EXECUTIVE SUMMARY

OF

DRAFT EIA/EMP REPORT

FOR

SURJAGARH IRON ORE MINES

Extent	**348.09 Ha**
Production	**Expansion of iron ore production capacity from 3.0 to 10.0 MTPA (ROM) along with crushing & screening plant**
Location	**Near Surjagarh village, Etapalli Tehsil, Gadchirolli district of Maharashtra state**

PROJECT PROPONENT

LLOYDS METALS & ENERGY LTD.

Plot A1 & A2, MIDC Area, Ghugus, Chandrapur-442505, Maharashtra

CONSULTANT

CREATIVE ENGINEERS & CONSULTANTS

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JULY 2022

EXECUTIVE SUMMARY

1.1 INTRODUCTION:

Surjagarh Iron Ore Mine of M/s. Lloyds Metals & Energy Limited over an extent of 348.09 Ha is located near Surjagarh village, Etapalli tehsil, Gadchirolli district of Maharashtra state. The entire lease area is forest land. This mine is presently operating with a production capacity of 3.0 MTPA of Iron Ore. The proponent proposes to expand the production capacity form 3.0 MTPA to 10.0 MTPA (ROM) of iron ore along with crushing and screening plant and has initiated action towards obtaining environmental clearance for the same. ToR was issued by MoEF&CC vide letter J-11015/348/2005.IA.II(M) dated 18.07.2022.

Draft EIA/EMP report is prepared based on Terms of Reference issued by MoEF&CC. Salient details of the EIA/EMP is given below:

1.2 STATUTORY APPROVALS:

Mining Lease: Initially mining lease was granted for 20 years over an area of 348.09 Ha vide Lr.No – MMN-1104/C.R.683/Ind-9 dated 13.04.2007 and executed on 03.05.2007. Further, as per MMDR Amendment Act, 2015, Supplementary lease deed for extension of lease period was executed on 03.12.2021 valid up to 02.05.2057**.**

Table 1: Statutory Clearances

S.No	Name	Authority	Status	Letter Number	Date of issue
Existing Clearances/Permissions available for Production Capacity of 3.0 MTPA					
1	Forest Clearance over 374.90 Ha *(348.09 ha of ML area and remaining for road and transmission line)*	MoEF&CC	Granted	F.No- 8-31/2005 /FC	23.03.2007
2	Environmental Clearance for 3.0 MTPA production	MoEF&CC	Granted	J-11015/348 /2005.IA.II(M)	29.05.2006
3	Consent to Operate	SPCB	Obtained	Format1.0/CC/UAN.NO 0000122378/ CO2111000155	02.11.2021
5	NOC for Groundwater Drawl	CGWA	Obtained	21-4/7585/MH/MIN/2022	21.03.2022

6	Certified EC compliance Report	MoEF&CC	Under Process	--	--
7	Wildlife Conservation Plan	Prepared by WII, Dehradun	Amount paid Rs 53.25 lakhs	WII-EIA(AR) /Gadchiroli-2005 dated 23-10-2006	23.10.2006
9	Explosives License	PESO	Agreement with license holder	E/HQ/MH/SM6E5 1616	06.05.2021
10	Review of Mining Plan for 10 MTPA production	IBM	Approved	GAD/FE/MPLN-86292)/NGP-2022	28.03.2022
12	Allocation of Surface Water	Dept of Water Resources, Govt of Maharashtra	Under Process	Recommended by Chief Engineer. Final allocation letter awaited.	--
13	Past production certificate	IBM /Directorate of Geology & Mining, Govt. of Maharashtra	Obtained	795/45/16/2012/NGP/747	23.06.2022

1.3 SALIENT FEATURES OF THE PROJECT:

Table 2: Site Details

PARTICULARS	DETAILS
Project Name	Surjagarh Iron Ore Mine of M/s. Lloyds Metals & Energy Limited
Extent	348.09 Ha
Production	Expansion of Production Capacity from 3.0 to 10.0 MTPA (ROM) (The total handling quantity of 1,17,68,960 TPA (11.76 Mil.Tonnes) includes 99,99,760 TPA (10 MTPA) ROM and 17,69,200 TPA (1.769 MTPA) Waste.)
Villages	Surjagarh
Tehsil	Etapalli
District	Gadchirolli
State	Maharashtra
Latitude	19°36’58.96"N - 19°38’21.48"N
Longitude	80°20’57.10"E- 80°22’32.77"E
Toposheet	65 A/6 (New Topo sheet No E 44C6)
Type of land	Entire lease area falls in Bhamragarh Reserve Forest
Topography	Maximum Elevation – 710m RL (central and western portion of lease) Minimum Elevation – 315m RL (Southern portion of the lease)
Climate	The climate of the district is characterized by a hot summer May is the

PARTICULARS	DETAILS
	hottest month while December is the coldest month of the year within the district. On an average 1400 to 1500 mm of rainfall occurs during the year (from June to October). The rainfall during the southwest monsoon months of July, August and September constitutes 70 to 80 percent of the annual rainfall.
Accessibility	The area is approachable from Gadchiroli via Asthi-Allapalli-Etapalli Road with a distance of 165 km. The lease area has well established connection facilities. The nearest railway station is Ballarshah which located about 157Km from the lease area.
Nearest Major RS	Ballarshah - 157 kms; Chennai - New Delhi route
Nearest Airport	Nagpur – 313 kms

Table 3: Environmental Setting of the Study Area

PARTICULARS	DETAILS
Nearest major water bodies	Bande river 1.75 kms – West Jambla river – 7.77 kms – SE Akera-N – 6.04 Kms – W Dumme N – 6.07 Kms –SW Kappe N – 2.95 Kms - N
Notified Archaeologically important places, Monuments	Nil within 10Km Radius.
Local Places of Historical and Tourism Interest	As per district and state record, there are no such places within 10Km radius.
Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	Nil within 10 Km radius
Reserved / Protected Forests	Entire lease area falls in Bhamragarh Reserve Forest
Defence Relocations	Nil within 10 km radius
Seismic Zone	Zone – II (Least Active)
Other Industries in the area	Nil

Table 4: Technical Description

<table>
<tr><th>PARTICULARS</th><th>DETAILS</th></tr>
<tr><td>Geological reserve</td><td>87.927 Million Tonnes</td></tr>
<tr><td>Mineable reserve</td><td>58.204 Million Tonnes</td></tr>
<tr><td>Waste generation and Management</td><td>
<table>
<tr><th>Waste Management</th><th>Plan Period (Mil.cum)</th><th>Conceptual Period (Mil.cum)</th><th>Total (Mil.cum)</th></tr>
<tr><td>Road Maintenance</td><td>0.746</td><td>1.449</td><td>2.195</td></tr>
<tr><td>Dumping</td><td>1.742</td><td>2.173</td><td>3.915</td></tr>
<tr><td>Total</td><td>2.488</td><td>3.622</td><td>6.110</td></tr>
</table>
</td></tr>
<tr><td>Method of Mining</td><td>Open cast mechanized mining method</td></tr>
<tr><td>Mineral Processing</td><td>ROM ore to be excavated from the mine will be sent to the screening plant to segregate the ore to different size. Oversize boulders will be crushed in the primary jaw and secondary cone crusher for size reduction as per the plant requirement and buyer’s specification. This will be done in the crusher and screen unit located within the lease area.</td></tr>
<tr><td>Bench Height and Width</td><td>Bench Height – 10m, Minimum bench width maintained more than 15m. At in the ultimate stage, the bench width shall be reduced to 10m</td></tr>
<tr><td>Mine depth</td><td>Up to 480 mRL</td></tr>
<tr><td>Life of the Mine</td><td>9 years.
(Further exploration being carried out in the unexplored area which in turn will increase the reserves and the life of the mine considerably)</td></tr>
<tr><td>End Use</td><td>Utilized for own consumption as well as sold to surrounding sponge, pellet and steel plants in the State as well as neighboring states.</td></tr>
<tr><td>Overall Pit Slope</td><td>45^{o}</td></tr>
<tr><td>Man power</td><td>About 5000 persons (direct & indirect) after expansion.</td></tr>
<tr><td>Mode of transport</td><td>By Road</td></tr>
<tr><td>Water requirement and Source</td><td>Total water requirement - 1200 KLD
Source - Borewells and surface water.</td></tr>
<tr><td>Power Requirement</td><td>33 KVA State Grid is installed inside the mine lease for power distribution towards mining & allied activities. In addition, 15 KVA,</td></tr>
</table>

PARTICULARS	DETAILS
	to 1200KVA generators of sufficient numbers are also provided to meet the power requirement.
Site Services	Existing available site services such as site office, weigh bridge, rest shed, first aid center, VT centre, blasting shed, security house, canteen, magazine, workshop, dispensary, HSD Pump station etc in the lease area will be further augmented to meet the expansion needs.
Project Cost	Rs 364.28 crores.

1.4 EXISTING ENVIRONMENTAL SCENARIO:

1.4.1 GENERAL:

The baseline monitoring been carried out by Star Analytical Services, who are an MoEF&CC recognized and NABL accredited laboratory systematically and meticulously as per relevant IS codes, CPCB, MoEF&CC guidelines during Summer Season (March – May 2022).

1.4.2 SOCIO-ECONOMIC STATUS:

The lease area is located in Surjagarh village, Etapalli Tehsil, Gadchirolli District, Maharashtra State. Based on 2011 census data, in the 10km radius there are 40 rural villages from Etapalli Tehsil are falling in the study area. Total population is 15092, out of which 7398 is male population and 7694 is female population. Male & female ratio is almost equal. Most of the population is schedule tribe. 50% population is literate. In terms of occupation is concerned out of the total population 55% are worker, out of which 35.60% are main workers and 19% are marginal workers.

1.4.3 SAMPLE SURVEY:

A socio-economic survey for need assessment in the area is carried out by Trisharan Enlightenment Foundation to gather socio economic baseline information. Villages under Pursalgondi GP along with adjoining villages are covered such as Etapalli, Jivangatta, Yelchil, Parasalgondi, Tumarguda, Aldandi, Hedri, Todsa, Udera, Surjagarh etc. Based on the existing

condition, various activities are identified to be carried out in the future with total budget of Rs 4.51 Crores.

1.4.4 EXISTING ENVIRONMENTAL QUALITY:

Table 5: Baseline Data

A) METEOROLOGICAL DATA	**Monitoring Location -** Mines site Office		**Season:** Summer (March – May 2022)
PARAMETERS	**MINIMUM**		**MAXIMUM**
Temperature in ^{o}C	16.0		38.0
Humidity in %	14		92
Wind speed Km/Hr	<1.8		32.4
Total Rainfall in mm	0.0		
Predominant wind direction (From)	W & NW		
B) AMBIENT AIR QUALITY	**Monitoring Location –** 10 locations		**Season:** Summer (March – May 2022)
PARAMETER	**RESULT (µg/m3)**		***LIMIT (µg/m3)**
	Core Zone	**Buffer Zone**	
Particulate Matter (Size <10 µm)	63.6-78.6	47.7-60.8	100
Particulate Matter (Size <2.5 µm)	26.0-34.9	18.8-28.0	60
Sulphur Dioxide (as SO_2)	12.9-22.4	9.0-14.8	80
Nitrogen Dioxide (as NO_2)	18.3-27.8	14.1-20.4	80
Conclusion: The existing Ambient Air Quality levels for PM10, PM2.5, SO2 and NO2, are within the NAAQ standards prescribed CPCB limits of 100 µg/m3, 60 µg/m3, 80 µg/m3 & 80 µg/m3. Silica values in the study area are found to be below detectable limit. (Detection limit – 0.05 mg/m3) Other parameters like Ozone (O3), Carbon Monoxide (CO), Lead, Ammonia, Benzene, Benzo (a) Pyrene, Arsenic, Nickel, were also analysed and it was found that they were well within their stipulated limits throughout their study period.			
C) WATER QUALITY	**Monitoring Location –** 9 Groundwater and 3 Surface water		**Season:** Summer (March – May 2022)
PARAMETER	**Result**		***LIMIT (µg/m3)**
	Surface Water	**Groundwater**	
pH at 25 ˚C	7.10 – 7.52	6.99 – 8.02	**6.5-8.5**
Total Dissolved Solids, mg/L	255 - 360	268 - 712	**2000**
Chloride as Cl-, mg/L	45 - 55	52.50 - 202	**1000**
Total Hardness (as CaCO3), mg/L	120 - 245	180 - 585	**600**

Total Alkalinity (as CaCO3), mg/L	135 - 205	160 - 410	**600**
Sulphates as SO42-, mg/L	30.40 – 62.50	22.80 - 73	**400**
Iron as Fe, mg/L	0.07 – 0.15	0.03 – 0.12	**0.3**
Nitrate Nitrogen as N, mg/L	2.60 – 3.41	0.60 – 22.50	**45**
Fluoride as F, mg/L	BDL	BDL	**1.5**
Conclusion: The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms. Surface water quality was also analysed and elaborate details are provided in Table No.3.16 – Chapter-III.			

D) NOISE LEVELS	**Monitoring Location –** 10 locations	**Season:** Summer (March – May 2022)

PARAMETER	**RESULT dB(A)**		***LIMIT (µg/m3)**
	Day Equivalent	**Night Equivalent**	
Core Zone	61.4-65.1	57.2-59.6	**90 dB(A)**
Buffer Zone	51.9-53.4	40.6-43.8	**Day Equivalent - 55dB(A), Night Equivalent - 45dB(A)**
*Permissible noise for industrial workers as laid down by CPCB (at 8 hrs Exposure Time). While comparing with the MoEF&CC Norms, the monitored ambient noise levels are generally within the limit values.			

E) SOIL QUALITY	**Monitoring Location –** 9 locations	**Season:** Summer (March – May 2022)
PARAMETER	**Core Zone**	**Buffer Zone**
pH	7.28	6.98 – 7.76
Electrical Conductivity (µmho/cm)	325.6	54.20 – 312.50
Total Organic Carbon (%)	0.92	0.21 – 1.12
Nitrate as N (Kg/Ha)	145.6	135.60 – 231.70
Phosphorus (Kg/Ha)	7.23	3.10 – 7.82
Sodium (mg/kg)	25.9	10.63 – 18.40
Potassium (Kg/Ha)	9.62	8.81 – 152.80
Conclusion: From the results it is found that the soil quality can be advantageously used for vegetation with further enrichment of its quality with manure or so.		

1.4.5 LAND ENVIRONMENT:

LULC environment of the buffer area is compiled using larger resolution remote sensing satellite data of LISS IV of Resourcesat 2. The spatial estimation of various land use and land cover categories of the buffer area indicate that forest is a predominant category as Dense Mixed forest covers 48.13%, Sparse Mixed Forest covers 22.78%, Open Mixed forest covers 7.92%

and Degraded forest covers 0.93%. Together these LULC categories constitute 79.76% of the buffer zone.

1.4.6 BIOLOGICAL ENVIRONMENT:

Flora: Entire lease area is forest land. In the core zone. Teak, Bija, Beheda, Dhawada and other species are observed. About 79% of the study area is forest area. Dominant species in the Forest land are Teak, Bija, Beheda, Dhawada, Bamboo, Kendu, Bel, Haldu etc. Agricultural activity (crop land, fallow land) is very limited in the study area owing to limitations imposed by terrain setting.

Fauna: There are no rare, endangered, threatened (RET) species in the study area. There is no Wild Life Sanctuary or National Park within the study area of 10 km. Bhamragarh Wild Life Sanctuary is located 30.43km east of the lease area. Sloth bear and Pea Fowl are placed under Schedule-I as per Wild Life (Protection) Act, 1972 is found in the Study area (buffer zone).

1.4.7 HYDROLOGICAL STUDY:

“Comprehensive hydrogeological reports of core and buffer zones for Surjagarh Mines, Etapalli Block, Gadchiroli District, Maharashtra” has been prepared.

The geophysical studies indicate the presence of top soil followed by shallow weathered and jointed zones having limited water potential. The deeper zones are devoid of any potential fractures in the study area but for few isolated zones near the foothills. The saturated thickness of shallow aquifer is varying from place to place which is around 20 m in few favorable points where the bore wells give poor yield.

To understand the ground water situation of the study area covering 10 km radius, ground water level monitoring was carried out in 16 Dug wells/ dug cum bore wells and bore wells located in different places of the core and buffer zones of the study area. The water table fluctuation in rain fall year is 0.7 to 3.6 m. The ground water level data from 2010 to 2020 has been collected from INDIA-WRIS website. The data indicates that the average ground level ranges between 0.65 - 13.25 m below ground level in last 10 years at Etapalli.

1.5 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.5.1 AIR ENVIRONMENT

The principal sources of air pollution in the area due to mining and allied activities are dust generation in the mine due to various activities. Besides, Gas emission also occur as a result of emission of SO2, NOx, CO etc., from diesel driven mining equipment, compressors, generator sets, etc. In the mining industry, impact is primarily due to fugitive dust emission. In the present mine workings, following measures are adopted to control impact on the air quality in the area. These measures will be suitably upgraded during the present expansion.

Table - 6: Mitigation Measures – Air Environment

S. No	Activity	Mitigation Measures
1	Drilling	**Existing:** • Drilling with dust extractors, usage of sharp drill bits and with inbuilt water injecting system. • Provision of PPEs including nose mask to the workers engaged in the operation. • Usage of Drill bits of good condition & proper maintenance of drills, compressors **Proposed:** • The existing mitigation measures will be continued in the future also. • Proposed additional drills will also be fitted with dust extraction system along with wetting provision.
2	Blasting	**Existing:** • Controlled blasting technique • Well-designed blast by effective stemming & use of optimum charge per delay. Use of SME and electronic initiation system for safe blasting operations • Avoiding blasting during high wind periods where the fine dust is carried away easily affecting the ambient air quality. **Proposed:** • The existing mitigation measures will be continued in the future also. • Same will be continued. Periodical Ground vibrations monitoring and ensuring results are well within the norms. Blasting with safe and optimum blast design patterns for future enhanced working as suggested by CSIR -CIMFR in their study report for keeping ground vibrations, noise/air overpressure and fly rocks

		within the safe limits will be followed.
3	Excavation and Loading	**Existing:** • Proper maintenance of HEMM. • HEMM will be operated as per the manufacturer's guidelines • Enclosures for operator cabin. • Imparting sufficient training to operators on safety and environmental parameters • Proper maintenance of hauling equipments • Provision of dust filters / mask to workers working at highly dust prone and affected areas. • Avoiding overloading of dumpers. • Proper loading and unloading will be ensured. **Proposed:** • The existing mitigation measures will be continued in the future also. • Additional excavators are proposed for expansion. They will also be properly maintained. • Same will be continued. A continuous ambient air quality monitoring station is proposed within the lease area.
4	Ore and Waste Transportation	**Existing:** • Regular water sprinkling by engaging 4 nos. of mobile water sprinklers on internal haul roads, loading and unloading points for dust suppression on a common basis. • Fixed water sprinkling arrangement of 600 m length is already installed. • Only vehicles having valid permission as per Central Motor Vehicle Rules, 1989 and The Motor Vehicles (Amendment) Act, 2019 will be used for transportation of material. • Avoiding overloading of Tippers carrying ore. Besides, the trucks shall be covered with tarpaulin. • Maintenance of haul road by regular grading is carried out through grader, dozer • Vehicular emissions controlled through regular and proper preventive maintenance schedules and emissions tests will be done with diesel smoke meter equipment to ensure emission values. • Sufficient time lag will be left between movement of two truck to allow settling of dust

		Proposed:) The existing mitigation measures will be continued in the future also.) Provision of additional 4 no Mobile water sprinkler is made.) Additionally proposal of 2500m length fixed sprinkler is made) Additional dumpers are proposed for the expansion. Same will be ensured.) It is ensured that there is no overloading of trucks by having Quick Dispatch system at the weigh bridge cum dispatch gate which will reduce the traffic congestion and in turn dust emission.
5	Transportation outside the lease area	**Existing:**) The existing roads from mines to the connected State Highway upto Etapalli and further upto Alapalli got augmented incurring the additional cost of about Rs.40 crores. This is being maintained **Proposed:**) The existing mitigation measures will be continued in the future also.) It will be ensured that proper maintenance of the roads is being implemented from time to time. Implementing necessary measures, along with supporting the government implemented programs.) Vacuum cleaner for cleaning of dust from permanent haul road within the lease area & also vehicle was facility will be provided.
6	Others	**Existing:** Gap filling plantation in the lease periphery in the safety zone, plantation along the mineral transport route. **Proposed:** Maintenance of existing plantation, additional gap filling plantation within the lease area. Plantation outside the lease area in consultation with forest department will be carried out.
7	Crushing and Screening	**Existing:**) Dry fog systems is installed at all the crushing and screening points.) All the conveyor belts of hooded with GI sheets.) Provision of PPEs including nose mask to the workers engaged in the operation) Proper periodical maintenance of crushers and screens

		Proposed: • The existing mitigation measures will be continued in the future also. • Integrated Stationery crushing and screening plant and additional crusher/screening plant will also be provided with enclosure all around the loading and discharge point, enclosing of conveyors, provision of dry fog system in all the feeding and discharge points. • Fixed water sprinkling arrangement will be provided in the access road from the mine face to the processing plant and mineral stack yard area.

Due to adoption of well – designed and appropriate mitigative measures adopted and to be adopted in the project, the impact on air environment is expected to be well within statutory limits. Impact on air quality due to fugitive emissions was estimated based on AERMOD View Gaussian Plume Air Dispersion Model.

From the modelling prediction, it can be seen that the resultant added concentrations with baseline figures even at worst scenario, show that the values of ambient air quality with respect to PM_{10} are in the range of 53.6 ⇑g/m3 to 85.2 ⇑g/m3 and with respect to PM2.5 are in the range of 24.8 ⇑g/m3 to 36.9 ⇑g/m3 which are within the statutory stipulations in each case. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the expansion is expected.

1.5.2 WATER ENVIRONMENT

Water Requirement: The total water requirement will be 1200 m3 comprising 1010m3 for dust suppression, 135 m3 for Domestic & drinking purpose, 15 m3 for ETP and 40 m3 for greenbelt use. The Source of water is Ground Water and Surface Water. NOC of CGWA for drawl of 70 KLD ground water is obtained. Allocation for surface water is under process from Department of Water Resources, Government of Maharashtra. Chief Engineer has recommended and the final allocation letter is awaited.

Table 7: Mitigation Measures – Water Pollution

S.No	Source	Mitigation Measures	
		Existing	**Proposed**
1	Workshop, service building	ETP for the workshop effluent with oil & grease trap facility is available.	The existing facility is adequate to take care of the expansion needs
		The treated water is reused for greenbelt area	Same will be continued

		The oil and grease from separate storage tank is safely disposed to CPCB authorized re-processor.	Collected oil and grease will be stored in separate containers and is safely disposed to CPCB authorized re-processor
2	Domestic use – Rest area, Canteen	Presently the domestic waste water is being treated through a STP.	The existing facility is adequate to take care of the expansion needs
3	Rainfall – Runoff from mine face, waste dump and mineral stack	Presently mining and allied activities are restricted to a portion of east block only. Effective monsoon surface run off management like provision of about 4000m of Garland drains in the uphill side of the working mine faces, garland drains around the available small waste dump, along haul road, mineral stack. About 600m of Retaining wall is constructed at the toe of the dump. Drains are connected to the settling ponds and supernatant clear water is let out.	During the course of further mining, based on the surface condition, need and priority, surface runoff from working areas will be channelized in to settling cum percolation ponds located at various strategic locations. Rest part is channelized through garland drain to percolation cum settling pits and check dams. Clear water will be let out to down stream users.
		Plantation of native species on dump tops and slopes with geo-matting to arrest and prevent erosion made.	The existing mitigation measures will be continued.
		Coir matting of 24,600 sq.m is carried out to prevent dump erosion	Additional Coir matting of 25,000 sq.m will be carried out to prevent dump erosion.
		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	Further additionally the retaining wall (2335-m) and garland drains (1735 m) are proposed at the toe of new dumps to prevent run offs. It will be connected to 6 Nos. of settling ponds.
4	Water consumption	Rainwater harvesting pits are constructed in mines along with a recharge pond and a check dam to reduce the dependence of surface water as well as augmentation of groundwater.	) Rooftop rainwater harvesting structure is proposed for the administrative building and base camp to reduce the dependence of surface water as well as ground water.) Further additional Rainwater harvesting pits will be constructed in mines along with a recharge pond and a check dam to reduce the dependence of surface water as well as ground water) The existing mitigation measures will be continued

Stage of Groundwater Development: Estimation of Ground Water Resources has been carried out based on the methodology recommended by the Ground water Estimation Committee. Thus the buffer zone represents an area where stage of development is 'Safe' from ground water development point of view. Thus there is tremendous scope for further ground water development.

1.5.3 NOISE ENVIRONMENT:

Anticipated noise levels resulting from operation of the various machineries like excavator, tippers, drill have been computed using point source model. Computation of cumulative noise levels at the nearby villages is made based on the assumption that there are no attenuation paths between the source and the boundary. From the studies, it is found that the predicted Noise Levels due to mining operations at the periphery of the mine lease itself will be less even without considering any attenuation factor.

Periodical monitoring of noise level in the existing mine shows that the values are well within statutory limits. Hence, by continuing the following mitigative measures already being adopted in the existing mine workings, no major impact due to noise level is expected after enhanced production also.

- Providing Sound proof operator's cabin for equipment's like dumpers, shovel, tippers, etc.
- Planting trees at various places within the lease area , on either side of the mineral transport road to act as acoustic barriers.
- Proper and regular maintenance of vehicles, machinery and other equipment. All HEMM are monitored for any abnormal sound and rectified with due precaution by maintenance personnel.
- Providing in-built mechanism for reducing sound emissions.
- Providing workers with earmuffs & earplugs, as a protection from exposed to higher noise level.
- Conducting regular health check-up of workers including Audiometry test for the workers engaged in noise prone area.
- Displaying the noise level status of operational machinery on the machines to know the extent of noise level and to control the time to which the worker is exposed to higher noise levels.

1.5.4 GROUND LEVEL VIBRATION ARISING FROM BLASTING OPERATIONS:

Lloyds Metals & Energy Ltd awarded a scientific study to the Rock Excavation Engineering Division (Erstwhile Blasting Department) of CSIR - Central Institute of Mining and Fuel Research **(CSIR-CIMFR), Dhanbad, Jharkhand**.

Based on the study, the safe values of maximum charge per delay after expansion for different residential houses and structures are determined.

Since, the villages are located more than 2.0 km from the mining lease boundary, blasting operations can be carried out safely without causing any adverse impacts to the residential houses/structures of the nearby villages.

Due to the sensitiveness of the area, SME explosives and electronic detonators were used in all the experimental blasts. It is recommended to continue SME and electronic initiation system for safe blasting operations at the mine. However, it was also observed that shock-tube initiation system and other explosive system can also be used without any adverse blasting impacts to the nearby villages/habitats as the villages are located more than 2.0 km from the mining lease boundary. Besides, various control measures are recommended for ground vibration and to control fly rock. All these measures being implemented in the preset working mines will be continued effectively and it will be ensured that there is no impact due to blasting induced vibration after the expanded mining operations also.

1.5.5 SLOPE STABILITY STUDY:

CSIR-CIMFR has conducted a slope stability study to suggest scientific method for extraction of iron ore from the mine. Rock samples were collected from the mines and tested for their compressive strength as a part of the geotechnical investigation. It was observed that the compressive strength varies from 53MPa to 138 MPa which indicates that the rock is strong to very strong and can sustain bench height of 10m. Slope stability analysis was performed using the Slope Stability Analysis software GALENA (v.4.0). The observation of mine workings shows that the workings can be safely considered up to 10 meter bench after adopting the proper drainage plan in this mines. The current pit slope vis-à-vis the condition of rock mass does not indicate any significant problem with regard to overall slope stability in these mines keeping bench height of 10 meter. The visual observations and the results of stability analysis of the existing slopes indicate overall slopes to be stable at these mines.

1.5.6 LAND ENVIRONMENT:

The entire mining lease area of 348.09 ha falls within the Bhamragarh Reserve Forest. Forest clearance already obtained for 374.90 Ha (comprising 348.09 ha of ML area and balance road and transmission line area).

An amount of Rs.2,49,93,618/- paid towards compensatory afforestation and Rs.8,60,639/- paid for afforestation over 13.00 ha degraded forest area (together deposited through DD no.633149 Dtd.22.02.2007 in CAMPA Fund respectively). The proponent has deposited Rs.34,26,51,000/- as NPV amount with DCF Bhamragarh in Corporation Bank New Delhi vide DD no.633149 dated 22.02.2007. Mining activity in this lease is in vogue since year 2007. An area of 48.83 Ha of land is already degraded / utilized for mining, dumping, office, road, etc as on 31.03.2022. In the post mining stage, infrastructures will be demolished. Since it is a forest area the entire area will be reclaimed by plantation.

1.5.7 BIOLOGICAL ENVIRONMENT:

The impact on bio-diversity and flora fauna status due to project operations will be effectively managed and more emphasis will be given for well-planned reclamation measures for restoration of land. At present gap filling plantation has been carried out in the safety zone area and good avenue plantation in the road from Hedri to Alapalli is also completed. So far, about 17,840 trees have been planted in both these areas with local species such as Amla, Karanj, Beda, Moha, Babu, Neem, Chiach, Ficus, Gambari, Jamun, etc. During the plan period, gap filling plantation within safety zone area by planting 3750 saplings. Plantation outside the lease area in consultation with forest department will also be carried out.

Wildlife conservation plan for Surjagarh Iron Ore Mine in South Etapalli Range of Bhamragarh Forest Division, Maharashtra was prepared by M.G.Gogate and V.B.Sawarkar, reviewed finalized by Wildlife Institute of India, Dehradun (WII). On its approval by Principal Chief Conservator of Forests (Wildlife), Maharashtra, Nagpur a financial provision of Rs. 1.47 Crores is made. The Project has deposited Rs.53,25,440/- vide DD no.143677 dated 03.07.2007 in favour of Dy. Conservator of Forests, Bhamragarh to this effect.

1.5.8 SOCIO ECONOMIC ENVIRONMENT:

The local tribal population who encompass more than 90% of the population in the study area will be benefitted by means of employment that arises due to this project. The mine is already providing employment to about 3000 persons in various fields like traffic regulators, drivers, security guards etc. and has provided priority to these locals villages. The expansion project will further provide employment opportunities to more people.

The project proponent has carried out beneficial social welfare activities to improve the social and physical infrastructure of the local area. So far, they have spent Rs.58.39 Crores under various heads such as infrastructural development, health facilities, sanitation, employment, etc. In future, various social welfare activities will be continued to improve the physical and social infrastructures of the local community. Further budget of Rs.4.51 Crores has been allocated for the same under various heads such as infrastructure, education, prevention of child marriage, providing basic facilities, self-employment and health food for locals.

1.5.9 OCCUPATIONAL HEALTH AND SAFETY ASPECTS:

There are dispensaries in mines, Hedri village and Etapalli village, which are primary functioning as an initial treatment center. There are two doctors, pharmacy and assistant staffs available in this center. Cumulatively there are also 3 ambulances and oxygen plants having 25 tonnes capacity. Besides, under CSR program, the proponent has conducted health camp in Surjagarh and Hedri village wherein over 600 people benefitted and has spent Rs.3.72 Lakhs for the same.

Occupational health survey will be carried out for the workers and officers. IME will be carried out for all the category of workers and thereafter every five years. Periodic medical examination (PME) occupational health checkup such as Lung Function, Audiometry, CBC, Blood Sugar, Lipid Profile etc. will be carried out and maintained as per Factories Act & Factories Rule. So far Rs. 2.51 Crores has been spent under health and safety which includes the occupational health and also the dispensaries in the nearby villages. Besides, the present recurring cost is Rs.1.54 crores per annum. This budget will be suitably augmented to meet the needs post expansion also.

1.5.10 LOGISTICS SYSTEM OF THE AREA:

Iron ore produced from this mine will meet the raw material requirement of Lloyds metals as well as various Steel and sponge plants are in the region. Volume - Capacity ratio has been determined for various road links falling in the influence region of the study area. As Surjagarh iron ore mine is the only industry in the district, so whatever the traffic trucks plying on the road network are from this mine only. The maximum V/C ratio on these stretches of the road is 0.17 which is under category “A” LOS as per the IRC guideline. Additional 59 tucks/hour will be added in the existing traffic of the road after expansion, which will have very negligible impact. Further, the maximum V/C ratio will go up to 0.28 and the level of service (LOS) will be in Category “B” which represents a zone of stable flow. Existing road network of the area easily accommodate the additional traffic due to expansion of 10 MTPA without any adverse impact. All control measures towards transportation will be adopted.

1.6 ENVIRONMENTAL MONITORING PROGRAM:

In this ongoing project, appropriate environmental monitoring programme is already in place. Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised and implemented.

The proponent regular Environmental monitoring is being conducted for various parameters and the same are submitted to statutory authorities. The monitoring schedules are planned for systematic study of various pollution levels with respect to air and water qualities, noise levels, etc. Presently monitoring is carried out through reputed external agencies. It is proposed to install a continuous ambient air quality monitoring station for this project and Rs. 55 Lakhs has been allocated towards the same. Towards environmental monitoring the proponent is presently allocated a budget of Rs.18.64 Lakhs per annum, additionally Rs.15.0 Lakhs per annum is proposed to be allocated post expansion.

1.7 PROJECT BENEFITS:

Gadchiroli is one of the poorest and least developed districts in India with 36% tribals and lagging behind in various parameters of human development index with the HDI (2002) of 0.22, the lowest in the State. The existing mining operations in the area have already brought about positive impact locally by way of employment generation, increase in income generation,

creation of infrastructural facility, marked improvement in the life style and living standards of the entire tribal and scheduled caste population of the surrounding area. The project proponent has already carried out extensive beneficiary works, under their CSR responsibility objectives. So far they have spent Rs. 58.39 Crores towards socio economic development of the area.

There will be continued substantial improvement in case of local population in living standards, receipt of per capita income, cultural patterns, living styles, educational standards, etc. after expansion also.

About 3000 people are engaged in the project and women employment is also given a priority. Conveyance is provided to the locals by means of bus facility. Training is provided to women for operation of LMV and volvo through simulators and so far 10 local girls have completed the same. Besides, the proponent is under process of developing a skill development center near Allapalli which will further aid in imparting training to the locals to boost their skills.

The proponent is committed to aiding and improving the health care facilities of the area. They have already established a dispensary with various facilities like 2 doctors, 3 ambulances, oxygen plants with 2 Tonnes capacity, pharmacy etc. Commendable free treatment is provided for employees and the nearby villagers. Primary treatment can be carried out here. If further referral is required, they are taken to the district hospital in Gadchiroli and Chandrapur by means of ambulance for further treatment.

With a motive of establishing a good logistical system in the area, so that this interior area will gain connectivity to the nearby larger towns with ease, the proponent has completed the construction work of 51km from Alapalli to Choke Wada, Etapalli. Road augmentation works, High mast light provision in nearby villages, establishment of 1 BSNL tower for ease of communication.

Towards improvement of sanitation facilities, in the nearby villages borewells, RO machines and over head tanks are already provided. Besides, other general welfare amenities such as blankets, torchlights and mobile phones were also distributed among the local villagers. A security academy is established over an area of 11.5 acres in Karishnar. So far 114 people are trained and engaged in road traffic management. Besides, PP is also associated with Sahyadri Farm for development of bamboo based value chain in the area by ensuring a sustainable income to small & marginal farmers of this locality.

The proponent has so far contributed Rs. 248.78 Crores to DMF. The objective of District Mineral Foundation is to work for the interest of the benefit of the persons and areas affected from mining related operations in such manner as may be prescribed by the State Government. This fund will be used for welfare of the people affected in the mining affected areas.

1.8 ENVIRONMENTAL MANAGEMENT PLAN:

The company has formulated a well-planned and Environmental policy. Lloyds Metals & Energy Ltd. is an ISO14001:2015 (Environment Management System), ISO 9001:2015 (Quality Management system) and ISO 45001:2018(Occupational Health & Safety Management system) certified company.

An environmental management cell is available for this project. This cell undertakes effective monitoring, ensure implementation of various environmental control measures effectively and oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programmes, social development schemes, construction of garland drains, etc., in the mines. The EMC is headed by the Environment Manager who will coordinate at the project site and he is directly responsible for various environmental activities in the site and will report to the project head.

An amount of Rs. 345.5 Lakhs has already been spent and Rs. 442.50 Lakhs is proposed to be incurred as capital cost of EMP activities. With regards to recurring cost, it is seen that Rs.78.25 Lakhs per annum is already incurred and Rs. 141.10 Lakhs per annum is proposed to be incurred under recurring cost of EMP.

1.9 REMEDIATION, NATURAL & COMMUNITY RESOURCE AUGMENTATION PLAN:

Assessment of Ecological Damage with respect to air, water, land and other environmental attributes and remediation plan and natural and community resource augmentation plan has been prepared with budgetary estimation in line with SOP dated 07.07.2021.

1.10 CONCLUSION:

The proponent's core corporate motive is to form a relationship of synergy between the mine development and the overall upliftment of the nearby areas not only in terms of physical or infrastructural development, but also by providing a platform to the local tribals to aid in their skill

development, which in the long term will encourage an environment of independent progression that can cause the entire area to flourish.

Due to the expanded mining operations, more commercial opportunities will be available for economic development and it will create an excellent industrial climate that will diffuse the potentially grave social problems that the district faces. This project will provide wide opportunities for increased interaction with outside world and will draw the local tribal population out of their shell and encourage them to join the national mainstream.

This project will also reduce the distance over which iron ore is brought to the existing present iron ore-based industries of Maharashtra which are sourced mainly from far away Chhattisgarh and Odisha state for raw material which implied huge saving on precious fuel used in road transport and also aiding towards environmental betterment. The project will also provide direct benefits to the Government in terms of tax, royalty, DMF, etc.

A meticulously well-planned Environmental Management Plan, with various programme schedules and timely execution objectives, as above, will ensure that the future environmental quality in the area will be maintained within statutory limits. The environmental management strategy will prove that industrial growth, if properly planned with all environmental concerns and appropriate remedial measures can go a long way to improve life pattern and living conditions of the local community around the project along with visible biological improvement due to proposed greenbelt development and land reclamation.

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