

EC COMPLIANCE REPORT

Chuinpalli Quartzite Mines, Jharsuguda, Odisha
Period: April - September 2015

M/s TRL Krosaki Refractories Ltd

ML AREA : 102.123 HA



15

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ANNEXURES	TITLE
Annexure 1	Environmental Monitoring Reports (April – September 2015)
Annexure – 2	Rain Water Harvesting Proposal & Implementation Details
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CHAPTER 1

INTRODUCTION

Chhuinpali Quartzite ore mine covering an area of 102.123 Ha is situated in the village Chuinapli at Lakhanpur Tehsil of Jharsuguda district, Orissa. Mining lease was granted over an area of 102.123 hectares executed on 22.05.2000 for 20 years. The lease will expire on 21.05.2020. Surface rights were granted over two separate blocks measuring 4.561 ha (Block A) and 13.771 ha (Block B). The present excavation is restricted to the smaller block of 4.561 ha in the west. This is a semi-mechanized open cast mine which falls under screening category A as per EIA Notification, 2006 MoEF, Govt. of India, New Delhi and subsequent amendments. The project has been granted environmental clearance by the Ministry of Environment and Forests (MoEF), New Delhi, vide letter number J-11015/134/2008-IA.II(M) dated 18th August 2012. The project has also obtained Consent to Establish (NOC) from State Pollution Control Board, Odisha vide letter no. 1739/III-CON (NOC)-296/2009-10 dtd. 21.06.2011 and consent to operate vide letter no. 336/Ind-II Con (Mines)18 dated 07.03.2015 with consent order no. RO/SPCB/JSG/ APC & WPC-010 and valid up to 31.03.2016 for operation of the mines.

PROJECT DESCRIPTION

ATTRIBUTES	DETAILS
Location	Village – Chhuinpali , Tehsil- Lakhanpur, District – Jharsuguda, Orissa
Latitude	21° 45’ 31” to 21° 46’ 28” N
Longitude	83° 33’ 24” to 83° 34’ 15” E
Toposheet No.	64 O/5
ML Area	102.123 Ha
Highest Altitude	425 AMSL
Lowest Altitude	213 AMSL

Terrain & Gradient	Hilly, Slope is generally towards south.
Method of Mining	Opencast Semimechanised
Drainage Pattern	Dendritic
Water Bodies	Chhote - Kelo river at 1km west from the ML area. Nearest distance of Hirakud Back Water is at 300 m from the south eastern boundary of ML area.
Notified Sensitive Areas Within 10 Kms	NIL IB valley-Jharsuguda area (IB-Jharsuguda cluster defined by OSPCB & CPCB in the Action plan for abatement of pollution in critically polluted industrial clusters) at a distance of 29.02 Km
State Boundary	3.55 Km from Orissa – Chattishgarh state boundary
Water requirement/Sources	Domestic – 2cum per day (From dug well) Non Domestic use– 9.25 Cum Per day,
Life of the mine	50 Years
Grade of Ore	Less than 0.5% of Fe ₂ O ₃
Ultimate working depth	225 mRL (For Block A) & 270 mRL (For Block B)
The ground water table	200 mRL
Drilling and Blasting	Occasional Drilling & Shot hole blasting
Nature of Waste	OB Soil & Waste rock
Present Employment	135 Nos

PRESENT STATUS OF THE MINES

The mine is in working condition and environment protection measures has been undertaken as per the EC conditions

PURPOSE OF THE REPORT

This six-monthly report is being submitted as per the condition stipulated in the Environmental Clearance Order. The regular monitoring and analysis as per the requirement of post Environmental clearance is being carried out by M/s Kalyani Laboratories Pvt. Ltd. Bhubaneswar which is a MoEF recognised Laboratory vide notification no. 1573 dated 6th August 2014.

Further, the environment compliance report depicts the environmental impacts of the project on the surrounding environment. This report reveals

- That the project does not have any adverse environmental impacts in the project area and its Surrounding
- Compliance to the conditions stipulated in the Environmental Clearance Letter.
- That the Project Management is implementing the environmental mitigation measures and safeguards in true spirit as suggested in the approved Environmental Management Plan (EMP).

CHAPTER 2

**STATUS OF IMPLEMENTATION OF EC
CONDITIONS**

Sl. No	EC Conditions	Status of Implementation
Specific Conditions		
i.	The Project proponent shall obtain Consent to Establish and Consent to Operate from the State Pollution Control Board and effectively implement all the conditions stipulated therein.	Consent to establish has been obtained from State Pollution Control Board, Odisha vide letter no. 1739/III-CON (NOC)-296/2009-10 dtd. 21.06.2011 and consent to operate also obtained vide letter no. 336/Ind- II Con (Mines)18 dated 07.03.2015 with consent order no. RO/SPCB/JSG/ APC & WPC-010 and valid up to 31.03.2016 for operation of the mines. Copy already submitted with previous compliance report.
ii.	Environmental clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No. 460 of 2004, as may be applicable to this project	Noted
iii	Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from	The mine site is located outside of any eco sensitive zone. Therefore clearance under the Wildlife

	<p>the competent authority, as may be applicable to this project.</p>	<p>(Protection) Act, 1972 from the competent authority is not applicable for the present case of mining.</p> <p>However a site specific wildlife conservation plan has been prepared for the project and approved by Principal Chief Conservator of Forest (Wild Life) and Chief wild life warden: Odisha, Bhubaneswar vide letter no. 3856/1/ WL(C)SSP-293/2011 dtd. 7th June 2011.</p> <p><u>Rs. 43,91,289/- paid 18.02.2014 (Regional Wild Life Management Fund)</u></p> <p><u>Rs. 69 Lakh paid on 30.04.2014 (for Site Specific Wild Life Conservation Plan).</u> No further investment wrt Wildlife management plan has been incurred during the reporting period.</p>
iv	<p>The Company shall submit within 3 month their policy towards Corporate Environment Responsibility which should inter-alia address (i) Standard Operating Process/ Procedure to bring into focus any infringements/ deviation/ violation of Environmental or forest norms/conditions. (ii) Hierarchical system or Administrative order of the company to deal with</p>	<p>Policy towards Corporate Environment Responsibility has been already submitted vide letter no. SRMS/CQM/ENV/12-13/03 dtd. 01.11.2012. The policy addressing Standard Operating Process/ Procedure to bring into focus any infringements/ deviation/ violation of Environmental or forest norms/conditions. (ii) Hierarchical system or Administrative order of the</p>

	environmental issues and ensuring compliance EC conditions and (iii) System of reporting of non-compliance / violation environmental norms to the Board of Directors of the company and/or stakeholders and shareholders.	company to deal with environmental issues and ensuring compliance EC conditions and (iii) System of reporting of non-compliance / violation environmental norms to the Board of Directors of the company and/or stakeholders and shareholders.
v	The mining operation shall be restricted to above ground water table and it should not intersect the ground water table. In case of working below the ground water table, prior approval of the Ministry of Environment and Forests and the Central Ground Water Authority shall be obtained, for which a detailed hydro-geological study shall be carried out.	The ground water table of the area is at 200 mRL and the ultimate depth of the mining will be 225 mRL which is much above the ground water table. So the mining operation throughout the entire life will not intersect the ground water table. Therefore there is no requirement of hydrogeological study in the present case of mine. However to assess the hydrogeology of the area and monitoring of ground water there is the proposal for carry out a hydrogeological study by establishing a network of existing wells.
vi	The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations. Adequate measures shall be taken for conservation and protection of the 1 st and 2 nd order streams, if any emanating or passing through the	There is no natural water body passes through the ML area which will be obstructed due to mining operation.

	mine lease during the course of mining operation.	
vii	The project proponent shall take adequate environmental safe guard measure for control of rolling down of silt and sediments and protection of the catchment area of Kelo River and the Hirakud reservoir during the course of mining operation.	<ul style="list-style-type: none"> • Hirakud back water reservoir is located at a distance of 300m • Garland drain (1m x 0.75mx 100m) and retaining wall (1m x 1m x 100m) has been constructed to check the surface run off from the dumps. • The water from these drains is being diverted to settling pits for settling and the clean water is being discharged outside. • Contour trenches are made on overburden dumps to control surface run off and subsequent erosion. • The retaining wall constructed in the southern side of the lease boundary to check the surface run off from mine. • The clarified water will be diverted and discharged into irrigation tank and used in the agricultural field. • The mine drainage water is being analyzed on quarterly basis. The analysis carried out in the month of February is being presented in the table below: Analysis of mine drainage water:

		Parameters	Result
		pH	7.2
		TDS (mg/l)	100
		TSS (mg/l)	50
		DO(mg/l)	5.3
		Total Iron (mg/l)	2.18
		<ul style="list-style-type: none"> The garland drain and settling tank will be cleaned time to time. 	
viii	The project proponent shall effectively implement the mitigative measures suggested by the Hirakud Dam Authorities to check the surface run-off and sediments into the reservoir back water.	<ul style="list-style-type: none"> We are effectively implement the mitigative measures suggested by Superintending Engineer, Hirkud Dam Circle, Burla. According to the suggestions of Hirakud Dam authority garland drains, retaining walls, contour trench and settling pits has been constructed to check the surface run off from the mines. The mine discharge water is regularly monitored and analyzed by authorized laboratory before discharge to outside. It has been observed from the analysis result that the parameters are within the prescribed range for discharge to outside. The test report attached for reference. Before discharging of mine drainage water it will passes through the garland drain and 	

		settled in the settling pit so that clean water will be discharged outside the ML area.
ix	The top soil shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation.	During the present compliance period no top soil has been generated as the mining activity will continue in the existing quarry only.
x	The over burden generated during the mining operation shall be temporarily stacked at earmarked dump site(s) only and it should not be kept active for long period of time and its phase-wise stabilization shall be carried out. Proper terracing of the dumps shall be carried out so that the overall slope of the dumps shall be maintained to 28°. The over burden dump shall be scientifically vegetated with suitable native species to prevent erosion and run-off. In critical areas, use of geotextiles shall be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self sustaining. Compliance status shall be submitted to the Ministry of Environment and Forests and its	There is an existing waste dump over an area of 0.453 Ha with OB of 1200 cu.m. During the period of compliance 6386 MT of mineral waste has been generated which is being dumped over an area of 0.453 Ha. Retaining wall and garland drain has been constructed around the dump for protection of surface run off.

	Regional office located at Bhubaneswar on six monthly basis.	
xi	Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, OB, sub-grade and mineral dump(s) to prevent run off of water and flow of sediments directly into the Kelo River, the Hirakud Reservoir and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after the monsoon and maintained properly.	<ul style="list-style-type: none"> • To prevent the runoff from the ML area garland drains, retaining wall and settling pits has been constructed. • Three nos of settling pit of dimension 5 x 5 x 2m has been constructed in the ML area.
xii	Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed around the mine pit, OB, sub-grade and mineral dump(s) to prevent run off of water and flow of sediments directly into the Kelo River, the Hirakud Reservoir and other 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.	<ol style="list-style-type: none"> 1. Garland drain of dimension is being made to prevent rain water gushing through the slope. The water from these drains is being diverted to settling pits for settling and settled water is being discharged. 2. A check dam has been constructed in the southern side of the lease boundary to check the surface runoff from mine to the Hirakud Reservoir. 3. The clarified water will be diverted and discharged into irrigation tanks

	<p>Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and desilted at regular intervals.</p>	<p>which will be used for plantation, dust suppression or agricultural activities.</p> <p>4. Sedimentation pit has been constructed at the corners of garland drain and desilted at regular intervals.</p>
xiii	<p>Dimension of the retaining wall at the toe of temporary OB dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.</p>	<p>Retaining wall of 1m x 1m x 100m size has been constructed in the toe wall of the OB dump to check the runoff and siltation.</p>
xiv	<p>The void left unfilled in an area of 6.786ha shall be converted into water body. The higher benches of excavated void/mining pit shall be terraced and plantation done to stabilize the slopes. The slope of higher benches shall be made gentler for easy accessibility by local people to use the water body. Peripheral fencing shall be carried out all along the excavated area.</p>	<p>At present there is no void for reclamation. The reclamation procedure will start after complete exhaustion of the minerals from the mining quarry.</p> <p>During the conceptual period, a void of 12.0 Ha will be created. Out of the total quarry area 6.786ha shall be converted into water body and made accessible to the local people to use the water body. Proper fencing of the water body will do to avoid any accident.</p> <p>A 3m wide plantation zone will be created around the water reservoir to increase the aesthetic value of the area.</p> <p>5.214 Ha of the mined out area will be</p>

		backfilled with the generated waste and covered by top soil. This area will be stabilized by plantation. Till date 10.8 Ha of plantation zone with 14000 saplings has been made within the ML area and 7.5 Ha of plantation made in the village waste land of Banjari and Kumar village.																																										
xv	Plantation shall be raised in an area of 20.967ha including a 7.5m wide green belt in the safety zone around the mining lease by planting the native species around the reclaimed area, OB dumps, mine benches, around water body, along the roads etc. in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per hectare. Greenbelt shall be developed all along the mine lease area in a phased manner and shall be completed within first five years.	<table border="1"> <thead> <tr> <th>Yr.</th> <th>Location</th> <th>Area (Ha)</th> <th>No. of sapling</th> <th>Species</th> <th>planted</th> <th>Density</th> </tr> </thead> <tbody> <tr> <td>Jan- June 2013</td> <td>Kumar village</td> <td>6.0</td> <td>6000</td> <td>Neem, Karanja, Simarouba</td> <td></td> <td>1000/ Ha</td> </tr> <tr> <td>Sept 2013 - March 2014</td> <td>Bhikampali Village</td> <td>2.00</td> <td>3000</td> <td>Teak, Karanja</td> <td>Neem,</td> <td>1500/ Ha</td> </tr> <tr> <td>March 2014- Sept 2014</td> <td>Bhikampali Village</td> <td>1.8</td> <td>3000</td> <td>Neem, Karanja, Simarouba</td> <td></td> <td>1600/ Ha</td> </tr> <tr> <td>April 2015 - Sept. 2015</td> <td>Bhikampali Village (Green belt & Avenue)</td> <td>1.0</td> <td>1500</td> <td>Debadaru-330 Nos Saguan-230 Nos Karanja- 550 Nos Krushnachuda-200Nos Radhachuda-200 Nos Neem- 440 Nos Jamu- 50 Nos</td> <td></td> <td>2000/ Ha</td> </tr> <tr> <td>April 2015 - Sept. 2015</td> <td>Safety zone</td> <td>0.5</td> <td>500</td> <td>Teak</td> <td></td> <td>1000/ Ha</td> </tr> </tbody> </table>	Yr.	Location	Area (Ha)	No. of sapling	Species	planted	Density	Jan- June 2013	Kumar village	6.0	6000	Neem, Karanja, Simarouba		1000/ Ha	Sept 2013 - March 2014	Bhikampali Village	2.00	3000	Teak, Karanja	Neem,	1500/ Ha	March 2014- Sept 2014	Bhikampali Village	1.8	3000	Neem, Karanja, Simarouba		1600/ Ha	April 2015 - Sept. 2015	Bhikampali Village (Green belt & Avenue)	1.0	1500	Debadaru-330 Nos Saguan-230 Nos Karanja- 550 Nos Krushnachuda-200Nos Radhachuda-200 Nos Neem- 440 Nos Jamu- 50 Nos		2000/ Ha	April 2015 - Sept. 2015	Safety zone	0.5	500	Teak		1000/ Ha
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xvi	Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and	Regular water sprinkling is being carried out twice in a day in the haul road, mining benches, on the dump and loading and unloading sites to minimize the emission of particulate matter. A 5000 liter capacity water tanker is being used for this purpose.																																										

	transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	Regular monitoring of ambient air quality at 4 locations (2 inside lease area and 2 outside the lease area) is being carried out on monthly basis by MoEF recognized laboratory. Test reports attached for reference. The concentration of PM10, PM2.5, SOx, and NOx for the period of October 2014 to February 2015 has been given in Chapter – 3 and Annexure 1.
xvii	The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.	The project authority has been taken up the rain water harvesting within the lease area. The detail proposal is being attached as Annexure 2.
xviii	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and installing new piezometers during the operation. The periodic monitoring [(at least four times in a year- pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January); once in each season)] shall be carried out in consultation with the State Ground Water Board/Central	The ground water quality is being monitored once per season. It has been observed that the parameters analyzed are found to be within the prescribed limit. The analysis result has been given in Chapter 3 and Annexure 1.

	Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional Office Bhubneswar, the Central Ground Water Authority and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.	
xix	Appropriate mitigate measures shall be taken to prevent pollution of Kelo River in consultation with the State Pollution Control Board.	As Kelo river is the major drainage system of the area which flows at a distance of 1 Km in the western side of the ML area and It meets Hirakud reservoir on Mahanadi. Before discharge of any mine drainage water to outside the lease area following necessary preventive measures have been under taken. <ul style="list-style-type: none"> • Settling of the drainage water • Regular analysis of the mine drainage water • Reuse of the water in plantation and dust suppression activities.
xx	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of water required	Total water requirement for the project is 11.25 KLD, out of which 9.25 KLD will be required for plantation, dust suppression and other non domestic

	for the project.	<p>purposes. Only 2 KLD water will be used for drinking purpose.</p> <p>Agreement with the Executive Engineer, Sambalpur Irrigation division, Burla, has been done on 19.09.2013 which has been deposited to the Ministry earlier. We are depositing water license fees @ Rs. 6.80 per KL for 15 KL per day every month since October'2012.</p>
xxi	The project proponent shall practice suitable rainwater harvesting measures on long term basis and work out a detailed scheme for rainwater harvesting in consultation with the Central Groundwater Authority and submit a copy of the same to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar.	The project authority has taken up rainwater harvesting for ground water recharge within the ML area. Detail proposal attached as Annexure 2 .
xxii	Vehicular emissions shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The mineral transportation shall be carried out through the covered trucks only and vehicles carrying the mineral shall not be overloaded. No	<ul style="list-style-type: none"> • The transportation vehicles are regularly maintained to avoid pollution. • Overloading is strictly prohibited • Transportation will be done in the day time only

	transportation of ore outside the mine lease shall be carried out after sunset.	
xxiii	No blasting shall be carried out after the sunset. Blasting operation shall be carried out only during the daytime. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	<ul style="list-style-type: none"> • Blasting will be carried out in day time only and the time is being fixed from 12.00 noon to 1.00 pm and this time is displayed on the display board shown in photograph. (Plates I) • For any possibility of objectionable ground vibration the broad blasting parameters may be implemented as per the field condition along with the use of delay detonator. The blasting parameters will be suitably set to minimize ground vibration within safety limit. • Muffled blasting with delay detonator will be restored to control the throw of rock and minimizing the ground • Blasting of the Jackhammer-drilled benches will be carried out with small diameter 80% strength Special Gelatine explosives. Detonation of the explosives will be carried out by electric delay detonators which will be exploded by multi-shot

		<p>exploders.</p> <ul style="list-style-type: none"> • Blasting shelters has been constructed within the lease area
xxiv	Drills shall either be operated with the dust extractors or equipped with water injection system.	Drilling machines are equipped with water injection system to decrease dust generation.
xxv	Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.	Mineral handling area, Loading and unloading area has been provided with water sprinkling facility to suppress dust emission.
xxvi	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for the workshop and wastewater generated during the mining operation.	As the mines workers are from the nearby areas, there is no residence within the lease area. So there is no proposal for STP within the lease area. There is no generation of waste water during the mining operation. During the rainy season only there will be generation of mine drainage water which will be discharged outside after proper settling. So no ETP is proposed within the lease area.
xxviii	Effective safeguard measures should be taken to control fugitive emissions so as to ensure that RSPM (PM ₁₀) levels are within prescribed	<ul style="list-style-type: none"> • Regular water sprinkling on the unmetalled hauls road of the ML area. • Water also sprinkled over the

	limits.	<p>dumping area</p> <ul style="list-style-type: none"> • Overloading of the transport equipments shall control to stop spillage. • While transport the material it should be covered with plastic polythene • Gaseous pollutants in the exhaust fumes generated by the transportation machinery are minimized by proper maintained. • When blasting is doing in ML area the ground and blasted material is always wetted to reduce the dust generation.
xxix	Concentration of free silica in the ambient air shall be monitored regularly and records maintained as part of post project monitoring. Necessary safeguard measures as may be required based on monitoring data of free silica shall be taken	Respirable free silica was sampled by personal sampler Envirotech APM 800. The samples were collected from the breathing zone during an 8-hr work shift. The analysis was done by Visible spectrophotometric method as per NIOSH Manual of Analytical Methods (NMAM) No. 7601. The quotient of the respirable dust exposure and OSHA PEL was determined to establish the degree of compliance with the PEL. The Occupational Safety and Health Administration (OSHA) 8 h time-weighted (TWA) permissible exposure

		limit (PEL) was calculated and it is being observed that permissible limit for crystalline silica as respirable quartz is 0.1 mg/m ³ . The monitoring of free silica carried out during this reporting period is being attached Annexure 1.												
xxx	Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.	<p>The initial medical examination for 100 nos of mines worker has been conducted during 27.06.2013 & 28.06.2013. The average age group of the workers undergone the medical examination is 35 – 45 yrs by Dr. B.N. Mohapatra & Team of Utkal Polyclinic, Bhubaneswar (ILO Classified) has conducted the medical examination. The periodical health examination will be conducted once in 5 years. The schedule for periodic health check up is given as below and followed in the mines.</p> <table border="1"> <thead> <tr> <th colspan="2">Schedule for Periodic Health Check up</th> </tr> <tr> <th>Activity</th> <th>Proposed Frequency</th> </tr> </thead> <tbody> <tr> <td>Risk rated workers will be examined and treated free of cost</td> <td>Annual</td> </tr> <tr> <td>Mobile medical camp</td> <td>Twice in a year</td> </tr> <tr> <td>Provision of supplying PPEs</td> <td>All the workers to be supplied with PPEs on joining</td> </tr> <tr> <td>First aid facility</td> <td>As and where required</td> </tr> </tbody> </table>	Schedule for Periodic Health Check up		Activity	Proposed Frequency	Risk rated workers will be examined and treated free of cost	Annual	Mobile medical camp	Twice in a year	Provision of supplying PPEs	All the workers to be supplied with PPEs on joining	First aid facility	As and where required
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xxxi	The project proponent shall take all precautionary measures during mining operation for conservation	During the operational phase of mines the proponent has taken proper measures for conservation and												

	<p>and protection of endangered fauna namely python, monitor lizard, peacock etc. found in the study area. Action plan for conservation of flora & fauna prepared shall be effectively implemented in consultation with the State Forest and Wildlife Department. All the safeguard measures brought out in the Wildlife Conservation Plan prepared specific to this project shall be effectively implemented. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. A copy of action plan shall be submitted to the Ministry of Environment and Forests and its Regional Office, Bhubaneswar.</p>	<p>protection of endangered fauna namely python, monitor lizard, peacock etc. found in the study area. A detail action plan has been prepared with consultation of the forest department and as per the suggestions all the measures has been taken up by the proponent. The copy of site specific conservation plan has already been submitted to the Ministry earlier.</p> <p><u>Rs. 43,91,289/- paid 18.02.2014 (Regional Wild Life Management Fund).</u></p> <p><u>Rs. 69 Lakh paid on 30.04.2014 (for Site Specific Wild Life Conservation Plan)</u></p> <p><u>No additional investment made during the reporting period.</u></p>
xxxii	<p>Provision shall be made for the housing of construction labor within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.</p>	<ul style="list-style-type: none"> • In mines area there are existing infrastructure like Officer’s guest house, rest shed for workers and toilets facility for the workers are present. • All mines workers are belong to nearby village falling within 2-5 Kms from the Mine. So no permanent housing exists for workers

		<ul style="list-style-type: none"> • A first aid station has been provided with all necessary medical kit. An ambulance is also provided for the mines worker. • Drinking water facility is available for mines workers in the ML area • The mines workers also avail the free treatment facility at TRL Krosaki Refractories Limited, Belpahar Hospital which is 45 Km from the lease area.
	<p>The critical parameters such as RSPM (Particulate matter with size less than 10micron i.e. PM₁₀ and NO_x in the ambient air within the impact zone peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further quality of discharged water shall also be monitored [(TDS, DO, PH and Total Suspended Solids (TSS)].</p>	<p>The monitoring of PM10 and NO_x is being carried out regularly on monthly basis within the ML area i.e. within the impact zone and in the nearest habitation. Details of monitoring given in Chapter 3 and monitoring report of PM10 & NO_x for your reference. Annexure 3.</p> <p>A study has been carried out within the ML area for Peak particle velocity considering the charge per delay used for blasting in our mines. In Chhuinpali Quartzite Mines, shot hole (-38 mm diameter) drilling of 1.5 to1.8 mtr depth and primed with 125 grams cartridges using delay detonators are blasted. Charge per hole comes to 0.5 Kg to 0.75 Kg. Maximum number of holes blasted at a time is 6-8 numbers.</p> <p>IBM method for determining safe distance with respect to charge per delay for predicting the probability of structural damage due to ground vibration is being used.</p>

		<p>The ground vibration at specified distance as calculated from the source is as below:</p> <table border="1"> <thead> <tr> <th>Distance from source (m)</th> <th>Ground (mm/sec)</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>3.65</td> </tr> <tr> <td>30</td> <td>2.17</td> </tr> <tr> <td>40</td> <td>1.50</td> </tr> <tr> <td>50</td> <td>1.13</td> </tr> <tr> <td>70</td> <td>0.73</td> </tr> <tr> <td>100</td> <td>0.46</td> </tr> <tr> <td>150</td> <td>0.28</td> </tr> </tbody> </table> <p>As per the IBM method beyond 61m from the blasting site the ground vibration is almost zero. The nearest habitation i.e. Chuinpalli village is located at a distance of 500m from the lease area. So it can be concluded that there is no impact of ground vibration at a distance of 300m from the blasting site and also on the human habitat.</p> <p>The mine discharge water is regularly monitored for TDS, DO, PH and Total Suspended Solids (TSS) and found to be within the prescribed limit.</p>	Distance from source (m)	Ground (mm/sec)	20	3.65	30	2.17	40	1.50	50	1.13	70	0.73	100	0.46	150	0.28
Distance from source (m)	Ground (mm/sec)																	
20	3.65																	
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xxxiii	<p>The monitored data shall be uploaded on the website of the company as well as displayed on a display board at the project site at a suitable location near the main gate of the company in the public domain. The circular no. J-20012/1/2006-IA.II (M) dated 27.05.2009 issued by the Ministry of Environment and Forests which is</p>	<p>A display board has been placed near the main gate of the company for public domain. Photograph attached Plate I.</p>																

	available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for its compliances.																						
xxxiv	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	Mine closure plan has already submitted.																					
General Conditions																							
(i)	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	As approved by MoEF the mine is continuing with semi-mechanized open cast method with occasional blasting.																					
(ii)	No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.	<p>The average rate of production will be 1, 50,000 TPA.</p> <p>The excavation and production rate will not exceed the approved quantity. The production from the mine will be remaining within the maximum limit. The production detail for the reporting period is as below:</p> <table border="1"> <thead> <tr> <th>Month</th> <th>Production</th> <th>Waste/Re</th> </tr> </thead> <tbody> <tr> <td>April</td> <td>870</td> <td>6</td> </tr> <tr> <td>May</td> <td>930</td> <td>6</td> </tr> <tr> <td>June</td> <td>1030</td> <td>7</td> </tr> <tr> <td>July</td> <td>2030</td> <td>14</td> </tr> <tr> <td>August</td> <td>2300</td> <td>16</td> </tr> <tr> <td>September</td> <td>1550</td> <td>12</td> </tr> </tbody> </table>	Month	Production	Waste/Re	April	870	6	May	930	6	June	1030	7	July	2030	14	August	2300	16	September	1550	12
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		Total	8710	6386
(iii)	At least four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10micron i.e., PM ₁₀) and 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.	Ambient air quality monitoring is being conducted in 4 sampling locations including the lease area once in a month. The sampling stations are decided based on the meteorological data, wind flow pattern and topographical features of the area. The detail monitoring results of Ambient air quality has been discussed in Chapter 3 and test reports attached as Annexure 1 .		
(iv)	Data on ambient air quality [(RSPM(Particulate matter with size less than 10micron i.e., PM ₁₀) and 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.	Ambient air quality monitoring result from April 2015 to September 2015 has been given as Annexure 1 .		
(v)	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying	Fugitive dust emission control measures followed within the mine are: <ul style="list-style-type: none"> • The unmetalled hauls road has been 		

	<p>arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.</p>	<p>adequately compacted.</p> <ul style="list-style-type: none"> • Regular water sprinkling on roads. • Overloading of the transport equipments shall prevent in order to stop spillage. • Dumping areas will be sprayed with water and grass will be immediately planted on the completed dumps to reduce fugitive dusts. • Backfilled areas will be spread with good quality soil and plantation will be made over them in no time. • To continue the practice of regularly wetting the blasting ground and spraying water over the blasted material. • Wet drilling on the benches is proposed.
(vi)	<p>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.</p>	<p>To control the noise level within the permissible limit following measures are taken:</p> <ul style="list-style-type: none"> • Provision of protective devices like ear plug, and ear muffs to the workers exposed to noise more than 80 dBA. • Provision of sound proof Cabins for the workers deployed on machines producing higher level of sound like dozers, dumpers, shovels etc. • Proper maintenance of noise generating machineries including

		<p>transporting vehicles would be ensured.</p> <ul style="list-style-type: none"> • A thick green belt shall be provided around the periphery of the mine to attenuate the high noise level to the local people. • The monitoring of noise is being carried out with the ambient air in 4 sampling station and it has been found that the noise level is below the permissible limit. <p>The noise monitoring result is given Chapter 3 and test reports attached as Annexure 1.</p>
(vii)	<p>Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.</p>	<p>No generation of industrial waste water is there. Mine drainage water is being settled within the lease area and discharged outside for irrigation purpose. The mine drainage water is being analyzed regularly for presence of any toxic material and it has been observed that the mine drainage water doesnot contain any toxic element.</p>
(viii)	<p>Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and</p>	<p>To ensure the occupational safety of the workers following measures will be undertaken by the mining authority:</p> <ul style="list-style-type: none"> • Implementing safety and health management system and assessing the

	<p>health aspects.</p>	<p>effectiveness through periodic audits.</p> <ul style="list-style-type: none"> • Monitoring the effects of mining activities on safety and health and conducting regular performance reviews. • Provision of necessary personal protective equipments. • Establishing and maintaining a system of medical surveillance for employees • Ensuring employees at all levels receive appropriate training and are competent to carry out their duties and responsibilities. • Dust masks will be provided to the workers in dust prone area like excavation site, transfer points, loading and unloading sites etc to reduce the dust exposure and thereby reducing the risk of lungs disease. • Provision of periodical health check up • Training to the workers related to occupational safety and risk management. • The mines workers are regularly using the PPEs during the working hours. • During the period 100 pairs of safety shoes, 6 helmets, 32 pairs of leg guards, 48 pairs of goggles, 12 pairs, 12 pairs of gloves, 26 nos of nose
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		masks and 8 pairs of earmuffs has been provided to the workers.														
(ix)	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.	<p>Occupational health surveillance program is being proposed as below:</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Proposed s</th> </tr> </thead> <tbody> <tr> <td>Risk rated workers will be examined and treated free of cost</td> <td>Annual</td> </tr> <tr> <td>Initial Medical examination</td> <td>During the workers</td> </tr> <tr> <td>Periodical health check up</td> <td>Once in 5 year</td> </tr> <tr> <td>Mobile medical camp</td> <td>As and when r</td> </tr> <tr> <td>Provision of supplying PPEs</td> <td>All the worke supplied with joining</td> </tr> <tr> <td>First aid facility</td> <td>As and when r</td> </tr> </tbody> </table> <p>The initial medical check up of all the employees has been conducted during 27.06.2013 & 28.06.2013 and till then no risk rated workers has been diagnosed for medical check up.</p>	Activity	Proposed s	Risk rated workers will be examined and treated free of cost	Annual	Initial Medical examination	During the workers	Periodical health check up	Once in 5 year	Mobile medical camp	As and when r	Provision of supplying PPEs	All the worke supplied with joining	First aid facility	As and when r
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(x)	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.	As the pollution load is very less, the EMMD will be headed by the Mines manager supported by two of his senior staffs and assisted by other supervisory staffs														
(xi)	The funds earmarked for	The detail cost for implementation of														

	<p>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.</p>	<p>environmental management plan for the period of April 2015 to September 2015 has been given in the table below</p> <table border="1" data-bbox="831 477 1369 1039"> <thead> <tr> <th data-bbox="831 477 906 584">Sl. No</th> <th data-bbox="906 477 1233 584">Activities</th> <th data-bbox="1233 477 1369 584">Cost (Lak)</th> </tr> </thead> <tbody> <tr> <td data-bbox="831 584 906 692">01</td> <td data-bbox="906 584 1233 692">Construction of garland drain</td> <td data-bbox="1233 584 1369 692">2.0</td> </tr> <tr> <td data-bbox="831 692 906 748">02</td> <td data-bbox="906 692 1233 748">Monitoring</td> <td data-bbox="1233 692 1369 748">1.37</td> </tr> <tr> <td data-bbox="831 748 906 804">03</td> <td data-bbox="906 748 1233 804">Water sprinkler</td> <td data-bbox="1233 748 1369 804">2.0</td> </tr> <tr> <td data-bbox="831 804 906 983">04</td> <td data-bbox="906 804 1233 983">Supply of Personal protective equipments for workers</td> <td data-bbox="1233 804 1369 983">1.5</td> </tr> <tr> <td colspan="2" data-bbox="831 983 1233 1039">Total</td> <td data-bbox="1233 983 1369 1039">6.87</td> </tr> </tbody> </table>	Sl. No	Activities	Cost (Lak)	01	Construction of garland drain	2.0	02	Monitoring	1.37	03	Water sprinkler	2.0	04	Supply of Personal protective equipments for workers	1.5	Total		6.87
Sl. No	Activities	Cost (Lak)																		
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Total		6.87																		
(xii)	<p>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.</p>	<p>The mining scheme was approved vide letter no. 5095/DM dated 05.05.2010 from the Directorate of Mines, Bhubaneswar, Orissa.</p> <p>The approval of Mining scheme for the period of 2015-16 to 2019-20 is under process.</p> <p>The mining operation was started on 01.11.2012 after obtaining environmental clearance from MoEF, New Delhi.</p>																		
(xiii)	<p>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</p>	<p>--</p>																		

	the requisite data / information / monitoring reports.	
(xiv)	<p>The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.</p>	<p>We are being submitting six monthly reports on the status of compliance of the environmental clearance conditions to the Ministry of Environment and Forests, its Regional Office Bhubaneswar. It will also be sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.</p> <p>1st EC compliance has been submitted to MoEF regional Office, Bhubanewar vide letter no <u>SRMS/CQM/EC Com/12-13/01 & dated 25.01.2013.</u></p> <p>2nd EC compliance has been submitted to MoEF regional Office, Bhubanewar vide letter no <u>RMEM/CQM/EC/13-14/01 dated 24.08.2013.</u></p> <p>3rd EC compliance has been submitted to MoEF regional Office, Bhubanewar vide letter no <u>RMEM/CQM/EC/13-14/02 dated 02.04.2014.</u></p> <p>4th EC compliance has been submitted to MoEF regional Office, Bhubanewar vide letter no <u>RMEM/CQM/EC/14-15/01 dated 08.10.2014.</u></p> <p>5th EC compliance has been submitted to</p>

		MoEF regional Office, Bhubanewar vide letter no <u>TRLK/COM/EC/2015-2016 dated 17.04.2015.</u>
(xv)	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	A copy of the clearance letter has been sent by the proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban Local Body and the Local NGO.
(xvi)	The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the Collector's office/ Tehsildar's Office for 30 days.	--
(xvii)	The environmental statement for each financial year ending 31 st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also	Form V has been submitted to State Pollution control board.

	<p>be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.</p>	
(xviii)	<p>The project authorities should advertise at least in two local newspapers of the District or State in which the project is located and widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.</p>	<p>Published in three local news papers. Details of publication have been already submitted. We have uploaded the EC grant letter and the EC compliances in our Company website. http://www.tataref.com/corporate-sustainability/mines-of-trl-krosaki.html. The proof of the same is being attached for your reference. Annexure 3.</p>

CHAPTER 3

ENVIRONMENTAL MONITORING

3.1 AMBIENT AIR QUALITY MONITORING

Ambient air quality monitoring has been carried out at four locations i.e. two inside the lease area and other two in the nearby villages. This will enable to have a comparative analytical understanding about the ambient air quality and the changes in the air environment in the study area with respect to the condition prevailing. The locations of the ambient air quality monitoring stations are given in Table below:

3.1.1 Ambient Air Monitoring Stations

Sl.No	Location	Frequency
1.	Bhikampalli Village (A1)	Once in a Month
2.	Near Quarry Faces Of block A (A2)	Once in a Month
3.	Near Southern Dump of Block B (A3)	Once in a Month
4.	Near Pump House (A4)	Once in a Month

The Monitoring was conducted in respect of the following parameters:

- Particulate Matter (PM10)
- Particulate Matter (PM2.5)
- Sulphur Dioxide (SO₂)
- Oxides of Nitrogen (NO_x)

The duration of sampling of PM10, PM2.5, SO₂ and NO_x was 24 hourly continuous sampling. The monitoring was conducted for one day at each location. This is to allow a comparison with the National Ambient Air Quality Standards as given in the table below:

3.1.2 Technique & Standard of Ambient Air Quality

Sl. No.	Parameter	Analysis Procedure	National Ambient Air Quality Standards 18th November 2009
1.	Particulate Matter (PM 2.5)	Gravimetric Method	60 $\mu\text{g}/\text{m}^3$
2.	Respirable Particulate Matter	Respirable Dust Sampler(Gravimetric method)	100 $\mu\text{g}/\text{m}^3$
3.	Sulphur dioxide	Modified West and Gaeke	80 $\mu\text{g}/\text{m}^3$
4.	Oxides of Nitrogen	Jacob & Hochheiser	80 $\mu\text{g}/\text{m}^3$

3.1.3 Ambient Air Quality Monitoring Results

The ambient air quality monitoring is being carried out in four sampling location on monthly basis. The monthly test reports for the period (April 2015 to September 2015) is being attached as **Annexure 1**. The variation of concentration of the ambient air quality parameters has been presented graphically as below.

Fig. 1: Variation in Concentration of PM10 (April -2015 to September 2015)

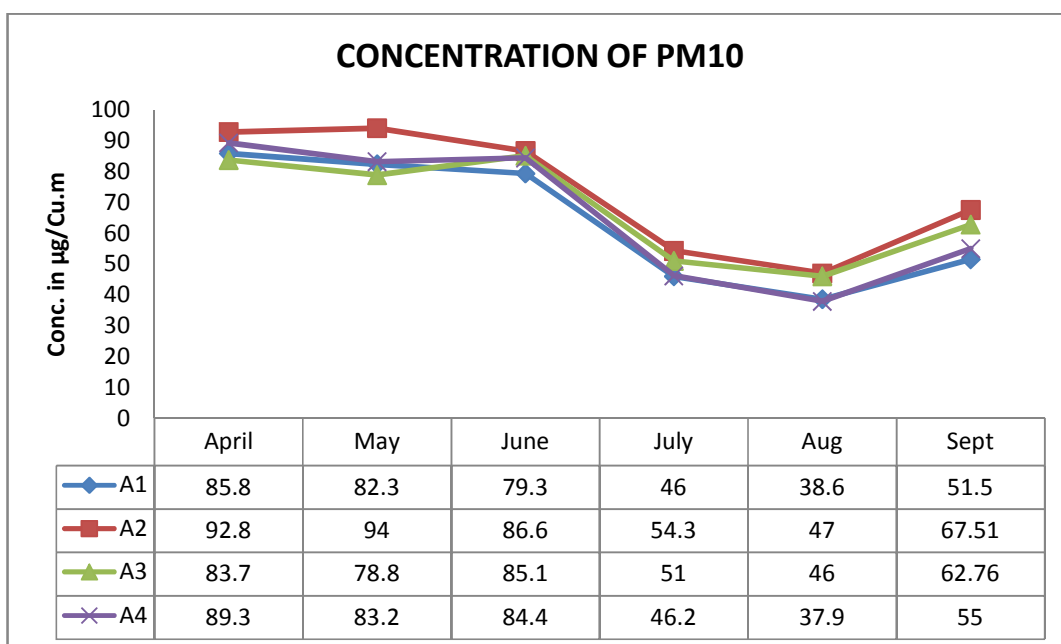


Fig.2: Variation in Concentration of PM2.5 (April -2015 to September 2015)

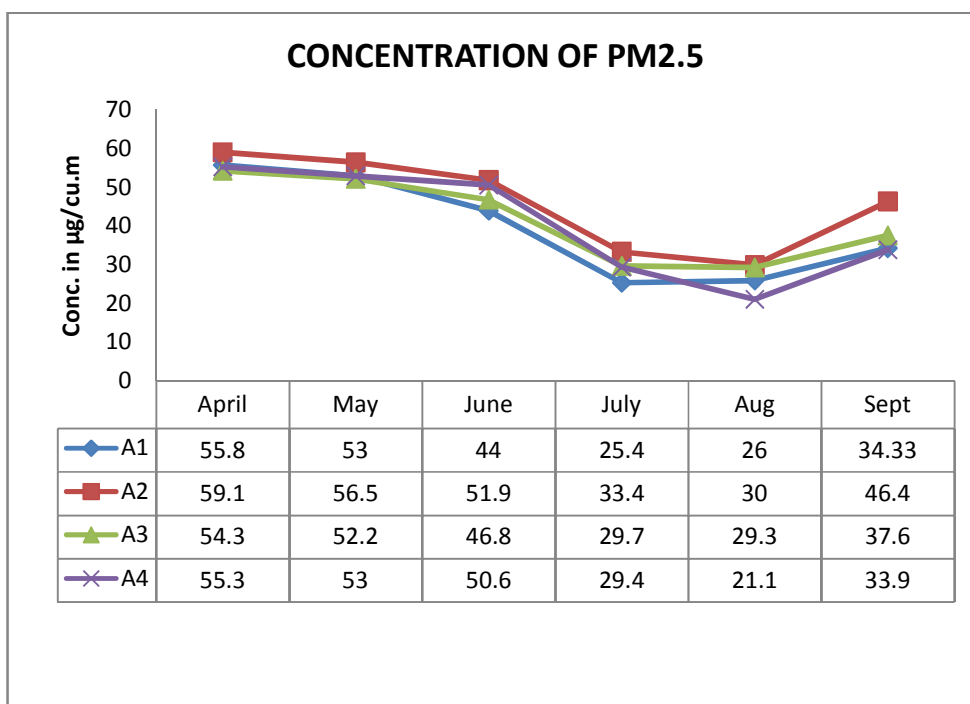


Fig.3: Variation in Concentration of SOx (April -2015 to September 2015)

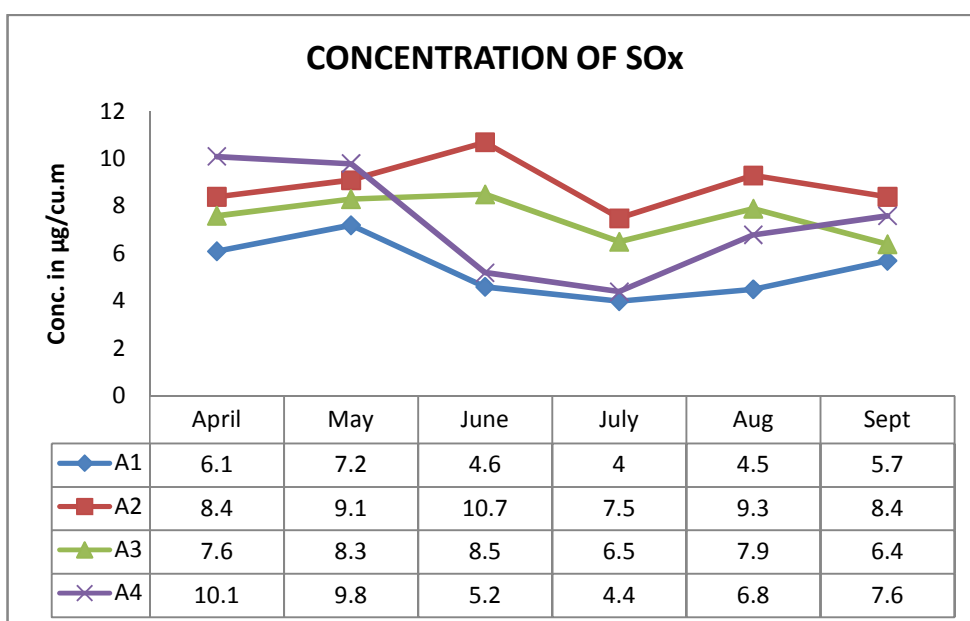
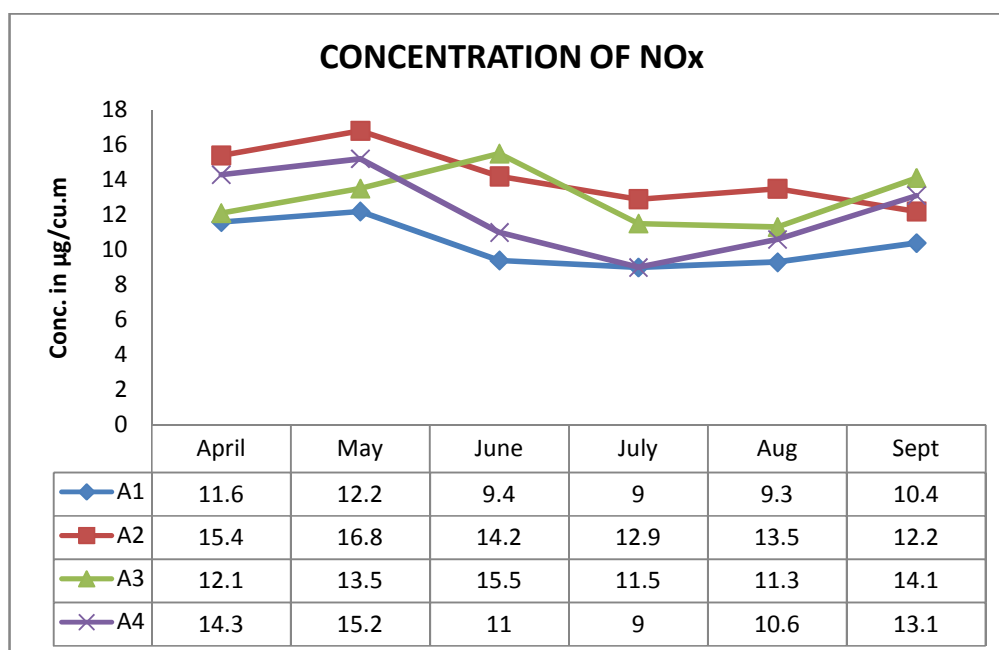


Fig.4: Variation in Concentration of NO_x (April -2015 to September 2015)



Conclusion

The ambient air monitoring result for the period of April to September 2015 reveals that the conc. of PM₁₀ ranges from 37.9 – 92 µg/ cu.m within the lease area and 38.6 to 85.8 µg/ cu.m in the villages. The result of PM₁₀ is below the permissible limit of 100 µg/ cu.m as per NAAQM standard, 2009.

The conc. of PM_{2.5} ranges from 21.1 to 59.1 µg/ cu.m within the lease area and 25.4- 55.8 µg/ cu.m outside the lease area. The result of PM_{2.5} is below the permissible limit of 60 µg/ cu.m as per NAAQM standard, 2009.

The conc. of SO_x and NO_x is much below the permissible limit i.e. 80 µg/ cu.m as per NAAQM standard, 2009.

3.2 AMBIENT NOISE MONITORING

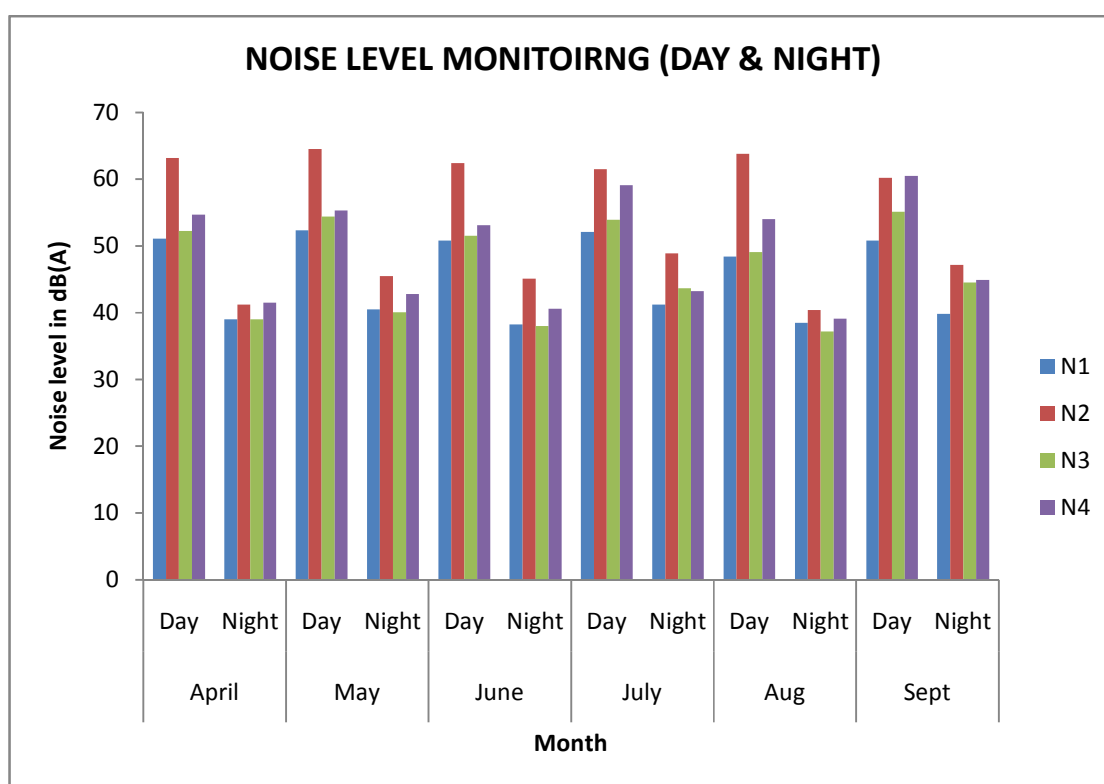
The main objective of noise monitoring in the study area is to assess the present ambient noise levels in project site & project boundary due to various construction allied activities and increased vehicular movement. Ambient noise monitoring was conducted at 4 locations of the project site and the detailed described below.

3.2.1 Noise Monitoring Locations

Sl. No	Location	Frequency
1.	Bhikampalli Village (N1)	Once in a Month
2.	Near Quarry Faces Of block A (N2)	Once in a Month
3.	Near Southern Dump of Block B (N3)	Once in a Month
4.	Near Pump House (N4)	Once in a Month

3.2.1 Ambient Noise Monitoring Results

The Ambient Noise variation as monitored has been given in the figure below:



Conclusion

The ambient noise level within the lease area varies from 49.1 to 64.5 dBA during the day time against the standard of 75 dBA. The day time noise is mainly contributed by blasting, movement of vehicles, excavation etc. Outside the lease area the noise level ranges from 48.4 to 52.3 dBA against standard of 55 dBA.

During the night time noise level is comparatively low and ranges from 38.0 to 47.2 dBA against the standard of 55 dBA.

3.3 GROUNDWATER QUALITY MONITORING

The ground water monitoring was carried out within the lease area once in 3 months. The water was collected from the bore well located within the lease area in the month of April 2015 and June 2015. The analysis report is attached as **Annexure 1**.

The analysis of ground water quality shows that the water is devoid of any heavy metals like Cd, Hg, Pb, Ni, Se, Ba, Cr etc. The water quality has been found to be well within the prescribed standard for ground water.

3.4 ANALYSIS OF MINE DRAINAGE WATER

The mine drainage water generated during monsoon was analyzed for presence of any toxic elements. During the reporting period the mine drainage water was analyzed during the month of July. The test report is being attached as **Annexure 1**.

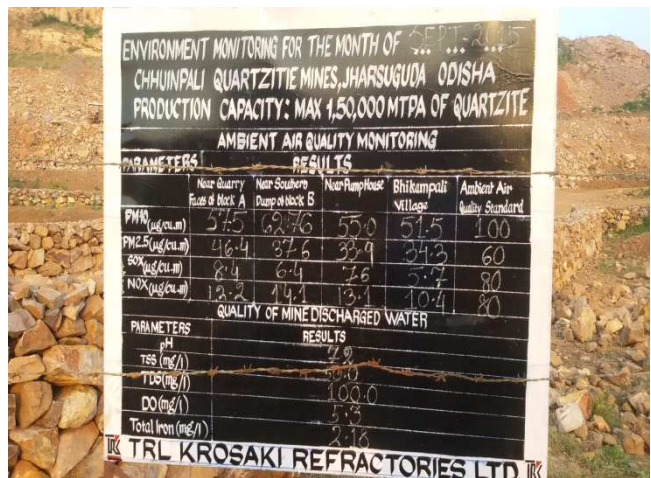
PHOTOGRAPHS OF CHUINPALI QUARTZITE MINES, JHARSUGUDA, ODISHA



Plantation in the safety zone



Retaining wall & Garland Drain



Environmental Monitoring Display Board

ENVIRONMENT MONITORING FOR THE MONTH OF SEP 2015
 CHUINPALI QUARTZITE MINES, JHARSUGUDA, ODISHA
 PRODUCTION CAPACITY: MAX 1,50,000 MTPA OF QUARTZITE

PARAMETERS	RESULTS				
	Near Quarry Flux of block A	Near Southern Dump of block B	Near Pump house	Bhikumpali Village	Ambient Air Quality Standard
PM10 (ug/cu.m)	54.5	62.76	55.0	51.5	100
PM2.5 (ug/cu.m)	46.4	37.6	33.9	34.3	60
SO2 (ug/cu.m)	8.4	6.4	7.6	5.7	80
NOX (ug/cu.m)	12.2	14.4	13.1	10.4	80

PARAMETERS	RESULTS	
	pH	7.9
TSS (mg/l)	3.0	
TDS (mg/l)	100.0	
DO (mg/l)	5.3	
Total Iron (mg/l)	2.16	

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