
Name of the Client : Raikela Iron Ore mines of M/s Geetarani Mohanty
Address : Raikela, Koira, Sundargarh, Odisha
Period : September-2022
Identification of Sample : Noise Monitoring Report
No of Samples : 8 Nos.

Issue Date:07.10.2022

Sl. No.	Location	Date of Monitoring	Day Time dB(A) Leq (6Am to 10Pm)			Night Time dB(A) Leq (10Pm to 6Am)		
			Max.	Min.	Avg.	Max.	Min.	Avg.
1	Nuagaon	02.09.2022	50.6	46.6	49.6	45.2	35.0	43.6
2	Tentulidihi	06.09.2022	51.3	46.4	50.2	44.2	33.8	42.6
3	Dengula	08.09.2022	50.4	43.8	49.1	41.2	32.5	39.7
4	Office	12.09.2022	52.4	48.8	51.5	44.8	33.2	43.2
5	North Boundary	15.09.2022	49.3	47.0	48.7	43.8	36.0	42.4
6	South Boundary	20.09.2022	51.8	47.7	50.8	41.5	33.4	40.1
7	East Boundary	22.09.2022	50.9	47.4	50.0	43.8	32.4	42.2
8	West Boundary	28.09.2022	49.4	46.3	48.6	40.8	35.7	39.7

Noise Standard in dB(A) Leq		
Category of Area	Day Time	Night Time
Industrial Area	75	70
Commercial Area	65	55
Residential Area	55	45
Sensitive Area	50	40

-END OF REPORT-


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खान मंत्रालय MINISTRY OF MINES
भारतीय खान ब्यूरो INDIAN BUREAU OF MINES
क्षेत्रीय खान नियंत्रक के कार्यालय
OFFICE OF THE REGIONAL CONTROLLER OF MINES



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Plot No.149, Pokhariput

BHUBANESWAR-751020

No. MRMP/A/32-ORI/BHU/2021-22

Date: 06.01.2022

सेवामे

✓ Shri Srinibash Sahoo, Managing Partner,
M/s Geetarani Mohanty, House No-96,
Station Road, At/Po- Barbil,
Dist- Keonjhar, Odisha-758035
Email:- geetarani.mines@gmail.com

विषय: Approval of modification of Review of Mining Plan of Raikela Iron Ore Mine along with Progressive Mine Closure Plan (PMCP), over an area of 67.586 ha in Sundargarh district of Odisha State, submitted by M/s Geetarani Mohanty under Rule 17(3) of MCR, 2016.

संदर्भ: - i) Your letter No. Nil dated 01.12.2021.
ii) This office letter of even no. dated 02.12.2021.
iii) This office letter of even no. dated 14.12.2021.
iv) Your letter No. 107/GRM/IBM/21-22 dated 24.12.2021.

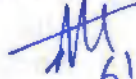
महोदय,

In exercise of the power delegated to me vide Gazette Notification No. S.O. 1857(E) dated 18.05.2016, I hereby Approve the modification of Review of Mining Plan of Raikela Iron Ore Mine along with Progressive Mine Closure Plan (PMCP), over an area of 67.586 ha in Sundargarh district of Odisha State, submitted by M/s Geetarani Mohanty under Rule 17(3) of MCR, 2016. This approval is subject to the following conditions:

- I. The modification of review 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.
- II. The proposals shown on the plates and/or given in the document is based on the lease map /sketch submitted by the applicant/ lessee and is applicable from the date of approval.
- III. It is clarified that the approval of aforesaid modification of review 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, the Occupational Safety, Health and Working Conditions Code, 2020 and Rule & Regulations made there under.
- IV. Indian Bureau of Mines has not undertaken verification of the mining lease boundary on the ground and does not undertake any responsibility regarding correctness of the

- boundaries of the leasehold shown on the ground with reference to lease map & other plans furnished by the applicant / lessee.
- V. At any stage, if it is observed that the information furnished, data incorporated in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.
- VI. If this approval conflicts with any other law or court order/ Direction under any statute, it shall be revoked immediately.
- VII. Validity of this document shall expire on 31.03.2026 and subject to validity of mining lease period.
- VIII. Next Financial Assurance shall be due for submission on 31.03.2026.

भवदीय / yours faithfully,


6/11/22

Encl: - One copy of modification
of Review of Mining Plan

(बाबुलाल गुर्जर)

क्षेत्रीय खान नियंत्रक

प्रतिलिपि सादर सूचनार्थ:-

1. The Director of Mines, Directorate of Mines, Government of Odisha, Heads of the Department Building, Bhubaneswar- 751001, Odisha along with one copy of modification of review of Mining Plan by **REGISTERED PARCEL**.
2. Shri Pradcept Mohapatra, World Consultancy Services, Plot No-766, Besides NH-16, 2nd Floor, Above Usha International, At-Telengapentha, Dist- Cuttack, Odisha- 754001. Email:- pmohapatra_07@yahoo.com
3. The Director (Mining), Chaibasa Region, Post Office: Chaibasa; Dist. Singhbhum (West), Jharkhand, Pin: 833201, Email:- altafhusainaksa@gmail.com


(बाबुलाल गुर्जर)

क्षेत्रीय खान नियंत्रक

ANNEXURE-XIV

PHOTOGRAPH SHOWING WATER SPRINKLING





Annexure XV

5 Years Period	YEAR	PLANTATION AREA	Saplings to be Planted	Survival @ 90 %	Capital Cost in Rs	Recurring Cost in Rs	Budgetary Provision @ Rs.1500	Location for Plantation/Afforestation
1	21-22	0.346	865					Safety Area
	22-23	0.344	860	774	1290000	619200	1909200	
	23-24	0.34	850	765	1275000	612000	1887000	
	24-25	0.33	825	742.5	1237500	594000	1831500	
	25-26	0.24	600	540	900000	432000	1332000	
2	26-27	0	0	0	0	0	0	21°.86716 N to 21°.871851 N 85°.17599 E to 85°.183089 E
	27-28	6	15000	13500	22500000	10800000	33300000	
	28-29	6	15000	13500	22500000	10800000	33300000	
	29-30	8	20000	18000	30000000	14400000	44400000	
	30-31	6	15000	13500	22500000	10800000	33300000	
3	31-32	7	17500	15750	26250000	12600000	38850000	21°.86514 N to 21°.87186 N 85°.17731 E to 85°.184501 E
	32-33	7	17500	15750	26250000	12600000	38850000	
	33-34	7.4	18500	16650	27750000	13320000	41070000	
	34-35	8	20000	18000	30000000	14400000	44400000	
	35-36	5	12500	11250	18750000	9000000	27750000	
	36-41	2.1	5250	4725	7875000	3780000	11655000	Stabilized Dump
		0.89	2225	2002.5	3337500	1602000	4939500	Rain Water Pond
		64.99	162475	145449	242415000	116359200	358774200	

PHOTOGRAPH SHOWING INSTALLATION OF ONLINE MONITORING SYSTEM



**SITE SPECIFIC CONSERVATION PLAN
&
WILDLIFE MANAGEMENT PLAN OF
RAIKELA IRON ORE MINES
IN SUNDARGARH DISTRICT OF ORISSA**

**OF
M/S GEETARANI MOHANTY
BARBIL, KEONJHAR, ORISSA**

Prepared by
**SRI B.R. PATNAIK IFS (Retd.)
SRI P.K. SARANGI IFS (Retd.)**

B.K.Patnaik IFS (Retd.)

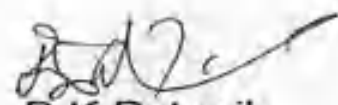
PREFACE

Raikela Iron Ore Mines of M/s Geetarani Mohanty, in the District of Sundargarh spreads over an area of 67.586Ha out of which 66.671ha comes under Forest Kissam land and the balance 0.915Ha is non-Forest land. The entire lease area is under the control of Revenue Department. There are 50 villages situated within the Zone of Influence with population of 30415. Due to diversion of this area for non forestry activities there will be additional pressure on the adjoining Forest. The Mining activities in the area will affect the Wild-life of the lease hold area as well as the adjoining forest areas and will pose various threats to the Wild animals. As various Mines are in operation adjoining the lease area the problem can be properly addressed only if a comprehensive wild-life Management plan is prepared for the entire belt which will help in protecting the wild-life as well as their habitat. In this Plan therefore it is left to the discretion of the DFO/ Forest Department to alter the proposal depending on the field demand and necessity.

This plan aims at minimizing the threats posed by mining activities and to improve the Wild-life Habitat in the adjoining Forest area such as the Zone of Influence and beyond.

Proper implementation of the Plan will definitely improve the Wild-life Habitat in the area and will reduce man-wild animal conflict.

Our thanks are due to Sri P. K. Sethi IFS, DFO Bonai Forest Division and his staff for providing relevant information for the plan.


B.K.Patnaik

CONTENTS

Sl.No	Title	Page Nos.
1	Executive Summary	1 - 4
2	Chapter- I Introduction	5 - 6
3	Chapter- II Details of Project site	7 - 21
4	Chapter- III Mining process	22 - 28
5	Chapter- IV Threats to Wild-life and its Habitat	29 - 35
6	Chapter- V Wild-life Management Plan	36 - 47
7	Chapter- VI Financial Forecast	48 - 49
8	REFERENCES	50

Plates

01	Location Map on Toposheet	Plate No. 1
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Annexures

01	Copy of letter No.2840 /6F-dt.29.6.07 of D F O Bonai Forest Division.	<i>Annexure-I</i>
02	Copy of letter No.8-37/2007 Dt.25 th Aug,2008 of MoEF, Govt. of India.	<i>Annexure-II</i>
03	Copy of Letter No. J-11015/ 380/ 2006- IA.II(M) Dated the 2 nd July,2008 of MoEF, Govt. of India.	<i>Annexure-III</i>
04	Copy of Site inspection Report of DFO, Bonai Forest Division.	<i>Annexure-IV</i>
05	Copy of letter No.10F(Cons)120/2006- 6879/F&E Dated 5/5/07 of Govt of Orissa	<i>Annexure-V</i>

EXECUTIVE SUMMARY

0.0.0 This Wild-Life Management Plan is prepared as a partial fulfillment of the requirements of MoEF, Govt. of India for diversion of Forest land for mining activities.

0.1.0 Raikela Iron Ore Mines has been leased out to M/S Geetarani Mohanty for a period of 20 years from Dt.02.07.1991 to Dt.01.07.2011.

The total area of the mine is 67.568ha out of which 66.67ha is Forest kissam Land. Diversion proposal has been submitted for 64.148ha excluding safety Zone. The safety Zone has not been included in the Diversion proposal as the said area will be maintained as such

Different types of Land involved are:

Forest Kissam Land	- 66.671 ha
Non Forest Land	- 0.915 ha
Total	- 67.586 ha

0.2.1 The net Reserve of Iron ore in the lease area has been estimated to be, 17.611 million Tons out of which Mineable reserve has been estimated to be 16.952million Tons. The production target has been fixed at 0.864million Tons per annum which is proposed to be enhanced to 1.50 million Tons per annum.

0.2.2 The lease area of Raikela Iron Ore Mines can be located on Topo sheet No.73G/1 and is bounded by

Latitude – 21° 00' 17" N and 21° 03' 50" N.

Longitude – 85° 01' 50" E and 85° 02' 30" E.

This area is situated at a distance of 2.5kms from Tensa and at a distance of 17kms from Barsuan. The area is highly undulating and mountainous. The altitudes vary from 300 mt. to 1020 mtr. above MSL. The general slope of the area is towards south-west and the drainage ultimately leads to river Baitarani.

M/s GEETARANI MOHANTY

0.2.3 The climate is Tropical with a very hot summer, the temperature rising up to 42°C, a moderate to cool winter and well defined rainy season. The minimum temperature during winter is as low as 7°C.

0.2.4 The existing forest standing on the nearby Reserved Forest as well as the Forest kissam lands can be classified as Moist peninsular valley Sal.

0.3.1 The lease area does not form a part of any National Park or Sanctuary or Critical Wild Life habitat. No protected area is situated in the vicinity or within the zone of Influence.

0.3.2 The common wild life occasionally noticed in the area is limited to Monkeys, Jackal, Hyena, Kufura, Wild Pig, Porcupine, Neulia etc.

0.4.1 There is no population within the lease area. There are 50 villages within the zone of influence with total population of 30415, with 69.93% Tribal population.

0.4.2 The major employment of the population is mining. The proposed mine will directly employ 194 persons in various mining activities. Besides several other persons will be engaged in scores of related activities on contract basis such as Ore crushing, Transportation etc.

0.5.1 The process of mining will be opencast mechanized method with drilling and blasting.

0.6.1 The threats perceived due to operation of the mine are:

- (a) Reduction of wild life habitat
- (b) Soil erosion
- (c) Water pollution & water scarcity
- (d) Dust pollution

- (e) Noise pollution
- (f) Lighting problems
- (g) Garbage problems
- (h) Physical threats such as fall of animals in the pits, poaching etc.
- (i) Forest fire

0.6.2 The management plan has addressed all the above threats and tried to minimize such threats.

- (a) Restoration of habitat will be done by planting 33850 nos of seedlings within the lease area. It is also proposed to raise 40 ha plantation and develop 5 ha grass land within the Zone of Influence and to maintain Forest Cover in the safety zone.. The lessee will contribute Rs. 22.50 lakhs for this purpose.
- (b) Soil conservation measures will be taken up by constructing check Dams. The lessee has proposed to contribute Rs.5.00 lakhs for this purpose.
- (c) Sub-soil and ground water recharge will be done through a series of percolation Pits. For this the lessee will contribute Rs.2.50lakhs.
- (d) One large water body will be created at a cost of Rs. 5.00 lakhs to provide water to animals throughout the year.
- (e) Water pollution will be checked by diverting the water to pass through garland drains and settling tanks and treating the water generated in the mine .
- (f) Dust pollution is controlled by regular spray of water on haul roads and the mine product.
- (g) Garbage will be disposed of through efficient garbage management methods.
- (h) Man animal conflict will be reduced by quick payment of compassionate amounts.

(h) The proposed cost for implementation of this plan is Rs.86.80 lakhs out of which the lessee will take up the activities for Rs. 24.10 lakhs and the Forest Department will take up various measures for Rs.62.70 lakhs. This amount of Rs.62.70 lakhs will be deposited with the Forest Department.

0.6.3 Besides the proposed amount indicated above, the lessee proposes to extend logistic support in shape of equipments, Vehicles etc. as required by the implementing DFO. The lessee further proposes to incur expenditure of up-to Rs.6.00 lakhs for the purpose.

M/s GEETARANI MOHANTY

CHAPTER- I

INTRODUCTION

Raikela Iron Ore Mines is being operated by M/S Geetarani Mohanty in the District of Sundargarh.

- 0.2.0 The mining lease was granted on Dt.02.07.1991 for a period of 20years over an area of 67.586ha. The lessee is also proposing to seek further extension of the lease. The total area included ,

Forest Kissam Land	-	66.671 ha
Non Forest Land	-	0.915 ha
		67.586 ha

The Forest Diversion Proposal for 64.148 ha in the year 2007 which has been forwarded by Govt. of Orissa to Govt. of India in letter No 10F(Cons)120/2006-6879/F&E, Dated 5/5/07.

- 0.3.0 The lease area of Raikela Iron Ore Mines can be located on Topo sheet No.73G/1 and is bounded by

Latitude – 21° 00' 17" N and 21° 03'50" N

Longitude – 85° 01' 50" E and 85° 02' 30" E.

- 1.3.0 The mining plan has been approved by the Indian Bureau of Mines and being renewed from time to time. The last renewal being in the year 2009. The production capacity of the mine as approved is 0.864 million Tons and the lessee proposes to enhance the production capacity to 1.50 million tons per annum. The total mineral resource was estimated to be 24.64 million Tons out of which the present available is 11.60 million Tons proved category and 0.64 million Tons possible category. Therefore the life of the mine is estimated to be 8 years.

Extraction at the enhanced rate is proposed to start immediately after approval by the appropriate authority. All the required infrastructures are available for the enhanced target.

- 1.5.0 The Environment Management plan has been prepared as a part of Mining Plan.
- 1.6.0 Sundargarh District is very rich in Forest as well as wild life. This district is a part of Eastern Ghats and is a continuation of famous Saranda Forest. Various Wild Life species including Elephants are present in this District.
- 1.7.0 The lease area is a part of Bonai Forest Division adjoining Keonjhar District. The entire belt is very rich in mineral deposits such as Iron Ore and Manganese Ore.
- 1.8.0 Sundargarh District is also an Industrial Belt. A number of Industries have come up in the District. Presence of Wild-Life along with Industries and Mining activities create a conflicting situation.
- Hence this Plan aims at minimizing the conflict to the extent it relates with the Mining activities.
- 1.9.0 This plan (Wild Life Management Plan and Site Specific Conservation Plan) is prepared as a partial fulfillment of the conditions as required by the MoEF, Govt. of India for diversion of Forest Land for the Mining activities.
- 1.10.0 This Plan is prepared for a period of 8 years (ie. the proposed life of the mine) after which the same can be reviewed.

CHAPTER – II

DETAILS OF THE PROJECT AREA

2.0.1 This Raikela mining lease for extraction of Iron Ore has been granted in favour of M/S Geetarani Mohanty, with Registered Office at Station Road, Barbil, Dist – Keonjhar, Orissa – 758035.

2.0.2 **Brief of the lease area.**

Raikela mining lease area falls almost at the junction of Sundargarh and Keonjhar Districts. The total area for which the lease has been granted is 67.586 ha including Forest area (forest kissam land) of 66.671ha. Diversion proposal has been submitted for 64.148Ha of Forest land excluding the safety zone of 2.523Ha.

The mining lease area covers portions of non Forest land of 0.915ha.

2.1.0 **Location**

District and State	—	Sundargarh, Orissa
Sub-Division	-	Bonai
Village in the vicinity	-	Raikela
Mining lease area	-	67.586Ha.
Forest land (under control of Revenue Deptt.)	-	66.671Ha
Non Forest land (Sarbasadharan)	-	0.915 Ha

This area can be located on Topo Sheet No.73G/1 with

Latitude – 21° 00' 17" N and 21° 03' 50" N.

Longitude – 85° 01' 50" E and 85° 02' 30" E.

- (a) The lease area does not come under any Reserve Forest or Protected Forest. The nearby Reserved Forests are, *Sarkunda* Reserved Forest in the North, *Torha* Reserved Forest extending from west to South, *Karo & Kathamala* Reserved Forests are located in the North- East direction of the lease area.

- (b) This area comes within the Village limit of Raikela, at a distance of 1.5 kms from the settlement. Other Revenue villages situated at the vicinity of the lease area are, Dengula- 4 kms, Bandhal- 2.5 kms, Tantra- 5 kms.
- (c) There are several operating mines around the lease area. Precisely within a radius of 5kms 10active mines are in operation.
- (d) This area can be approached from Koida of Sundargarh District or from Joda of Keonjhar District through a series of mines. The distance of the lease area is 2.5 kms from Tensa, around 17kms from Barsuan.
- (e) The nearest Township are Barsuan, Koida and Joda where all the market facilities, transport and excellent health care are available.
- (f) The nearest Railway Stations is Barsuan which is situated at a distance of 17 kms from the lease area where excellent loading facilities are available. Road Transport facilities at Barsuan, Joda and Koida are also excellent.

The nearest port is Paradeep, situated at a distance of around 370 km. and the Airport at Bhubaneswar at a distance of around 310 kms. from the mining area.

2.1.1 Land use Pattern

The land schedule as per Revenue Department record is as follows

Khata No.	Plot No.	Kissam	Land classification	Area in Acres	Remarks
592	66	Pahad	Abad Ajogya Anabadi (AAA)	0.27	Classified as Forest by DLC
593	66	Pahad	AAA	14.28	Classified as Forest by DLC
594	64	Village Road	Sarbasadharan	2.24	
595	66	Pahad	AAA	35.53	Classified as Forest by DLC
596	66	Pahad	AAA	23.90	Classified as Forest by DLC
607	66	Nayanjori	Sarbasadharan	0.02	
608	66	Pahad	AAA	23.67	Classified as Forest by DLC

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609	66	Pahad	AAA	16.11	Classified as Forest by DLC
610	66	Pahad	AAA	40.00	Classified as Forest by DLC
611	66	Pahad	AAA	10.88	Classified as Forest by DLC
593/793	66	Pahad	AAA	02.09	Classified as Forest by DLC
Total				167.00Ac or 67.586Ha	

The lease area is mostly broken up area and devoid of any human habitation. The actual land use pattern against the proposed land use till date and proposed during the conceptual plan period is as follows.

	Purpose	Target land use in Ha	Actual land use in Ha	Proposed during the Conceptual period in Ha
1	Mining Pit	36.893	29.893	50.893
2	Over Burden Dump	3.000	2.000	3.000
3	Mineral Storage	4.568	3.568	4.568
4	Infrastructure	0.200	0.200	0.200
5	Roads	2.900	2.900	2.985
6	Crushing Plant	1.890	1.890	2.422
7	Green Belt	2.603	2.603	2.603
8	Undisturbed area	15.532	24.532	0.915
	Total	67.586	67.586	67.586

The conceptual plan has been prepared for the next three years and the proposed land use pattern of the lease area is as follows.

towns. There is availability of Electric Power, Water Source with in the lease hold area.

2.1.3 Topographical Features

The Mining lease area lies in the southern continuation of Bonai-Keonjhar Belt of Ranchi Plateau. The area is deeply dissected with rugged topography and distinctly marked by narrow hill ranges and flattops with prominent peaks. The elevation of the lease area varies from 615mt. above MSL to 790mt. above MSL. The highest altitude in the vicinity is 1010mts above MSL.

2.1.4 Climate

The lease are falls with in the Tropical region which is marked by very hot and prominent summer. There are three distinct seasons, a prominent summer season from March to mid June. Well defined rainy season from mid June to October and moderate winter from November to February.

The average annual rainfall is 1370 mm. Maximum rainfall is received due to South West Monsoon. About 80% of the rainfall is received during the month of June to August. The number of rainy days varies from 65 to 80 days during the year.

The temperature during summer rises very high. The maximum temperature rises to 42°C in hot summer where as the minimum temperature is 7°C during winter months.

2.1.5 Drainage

Due to the high altitude the lease area does not contain any perennial water source. There is only one seasonal Nala in the lease area running from NNE to SSW which is along the general slope of the area. There is another seasonal nala situated along the waste of the lease area. During rainy season the surface run off drainage takes place through these two seasonal nalas. The drainage from this area ultimately leads to river Baitarani.

upper shales. Economic mineral deposits of iron & manganese are confined to BIF and shales respectively. The host rocks which forms a part of the eastern limb of the famous horse-shoe shaped, Bonai synclinalorium are in consonance with the disposition of the synclinalorium.

The latest regional stratigraphy of the area is given as below :

	Ultramafic Intrusions
	Kulhan Group
	----- Unconformity -----
Dhanajori Group	Jaganathpur
	Lavas
	Quartzite, Conglomerates
	----- Unconformity -----
	Chaibasa Formations
	----- Unconformity -----
	Singbhum Granite
	----- Iron Ore Orogeny -----
	Iron Ore Group
	----- Unconformity -----
	Older Metamorphic Gneiss
	----- O.M. Orogeny -----
	Older Metamorphic Group

In this area Lateritisation is a common feature affecting almost all the rock types.

2.2.1 Forest and Forest type :

As per the India State of Forest Report 2009 the total forest area in the district of Sundargarh is as follows.

1. Geographical area	-	9712 sq.km.
2. Very dense forest	-	1047 sq.km
3. Moderately Dense Forest	-	1773 sq.km
4. Open Forest	-	1243 sq.km
5. Total forest	-	4063 sq.km

As per the Orissa forest status report 2003-04 the total forest area in the district of Sundargarh is as follows.

1. Geographical area	-	9712 sq.km.
2. Reserved forests	-	2651.88 sq.km
3. Demarcated Protected forest (DPF)	-	836.85 sq.km
4. Other forest under the control of Rev. Deptt.	-	1466.87 sq.km

Total Forest area 4955.60 sq.km

Thus around 900 sq.kms of Forest land is either barren or utilized for other purpose.

The Forest type of the lease area can be classified as

Group 3C : Northern Tropical Moist Deciduous Forest.

Sub-group-3C/C_e (iii) Moist peninsular valley Sal.

The area contains open crop with very low density.

2.2.2 Working Plan Prescription :

The lease area is under the control of Revenue Department, therefore it is not covered under Forest Working plan.

2.2.3 Flora Fauna :



The lease area doesn't form part of any National Park, Wild Life Sanctuary, Elephant Reserve, Biosphere Reserve or any critical wildlife habitat. In this context The D.F.O, Bonai Forest Division has issued a certificate in his letter No.2840/6F Dated 29.6.07 (Copy enclosed as Annexure). As per the enumeration conducted jointly by the Forest and Revenue Departments along with the lessee the trees have been enumerated. However on field enquiries some of the common species of Flora and Fauna available in the area are as follows.

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CORE ZONE (M.L. AREA)**FLORA**

Local Name	Botanical Name	Family Name
TREES		
Achu	<i>Morinda tinctoria</i>	Rubiaceae
Amba	<i>Mangifera indica</i>	Anacardiaceae
Asan	<i>Terminalia tomentosa</i>	Combretaceae
Bahada	<i>Terminalia belerica</i>	Combretaceae
Bheru	<i>Chloroxylon swietenia</i>	Meliaceae
Bija	<i>Pterocarpus marsupium</i>	Papilionaceae
Char	<i>Buchnanan lanzan</i>	Anacardiaceae
Dhaura	<i>Anogeissus latifolia</i>	Combretaceae
Dhobi	<i>Dalbergia paniculata</i>	Papilionaceae
Gambhari	<i>Gmelina arborea</i>	Verbinaceae
Haldu	<i>Adina cordifolia</i>	Rubaceae
Harida	<i>Terminalia chebula</i>	Combretaceae
Jamun	<i>Syzygium cumini</i>	Myrtaceae
Kangada	<i>Xylia xylocarpa</i>	Mimosaceae
Kashi	<i>Bridelia retusa</i>	Euphorbiaceae
Kendu	<i>Diospyrus melanoxylon</i>	Ebenaceae
Khakada	<i>Casearia tomentosa</i>	Flacourtiaceae
Kumbhi	<i>Careya arborea</i>	Myrtaceae
Kusum	<i>Schleichera oleosa</i>	Sapindaceae
Mahul	<i>Madhuca indica</i>	Sapotaceae
Moi	<i>Lannea grandis</i>	Anacardiaceae
Pipal	<i>Ficus religiosa</i>	Moraceae
Rai	<i>Dillenia pentagyna</i>	Dilleniaceae
Sal	<i>Shorea robusta</i>	Dipterocarpaceae
Sidha	<i>Lagerstroemia parviflora</i>	Lythraceae
Siris	<i>Albizzia lebbek</i>	Mimosaceae
Teak	<i>Tectona grandis</i>	Verbinaceae
Tentuli	<i>Tamarindus indica</i>	Cesalpiniaceae
GRASSES		
Khara grass	<i>Imperata cylindrical</i>	Gramineae
Phulabandhuni	<i>Thysanolaena maxima</i>	Gramineae
SHRUBS / HERBS		
Anantamula	<i>Hemidesmus indicus</i>	Asclepidaceae
Arakha	<i>Calotropis gigantia</i>	Asclepidaceae
Basanga	<i>Adhatoda vasica</i>	Acanthaceae
Dhatki	<i>Woodfordia fruticosa</i>	Lythraceae
Kurei	<i>Holarrhena antidysenterica</i>	Apcynaceae
CLIMBERS		
Atundi	<i>Combretum decandrum</i>	Combretaceae
Baidanka	<i>Mucuna monosperma</i>	Papilionaceae
Bichhuati	<i>Urtica dioica</i>	Euphorbiaceae
Mututri	<i>Smylax macrophylla</i>	Liliaceae

Local Name	Botanical Name	Family Name
Siali	<i>Bauhinia valii</i>	Papilionaceae
Satabari	<i>Asparagus racemosus</i>	Liliaceae

The lease area being an old lease is devoid of any Wild-life. As per the information collected locally, some of the occasionally stray away from the nearby forest areas and move in the lease area.

FAUNA

Local Name	English Name	Zoological Name	Schedule
MAMMALS			
Barha	Wild Boar	<i>Sus scrofa</i>	III
Bilua	Jackal	<i>Canis aureus</i>	II
Heta	Hyaena	<i>Hyaena hyaena</i>	III
Jhinka	Porcupine	<i>Hystrix indica</i>	IV
Kutura	Barking deer	<i>Muntiacus muntjak</i>	III
Neula	Mongoose	<i>Herpestes edwardsii</i>	II
BIRDS			
Bana Kukuda	Jungle fowl	<i>Gallus gallus</i>	IV
Kapta	Ring Dove	<i>Streptopelia chinensis</i>	IV
Koel	Cuckoo	<i>Eudynamis scolopacea</i>	IV
Kumbhatua	Crow pheasant	<i>Centropus sinensis</i>	IV
Gunduri	Partridge	<i>Perdica asiatica</i>	IV
Kathahana	Wood pecker	<i>Picoides nanus</i>	IV
REPTILES			
Ajagar	Python	<i>Python molurus</i>	I
Dhamana	Rat snake	<i>Ptyas mucosus</i>	II

The Zone of Influence extending over various Reserve Forests is a rich source of Forest and Wild Life. The important Flora and Fauna found in the ZoI are as follows:

BUFFER ZONE (ZONE OF INFLUENCE)

FLORA

Local Name	Botanical Name	Family Name
TREES		
Achu	<i>Morinda tinctoria</i>	Rubiaceae
Amba	<i>Mangifera indica</i>	Anacardiaceae
Amla	<i>Emblica officinalis</i>	Euphorbiaceae
Ankula	<i>Alangium lamarckii</i>	Cornaceae
Asan	<i>Terminalia tomentosa</i>	Combretaceae
Bahada	<i>Terminalia bellerica</i>	Combretaceae
Bara	<i>Ficus bengalensis</i>	Moraceae
Barakoji	<i>Zizyphus mauritiana</i>	Rhamnaceae
Baruna	<i>Crateva religiosa</i>	Capparidaceae

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Local Name	Botanical Name	Family Name
Bandhan	<i>Ougeinia oojenensis</i>	Papilionaceae
Bel	<i>Aegle marmelos</i>	Rutaceae
Bana Bhalia	<i>Semicarpus anacardium</i>	Anacardiaceae
Behenta	<i>Lemonia acidissima</i>	Rutaceae
Bheru	<i>Chloroxylon swietenia</i>	Meliaceae
Bija	<i>Pterocarpus marsupium</i>	Papilionaceae
Char	<i>Buchnanania lanzan</i>	Anacardiaceae
Chhatian	<i>Alstonia scholaris</i>	Apocynaceae
Dhaman	<i>Grewia tillaefolia</i>	Tiliaceae
Dhaura	<i>Anogeissus latifolia</i>	Combretaceae
Dimiri	<i>Ficus glomerata</i>	Moraceae
Gambhari	<i>Gmelina arborea</i>	Verbinaceae
Genduli	<i>Sterculia urens</i>	Sterculiaceae
Haldu	<i>Adina cordifolia</i>	Rubaceae
Harida	<i>Terminalia chebula</i>	Combretaceae
Jamun	<i>Syzygium cumini</i>	Myrtaceae
Kalucha	<i>Glochidion lanceolarium</i>	Euphorbiaceae
Kanchan	<i>Bauhinia variegata</i>	Cesalpiniaceae
Kangada	<i>Xylia xylocarpa</i>	Mimosaceae
Karada	<i>Cleistanthus collinus</i>	Euphorbiaceae
Kasi	<i>Bridelia retusa</i>	Euphorbiaceae
Katrang	<i>Gardenia latifolia</i>	Rubiaceae
Kendu	<i>Diospyrus melanoxylon</i>	Ebenaceae
Khair	<i>Acacia catechu</i>	Mimosaceae
Kumbhi	<i>Careya arborea</i>	Myrtaceae
Kusum	<i>Schleichera oleosa</i>	Sapindaceae
Mahaneem	<i>Melia azadirachta</i>	Meliaceae
Mahul	<i>Madhuca indica</i>	Sapotaceae
Moi	<i>Lannea grandis</i>	Anacardiaceae
Palas	<i>Butea monosperma</i>	Papilionaceae
Pipal	<i>Ficus religiosa</i>	Moraceae
Rai	<i>Dillenia indica</i>	Dilleniaceae
Rohini	<i>Mallotus philippensis</i>	Euphorbiaceae
Sal	<i>Shorea robusta</i>	Dipterocarpaceae
Semul	<i>Bombax ceiba</i>	Bombacaceae
Sidha	<i>Lagerstroemia parviflora</i>	Lythraceae
Siris	<i>Albizia lebbek</i>	Mimosaceae
Sissoo	<i>Dalbergia sissoo</i>	Papilionaceae
Sunari	<i>Cassia fistula</i>	Cesalpiniaceae
Teak	<i>Tectona grandis</i>	Verbinaceae
Tentuli	<i>Tamarindus indica</i>	Cesalpiniaceae
GRASSES		
Bamboo	<i>Bambusa arundinacea</i>	Bambusaceae
Dhantwary	<i>Cymbopogon martini</i>	Gramineae
Khara grass	<i>Imperata cylindrical</i>	Gramineae
Phulabandhuni	<i>Thysanolaena maxima</i>	Gramineae

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Local Name	Botanical Name	Family Name
Sabai	<i>Eulaliopsis binata</i>	Gramineae
SHRUBS / HERBS		
Anantamula	<i>Hemidesmus indicus</i>	Asclepidaceae
Arakha	<i>Calotropis gigantea</i>	Asclepidaceae
Basanga	<i>Adhatoda vasica</i>	Acanthaceae
Dhatki	<i>Woodfordia fruticosa</i>	Lythraceae
Kurei	<i>Holarrhena antidysenterica</i>	Apocynaceae
CLIMBERS		
Atundi	<i>Combretum decandrum</i>	Combretaceae
Baidanka	<i>Mucuna monosperma</i>	Papilionaceae
Bichhuati	<i>Urtica dioica</i>	Euphorbiaceae
Mututri	<i>Smylax macrophylla</i>	Liliaceae
Siali	<i>Bauhinia valii</i>	Papilionaceae
Satabari	<i>Asparagus racemosus</i>	Liliaceae

FAUNA

Local Name	English Name	Zoological Name	Schedule
MAMMALS			
Bana bilei	Jungle cat	<i>Felis chausaffinis</i>	II
Barha	Wild Boar	<i>Sus scrofa</i>	III
Bilua	Jackal	<i>Canis aureus</i>	II
Bhalu	Sloth bear	<i>Melur susursinus</i>	I
Harin	Spotted deer	<i>Axis axis</i>	III
Hati	Elephant	<i>Elephas maximus</i>	I
Heta	Hyaena	<i>Hyaena hyaena</i>	III
Jhinka	Porcupine	<i>Hystrix indica</i>	IV
Kutura	Barking deer	<i>Muntiacus muntjak</i>	III
Mankad	Langoor	<i>Presbytis entellus</i>	II
Neula	Mongoose	<i>Herpestes edwardsii</i>	II
Sambar	Sambar	<i>Cervus unicolor</i>	II
Thekua	Hare	<i>Lepus nigricollis</i>	IV
Udanta musha	Bandicoot	<i>Bandicoot indica</i>	V
BIRDS			
Bana Kukuda	Jungle fowl	<i>Gallus gallus</i>	IV
Gunduri	Partridge	<i>Francolinus pondicerianus</i>	IV
Kapta	Ring Dove	<i>Streptopelia decaocto</i>	IV
Koel	Cuckoo	<i>Eudynamis scolopaceus</i>	IV
Kumbhatua	Crow pheasant	<i>Centropus sinensis</i>	IV
Kathahana	Wood peacker	<i>Picoides nanus</i>	IV
Sari	Hill myna	<i>Gracula ptilogenis</i>	IV
Sua	Indian myna	<i>Acridotheres tristis</i>	IV
REPTILES			
Dhamana	Rat snake	<i>Ptyas mucosus</i>	II
Godhi	Yellow monitor	<i>Varanus monitor</i>	I
Ajagar	Python	<i>Python molurus</i>	I

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2.2.4 Population :

Lease area :- Although the lease area falls within the village limits of Raikela, there is no human settlement within the area.

Zone of Influence :

The Zone of Influence within a radius of 10kms spread over fifty villages either fully or partially. The total no of household in these villages is 6531 and total population of this area is 30415.

The details are:

Male Population - 15463 (50.84%)

Female Population - 14952 (49.16%)

Scheduled Caste

Total - 1957 (6.4%)

Male - 989

Female - 968

Scheduled Tribe

Total - 21268 (69.93%)

Male - 10798

Female - 10470

Total Workers - 11653

Male workers - 7947

Female workers - 3706

Total Non Workers - 18732

Male non workers - 7516

Female non workers - 11216

Male literacy is 63% while Female literacy is 31%.

The Village wise details is enclosed in Annexure.

The literacy rate is high because it includes the town area of Barsuan. The total work force is also substantially high.

- 2.2.5 **Employment:** The lease area as well as the zone of Influence comes within the industrial and mining belt of Sundargarh District. The major employment of the population is Mining, and some are however Industrial Workers.

This mine will provide direct employment to 194 persons besides a large number of people will be engaged in various ancillary operations.

- 2.2.6 **Agriculture:** In the villages situated within the Zone of Influence the Agriculture land is only 18.66% of the total land area. Therefore only few people depend on Agriculture alone. Crops like Paddy, maize, millets such as bajara , jawar, cowpea, barsim etc. are raised for their own domestic consumption. At places where there is water availability the people also grow vegetables. The agricultural products are mostly used by people for their own bona-fide consumption.

- 2.2.7 **Industries:** A number of industries are situated around the lease area. The most important industry is the Ferro-chrome Plant of TATA Steels. Several Iron Ore Crushers are also situated in the nearby areas. Rourkela Steel Plant is also situated within the same district at a distance of about 70 kms.

CHAPTER – III

MINING PROCESS

- 3.1.0 **Process** : The mining process is open cast mechanized mining method with deployment of mechanized shovel and high capacity dumper of matching size. Drilling and blasting activities will also be taken up. The method is called as shovel dumper system. The Ore will be transported through road, to the crusher unit for crushing. The transport will be by high capacity dumpers and Mechanised, loading arrangements are made at the mine area. Transportation to the Railway siding will also be done through high capacity dumpers. Several high capacity Dumpers are utilized for such transportation. For excavation of the mineral 10 high capacity Dumpers (10 MT capacity) are being utilized.
- 3.2.0 **Overburden**: The over burden will be drilled and blasted by using Air Compressor Wagon Drills and Jack hammer Drills. Volvo Loaders of 2.3Cum capacity shall be used for Loading of the Ore and removal of over burden. The overburden will be removed by dumpers. Total generation of overburden during the last five years has been as follows.

Year	Target in Cum		Achievement in Cum	
	Waste	Sub grade	Waste	Sub grade
2004-05	130380	43460	244347	137410
2005-06	129804	43268	342000	101400
2006-07	132660	44220	417207	136515
2007-08	143820	47940	82842	27321
2008-09	143940	47980	85461	28548
Total	680604	226868	1171857	431194

The production of Waste (Overburden) and Sub-grade Ore during the Last 5years has been almost double of the estimated target while the production of Ore has been 53% of the target

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During the conceptual period total waste generation will be as follows:

Year	OB	Sub-grade	Waste to be re-handled	Total
2009-10	44240	110600	40000	154840
2010-11	44290	110725	140000	155015
2011-12	15360	38400	40000	53760
Total	103890	259725	220000	363615

Waste generation during the conceptual period – 103890Cum

Re-handling of existing Waste will be – 222000 Cum

On an average annual Waste generation has been estimated to be 45000Cum and total generation of Waste to be 11.24Cum. These Waste will be efficiently managed to create minimum problem to the local people as well as Wild-life.

3.2.1

Waste Management: At present 3Ha area has been set out for OB

Dump, and during the conceptual period an area of 7Ha has been proposed to be used as OB Dump. This area can accommodate 16,00,000Cum of loose material or 13,33,00Cum of compact materials. Hence there will be no problem in accommodating the entire Over Burden. Two dump benches of 10mtr each height will be maintained. Average dump slope will be maintained at 28°. The Dump site will be surrounded by garland drains which will prevent washing away of the dump materials.



Retaining wall is being provided around the dump area to prevent erosion.

3.3.0 **Production of Ore:** During the 5years the target and production of Iron Ore has been as follows:

Year	Target of Ore Extraction in Tons	Achievements in Tons
2004-05	782280	445907
2005-06	778824	595300
2006-07	795960	794285
2007-08	862920	165370
2008-09	863640	174410
Total	4083624	2175272

Thus only 53% of the Target has been achieved during the last 5years.

3.4.0 **Size of the Benches** : The height and width of the Benches shall be maintained at 6mts and 10mts each respectively.

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The overall bench slopes is proposed to be 35° with the horizontal.

- 3.5.0 **Drilling & Blasting** : The proposed mining will have 6 m height benches and will be drilled for blast holes by 32mm compressed air operated Jack hammers and 100mm Wagon Drill. Sequential blasting with delayed detonators, proper spacing, usage of optimum explosives etc. will be adopted to reduce fly rock and vibrations.



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The in-situ massive ore will be dislodged by drilling followed by blasting prior to excavation and loading. The most common type of explosives readily available and will be used for the mine are as under:

- Slurry based explosives.
- Ammonium nitrate fuel oil mixture (ANFO)

3.5.0 **Extent of mine pits** : The lease area at present has pit size of 900m x 400m extending over 49,451 Ha and during the conceptual period the Pit size will be 923m x 590m extending an area of 50.893Ha.

3.6.0 **Ore Crushing Unit** : The ore obtained from the mines will be transported to the crushing unit and the crushed materials will be transported by dumpers to the Railways siding.

3.7.0 **Water Management** : The Ground water table in the lease area is very low and therefore the mine will generate very small amount of water. However during rains there will be accumulation of some water. The rain water will be channelised through garland drains provided around the dumps and mine pits to the settling tanks provided along the drains. The rain water dewatering process if required will involve chanalising the water along with slurry to pass through these garland drains and settling tanks. The treated water will be utilized for spraying the haul road for suppression of dust and the surplus treated water will be released to the natural drainage system.



Photograph of Check Dam and Settling Tank

3.8.0 Vehicles and machineries: The major mining activity will involve excavation and transportation of the Ore. For this purpose large numbers of vehicles will be used in the mining process besides use of drilling machines, generator operated-trolley mounted lighting systems and other required machineries like shovel loaders etc. The following machineries are proposed to be put in operation for the Mining purpose.

1. L&T Poclain CK 90- 0.9Cum	-	1 no
2. P C 200 – 0.9 Cum	-	2 no
3. Kamatsu 180 - 1.7Cum	-	2 no
4. VOLVO Loader - 2.3 Cum	-	1 no
5. L&T 580 – 2	-	1 no
6. Dumper 10MT	-	10 no
7. Air compressor 4" Wagon drill	-	2 no
8. Jack Hammer Drill	-	1 n o
9. Tractor with air compressor	-	1 no

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10. Jeeps	- 2 no
11. Dust screening Plant 200TPH	- 1no
12. ROM Plant	- 1 no

3.9.0 Engagement of Staff: The following persons will be directly employed in the Mining Process.

1. Mines Manager	- 1
2. 2 nd class Manager	- 2
3. Foreman	- 4
4. Supervisors	- 10
5. Mechanical Engineer	- 1
6. Mining Engineer	- 1
7. Electrical Engineer	- 1
8. Geologist	- 1
9. Surveyors	- 2
10. Blaster	- 2
11. Clerical Staff	- 6
12. Supporting Staff	- 11
13. Other Workers	- 152
Total	- 194

Besides the above numbers of staff directly employed in the Mining activities, around 2000 persons will be indirectly benefited in other ancillary works.

3.9.0 Salient Features of mode of working: The Mining can be called as opencast Mechanized method. The mining operation such as excavation, blasting, loading and ore crushing will be mechanized. The overburden transportation will be done through dumpers.

The mine product will be transported through high capacity dumpers to the Railway siding

CHAPTER IV

THREATS TO WILDLIFE AND ITS HABITAT

4.0.1 The lease area of Raikela Iron Ore mines is spread over 67.586Ha. Out of the total area of 67.586Ha, 66.671Ha area is Forest Kissam land which is under the control of Revenue Department.

The vegetation in the Lease hold area is sparse. This area does not form a part of any Sanctuary or National Park. It is also not covered under any Forest Working Plan. No wild animals are present in this area. This area is also surrounded by various mines and mining activities.

This lease area being surrounded by various mining leases is not a good habitat for wild life.

The Forests around the lease area are disturbed due to various Mining activities and therefore the presence of Wild-life is very sparse. As per the information collected the following important Wild life species are occasionally found in the Forests areas within the Zone of Influence.

<i>Local Name</i>	<i>English Name</i>	<i>Zoological Name</i>	<i>Schedule</i>
MAMMALS			
Bana Bilei	Jungle Cat	<i>Felis chausaffinis</i>	II
Barha	Wild Boar	<i>Sus scrofa</i>	III
Bhalu	Sloth bear	<i>Melur susursinus</i>	I
Bilua	Jackal	<i>Canis aureus</i>	II
Gunduchi	Squirrel	<i>Funambullus penanti</i>	IV
Hati	Elephant	<i>Elephas maximus</i>	I
Harin	Spotted deer	<i>Axis axis</i>	III
Heta	Hyaena	<i>Hyaena hyaena</i>	III
Jhinka	Porcupine	<i>Hystyrix indica</i>	IV
Kutura	Barking deer	<i>Muntiacus muntjak</i>	III
Mankad	Monkey	<i>Presbytes entellus</i>	II
Neula	Mongoose	<i>Herpestes edwardsii</i>	II
Neula	Hill Mongoose	<i>Herpestes javanicus</i>	IV

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<i>Local Name</i>	<i>English Name</i>	<i>Zoological Name</i>	<i>Schedule</i>
Sambar	Sambar	<i>Cervus unicolor</i>	II
Thekua	Hare	<i>Lepus nigricollis</i>	IV
Udanta Musa	Giant Squirrel	<i>Ratufa indica</i>	II
BIRDS			
Bana Kukuda	Jungle fowl	<i>Gallus gallus</i>	IV
Kapta	Ring Dove	<i>Streptopelia chinensis</i>	IV
Koel	Cuckoo	<i>Eudynamis Scolopaceus</i>	IV
Kumbhatua	Crow pheasant	<i>Centropus sinensis</i>	IV
Gunduri	Partridge	<i>Perdica asiatica</i>	IV
Kathahana	Wood peacker	<i>Picoides nanus</i>	IV
Kumbhatua	Crow Pheasant	<i>Centopus sinensis</i>	IV
Petcha	Owl	<i>Athenebrama indica</i>	IV
Sari	Indian Moyna	<i>Acridotheres tristis</i>	IV
REPTILES			
Ajagar	Python	<i>Python molurus</i>	I
Boda	Common Boa	<i>Erix conicus</i>	IV
Naga	Cobra	<i>Naja naja naja</i>	II
Dhamana	Rat snake	<i>Ptyas mucosus</i>	II
Godhi	Yellow monitor	<i>Varanus monitor</i>	I

Non of the Endangered or Endemic Wild-Life species are found here. Even though this area does not form a part of any National Park or Sanctuary or Critical Wild Life Habitat, the following threats are anticipated to the wild life and its habitat.

1. Threats within the mining area.
2. Threats within the Zone of Influence.

4.1.0 Threats within the Mining area.

Mining operation in the area will involve various activities such as Drilling, Blasting, Crushing the Ore, movement of large number of Machineries, Vehicles and Workers. Such activities may cause the following threats.

4.1.1 Reduction in wildlife habitats

Due to the mining activities 66.671Ha. forest area will not be available for general purpose such as collection of fuel, small timber and other NTFP items by the local population. This area will also not be available for use by the wild animals however occasional it may

be. Thus Wild-Life Habitat to the extent of lease Will be reduced.

4.1.2 Soil erosion

The mining activity will involve removal of all the forest cover and top Soil and digging of large pits. Major part of the forest land will come under the mining pit setting aside the safety zone. The Topographical features of the lease area puts it in high erosion prone area. Therefore Large scale soil erosion is bound to take place which may cause formation of Gullies and Ravines leading to further destruction of adjoining Forest as well as wild-life habitat. The possibility of land slide also cannot be ruled out.

4.1.3 Water availability

- (a) **Loss of Moisture:-** Due to mining activity there will be large scale evaporation from the exposed soil and moisture retention capacity of the soil along the periphery of the mine pits will reduce. The sub-soil water will also be reduced which may lead to destruction of some more vegetation due to desiccation. The process of dewatering and releasing huge quantities of water in to the natural drainage system may reduce the recharge of Sub-soil water and ground water, resulting in water scarcity.
- (b) **Water accumulation:-** Digging of large pits will accumulate huge quantities of water which will lure the Wild animals and ultimately may trap them in the pits which will be fatal for them.

4.1.4 Water pollution

The water source available within the mining area is likely to be muddy due to presence of large amount of dust and broken up soil and mineral particles. It is also likely to be contaminated due to excessive plying and cleaning of heavy vehicles and machineries. Use of Slurry pumps for de-watering purpose and releasing the said water along with Slurry in the natural drainage system will contaminate the natural streams and pose health hazards for the human population, as well as animals.

4.1.5 Dust pollution

The mining process includes Blasting, Drilling, movement of
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heavy vehicles and machineries etc. These activities will produce large amount of dust. There will also be some Ore Crushing and Dressing Units which will generate dust along with some mineral powder. The process of internal transportation, unloading, reloading etc. may spread large amount of dust. Such dust mixed with mineral powder is likely to cause air pollution. This will create respiratory problems in wild animals. Large amount of Dust will settle on the Grasses and other fodder plants which when taken by animals will cause Digestive problems.

4.1.6 Noise pollution

The Environmental Management Plan sets out that, there will be no impact of Noise produced in the Mining process. The Noise Levels are proposed to be kept within permissible limits. However operation of heavy machinery and Blasting in the mining area will produce large amount of sound which may cause disturbance to wild animals within the nearby Wild-life habitat. Movement of large numbers of heavy vehicles in and around the lease area will disturb the wild animals and create panic.

4.1.7 Lighting

The entire lease area will be lighted for safety reasons and convenience. Such lighting will create panic in wild animals surrounding the lease area. However due to such lighting the wild-animals will try to avoid the mining area.

Movement of large number of vehicles at night with their lights on in and around the lease area will disturb the Wild animals.

4.1.8 Accumulation of Garbage

Due to various activities in the mining process, movement of large number of work force and vehicles within the mining area, a large quantity of garbage will be generated within the mining area.

The Garbage include Solid Wastes such as Over burden, Mine

Waste, Sub-grade Ore etc.

Besides some amount of non Bio degradable Waste and Hazardous waste such as used oil, used batteries, oily sludge, filter materials containing oil are likely to be generated within the lease area.

These dangerous materials will create various health problems for both human population as well as animal population including wild animals.

4.1.9 Fall of animals in Mine pits

The mining pits are dug with very steep slopes. The bench height will be 6mts with slope of 70° and bench width of 12mts makes the overall slope 28° . Usually no physical barrier is provided around the mine pits. Any accidental fall of the animals in those pits may be fatal for the animals.

4.1.10 Poaching

The poachers may also drive the animals and lead them in to the mining pits using the same as animal traps.

4.2.0 Threats in the Zone of Influence.

Due to the mining operation there will be some disturbance in the surrounding area, particularly in the Zone of Influence.

4.2.1 Destruction of wildlife habitat.

Due to mining activity over the lease area, the biotic pressure which was exerted over the lease area will be shifted to the surrounding areas. Collection of fuel wood, small timber and other NTFP by the local people will also be shifted to the surrounding area which will create additional pressure on the surrounding area. Grazing pressure of the local Cattle will also be shifted to these Forests. Therefore the wildlife habitat in these Forest areas is likely to be disturbed.

4.2.2 Water pollution

Large quantities of water produced in the process of mining which are highly polluted will be released in to the natural drainage system, there by contaminating natural water sources. The slurry generated in the mining process will also be pumped out in to the natural drainage system making the natural water source unfit for consumption by animals as well as human beings. Besides large amount of Garbage will be generated in the mining area and will contaminate the water. These contaminated water will create health problems within the Zone of Influence as well as beyond.

4.2.3 Dust pollution

The mining process, Ore Crushing/dressing and transportation will spread large quantities of dust in the surrounding area. There will be heavy air pollution in and around the lease area creating various problems for the animals.

4.2.4 Man animal conflict.

Due to reduction of habitat, additional biotic interference will be exerted in the Zone of Influence which will create disturbance. There will be also shortage of food. The animals are therefore likely to invade cultivated lands and human habitation which will result in man-animal conflict.

4.2.5 Accidental killing of animals

Due to plying of large number of vehicles the animals will be scared and in the process some animals may be killed accidentally by vehicles.

4.2.6 Forest Fire

Forest fire is a common phenomena in almost all forests areas irrespective of mining activity. But due to mining activity such as movement of large number of vehicles, people etc. the incidence of accidental fire is likely to increase. The wildlife habitat is destroyed along with important flora and fauna due to forest fire. The small

animals including reptiles are usually killed in the forest fire. Sometimes the large animals are also trapped in the fire. Increased Biotic pressure in the Zone of Influence will also increase the incidence of fire hazard.

CHAPTER V

WILDLIFE MANAGEMENT PLAN



5.0.0 Although there are no Wild animals within the lease area their occasional movement in the area can not be ruled out. Due to grant of lease and operation of various mining activities the Wild life movement within the lease area will be threatened. Besides the Wild-life habitat is reduced to the extent of lease. The Wildlife Management Plan therefore aims at improving the habitat in the surrounding areas. Certain measures are also required to be taken within the mining area.

The proposed measures can be taken within the mining area by the lessee and beyond the lease area by the Government (Forest Department) with the financial support provided by the lessee.

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5.0.1 **Management Plan**

Basing on the perceived threats to wildlife as per the foregoing chapter, the Management Plan is prepared to address almost all such threats. The lease hold area as well as the Zone of Influence will be treated for habitat improvement so that, more fodder and water will be available for the wild animals.

The life of the mine has been estimated to last beyond 2018-19. But this plan is proposed for a period of 5 years on the presumption that, the habitat improvement in the adjoining area i.e. the Zone of Influence can be achieved to the desired level.

5.1.0 **Measures to be taken within the mining Lease area.**

The activities taken up in the lease area will pose maximum threat to wildlife. It is therefore necessary to minimise such threats. The following steps will be taken within the lease area.

5.1.1 **Safe passage to Existing Wild-life**

Even though Wild animals are not found in the lease area it is probable that, some reptiles and small animals might be living in the area. It is therefore very important to save the existing wild animals available within the lease area and to divert them to safer locations. It can be possible to achieve such objective by commencing the mining activities from locations situated away from the Forest areas. Thereby the Wild animals present within the Lease area will find their way to nearby Forest areas.

5.1.2 **Restoration of habitat**

In the mining lease area the lessee has already planted 17900 seedlings of different species within the lease area over an area of 7.62Ha from the year 2004-05 to 2008-09 and 9550 seedlings planted outside the lease area during the said period. It is further proposed to plant another 6400 seedlings during the next three

years. The safety zone of 7mts around the mining lease area will be maintained with good vegetation creating a green belt around the lease area which will control spreading of dust. This belt will also act as a buffer zone between the mine and the Wild-life habitat. This aspect has been proposed in the approved Mining Plan, hence no additional funds are proposed for this.

Besides the above proposed steps the overburden will be filled back in the mine pits and plantations will be taken up as per Mine Closure Plan.

The major steps taken in regard to restoration of habitat within the lease area are:

- (i) Existing plantation of 17900 seedlings.
- (ii) Proposed plantation of 6400 seedlings in next 3years.
- (iii) Maintain Forest Growth along the safety zone.
- (iv) Planting of grasses and other species on the OB Dumps.

5.1.3 **Soil and water conservation**

There will be substantial loss of moisture as well as occurrence of soil erosion due to mining activity. For enhancing seepage of water and to reduce soil erosion the rain water will be channallised through garland drains provided around the dumps to the settling tanks provided along the drains. The rain water dewatering process if required will involve channallising the water along with slurry to pass through these garland drains and settling tanks. The treated water will be utilized for spraying the haul road for suppression of dust.

In the safety zone the rain water will be diverted through easy gradient drains to minimise soil erosion. Check-dams will be provided on the natural channels in order to prevent soil erosion in the safety zone. These activities have been proposed in the Mining Plan, hence no separate provision is made on this account.

5.1.4 Control of Dust



Dust hazards affect more to the human beings and the workers engaged in the mining activity, besides creating problems for the wild animals. Therefore dust control is a major activity in the mining process. Dust pollution cannot be completely eliminated, but attempt is made to reduce the quantum of dust pollution.

The Haul Road in the mining area are regularly sprinkled with water so that, dust is minimised due to movement of vehicles.

The Ore at the time of loading, transportation and unloading in and around the mining area will also be sprinkled with water to reduce Dust pollution.

Dust control measures have been proposed as a requirement in the approved Mining Plan and therefore special provision is not made for this activity in this Plan.

M/s GEETARANI MOHANTY

5.1.6 Control of water pollution

Water pollution is the most important factor in mining process. Huge quantities of water will be produced every day along with slurry which are to be removed from the mining pits and released to the natural drainage system. Besides contaminated water due to cleaning of vehicles and machineries, dumping of Garbage etc. will flow to the natural water sources creating health hazards.

The water pollution will be controlled by treatment of water before releasing the same to the natural drainage system

Since the lease area is situated on higher altitude the generation of water from the mine pit will be minimum which can be easily handled.

The discharged water will be collected in sump pits and channelled to treatment plant. The treatment plant will consist of :

- (i) Oil, Grease trap,
- (ii) Sedimentation pond,
- (iii) Chemical dosing arrangement to arrest suspended Solid, oil and Grease.

The treated water instead of releasing to the natural drainage system will be used in dust suppression on haul roads, washing of dumpers and dozers etc.

Oil and Grease recovered in the process will be stored in drums and auctioned.

Surface runoff will be collected through garland drains and diverted to sedimentation tanks. There after the overflow will be diverted to the natural drainage system.

All these measures are required to be complied in the approved Mining Plan, therefore special provision is not made for this in this Plan.

5.1.7 Noise control

The following measures will be taken to keep the noise at the minimum possible level.

M/s GEETARANI MOHANTY

- Proper designing of plant & machinery by providing in-built mechanisms like silencers, mufflers and enclosures for noise generating parts and shock absorbing pads at the foundation of vibrating equipment.
- Routine maintenance of equipment.
- Enclosures for Ore Crushing/dressing units etc.
- Rational deployment of noise generating plant and machinery.
- Greenbelts around the quarry, infrastructure sites, service building area
- Provision of isolation for vibrating equipment (both fixed and mobile) foundation.
- Regular monitoring of noise levels at various points.

5.1.8 Lighting



The core area of the mining activity is sufficiently illuminated. Such illumination detracts the animals from the core mining area, which would otherwise be dangerous to their lives. Care will be taken to focus the lights to the mine pits from the safety zone.

The use of vehicular Headlights which disturbs the animals is restricted and only dippers are allowed within the mining area.

These activities have been included in the mining process and hence no special funds are required .

5.1.9 **Garbage Management**

Garbage not only creates problems for the wild life but also creates problems for mining activity. Particularly non-degradable materials like polythene bags etc. pose a lot of problem for the machineries as well as Wild animals. Hence proper Garbage Management is also an important activity in Mining process. Some of the steps to be taken in the Mining area have been indicated under water pollution.

During the next three years of this Plan period the Solid Waste generation is estimated to be 1,03,890Cum. along with 2,20,000Cum. of rehandled waste. An area of 3.00Ha has been set out for the Waste Dump. It is estimated that, the proposed Dump site will be full within a period of 4 years. There after it is proposed to back fill the exhausted and abandoned mine pits so as to generate adequate space for the Waste. The Dump site will be surrounded by retaining walls followed by a series of garland drains. The size of the garland drains will be 1m wide and 0.5m deep. The water percolated through the wastes will be drained to the garland drains and then to settling tanks.

Besides the above steps, the additional steps which are to be taken for Garbage management are as follows.

M/s GEETARANI MOHANTY

- (a) Entry of non-biodegradable materials which are likely to produce Garbage such as Polythene bags, Aluminium foils, Tin foils etc. are restricted in to the Mining area.
- (b) The Garbage generated in the Mining area are regularly collected and segregated in-to Bio-degradable and non-degradable materials.
- (c) The non-degradable materials if any are sent for recycling.
- (d) The Bio-degradable substances are put in the Compost pits of size 10' x 10' x 6' for conversion in-to manure. The Manure obtained from these pits will be utilised for plantation purpose.

Two persons will be engaged on regular basis for collection, segregation of Garbage and putting the same at proper place. The expenditure on this account is proposed to be (2x4000x12x5=Rs.4,80,000/- + Compost pits Rs.50000/-) = Rs5.30lakhs.

5.1.10 Fall of animals in the mining pits.

In order to prevent accidental fall of animals in the mine pits the following steps shall be taken:

- (a) Two persons will be exclusively engaged in the mining area during night who will keep a watch on straying wild animals and drive them away to safe distance. The total expenditure for the animal watcher during the proposed 5 years period will be (2x4000x12x5=) Rs.4,80,000/-.
- (b) Solar electric fencing will be provided at strategic locations where possibility of entry of wild animals in to the mining area is there particularly towards the forest area. It is proposed to provide Solar Electric fence over 2Kms., at a cost of Rs.6.00lakhs.
- (c) The mining area will be sufficiently illuminated so that the wild animals will avoid the area.
- (d) In-spite of the precautions taken, in case of accidental fall of any wild animal in the mining pit, the workers will be educated to inform the local Forest authorities and act as per their advise.

M/s GEETARANI MOHANTY

5.1.11 Prevention of poaching

The mining area is well guarded and sufficiently illuminated. Hence no poaching can be possible within this area.

5.1.12 Creation of awareness

The lessee will also create awareness around the lease area regarding protection of wild life and its habitat through distribution of leaflets, organising Essay Competition, Debate Competition in the Schools etc. For this purpose the lessee will incur expenditure of Re.2.00lakh.

5.2.0 Measures to be taken within the Zone of Influence.

Due to diversion of Forest area of 66.671Ha for mining purpose the wild-life habitat to this extent will be reduced. The congregation of wild animals in the Zone of Influence is likely to increase. These animals will therefore be susceptible to greater threats. There will also be additional Biotic pressure on the Zone of Influence. The Management Plan therefore aims at reducing such threats. These activities beyond the Mining lease area and beyond the control of the Lessee will be undertaken by the Forest Department.

5.2.1 Habitat Improvement

It is proposed to improve the wild life habitat within the Zone of Influence with the following activities.

(a) Plantation :- Creation of cover for the wildlife by planting of suitable species in degraded forest areas. It is proposed to take up plantation over 40 ha. within 5 years period at a cost of Rs.20.00 lakhs.

(b) Grass Land development:- The natural blanks in the forest areas are to be developed as grass lands. It is proposed to create 5 Ha Grass land during the initial two years period at a cost of Rs.2.50 lakh.

(c) Soil and moisture conservation:- Check dams of random rubble

stones are to be provided to prevent soil erosion and conserve moisture. It is proposed to provide Rs.5.00 lakhs for the activity.

(d) It is also proposed to recharge the ground water and sub-soil water by providing a series of percolation pits. These percolation Pits will also arrest soil erosion by reducing surface run-off. The lessee proposes to contribute Rs.2.50 lakhs for the purpose.

(e) **Creation of Water body** :- In order to contain the wild animals in a safe habitat, it is proposed to make provision for availability of water during summer season. It is proposed to create one water body at a strategic location at a cost of Rs.5.00 lakhs.

5.2.2 **Control of Water pollution.**

Release of untreated water to the natural drainage system will create health hazards for the animals as well as human beings. All the water including slurry generated in the mining process will be treated. Attempt will be made to utilize the total quantity of water generated in the mine itself for suppression of dust and irrigation of the plantation. Only some surplus treated water will be released to the natural drainage system. This aspect has been dealt in the Mine plan and hence no separate provision is made in this Plan.

5.2.3 **Reducing Man-animal conflict**

In the lease area as well as the areas within the Zone of Influence the man-animal conflict is found to be minimum. Most important man-animal conflict is Man-Elephant conflict. Such conflict will be reduced by creating awareness in the forest fringe villages about the behaviour of the animals and the procedure to tackle the emergency. The local people can be educated regarding the wild-animal habits and how to tackle the emergency situations. It is proposed to engage two motivators for a period of five years. The cost on this account will be $(5 \times 2 \times 4000/- \times 12 \text{ months}) =$ Rs.4.80 lakhs. This amount is proposed to be borne by the lessee.

5.2.4 **Forest Fire prevention**

Forest fire is the greatest threat, not only to the wild life but also to the

forest itself. Repeated forest fire destroys the ground vegetation and the humus. The wild animals do not get adequate food and cover due to such repeated forest fire.

The Wildlife Management Plan therefore lays maximum emphasis on prevention of forest fire. The following measures are therefore proposed to be taken to prevent forest fire:

(a) Engagement of Fire watchers.

Fire watcher shall be engaged in the area from the month of March to June every year for a period of 5 years. The lessee proposes to bear the cost of 3(three) fire watchers during the summer months every year. The total cost on this account will be $(3 \times 4000 \times 4 \times 5) = \text{Rs. } 2.40 \text{ lakhs}$. These Fire watchers will also be equipped with certain tools to attend to emergencies. The lessee therefore proposes to contribute Rs.1.00 lakh for such fire fighting equipments.

(b) Provision of incentive to fringe villages.

Awareness will be created among the forest fringe villages to prevent forest fire. The village which can successfully prevent forest fire in the specified patch of the forest near their village will be rewarded with incentive. It is proposed to reward such villages with Rs.10,000/- annually. The lessee proposes to bear the cost of incentive for 5 such villages within the Zol and the amount will be deposited with the D.F.O. The cost will therefore be Rs2.50lakhs.

(c) Fire lines

Fire lines is an effective means to prevent spreading of Forest fire. The lessee proposes to share the cost of 10 kms. of fire line @4,000/- per kms. annually during the proposed period of five years with a total cost of Rs2.00lakh.

5.2.5 Solar Electric Fencing

At important places solar electric fencing can be taken up to prevent the animals from entering in to human habitation. This can be done at the discretion of the Forest Department. The Lessee proposes to contribute Rs.5.00 lakhs for this purpose.

M/s GEETARANI MOHANTY

5.2.6 Provision of Corpus fund

Usually any damage to human life and property by wild-animals are compensated through Compassionate Grants released by Govt. But at times delayed payment of compassionate amount leads to revengeful attitude of local people. It is therefore proposed to create a revolving fund for quick payment of compassionate grants. The lessee proposes to contribute Rs.5.00 lakhs for this purpose.

5.2.7 Collection of Intelligence.

In-order to properly address the problem of Wild Animal Poaching , it is necessary to keep track of the local Poachers and to collect information regarding their movement. For this it is proposed to reward the Informers and Decoys. The reward can be paid to the Informer or Decoy either on regular wage basis or lump sum basis at the discretion of the Forest Department. The VSS or Eco-Development Committees can also be involved with an assured reward system. The lessee proposes to deposit Rs.5.00 lakhs in Fixed Deposit Account in favour of the DFO and the annual interest can be drawn by the DFO and utilized for this purpose.

5.2.8 Provision of equipments & Logistics.

Certain equipments such as Computers, GPS, four wheeler, Motor-cycles, Crackers, Search lights etc, as per the requirement and specification of the implementing DFO/ Forest Department, will be supplied by the lessee . It is proposed to provide Rs.6.00 lakh for this purpose.

5.3.0 Discretion of Forest Department

Although the above proposals are submitted for the mitigation of various threats to Wild-life and its habitat, the Forest Department is free to make alteration of the proposal or to divert the proposed activities to any other suitable locations.

M/s GEETARANI MOHANTY

CHAPTER-VI FINANCIAL FORECAST

- 6.4 Based on activities suggested in the Chapter-V broad financial estimate for activities within the lease hold area and in the adjoining forest etc. areas.
- 6.5 The activities proposed to be taken up inside the leasehold area are to be executed by the User agency under the supervision and monitoring of DFO, Bonai Forest Division.
- 6.6 The following table indicates the cost estimate for measures to be taken inside & outside the project area within 10-years. The cost of activities to be taken up in the project impact area (ZoI) i.e. outside leasehold area shall be deposited with the Forest Department to be utilized by the Divisional Forest Officer, Bonai Division for execution of works under the guidance of Conservator of Forests, Rourakela Circle. User agency will deposit Rs.72 lakhs with DFO, Bonai Division under CAMPA for implementation of the plan.

6.1.0 Activities within the Project area.

(Rs. In lakhs)

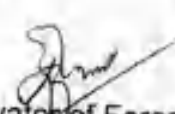
Sl. No.	Item of work	Amount approved by CWLW
1	Garbage Management- Wages Compost pits	To be approved by Pollution control board as per their norms.
2	Wild animal watchers- 2nos.	5.00
3	Solar electric fencing- Fencing should be confined to mining pits and proper corridor and passage should be left for passing wild animals including Elephants moving in the area.	6.00
4	Awareness promotion, livelihood activities, signages, animal and health camps.	2.00
5	Soil & Moisture conservation measures with contour trenches/ series of check dams on nalas & rivulets/ brushwood dams/ especially to avoid choking of nalas/soil erosion etc.	3.00
6	Creation of Water sources in the forest area for the residual wild life including small mammals, reptiles, Avifauna etc in the area for 10 years including artificial refilling if necessary during hot summer months HDPE troughs, ponds etc.	2.00
7	General provision for equipments, such as GPS, Computers, Vehicle, Motor Cycles, Crackers, Search lights etc. as per specification of the DFO.	10.00
	TOTAL	28.00

6.2.0. Activities within the Project Impact area (zone of influence).

Sl. No.	Item of work	Amount proposed for approval by CWLW
1.	Habitat improvement both in project impact area including with Fodder & fruit bearing species block plantations and ANR with gap plantations with above species, meadow development, Bamboo plantations/bamboo clumps silvicultural operations etc.,	23.00
2	Soil & Moisture conservation measures/percolation pits, with contour trenches/ series of check dams on nalas & rivulets/ brushwood dams/ especially to avoid choking of nalas/soil erosion etc.	8.00
3	Creation of Water Body	5.00
4	Fire watchers-3nos.	2.50
5	Fire fighting equipments	1.00
6	Incentive for fire prevention	2.50
7	Fire line tracing	2.00
8	Solar electric fencing	5.00
9	Corpus fund	5.00
10	Intelligence collection	5.00
11	Biodiversity monitoring & Development of communication network / GIS based maps Satellite maps on GIS domain should be procured every year to know the changing profile of the project area in both dry season and wet season for 10 years preferably using the GIS lab of PCCF(WL), Orissa	5.00
12	Awareness promotion, livelihood activities, signages, animal and health camps.	6.00
13	Unforeseen expenditure	2.00
TOTAL		72.00

N.B: All measures for dump reclamation, dust suppression, garbage bins, soil erosion measures should be taken up including retaining walls, plantation, plantations in the safety zone etc. as per the reclamation plan/safety zone plantation scheme etc to be prepared in terms of the approved plans and other guidelines. These components are to be dealt separately as per the above guidelines and to be approved by competent authority. Hence no financial forecast on this account is indicated in the conservation plan.

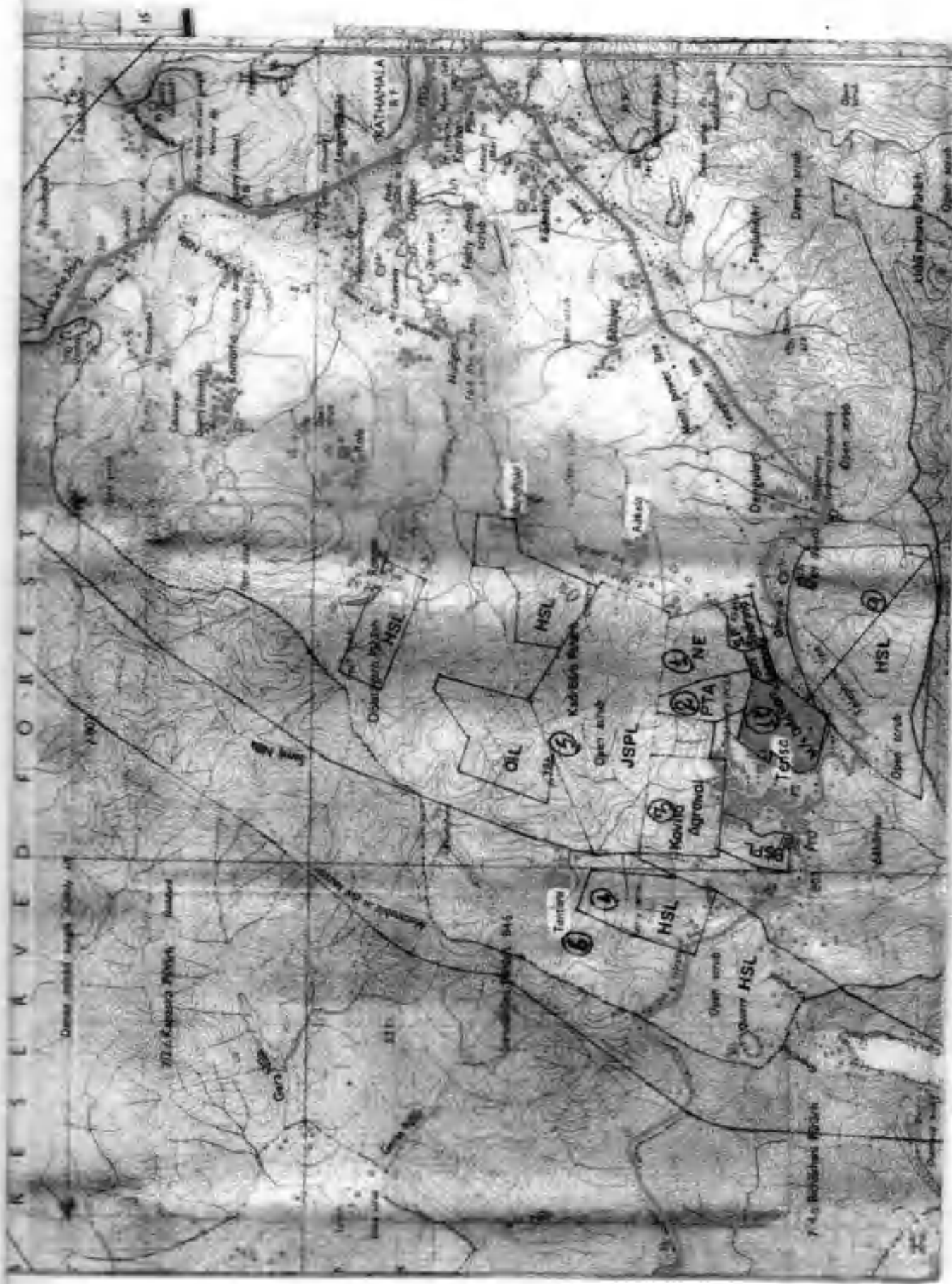
Approved by PCCF(WL)& CWLW, Orissa.


Conservator of Forests (WL)

Conservator of Forests (WL)
C/O PCCF(WL) & CWLW, Orissa
Orissa, Bhubaneswar

REFERENCES

1. Mining Plan of Raikela Iron Ore Mines.
2. India State of Forest Report 2009
3. Orissa Forest Status Report 2003-2004
4. Working Plan of Bonai Forest Division.
5. District Census Hand Book.



OFFICE OF THE DIVISIONAL FOREST OFFICER: BONAI DIVISION
Ph/Fax-06626-244434 Email: dfo_bonai@sancharnet.in

No. 2840 /6F-dt. 29.6.07

To,

Sri Srinibas Sahu,
Managing Partner,
M/s Geetarani Mohanty,
Station Road, At/Po-Barbil,
Dist-Keonjhar.

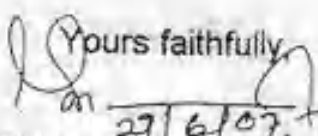
Sub:- Environmental Clearance of Project of Raikela Iron Ore
Mines of M/s Geetarani Mohanty over an area of 67.586 Ha
in village Raikela of Sundargarh District.

Ref:- Your letter No. 45 dt.25.6.2007.

Sir,

With reference to your letter cited above, the Certificate
required for Environmental clearance of your Raikela Iron Ore Mines is
furnished below.

" Certified that the lease-hold area of Raikela Iron Ore Mines
does not form part of any National Park, Wild Life Sanctuary, Bio-sphere
Reserve, Tiger Reserve or, Elephant Corridor."

Yours faithfully,

29/6/07
Divisional Forest Officer,
Bonai Division.

D No. B-37/2007-FC
Government of India
Ministry of Environment and Forests
(F.C. Division)

Paryavaran Bhawan,
CGO Complex, Lodhi Road,
New Delhi - 110 003.

Dated: 25th August, 2008.

To

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

Sub: Diversion of 64.148 ha of forest land for Iron Ore mining in favour of M/s Geetarani Mohanty in village Raikela of Bonai Tahasil in Sundargarh district of Orissa.

Sir,

I am directed to refer to the State Government's letter No. 10P(Cons)120/2006.6879/F&E dated 05.05.2007 on the above mentioned subject, wherein prior approval of the Central Government for the diversion of 64.148 ha of forest land for Iron Ore mining in favour of M/s Geetarani Mohanty in village Raikela of Bonai Tahasil in Sundargarh district of Orissa, was sought, in accordance with Section 2 of the Forest (Conservation) Act, 1980. The said proposal has been examined by the Forest Advisory Committee constituted by the Central Government under Section 3 of the aforesaid Act.

2. After careful consideration of the proposal of the State Government of Orissa and on the basis of the recommendations of the Forest Advisory Committee, the Central Government hereby agrees in principle for the diversion of 64.148 ha of forest land for Iron Ore mining in favour of M/s Geetarani Mohanty in village Raikela of Bonai Tahasil in Sundargarh district of Orissa, subject to the fulfilment of the following conditions:-

1. Legal status of the diverted forest land shall remain unchanged.
2. (i) The User Agency shall identify and acquire non-forest land equal in extent to the area to be diverted (64.148 ha) for Compensatory Afforestation, which shall be mutated in favour of the State Forest Department.
- (ii) The land identified for the purpose of Compensatory Afforestation shall be clearly depicted on a Survey of India toposheet of 1:50,000 scale.
- (iii) The User Agency shall transfer the cost of Compensatory Afforestation to the State Forest Department at an enhanced rate of 2.5 times of the proposed rates.

- (iv) Clarification regarding proximity of CA land for proper management shall be furnished by the State Government.
- (v) The non-forest land identified for raising Compensatory Afforestation shall be notified by the State Government as RF under Section-4 or PF under Section-29 of the Indian Forest Act, 1927 or under the relevant Section(s) of the land Forest Act, as the case may be, within a period of six months. The Nodal Officer (Forest Conservation) shall report compliance in their regard.

3. Fencing, protection and regeneration of the safety zone area (7.5 metre 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.

All measures should be taken to prevent pollution of tanks, rivers and nallas, etc. The desilting of adjoining villages in radius of 5 Km may also be taken up by the User agency from time to time.

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.

Wherever possible and technically feasible, the User Agency shall undertake by involving local community, the 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.

7. The period of diversion under this approval shall be twenty (20) years subject to possession of valid lease by User Agency under the MMDR Act, 1957.

8. The State Government shall charge the Net Present Value of the forest area diverted under this proposal from the User Agency as per the Orders of the Hon'ble Supreme Court of India dated 30.10.2002, 01.08.2003, 28.03.2008 and 09.05.2008 in WP(C) No. 202/1995 and as per the guidelines issued by this Ministry vide letters No. 5-1/1998-FC(Pt II) dated 18.09.2003 and 22.09.2003 in this regard.

9. At the time of payment of the Net Present Value (NPV) at the present rate, the User Agency shall furnish an undertaking to pay the additional NPV, if so determined as per the final decision of Hon'ble Supreme Court of India.

10. All the funds received from the User Agency under the project shall be transferred to in Account No. 344901010070128 of Union Bank of India, Sunder Nagar, New Delhi-110003.

11. The User Agency will bear the cost of Penal Compensatory Afforestation over equivalent degraded forest land for violating the Forest (Conservation) Act from 1986 to 1996.

- After receipt of the compliance report or fulfillment of the conditions mentioned above, the proposal shall be considered for final approval under Section-2 of the Forest (Conservation) Act, 1980.
13. Transfer of forest land shall not be affected till final approval is granted by the Central Government in this regard.
 14. The lease will remain in the name of M/s Geeta Rani Mohanty and if any change has to be done, it will require prior approval of the Central Government as per guidelines.
 15. Any other condition that the CCF (Central), Regional Office, Bhubaneswar / the State Forest Department may impose from time to time for protection and improvement of flora and fauna in the forest area, shall also be applicable.
 16. All other conditions under different rules, regulations and regulations including environmental clearance shall be complied with before transfer of forest land.

Yours faithfully,


(B.K. Singh)

Sr. Assistant Inspector General of Forests

Copy to:

1. The PCCF, Government of Orissa, Bhubaneswar.
2. The Nodal Officer, O/o PCCF, Bhubaneswar.
3. The Chief Conservator of Forests (Central), Regional Office, Bhubaneswar.
- ✓ 4. The User Agency.
5. The Monitoring Cell, FC Division, MoEF, New Delhi.
6. Guard File.


(B.K. Singh)

Sr. Assistant Inspector General of Forests

Ministry of Environment & Forests
Government of India
Ministry of Environment & Forests

Paryavaran Bhavan,
C.G.O. Complex, Lodi Road,
New Delhi-110003.

Dated the 2nd July, 2008

M/s Geetarani Mohanty
Station Road, Barbil,
Keonjhar,
ORISSA-758 035
E: mail: sahoo_ore@yahoo.co.in

Subject: Expansion of Raikela Iron Ore Mining Project of M/s Geetarani Mohanty located in Village Raikela, Tehsil Bonai, District Sundergarh, Orissa-environmental clearance reg.

Sir,

This has reference to your letter No. 231/GRM/MoEF/05-06 dated 17.03.2006 and subsequent letters dated 05.12.2006, 27.07.2007, 15.10.2007, 17.12.2007, 23.03.2008 and 02.04.2008 on the subject mentioned above. The proposal is for enhancement of production of iron ore from 0.142 million tonnes per annum (million TPA) to 0.864million TPA. The total mine lease area of the project is 67.586ha, out of which 66.671ha is forestland and 0.915ha is others (Sarba Sadharana). Area proposed for mining is 50.893ha, an area of 3ha is kept for over burden dump, 4.568ha for mineral storage, 0.2ha for infrastructure, 2.985ha for roads, 2.603ha for green belt, 2.422ha for mineral separation plant and 0.915ha is others. It has been proposed that the Sarba Sadharana land of 0.915ha will not be acquired. The Suna Nallah is located at a distance of 1km toward North West boundary of mine lease area. The Karo River is reported to be located at a distance of 7.5km in South West of the mine lease. No national park/wildlife sanctuary/biosphere reserve/tiger reserve/elephant reserve etc. is reported to be located in the core and buffer zone of the mine and that the area does not report to form corridor for Schedule-I fauna. In support of this, the project proponent has furnished a map duly authenticated by DFO and Wildlife Warden, Boani Division. The Torha RF and Amrohi RF are in the buffer zone of the mine. The mine working will be opencast by semi-mechanised method involving drilling and blasting. The targetted production capacity of the mine is 0.864million TPA of iron ore and life of mine is 15years. Approximately 3000TPD of mineral will be transported through road. Mineral beneficiation is not a part of the project; however, sizing and screening of the ore will be carried out in the lease area. The topography of the area is hilly at an

..2/-

elevation ranging from 300m-840m AMSL. The ultimate working depth of mine will be 658m RL. The ground water table reported to prevail at 670m RL and the mine working will, therefore, go beyond water table. The water requirement of the project is estimated as 64.5m³ per day, out of which 14m³ per day will be sourced from the groundwater and remaining 50.5m³ per day

will be met from the surface water (pale revenue village namely Raikela having no population is in the core zone of the mine, however, displacement of population and R&R is involved. Approximately $16,000\text{m}^3$ per month of solid waste comprising $12,000\text{m}^3$ per month of over burden (ferruginous laterite) $4,000\text{m}^3$ per month of sub grade ore will be generated, which will be stacked in the earmarked areas. It is estimated that $21,44,567\text{m}^3$ of waste will be generated during the mine life, out of which $8,17,002\text{m}^3$ will be disposed off in the form of external dump and $13,27,565\text{m}^3$ will be backfilled in 7ha of mined out area. Plantation will be raised in an area of 20.276ha at the end of the mine life. The public hearing of the project was held on 20.10.2005. The consent to establish from the State Pollution Control Board, Orissa obtained on 31.01.2006 for production of 72000TPM of iron ore involving lease area of 64.068ha. The Indian Bureau of Mines had approved scheme of mining along with the progressive mine closure plan of the project on 17.02.2005 for lease area of 67.586ha. The capital cost of the project is Rs.981.4Lakhs.

2. The Ministry of Environment and Forests has examined the application in accordance with Section 12 of the EIA Notification, 2006 read with para 1.2 of the Circular No. J-11013/41/2006-IA.II(I) dated 13.10.2006 and hereby accords environmental clearance under the provisions thereof to the above mentioned Raikela Iron Ore Mining Project of M/s Geetarani Mohanty for an annual production capacity of 0.864million tonnes of iron ore(ROM) by opencast semi-mechanized method involving mining lease area of 67.586ha, subject to implementation of the following conditions and environmental safeguards.

A. Specific conditions

- (i) All the conditions stipulated by the State Pollution Control Board, Orissa in their consent to establish shall be effectively implemented.
- (ii) Necessary forestry clearance under the Forest (Conservation) Act, 1980 for an area of 66.671ha is forestland shall be obtained before starting mining operation in that area. Environmental clearance is subject to grant of forestry clearance.
- (iii) The mining operations shall be restricted to 2m above the reported water table i.e. 672m RL and it should not intersect groundwater table.

..3/-

In case of working below ground water table, prior approval of the Ministry of Environment and Forests and Central Ground Water Authority shall be obtained, for which a detailed hydro-geological study shall be carried out.

अनुमोदित

- (iv) The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations.
- (v) The top soil, if any, shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for a period more than 3years. The

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Water shall be used for land reclamation and plantation.

The over burden (OB) generated during the mining operation shall be stacked at earmarked dump site(s) only and should not be kept active for long period of time. Proper terracing of OB dump shall be carried out so that the overall slope shall not exceed 28 degree. Out of the total 21,44,567m³ of waste to be generated during the mine life, 8,17,002m³ shall be disposed off in the form of external dump and 13,27,565m³ shall be backfilled in 7ha of mined out area. The backfilled area shall be afforested. The over burden dumps shall be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be undertaken for stabilization of the dumps. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on six monthly basis.

- (vii) Catch drains and siltation ponds of appropriate size shall be constructed around the working pit(s), mineral and OB dumps to prevent run off of water and flow of sediments directly into the Suna Nallah, Karo nallah, rivers and water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted particularly after monsoon and maintained properly.

Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and temporary over burden dumps to prevent run off of water and flow of sediments directly into the Suna Nallah, Karo nallah, rivers and water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals.

..4/-

- (viii) Dimension of the retaining wall at the toe of over burden dump and over burden benches within the mine to check run-off and siltation shall be based on the rain fall data.
- (ix) Plantation shall be raised in an area of 20.276ha including a 7.5m wide green belt in the safety zone around the mining lease, backfilled area, quarry benches, roads etc. by planting the native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.

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- (x) Regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM and RPM such as around crushing and screening plant, loading and unloading point and transfer points. Extensive water sprinkling should be carried out on haul roads. It shall be ensured that the Ambient Air Quality parameters conform to the norms

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Injection = 45 ft

- (xxi) Consent to operate shall be obtained from the State Pollution Control Board prior to start of enhanced production from the mine
- (xxii) Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and wastewater generated during mining operation.
- (xxiii) The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna, if any spotted in the study area and contribute towards the cost of implementation of the plan and/or Regional Wildlife Management Plan for conservation of flora and fauna so prepared by the State Forest and Wildlife Department. The amount so contributed shall be included in the project cost. A copy of action plan may be submitted to the Ministry and its Regional Office, Bhubaneswar within 3 months.
- (xxiv) A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.

B. General conditions

- (i) No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.
- (ii) No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.
- (iii) Four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RPM, SPM, SO₂ & NO_x monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.
- (iv) Data on ambient air quality (RPM, SPM, SO₂ & NO_x) should be regularly submitted to the Ministry including its Regional office located at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.
- (v) Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.
- (vi) Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.

(vi) Industrial waste water (workshop effluent) waste water from the plant should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 11th December 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.

(viii) 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.

Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.

(ix) A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.

(x) The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.

..7/-

(xi) The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.

(xii) The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.

(xiii) The project proponent shall submit six monthly report on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Bhubaneswar, Central Pollution Control Board and State Pollution Control Board.

(xiv) A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation has been received while processing the proposal.

(xv) State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector's office/ Tehsildar's Office for 30 days.

(xvi) The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and

Forwards at <http://envfor.nic.in> and also in the same manner to the Regional Office of this Ministry located at Bhubaneswar.

3. The Ministry or any other competent authority may alter/modify the above conditions or stipulate any further condition in the interest of environment protection.

4. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

5. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules made thereunder and also any other orders passed by any Court of Law relating to the subject matter.

..8/-

6. Any appeal against this environmental clearance shall lie with the National Environment Appellate Authority, if preferred within a period of 30 days as prescribed under Section 11 of the National Environment Appellate Act, 1997.

(SATISH C. GARKOTI)
Additional Director (S)

Copy to:

- (i) The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.
- (ii) The Secretary, Department of Environment, Government of Orissa, Secretariat, Bhubaneswar.
- (iii) The Secretary, Department of Mines and Geology, Government of Orissa, Secretariat, Bhubaneswar.
- (iv) The Secretary, Department of Forests, Government of Orissa, Secretariat, Bhubaneswar.
- (v) The Chief Wildlife Warden, Government of Orissa, Bhubaneswar.
- (vi) The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.
- (vii) The Chief Conservator of Forests, Regional Office (EZ), Ministry of Environment and Forests, A-3 Chandrashekharpur, Bhubaneswar-751023.
- (viii) The Chairman, Orissa State Pollution Control Board, Parivesh Bhawan, A/118 Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012.
- (ix) The Member Secretary, Central Ground Water Authority, A2, W3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.

5/5

- (x) The District Collector, Sundergarh District, Government of Orissa.
- (xi) EI Division, Ministry of Environment & Forests, EI Division, New Delhi.
- (xii) Monitoring File.
- (xiii) Guard File.
- (xiv) Record File.

(SATISH C. GARKOTI)
Additional Director (S)

अनुमोदित
APPROVED

1. Name of the Project :- Diversion of 64.148 Ha. of forest land for Mining of Iron Ore in village Raikela in Bonai Division.
2. Name of the District/Division :- Sundargarh District / Bonai Forest Division.
3. Date of Inspection :- 28/06/2005.
4. Name and designation of Inspecting Officer :- Sri K.C.Hansda, I.F.S.
Divisional Forest Officer, Bonai Division.
5. Name and Designation of other officers who attended the inspection including representative of User Agency :- 1. Sri A.C.Patra, Range Officer, Barsuan Range.
2. Sri Maheswar Behera, Senior Manager, Raikela Iron Ore Mines, M/s Geetarani Mohanty.
6. Legal Status of forest land with area proposed for diversion :- D.L.C. - 64.148 Ha. - *Govt. not forest land included in 8th level Committee rep!*
(Deemed forest land)
7. If area required for diversion has been demarcated on the ground :- Yes

8. Item-wise break-up of forest land proposed for diversion.

The item-wise break-up of forest land proposed for diversion is as follows :

i)	Mining	...	...	...	...	...	50.893 Ha.
ii)	Storing Mineral / Ore	...	...	...	...	...	4.568 Ha.
iii)	Dumping of overburden	...	...	...	...	...	3.000 Ha.
iv)	Const. of Building, Power Station, Workshop etc.	...	...	...	...	...	NIL
v)	Storing tools & machinery	...	...	...	...	...	2.422 Ha.
vi)	Const. of Road / Ropeway / Railway line	...	...	...	...	...	3.065 Ha.
vii)	Township / Housing Colony	...	...	...	...	...	0.200 Ha.
viii)	Const. of Magazine	...	...	...	...	...	NIL
	Sub-Total:-	...	...	...	...	...	64.148 Ha.
ix)	Safety Zone area	...	...	...	...	...	2.523 Ha.
	Grand Total :-	...	...	...	...	...	66.671 Ha.

9. Condition of vegetation and type of forest in applied area :- Vegetation in the applied area is sparse and scattered.

Contd. 122

10. Position of Wildlife in general

The following migratory animals and birds occur in the applied area.

Animals	English Name	Zoological Name
1. Bhalu	Sloth bear	Melursus ursinus
2. Bilua	Jackal	Canis aureus
3. Banabilei	Jungle cat	Felis chaus
4. Thekna	Hare	Ruficaudatus
5. Muga	Rat	Rattus rattus
6. Neula	Mongoose	Herpestes eudardsi
Birds	English Name	Zoological Name
1. Bani	Indian myna	Acridotheres tristis
2. Baga	Little arget	Eggatta garzetta
3. Kau	Common crow	Corvus splendens
4. Pecha	Spotted owl	Anthena brama
5. Kajalapati	Common dronge	Dicurus macrocerus
6. Kapta	Ring Dove	Strepto pelia dactylocten
7. Damara Kau	Jungle crow	Corvus macrorhynchos
8. Kathahana chadei	Pigmy wood picker	Picodes nank

11. Whether the applied area is involved with any eco-sensitive zone/ National Park/Sanctuary
 - The applied area does not involved with any eco-sensitive zone / National Park / Sanctuary.
12. Number of trees to be felled and its impact on the eco-system
 - 633 Nos. of trees are to be felled, which will not have any impact on the eco-system.
13. Details of broken-up area and reclamation done, if any. (Mining cases)
 - Out of total 64.148 Ha. applied for diversion, 43.054 Ha has been treated as broken land vide DDM'S memo No 4065 dt 27.7.98 (Annexure-6c). Reclamation shall be undertaken by the User Agency as per reclamation plan enclosed vide Annexure-17.
14. Position of displacement of people and adequacy of rehabilitation, if any
 - Displacement of people is not involved, and hence no rehabilitation.
15. Position of rare and endangered species available or importance of area from eco-social point of view
 - There is no rare and endangered species in the applied area. The area is also not important from eco-social point of view.
16. Non-forest land used in the project, and non-forest land selected for Comp. Affn. is included in the D.L.C. report or not
 - Non-forest land required to be used in the project, i.e., 0.835 Ha., as well as the non-forest land selected for Comp. Affn. are not included in the D.L.C. report.
17. Suitability of the identified non-forest land / degraded forest land for Comp. Affn.
 - The non-forest land identified is suitable for Comp. Affn.
18. Violation of F.C. Act, if any, and action taken thereon
 - There is no violation under the F.C. Act.


 Divisional Forest Officer,
 Bonal Division.

Government of Orissa
Forest & Environment Department

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No. 10F(Cons)120/2006. 6879 /F&E, Bhubaneswar, dated. 5/5/07

From

Sri P.N. Padhi, IFS,
Special Secretary to Government.

To

The Assistant Inspector General of Forests,
Govt. of India, Ministry of Environment & Forest,
(F.C. Division), Paryavaran Bhawan,
C.G.O. Complex, Lodhi Road,
New Delhi -110003

Sub: Proposal for diversion of 64.148 ha. of forest land in Village- Raikela of Bonai Tahasil in Sundargarh district, Orissa for Iron Ore mining by M/s Geetarani Mohanty.

Sir,

I am directed to send herewith a proposal received from the PCCF, Orissa for diversion of 64.148 ha. of forest land in Village- Raikela of Bonai Tahasil, Sundargarh district for Iron Ore mining by M/s Geetarani Mohanty as required under the provisions of Forest (Conservation) Act, 1980.

1. **Brief Description.**

Govt. of Orissa in Department of Steel & Mines granted a Mining lease over 67.586 ha. non-forest land for Iron ore mining in village Raikela of Bonai Tahasil in favour of Smt. Geetarani Mohanty for 20 years with effect from 2.7.1991 to 1.7.2011. This lease deed was executed on 02.07.1991 (Page-21/DP). Subsequently this lease was transferred in favour of M/s Geetarani Mohanty a registered firm bearing registration No. 5/92, Cuttack (Page-76/DP) with due permission of Govt. of India followed by the permission of State Govt. in Department of Steel & Mines vide Proceeding No. IV(B)SM-8/92-11868 Dt. 17.10.1992 (Page-72/DP). This transfer lease deed was executed on 13.01.1993 (Page-75/DP). But consequent upon resignation of one of the partner Smt. Geetarani Mohanty from this firm and joining of two more partners with effect from 01.04.1993 (Page-243-A & 243-B/DP) a partnership deed was reconstituted on 01.04.1996 among three partners viz. Sri Srinibash Sahoo, Sri Dushasan Sahoo and Smt. Suprasanna Sahoo (Page-244/DP). As per Page-1 of the Reconstituted partnership deed (Page-244 of DP) the name and style of the firm continues to be M/s Geetarani Mohanty.

Originally the lease area comprised of 66.671 ha. of non-forest land and 0.915 ha. of Sarbasadharan land. A Mining Plan was also approved by I.B.M. vide their letter No QP/CAL/006/87/A/MO-94 Dt. 27.6.1990 which was valid up to 1999. Accordingly the mining operation started on 23.8.1993 on the non-forest land.

Subsequently the above non-forest land over 66.671 ha was included as Deemed Forest land in D.L.C. report of Sundargarh Dist. during 1997 but the Sarbasadharan land remained as such. The land schedule of ML area has been furnished at Page-188/DP. The joint verification report Dt. 6.6.1998 reveals that 43.054 ha. has been broken (Page-1902/DP & Plate-VIII). Thus the lease area comprises of 43.054 ha of broken land, 23.617 ha of virgin land and 0.915 of Sarbasadharan land. Since the entire broken and virgin lands are Deemed Forest land included in DLC report, out of this the User Agency has now applied for diversion of 64.148 ha. under section 2 of Forest (Conservation) Act, 1980 and balance 2.523 ha. Deemed Forest land has been set aside for Safety Zone.

		Broken	Virgin	Total	Land (Ha)	Total (Ha)
01	Mining	29.893	21.000	50.893	Nil	50.893
02	Storing of minerals	3.568	1.000	4.568	Nil	4.568
03	Dumping of over burden	2.656	0.344	3.000	Nil	3.000
04	Storing of tools & machinery	1.890	0.532	2.422	Nil	2.422
05	Building Power station & Workshop etc.	Nil	Nil	Nil	Nil	Nil
06	Township/ Housing colony	0.200	Nil	0.200	Nil	0.200
07	Road & Railway etc.	2.900	0.165	3.065	0.835	3.900
	Sub Total	41.107	23.041	64.148	0.835	64.983
08	Safety Zone	1.947	0.576	2.523	0.080	2.603
	Grand Total	43.054	23.617	66.671	0.915	67.586

4. Flora & Fauna

Tree Species which are commonly noticed in this area are Sal, Gambhar, Bija, Kurum, Kumbhi, Kendu, Mango, Dhaura, Kusum, Harida, Bahada, Bheru, Kasi, Char, Mai & Mahul etc. Fauna noticed in this locality are Bear, Jackal, Jungle Cat, Hare, Mongoose, Myna, Jungle fowl, Egret, Owl and Drongo etc. No rare or endangered flora or fauna is noticed in this area.

5. Wildlife Management

Though the area does not form a part of National Park/Wildlife Sanctuary or Elephant Corridor, due care is to be taken for conservation of Wildlife. For this purpose a comprehensive Wildlife Management Plan covering the entire mining belt of Bonai and Keonjhar Division has been prepared. Accordingly the User Agency has to pay @-Rs. 15,000/- per hectare of leasehold area as per norm approved by Govt. of Orissa. The lessee has furnished undertaking to bear the cost of Wildlife management (Page-224/D?).

6. Tree enumeration

Total enumeration has been carried out over the entire area applied for diversion and it has been recorded that, 432 trees are standing over the virgin forest land (Page-214/DP) and 201 trees (Page-220/DP) over the broken up forest land. Thus, in total 633 trees will be felled in phases during the process of mining. Besides, 164 trees are existing over the land earmarked for Safety Zone. The canopy density has been reported to be 0.03 over broken up forest land and 0.1 over virgin forest land (Page-7/DP).

7. Compensatory afforestation

In lieu of Deemed Forest land applied for diversion, Tahasildar, Bonai has identified equivalent non-forest land of 65.46 ha for Compensatory Afforestation. This non-forest land includes plot No.1,2/Part,3/Part,4/Part,5/part,7/Part & 9 Part of Khata No.1 of village-Sanathalakudar in Bonai Tahasil of Sundergarh district. The land suitability certificate, non-encroachment and non-encumbrance certificate have been furnished at Page-205 & 207/DP. The D.F.O., Bonai Divn. has prepared a site specific scheme in R.D.F. model with provision for soil conservation and stonewall fencing. The species to be planted in gaps are Karanj, Mahul, Harida, Bahada, Sissoo, Amla, Teak and Bamboo. The total financial outlay of

15. Others

The Basic Information of Bonai Division, District Profile of Sundergarh District and the State profile have been furnished at Page-260, 261 and 262/DP respectively. The Site Inspection Report of DFO has been furnished at Page-10/DP.

Conservator of Forests, Rourkela Circle has also furnished the Site Inspection Report at Page 12/D.P.

N.P.V. is applicable to this proposal. The User Agency has furnished undertaking to pay the NPV at Page 224/DP.

The PCCF, Orissa has recommended the proposal.

All the parts of the statutory proforma has been duly filled in.

In view of the above, I would request you to kindly convey the approval of GOI, MoEF for diversion of 64.148ha of forest land (Virgin 23.041 ha. + Broken 41.107 ha) for mining purposes in Sundargarh district of Orissa under Sec.2 of Forest (Conservation) Act, 1980 in favour of the user agency to this Department at an early date with the following stipulations.

- i) The user agency shall implement a 'Conservation Plan' in their leasehold area as per guidelines of the Chief Wildlife Warden, Orissa,
- ii) The user agency shall pay the evaluated royalty of 633 enumerated trees before commencement of work on Stage-II approval.
- iii) The user agency shall furnish an undertaking to abide by the policy decision of State Government issued vide Steel and Mines Department Notification bearing SRO No 37/2004 dated 15.1.2004.

Yours faithfully,

Memo No. 6880 /F&E., Dated- 5/5/07 Special Secretary to Government.

Copy alongwith copy of the enclosure forwarded to the Chief Conservator of Forests (Central), Government of India, Ministry of Environment & Forests, Eastern Regional Office, A-3, C.S.Pur., Bhubaneswar for information & necessary action.

Memo No. 6881 /F&E., Dated- 5/5/07 Special Secretary to Government.

Copy forwarded to the Pr. C.C.F., Orissa / PCCF (WL) & CWLW, Orissa for information & necessary action.

Memo No. 6882 /F&E., Dated- 5/5/07 Special Secretary to Government.

Copy forwarded to the C.F., Rourkela / DFO, Bonai for information & necessary action.

Memo No. 6883 /F&E., Dated- 5/5/07 Special Secretary to Government.

Copy forwarded to Steel & Mines Department for information & necessary action.

Memo No. 6884 /F&E., Dated- 5/05/07 Special Secretary to Government.

Copy forwarded to M/S Gitarani Mohanty, Station Road, At/Post- Barbil-758035 for information & necessary action.

Special Secretary to Government

Villages within 10 Kms. Radius from the mine site

Sl. No.	Name of Village	Area of Village in (Ha)	No of House holds	Population			SC		ST		Total Workers		Non-Workers		Literacy rate %	
				Total	M	F	M	F	M	F	M	F	M	F	M	F
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Basada	312.77	22	104	56	48	00	00	56	48	30	04	26	44	39.5	08.1
2	Kusumdihi	662.68	133	678	313	365	03	03	241	274	151	133	162	232	46.3	20.1
3	Reserve forest	N.A.														
4	Krakudar	202.75	70	324	148	170	00	00	144	170	70	02	78	174	16.7	05.4
5	Beechilada	235.19	71	315	156	159	00	00	154	157	105	97	51	62	55.6	29.8
6	Talali	727.90	63	261	132	129	00	00	125	121	66	46	66	83	74.8	11.4
7	Meharda	4,816.28	38	187	95	92	00	00	94	88	46	37	49	55	46.5	13.0
8	Tada	656.13	555	2,387	1,278	1,109	35	44	1060	938	622	59	656	1050	66.3	34.0
9	Kalla	247.26	519	2,329	1,275	1,054	103	112	758	654	573	49	702	1005	78.6	57.4
10	Kamanda	700.21	209	944	471	473	38	38	365	156	249	65	222	408	71.1	22.8
11	Kula	332.10	112	638	307	331	11	09	165	193	131	48	176	283	59.8	25.0
12	Rengua	265.14	47	235	111	124	00	00	111	124	63	10	48	114	40.2	19.4
13	Dandai	437.14	78	391	195	196	15	08	178	185	116	59	79	137	65.2	17.5
14	Tandra	1,136.12	170	781	419	362	11	06	256	272	262	67	157	295	77.2	44.0
15	Rakela	683.00	252	1,093	539	554	31	27	488	505	322	232	217	322	47.4	15.1
16	Dangua	3,496.11	172	947	513	434	62	39	387	326	189	62	324	372	74.5	28.6
17	Tarauli	465.60	59	284	148	136	00	00	148	136	72	18	76	118	39.7	13.4
18	Nuagaun	432.23	79	391	185	206	00	00	185	206	86	38	99	168	91.0	42.1
19	Kadokila	230.15	125	643	301	342	91	97	151	180	159	102	142	240	77.0	37.3
20	Sidimba(A)	378.00	38	160	89	71	00	00	64	49	52	43	37	28	09.7	01.7
21	Jaladi	1,104.49	57	226	106	120	03	03	44	48	69	79	37	41	55.1	24.0
22	tanigram	56.60	36	181	82	99	00	00	77	95	51	50	31	49	36.2	07.3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
23	Kalmanga	410.24	252	1091	552	539	72	66	333	329	277	140	275	399	57.4	25.0
24	Baldhi	508.26	74	327	176	151	78	61	98	90	73	23	103	128	59.4	20.3
25	Teherej	544.21	147	602	280	322	04	02	211	249	134	53	146	269	53.9	26.7
26	Sanua	273.20	65	266	132	134	21	25	33	33	60	18	72	116	44.6	23.0
27	Kasira	777.00	173	835	389	446	45	64	307	335	216	171	173	275	61.5	22.7
28	Bhanjapali	554.18	171	659	356	303	26	33	225	221	184	87	172	216	55.4	26.8
29	Segasahi	400.12	58	255	122	133	00	00	117	130	67	68	55	65	29.5	4.8
30	Harischandrapur	122.62	151	682	353	329	69	76	236	212	187	147	166	182	56.7	24.5
31	Choredhara	1763.28	355	1713	869	844	07	06	784	757	489	440	380	404	37.6	17.4
32	Nuatantra	417.30	98	445	225	220	00	00	224	220	152	138	73	82	41.8	12.7
33	Phalatangara	804.00	160	598	295	303	01	00	294	303	178	175	117	128	51.5	17.4
34	Antedola	197.09	53	196	98	98	04	04	87	82	54	44	44	54	53.9	11.7
35	Tinko	504.55	87	432	214	218	02	01	67	58	104	50	110	168	76.5	39.3
36	Rakela	602.51	114	48	241	239	00	00	135	123	128	34	113	205	61.9	31.3
37	Kusumdhil	292.67	30	122	62	60	00	00	62	60	29	20	33	40	44.4	13.5
38	Baurkela	260.67	22	98	45	53	00	00	45	53	22	13	23	40	57.9	13.2
39	Saskela	603.39	396	1714	862	852	19	09	335	368	457	235	405	617	69.8	39.6
40	Barsuan	514.40	675	2798	1449	1349	158	160	489	464	706	121	743	1,228	80.2	62.5
41	Sannuagaon	1,004.82	136	680	340	340	00	00	328	327	159	87	181	253	47.5	28.2
42	Damatu	730.00	85	405	196	209	07	08	125	147	82	49	114	160	53.9	28.1
43	Randa	402.28	52	189	99	90	01	04	86	79	58	40	41	50	37.5	13.6
44	Rania	1,165.20	154	588	291	297	22	18	210	222	150	79	141	218	49.1	32.8
45	Batagaon	735.63	33	141	78	63	00	00	78	63	35	06	43	57	05.9	00.0
46	Raisuan	479.93	50	221	113	108	11	08	95	93	54	06	59	102	28.6	04.1
47	Bhutuda	1,057.56	153	599	313	286	32	31	201	200	157	110	156	167	49.4	28.5
48	Lasi	1,021.16	127	509	267	242	07	05	235	216	177	20	90	222	24.4	07.7
49	Kensara	1,334.87	28	145	75	70	00	00	72	67	47	02	28	68	08.5	00.0
50	Choda	148.57	10	52	22	30	00	00	09	13	10	04	12	26	28.6	18.8
51	Siliguda	454.44	17	74	30	44	00	00	26	33	17	17	13	27	18.2	09.7

Gende	Name	Yea	Spleen	Tum	Gener	Epile	para	Mental	Right Eye	Left Eye	Locom	Hydro	Night	Other	Colou	Urine R	Squir	Albur	Suga	Skiagram	RightEar	LeftEar	PFT	PFT	Orgar	Inspir	Expira	Anyo	Abno	Abnormal	Abnorm	Abnorm	Abnorm	Suggestio	Suggestio	Suggestio	Suggestio	Suggestio	BloodPri	Pulse	Pulse2	Liver	
Male	Shri. JATINDRA PRADHAN	42	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MILD RESTRIC	NO	94	87	NO												114/70	100	Per Minut	Not Palpable	
Male	Shri. BRUNDA MUNDA	41	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MILD RESTRIC	NO	92	88	NO											120/80	72	Per Minut	Not Palpable		
Male	Shri. PRAMOD MAHANTA	40	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MILD RESTRIC	NO	104	98	NO											138/86	93	Per Minut	Not Palpable		
Male	Shri. HARI NAIK	46	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	90	83	NO											106/70	89	Per Minut	Not Palpable		
Male	Shri. UGRASEN MAHANTA	50	Not Palp	NO	Good	No	NO	GOOD	6/6 With G	6/6 With	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	94	90	YES	REFRA	DIAB	ETES MELLITUS ON MEDICATI	CONSTAN	FAT FREE	REGULAR	& PHYSICIAN CHECK	124/80	74	Per Minut	Not Palpable					
Male	Shri. PAULUSH LAKRA	40	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MILD RESTRIC	NO	97	93	NO											110/70	104	Per Minut	Not Palpable		
Male	Shri. NATABARA MAHARANA	50	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	93	87	NO											124/80	87	Per Minut	Not Palpable		
Male	Shri. SANTOSH KUMAR BARIK	41	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	+	NORMAL	NORMAL	NORMAL	NORMAL	NO	104	97	YES	DIABETES	MELLITUS			REGULAR	FAT FREE	REGULAR	PHYSICAL EXERCISE	110/70	83	Per Minut	Not Palpable				
Male	Shri. ANUP SINKU	35	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	105	100	NO											114/70	59	Per Minut	Not Palpable		
Male	Shri. LACHHAMAN NAIK	42	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	86	81	NO											110/70	101	Per Minut	Not Palpable		
Female	Shrimati. SUKUMANI NAIK	43	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	Not A	NO	NO	NO	ACIDIC	NO	+	Nil	NORMAL	NORMAL	NORMAL	NORMAL	OB	NO	82	78	YES	PFT:OBST.	WITH POSSIBLE RESTRICTION	REGULAR BREATHING EXERCISE &	USE OF PPE					110/70	79	Per Minut	Not Palpable			
Female	Shrimati. DRUPATI NAIK	37	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	Not A	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MILD RESTRIC	NO	90	86	NO												110/70	88	Per Minut	Not Palpable	
Female	Shrimati. LACHHMA NAIK	42	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	Not A	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	83	79	NO												110/70	87	Per Minut	Not Palpable	
Female	Shrimati. JADINI NAIK	37	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	Not A	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	73	69	NO												106/70	88	Per Minut	Not Palpable	
Male	Shri. SATYANANDA JHAMPULA	40	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MODERATE R	NO	98	94	YES	PFT:MOD.	RESTRICTION			REGULAR BREATHING EXERCISE &	USE OF PPE					134/80	91	Per Minut	Not Palpable		
Male	Shri. SANTOSH OJHA	22	Not Palp	NO	Good	No	NO	GOOD	6/6 With G	6/6 With	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	95	89	YES	REFRACTIVE	E ERROR CORRECTED BY GLAS	CONSTANT USE OF GLASSES								120/80	83	Per Minut	Not Palpable		
Male	Shri. TANAMANI NAIK	45	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	80	76	NO												110/70	84	Per Minut	Not Palpable	
Male	Shri. TOPI MUNDA	43	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	++	NORMAL	NORMAL	NORMAL	NORMAL	NO	92	88	YES	DIABETES	MELLITUS			REGULAR	FAT FREE	REGULAR	PHYSICAL EXERCISE	130/80	89	Per Minut	Not Palpable				
Male	Shri. JAGADISH PATRA	46	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	96	90	NO												114/70	60	Per Minut	Not Palpable	
Male	Shri. BASANTA KUMAR PRADHAN	49	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	92	86	NO												110/70	84	Per Minut	Not Palpable	
Female	Shrimati. PRATIMA NAIK	31	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	Not A	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MILD RESTRIC	NO	84	80	NO													114/70	97	Per Minut	Not Palpable
Female	Shrimati. NIRASA NAIK	44	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	Not A	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	80	76	NO												106/70	72	Per Minut	Not Palpable	
Male	Shri. MILU CHARAN MAHAKUD	33	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MODERATE R	NO	92	87	YES	PFT:MOD.	RESTRICTION			REGULAR BREATHING EXERCISE &	USE OF PPE					110/70	61	Per Minut	Not Palpable		
Male	Shri. YUDHISTIRA PATRA	40	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MILD RESTRIC	NO	89	84	NO													130/80	73	Per Minut	Not Palpable
Male	Shri. NIRANJAN NAIK	44	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	86	80	NO													120/84	85	Per Minut	Not Palpable
Male	Shri. KABITRA DEHURY	42	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	95	88	NO													110/70	93	Per Minut	Not Palpable
Male	Shri. SURENDRA PALEI	42	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	97	93	NO													136/84	92	Per Minut	Not Palpable
Male	Shri. SHARATA NAIK	43	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MILD RESTRIC	NO	86	80	NO													110/70	84	Per Minut	Not Palpable
Male	Shri. HEMAKANT KHORA	30	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	91	87	NO													110/70	92	Per Minut	Not Palpable
Male	Shri. BIDYADHAR NAIK	50	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	86	81	NO													124/80	80	Per Minut	Not Palpable
Male	Shri. PRAMOD KUMAR SAHOO	53	Not Palp	NO	Good	No	NO	GOOD	6/6 With G	6/6 With	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	108	101	YES	HYPER	ON	MEDICATION			FAT FREE	REGULAR	PHYSICIAN CHECKUP	140/90	94	Per Minut	Not Palpable				
Male	Shri. MANAS KUMAR DAS	40	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	102	98	YES	HYPERTEN	SION ON MEDICATION			FAT FREE	REGULAR	& PHYSICIAN CHECKUP	134/84	78	Per Minut	Not Palpable					
Male	Shri. PRAFULLA MAHAKUD	39	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	86	81	NO													110/70	68	Per Minut	Not Palpable
Male	Shri. SHIVA CHARAN MAHANTA	52	Not Palp	NO	Good	No	NO	GOOD	6/6 With G	6/6 With	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	94	90	NO													116/70	70	Per Minut	Not Palpable
Male	Shri. DAMDEV DEHURY	45	Not Palp	NO	Good	No	NO	GOOD	6/6 With G	6/6 With	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	91	86	YES	REFRACTIVE	E ERROR CORRECTED BY GLAS	CONSTANT USE OF GLASSES										130/80	68	Per Minut	Not Palpable
Male	Shri. SINGA MUNDA	42	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MILD RESTRIC	NO	93	87	NO													130/86	75	Per Minut	Not Palpable
Male	Shri. BASUDEV DEHURY	51	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	84	80	NO													110/70	71	Per Minut	Not Palpable
Male	Shri. RAMAKANTA DAS ADHIKARI	57	Not Palp	NO	Good	No	NO	GOOD	6/6 With G	6/6 With	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	91	87	YES	REFRACTIVE	E ERROR CORRECTED BY GLAS	CONSTANT USE OF GLASSES										110/70	82	Per Minut	Not Palpable
Male	Shri. ASHOK KUMAR MOHAPATRA	45	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	91	87	NO													110/70	67	Per Minut	Not Palpable
Male	Shri. PRATAP NAIK	44	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	90	85	NO													110/70	57	Per Minut	Not Palpable
Male	Shri. NARAHARI NAIK	44	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	++	Nil	NORMAL	NORMAL	NORMAL	NORMAL	NO	91	87	NO													120/80	83	Per Minut	Not Palpable
Male	Shri. PURNA CHANDRA SAHOO	48	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	Nil	NORMAL	NORMAL	NORMAL	MILD RESTRIC	NO	93	87	NO													124/80	59	Per Minut	Not Palpable
Male	Shri. GOURANGA CHARAN PARIDA	39	Not Palp	NO	Good	No	NO	GOOD	6/6 Witho	6/6 Witho	NAD	NO	NO	NO	NO	ACIDIC	NO	Nil	++++	NORMAL	NORMAL	NORMAL	NORMAL	NO	99	94	YES	DIABETES	MELLITUS UNDER MEDICATION	REGULAR	FAT FREE	REGULAR	PHYSICAL EXERCISE	130/80	98	Per Minut							

THE WORLD MINES
M/S. GEETARANI MOHANTY

H.O. : Station Road, Barbil, Keonjhar, Odisha

Tel/Fax No. : (06767) 275896

E-Mail : accounts@theworldmines.in / geetarani@mines@gmail.com

UNDERTAKING FOR PERIODICAL HEALTH CHECKUP

We commit to carry out the periodical occupational health checkup of employees and local people at regular interval as per the action plan submitted along with EC report according to condition no IX (ii) of General conditions stipulated in EC vide Jr no. 41890/08-MINB1/09-2019 dt 23.11.2020 for enhancement of production capacity of Iron Ore from 0.864 MTPA to 2.99 MTPA at Ralkela, Tehsil-Koira, Dist-Sundergarh, Odisha by Ralkela Iron Ore Mines of M/s Geetarani Mohanty.

Occupational health check up of employees has already been carried by the assistance of EZMA. The occupational health checkup report has been furnished along with the compliance report.

For M/s Geetarani Mohanty


Managing Partner

ANNEXURE XVIII

STATUS OF IMPLEMENTATION OF CER ACTIVITIES

S.NO	Item	Description	CER Plan during construction Phase				As on date Status
			1st yr (in lacs)	2nd Yr (in lacs)	3rd Yr (in lacs)	Total (in lacs)	
1	Refreshers course to technical persons, on advanced industrial training and practical exposure to industries, like process, safety, disaster etc.	Rent Establishment + Training Material + Stipend+ faculty	15	15	60	30.0	Vocational Training is being given to the semi-skilled, Unskilled and workers with a cost of 5lacs
2	Development of water shed and installation of tube wells at Koira, Raikela, Dengula and Bandhala villages. Digging, Paving, de-siltation & removal of Aquatic weeds	Sinking up tube wells in villages Koira:- 4nos. Raikela:-3nos. Dengula:- 3nos. Bandhala:-3nos. Total:13nos.@ Rs.40,000	2.8	-	2.4	5.20	Drinking water facility has been provided to Raikela and Dengula villagers with a cost of Rs. 9.27 lacs.
3	Adoption of primary schools	Appointment of PDC teacher and construction of toilets.	5	5	-	10	PP is providing salary to 2nos of PDC teachers @ Rs. 13000/- per month.
4	Technical and Infrastructural aid to farmers.	Providing deep irrigation points with electricity, supply of high yield seeds, fertilizer to poor farmers. The villages will be decided in consultation with local administration.	4.8	-	-	4.8	A tractor has been provided to nearby villagers for cultivation with a cost of Rs. 20lacs
5	Livelihood Generation	Financial aid to farmers for Mushroom Cultivation & Cow farming	15	-	15	30	To be implemented
Total expenditure			80				

Annexure - XIX

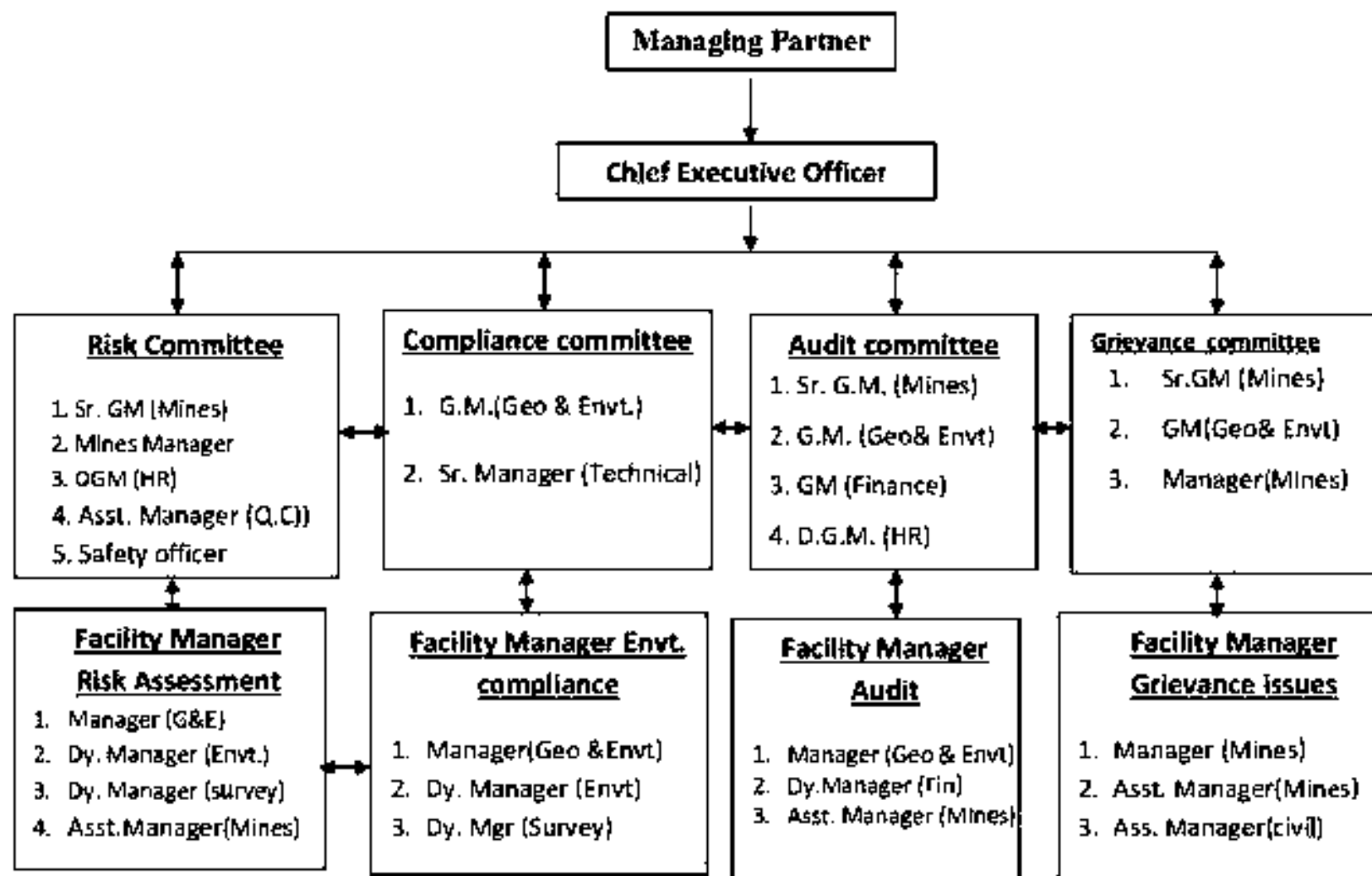
STATUS OF IMPLEMENTATION OF CER ACTIVITIES

S.NO	Item	Description	CER Plan during construction Phase				As on date Status
			1st yr (in lacs)	2nd Yr (in lacs)	3rd Yr (in lacs)	Total (in lacs)	
1	Refreshers course to technical persons, on advanced industrial training and practical exposure to industries, like process, safety, disaster etc.	Rent Establishment + Training Material + Stipend+ faculty	15	15	60	30.0	Vocational Training is being given to the semi-skilled, Unskilled and workers with a cost of 5lacs
2	Development of water shed and installation of tube wellsat Koira, Raikela, Dengulaand Bandhala villages. Digging, Paving, de-siltation & removal of Aquatic weeds	Sinking up tube wells in villagesKoira:- 4nos. Raikela:-3nos. Dengula:- 3nos. Bandhala:-3nos. Total:13nos.@ Rs.40,000	2.8	-	2.4	5.20	Drinking water facility has been provided to Raikela and Dengula villagers with a cost of Rs. 9.27 lacs.
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5	Livelihood Generation	Financial aid to farmers for MushroomCultivation & Cow farming	15	-	15	30	To be implemented
Total expenditure			80				

PHOTOGRAPH SHOWING 30KVA SOLAR POWER



ORGANISATIONAL STRUCTURE



Letter No

330270|SEZ|Chaibasa Region|Perm|2020|7414|PLCommon_MMR1961|2

	भारत सरकार Govt. of India श्रम एवं रोजगार मंत्रालय Ministry of Labour & Employment सामान्य सुरक्षा महाविदेशालय Directorate-General of Mines Safety	
NO: 330270|SEZ|Chaibasa Region|Perm|2021|7414		Date 13.01.2021

From:

Altaf Hussain Ansari

Director of Mines Safety

Chaibasa Region, Chaibasa.

To,

The Owner,

Raikela Iron Ore Mines

M/s Geetarani Mohanty,

Station Road, Barbil – 758 035,

Dist – Keonjhar (Odisha).

Subject: Permission under Regulation 106(2)(b) of the Metalliferous Mines Regulations, 1961 to deploy Heavy Earth Moving Machineries for excavation, digging and removal of OB and ore and/or conduct deep hole blasting at Raikela Iron Ore Mines of M/s Geetarani Mohanty.

Sir,

Please refer to your online application Id 140570 dated 23.11.2020 and the plans and sections submitted offline, on the above mentioned subject.

The matter has since been considered and examined in the light of the particulars furnished by you. In exercise of the powers conferred on the Chief Inspector of Mines (also designated as Director-General of Mines Safety) under provisions of Regulations 106(2)(b) of the Metalliferous Mines Regulations, 1961 and by virtue of the authorisation granted to me by the Chief Inspector of Mines (also designated as Director-General of Mines Safety) under Section 6(1) of the Mines Act, 1952, I, in suppression of earlier permissions granted on the above subject, hereby permit you to deploy Heavy Earth Moving Machineries for excavation, digging and removal of Overburden & Ore in the areas bounded by “A-B-C-D-E-F-G-H-I-J-K-A” and “L-M-N-O-P-Q-L” as shown in blue colour bold lines and conduct deep hole blasting in the area bounded by “1-2-3-4-5-6-7--1” as shown in pink colour bold lines on the Surface Plan No. GRM/SUR/01 dated 18.11.2020

at Raikela Iron Ore Mines of M/s Geetarani Mohanty; subject to the conditions specified in the Annexure 'A' attached with this permission and the following conditions being strictly complied with-

(1) A person holding a First Class Managers' Certificate of Competency under Metalliferous Mines Regulations, 1961, shall remain as Manager of the mine. This permission shall stand revoked as soon as the qualified Manager ceases to work at the mine.

(2) Adequate numbers of supervisors including qualified Foreman & Mates shall be appointed to assist the manager. Mine Foreman's district shall not contain more than two excavators ancillary equipment viz. dumpers, loaders and drills etc and one Foreman shall not supervise work of more than two Mining Mates.

(3) No ore dressing/ handling/processing plant shall be attached with the mine.

(4) No person shall be engaged in ore/overburden benches within 60m of any Heavy Earth Moving Machinery deployed therein.

(5) Adequate general lighting as required under notification No. GSR-618(E), dated 28th April, 2017, published in the Gazette of India dated 21st June, 2017, Part II Section 3(i) (DGMS Legis. Circular No.3 of 2017) shall be kept provided and maintained during working hours at different places or areas where natural light becomes insufficient.

(6) Drilling, Charging and Blasting operation shall be done under the personnel supervision of the Mine Manager or a separate Officer holding at least a Second Class Managers' Certificate of Competency under Metalliferous Mines Regulations, 1961.

(7) Blasting parameters with a rough sketch showing the drilling pattern and the holes charged shall be maintained in a register kept for the purpose for each blast.

(8) No work of removal of overburden and extraction of ore by use of explosives shall be done within 300m of surface structure/ buildings unless separate permission under Regulation 164(1-B) of the Metalliferous Mines Regulations, 1961 is obtained from this Directorate.

(9) No working with Heavy Earth Moving Machinery shall be extended within 45.0m of any surface feature or public road not belonging to the owner unless the same is acquired or consent to operate is obtained from the owner concerned.

(10) A suitable 'Code of Traffic Rules' for regulating the movement of Heavy Earth Moving Machinery (commensurate with the capacity/size type of machines used in the mechanised opencast mine) shall be framed and enforced immediately. Such Code of Traffic Rules should be approved by Tri-partite Committee. A copy of such Code shall be submitted to Director of Mines Safety, Chaibasa for record.

(11) The operator's cabins of heavy earth moving machinery shall be well designed and substantially built so as to ensure adequate protection to the operator against heat, dust, noise etc. and at the same time provide adequate safety to the operator in the event of overturning of heavy earth moving machinery. A seat belt for the safety of the operator shall also be provided.

(12) A code of practice shall be drawn up for dealing with fires at different locations in the opencast mine, including HEMM. Arrangements for fighting fire should be provided on all heavy earth moving machineries. Such arrangements should, if possible, operate automatically on appearance of fire.

(13) Separate ore stockyards shall be maintained for dumping and dispatch of ore and it shall be ensured that dispatch of mineral is not carried out from the dump yard where dumping is under progress. Further, buyers' trucks shall be parked away from the mine premises and only such trucks shall be allowed to enter the mine, which are due for loading during the shift. Also, it shall be ensured that only permitted quantity of mineral is loaded in the trucks so as to obviate the risk of accidents due to overloaded trucks in the mine premises.

(14) All persons to be employed to drive/operate HEMM should be trained and their competency should be evaluated by a Board constituted by the management. The members of such board shall be persons who are

not connected with imparting of training. However, the training officers may be co-opted in the Board as observer.

(15) Only such fitters/mechanics who possess driver's/ operator's license should be allowed to carry out test-run of HEMM.

(16) The portion of surface haul road in mine premises where there is heavy traffic of men and machines should be provided with a separate lane properly fenced off from the haul road for pedestrians and two wheelers.

(17) Trucks and other heavy vehicles, not belonging to management should not be allowed in the mine premises without a valid pass issued by the manager or other competent person. Before the pass is issued the engineer shall check the road-worthiness of such vehicles.

(18) In order to check entry of unauthorized vehicles into the mine premises, a properly manned check gate(s) at the entrance(s) shall be set up where record of entry and exit of each such vehicle shall be maintained.

(19) At the check gate the license of the drivers shall also be checked for eliminating the possibility of unlicensed persons driving the vehicles.

(20) Persons engaged in surface operations and, in particular, the contractor's workers, who incidentally are often inexperienced and least informed about job-safety matters, need closer and more competent supervision. To minimize accidents due to surface operations it shall be ensured that all persons engaged at any work within the mine premises through the contractors have received relevant training and other job-related briefings and that the drivers of vehicles belonging to contractors entering the mine premises have additionally been explained the salient provisions of "traffic rules".

(21) Each and every operation, including the operation carried out through contractor's workers or by outside agency, shall be placed under the charge of a competent supervisor, duly appointed and authorized by the manager, his jurisdiction being clearly demarcated.

(22) (a) A code specifying the duties and responsibilities of all officers of mining cadre, Mine Engineer, Supervisors, Technicians, Mechanics, Fitters, Machine Operators, helpers, loading supervisors etc. shall be drawn up and distributed to all.

(b) It shall be the responsibility of the Manager, Engineer and other supervisors to see that all persons working in the mine in all machines/equipments etc. work as per the code and all machines and equipments etc. are installed, operated and maintained in safe working conditions.

(c) All damages to the lives and property not belonging to the management of the mine and damages or injuries to persons as a result of blasting or mining operations shall be adequately indemnified. Shall there be any controversy in this respect, the decision of the Director General of Mines Safety shall be final and binding on the management.

(23) In the event of any change in the circumstances connected with this permission which is likely to endanger the life of persons employed in the mine or the mining operations for which this permission has been granted shall be stopped forthwith and intimation sent to the Director of Mines Safety thereof. The said mining operation shall not be resumed without express and fresh permission in writing from this Directorate.

(24) If at any time any one of the conditions subject to which this permission has been granted is violated or not complied with, this permission shall be deemed to have been revoked with immediate effect.

(25) This permission may be amended or withdrawn at any time if considered necessary in the interest of safety and is being issued under Regulation 106(2) (b) of the Metalliferous Mines Regulations, 1961 only without prejudice to any other provisions of law which may be or may become applicable at any time.

(26) This Directorate shall be informed as soon as the mining operations are commenced in accordance with the above permission. Intimation about completion of the mining operations should also be sent promptly

and in any case not later than one month thereof.

(27) This permission shall be valid for a period of five (5) years from the date of issue of this letter.

Annexure 'A'

1.0. GENERAL:

I. Except where otherwise provided for in this conditional permission all provisions of the Metalliferous Mines Regulations, 1961 relating to opencast workings, use of explosives and machinery shall be strictly complied with.

II. (a) All damages to property not belonging to the owner of the mine and injuries to persons as a result of mining operations shall be adequately indemnified. Should there be any controversy in this respect; the decision of the DGMS shall be final and binding on the management.

(b) No workings shall be extended to any point within 45m of village, dwellings, Roadway, Roadway, Railway acquired land and Public structure, H.T. Power line etc.

III. No work whatsoever shall be done where the provisions of Regulation 127 are attracted due to the presence of River, jore and nallah in the vicinity. The entire ground lying within 15m of all the River, nallahs and jores shall be filled up and raised and consolidated to a RL of at least 3m above the Highest Flood Level.

IV. No person shall be engaged or work or allowed to travel close to high sides/ benches, from which he is likely to fall for more than 1.8 m vertically down, unless he is provided with and uses a safety belt or rope.

V. Quarrying operations shall be conducted from top downwards.

VI. No person other those required for operating the machinery shall be allowed to remain near the foot of the benches exceeding 3.0m in height. When persons are employed within 3.0m of the bench sides, adequate precautions shall be taken to ensure their safety by dressing or/and supporting the sides of the benches.

VII Sufficient number of safety belts shall be available at the site and shall be ensured the use of the same.

VIII. Proper drains shall be provided at the benches to prevent accumulation of water.

2.0. OPENCAST WORKINGS:

(a) The height of the benches in alluvium and soft rock formation shall not be more than 3m and in overburden, ore or other hard rock formation not be more than the digging height of the machine used for digging, excavation or removal.

(b) The width of any bench shall not be less than; (i) the width of the widest machine plying on the bench plus two meters, or (ii) if dumpers ply on the bench three times the width of the dumper, or (iii) the height of the bench, whichever is more.

(c) If tippers or similar transport vehicles are deployed for transportation of ore, separate roads for such tipping trucks or similar vehicles shall be provided and safe loading practices shall be adopted avoiding plying of trucks on the same bench where men are to work, travel or rest.

(d) No manual workers shall be employed where HEMM is deployed in the mine.

3.0. FENCING AROUND OPENCAST WORKINGS:

(a) The periphery around the limits of opencast workings shall be kept fenced with a masonry wall not less than 0.40m thick and not less than 1.2m high, with parapet top.

(b) The edges of benches of the opencast workings shall be kept fenced with wire ropes strand or barbed wire supported by movable posts (wooden, iron or concrete). The gap between the adjacent rope strands or wires

shall not be more than 0.30m and the bottom most rope strand wire shall not be more than 0.25m and the top most rope strand or wire not less than 1.0m from ground level.

(c) Before abandoning the mine, the pits/quarry shall be filled upto adjuscent ground level by earth, where ever applicable.

4.0. SPOIL OVERBURDEN OR DEBRIS BANKS:

I (a) Spoils, overburden or debris shall be deposited at places belonging to the mine and duly approved by the manager in writing.

b) Spoils, overburden or debris shall not be deposited, beneath transmission, telephone or power lines or near any public structure.

(c) The slope of a spoil bank face shall be determined by natural angle of repose of the material being deposited, but shall in no case exceed 37.5 degree from the horizontal. The spoil bank face shall not be retained by artificial means at an angle in excess of its natural angle of repose.

(d) Any spoil bank exceeding 30m in height shall be kept benched so that no such bench exceeds 30m in height and the general slope does not exceed 1 vertical to 1.5 horizontal. In no case, the height of any spoil bank shall be allowed to exceed 60m unless a scientific study on its stability has been done and a separate permission is obtained from this Directorate.

(e) The spoil bank face shall not be retained by and artificial means at an angle in excess of it's natural angle of slope.

II. (a) The spoils overburden or debris shall not be deposited within 45m of a railway or other structures and it shall not be permitted to approach any of the above said structures closer than a distance equal to 1.5 times the vertical height of its face.

(b) The toe of a spoil-bank shall not be permitted to approach a railway or other public works, public road or building or other permanent structure not belonging to the owner of the mine closer than distance equal to the vertical height of its face.

(c) A suitable fence shall be erected between any railways of public works or road or building or structures and the toe of an active spoil bank so as to prevent un-authorised persons from approaching the spoil bank.

(d) The backfilled area shall be kept benched and the distance of any active mine workings (faces) from the toe of bottom-most backfilled face (bench) shall not be less than 100m.

(e) Spoils, overburden or debris shall not be deposited within 45m of any river, jore or any natural course of water, power transmission line, any building, structures, road etc.

III. No person shall, or shall be permitted to approach the toe of an active spoil bank where he may be endangered from material rolling down the face. Suitable signs for warning the persons at conspicuous places shall also be displayed.

IV. Dozers shall be provided with the following safety features in addition:

- 1) Roll over protection
- 2) Turbo charge guard.
- 3) Fire resistant hydraulic hoses and wiring near hot zone
- 4) Seat belt.

5.0. ROADS FOR TIPPING TRUCKS AND DUMPERS ETC:

I. All haul roads for dumpers or other mobile machinery shall be constructed to suit its load capacity and maintained in good condition. No vehicles other than heavy transport vehicles shall use haul roads except between designated points and when permitted in writing by the manager.

II. Where practicable, all roads leading from the opencast workings to surface shall be arranged to provide one-way traffic and no road shall be of a width less than three times plus 5m the width of the largest vehicle plying on that road. Where it is not practicable, definite turnouts, crossing points and waiting points shall be designated for use of vehicle.

III. All corners and bends shall be made in such a way that the operators and drivers of vehicle have clear view of distance of not less than 3 times the breaking distance of largest HEMM working at 40 KM/hour.

IV. Where it is not possible to ensure a visibility for a distance as mention in (III) there shall be provided with two roads of width not less than 2 times plus 3m of largest vehicle plying on the road with a strong road divider at centre with adequate lighting and reflector along the divider.

V. Where any road existing above level of surrounding area, it shall be provided with strong parapet wall or embankment of following dimensions:

(a) Width at top not less than 1m.

(b) Width at bottom not less than 2.5m.

(c) The height not less than the diameter of any type of largest vehicle plying on road. It may be noted that just dumping of mud or OB shall not be treated as strong parapet wall.

VI. No road shall have gradient more than 1 in 16. Ramps with 1 in 10 gradients should not be more than 10m at one stretch.

VII. If large capacity dumpers and smaller capacity tipping trucks or similar transport vehicle are deployed in the mine, separate roads for tipping trucks or similar transport vehicles shall be provided.

VIII. Plying of dumpers or tipping trucks on the same bench where men are to work, travel or rest shall be avoided.

IX. Warning notices and road signs shall be posted along the haul roads at appropriate places like crossings, curves etc for guidance of drivers of dumpers/trucks/tippers.

X. At every curve, parapet wall or vertical posts with Zebra lines shall be provided to help the drivers to keep the trucks/tippers/dumpers on the track.

6.0. ADDITIONAL DUTIES OF ASSISTANT MANAGER INCHARGE OF OPENCAST WORKING:

I. During every shift, the opencast workings shall be placed under the charge of a qualified experienced Assistant Manager to have overall control and guidance of all operations.

II. During his shift the Assistant Manager shall: -

a) Make frequent inspections for evidence of any unsafe conditions including evidence of slide of material from high wall and shall guide so that operations are conducted in a safe and efficient manner.

b) Not allow any person to work under overhanging edges or where there is evidence of slides, until such danger has been removed.

c) Ensure that every person engaged in dressing operations on high walls is provided with and uses safety belt of a type approved by this Directorate.

d) Ensure that all loose material is removed from high walls before drillers are engaged there; and

(e) Ensure that parapet walls along truck roads are properly maintained.

7.0 ADDITIONAL DUTIES OF ENGINEERS PLACED IN CHARGE OF MACHINES AND EQUIPMENTS IN OPENCAST WORKINGS:

The machines and equipments at work shall be placed under the charge of qualified and experienced engineer to effect inspection, examination, safe operations and maintenance of the machines, equipments and accessories. The engineer/engineers shall;

- a) inspect, examine machines, equipments and accessories and satisfy himself that they are in sound and safe working order;
- b) not allow any machine, equipment to be used, if it is found defective;
- c) ensure that every machine, equipment, accessory used is in a safe and efficient order;
- d) ensure that each operation, activity is carried on in safe and efficient manner.

8.0. INSPECTION, EXAMINATION, REPAIR AND MAINTENANCE OF HEMM AND OTHER MACHINES:

I. a) A code of practice for inspection, examination and repair of all breakdowns and repairs etc. shall be drawn up and practiced. A copy of the same shall be submitted to this Directorate promptly.

b) Every drilling and earth moving machinery or equipment or accessory (herein after called machine) shall be thoroughly examined at least once in each shift and maintained in good and safe working conditions.

c) A record of all such examinations and maintenances shall be maintained in a bound paged register and shall be signed by the engineer in charge of the shift and countersigned by the mine Engineer.

d) The layout of the workshop for maintenance of HEMM and other equipments shall be as per requirement mentioned in the DGMS Circular No.08 of 2003.

II. a) Every machine shall be allocated at least one day in every week for examination and maintenance, when it shall be thoroughly examined and inspected by the Engineer, who shall satisfy himself that it is mechanically sound and is in efficient working order before it is allowed to be re-used.

b) A report of every maintenance made under clause (a) shall be recorded in a bound paged book kept for the purpose, and shall be signed and dated by person making the inspection and countersigned by the Engineer.

c) If the engineer, mechanical Foreman or other competent person making an inspection under Clause (I) (a), notices any defect in any machinery, the said machinery shall not be used until the defect has been remedied.

d) Any defect in machinery reported by its operator shall be promptly attended to.

III. a) Any machinery found to be in an unsafe operating condition shall be tagged at the operator's position; "Out of Service, Do not Use" and its use shall be prohibited until the unsafe condition has been corrected.

b) All repairs to a machine shall be done at a location, which will provide a safe place for the persons engaged on repairs.

c) Except for testing, trial or adjustment, which must necessarily be done while the machine is in motion, every machine shall be shut down and positive means taken to prevent in operation while any repair or manual lubrication is being done.

d) Any machinery, equipment or part thereof which is suspended or held apart by use of slings, hoists jacks shall be substantially blocked or cribbed before men are permitted to work underneath or between the same.

e) The operator or driver shall not leave the machine while it is running unless it is placed under the charge of a competent person.

f) Power shall be disconnected when repairs are to be carried on any electrically powered machine/apparatus.

IV. In addition following provisions shall be ensured in general:

- 1) The approved type of audio visual alarm shall be provided in all equipment.
- 2) The approved type of fire suppression system shall be provided in all equipment.
- 3) The stability of HEMM shall be carried out at least once in year and after every major overhaul by an independent agency.
- 4) The crane and overhead crane shall be subject to proof load test and NDT test once in a year from a competent authority.
- 5) The pressure vessel receiver are subject to hydraulic and NDT test and shall be carried out by a competent authority.
- 6) In case of any defect in equipment such as brake, steering and safety device the equipment shall be immediately taken out of use and a record shall be kept.
- 7) The code of practice for installation operation and maintenance of all equipment shall be prepared and implemented before putting the equipment to use in mine.
- 8) The safety feature recommend in equipments shall be a part of notice inviting tender for new procurement and the design and drawing shall be obtained from OEM for fitting the same in old equipment.

9.0 PROTECTIVE EQUIPMENT, DUST ETC:

I. PROTECTIVE EQUIPMENT: Every person working in the opencast working shall be provided with, and shall use a hard hat and reinforced safety boots of a type approved by the Chief Inspector of Mines.

II. PRECAUTIONS AGAINST DUST: Adequate arrangements, to allay dry dust by wetting shall be made on roads and benches where HEMM, trucks and dumpers operate. All drills shall be provided with wet drilling arrangement and it shall be maintained in working order. No dry drilling operation shall be carried out.

10.0 DRILLING AND BLASTING OF DEEP HOLE:

10.1 GENERAL:

- (a) Operations connected with Drilling, Charging, Stemming and Blasting of deep holes shall be placed under overall charge of the Mine Manager or an Assistant Manager, holding at least a second class manager's certificate of competency granted under the Metalliferous Mines Regulations, 1961, who shall supervise the said operations in accordance with the guidelines and directives issued by the Manager.
- (b) Notwithstanding anything contained in the Metalliferous Mines Regulations, 1961, preparation of charges, charging and stemming of holes shall be carried out under the personal supervision of a Foreman, who shall fire the shots in deep holes himself.
- (c) A proper record for every blast, showing blasting parameters like hole size, spacing, burden, depth of holes, number of holes fired in the round, charge/hole, charge/delay and total charge of explosives fired in the round, with a rough sketch showing the drilling and firing pattern shall be kept maintained in a bound pagged register kept for the purpose.
- (d) Lives of persons and property not belonging to the management against injury and damages resulting out of blasting or operations being carried on in the mine shall be adequately indemnified. Should there be any controversy in this regard, decision of the D.G.M.S. shall be final and binding.

10.2 DRILLS: The following safety features shall provide.

- 1) Approval type of dust prevention or suppression system.
- 2) Each moving parts of the machinery shall be guarded/f encd and also ensure its effectiveness all the time.
- 3) (i) Emergency of push bottom in
 - a) Operator's cabin.
 - b) Main frame.
 - c) Propeller pendent.
 - d) Rear end.(ii) Tripping device to trip the field switch.
- 4) Thermostat motor protection relay in winding temperature and other related parts.
- 5) Explosive vent in transformer.
- 6) Propel interlock (an electric interlock between drilling and propeller operation).
- 7) High air discharge temperature switch.
- 8) Low lubrication oil pressure switch.
- 9) Oil stop valve (electric solenoid valve in compressor lubrication line.
- 10) No lump circuit.
- 11) Tower lock and lock check valve.
- 12) Propel joystick-spring loaded type to return to neutral (dead man safety).
- 13) Disk-brake and brake valve and its testing parameters.
- 14) Lock check valve for preventing creeping in drill.
- 15) Seat belt.
- 16) Fire resistant hydraulic hoses and wiring near hot zone.
- 17) Turbo charge guard.
- 18) Cabin for the operator.

10.3 PRECAUTIONS WHILE DRILLING:

I. The position of every deep hole to be drilled shall be distinctly marked by the mine foreman so as to be readily seen by the drillers.

II. a) No drilling shall be commenced in an area where shots have been fired, until the shot firer has made a thorough examination at all places, including remaining butts of old deep holes, for unexploded charges that the drill may strike.

b) No drill or bore rod or pick shall be inserted in butts of old deep holes even if an examination under clause (a) has failed to reveal presence of explosives.

III. a) Drilling and charging of deep holes shall not be carried out in the same area at the same time.

b) Drilling operations shall not be carried on simultaneously on two benches, at places directly one above the other.

10.4 DUTIES OF DRILL OPERATORS:

I. At the beginning of his shift, the drill operator shall examine the drilling equipment and satisfy himself that:

- a) Crown blocks are mounted securely;
- b) where compressed air operated drills are used, all hoses' connections are in order; and
- c) the drilling equipment is in safe working condition.
- d) Wet drilling system is in order.

II. The drill operator shall ensure that;

- a) work-persons keep clear of auger and drill stem while the drill is in motion;
- b) work-persons do not work under suspended tools, when tools are removed from the holes, these shall be lowered on the platform; and
- c) all finished drill holes are properly plugged so as avoid possible leg injuries to any one accidentally stepping into the hole.

10.5 TRANSPORT OF EXPLOSIVES:

Where explosives are transported in bulk for deep hole blasting, the following precautions shall be taken: –

(I) Transport of explosives from the magazine to the priming station or the site of blasting shall not be done except in the original wooden or cardboard packing cases. The quantity of explosives transported at any time at the site of blasting shall not exceed the quantity required for use in one round of shots. The explosives shall be transported to the site of blasting not more than 90 minutes before the commencement of charging of the holes.

(II) (a) No mechanically propelled vehicle shall be used for the transport of explosive unless it is of a type approved. A jeep or land rover may be used for the transport of detonators from magazines to priming stations subject to the following conditions -

- (i) Not more than 200 detonators are transported in a vehicle at a time.
 - (ii) The detonators are packed suitably in a wooden box.
 - (iii) The wooden box containing detonators is placed, inside an outer metal case.
 - (iv) The outer metal case shall be suitably bolted to the floor of the vehicle or otherwise fixed in a wooden frame so that the container does not move about while the vehicle is in motion and
 - (v) No person shall ride on the rear portion of the vehicle.
- (b) Every vehicle used for the transport of explosive shall be marked or placarded on both sides and ends with the word "EXPLOSIVES" in red letters not less than 15cm high on a white background.
- (c) Every mechanically propelled vehicle transporting explosives shall be provided with not less than two fire extinguishers (one suitable for petroleum fire and the other for electrical fire) suitably placed for its convenient use.

(III) (a) The vehicle used for transport of explosives shall not be overloaded and in no case shall the explosive cases be piled higher than the sides of its body.

b) Explosives and detonators shall not be transported the same vehicles, at the same time.

(IV) (a) No person other than the driver and his helper (not below 18 years of age) shall ride on a mechanically propelled vehicle used for the transport of explosives.

b) The explosive van shall not be left unattended.

c) The engine of the vehicle transporting explosives shall be stopped and the brakes set securely before it is unloaded or left standing.

d) A vehicle transporting explosives shall not be driven at a speed exceeding 25km per hour.

e) A vehicle loaded with explosives shall not be taken into repair shop and shall not be parked in a congested place.

f) A vehicle transporting explosives shall not be refueled except in emergencies and then also, when its engine is stopped and other precautions taken to prevent accidents.

g) No trailer shall be attached to a vehicle transporting explosives.

(V) Every vehicle used for the transport of explosives shall be carefully inspected once in every 24 hours by a competent person to ensure that –

i) The Fire extinguishers are filled and are in place;

ii) The electric wiring is well insulated and firmly secured;

iii) The chassis engine and body are clean and free from surplus oil and grease;

iv) The fuel tank and feed lines are not leaking; and

v) Lights, brakes and steering mechanism are in good working order.

All reports of every inspection made as above shall be signed and dated by the competent person making the inspection.

(VI) All operations connected with the transportation of explosives shall be conducted under the personal supervision of a Foreman/ Blasting in charge so authorised by the Manager and who shall assist the officer in charge of blasting operations at the mine.

(VII) The blasting incharge shall personally search every person engaged in the transport and use of explosives and satisfy himself that no person so engaged has in his possession any cigarette, BEEDI or other smoking apparatus of any kind capable of producing a light, flame or spark.

11.0 DESIGN, OPERATION AND MAINTENANCE OF EXCAVATORS:

(A) DESIGN:

I. a) Every excavator shall be so designed as to afford the operator clear and uninterrupted vision all around.

b) Every excavator shall be provided with: -

i) efficient warning devices;

ii) adequate front and rear lights and a portable lamp for emergency, unless the excavator is not used after day-light hours; and

iii) an efficient portable fire extinguisher so placed as to be within easy reach of the operator.

II. A special retracting ladder mounted on the excavating machine.

III. The following safety feature shall be provided with Excavators:

- i) All functions cut off switch.
- ii) Swing Motor Brake.
- iii) Fire resistant hydraulic hoses in place of ordinary hoses to decrease the chance of Fire. All the sleeves and conducts where cable/wire are passed shall be fire resistant.
- iv) Turbo charger Guard.
- v) Seat belt.
- vi) Vent valve on top of hydraulic tank should be able to be removed without any tool.
- vii) A baffle plate between cold zone and hot zone.
- viii) Provision for Limiting of hydraulic cylinders-Stoppers.

(B) OPERATION:

I. Every excavator shall be under the charge of a competent person authorised in writing by the manager, herein called the 'Operator'.

II. a) No person other than the operator or his helper if any, or the manager or any person so authorised in writing by the manager shall ride on any excavator.

b) No person shall be permitted to ride in the bucket of a excavator.

III. Excavator boom shall be lowered to the ground during greasing operations.

IV. a) No excavator shall be operated in a position where any part of the machine suspected and leads or lines are brought closer than 3m to exposed high voltage lines, unless the current has been cut off and positive means taken to prevent the lines from being energized. A notice of this requirement shall be posted at the operator's position.

b) Electrical cables, if any, shall be laid in such a manner that they are not endangered either by falling rocks or by any mobile equipment.

V. The excavator bucket shall be pulled out of the bank as soon as it is full.

VI. a) When being operated in soft or unstable ground, every excavator shall be supported by mats, heavy planks or poles so as to distribute the load of the machinery over larger area and to prevent any danger of the excavator overturning itself.

b) When not in use, the excavator shall be moved to and stood on stable ground.

VII. If more than one stripping machines are in use in any area either on the same bench or on different benches, the machines shall be so spaced that there is no danger of accident from flying or falling objects etc. from one machine to the other.

(C) DUTIES OF EXCAVATOR OPERATORS:

I. a) At the commencement of every shift, the operator shall personally inspect and test the machine, paying special attention to the following details:

i) that every warning device is in working order; or

ii) if the machine is required to work after day-light hours, he shall not take out the machine for work nor shall he work the machine, unless he is satisfied that it is mechanically sound and in efficient working order

including the lighting fixtures.

b) The operator shall maintain a record of every inspection made under clause (a) in a bound paged book kept for the purpose and shall sign every entry made therein.

II. a) The operator shall keep the cab window clean so as to ensure clear vision at all times.

b) The walkways in or about the cab of any excavator shall be kept free of loose tools, grease containers or other materials that might fall or present a falling or tripping hazard.

III. a) The operator shall not operate the machine when persons are in such proximity as to be endangered.

b) He shall not swing the bucket over passing haulage unit when the trucks/dumpers are being loaded, he shall swing over the body of the truck/dumpers and not over the cab, unless the cab is protected by a substantially strong cover.

IV. Before leaving the machine, the operator shall lower the bucket to the ground.

V. The operator shall not allow any un-authorized person to ride on the machine.

12.0 DESIGN, OPERATION AND MAINTENANCE OF DUMPERS AND TIPPING TRUCKS:

(A) DESIGN:

(I) Every tipping truck or dumper shall be provided with:

i) efficient brakes;

ii) efficient audible warning devices; and

iii) efficient head-lights, if the truck or dumper is required to work after day-light hours.

iv) an automatic audio-visual alarm which shall operate on reversal and be of such intensity which is not less than 5dB(A) above the surrounding noise level..

(II) In addition, the following safety features shall be provided in dumper:

1. Mechanical steering locking to prevent untoward movement of steering wheel and tyre while work persons working below the cabin while engine is running.

2. Blind spot mirror apart from rear view mirror to enable operator to have clear visibility of blind spot in and around dumpers.

3. Mechanical type Anti collision device to avoid head to tail collision on haul road such as tail gate, bumper extension or any other strong device.

4. Fire resistant hydraulic hoses in place of ordinary hoses to decrease the chance of fire. All the sleeves and conducts where cable/ wire are passed shall be fire resistant.

5. Seat belt for operator.

6. The maximum speed of vehicle shall be restricted to 30km/hours by blocking higher gear or any other automatic means.

7. Propeller shaft guard.

8. Proximity warning device.

9. Cabin Guard Extension: Canopy shall cover the operator's cabin fully.

10. Exhaust/Retard Brake: Device to control the speed of truck while operating down the gradient. Refer DGMS (Tech.) Circular No.02 of 2004.

11. Tail gate protection: Protection of operator against collision either by head on or head to tail.

12. Limiting speed device: Enable mine management to decide the maximum speed of vehicle to be operated in mine. The device may be Electronic or mechanical type speed governors.

13. Audio-visual alarm while reversing: The audio-visual alarm provided should confirm to DGMS (Tech.) Circular No.01 of 2010.

14. Provision of two brakes: One of brakes shall be fail safe. For details refer DGMS Circular No.09 of 1999.

15. Body lifting position locking arrangement: A hooter along with an indication is provided to indicate the body is still in lifted position.

16. Fire suppression System: Refer DGMS Circular No.10 of 2004. The fire suppression system shall be a factory fitment and of approved type from Directorate.

17. Electric Wires and sleeves are to be of fire resistant quality: To decrease chance of fire.

18. Turbo Charge and Exhaust tube coated with heat insulated paint: To decrease chance of fire.

19. Battery Cut off Switch: To decrease chance of fire.

20. Retro reflectors on all sides: For visibility of truck during beyond daylight hours.

21. Proximity warning device: To alert operator when approaching any vehicles/obstructions.

22. Rear Vision System: To assist operator during reversing. Refer DG Circular No.12 of 2009.

23. Auto dipping System: To reduce glaring on eyes of operator during night operation.

24. Load Indicator and Recorder: Enables management to detect and prevent over loading.

(B) OPERATION:

I. Every truck or dumper shall be under the charge of a competent person authorised in writing by the manager herein called the 'driver'. No person shall be so authorized unless he possesses a valid driving license to drive a heavy vehicle under the Motor Vehicles Act.

II. a) No person other than the driver or his helper, if any or the manager or any person authorised in writing by the manager shall ride on a truck or dumper.

b) No person shall be permitted to ride on the board of a running truck or dumper.

III. a) As far as possible, loaded trucks or dumpers shall not be reversed on gradients.

b) Sufficient stop blocks shall be provided at every tipping point and these shall be used on every occasion, material is dumped.

c) Standard traffic rules shall be adopted and followed during movement of all trucks and dumpers. They shall be prominently displayed at relevant places in the opencast workings and truck/dumpers roads.

IV. When not in use, every truck or dumper shall be moved to and parked at proper parking places.

V. No person shall be permitted to work on the chassis of a truck or dumper, with the body in a raised position until after the truck or dumper body has been securely blocked in position. The mechanical hoist mechanism shall not be depended upon to hold the body of the truck or dumper in a raised position.

VI. The safety features recommended in the dumpers/truck/tippers shall be made a part of the notice inviting tender for new procurement and the design drawing shall be obtained from OEM for fitting the same in old equipment.

(C) DUTIES OF TRUCK/DUMPER OPERATORS:

I. A) Before commencing work, the driver shall personally inspect and test the vehicle, paying special attention to the following details:

i) that the brakes are in working order;

ii) that the warning devices including automatic audio visual reversing alarm are in working order and he shall not take out the vehicle for work nor shall he drive the vehicle, unless he is satisfied that it is mechanically sound and in efficient working order.

b) The driver shall maintain a record of every inspection made under clause (a) in a bound paged book kept for the purpose and shall be signed and dated by the person making the inspection.

II. The driver shall keep the cab window clean so as to ensure clear vision at all times

a) The driver shall ensure that the gear is in neutral position before stopping the engine.

b) The driver shall handle the truck/dumper carefully and keep it under control at all times. He shall negotiate downhill gradients in low gear so that minimum of braking is required.

c) He shall not drive too fast, shall avoid distractions and shall drive defensively. He shall not attempt to overtake another vehicle unless he can see clearly for enough ahead to be sure that he can pass it safely. He shall also sound audible warning signal before overtaking.

d) When approaching stripping equipment, the driver of the truck or dumper shall sound the audible warning signal and shall not attempt to pass the stripping equipment until he has received a proper audible signal in reply.

e) Before crossing a road or railway line, he shall reduce his speed, look in both directions along the road or line and shall proceed across the road or line only if it is safe to do so.

f) The driver shall not operate the truck or dumper in reverse unless he has a clear view of the area behind the vehicle or he has the assistance of a 'spotter' or 'pitmen/trip man' duly authorised in writing for the purpose by the manager. He shall give an audible warning signal before reversing a truck or dumper.

g) The driver shall be sure of clearance before driving through tunnels, archways, plant structure etc.

III. The driver shall see that the vehicle is not overloaded and that material is not loaded in a truck or dumper as to project horizontally beyond the sides of its body and that any material projecting beyond the front or rear is indicated by the red flag during day and a red light after daylight hours.

IV. The driver shall not allow any unauthorized person to ride on the vehicle. He shall also not allow more than the authorized number of persons to ride on the vehicle.

(D) TESTING OF BRAKES:

At least once in two weeks, the brakes of the truck, dumper or any such other vehicles shall be tested as indicated below:

I. a) SERVICE BRAKE TEST:

The brake shall be tested on a specified gradient and speed when the vehicle is fully loaded. The vehicle shall stop within a specified distance when the brake is applied. The specified stopping distance shall be obtained from the manufacturer of the vehicle.

b) PARKING BRAKE TEST:

The parking brake shall be capable to hold the vehicle when it is fully loaded and placed at the maximum gradient of roadway, which is permitted for a period of at least ten minutes.

c) A record of such test shall be maintained in a bound paged book and shall be signed by the person carrying out the test and the engineer and manager.

(E) INSPECTION AND OTHER PRECAUTIONS:

I. Surprise inspection shall be carried out by the Engineer/Superior official at an interval not exceeding 15 days to ensure that the examination schedule of machinery/equipment are carried out.

II. While inflating tyres, suitable protective cages shall be used. Tyres shall never be inflated by sitting either in the front or on the top of the same.

III. While the vehicle is being loaded/unloaded on gradient, the same shall be secured stationary by parking brake and other means such as suitably designed stopper blocks, which could be placed below the tyres.

IV. Operation and maintenance of heavy machineries such as excavators, dumpers etc. shall be done strictly in accordance with the operation instructions. The operation instructions and maintenance schedule shall be obtained from the manufacturers.

V. a) Automatic fire protection system shall be provided and maintained in working order for surface heavy machinery such as blast hole drills, hydraulic excavators etc. It is also necessary that the recommended procedure for testing of such fire protection system at a given schedule by the manufacturer be also adopted. The automatic fire systems consist of one or more containers of fire suppressant (usually a dry chemical) connected by a fixed plumbing network to nozzles directed at specific pre-determined fire hazard areas of the machinery.

b) Optical, thermal or any other suitable type of sensing device shall be suitably located to sense the fire and actuate the suppressant to come out through the nozzles already fixed to deal with the fires. An over riding manual system along with fire alarm shall also be additionally provided for better effectiveness of the system.

VI. Entry of private trucks within the mine premises for dispatch of ore etc. shall be regulated and checks for driving license and it's validity, road worthiness of the vehicle, identity of the driver and his helpers, etc. shall be carried out whenever such trucks are allowed to enter into the mine premises. Further crowding of trucks near ore stockyards or inside the mine premises shall not be allowed and only required trucks for immediate loading shall be allowed inside the mine. The management shall provide proper supervision of the trucks and the loading Mazdoors. Management shall be responsible for ensuring compliance of all statutory provisions of the Mines Act, 1952 and subordinate legislation framed there under by all the contractor workers/truck drivers, helpers etc in so far as it applies to them. Further no truck shall be allowed to be loaded beyond its permissible capacity.

13.0 It shall be the duty of the Owner, Agent or Manager of every mine to establish and follow a ground control plan for control of all sides, slopes, faces in all opencast workings and overburden dumps. The height of bench and slope of its sides shall be so kept so as to ensure absolute stability under all conditions and shall not, in any case, exceed the general provisions as incorporated in this permission.

Yours faithfully



ALTAF . HUSSAIN (DIRECTOR - CHAIBASA REGION)

THIS IS A SYSTEM GENERATED DOCUMENT, DOES NOT REQUIRE ANY SIGNATURE.