"EXECUTIVE SUMMARY"

OF

ENGLISH & HINDI

FOR

SATAK MANGANESE MINE

Near Village – Satak, Tehsil – Parseoni, District – Nagpur,

State - Maharashtra

Applied M.L. Area– 5.62 ha.,

Purpose – Environment Clearance for fresh grant

Proposed production – 7700 TPA (RoM) Manganese

PROJECT COST – 55Lacks

CATEGORY- 'B1'

STUDY PERIOD-MARCH TO MAY, 2018

Applicant

MOIL LIMITED
Formerly Maganese Ore(India) Limited
A Government of India Enterprise

(A Government Undertaking)

MOIL Bhavan, 1-A, Katol Road, Nagpur-440013

Tel. No.: 0712-2592272

E-mail:- kishorchandraker66@gmail.com

Prepared BY

Wolkem INDIA LTD

Wolkem India Limited

NABET Certificate No: NABET/EIA/1720/RA0080 Valid Till 19/04/2020

NABL Accredited & Recognized MOEFCC, New Delhi.

E- 101-102, Mewar Industrial Area, Madri, Udaipur, Pin Code 313003, Rajasthan

Phone No. 0294-6452067, Fax: 0294-2491826

EXECUTIVE SUMMARY IN ENGLISH & HINDI

1. INTRODUCTION

This report is prepared to evaluate the environmental impacts of the project namely Satak manganese Mine over an area of 5.62 ha situated at near village Satak, Tehsil – Parseoni, District – Nagpur (Maharashtra) in line with the requirements of EIA notification SO 1533(E) dated 14.9.2006 and amendments made thereof.

1.1 PROJECT IDENTIFICATION

This is a mining project of manganese ore situated at near village-Satak, Tehsil- Parseoni, Distt, Nagpur (Maharashtra) over an area of 5.62 ha (Pvt. Land).

Govt. of India vide Gazette notification No.-571, dated October 6th, 2009 has reserved over an area of 814.71 Ha. in Bhandra and Nagpur district in favour of MOIL limited for exploitation of Manganese ore. Accordingly MOIL has applied PL (prospecting licence) within the reserved area. Govt. of Maharashtra vide letter no. PLV-N-1678/2011/2673 dated 3.12.2013 has granted prospecting license for Manganese ore over an area of 5.62 ha. The LOI was granted to MOIL Limited by Government of Maharashtra vide letter Number MMN-0216/L. No. 21/Industry-9, Mumbai dated 06.04.2016 over an area of 5.62 ha in at village Satak, Tehsil- Parseoni, Dist: Nagpur (Maharashtra).

Mining Plan and Progressive Mining Closure Plan was approved by Regional Controller, Nagpur Region, IBM vide letter no. NGP/MN/MPLN-1172/NGP-2016 on dated 09.08.2016.

1.2 IDENTIFICATION OF PROJECT PROPONENT

Applicant	Authorized Signatory
M/s MOIL Limited. (A Government of India Enterprise) 1A- MOIL Bhawan, Katol Road, Nagpur-440 013 Telephone: 0712-2590775 Fax: 0712-2592073 E-mail: moilindngp@sancharnet.in Website: www.moil.nic.in	**Mr. Kishor Chandrakar** Senior Deputy General Manager of MOIL LTD. Nagpur Add.- MOIL Limited, MOIL Bhawan, 1-A, Katol Road Nagpur- 440013 (MS) Phone: 0712-2589746 E-mail:- kishorchandraker66@gmail.com

2. PROJECT DESCRIPTION

This project is for mining of Manganese ore situated at near village-Satak, Tehsil-Parseoni, Distt.-Nagpur, State-Maharashtra over an area of 5.62 ha (Pvt. Land). The mining lease area falls in Survey of India Toposheet No. 55 O/7 & 55 O/3.

TABLE; 1.1PROJECT PROFILE & SALIENT ASPECTS

S.No	Particulars	Details
1.	Name of the Project	Satak Manganese Mine
2.	Proposed production	7700 TPA (RoM) Manganese Ore
3.	Project Proponent	**M/s MOIL Limited,**
4.	Location of the project	Near village-Satak, Tehsil- Parseoni, Distt, Nagpur (Maharashtra)
5.	Latitude & Longitude	21° 20' 35.33"N to 21° 20' 27.04"N 79° 16' 23.84"E to 79° 16' 9.91“E
6.	Mine site topography	Flat topography
7.	ML area	5.62 hectare (Pvt. Land)
8.	Water KLD	5 KLD for drinking, dust suppression & Plantation purpose.
9.	Nearest Railway station	The nearest railhead is at Ramtek which is distance about 6.2 Km in NE direction from mine site.
10.	Nearest Airport	Nagpur which is distance around 35 km in South West direction
11.	Nearest Town	Nagpur
12.	Nearest villages	Satak

2.1 Description of applied lease and mining process:

Proposed working: Mining will be done with open cast semi mechanized method of mining. This is a virgin area and manganese ore are found at Block A below 10 m from the surface up to 20 meter depth & in Block B & Block C below 5 meter upto the depth of 45m. Deposit is located at shallow depth & hence opencast mining will be carried out during the 1st 5 year.

As the manganese deposit is shallow in Block B & C at 5 m and at Block A at 10 m respectively. Box cut of 10 m wide shall be commenced from hang wall side and exposed up to footwall in Block A. Road from footwall side will be made for desposal of

ROM and Overburden and top soil in lease area. Development and ramps will be prepared in Block A.

After development of Block A, box cut will be developed at Block-B & C from hang wall side and exposed up to footwall and the box hole will be connected to the travelling road made in the lease area for Block-A. Preparation of ramp and development of benches will be carried out in Block B&C in such a way by leaving safe distance of 50 m from the nallah located in eastern side of Block B & C. Top soil will be stacked separately in footwall side as marked as Top Site dump in surface plan and overburden will be stacked separately as marked as OB dump in surface plan.

Barrier pillar of 7.5 m wide will be kept near boundary of the lease as marked in the plan at Block B & C and in Block-A.

A. Salient feature of the proposed method of mining:-

The parameters of open cast development is as below-

- Height of Benches: 6.0 M
- Width of benches: Not less than Height – 10 m
- Development to be done in horizontal plane.
- Development extends from 297 MRL to 268 MRL in vertical plane.
- Bench alignment –Parallel to the strike of ore body i.e. E-W
- The ultimate pit slope angle – Not more than 30°.
- Direction of face advance- Across the strike of ore body.

Angle of the benches is kept about 70°- 60° with ultimate pit slope of 30°-35°. Controlled blasting technique will be used. Nonel or relays will be used to avoid ground vibrations, noise and fly rocks.

During the rains, sump will be prepared at dip side and diesel/ electric operated submersible pumps of 2000 ltrs capacity will be deployed for discharge of water.

Manpower: As per the approved mining plan, about 57 man powers will be required for mining operation.

Machinery to be deployed: Detail of the mining machinery to be deployed is given in the table below. –

TABLE -1.2 DETAIL OF MACHINERY DEPLOYED OR TO BE DEPLOYED

S.No.	Machinery	No's
1	Excavator 1.4 cu. m	2
2	Tipper 25 t capacity	3
3	Drill machine of 100 mm dia with DTH hammer.	-

2.2 Need of the project: The manganese ore produced from Satak Mine. MOIL Limited, the leading producer of high grade Manganese ore and manufacturer of Electrolytic Manganese Dioxide and Manganese alloys in India, markets various grades and blends of ores to suits individual requirements of consumers, particularly for Steel, Ferro Manganese, Dry Battery, and Chemical Industries.

1.3 DESCRIPTION OF THE ENVIRONMENT

The baseline environmental monitoring was carried out during pre-monsoon season of year March 2018 to May 2018. The various environmental components which are thoroughly studied during the study period include:

- Meteorology
- Land Environment
- Water Environment (surface and ground water)
- Air Environment
- Noise Environment
- Biological Environment
- Socio- Economic Environment

A. METEOROLOGY

Micro meteorological data temperature & relative humidity were recorded at site during the study period (March to May 2018) which is summarized in the table.

TABLE 1.2: SITE SPECIFIC MEAN TEMPERATURE & RELATIVE HUMIDITY

Month	Temperature (°C)		Relative Humidity (%)		Rainfall in mm
	Max.	Min.	Max.	Min.	
March to May 2018	46	20	69	19.5	21.00

B. LAND ENVIRONMENT

Land use: The existing land use pattern in the study area has been studied through satellite imagery. The pre-dominant land use of the study area is divided into the following categories, Forest Land 1930.62 ha (5.95%), Barren/waste/wet land 1930.30 ha (5.95%), Crop land 22222 ha (68.45 %), Fallow land 3707.53ha (11.42 %), Open scrub

land 698.70ha (2.15%), Habitation 1179.28ha (3.63%), River/ water bodies 795.84ha (2.45%).

Land use patter of core zone

S. No.	Particulars	Pre operational (In ha.)	Operational (In ha.)	Post operational (In ha.)
1.	Area to be excavated	0.0	1.290	1.6745
2.	Storage for top soil	0.0	0.045	0.0
3.	Overburden Dumps/Black dump mineral rejects25	0.0	0.700	0.700*
4.	Mineral storage	0.0	0.105	0.0
5.	Infrastructure	0.0	0.060	0.060
6.	Roads	0.0	0.545	0.545
7.	Green Belt	0.0	0.58	2.640
8.	Remaining Land	0.0	2.295	0.0
Total		**5.62**	**5.62**	**5.62**

Note –At the end of mine life 1.6745 Ha pit area will be used for rain water storage and approx. 0.700 ha dump area will be stabilized with plantation and approx. 2.640 ha lease area will be planted in remaining land.

Type of soil: There are six types of soils found in Nagpur district like Kali soils, Morand soils, Khardi soils, Bardi soils, Kachchar soils, Wardi soils.

Agriculture crop- Major crops in Nagpur district is Jawar, Cotton, wheat, rice, Groundnut, Sesamum, Soya bean, total pulses like Moong, Urd, Tur etc.

C. WATER ENVIRONMENT

There is no ground water source exist in mining lease. There is no any water source in this area of Satak Manganese deposit however seasonal nallah flowing from north to south and located at eastern section of the ML area and joining ultimately to the Kanhan River. Safety barrier of 7.5 m will be left for sides of the Nallah & leaving safe distance of 50 m from the nallah located in eastern side of Block B & C. Parapet wall will be construct along with barrier.

The assessment of present status of water quality within the study area was conducted by collecting water from ground & surface water sources during the period of March 2018 to May' 2018.

- It is observe that the pH of the ground water samples are range from 6.97 to 8.18, which is between the acceptable pH limit for drinking water.
- The concentration of Total dissolve solides (TDS) are in the range of 330 to 1032 mg/l which falls in permissible category stipulated by Bureau of Indian standards. The desirable limit for total dissolved solids as per IS-10500 Standards is 500 mg/l whereas the permissible limit in absence of alternate source is 2000 mg/l.
- Total hardness of the ground water sample observed in the range of 84 to 894 mg/l as $CaCO_3$. The desirable limit is 200 mg/l and permissible limit is 600 mg/l.
- Fluoride Concentration is between 0.30 to 0.60 mg/l. The desirable limit of 1 mg/l and permissible limit of 1.5 mg/l.
- chlorides Concentration is between 22 to 248 mg/l. The desirable limit of 250mg/l and permissible limit of 1000 mg/l.

Results & Discussion- From the analysais data is observed all parameter are within permissible limit of drinking water standard.

D. AIR ENVIRONMENT

Ambient air quality has been determined by measuring the concentration of parameters like $PM_{10,}$ $PM_{2.5}$, SO_2, NO_2 & CO in the air and results are within the NAAQS standards.

PM_{10} level in the study area:

In core zone the PM10 value recorded during the study period ranges between 50.9 µg/m3 to 74.1 µg/m3. In buffer zone the PM_{10} values ranges between 46.8 µg/m^3 to 74.3 µg/m3.

$PM_{2.5}$ level in the study area:

The minimum and maximum value of $PM_{2.5}$ recorded in the core zone is 23.5µg/$m^3$and 35.1µg/m^3 respectively whereas in buffer zone the minimum and maximum value of $PM_{2.5}$ is 21.3µg/m^3 and 42.4µg/m^3 respectively.

SO_2 level in the study area:-

During study period, the concentration of sulphur dioxide recorded in the core zone ranges between 6.7µg/m^3 to 9.6µg/$m^3$and in buffer zone it ranges between 5.8 µg/m^3 to 9.6 µg/m^3.

NO_2 level in the study area:

The concentration of nitrogen dioxide recorded in core zone ranges between 7.8µg/m^3 to 31.6 µg/$m^3$and in buffer zone it ranges between 12.2 µg/m^3 to 26.9 µg/m^3.

CO level in the study area:

The concentration of nitrogen dioxide recorded in core zone ranges between 0.33mg/m^3 to 0.67mg/$m^3$and in buffer zone it ranges between 0.22mg/m^3 to 0.67mg/m^3.

E. NOISE ENVIRONMENT

The noise monitoring shows that Leq day and night time noise levels in applied lease area are within the CPCB standards.

During the study period ambient noise level were monitored and observed maximum level was: 54.8 at Satak village in 500 D/W directions during day time & minimum was 35.9 at Village Hiwri during night time.

F. BIOLOGICAL ENVIRONMENT-

The biological study of the area has been conducted in order to understand the ecological status of the existing flora and fauna to generate baseline information and evaluate the probable impacts on the biological environment.

There is no national parks wild life sanctuary in the study area however Ghuksi reserve forest is exist in study area which is approx. 9.21 km in NW direction from the lease area. No Threat & endangered species found in the core & buffer zone.

G. SOCIO ECONOMIC ENVIRONMENT-

No. of Villages	48
Total Population	66804
Male	34180
Female	32624
Literates	49352(73.88%)
Male	26654 [77.98 %]
Female	22698[69.57%].
Main worker population	24030 (35.97%)
non worker population	36166 (54.14%)
Marginal worker	6608 (9.89%)

Source- As per census data of 2011.

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Land Environment-

Anticipated Impacts-

- Change in topography and drainage of applied lease area.
- The land use of the buffer zone may be change in form of roads new building due to the proposed project.

Mitigation measure-

- The proposed project will not have much impact on the land use in the surrounding areas as the mine will be confined strictly within the demarcated area.
- At the end of mine life 1.6745 Ha pit area will be used for rain water storage and approx. 0.700 ha dump area will be stabilized with plantation and approx. 2.640 ha lease area will be planted in remaining land.

Air Environment-

Anticipated Impacts-

- The dust liberated in mining and other related operations is injurious to heath if inhaled in sufficient quantity.
- Mining Operation carried out by opencast mechanized method generate dust particles due to loading & unloading of manganese during transportation.
- Gases, such as, Sulphur Dioxide, Oxides of Nitrogen etc. from vehicular exhaust.

Mitigation measure-

- Proper mitigation measures like water sprinkling will be adopted to control dust emissions.
- Personal protective equipment like dusk Masks will be provided to workers.
- To control the emissions regular preventive maintenance of equipment will be carried out on contractual basis.
- At the end of mine life about 3.34 ha area will be covered under plantation.

Water Environment-

Anticipated Impacts-

- No water is discharged to environment from manganese mining at the project site.
- There is seasonal nallah flowing from north to south and located at eastern section of the ML area. If mining will not done proper manner it may be pollute nearest water body due to mining operation.

Mitigation measure-

- Garland drains are suggested to be constructed on all side of quarries and external dumps. All the garland drains should be routed through adequately sized catch pits or settling pits to remove suspended solids.
- Suitable drainage system will be provided to prevent surface water from entering into mines directly.
- Safety barrier of 7.5 m will be left for sides of the Nallah & leaving safe distance of 50 m from the nallah located in eastern side of Block B & C. Parapet wall will be constructed along with barrier.
- No waste water will be generated during mining activity.
- Retaining wall will be constructed at the toe of dump area.
- Rain water will be collected in the open pits & after de-silting it can be pumped out & its use for plantation purpose

Noise & vibration Environment-

Anticipated Impacts-

- Decrease in speech reception, distraction, insomnia and fatigue and diminished concentration thus adversely affecting job performance efficiency.
- Irreparable cardiovascular, respiratory and neuralgic damages in certain extreme cases.

Mitigation measure-

- In order to reduce the effect of noise pollution, ear plugs /earmuffs will be provided to workers.

- The workers will not be allowed to work more than one hour in noise prone area, and will be shifted to other places.
- Plantation will be carried out waste dump & remaining land. The greenbelt minimizes propagation of noise.
- Proper maintenance of vehicles will be done.
- Mine operations will be limited to day time i.e. 9AM to 6 PM.
- Ambient and Source Noise level Monitoring will be conducted on regular basis.
- Power Horns will not be allowed in dumper. Drivers will be further instructed not to use music systems at high volumes.

Biological Environment-

Anticipated Impacts-

- During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.

Mitigation measure-

- All the preventive measures will be taken for growth & development of flora.
- Fencing around the pit mouth to prevent fall of animal.
- Creating and developing awareness for nature and wild life in the adjoining villages.
- Plantation will be taken up in consultation with Forest department and species local to the area shall be planted as per findings during baseline environment which help maintain the regional ecological balance, soil and hydrological conditions.

Socio-Economic Environment-

Anticipated Impacts-

- Dust generated from the mining activity can have negative impact on the health of the workers.
- Approach roads can be damaged by the movement of trucks/dumpers.
- Nearby agricultural field can also be affected by the dust generation.

Mitigation measure-

- Adequate measures will be adopted to control dust generation like water sprinkling on unpaved road, working sites and wheel & truck wash facility at applied site.
- Construction and maintenance of approach roads.
- Material will be covered during transportation.
- Paving of unpaved roads.
- Medical camp will be organized by MoIL at nearby areas.

<u>Occupational Health & Safety-</u>

- Exposure to dust can results in Respiratory problems.
- Injuries during Project operation are typically related to slips and falls; contact with falling / moving objects; and lifting / over-exertion.

Mitigation measure-

- The working in the applied lease area will be done with all safety measures under the supervision of qualified staff.
- The workers will be provided dust mask, safety boot, helmet and other safety equipment. A well-equipped first aid box will be maintained at site.
- Regular water sprinkling on haul roads.
- Periodical medical examinations will be carried out for the workers as per Norms.
- Medical records will be keeping maintained.
- Medical facilities will be providing for workers.
- Any early symptom of diseases, if observed, such workers will be taken off in the dusty atmosphere and suitable employed elsewhere.
- Personal Protective Equipment's will be provided to the workers.
- Vocational Training will be provided to the workers.

- Safety of the employee during mining will be taken care as per Mine Regulations.

1.5 PROJECTS BENEFITS:-

There are various aspects of this project and allied activities that will be beneficial to the locality, region and nation.

- The manganese production from this mine is suitable for ceramic industry. There is sufficient demand in this region for the purpose. This project will benefit the industry.
- The production of Manganese from the proposed project will benefit the state government by the way of revenue.
- Direct and indirect generation of employment, about 57 people will get direct employment in the mine including supervisory staff and labours.
- Improvement in the physical & social infrastructure is another benefit that will arise from this mining project. People in the adjoining area will be helped through the CSR activities and other funds allocation especially for the development of the area.
- Tangible benefits like improved standard of living, health and education.
- This project is beneficial at all levels providing benefits to the industry, local inhabitants and state government.

1.6 ENVIRONMENT MANAGEMENT PLAN

The main objective of environmental management plan is implementation of all environment pollution controlling system effectively to maintain the ecological balance of the area and also to promote the sustainable development during the operational and post operational phase in the area.

The monitoring schedule along with monitoring parameters, monitoring frequencies and duration is given in the below table.

TABLE; 1.3 MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS			
Particulars	**Monitoring Frequencies**	**Duration of Station**	**Important Monitoring Parameters**
Surface water/ Ground water Sampling	Twice in a year	-	EC, PH, TDS, TSS, Iron, Hardness, Alkalinity, Chlorides, Calcium, magnesium, Nitrates, Sulphate, manganese & Fluorides.
Ambient air quality monitoring	Twice in a year.	24/8 hr.	$PM_{2.5}$ PM_{10}, SO_2 and NO_2.
Noise Monitoring	Twice in a year.	8/1 hr.	Level in dB (A). Day/Night
Soil Sampling	Twice in a year	-	PH, Conductivity, organic matter permeability, water holding capacity, Alkalinity & texture.

FUNCTIONS OF THE MONITORING CELL

- To carry out the environment monitoring for environmental parameters given in the above mention table by an outside agency & analysed monitoring data.
- To observe the effectiveness of mitigation measures.
- Regular visit of the working site to examine the slope stability, mine faces and waste dump.
- Regular checking of garland drain for any blockage due to silting or accumulation of the loose materials.
- To ensure the green belt development in a time bound manner and also regular monitoring of planted species for survival rate.
- Regular water monitoring for the parameters prescribed in the consent conditions of SPCB.
- Monitoring of ambient air quality at the desired monitoring location covering both upwind and downwind directions and also to make sure that control measures are effectively implemented.
- Health check-up of the workers will be conducted regularly for Occupational health and safety and also concentration of repairable dust in the workplace will be regularly measured as laid down by DGMS.
- Health status of the workers will be maintained.
- Conducting safety week programmes to create safety awareness amongst the workers and other staff. This will educate the workers to work safely in mine lease with different equipment along with all PPE's.
- To make sure that CSR activities are taken up in the proposed villages.
- Coordinating the environment related activities within the project as well as with outside agencies.
- To comply with all the EC conditions effectively.

1.6.1 BUDGETARY PROVISION FOR ENVIRONMENTAL PROTECTION MEASURES & CSR ACTIVITY

The below table give overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

TABLE 1.4 -COST OF ENVIRONMENTAL PROTECTION MEASURES

S. No.	Particulars	Capital cost (In Rs.)	Annual recurring cost (in Rs.)
		Proposed	Proposed
1	Pollution control	5000000/-	500000/-
2	Pollution monitoring	5000000/-	550000/-
3	Plantation on barren area	3000000/-	300000/-
4	Occupation health & Safety	2000000/-	175000/-
5	Miscellaneous (fencing, Hydrogeology studies, Risk analysis etc.)	5000000/-	250000/-
Total		20,000,000.00/-	17,75000.00/-

Total investment on environmental improvement works is envisaged Rs. 20,000,000.00/-and recurring expenditure during the stage of production is Rs. 17, 75000.00/- as recurring investment is earmarks for EMP.

TABLE 1.5 –PROPOSED CSR ACTIVITY

S.No.	Particular	Cost in Lack/-
1.	Other works related to rural developments.	**1.5/-**
2.	Construction & development activities in school or village.(washroom for girls , road repairing, drinking water facility as per requirement)	**2.0/-**
3.	Organize Medical camps, free distribution of medicines in nearby villages	**1.5/-**
Total		**5.0/-**

1.7 CONCLUSIONS

The project has positive impact to the local people as direct and indirect employment opportunity have been generated. There will be no significant pollution of air, water, soil and noise. Regular monitoring of all the components of environment will be done. Increased social welfare measures taken by the company. All possible environment aspects have been adequately assessed and necessary control measures have been formulated to meet statutory requirement.

=======********=====