



STEEL AUTHORITY OF INDIA LIMITED

PRE-FEASIBILITY REPORT
OF
JHILLINGBURU-I
IRON & MANGANESE ORE MINING PROJECT



MECON LIMITED
RANCHI – 834002
INDIA

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PLATES

<i>Plate No.</i>	<i>Title</i>
Drg. No. MEC/G23J/11/S2/(F-I)1	<i>Location of project</i>

1.0 EXECUTIVE SUMMARY:

Jhillingburu-I Mining Lease (ML) forms a part of Gua Ore Mines, which was the captive mine of the erstwhile Indian Iron and Steel Company Ltd. (IISCO), Burnpur. Since the takeover of IISCO by SAIL, Gua Ore Mines (GOM) is operated by the Raw Materials Division of SAIL and supplies iron ore mainly to ISP, Burnpur. Initially mining was carried out by manual means, which was subsequently mechanized during 1958 by commissioning & erection of Ore Handling Plant. Gua Ore Mine is the first mechanized mine of our country. The mine has been developed under Duarguiburu Iron Ore ML over an area of 1443.756 ha, the main & largest ML under GOM. The other three leases are Jhillingburu-I (210.526 ha), Jhillingburu-II (30.43 ha) and Topailore (14.15 ha). Jhillingburu-I & Jhillingburu-II are the iron & manganese leases, while Durgaiburu and Topailore are iron ore leases. In addition there is also a Surface Right Area spread over 242.8 ha, where most of the infrastructure for the mines (township, railway siding etc.) is located.

Jhillingburu - I ML was granted in favor IISCO with effect from 12.5.1950 for 30 years. The renewal application was filed on 7.5.1979 for another 30 years period as per existing clauses of the lease deed. Presently the mine is under the control of the Raw Materials Division (RMD) of Steel Authority of India Limited (SAIL), which took over IISCO in 2006. The lease was thus due to expire by 11.5.2010 before which SAIL has filed the second renewal application vide Gua/E&L/IB-I/09-10/011 dated 25.04.2009 for renewal for a period of 20 years. The extension of lease period is under consideration with Govt. of Jharkhand as per the provisions of MMDR Amendment Act 2015 & The Mineral (Mining by Govt. Company) Rule 2015. Mining Plan is approved by IBM for periods of 20 years vide letter no. 314(3)/2010-MCCM(C)/MP-14 dated 10.02.2011. Modified Mining Plan along with PMCP for the period 2015-16 to 2019-20 has been approved by IBM vide letter no. KOL/SB(W)/Fe&Mn/MP- 429, dated 09.10.2015 for 61,362 TPA Mn ore. The ML is primarily for producing manganese ore. The mine had operated during the period 1961 – 1971 with maximum production of 42,532 t/yr of manganese ore in 1964. Mining resumed in 2008, but has been suspended for want of Environmental Clearance. The present proposal envisages resumption of mining @ 61,362 t/yr of manganese ore. The expected life of the mines is 7 years.

The manganese and iron ores deposit of Gua, form an important part of the Iron Ore series of Bonai Range and is a part of famous "Horse Shoe" shaped manganese and iron ores belt of Jharkhand-Orissa belt. In general, the area has a rugged hilly topography. The first order drainage pattern in the hill is radial, radiating from the peak and ridges of the area. The area experiences heavy rain from July to Sept. During summer the climate is fairly hot. Winter months spread from November to February.

The lease area can be approached by all-weather metaled roads *viz.* Jamda - Thalkobad road. The nearest railway station is Gua on SE Railway's broad gauge branch Rajkharsawan Junction (on Howrah–Mumbai main line)–Barajamda-Gua branch line. Gua railway station is located in the Surface Right Area of GOM

about 2.5 km from Jhillingburu – I ML. The leasehold is well connected with Tatanagar (147 km) by metalled road as well as by rail route via Barajamda, and Noamundi and Chaibasa. GOM can also be approached through metalled and unmetalled roads from Manoharpur railway station on Howrah–Bombay main line.

The salient features of the project include:

Proposal	Resumption of mining @ 61,362 t/yr of manganese ore without increase in ML area of 210.526 ha
Location of Mine	Ghatkuri compartment under Gua Range of Saranda Forest Division At P.O- Gua, Block – Noamundi, Dist – Singhbhum (W), Jharkhand, Pin- 833213.
Latitude	22°11'15" to 22°12'28" N
Longitude	85°22'00" to 85°22'54" E
Land Use	Total Forest Land (210.526 ha). Stage-I FC obtained for 210.526 ha vide order dated 25.09.2017
Total Mineable Reserves	0.51 million tonnes of Manganese ore (+10% Mn)
Life of Mine	7 Years for Mn ore
Method of Mining	Mechanized Open cast mining by conventional shovel dumper combination
Quarries	Excavation shall be confined only in Quarry-1 till first 5 years. All existing and ultimate pit bottoms will be above ground water table.
Waste disposal	External dumping of waste for 1 st & 2 nd year. Backfilling in quarry 1 will commence from 3 rd , 4 th and 5 th year onwards.
Mineral Processing	Manual sorting & screening
Mineral Transport	By 25 t dumpers to Gua railway siding
Number of working days	300 days, 1 shift per day
Water Demand	100 m ³ /day
Source of water	River Karo
Man Power	152
Fuel Consumption	50 kl/yr
Explosive Consumption	25 t/yr
Infrastructure	Most of the infrastructure (viz. Workshop, stores, railway siding, township) are at place in adjoining leasee's Durgaiburu ML.
Proposed Investment	Rs. 10 Crores
Production Cost	Rs.1100-1400 per tonne at rated capacity
CSR Budget	A budget of total Rs. 39.60 lakhs for 2017-18 has been proposed for GOM region.

Manganese ore produced from Jhillingburu – I ML will be a captive source for SAIL's own steel plants. This will bridge the gap between supply and demand of manganese ore. This will also generate much needed employment to the local people. Economy of the area will get a boost and there will be overall growth of the region interim of education, health, training and transport etc. The local people's standard of living is also expected to improve.

2.0 INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION :

2.1 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT:

Jhillingburu-I ML was granted in favor of IISCO with effect from 12.5.1950 for 30 years. The renewal application was filed on 7.5.1979 for another 30 years period as per existing clauses of the lease deed. Presently the mine is under the control of the Raw Materials Division (RMD) of Steel Authority of India Limited (SAIL), which took over IISCO in 2006. The lease was thus due to expire by 11.5.2010 before which SAIL has filed the second renewal application on 05.05.2009. The extension of lease period is under consideration with Govt. of Jharkhand as per the provisions of MMDR Act 2015 & The Mineral (Mining by Govt. Company) Rule 2015. Mining Plan is approved by IBM for periods of 20 years vide letter no. 314(3)/2010-MCCM(C)/MP-14 dated 10.02.2011. Modified Mining Plan along with PMCP for the period 2015-16 to 2019-20 has been approved by IBM vide letter no. KOL/SB(W)/Fe&Mn/MP- 429, dated 09.10.2015. The proposed rate of production is 61362 t/yr of manganese ore. The estimated project cost is Rs. 10.00 Crores. The expected life of the mines is 7 years.

Steel Authority of India Limited (SAIL), a Maharatna public sector undertaking under Ministry of Steel, Government of India, is the leading steel maker in the country and is having integrated steel plants at Bokaro, Durgapur, Rourkela, Bhilai & Burnpur and special steel plants at Durgapur, Salem & Bhadravati. Also, SAIL has the second largest mining outfit in the country after Coal India Limited. SAIL's mines are spread over the states of Jharkhand, Orissa and Chhattisgarh. These mines commenced their operations as captive sources of raw materials for its integrated steel plants.

2.2 BRIEF INFORMATION OF THE PROJECT:

The present proposal envisages resumption of mining @ 61,362 t/yr of manganese ore by mechanized opencast mining without increasing the ML area of 210.526 ha. The entire lease area is located in Ghatkuri compartment under Gua Range of Saranda Forest. The Stage-II Forestry Clearance for diversion of 32.11 ha under the lease was granted by MoEF&CC vide F. No. 8-75/98-FC dated 23.11.2000 for 20 years period. Also, Stage-I FC of total forest land under the lease i.e. 210.526 ha was obtained vide F.No. 8-75/1988-FC (Vol.) dated 25.09.2017.

Total mineable reserves available are 0.51 million tonnes of manganese ore (+15% Mn) and geological reserve 1.19 million tonnes (+10% Mn). The expected life of the mine with proposed rated production capacity of 61,362 t/yr. is 7 years. Generation of waste during the next 5 years is expected to be about 1.163 million cubic meter, which will be dumped to designated external dumping areas created temporarily near the north-western side of Quarry 1 in a non-mineralized zone during 1st & 2nd year of the scheme period. Waste generated during 3rd, 4th & 5th year of the scheme period will be backfilled in Quarry 1. Subsequently, the waste generated during the 1st & 2nd year of scheme period, which were dumped in external dump will also be re-handled and backfilled in quarried out voids.

The total mineable iron ore would be 0.44 Mt. Presently there is no proposal for carrying out iron ore mining from Jhillingburu-I ML.

Green belt will be generated all along the periphery of ML boundary (safety zone) and afforestation will be made around sub grade ore dump. Water requirement for the proposed project for industrial purposes has been estimated to be 90 m³/day, whereas potable water demand has been estimated to be 10 m³/day. The water will be drawn from Karo River flowing just outside the lease's eastern boundary.

2.3 NEED FOR THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY OR REGION :

Dept. of Mines and Geology has granted the ML on the availability of manganese and iron ores. It will also generate revenue in terms of royalty and taxes to the State. This will generate employment to the people and ancillary industries around the area. It will also bridge the gap between demand and supply of manganese ore to the country. The Project will help in the overall growth of the Region.

2.4 DEMAND AND SUPPLY GAP:

The major application of manganese ore in India is for manufacture of silico-manganese (66%) and ferro-manganese (26%), which are used for manufacture of steel. Manganese ore is also used as direct feed to blast-furnaces of integrated steel plants (5%) and kilns of sponge iron plants (2%). The balance is consumed by the non-ferrous metallurgical industries, chemical industries, glass industries etc.

In 2014-15, the indigenous production of manganese ore was 23,45,361 t. Madhya Pradesh was the highest producer of manganese ore followed by Maharashtra, Odisha & Andhra Pradesh and Karnataka. In the same year, India imported 3.17 million tonnes of manganese ore, mostly from South Africa (64%), Australia (24%) and Gabon (18%). These comprised of 8,92,093 t of high grade ore (+46% Mn), 20,90,840 t of medium grade ore (46 – 35% Mn) and 1,70,570 t of low grade ore (35 – 30% Mn).

Manganese ore produced from SAIL's captive mines will be entirely consumed in the company's plants. The Mining Industry has witnessed continuous modernization and adoption of need of technology in recent years for the excavation of mineral like manganese and iron ores. Manganese and iron ores raw materials demand has been on an upsurge in India due to high demand in Steel Industry.

2.5 IMPORT VS INDIGENOUS PRODUCTION :

In 2014-15 indigenous production of manganese ore was about 2.34 million tonnes (Mt). In the same year 3.17 Mt of ore, mostly high grade ore, was imported.

2.6 EXPORT POSSIBILITIES :

Manganese ore produced from this project will be exclusively consumed in SAIL's plants. There is no proposal for export of manganese ore from this project.

2.7 DOMESTIC / EXPORT MARKET:

Manganese ore is used mostly in the iron & steel industry. It is a basic raw material required for manufacturing of various grades of steel. India is a net importer of manganese ore. The ore produced from this project, will contribute towards reducing imports.

2.8 EMPLOYMENT GENERATION:

Jhillingburu-I mines will be headed by the Mines Manager who will be the responsible for the supervision, control and management of the mines. The Mines Manager shall report to the Mines Agent, both of whom will be provided residential accommodation at Gua Township. The senior most executive of Gua Ore Mines will normally be the Mines Agent for Gua Jhillingburu – I, Iron & Manganese Mines. Director (Raw Materials & Logistics) is the nominated owner of Gua, Jhillingburu – I, Iron & Manganese and iron ores Mines.

All statutory supervision i.e. Mines Foreman, Mining Mate etc. will be employed as specified in the Metalliferous Mines Regulation, 1961. Employment potential at Jhillingburu- I, iron & manganese ore mines are as follows:

Sl. No.	Category	No. of Persons
1.	Office Staff	11
2.	Highly skilled worker	12
3.	Skilled worker	18
4.	Semi skilled worker	16
5.	Un-skilled worker	95
	Total	152

Most of the unskilled, semi-skilled and skilled workers will be local persons. The officers and highly skilled workers and some of the other employees will be housed in the existing Gua Township, which is being expanded.

3.0 PROJECT DESCRIPTION

Gua Ore Mines (GOM), a captive Iron Ore Mine of Raw Materials Division of SAIL has been the traditional supplier of iron ore lumps to the IISCO Steel Plant (ISP), Burnpur of SAIL, the oldest iron & steel plant of the country, since 1927. Initially mining was carried out by manual means which was subsequently mechanized during 1958 by commissioning & erection of Ore Handling Plant. GOM is the first mechanized mines of the country. The mine consists of 4 adjacent leases: Duargaiburu (1443.756 ha) which is an iron ore mining lease, Jhillingburu - I (210.526 ha), Jhillingburu-II (30.43 ha) are the iron & manganese leases and Topailore (14.15 ha) is an iron ore lease. In addition there is also a Surface Right Area spread over 242.8 ha, where most of the infrastructure for the mines (township, railway siding) are located. Since the takeover of IISCO by SAIL, GOM is operated by Raw Materials Division of SAIL and supplies iron ore mainly to SAIL's IISCO, Burnpur. GOM is now under the control of the Raw Materials Division (RMD) of SAIL.

3.1 TYPE OF PROJECT INCLUDING INTERLINKED AND INTER DEPENDENT PROJECT

The proposed project falls under Category "A", as per EIA notification – 2006 and amendments thereon of the Ministry of Environment, Forest & Climate Change, New Delhi. This is a self-dependent project. The mine will be the captive source of manganese ore for SAIL's plants.

3.2 LOCATION:

The Mining lease area is located at Ghatkuri compartment under Gua Range of Saranda Forest Division in Noamundi Tehsil of West Singhbhum District, Jharkhand. The mining lease area falls under Toposheet No. 73F/8 between Latitudes 22°11'11" N and 22°11'43" N and longitudes 85°22'06" E and 85°23'01" E. The location of project is shown in **Drg. No. MEC/G23J/11/S2/(F-I)1.**

3.3 DETAILS OF ALTERNATE SITE:

Since the proposed project envisages resumption of mining of an existing closed mine, possibility of alternate site is not applicable.

3.4 SIZE AND MAGNITUDE OF OPERATION:

The mine lease is spread over 210.526 ha. It has been envisaged to increase in ROM production of Manganese ore to 61,362 t/yr. Presently mining is suspended for want of EC and FC. There is no proposal to increase the lease area.

Although, iron ore is present in Jhillingburu I Lease, there is no proposal at present to mine the same.

3.5 MINE DESCRIPTION

3.5.1 Geology:

The terrain forms a part of the oldest meta-sedimentary formations of the Chotanagpur plateau. The different lease holds of SAIL in the Gua region are parts of Singhbhum – Bonai – Keonjhar group of iron ore deposits. The iron & manganese ores bearing banded iron formations (BHJ/BHQ) lie between shale, Phyllite, Sandstone etc. The Ore zone and the wall rock are folded in a rather complicated manner. Dip and strike are variable. Strike is trending NNE-SSW and dip around 45° towards east / west.

The rock type that have been encountered in this lease hold area are BHJ, Shale, Laterite, Phyllites, Fault breccia, Iron Ore (brecciated) and the associated manganese and iron ores. The pattern of mineralization at Jhillingburu – I is not very regular. The horizontal & vertical extent of host rock containing manganese and iron ores vary considerably. Occurrence of iron in the form of boulder to fractured hematite has been noted in the entire lateritic zone and also in the neighboring zone.

3.5.2 Mineral Reserves:

The mineral resources have been estimated by area method. The measured mineral resources thus estimated is given below. The reserves and resources of manganese ore as on 01-04-2014 are as follows:

Sl. No.	Classification	Code	Qty. in Mt	Grade
1	Probable mineable reserve	122	0.51	Mn. +15%
2	Pre-feasibility mineral resource	221	0.68	Mn. 10-15%
	Grand Total		1.19	Mn. +10%

The Total Mineable Reserves of manganese ore would be 0.51 Mt. Considering the production of manganese ore in the next 5 years 0.31 million tonnes (Mt), the balance mineable reserve after this plan period would be 0.13 Mt. The year wise production at the rate of about 61,000 t/yr. Thus the life of the mine would be around 5+2= 7 years on the basis of present reserve position. The reserve and life of the mines may be enhanced after the further exploration proposed during the plan period in lease area.

3.5.3 Mining:

At present there are two open cast quarries in the deposit viz Quarry No. 1 and Quarry 2. It is proposed to re-activate the mine by resuming operations in Quarry 1. The mine will be worked by means of opencast mechanized method of mining with the conventional system which includes drilling, blasting, loading and transportation etc.

The benches in the area will be of 6 m height having minimum width of 12 m for machine mining and will be sloping gently away from the mining faces. Haul Roads will be laid on the foot wall side at a gradient of 1 in 16 except for short ramps, if any, will be up to 1 in 12.

Hydraulic Excavators/shovels of 1.2 m³ capacity in conjunction with tippers of 16 tonnes capacity shall be deployed. 110 mm dia. drills are planned for primary drilling. OB has been considered to be generated at a stripping ratio of ~1:1.09 (on tonne to cu.m basis and Ore: OB).

The year-wise generation of ore and waste during the next five years is as follows:

Year	<i>O.B.</i> (m ³)	<i>INTERBURDEN</i> (m ³)	<i>TOTAL WASTE</i> (m ³)	<i>SUBGRADE</i> (t)	<i>ORE (t)</i>	<i>Striping Ratio</i>
1 st	19748	105733	125481	32533	61000	1:0.88
2 nd	6018	105734	111752	32533	61000	1:0.79
3 rd	19962	105733	125695	32533	61000	1:0.88
4 th	38772	105733	144505	32533	61000	1:1.02
5 th	159770	105733	265503	32533	61000	1:1.87
Total	244270	528666	772936	162665	305000	1:1.09

The mine will attain its rated capacity in the 1st year of operation itself. The mine shall operate 300 days per year with one daily shift.

During the first 5 years of operation, only Quarry 1 will be worked. The entire waste produced during 1st & 2nd year of operation will be dumped temporarily in earmarked external dump area. Waste generated during 3rd, 4th and 5th year onwards will be backfilled in Quarry 1. Subsequently, the waste generated during 1st & 2nd year of scheme period will also be backfilled. Sub-grade ore will be stacked separately in Quarry 2 for possible future use.

About 10 ha area will be required for OB dump at the conceptual stage and the maximum height of the dump would be 20 m. Thus, the ultimate dump capacity would be about 2 Mm³ including swelling factor @ 20% of the total production.

On cessation of mining, the mine shall be closed down in accordance with the approved mine closure plan. All waste dumps will be stabilized and biologically reclaimed. Some of the other infrastructure will be dismantled. Others, especially buildings will be handed over to local panchayats or the State Government.

3.5.4 Mineral Processing:

Manganese Ore produced at Jhillingburu-I ML will be having average Mn at about 21% Manganese content. Presently SAIL does not have any proposal for Manganese ore beneficiation. No wet process is envisaged presently. Blasted ROM ore will be manually sized followed by picking and sorting also by manual means. Hand screening will be done using 40 mm & 10 mm screens. However Mechanized Screen may also be installed if requirement arises during the course of mining. The ore between -40 mm & +10 mm fraction will be sent to Steel Plants. The undersize (-10 mm) materials will be stacked separately for future use which will encourage mineral conservation. This will also help in protection of environment.

3.5.5 Mineral Transport

The ore recovered from Jhillingburu-I will be dispatched by tipper trucks to Gua railway siding, which is at a road distance of about 2.5 km, for loading onto railway wagons.

3.6 RAW MATERIALS

The only raw materials consumed in the project are fuel (HSD) and explosives. The fuel consumption in the expanded mine is estimated to be 50,000 litre per year. The explosive consumption is expected to be 25 t/yr. The storage facilities of Gua Mine located in Durgaiburu ML will cater to the needs of Jhillingburu-I lease also.

3.7 RESOURCE OPTIMIZATION / RECYCLING AND RESOURCE

Effluents from the vehicle washing area in the workshop (9 m³/d) may contain suspended solids and oil & grease. The water shall be collected by garland drains and routed to a settling pit with a oil & grease trap. The clarified water shall be used for afforestation and greenbelt development.

3.8 SITE SERVICES

3.8.1 Water Requirement:

60 m³/day of water will be required for dust suppression operations. Another 27 (18+9 – recycled) m³/day of water will be required for irrigation of plantations and green belt. 10 m³/day of potable water will be required for mine drinking water, pit head baths, canteen etc. The water will be drawn from Karo River and treated using existing facilities before being distributed.

3.8.2 Power Requirement

As all machinery shall be diesel powered, no electric power shall be required for mine operations. Power shall not be required for illumination as the mine shall work only during day times. However, an estimated 3 kW of electricity shall be consumed in the mine's offices, rest shelter canteen etc. This power shall be supplied from Durgaiburu Lease.

3.8.3 Amenities

The mine shall have a site office. Rest shelters with drinking water facilities, toilets, bathing and washing facilities and canteen shall be provided. There shall be a First Aid Centre with an ambulance always available. Other amenities and infrastructure, such as township, hospital, stores, workshop, community center, schools etc. shall be shared with those of Durgaiburu Lease.

3.9 WASTES

Only solid wastes shall be generated from mining operation, whose quantity and disposal strategy has been described above. The existing pit bottoms do not touch the ground water table. The ultimate pit bottoms shall also not touch the ground water table. Thus no water, except storm water, shall be discharged from the mine.

4.0 SITE ANALYSIS

4.1 CONNECTIVITY

The lease area can be approached by all-weather metalled roads *viz.* Jamda - Thalkobad road. The nearest railway station is Gua on SE Railway's electrified broad gauge branch Rajkharsawan Junction (on Howrah–Mumbai main line) – Barajamda- Gua branch line. Gua railway station is located in the Surface Right Area of Gua Ore Mine about 2.5 km from Jhillingburu–I lease. The railway line from Gua to Barajamda is a single line; from Barajamda to Rajkharsawan the line is doubled. The leasehold is well connected with Tatanagar (147 km) by metalled road as well as by rail route via Barajamda, and Noamundi and Chaibasa. Gua Ore Mines can also be approached through metalled and unmetalled roads from Manoharpur railway station on Howrah–Bombay main line. The haulage distance to IISCO (Burnpur) is 267 km. The nearest National Highway is NH – 215, which runs 20 km south of Jhillingburu – I mine lease. The nearest airport, with regular scheduled services, is at Ranchi which is about 250 km from mine site.

4.2 LAND FORM, LAND USE, OWNERSHIP

The mine lease area falls entirely within Ghatkuri compartment under Gua Range of Saranda Forest Division in West Singhbhum District, Jharkhand.

The Topography is gently slopping type barring occurrence of few elevated areas/spurs in the region. The total lease hold is located in the foot hill of the main hill range of Durgaiburu lease. The ML area occupies the east central portion of the hill base. Highest level of the area is 600 m AMSL and lowest level of the area is 420 m AMSL.

Of the total 210.526 ha lease area, permission has been received for diversion of 32.110 ha of Forest Land, of which 6.69 ha has been utilized for open cast quarries and remaining 25.42 has been utilized for infrastructure. Stage-I FC has been obtained for diversion of entire forestland covering 210.526 ha.

4.3 TOPOGRAPHY

The topography is gently sloping type barring occurrence of few elevated areas/spurs in the region. It is gently sloping from, West to East. Highest RL of the area is 600 MSL and lowest RL is 420 MSL.

4.4 LAND USE

The entire lease area is located in Forest Land. Permission has been received for diversion of 32.110 ha of Forest Land within the mine lease. The existing Land Use pattern in the lease is as follows:

Sl.No.	Particulars	Areas in (ha)
1.	Excavated Area (Mining)	6.69
2.	Infrastructure & WTP	25.42
4.	Unutilised	178.416
Grand Total		210.526

The Karo River flows towards the north just outside the lease's eastern boundary. Another perennial river, the Koina flows 6 km to the west (Jhillingburu I lease does not fall in the catchment area of Koina).

4.5 EXISTING INFRASTRUCTURE

Haul roads, mine office, rest shelters are already existing within the mine lease. These will be augmented on resumption of the project. Other common infrastructure for the entire mine such as Main Administrative Building, workshop, stores, hospital, township and railway siding are existing in the Surface Right Area of Gua Ore Mines.

4.6 SOIL CLASSIFICATION

The soil is lateritic, typical of the area. The thickness of the top soil varies from nil (due to outcropping of ore to maximum of 60 cm.

4.7 CLIMATE

The mine lease area lies in tropical region where climate is characterised by very hot summers and cool winters. Summer is typically from March to June when monthly temperature ranges from a maximum of 40°C during daytime to a minimum of 20°C at night. Winter is from November to February when the maximum temperature during day goes up to 30°C and minimum temperature at night becomes as low as 10°C. The average annual rainfall as recorded at IMD observatory at Chaibasa is 1192 mm. The Southwest monsoon lasts from mid June to mid September and the area gets more than 80% of the annual rainfall during this period.

4.8 SOCIAL INFRASTRUCTURE AVAILABLE :

Gua Mine has been operating since 1927. IISCO (the original mine operator) and SAIL (who have taken over IISCO), have been providing social amenities for local villagers, most of whom are tribals. IISCO / SAIL have made arrangements for supply of clean drinking water to nearby villages. The company has built roads, community halls, bus shelters in villages. Village schools have been provided financial and material assistance. Financial grants have been given to village events / festivals. SAIL has a well-equipped hospital at Gua Township to cater to the needs of the mine's employees and their dependents. The hospital's facilities are also available to local villagers at nominal charge. SAIL's doctors hold free medical camps twice in a week, where medicines are also provide free of charge. SAIL has also been distributing good quality saplings of fruit bearing trees to local villagers free of charge.

5.0 PLANNING BRIEF :

5.1 PLANNING CONCEPT :

The proposed project envisages resumption of mining of a closed opencast mine. The mine had commenced operations in the early 1960s but had stopped operating in 1972. Mining resumed in 2008-09 but has been discontinued for want of environmental clearances. The basic infrastructure required for resuming operations are already in place. Once the necessary clearances are obtained mining will be resumed with an initial production of 61,000 t/yr of manganese ore.

5.2 LAND USE PLANNING :

The existing land use and the land use at the end of the mine's life are as follows:

Sl. No.	Type of land use	Area of land use (in ha)	
		Existing	Conceptual
1	Excavated Area (Mining)	6.69	95.34
2	Top Soil Storage	Nil	2.380
3	Waste Dump	Nil	10.000
4	Mineral Stock Yard	-	8.000

Sl. No.	Type of land use	Area of land use (in ha)	
		Existing	Conceptual
5	Infrastructure	25.42	25.420
6	Roads	-	0.900
7	Forestation	-	63.786
8	* Safety Zone	4.7	4.7
9	Undisturbed	173.716	0
	Total	210.526	210.526

On cessation of mining/ exhaustion of reserves, the mine will be shut down as per the Approved Mine Closure Plan. Some of the infrastructure will be dismantled. Others will be handed over to the State Government or the local populace. The waste dumps will be stabilized and biological reclaimed. Plantations will be carried out on benches and floors of unfilled quarries.

5.3 ASSESSMENT OF INFRASTRUCTURE DEMAND

Most of the infrastructure necessary for resumption of mining are already in place. Some of the existing infrastructure such as workshop, stores, railway siding, water pump house etc. are already at place in the adjoining Durgaiburu ML of SAIL .

Jhillingburu I mine will employ 152 persons of whom most will be local villagers. Less than 40 persons comprising of the officers, highly skilled workers and clerical staff may come from outside. These people will be provided accommodation in the existing Gua township, which has all amenities and is being expanded.

5.4 AMENITIES / FACILITIES

During the first year of proposed plan period SAIL will construct site office, Time Office, First Aid center, Rest shelter and Canteen etc. A rest shelter will be provided near working quarry. Provision of potable water will be made from stage pump no. 2.

6.0 PROPOSED INFRASTRUCTURE :

The area is well connected by road and rail network. The area is self sufficient to cater the needs of the project, hence, no additional infrastructure, other than some offices and rest shelters for workers, is proposed. A common township with necessary amenities is already in existence.

Green Belt : Plantation will be done along the periphery of ML boundary. During the 1st five years 4.70 ha of green belt will be planted all along the periphery of the ML boundary. Further plantation will be done all around the infrastructure of the ML area. Sapling will be planted with different species like Neem, Kusum, Jamun, Mahua, Guava, and other fruit bearing trees etc. By the end of the mine's life, plantations and green belt will cover 63.786 ha area.

CSR Activities: SAIL is already doing several activities under Corporate Social Responsibility and job are taken up within nearby villages falls within 10 km periphery of the project. Activities under CSR schemes already taken up are as follows:

- Free Medical Camp with medicine
- Solar light
- Distribution of School bags and stationary.
- Construction of Community Hall
- Approach Road
- Drinking Water supply
- Digging of Tank in villages
- Self employment / Income generation programme

7.0 REHABILITATION & RESETTLEMENT (R&R) PLAN :

The project does envisage any leasing or acquisition of private land. Hence there won't be any land oustees who have to be resettled or rehabilitated.

8.0 PROJECT SCHEDULE & COST ESTIMATE

8.1 LIKELY DATE OF START OF CONSTRUCTION AND LIKELY DATE OF COMPLETION:

The mine will be re-opened within about six months of receipt of all necessary statutory clearances. Initially the mine office, rest shelters and other amenities, which are lying unused since 1995 will be re-opened and refurbished. Simultaneously, clearing of the scrub vegetation from the quarries will be taken up. The production capacity of 61,000 t/yr will be maintained during the course of mine life.

8.2 ESTIMATED PROJECT COST ALONG AND ECONOMIC VIABILITY OF THE PROJECT

The estimated project cost will be Rs. 10.28 Crore. The mine abandonment cost has been estimated to be Rs. 175 lakhs.

8.2.1 Cost of Mining :

Production cost for Jhillingburu - I mine after re-opening has been worked out taking into account the annual production capacity (after expansion), requirement/ linkages/sourcing and pricing of various input materials to the mine site, requirement of manpower and their salaries & wages, power, fuel and other services & utilities, consumables, maintenance spares and various overhead expenses (this includes an annual expenditure of Rs 50,00,000/- under CSR activities).

The estimated production cost (including depreciation & interest) at 100% capacity utilization after proposed expansion will be Rs. 1100/- to Rs. 1400/- per tonne of product.

8.2.2 Cost of Mineral :

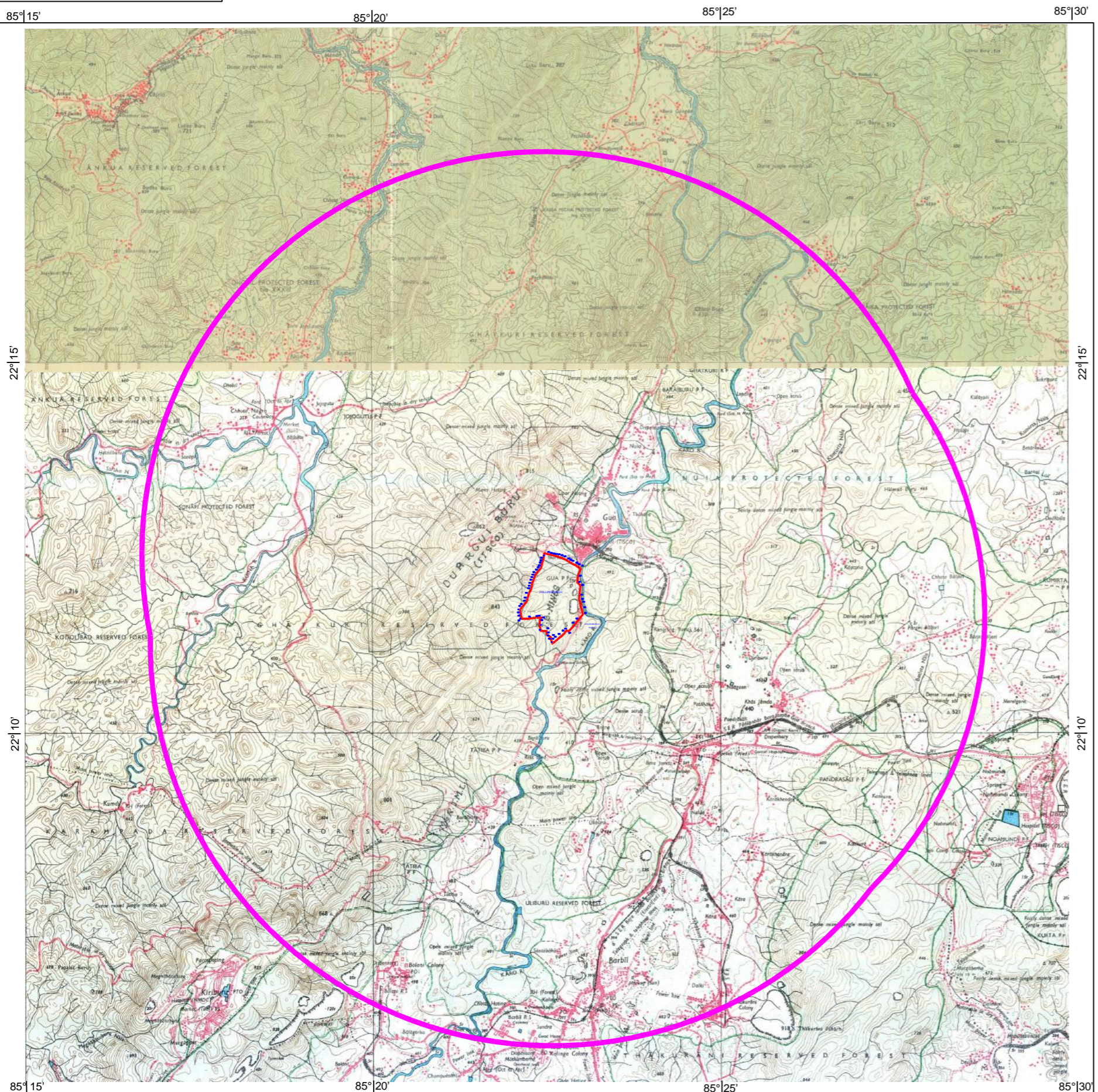
The entire production of manganese ore from Jhillingburu – I Mine will be consumed in SAIL's own steel plants. Cost of Production of manganese ore will claim on transfer price Rs. 1100 - 1400/- per tonne.

9.0 ANALYSIS OF PROPOSAL (FINAL RECOMMENDATION)

The re-opening of Jhillingburu-I project will have the following benefits:

- provide necessary raw materials for the steel industry from an indigenous source.
- add to revenue generation of the District / State.
- provide additional direct or indirect employment to the local population of the area.
- aims to fulfill its social sustainable responsibility through promoting and maintain permanent structure as follows :
 - Facility for village school including classroom, toilet construction, ceiling fan/coolers or books for school library.
 - Vocational training to be provided to the persons for improving their skills in income generation techniques like stitching, Hatchery. Plumber, carpenter, blacksmith etc.
 - Formation of self help groups to develop the saving and helping each other with financial resources instead of going for heavy interest debts.

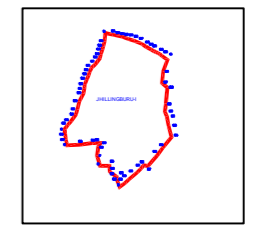
Considering the above points re-opening of Jhillingburu I mine has become necessary.



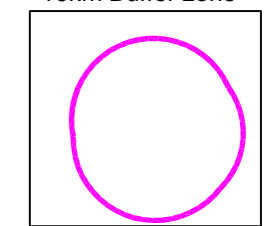
Pillar coordinates of the ML

Sl. No.	Pillar No.	Latitude	Longitude
1	PILLAR 23	22° 12' 28.415" N	85° 22' 20.977" E
2	PILLAR 14A	22° 12' 27.146" N	85° 22' 20.593" E
3	PILLAR 14B	22° 12' 24.736" N	85° 22' 19.874" E
4	PILLAR 14C	22° 12' 23.058" N	85° 22' 19.373" E
5	PILLAR 14D	22° 12' 20.518" N	85° 22' 18.717" E
6	PILLAR 14E	22° 12' 18.736" N	85° 22' 18.238" E
7	PILLAR 14F	22° 12' 15.554" N	85° 22' 17.093" E
8	PILLAR 14G	22° 12' 14.187" N	85° 22' 16.150" E
9	PILLAR 14H	22° 12' 11.667" N	85° 22' 14.232" E
10	PILLAR 14I	22° 12' 9.940" N	85° 22' 13.032" E
11	PILLAR 14J	22° 12' 7.900" N	85° 22' 12.007" E
12	PILLAR 14K	22° 12' 5.446" N	85° 22' 10.630" E
13	PILLAR 14L	22° 12' 3.306" N	85° 22' 10.310" E
14	PILLAR 14M	22° 12' 0.955" N	85° 22' 9.936" E
15	PILLAR 14N	22° 11' 56.874" N	85° 22' 7.916" E
16	PILLAR 14O	22° 11' 52.934" N	85° 22' 6.894" E
17	PILLAR 14P	22° 11' 50.186" N	85° 22' 6.117" E
18	PILLAR 14Q	22° 11' 46.703" N	85° 22' 4.080" E
19	PILLAR 14R	22° 11' 44.764" N	85° 22' 2.495" E
20	PILLAR 14	22° 11' 42.959" N	85° 22' 0.438" E
21	PILLAR 15A	22° 11' 40.509" N	85° 22' 0.674" E
22	PILLAR 15B	22° 11' 37.750" N	85° 22' 1.096" E
23	PILLAR 15	22° 11' 34.847" N	85° 22' 1.769" E
24	PILLAR 17A	22° 11' 35.082" N	85° 22' 8.123" E
25	PILLAR 17B	22° 11' 35.960" N	85° 22' 14.311" E
26	PILLAR 17C	22° 11' 35.898" N	85° 22' 16.108" E
27	PILLAR 17D	22° 11' 35.926" N	85° 22' 18.494" E
28	PILLAR 17E	22° 11' 34.181" N	85° 22' 17.433" E
29	PILLAR 17	22° 11' 29.558" N	85° 22' 16.883" E
30	PILLAR 18	22° 11' 25.471" N	85° 22' 18.368" E
31	PILLAR 18A	22° 11' 25.754" N	85° 22' 22.953" E
32	PILLAR 18B	22° 11' 22.407" N	85° 22' 23.106" E
33	PILLAR 18C	22° 11' 21.572" N	85° 22' 24.590" E

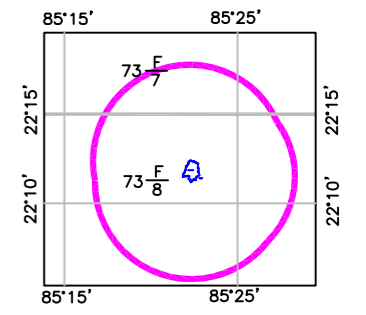
Mine Lease




10km Buffer zone



Toposheet Index



DRAWING NO. MEC /G23J/11/S2/(F-I)1

	PROJECT PROPONENT	STEEL AUTHORITY OF LIMITED LTD.
	EIA CONSULTANT	मेकॉन लिमिटेड MECON LIMITED
SECTION	RM & M.	JHILINGBURU I MINING PROJECT
LOCATION	RANCHI	
Mining Lease Area superimposed on toposheet		SCALE : As shown
TOPOSHEET NOS.- 73 F/7 & 73 F/8		REV
REFERENCES		0

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