INDIAN METALS & FERRO ALLOYS LIMITED

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Date : 22.08.2018

To

Director (EAC Non-Coal Mining),
IA Division
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhavan,
Aliganj, Jorbagh Road,
New Delhi-110003

Subject: Environmental Clearance of Sukinda Mines (Chromite) of M/s Indian Metals & Ferro Alloys Limited located in Village: Kaliapani, Tehsil: Sukinda, District- Jajpur, Orissa (MLA: 116.76 Ha)- **Regarding Extension in validity of ToR**

Reference: a) ToR Letter no. J-11015/204/2015-IA.II(M), dated 24.08.2015
b) Proposal no. IA/OR/MIN/28526/2015
c) Our letter dated 17th August, 2018.

Dear Sir,

With reference to above, we would like to bring to your kind notice that our project was granted TOR for enhancement in production from 3.51 Lakh TPA to 6.0 Lakh TPA, change in technology from opencast to both opencast & underground mining and establishment of Chrome Ore Beneficiation plant of 40 TPH feed capacity from your good office vide letter no. J-11015/204/2015-IA.II(M), dated 24.08.2015. As per ToR Condition, Public Hearing was conducted on 23rd June 2017 and Final EIA for appraisal was uploaded on portal on 18.09.2017. EDS was sought by Ministry on 04.05.2018. Reply of EDS was submitted on 07.07.2018. However due to certain reasons, appraisal of the Final EIA could not be done. Our ToR is now expiring on 23rd August, 2018 and for the appraisal of our EIA it is essential that validity of ToR shall be extended.

In view of the provisions contained in OM no J-11013/41/2006-IA-11(I) dated 29th August, 2017, you are kindly requested to grant us extension in the validity of the ToR for one more year for which we shall remain grateful to you. You are also requested to kindly allow us to submit the ToR extension at MoEF&CC portal.

Thanking you,

Yours Faithfully
for **Indian Metals & Ferro Alloys Ltd.**

(Sanjeev Das)
Sr. Vice President,
Head- Mining Business Unit
(Authorized Signatory)

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Dated 30th August, 2018

To Whom It May Concern

I hereby authorize M/s Perfact Enviro Solutions Pvt. Ltd., Address- 505, 5th Floor, NN Mall, Mangalam Palace, Sector-3, Rohini, New Delhi-100085, one of the approved consultant of Ministry of Environment, Forest & Climate Change, Govt. of India listed on MoEF&CC website for getting Environmental Clearance for my project "Sukinda Mines (Chromite) MLA: 116.76 ha. located at Village: Kaliapani, Tehsil: Sukinda, District- Jajpur, State: Odisha" from MoEF&CC, New Delhi.

Thanking You.

Yours faithfully,
For Indian Metals & Ferro Alloys Ltd.

(Sanjeev Das)
Sr Vice President,
Head – Mining Business Unit
Authorised Signatory

APPLICATION FOR GRANT OF EXTENSION IN TERMS OF REFERENCE

FOR
SUKINDA MINES (CHROMITE)
(ML Area: 116.76ha)
Proposed Production of Chromite Ore: 6 Lakh TPA

AT
Village - Kaliapani ,
Tehsil –Sukinda , District-Jajpur, Odisha

Project Proponent

M/s Indian Metals and Ferro Alloys

Correspondence Address: IMFA Building, Rasulgarh, Bhubaneshwar-751010
Odisha

Prepared By

Environmental Consultant

M/s Perfact Enviro Solutions Pvt. Ltd.
NABET registered Environment Consultant
List 1-Rev 68 A/10th August, 2018 at S.No.-116
503-507, 5th Floor, NN Mall, Mangalam Palace, Sector 3, Rohini, New Delhi
Phone No.: 011-49281360

Contents

FORM-I

FORM – 1

(I) Basic Information

S.No.	Item	Details
1.	Name of the Project/s	Sukinda Mines (Chromite)
2.	S. No. in the schedule	1 (a)- Mining of minerals
3.	Proposed Capacity/area/ Length/tonnage to be handled/ command area/ lease area/ number of wells to be drilled.	Maximum Proposed Production of Ore- **6.0 lakhs Tonnes Per Annum as per exploration details and approved mining plan from time to time.** Total area for ML: 116.76 ha
4.	New/Expansion/Modernization	Expansion from 3.51 Lakhs TPA to 6 lakhs TPA with change of mining technology from opencast to both opencast and underground along with 40 TPH capacity (input) beneficiation plant installation.
5.	Existing Capacity/Area etc.	3.51 Lakh TPA (Previous EC file No.-J-11015/346/2007-IA.II (M) on dated 18.06.2008 and extension of the same vide letter dated 22.05.2012 and 11.08.2014, for 3.51 Lakh TPA chromite ore)
6.	Category of project i.e. 'A' or 'B'	'A'
7.	Does it attract general conditions? If yes, Please Specify.	No
8.	Does it attract the specific condition? If yes, please specify.	No
9.	Location	Topo sheet 73-G/16 (OSM Sheet No: F45N16) Lat- $21^0$01'45.51"N to 21^0 02'33.81" N Long- 85^0 45'35.91" E to $85^0$46'42.03" E.
	Plot/survey/Khasra No.	488 (p), 502, 627 (p), 628 (p), 629, 630 (p), 641 (p), 691 (p), 888 (p), 889 (p), 892 (p), 894 (p), 895 (p), 627/1010(p), 627/1011(p), 883 (p)
	Village	Kaliapani Village
	Tehsil	Sukinda
	District	Jajpur
	State	Orissa
10.	Nearest Railway station/ airport along with distance in kms.	Nearest Railway station: Tomka railway Station–23 Km NE Nearest Air Port: Bhubaneswar Airport: 88.57 Km S

11.	Nearest Town/ city/ district Headquarters along with distance in kms.	Jajpur- 52 km, SE
12.	Village panchayats, Zilla parishad, Municipal corporation, Local body (complete postal addresses with telephone nos. to be given)	Village Panchayat – Kaliapani Zilla Parisad: Sukhinda Taluk
13.	Name of the applicant	Mr. Sanjeev Das
14.	Registered Address	IMFA Building, Rasulgarh, Bhubaneshwar, Odisha-751010
15.	Address for correspondence	
a	Name	Mr. Sanjeev Das
b	Designation (Owner/Partner/CEO)	Sr. V.P. (Head Mining Business Unit)
c	Address	IMFA Building, Rasulgarh, Bhubaneshwar, Odisha
d	Pin code	751010
e	E-mail	minesplanningcell@imfa.in
f	Telephone No.	0674-2580100
g	Fax. No.	0674-2580020
16.	Details of alternative Sites examined, if any. Location of these sites should be shown on a Topo sheet.	Not applicable
17.	Interlinked Projects	Not applicable
18.	Whether separate application of interlinked project has been submitted?	Not applicable
19.	If Yes, date of submission	Not applicable
20.	If No, reason	Not applicable
21.	Whether the proposal involves approval/ clearance under: if Yes, details of the same and their status to be given. (a) The forest (conversation) Act, 1980? (b) The wildlife (Protection) Act, 1972? (c) The C.R.Z. notification, 1991?	a) Yes, 115.05 ha. land of the lease is forest land for which forest clearance has been obtained. b) Not Applicable c) Not Applicable
22.	Whether there is any Government Order/Policy relevant/ relating to the site?	No
23.	Forest land involved(hectares)	As per Hon'ble Supreme Court guidelines of 10th March, 2015, 115.05 ha land of the lease is declared as forest land. Stage II Forest

		clearance has been obtained
24.	Whether there is any litigation pending against the project and/or land in which the project is proposed to be set up. (a) Name of the court (b) Case No. (c) Orders/ directions of the Court, if any and its relevance with the proposed project.	No (a) Not applicable (b) Not applicable (c) Not applicable

(II) Activity

1. **Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)**

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	Yes	Land Use has already been changed from Government waste land (116.76 ha. out of which 115.05 ha. land was declared as forest land and clearance of the same has been obtained) to mining area. This is an existing opencast working mine, there will not be any change in land use of the mine lease. The land cover or topography will change in time with the approved mining scheme.
1.2	Clearance of existing land, vegetation and buildings?	No	The project does not involve any additional clearance of existing vegetation or building.

1.3	Creation of new land uses?	Yes	It is an existing opencast mine. The mine lease area is already being used for mining & allied activities. Expansion is proposed on existing lease area only for underground mine and for setting up a beneficiation plant.
1.4	Pre-construction investigations e.g. boreholes, soil testing?	No	This is an existing mine. Detailed exploration of the area by way of core drilling was done in the year 1999 – 2000, 2000 – 2001, 2001 – 2002, 2007 – 2008, 2010 – 11, 2011-12, 2012 – 13 & 2017-18. Details of exploration is given in Pre-Feasibility report.
1.5	Construction works?	No	Mine and Administrative building, survey room, creche, canteen, rest shelter, dispensary, workshop, store, GVTC building, telecommunication and power supply etc. area already existing. Additional construction is proposed in the form of a beneficiation plant and surface structure of Shafts for underground mining.
1.6	Demolition works?	No	There is no demolition work involved.
1.7	Temporary sites used for construction works or housing of construction workers?	No	No temporary housing required as facilities like staff quarters, guest house, bachelor's barracks have been commonly provided for residence of employees for Sukinda and its adjoining Mahagiri mine.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	Yes	Mining activities like excavation and dumping will be done during this scheme period. Infrastructure like offices, store, dispensary, workshop, canteen etc exists. Further as per proposal Chrome Ore Beneficiation Plant will be set up over lease area.
1.9	Underground works including mining or tunneling?	Yes	Underground mining including shaft sinking will be done.
1.10	Reclamation works?	Yes	Dead end slope of the OB dump for an area on 13.684 ha. has been reclaimed & plantation done with 49332 nos of saplings over it till 31.03.2018. The overburden generated during the scheme period shall be accommodated in the OB dump. As the quarry shall not reach its ultimate pit limit till the end of the scheme period i.e. 2018-19, so there is no proposal for reclamation in the quarry.
1.11	Dredging?	No	Not Applicable
1.12	Offshore structures?	No	Not Applicable

1.13	Production and manufacturing processes?	Yes	Open Cast and Underground mechanized method of Mining will be done with drilling and blasting. The process of Chromite ore production from the mine will involve drilling, blasting, loading and transportation to the Ferro Chrome plants. The methodology of mining and its process details are given in PFR as enclosed.
1.14	Facilities for storage of goods or materials?	Yes	Store room and mineral stack yard will be provided for raw materials. The magazine has been provided to store the explosives with permission from the concerned authorities.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	It is proposed to start underground development in Band I. The overburden/waste generated will be dumped in the existing dump yard or will be backfilled in the mined-out area of Band I. Run-off from the mine is channelized to the garland land to settling pond constructed at the toe of the dump yard. The proposed COBP tailings (-10% Cr_2O_3) after being dried shall be dumped in the existing dump yard Domestic waste will be disposed off to soak pit via septic tank.
1.16	Facilities for long term housing of operational workers?	No	There is no proposal for construction of any captive colony inside leasehold area. Facilities like staff quarters, guest house, bachelor's barrack and administrative buildings etc has already been provided within the lease.
1.17	New road, rail or sea traffic during construction or operation?	No	Haul roads already exist inside the lease area.
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No	No other transport infrastructure is needed.
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	There is no proposal for closure or diversion of existing transport routes or change in traffic movements.
1.20	New or diverted transmission lines or pipelines?	No	No new or diversion of transmission lines or pipelines involved.

1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	No change is envisaged.
1.22	Stream crossings?	No	No stream is crossing within the lease area.
1.23	Abstraction or transfers of water form ground or surface waters?	Yes	The ground water abstraction for industrial and allied uses is 240 Cu M /day, as per CGWA permission F.No: CGWA/NOC/MIN/ORIG/2016/2166 dated 06.05.2016. Entire water requirement will be met from three bore wells and treated water from ETP
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	Not applicable
1.25	Transport of personnel or materials for construction, operation or decommissioning?	No	No such activity envisaged.
1.26	Long-term dismantling or decommissioning or restoration works?	No	Not applicable
1.27	Ongoing activity during decommissioning which could have an impact on the Environment?	No	Not applicable
1.28	Influx of people to an area in either temporarily or permanently?	Yes	No influx of people is envisaged. Mostly local people are employed in the mine. Part of supervisory and technical staff are from outside.
1.29	Introduction of alien species?	No	Only locally thriving species will be planted.
1.30	Loss of native species or genetic diversity?	No	No such loss is anticipated.
1.31	Any other actions?	No	Not Applicable

2. **Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are nonrenewable or in short supply):**

S.No.	Information/checklist confirmation	Yes/ No	Details thereof (with approximate quantities / rates, wherever possible) with source of information data

2.1	Land especially undeveloped or agricultural land (ha)	Yes	The total lease area is 116.76 Ha, involving no agriculture land. Mine is under operation since 1999.
2.2	Water (expected source & competing users) unit: KLD	Yes	Water consumption is for domestic purpose, plantation and water sprinkling for dust suppression on haul road and make up water for COB. The ground water abstraction is 240 Cu M/day & 3260 CuM/day seepage water, for which CGWA permission has been obtained vide F.No: CGWA/NOC/MIN/ORIG/2016/2166 dated 06.05.2016. Source: Existing Bore wells & Mine Seepage water.
2.3	Minerals (MT)	No	No mineral will be used.
2.4	Construction material – stone, aggregates, sand / soil (expected source – MT)	YES	Some quantity of aggregate, sand and other building material will be used for installation of beneficiation plant and structure of shaft
2.5	Forests and timber (source – MT)	No	The lease area falls under forest area which has already been diverted for mining use.
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	Power line has been drawn from the CESU grid line to this lease which runs for about 2.5 km. A 250 KVA Substation has been established in Sub-Station-1 & 500 KVA substation has been established in sub-station-2 with 33 KV/415V transformers. 415V power has been drawn from these substations. One 62.5 KVA, 200 KVA , 82.5 KVA & 250 KVA D G sets have been installed for illumination as well as operation of pumps in case of power failure. Power requirement for underground mine & COBP will be 4MVA and it will be met from CESU.
2.7	Any other natural resources (use appropriate standard units)	No	Not Applicable

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S.No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data

3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	**Yes**	HSD, explosives for blasting will be used and stored in the mine.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	**No**	Suitable drainage and waste management measures shall be adopted. This restricts stagnation of water or accumulation of water, hence there will be no occurrence of any disease. Proper training regarding health and hygiene is provided to the workers.
3.3	Affect the welfare of people e.g. by changing living conditions?	**Yes**	The project will benefit the locals by direct & indirect employment leading to better lifestyle.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	**No**	The lessee extends their help and monetary supports to welfare measures like free eye camp, health check up camps, provision of hand pumps, road repairing, provision of drinking water etc
3.5	Any other causes	**No**	Not Applicable

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

S.No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
4.1	Soil, overburden or mine wastes	**Yes**	There will be generation of overburden/waste from opencast & underground mine, which shall be dumped in a systematic manner over the existing dump yard and backfilled in the mined-out areas of opencast mine and underground stopes. The waste generated from ETP will be handed over to authorized agencies for disposal. The proposed COBP tailings (-10% Cr_2O_3) after being dried shall be dumped in the existing dump yard.
4.2	Municipal waste (domestic and or commercial wastes)	**Yes**	Municipal waste from domestic is being sent to Soak pit.

4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	Used oil from engines will be carefully stored in leak proof drums in isolated and covered facility. The used oil will be sold to vendors authorized by Central Pollution Control Board for the treatment of the same. Suitable care will be taken so that spills / leaks of used oil from storage will be avoided.
4.4	Other industrial process wastes	No	No other industrial waste generated.
4.5	Surplus product	No	Nil
4.6	Sewage sludge or other sludge from effluent treatment	Yes	Sludge generated from domestic is being sent to soak pit. Sludge from ETP is sent to authorized vendor.
4.7	Construction or demolition wastes	No	Not Applicable
4.8	Redundant machinery or equipment	Yes	As per replacement Schedule for the machinery or equipment, which has covered its economic life will be replaced with new equipment and old equipment will be disposed of appropriately
4.9	Contaminated soils or other materials	No	There is no top soil in the area as this is an existing mine. However, precautions will be taken to avoid spillage of used oil etc.
4.10	Agricultural wastes	No	No agricultural waste generated.
4.11	Other solid wastes	No	No other solid waste generated.

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	Diesel is used to run machineries and truck. They are likely to produce CO, SO_2& NOx. Emissions are also generated from standby DG sets. Proper maintenance of the mining equipments will be taken up.
5.2	Emissions from production processes	Yes	The project proposal is for both open and underground mining, and COB plant. Presently opencast mining is being carried out. Dust and particulates matters is being generated during the mining activity. Regular water sprinkling is done to arrest

			generated dust and particulates matters.
5.3	Emissions from materials handling including storage or transport	Yes	Fugitive dust is and will be generated from material handling and its transportation route, dumping and mineral stacking. Dry fog/water sprinkling system is adopted to control the emission of dusts. Trucks are covered by tarpaulin and are not overloaded.
5.4	Emissions from construction activities including plant and equipment	yes	There may be limited dust emissions during construction process of beneficiation plant and shaft structures. Due precaution will be taken to contain the emissions.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	Yes	Fugitive dust will be generating from handling and loading of material i.e. minerals, wastes, OB & rejects dumping.
5.6	Emissions from incineration of waste	No	Not envisaged.
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	No such activity is proposed.
5.8	Emissions from any other sources	Yes	Drilling and blasting are the other source of emission.

6. Generation of Noise and Vibration, and Emissions of Light and Heat:

S.No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	Noise generating machinery including the transport vehicles is being maintained properly. Operators of high noise generating equipments are provided with earmuff. Air silencers are provided in the machines to module the noise. Acoustic enclosures have been provided in the Genset to control the noise level. Exposure time of workers at high noise levels is reduced. There may be noise from the

			hauling operation through shaft and machines of beneficiation plant. These will be contained by taking suitable measures and by providing appropriate enclosures.
6.2	From industrial or similar processes	No	No other industrial process envisaged
6.3	From construction or demolition	No	No large scale construction or demolition activity generating noise or vibration envisaged.
6.4	From blasting or piling	Yes	Blasting is carried out during the opencast workings. Blasting parameters have been designed after carrying out study by CIMFR to keep vibration under control.
6.5	From construction or operational traffic	Yes	Mined out minerals will be transported to plant by truck. This will generate noise on its route which will be less than the prescribed limit.
6.6	From lighting or cooling systems	No	No cooling system required
6.7	From any other sources	Yes	From DG set. To control noise level DG sets are acoustically enclosed.

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

S.No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	Yes	Storage of used/waste oil on impervious surface will be provided. The used oil will be disposed to vendors authorized by CPCB/SPCB. Handling and storage of HW will be strictly followed as per HWM Rules 2016.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	No	Generation of mine water from the opencast pit is being pumped to common effluent treatment plant and treated. The treated water is being used for mines allied activities and for dust suppression. No effluent water will be discharged out of the mining lease area. In future, mine underground water also shall be pumped

			and will be channelized to the ETP through garland drains / pipeline from where treated water will be used in mine for sprinkling, plantation purpose and also in the beneficiation plant. Excess water will be discharge to the land after confirming the prescribed CPCB/SPCB norms. However, surface runoff during rainy season is coursed through garland drain into a sump and pumped to ETP for treatment. Most of the water used for the beneficiation of ore will be recycled. Only dried solid will be dumped on the dump yard designated for the purpose. The generated sewage from mine office and canteen etc. will be discharged to septic tank followed by soak pit.
7.3	By deposition of pollutants emitted to air into the land or into water	Yes	Deposition of dust on land due to mining, transportation will have negative impact and proper measures will be taken. All emission will be maintained strictly as per limits.
7.4	From any other sources	No	None
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	Yes	Project authorities are keen to follow the prescribed conditions as laid down in EC and will continue to do so.

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment.

S.No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	Yes	Explosive materials is being used for blasting in the mines. All appropriate measures is being taken as described in approved mining plan and as per statutory provisions and direction of DGMS. Hazardous waste shall be stored in leak proof drums/pits and kept in isolated place.
8.2	From any other causes	No	Not Applicable

8.3	Could the project be affected by natural disasters causing environmental damage (e.g: floods, Earthquakes, landslides, cloudburst etc).	Yes	The project may be affected by natural disasters. The mine lease area falls in Seismic Zone-II. Therefore, it is relatively safe from earthquake damage. Proper angle of repose will be kept to guard against such landslides. However timely evacuation, relief and rehabilitation activities have been planned by the management using their own resources and from outside agencies. Stoping operation including driving in the underground mine will follow safe procedure and adequate supports will be provided in the excavated areas.

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality.

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.: •Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • housing development • extractive industries • supply industries • other	Yes No Yes No Yes	Development of road and traffic density Not envisaged. Mined out minerals will be sent to the plant and low grade material is to be upgraded through beneficiation plant No as the suppliers are already identified. Indirect employment and transportation of material.
9.2	Lead to after-use of the site, which could have an impact on the environment	Yes	The mine will be abandoned as per Post mine closure plan; hence the adverse impact will be minimized.
9.3	Set a precedent for later developments	Yes	Development of good landscape
9.4	Have cumulative effects due to proximity to other existing or planned projects with	No	Not Applicable

	similar effects		

(III) Environmental Sensitivity

S.No.	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	None	None
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	**Water Sources or other water bodies** Damsal Nala Damsal Canal Karchamula Nala Nadibarana Nala Right Bank Canal Poruajora Nadi Pandara Nala Ragada Dam Puagaghua Nala Sasubhuashuri Nala Patharkanchia Nala Near Manatirari vill. Canal Petapeti Nala **Forest** Mahagiri PF Daitari PF Dhalparha RF Birasal RF Ranjagarh RF Tipilei RF Barabati PF Bhuban RF Pubal PF	 0.74 Km NW 4.13 km SW 2.93 Km W 3.88 Km W 4.11 Km W 8.91 km SW 4.54 km S 4.15 km NW 4.16 km, W 4.5 km, NW 9.5 km, SE 10.6 km, SE 9.2 km, W Project area falls 2.42 km NE 6.57 km S 6.25 km SW 3.78 km NWW 10.92 km, SW 10.93 km, SE 11.5 km, S 12.7 km, SE

3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	None	None
4	Inland, coastal, marine or underground waters	Not within 15 km	Not within 15 km
5	State, National boundaries	Not within 15 km	Not within 15 km
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	**Road/Highways** Kaliapani Road NH- 200 **Railway Station** Tomka Railway Station **Airport** Bhubneshwar Airport	 Adjacent to Project Area 11.83 Km S 23 Km NE 88.57 Km S
7	Defense installations	None	None
8	Densely populated or built-up area	Bhimtanagar	1.21 km SW

9	Area——s occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	**Hospital** OMC Hospital Tata Steel Hospital OMC Hospital, Daitari **Schools** Stewart School Shree Maa Aurbinda School Kakudia Primary School Krushnapur UP school **Place of worship** Jagannath Temple Kalarangi Shiv Mandir Lord Marang Buru Mandir Hanuman Mandir **Post office** Kalaringatta S.O. Kansa post office Ransol post office **Bank** State Bank of India HDFC Bank ATM Andhra Bank	 0.63 Km W 1.20 Km SW 9.39 Km NE 1.42 Km SW 2.06 Km NW 3.49 Km SW 4.78 Km SW 1.34 Km SW 3.99 km SW 4.15 Km NW 4.04 Km NE 1.81 Km SW 3.78 Km NE 4.44 Km SW 1.60 km SW 1.58 km SW 0.65 km W
10	Areas containing important, high quality or scarce resources (Ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	None	None
11	Areas already subjected to pollution or environmental damage. (Those where existing legal environmental standards are exceeded)	None	None within 15 Km
12	Areas susceptible to natural hazard which could cause the	Low damage risk zone	The project falls in seismic zone II as

	project to present environmental problems (Earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)		per the seismic map zone of India.

(IV) PROPOSED TERMS OF REFERENCE:

I hereby give an undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the project will be revoked at our risk and cost.

Date: _____
Place: Jajpur, Odisha

AUTHORIZED SIGNATORY

(Sanjeev Das)
Sr. Vice President,
Head – Mining Business Unit

M/s Indian Metals & Ferro Alloys Limited (IMFA)
IMFA Building, Bomikhal, Rasulgarh
Bhubaneswar (Odisha)- 751010
Tel. No.: 0674 - 2580100
E Mail: sanjeevdas@imfa.in

PRE-FEASIBILITY REPORT

1. Executive Summary

Background information

As per NMI database based on UNFC system, the total reserves/resources of chromite in the country as on 1.4.2015 have been estimated at 344 million tonnes with 102 million tonnes as Reserves (30%) and 241 million tonnes as Remaining Resources (70%). More than 96% resources of chromite are located in Odisha, mostly in Jajpur, Kendujhar and Dhenkanal districts. Minor deposits are scattered over Manipur, Nagaland, Karnataka, Jharkhand, Maharashtra, Tamil Nadu, Telangana and Andhra Pradesh. ***[Indian Minerals Yearbook 2017, 56th Edition].*** The lease was granted to IMFA on 04.09.1999 and doing opencast mining.

In present EC application for Sukinda mines (Chromite) the proposal is for the following:

(i) Change of technology from opencast to opencast & underground mining.

(ii) Increasing the production capacity from 3.51 LTPA to 6.0 LTPA.

(iii) Establishing a Chrome Ore Beneficiation (COB) plant of 40 TPH feed capacity.

Since IMFA has always focused on "value addition" the entire output will be supplied to the company's Ferro chrome /charge chrome manufacturing facilities in Therubali in Rayagada District and Choudwar in Cuttack District in Odisha.

Project Description

The proposal is for Expansion of Mining of Chromite mineral from Sukinda Mines (Chromite) of M/s Indian Metals & Ferro Alloys. The company has vast experience in mining of mineral. The proposal is for enhancement in production from 3.51 Lakh TPA to 6.0 Lakh TPA, change in technology from opencast to both opencast & underground mining and establishment of Chrome Ore Beneficiation plant of 40 TPH feed capacity from the mining lease area spread over 116.76 ha situated at Village: Kaliapani, Tehsil: Sukinda, Distt: Jajpur, Orissa. Environmental Clearance was obtained for a capacity of 2.55 LTPA by Ministry of Environment & Forests vide Letter No J-11015/28/2001-IA.II (M) dated 24.12.2004 and dated 10.02.2005 for 5 years. Proposal for enhancement of production from 2.55 LTPA to 3.51 LTPA was submitted by M/s IMFA and Environmental Clearance was obtained for the project from Ministry of Environment and Forests, vide letter no J-11015/346/2007-IA.II (M) dated 18.06.2008 and extension vide letter dated 22.05.2012 and 11.08.2014 for continuation of production of 3.51 LTPA of Chrome Ore by Opencast Method for Captive use valid up to 03.09.2029 (lease period).

Again, the proposal, for enhancement in production from 3.51 Lakh TPA to 6.0 Lakh TPA, change in technology from opencast to both opencast & underground mining and establishment of Chrome Ore Beneficiation plant of 40 TPH feed capacity was submitted to

Ministry of Environment, Forests & Climate Change (MoEF & CC) on 09.06.2015 vide Proposal number: IA / OR / MIN / 28526 / 2015 for determining the Terms of Reference. The proposal was considered by Honourable Environmental Appraisal Committee (EAC) during its 36th meeting held during July 29– 30, 2015 in New Delhi. Based on the Presentation made and discussion held thereafter the Honourable EAC committee, MoEF & CC has prescribed the Terms of Reference (TOR) vide letter No J-11015/204/2015-IA-II (M) dated 24th August, 2015 for undertaking EIA study in accordance with the provisions of Environmental Impact Assessment Notification dated 14-11-2006. Baseline study was done in Post monsoon season (Oct - Dec 2015). Public Hearing was done on 23.06.2017 as per EIA Notification 2006 & amendments thereof. EIA for appraisal was submitted to MoEF & CC portal on 18.09.2017. EDS was sought by Ministry on 12.06.2018. Reply of which was submitted on 07.07.2018. The case was listed on 23-24 Aug 2018 meeting but due to change of consultant appraisal of the project couldn't be done. A Letter was submitted to MoEF & CC on 20.08.2018 requesting for extension in TOR and deferment of meeting. Now we are requesting for TOR extension with updated documents.

The location of area falls on latitude $21^0$01'45.51"N to 21^0 02'33.81" N and longitude is 85^0 45'35.91" E to $85^0$46'42.03" E. The area falls in the Survey of India Topo sheet 73-G/16 (OSM Sheet no.F45N16). The project comes under Category A as per EIA Notification 2006 and subsequent Amendments.

Mining lease for the project was granted by Govt. of Orissa for 30 years which was executed on 04.09.1999. Mining operations commenced from 15.09.1999. Lessee has applied for extension of mining lease till 2049 as per MMDR, 2015.

The Mining Plan for period 1999-2000 to 2003-2004 was approved by Indian Bureau of Mines vide IBM Lr.No:314(3)/99-MCCM(C)/MP-4, dt 18.11.1999. 1st Modification of the approved mining plan for period 2002-03 to 2003-04 was approved by IBM vide letter no 314 (3)/2002-MCCM (C)/MP-10 dated 18.10.2002. Subsequently, 1st and 2nd Scheme of Mining was approved by IBM for years 2004-05 to 2008-09 and 2009-10 to 2013-14 respectively. The 3rd Scheme of Mining & Progressive Mine Closure Plan for the period from 2014-15 to 2018-19 was approved by IBM vide lr no 314 (3)/2012-MCCM(CZ)/MS-56/255 dated 31.07.2013. Modified Mining Scheme approved vide lr no: MSM/FM/06-ORI/BHU/2016-17/1697 dt: 23.09.2016. Modification in review of mining plan has been approved by IBM for period 2017-18 to 2018-19 vide letter no. MPM/FM/25-ORI/BHU/2017-18/2815 dated 14.02.2018.

Topography of the area comprises of hilly and undulating terrain. The highest elevation in the area is 185 mRL and the minimum is 110 mRL. Overall regional slope is from south to

north. Geological Survey of India carried out exploration on a regional scale in the entire TISCO lease hold area including the area under reference viz. Sukinda MInes (Chromite) during 1978 – 81. After the area was granted, IMFA explored the area in detail by way of core drilling in the year 1999 – 2000, 2000 – 2001, 2001 – 2002, 2007 – 2008, 2010 – 11, 2011-12, 2012 – 13 & 2017-18.

As per exploration done in the lease area the geological reserves as on date is estimated at 346.88 Lakhs Tonnes, Mineable reserves at 85.3 Lakhs Tonnes as per Approved Modified Mining Scheme. For opencast mining Proved Mineable reserve for Band I- 12,74,140 Tonnes and for Band -II it is 13,55,962 Tonnes while for underground mining proved mineable reserve & Resource for under ground mining for Band I- 51.40 Lakh tonnes and feasible mineral reserve for Band I is 51.40 Lakh + 193.78 Lakh =245.18 Tonnes, the life of mine is estimated to be 45.2 i.e. 46 years from the date of starting of production at the maximum production rate of 6 lakhs TPA. However, the validity of the M.L. area is till 2049 as per MMDR Act 2015.

In this project mining has been done by open cast Mechanized method by drilling and blasting. Now, Open cast and Underground mining both are proposed. It is proposed to set up a Chrome beneficiation Plant (COB) of 40 TPH feed capacity. Ore raised from this ML area is transported to company's ferro chrome plant in Choudwar (in Cuttack district) via Tomka or Mangalpur, by road. Also ore is transported to company's ferro chrome plant in Therubali (in Rayagada district) upto Tomka railway siding by road and from Tomka railway siding to Therubali by rail.

Till 2017-2018 quantity of waste generated is 11221721 cum. The OB/waste generated from the open cast mining till conceptual period will be 21.30 lakhs cum from Band I and 67.64 lakhs cum from Band-II. The mined-out OB/waste will be dumped in existing dump yard and will be backfilled in the mined-out areas of Band I. There will be generation of marginal quantity of top soil during mining of Band II which will be stored properly and will be utilized for plantation purpose. From underground mining 428940 cum of waste will be generated till lease period which will dumped in the existing dump yard and mined out areas of Band I and Band II.

The common dumping along boundary line has been proposed between M/s IMFA and M/s BAL. Necessary permission from Director General of Mines Safety has been obtained vide Lr No BJA/CH-2 & 12/P-111 (3)/2013/413-14, dated 13/02/2013.

Mining machineries required for opencast mining will be 4 Excavator of 2.4 cum bucket capacity (existing), 1 Wagon drill of 115mm (existing), Dumper (existing- 21, proposed-3), Water pump (Existing-6, proposed- 2), 1 Grader (existing), 3 Dozer (existing), 1 Loader

(existing), Water tanker (existing-4, proposed-2), Light Vehicle (Existing-2, Proposed-1), Explosive Van (Existing-1), Diesel Tanker (Existing-1, Proposed-1).

For underground mining machineries deployed will be Sinking Winder, Jackhammer/ Jumboo Drill, Compressor, Pumps, Auxiliary Ventilation Fan, DG set, Cement mixture machine.

Emulsion / slurry explosives of 83mm diameter are used for blasting. Electric /Non-electric delays and detonators are used for providing delays & blast initiation respectively. 28 TPA of explosives is required. A 5 tonne capacity magazine is available at the mine. The raw materials required for daily consumption at the mine will be diesel, around 5000 liters/day sourced from nearby Diesel station. Water, about 500 KLD water will be required per day at peak demand, however net water requirement will be 240 KLD which will be sourced from bore well drilled within the mine for which permission has been obtained from Central Ground Water Board. About 270 KLD will be required for sprinkling accumulated pit water will also be utilized for sprinkling, 30KLD will be needed for green belt development, 40 KLD for drinking and 160KLD (1600 KLD water will be circulated within the COB plant) for COB plant makeup water. Power line has been drawn from the CESU grid line to this lease which runs for about 2.5 km. A 250 KVA Substation has been established in Sub-station-1 & 500 KVA substation has been established in substation-2 with 33KV/415 V transformers. 415 V power has been drawn from these substations. One 62.5 KVA, 200 KVA, 82.5 KVA & 250 KVA DG sets have been installed for illumination as well as operation of pumps in case of power failure.

Power requirement for underground mine & COBP will be 4MVA and it will be met from CESU.

The maximum strength of direct workers will be 921 including managerial, Technical, skilled, semi skilled and unskilled workers majority of which will local people. At present 800 peoples are working at site, hence 121 more workers will be required during expansion. Besides there will be indirect employment on account of transportation, canteen, repair shop, security etc. Since there is no habitation in the lease area therefore no resettlement will be necessary.

Cost of the project is Rs 354.45 Crores for underground Mining operations and Rs 40 crores for Chrome Ore Beneficiation project.

The mine will always have economic viability as the market is already assured. There are no litigations against the project.

Analysis of proposal (Final Recommendations)

The project will provide direct employment to about 921 workers. At present 800 peoples are working at site, hence 121 more workers will be required during expansion. Besides there will be indirect employment for transportation, canteen, repair shop, security etc. Most of the employment will be given to locals from the nearby village. Further, the share of indirect employment like increased purchasing power, dhabas and retail shops etc. is largely shared by local residents.

2. Prefeasibility report

Introduction of Project—Background information

The proposal is for Expansion of Mining of Chromite mineral from Sukinda Mine (Chromite) of M/s Indian Metals & Ferro Alloys. The company has vast experience in mining of mineral. The proposal is for enhancement in production from 3.51 Lakh TPA to 6.0 Lakh TPA, change in technology from opencast to both opencast & underground mining and establishment of Chrome Ore Beneficiation plant of 40 TPH feed capacity from the mining lease area spread over 116.76 ha situated at Village: Kaliapani, Tehsil: Sukinda, Distt: Jajpur, Orissa. Environmental Clearance was obtained for a capacity of 2.55 LTPA by Ministry of Environment & Forests vide Letter No J-11015/28/2001-IA.II (M) dated 24.12.2004 and dated 10.02.2005 for 5 years. Proposal for enhancement of production from 2.55 LTPA to 3.51 LTPA was submitted by M/s IMFA and Environmental Clearance was obtained for the project from Ministry of Environment and Forests, vide letter no J-11015/346/2007-IA.II (M) dated 18.06.2008 and extension vide letter dated 22.05.2012 and 11.08.2014 for continuation of production of 3.51 LTPA of Chrome Ore by Opencast Method for Captive use valid up to 03.09.2029. EC Extension letter is attached at **Annexure II.**

Again, the proposal, for enhancement in production from 3.51 Lakh TPA to 6.0 Lakh TPA, change in technology from opencast to both opencast & underground mining and establishment of Chrome Ore Beneficiation plant of 40 TPH feed capacity was submitted to Ministry of Environment, Forests & Climate Change (MoEF & CC) on 09.06.2015 vide Proposal number: IA / OR / MIN / 28526 / 2015 for determining the Terms of Reference. The proposal was considered by Honourable Environmental Appraisal Committee (EAC) during its 36th meeting held during July 29– 30, 2015 in New Delhi. Based on the Presentation made and discussion held thereafter the Honourable EAC committee, MoEF & CC has prescribed the Terms of Reference (TOR) vide letter No J-11015/204/2015-IA-II (M) dated 24th August, 2015 for undertaking EIA study in accordance with the provisions of Environmental Impact Assessment Notification dated 14-11-2006. Baseline study was done in Post monsoon season (Oct - Dec 2015). Public Hearing was done on 23.06.2017 as per EIA Notification 2006 & amendments thereof. EIA for appraisal was submitted to MoEF&CC portal on 18.09.2017. EDS was sought by Ministry on 12.06.2018. Reply of which was submitted on 07.07.2018. The case was listed on 23-24 Aug 2018 meeting but due to change of consultant appraisal of the project appraisal of the project couldn't be done. A Letter was submitted to MoEF&CC on 20.08.2018 requesting for extension in TOR and

deferment of meeting. Copy of letter submitted attached as **Annexure- VII.** Now we are requesting for TOR extension with updated documents.

The location of area falls on latitude $21^0$01'45.51"N to 21^0 02'33.81" N and longitude is 85^0 45'35.91" E to $85^0$46'42.03" E. The area falls in the Survey of India Topo sheet 73-G/16 (OSM Sheet no.F45N16). The project comes under Category A as per EIA Notification 2006 and subsequent Amendments.

Mining lease for the project was granted by Govt. of Orissa for 30 years which was executed on 04.09.1999. Mining operations commenced from 15.09.1999. Copy of lease deed attached at **Annexure I.** Lessee has applied for extension of mining lease till 2049 as per MMDR, 2015.

The Mining Plan for period 1999-2000 to 2003-2004 was approved by Indian Bureau of Mines vide IBM Lr.No:314(3)/99-MCCM(C)/MP-4, dt 18.11.1999. 1st Modification of the approved mining plan for period 2002-03 to 2003-04 was approved by IBM vide letter no 314 (3)/2002-MCCM (C)/MP-10 dated 18.10.2002. Subsequently, 1st and 2nd Scheme of Mining was approved by IBM for years 2004-05 to 2008-09 and 2009-10 to 2013-14 respectively. The 3rd Scheme of Mining & Progressive Mine Closure Plan for the period from 2014-15 to 2018-19 was approved by IBM vide lr no 314 (3)/2012-MCCM(CZ)/MS-56/255 dated 31.07.2013. Modified Mining Scheme approved vide lr no: MSM/FM/06-ORI/BHU/2016-17/1697 dt: 23.09.2016. Modification in review of mining plan has been approved by IBM for period 2017-18 to 2018-19 vide letter no. MPM/FM/25-ORI/BHU/2017-18/2815 dated 14.02.2018. Approval letter of Modification in review of mining plan is attached at **Annexure IV.**

The maximum strength of direct workers after expansion will be 921 including managerial, Technical, skilled, semi skilled and unskilled workers majority of which will local people. At present 800 peoples are working at site, hence 121 more workers will be required during expansion. Besides there will be indirect employment on account of transportation, canteen, repair shop, security etc. Since there is no habitation in the lease area therefore no resettlement will be necessary.

Cost of the project is Rs 354.45 Crores for mining project including underground Mining operations besides Rs 40 crores for Chrome Ore Beneficiation project.

The mine will always have economic viability as the market is already assured. There are no litigations against the project.

Need of the project

To meet the sustainable requirement of chrome ore for the existing as well as proposed additional ferro chrome furnaces of M/s IMFA Ltd, the proposed project is essential.

Therefore, enhanced production of 6LTPA of chrome ore is extremely important to cater the requirements of the captive plants.

The project also involves the change of technology from opencast mining to open cast and underground mining, as the continuation of ore body in greater depths has been established by means of regional extents of ore bands, ore body exposure in opencast mine and the boreholes drilled till now. Thus, it may be concluded that present level of exploration is capable enough to establish the profile of the ore body and based on that the underground mining has been proposed. To mine out the strategic mineral beyond the opencast limit, it is necessitated to do mining by underground method. The proposed underground mining is more eco friendly and will enhance the life of mine.

In the mineral conservation point of view, the proposed chrome ore beneficiation plant (COBP) within the lease area shall convert the unusable chrome ore to usable ore.

Importance to Country and Region:

The following benefits are envisaged due to this project.

i. Ferro Chrome is a strategic metal for the country.
ii. It generates employment & improves the skill level for the local people.
iii. It will uplift the living standard and the socio-economic condition of the local people.
iv. It generates revenue to the State exchequer in the shape of royalty (approx. 600 crores per annum).
v. Country earns valuable foreign exchange.

Demand-Supply Gap:

About 96% of total chrome ore production is used in metallurgical applications i.e. for Ferro chrome production (94% high carbon Ferro chrome, 4% L.C Ferro chrome & 2% M.C Ferro chrome). The chrome ore is also used for foundry, chemical & refractory industry. About 29 million tonnes of chromite ore was produced in 2014. South Africa accounts for about 54% of global chromite production, followed by Kazakhstan with 15% & Turkey & India with 6% each.

Demand for chromite ore and Ferro chrome is expected to remain strong as stainless steel production in India is expected to increase from 3.1 million tons in 2014 to 5.4 million tons in 2020. Further, per capita consumption of stainless steel in India is about 2kgs whereas in China it is about 8kgs & in developed countries about 18-20kgs. This constitutes a huge opportunity for growth in India. With the Prime Minister's vision of setting up 100 smart cities & make in India campaign coupled with rising disposal incomes, stainless steel consumptions will get a boost. So, requirement of Ferro chrome would increase substantially due to higher stainless-steel production & consumption.

Imports vs. Indigenous Production.

India is one of the leading chromite ore producer globally with an output of about 2 million tons in 2014. India's chromite ore is mostly used for Ferro chrome productions & exports have been discouraged through high export tax. About 2.5 MT of Chromite ore is required for production of 1 MT Ferro Chrome & only vertically integrated producers (having access to chromite ore) can survive in a competitive market. Also, moving 2.5 MT of chromite ore to/from a distance adds to logistics cost thus making Ferro chrome operations unviable.

Export Possibility & Domestic Markets

Since IMFA has always focused on "value addition" the entire output will be supplied to the company's Ferro chrome /charge chrome manufacturing facilities in Therubali in Rayagada District and Choudwar in Cuttack District in Odisha.

Employment Generation

The project will generate direct employment for about 921 people along with indirect employment in the form of dhabas, transporters etc. which will improve the economic conditions of the area. At present 800 peoples are being employed and additional 121 workers will be given employment during expansion of the project.

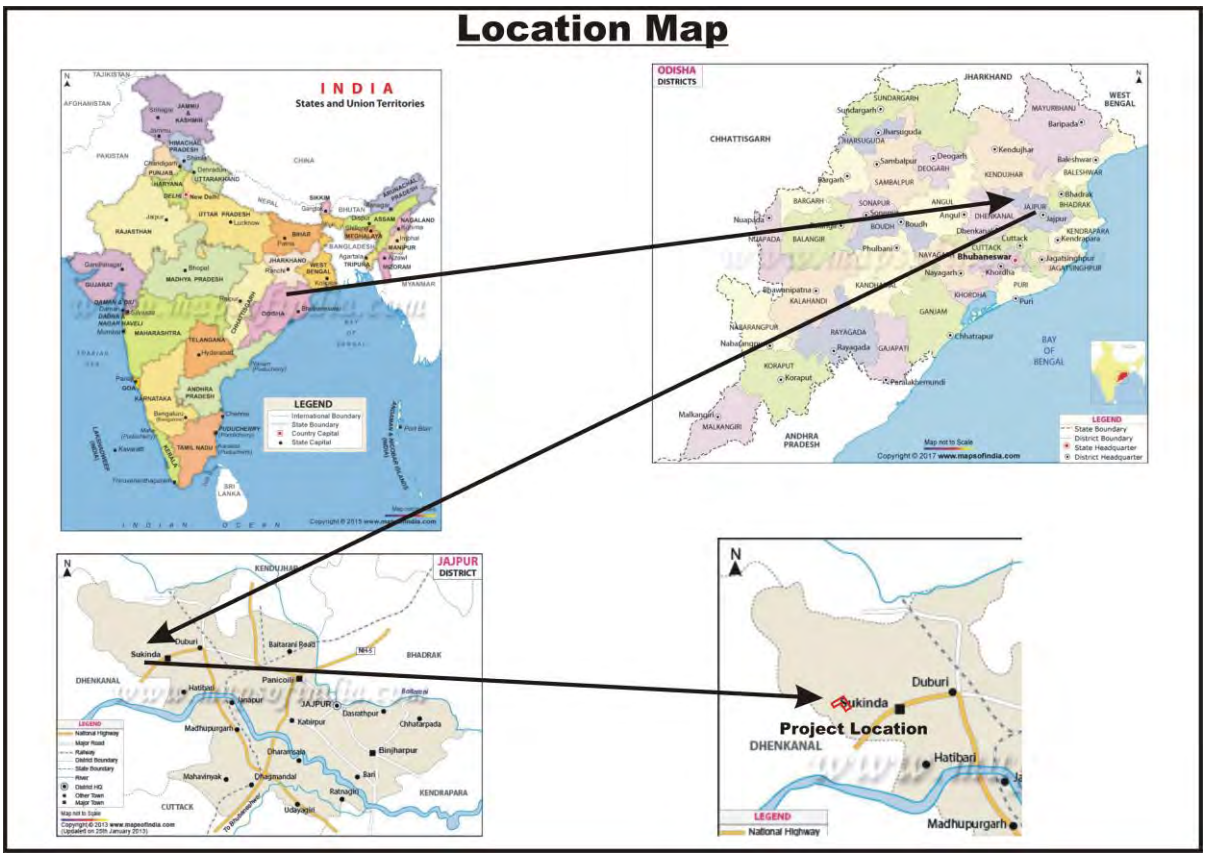
3. Project Description

Type of Project:

Present proposal pertains to mining of chromite mineral in 116.76 ha. mining lease area by opencast and underground mechanized mining with drilling and blasting method in District Jajhar, Orissa. The mined out chromite ore is then enriched/value added to produce ferro chrome in captive ferro alloys plants at Therubali in Rayagada District and Choudwar in Cuttack District in Odisha. The finished product is sold in domestic as well as international markets. The project is categorized as Schedule S. No. 1(a), Category-A for obtaining the environmental clearance.

Sukinda Mine (Chromite) by M/s Indian Metal & Ferro Alloys Limited

Location of mine is shown ahead:



Interlinked Projects:

It is not an interlinked project.

Lease Details:

Name of Lessee : M/s Indian Metals & Ferro Alloys Limited

Status of lessee : Public Limited Company

Correspondence Address: IMFA Building, Rasulgarh
Bhubaneshwar-751010
Odisha
Phone: (0674) 2580100/125
Fax: (0674) 2580020

S.No.	Particulars	Details
1.	Lease Area	116.76 Hectares
2.	Date of Grant	04.09.1999-03.09.2029, extension of mining lease till 2049 as per Amended MMDR, Act 2015.
3.	Location	Topo sheet 73-G/16 ; OSM Sheet no. F45N16 Lat- $21^0$01'45.51"N to $21^0$02'33.81" N Long- $85^0$45'35.91" E to $85^0$46'42.03" E. Village- Kaliapani, Tehsil- Sukinda, District- Jajpur, Odisha

Magnitude of operation:

Past Production: This is an existing operating mine. The Past production from the mine has been authenticated and attached at **Annexure-VI.**

Proposed Production: The maximum production proposed is 6.0 from opencast & underground mining as per exploration details and approved mining plan from time to time.

In addition, Chrome ore beneficiation plant of 40 TPH capacity has been proposed to process low grade and marginal grade chrome ore to produce high grade chrome concentrate.

Equipment: Existing and proposed mining machineries for open cast mining are given below:

Machineries	Existing	Proposed	Total
Excavator (2.5 cum bucket capacity)	4	0	4
Wagon Drill (115mm)	1	0	1
Dumper	21	3	24
Water pump	6	2	8
Grader	1	0	1
Dozer	3	0	3
Loader	1	0	1
Water tanker	4	2	6

Light Vehicle	2	1	3
Explosive Van	1	0	1
Diesel tanker	1	1	2

For underground mining machineries deployed will be Sinking Winder, Jackhammer/ Jumboo Drill, Compressor, Pumps, Auxiliary Ventilation Fan, DG set, Cement mixture machine.

Emulsion / slurry explosives of 83mm diameter are used for blasting for opencast mining. Electric /Non-electric delays and detonators are used for providing delays & blast initiation respectively. 28 TPA of explosives is required. A 5 tonne capacity magazine is available at the mine. In addition, a beneficiation plant having crusher, grinding unit, washing system, separating and grading facilities with a capacity of 40 TPH is also proposed to be set up.

Salient Features of the proposed Working:

As it is an existing mine, hence salient description of present and proposed mining method are given below:

Salient description of the present Mining method

- At present the mine is fully mechanized opencast mine and working is concentrated on Band–I with drilling and blasting.
- The ore and overburden is being mined out by mechanised opencast method. Till date the overall slope of the mines is being maintained at < 30^{O} with individual bench adequately sloped. The ultimate pit slope will be maintained at < 30^{O} for both Band I & II.
- OB/reject to be generated are stacked in dump created at the designated site.
- The ultimate maximum bench height will be up to 8m with minimum working width of 8-12m.
- The ultimate pit limit will be 30mRL in Band I and 46mRL in Band II.
- **Drilling & Blasting Parameter**: The details are given below:

Drilling & Blasting Parameters	
Drilling equipment	115mm DTH drills
Hole dia	115 mm
Length of hole	8.5 m
Spacing	3.0 to 6.0 m m
Burden	2.5 to 4.5 m
Powder Factor	3 to 5 cum/kg
Explosive	Emulsion/ slurry explosives of 83 mm diameter are used for blasting. Electric/ Non-electric delays and detonators are used for providing delays & blast initiation respectively. Requirement of explosives is 28 TPA.

Proposal for development/stoping for underground workings:

Opencast mining will be carried out by existing method and underground mining is also proposed salient features of which are given below:

Leaving sufficient parting below the Ultimate Pit Limit of the Opencast Mining, underground mining shall be commenced in Band-I.

i. Mode of Entry- Production (Circular) Shaft & Service (Rectangular) Shaft

There will be two vertical shafts. One will be used for production and another for services. The depth of the production shaft & service shaft shall be 705 m & 645 m respectively. It is proposed to develop both the shafts either in conventional or faster sinking method. The top portion will have shaft collar to support head frame and other structures. The shaft shall be concrete lined upto the hard rock formations. Thereafter it will be supported by rock bolts. Keys shall be provided in the lining. Weep holes/ water drainage garlands shall be provided at intervals throughout the shaft.

The shaft will be constructed by wedge/burn cut drilling and blasting. Progress per round will vary between 3 to 5 meters. Blasted muck will be loaded and taken out of the shaft by sinking winders. Side wall will be lined incase of weak strata and will be rock bolted incase of competent strata. Check survey will be conducted at regular intervals to check the verticality of shaft. The cycle will be repeated till shafts reaches their desired depths.

ii. Underground Layout:

It is proposed to sink two shafts during this plan period. The guidelines of NIRM report are considered for designing the level interval of 50 mtrs. It has been decided to develop -250mRL, -300 mRL levels from service shafts. The ground conditions will be monitored while shaft sinking, so as to finalise the drive sizes.

iii. System of drilling & blasting:

Drilling pattern in Waste Rock	Burn cut/Wedge cut during shaft sinking
Maximum number of holes blasted in a round	As per requirement
Charge per round (kg)	As per requirement
Charge per hole (kg)	As per requirement
Type of explosive	Emulsion/slurry explosive
Powder Factor (Norms) Rock development	1.5 kg/cum
Powder Factor (Actual) Rock development	Upon starting of sinking of shafts, the actual powder factor shall be assessed.

iv. Method and Sequence of Stoping

Method of Stoping

Considering the geo-technical studies carried out by NIRM and the dip of the ore

body, blast hole stopping with post filling method in the mine is being proposed with stope height of 50m, stope width of 20m (or the maximum ore body width) and the length of the stope (along the strike) of maximum 20 m.

Sequence of Stoping

The sequence of panel extraction shall be in three steps, i.e. primary, secondary and tertiary blocks. The primary block shall be extracted first, then secondary and eventually the tertiary blocks. The extraction method shall be blast hole stoping with post filling.

	Stope parameters:	
1.	Number of working stopes	Presently Stopes are in proposal stage
2.	Size of the panel	L= 20m & Width= Ore Body Width
3.	Level interval	50 m
4.	Thickness of crown pillar	280 m (Parting between surface & UG working)
5.	Thickness of Sill pillar	15 m
6.	Thickness of Rib pillar	6 m
7.	Size and interval of Stope pillar	Not Applicable
8.	Size/shape on man way	Not Applicable
9.	Size/shape of ore pass	Not Applicable
10.	Method of stowing/ back filling	Hydraulic Post Filling
11.	Method of drainage of stowed water	Decantation & Percolation

v. System of underground transportation:

During the scheme period only two vertical shafts shall be sunk and there is no proposal for lateral development.

vi. System of winding/hoisting:

The ore shall be hoisted by skip through main shaft which shall be circular one having minimum 6m in dia. The service shaft shall be rectangular one & having a dimension of minimum 5.5 m x 5.1 m. The service shaft shall hoist men & material from underground.

vii. Subsidence Management

The underground development has been planned as per recommendations of scientific study carried out by NIRM. Moreover, the stopes will be backfilled by cemented fill material. Therefore, subsidence is not expected. However, the stability of void shall be monitored regularly by strata monitoring instruments.

Chrome Ore Beneficiation

In order to beneficiate the stock of 6,12,929 tonnes of sub grade ore having (+) 10 to (-) 30% Cr_2O_3, a chrome ore beneficiation plant of 40 TPH feed capacity will be installed, to

produce usable grade of chrome concentrate. Details of COB plant parameters are detailed below.

Feed Rate:	40 tonnes / hr
Feed Grade:	10 – 30 % Cr_2O_3
Output Grade	Above 30 % Cr_2O_3
Yield:	75 % by weight concentrate
Tailing grade:	<10% Cr_2O_3

Tailing Disposal:

Approximately 25000 tonnes of tailing will be generated per annum. The tailing collected from the tailing ponds after being dried shall be shifted to the waste dump. Maximum of water used in the process shall be recycled. No water from the COB plant shall be discharged outside the lease area.

Raw Materials:

The important inputs required for mining are given below:

Inputs	**Approx Quantity required**
Diesel	5000 Liters per day
Water	500 KLD
• Water for Drinking & Domestic	40 KLD
• Water for Sprinkling	270 KLD
• Water for Green belt	30KLD
• COB plant makeup water	160KLD (1600 KLD water will be circulated within the COB plant)
Net water requirement	240 KLD from borewell & 260 KLD from ETP treated water.

Market and Mode of Transport: The chrome ore produced from the mine is being consumed by the Ferro chrome and Charge Chrome Plants of the lessee at Therubali in Rayagada District and Choudwar in Cuttack District of Odisha State. The Chrome Ore from mine to the IMFA Choudwar plant of the company at Cuttack is transported by road up to Tomka and then by railways.

Resource Optimization/Recycling:

- Waste will be dumped in the dumping yard situated within the mine site which will be stabilized later by afforestation.
- The used/waste engine oil / transmission oil / hydraulic oil will be collected and stored in barrels. The same will be then processed through authorized vendors as per HWM Rules 2016.

- The batteries of HEMM will be returned to the concerned authorized vendors for its recycle once it is being discarded Battery Waste Management & Handling Rules, 2011.

Requirement of Water, Energy/Power: The water will be used for drinking purpose, wet drilling, sprinkling, plantation and COB plant. Water requirement will be 500 KLD approx. at peak time. Water will be sourced by bore wells and from the mine pit. Power line has been drawn from the CESU grid line to this lease which runs for about 2.5 km. A 250 KVA Substation has been established in Sub-station-1 & 500 KVA substation has been established in substation-2 with 33KV/415 V transformers. 415 V power has been drawn from these substations. One 62.5 KVA, 200 KVA, 82.5 KVA & 250 KVA DG sets have been installed for illumination as well as operation of pumps in case of power failure.

Power requirement for underground mine & COBP will be 4MVA and it will be met from CESU. The daily consumption of diesel will be 5000 liters.

Waste Generation and Disposal:

Till 2017-2018 total quantity of OB generated is 11221721 Cum. The OB/waste generated from the open cast mining till conceptual period will be 21.30 lakhs cum from Band I and 67.64 lakhs cum from Band-II. The mined-out OB/waste will be dumped in existing dump yard and will be backfilled in the mined-out areas of Band I. There will be generation of marginal quantity of top soil during mining of Band II which will be stored properly and will be utilized for plantation purpose. From underground mining 428940 cum of waste will be generated till lease period which will dumped in the existing dump yard and mined out areas of Band I and Band II.

The common dumping along boundary line has been proposed between M/s IMFA and M/s BAL. Necessary permission from Director General of Mines Safety has been obtained vide Lr No BJA/CH-2 & 12/P-111 (3)/2013/413-14, dated 13/02/2013.

Stabilization of Waste dump:

One overburden dump is being maintained in the northern side of the lease over an area of 43.09 ha. The dump is made up of three stages of 20 mtrs height each and having terrace of adequate width. The height of the dump is maximum 60 mtrs. Common dumping along boundary with M/s BAL is in progress. Garland drain along with settling pond has been provided around dump yard and sub grade dump. In order to check siltation, a retaining wall has been provided at the toe of over burden and sub grade dump. Plantation over dump slopes has been done over an area of 13.684 ha.

To avoid the problem of soil erosion and formation of gullies in critical areas, application of geo textiles such as coir matting with plantation has been undertaken on dump slopes. Grass thatching has also been done on dump slopes to stabilize the dump slope to arrest

the soil erosion. Dump slope stabilization by small terracing and bamboo terracing has also been carried out in some part of dump yard.

4. Site Analysis:

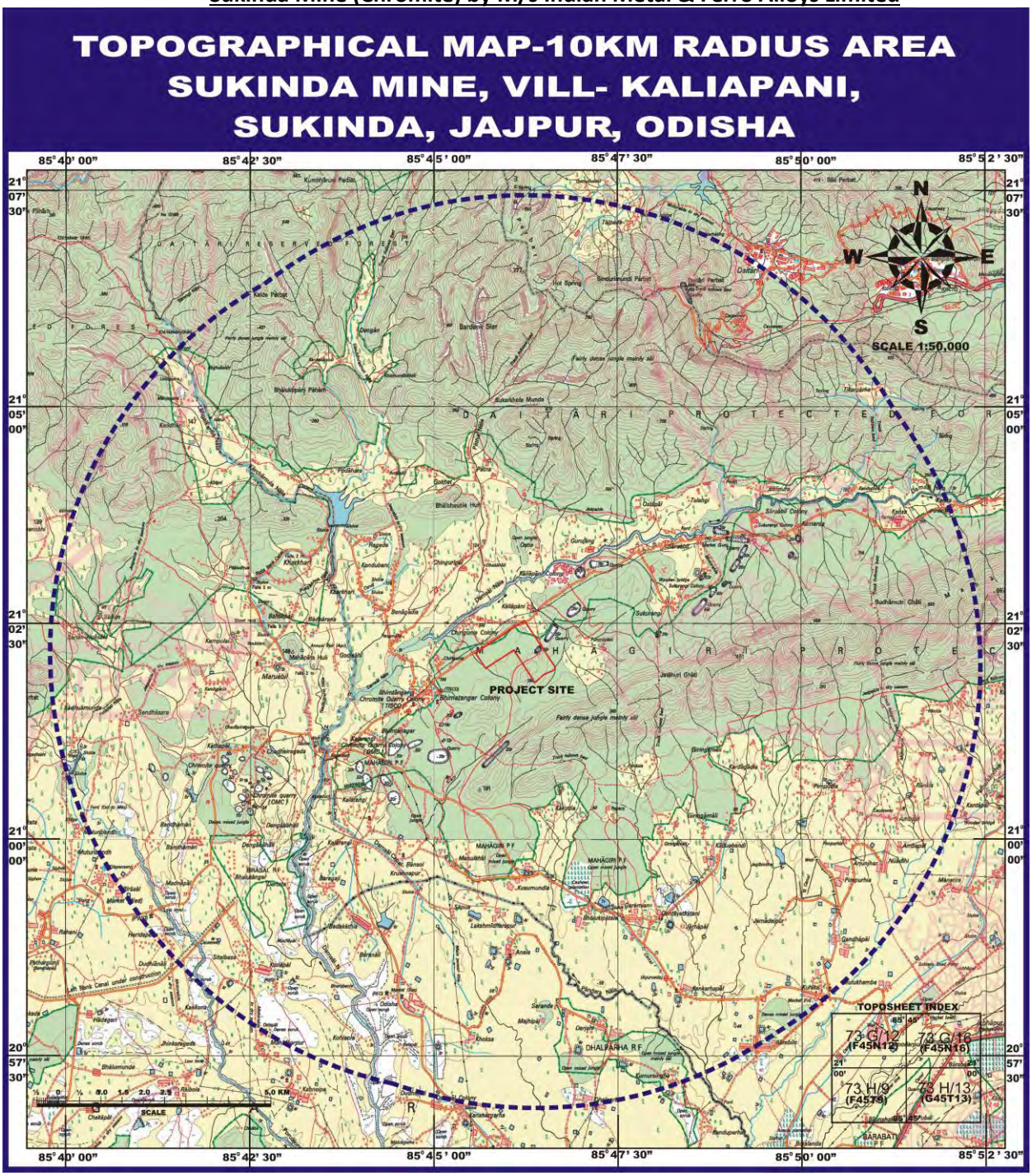
Location and Connectivity: The area falls in the Survey of India Topo sheet 73-G/16(OSM Sheet no. F45N16). The latitude is $21^0$01'45.51"N to 21^0 02'33.81" N, and longitude 85^0 45'35.91" E to $85^0$46'42.03" E.

The nearest railway station is Tomka at a distance 28 km NE. The nearest highway is NH 200 at 11.83 Km S. Nearest densely populated area is Bhimtanagar at about 1.21 km SW. Nearest Airport is Bhubaneshwar Airport at 88.57 km S.

The **location plan** & **10 Km. topographical map** is shown as **Annexure VIII & Annexure IX**

Land use and Land ownership: The total mining lease area of 116.76 Ha. 115.05 ha is declared as forest land for which forest clearance has been obtained rest 1.71 ha. is Govt. waste land.

Land Use	**Existing (in ha.)**			**At the end of scheme period (in ha.)**			**By the end of conceptual period (in ha.)**		
	Forest	**Non-Forest**	**Total**	**Forest**	**Non-Forest**	**Total**	**Forest**	**Non-Forest**	**Total**
Area under mining	28.300	0.00	28.300	29.090	0.00	29.090	39.540	0.00	39.540
Overburden dump & subgrade dump	48.820	0.770	49.590	51.380	1.060	52.440	51.380	1.060	52.440
Mineral storage	11.115	0.075	11.190	10.110	0.00	10.110	0.00	0.00	0.00
Infrastructure	12.035	0.337	12.372	9.750	0.122	9.872	12.870	0.122	12.992
Roads	4.300	0.050	4.350	3.130	0.050	3.180	2.440	0.050	2.490
ETP, Settling pond, pipeline etc	5.660	0.00	5.660	5.660	0.00	5.660	2.890	0.00	2.890
Township	1.050	0.00	1.050	1.050	0.00	1.050	1.050	0.00	1.050
Safety Zone	3.660	0.478	4.138	3.660	0.478	4.138	3.660	0.478	4.138
COB plant	0.00	0.00	0.00	1.110	0.00	1.110	1.110	0.00	1.110
Others (Magazine)	0.110	0.00	0.110	0.110	0.00	0.110	0.110	0.00	0.110
Total	**115.05**	**1.710**	**116.760**	**115.05**	**1.710**	**116.760**	**115.05**	**1.710**	**116.760**



Topography of the area: The area comprises of hilly and undulating terrain. The highest elevation in the area is 185 mRL and the minimum is 110 mRL. Overall regional slope is from south to north. The area is covered with highly weathered materials (soil and laterite) in the open pit. The waste dump in the area in the north side acts as a barrier to the natural slope. The **Surface Plan** of the area is shown in **Annexure X**

Drainage: Perennial drainage of the area is represented by Damsal nala flowing in the southwest direction, and is 1.5 km away from the lease area in north-west direction. It can

be classified as a 5th order stream, which is seasonal fed by several streamlets and gullies. The run-off water is collected by streamlets, and Damsal nala discharges into river Brahmani at a distance of about 25 km. The overall drainage pattern of the area can be categorized as dendritic which indicates weathered rock mass.

Geology of the area: Regional and Local Geology of the area is briefly described as under:

Regional Geology: The Sukinda MInes (Chromite)s deposit forms a part of famous chromite bearing Sukinda ultramafics complex. The Sukinda ultramafics belong to the metamorphosed rocks of Pre-cambrian age. The rocks of the area are associated with six sedimentary sequences separated by unconformities. The Sukinda ultramafics belong to the second sequence of the succession from a major intrusive into the older rocks and occur as intrusive. The ultramafics are distributed with two different types of metamorphic facies.

(a) Green Schist facies: Quartzite or Blotite hornblende – Granite in the Northern part.

(b) Granulite facies: Assemblages in the southern part of the region

The ultramafics suite of rocks of Sukinda area is a layered complex of alternate bands of Chromite, Dunite, Peridotite and Ortho-pyroxenite. The dunite peridotites are completely serpentinesed. The presence of numerous Chert bands in association with chromite bands is the characteristics feature of the area.

The lower sequence of Iron Ore Super Group (IOSG) of the region has been folded into syncline with gently plunge to the WSW direction. The ultramafics are intrusive into older sequence and subsequently co-folded. The area has been faulted along the northern margins of ultramafic body.

The chrome ore mineralization is mainly restricted to the ultramafics and occurs at six different stratigraphic levels. Band – I is the most important chromite bearing unit / member of the region. It extends for a longer distance and is the thickest among all the bands.

Local Geology:

The Stratigraphic sequence of different litho units as established from field observation and drill hold data are as follows:

Alluvium and Laterite
Pyroxenite
Yellow limonite with goethite
Limonite with chromite disseminations
Friable chromite
Cherty limonite

Topsoil of 10 cm thick occurs in this zone and ranges from yellowish brown to reddish brown colour, while the texture ranges from clayey loam to sand. Lateritic soil follows the topsoil for about 5 meter. Colour of the lateritic soil ranges from dark brown to blackish brown. The placement of pyroxenite-dunite suite (now altered to limonite) is still genetically debatable.

Two different stratigraphic chrome bearing units represented in the area of the lease hold area as follows:

Band – I
Band – II

Lithology

The lithounits encountered in the area are Pyroxenite, Limonite, Chert, Laterite and Nicleliferous limonite etc. In contrast, the wall rocks of southern part of the quarry is weathered but is of no economic significance as far as Ni-Co are concerned.

Exploration Undertaken: Geological Survey of India carried out exploration on a regional scale in the entire TISCO lease hold area including the area under reference viz. Sukinda MInes (Chromite)s during 1978 – 81. After the area was granted, IMFA explored the area in detail by way of core drilling in the year 1999 – 2000, 2000 – 2001, 2001 – 2002, 2007 – 2008, 2010 – 11, 2011-12, 2012 – 13 & 2017-18.

The details of exploration carried out in the area by GSI and IMFA are given in the following **Table**

Details of Exploration Carried out by GSI & IMFA

Exploration Parameter	Particulars	
	GSI	IMFA
Topographical Survey	116.760 Ha	116.760 Ha
Geological mapping	116.760 Ha	116.760 Ha
Core Drilling (Band – I)	910.40m in 6 holes	7556.34m in 26 holes
Core Drilling (Band – II)	174.75 in one hole	4715.600 in 17 holes
Core Drilling for providing Band III & IV	-	1197m in 6 holes
Sampling and Analysis	Samples were drawn at every one meter or less for the mineralized zone from the drill cores and analysed	

In addition to ascertain the top level of Band – II ore body, 29 nos of non-coring DTH holes were drilled. Out of 29 holes, only 14 no of holes encountered the ore body at 146 mRL approx.

Also in order to ascertain the grade and quantity of reserve from opencast mining of Band – II, the lessee drilled 865m of core drilling in Band II in the year 2012 – 2013.

Quality & Grade of Mineral: The composition is as below:

Category	Percentage
Cr_2O_3	30-54%

Reserves:

Classification	UNFC Code	Reserves (Lakh tonnes)			Grade Cr_2O_3
		Band – I	Band – II	Grand Total	
A. Mineral Reserves					
Proved Mineral Reserves	111	54.44	13.56	68.00	+10%
Probable Mineral Reserves	121	Nil	Nil	Nil	
Probable Mineral Reserves	122	17.30	Nil	17.30	
Sub Total		**71.74**	**13.56**	**85.3**	
B. Total Remaining Resources					
Feasibility Mineral Resources	211	196.74	4.87	201.61	+10%
Prefeasibility Mineral Resources	221	Nil	Nil	Nil	
Prefeasibility Mineral Resources	222	9.68	Nil	9.68	
Measured Mineral Resources	331	Nil	Nil	Nil	
Indicated Mineral Resources	332	Nil	Nil	Nil	
Inferred Mineral Resources	333	Nil	50.29	50.29	+10%
Reconnaissance Mineral Resources	334	Nil	Nil	Nil	
Sub- Total		206.42	55.16	261.58	
Total Reserves + Resources (A+B)		**278.16**	**68.72**	**346.88**	

Life of Mine: As per exploration done in the lease area the geological reserves as on date is estimated at 346.88 Lakhs Tonnes, Mineable reserves at 85.3 Lakhs Tonnes as per Approved Modified Mining Scheme. For opencast mining Proved Mineable reserve for Band I- 12,74,140 Tonnes and for Band -II it is 13,55,962 Tonnes while for underground mining proved mineable reserve & Resource for underground mining for Band I- 51.40 Lakh tonnes and feasible mineral reserve for Band I is 51.40 Lakh + 193.78 Lakh =245.18 Tonnes, the life of mine is estimated to be 45.2 i.e. 46 years from the date of starting of production at the maximum production rate of 6 lakhs TPA. However, the validity of the M.L. area is till 2049 as per MMDR Act 2015.

Sensitivity of Location:

- There is no national park, wild life sanctuary, eco-sensitive areas situated within the periphery of the lease area.
- Project area falls within the Mahagiri Protected Forest for which forest clearance has been obtained from MoEf&CC vide letter no. F.No. 8-16/2016-FC dated 22nd June, 2018.

- Forests like Daitari PF-2.42 km NE, Dhalparha RF- 6.57 km S, Birasal RF- 6.25 km SW, Ranjagarh RF-3.78 km NWW are within the buffer zone of the lease area.
- Water bodies such as Damsal Nala- 0.74 km NW, Karchamula Nala- 2.93 km W, Nadibarana Nala- 3.88 km W, Right Bank Canal- 4.11 km W, Ragada Dam- 4.15 km NW etc are in the buffer zone of the lease area.

Existing Infrastructure:

The area is connected with all season motor roads.

Soil classification:

The area has been degraded. Generally, the soil is lateritic. The area is covered with highly weathered materials (soil and laterite) in the open pit. Topsoil of 10 cm thick occurs in this zone and ranges from yellowish brown to reddish brown colour, while the texture ranges from clayey loam to sand. Lateritic soil follows the topsoil for about 5 meter. Colour of the lateritic soil ranges from dark brown to blackish brown. The placement of pyroxenite-dunite suite (now altered to limonite) is still genetically debatable.

Climatic data from secondary sources:

The climate of this region is mainly tropical type. South west monsoon season starts from June and extends up to October. Average annual rainfall of the region varies between 1300 to 1600 mm, out of which about 80% of the rainfall can be observed in the monsoon season only. The summer is severe during May-June with temperature as high as 46^0C. A pleasant winter prevails from December to January. During monsoon season, the average relative humidity goes upto 86% which is highest in comparison to other months. During winter, in the month of January, it comes down to 56%.

Social Infrastructure available:

- **Infrastructural Facilities -** The study area has well developed facilities for educational and health care, drinking water, post and telegraph offices, approach roads and irrigation.
- **Education -** Almost all the villages surveyed during study period have at least primary and middle school. The villages which have no High schools are having this facility within 5 to 10 km area. Based on the survey made in the study area, it was found that the educational facilities have been further strengthened now and a number of private schools have also come up in the study area.
- **Medical and Public Health -** Medical facilities available within the study area include

dispensaries, hospitals, health centers, public health sub-centers, maternity homes, etc. Almost all villages are having medical facilities either at door or within 5-10 km.

Based on the survey made in the study area, medical facilities have been further strengthened now and a number of private doctors are also practicing in the study area.

- **Drinking Water** Drinking water is available in all villages. The main source of drinking water is through hand pump, well and tank water. Based on the survey made in the study area, facilities have been further improved now.
- **Post and Telegraph -** All villages have post and telegraph facilities either at door or within 5-10 km. Moreover, mobile phone facility is available in almost all the villages.
- **Communications -** Road transport is the main communication linkage in the study area. About 55% villages in the study area have access to bus service. Transport facilities have improved significantly.
- **Road Network -** Transport and Communication facilities are considered is an administrative necessity as well as a public convenience. However, a well-knit transportation system is a pre-requisite for the social and economic development of any district. The linking of one place with the other by road is very essential to provide good transport system. The study area has good road network. About 70% of the villages have pucca approach road. Based on the survey made in the study area, facilities have further improved now.
- **Power and Electricity** - Almost 80% villages in the study area have power supply.
- **Cropping Pattern -** The main crop of the area is Paddy. The minor crops of the area are Wheat, Maize, Ragi, Green gram, Blackgram, Horsegram, Til, Groundnut, Mustard, Potato, Jute and Sugarcane.
- **Historical monuments:** No Natural Park, wildlife sanctuary, national monument or tourist interest exist in the lease area as well as in buffer zone. Hence, there will be no negative impact on this aspect.

5. Planning Brief

The present project commenced operation since 15.09.1999. Proposed project to produce 6 lakh TPA chrome ore will have following salient features:

- Mechanized open cast and underground mining with drilling & blasting will be undertaken.
- OB/reject will be generated which will be stacked in dumps created at the designated site/ opencast mines pit (Band -1).

- The ultimate maximum bench height will be upto 8m with minimum working width of 8-12m.
- The overall slope will be 30^{O}.
- Blasting Powder factor 4 cum/kg explosive is considered for estimating explosive requirement.
- Stoping method of mining will be adopted in underground mining operation with shaft to haul the ore to surface.
- Mineral Processing: Low grade mineral having grade 10 to 30 % Cr_2O_3 will be sent to company's proposed 40 TPH beneficiation plant to be set up within lease area. High grade Chrome ore is being directly sent to the company's existing plant.
- ROM will be excavated and stacked at designated area and will be sent to company's own ferro chrome beneficiation plant.
- No. of working day will be 250. Two shifts working will be done. Each shift will be of 8hours.
- Total no. of direct employment is about 921(Managerial, Technical, clerical, skilled, semi skilled and unskilled.) including existing 800 employees.
- SPCB, Odisha has accorded consent for operation for 0.351 million TPA of chrome ore vide letter no. 2483/IND-I-CON-2274 dated 06.02.2016 valid till 31.03.2021.

6. Proposed Infrastructure

a. Physical Infrastructure: This is an existing mine where mine office, rest shelter, canteen and First Aid etc. are already existing.

b. Green Belt/Afforestation: The plantations done during 2014-15 till 2017-18 are given in the following table.

Year	Area (in ha.)	No. of plants
2014-15	0.046	190 at safety zone
2015-16	0.54 ha 0.07 ha	2860 - At Dump 185- at safety zone
2016-17	0.73	2175- in dump yard
2017-2018 (till 30.11.2017)	0.55	1650 in dump yard 1500 no. as Gap Plantation

Till 31.03.2018, total 49322 plants has been planted over the reclaimed dump.

Proposed Plantation: It is proposed to do plantation in the dead ends of the dump yard during this plan period in an area of 1.4 ha.

c. Residential

Residential colony already exists within the mine lease area for the mine employees and workers. There will be marginal increase on the existing facilities.

d. Social Infrastructure

Development of social infrastructure is a core policy of the company. The company is taking socio economic development initiatives in the periphery of the project area through it's CSR wing, i.e. Bansidhar Ila Panda Foundation (BIPF). Social infrastructures like, drinking water projects, renovation of school building, youth clubs, bus shelters, community halls, village mandap, tube wells etc are being done. Apart from the above, the company is also organising Health camps, domestic animal treatment camp, distribution of first aid items to schools and clubs etc. Awareness programs on sanitation, general hygiene and drinking water are being conducted by it's employees through volunteer programs.

The company is constructing a ITC at Sukinda, for development of technical skillness of rural people.

S. No	Category	Expenditure already incurred in Rupees			
		2012-13	2013-14	2014-15	2015-16
1	Health & immunization	74411.50	77407.0	85692.00	0
2	Education	497483.25	277733.00	278268.00	215786.00
3	Cultural activities	20000.00	0	200000.00	0
4	Drinking water and sanitation	604169.00	1665556.00	105771.00	5943.00
5	Sports	25494.00	29770.00	29581.00	17976.00
6	Community development	11852.00	3150.00	0	0
7	Infrastructure development	2518150.54	6377168.00	632106.00	0
8	Donations	60950.00	286944.00	125963.00	215000.00
9	Plantation	98772.00	0	76290.00	1026200.00
10	Contingencies	0	0	0	13024.00
11	Avenue plantation	0	0	805275.00	0
12	Disaster management/Natural Calamities	0	0	24389.00	0
13	Promoting health care and preventive health care	0	0	0	89948.00
14	Supply of winter care to poor people	0	0	0	24000.00
Total		**3911282.29**	**8717728.00**	**2363335.00**	**1607877.00**

e. Drinking Water Management (Source and Supply of Water)

The drinking water requirement for personnel working at the project are met through ground water drawn from bore wells in the mine lease area.

f. Sewerage System

The domestic effluent from the mine office and from colony is discharged in septic tank followed by soak pits.

g. Industrial Waste Management

There will be generation of overburden/waste from opencast & underground mine, which shall be dumped in a systematic manner over the existing dump yard and backfilled in the mined out areas of opencast mine and underground stopes.

The waste generated from ETP will be handed over to authorised agencies for disposal.

The proposed COBP tailings (-10% Cr_2O_3) after being dried shall be dumped in the existing dump yard.

h. Power Requirement & Supply / Source.

Power line has been drawn from the CESU grid line to this lease which runs for about 2.5 km. A 250 KVA Substation has been established in Sub-station-1 & 500 KVA substation has been established in substation-2 with 33KV/415 V transformers. 415 V power has been drawn from these substations. One 62.5 KVA, 200 KVA, 82.5 KVA & 250 KVA DG sets have been installed for illumination as well as operation of pumps in case of power failure.

Power requirement for underground mine & COBP will be 4MVA and it will be met from CESU.

7. Rehabilitation and resettlement (R &R) Plan:

There is no habitation in the lease area therefore resettlement will not be applicable.

8. Environment Management Plan

- Mining operations mainly contribute to generation of dust for which sprinkling of water is proposed.
- Vegetative barrier is proposed for dust suppression.
- All the equipment's will be of highest standard of reputed make and adhered to international standards.
- Groundwater table has intersected, permission of the same has been obtained from CGWA.
- Maintenance of approach road will be done regularly.
- Benches shall be rehabilitated by planting local species in place of existing rocky and barren land.
- The lease area fall in the seismic zone II which is at low damage risk zone.

- Labors will be made aware of the ways of clean and green environment.

9. Project Schedule & Cost Estimates.

It is planned to start the development of underground mining after getting EC and other statutory clearances by way of sinking two nos of vertical shafts. The cost of underground mining project is estimated as Rs. 354.45 crores.

The construction of proposed Chrome Ore Beneficiation Plant shall after getting EC and other statutory clearances. The cost of project is estimated as Rs. 40.00 crores

10.Analysis of proposal (Final Recommendations)

The proposed underground mining is more eco friendly and the enhancement of chrome ore production is only from underground mining. Therefore, the net impact on the surrounding environment will be reduced.

The process in the proposed Chrome Ore Beneficiation Plant will be mainly wet gravity separation method. There will be marginal impact on the environment and the same will be kept under control by taking proper environment mitigation plan.

Moreover based on development of this project certain positive impact will be there on the nearby village population in terms of infrastructure development like education, transport, communication, employment, health etc. Hence, present request is for Environmental Clearance for change of technology, enhancement of production and establishment of COB Plant may be approved.

ANNEXURE

Annexure I

Lease Deed

Original

MINING LEASE FOR

CHROMITE

In favour of :

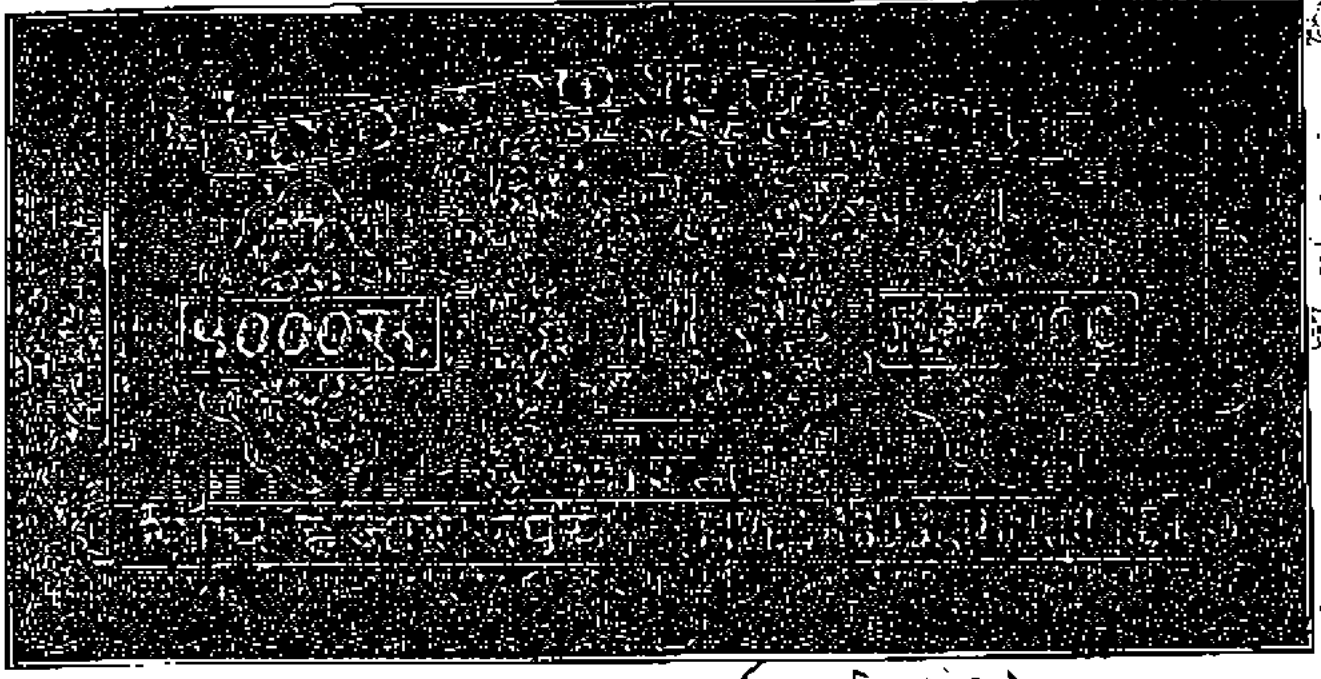
M/s INDIAN METALS & FERRO ALLOYS LTD.

Bomikhal, Rasulgarh, Bhubaneswar 751 010 (Orissa)

Dated the 4th Sept '1999

Over 288.52 Acres or 116.76 Hectares
in village, Kaliapani in Jajpur district.

2085 Original Lease 13,75,072/- 2059 5000Rs.



Adjudicable under rule 25 duly stamped under the Indian Stamp (Orissa Amendment) Act, 1986, Schedule I-A No. 35 (C) and Schedule-II (2) of the Orissa Additional Stamp Duty Act, 1986 exempted from the Orissa Stamp Duty

REGISTERING OFFICER
JAJPUR

FORM - K

MINING LEASE

(See Rule 31)

THIS INDENTURE made this

4th day of

September 1999 between

the Governor of Orissa

Com...

FOR INDIAN METALS & FERRO ALLOYS LTD.

4.9.99

CONSTITUTED ATTORNEY

REGISTRAR JAJPUR

Annexure II

Copy of Earlier EC letter

BY SPEED POST

No. J-11015/346/2007-IA.II(M)
Government of India
Ministry of Environment, Forests & Climate Change
Impact Assessment Division

3rd Floor, Vayu Wing,
Indira Paryavaran Bhawan,
Jorbagh Road, Aliganj,
New Delhi-110 003
Dated: 11th August, 2014

To,

M/s Indian Metals & Ferro Alloys Ltd.
IMFA Building,
B-4/147, Safdarjung Enclave,
New Delhi-110029

Subject: **Sukinda Mines of M/s Indian Metals & Ferro Alloys Ltd located at village kaliapani, Tahasil - Sukinda, District - Jajpur, Odisha(116.76ha)(3.51 LTPA ROM Chromite) Extension of Environmental clearance regarding.**

Sir,

This has reference to your letter No. IMFA/MPC/13/207 dated 17.10.2013 on the subject mentioned above. The proposal was considered by Expert Appraisal Committee in its meeting held during February 24-25, 2014. The Committee recommended the proposal for extension of environmental clearance.

2. The proposal of M/s Indian Metals & Ferro Alloys Ltd is for extension of environmental clearance from 01.04.2014 to 03.09.2029 for 3.51 LTPA Chrome Ore (116.76 Ha), keeping the same level of Production and Mine Lease area as there is no increase in area, production capacity & also no change in technology.

3. The Mine is located at village Kaliapani, Sukinda Taluk, Jajpur District, Odisha. The point-wise compliance of prior EC was submitted to MoEF, vide Letter. No: IMFA/SMC/13/2321, Dated 19.11.2013. The mining lease area is 116.76 ha which is Govt waste land. The lease has been granted up to 03.09.2029. The scheme of mining for the period 2014-15 to 2018-19 has been approved by IBM vide letter no: 314(3)/2012-MCCM(CZ)/MS-56, dated: 31st July 2013. IBM has estimated life of opencast mine up to year 2025-26.

4. Environmental Clearance for production of 3.51 LTPA by opencast method was accorded vide letter of even no. dated 18th June 2008 for a period up to March 2012 with a special condition for submission of approved Mining Plan for working beyond March 2012. The Ministry of Environment & Forests had accorded extension of Environmental Clearance vide letter of even no. dated 22nd May 2012, for continuation of production of 3.51 Lakh Tonnes Per Annum (LTPA) of Chromite ore by opencast method for captive use up to 31st March 2014.

5. For considering grant of Environmental Clearance beyond March 2014, MoEF had sought firmed up proposals for management of overburden / waste and

which is to be reflected in the Mine Plan / Mine Scheme. Project Proponent has informed that common boundary dumping along with firmed up proposal of management of OB/waste for whole life of opencast mine has been incorporated in the 3rd Scheme of Mining (2014-15 to 2018-19) along with PMCP and has been approved by IBM on 31st July 2013. Permission for dumping of overburden within 7.5 meter of common boundary between Kaliapani Chromite Mine of M/s Balasore Alloys Ltd. (BAL) and Sukinda Mines (Chromite) of M/s IMFA has been accorded by DGMS on 13.02.2013. This would facilitate increase of dump capacity by another 14.5 L CuM.

6. The Ministry of Environment and Forests has examined the application in accordance with the EIA Notification, 2006 and hereby accords extension of environmental clearance already granted vide letter no. J-11015/346/2007-IA.II(M) dated 18.06.2008 upto 31.03.2026 under the provisions thereof to the above mentioned proposal of M/s Indian Metals & Ferro Alloys Ltd. for production of 3.51 LTPA Chrome Ore over mining lease area of (116.76 Ha).

7. In addition, the following additional conditions are stipulated:

(i) Monitoring of dump with reference to safety and stability shall be done on six monthly basis and report submitted to the Regional Office of MoEF.

(ii) All precautions as recommended by DGMS should be implemented.

(iii) Reclamation plan for dead dump areas should be periodically implemented and report submitted to the Regional Office.

8. All the other conditions contained in the EC letter of J-11015/346/2007-IA.II(M) dated 18.06.2008 shall remain same.

9. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

10. This issues with the approval of Competent Authority.

(Dr. V.P. Upadhyay)
Director

Copy to:

(i) The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi.

(ii) The Secretary, Department of Environment, Government of Odhisa, Secretariat, Bhubaneswar.

(iii) The Secretary, Department of Mines and Geology, Government of Odisha, Secretariat, Bhubaneswar.

(iv) The Secretary, Department of Forests, Government of Odisha, Secretariat, Bhubaneswar.

(v) The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.

(vi) The Chief Conservator of Forests, Regional Office (EZ), Ministry of Environment and Forests, A-3 Chandrashekharpur, Bhubaneshwar-751023.

(vii) The Chairman, Odisha State Pollution Control Board, Parivesh Bhawan, A/118 Nilakantha Nagar, Unit-VIII, Bhubaneshwar-751012.

(viii) The Controller General, Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur-440 001.

(ix) The Member Secretary, Central Ground Water Authority, A2, W3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.

(x) The District Collector, Jaipur District, Government of Odhisa.

(xi) Record File.

(xii) MoEF Website

(Dr. V.P. Upadhyay)
Director

RECEIPT
M/s IMFA LTD
Kalapani
897
Date 26-08-2014.

Annexure III

Stage II Forest Clearance letter

F. No. 8-16/2016-FC
Government of India
Ministry of Environment, Forests and Climate Change
(Forest Conservation Division)

Indira ParyavaranBhawan
Aliganj, Jorbagh Road
New Delhi – 110 003

Dated: 22nd June, 2018

To,

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

Sub: **Diversion of 115.05 ha of Sabik Kisam forest land as on 25.10.1980 within total mining lease area of 116.76 ha for chromite mining in their Sukinda Chromite Mines within village of Kaliapani under SukindaTahasil of Jajpur district, Odisha by M/s IMFA Ltd. in Jajpur District, Odisha.**

Sir,

I am directed to refer to the Government of Odisha's letter No.10F (Cons)183/2016.12102/F&E dated 30.04.2016 on the above mentioned subject seeking prior approval of the Central Government under Section 2 of the Forest (Conservation) Act, 1980 and to say that the said proposal has been examined by the Forest Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act. After careful consideration of the proposal by the Forest Advisory Committee (FAC) constituted under section-3 of the said Act, ***In-principle*** approval was granted vide this Ministry's letter of even number dated 20.10.2016 read with 25.07.2017 subject to fulfilment of certain conditions. The State Government has furnished compliance report in respect of the conditions stipulated in the approval and has requested the Central Government to grant final approval.

In this connection, I am directed to say that on the basis of the compliance report furnished by the Addl. Pr. Chief Conservation of Forests & Nodal Officer (FCA), State Government of Odisha vide their letters No. No. 22102/9F (MG)-361/2016 dated 13.10.2017 and No. 8374/9F (MG)-361/2016 dated 17.04.2018, ***Stage-II/Final*** approval of the Central Government is hereby granted under Section-2 of the Forest (Conservation) Act, 1980 for diversion of 115.05 ha of SabikKisam forest land as on 25.10.1980 within total mining lease area of 116.76 ha for chromite mining in their Sukinda Chromite Mines within village of Kaliapani under SukindaTahasil of Jajpur district, Odisha by M/s IMFA Ltd. in Jajpur District, Odisha subject to following conditions:

(i) Legal status of the diverted forest land shall remain unchanged;

(ii) Compensatory afforestation over the non-forest land equal in extent to the area of 115.05 ha. of forest land being diverted shall be raised on the identified land within a period of three years with effect from the date of issue of Stage-II clearance and maintained thereafter in accordance with the approved Plan by the State Forest Department from the **funds of Rs. 3,82,85,800/- deposited in Ad-hoc CAMPA account** by the user agency;

(iii) The afforestation in lieu of 1.5 times the area under safety zone shall be raised on the identified land within a period of three years with effect from the date of issue of Stage-II clearance and maintained thereafter in accordance with the approved Plan by the State Forest Department from the **funds of Rs. 7,61,832/- deposited in Ad-hoc CAMPA account** by the user agency;

22.6.18

(iv) The non-forest land transferred and mutated in favour of the State Forest Department for raising Compensatory Afforestation shall be notified as reserved Forest under Section-4 or Protected Forest under Section-29 of the Indian Forest Act, 1927 or under the relevant Section(s) of the local Forest Act.;

(v) The user agency shall pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;

(vi) The State Govt. shall ensure that the fencing, protection and regeneration of the safety zone shall be done within three years as per approved plan of **Rs. 1,97,731/-** by the user agency at their cost in consultation with State Forest Department. The State Govt. also ensure that no mining shall be carried out in the land required to be maintained as safety zone all around the mining area.;

(vii) Period of diversion of the said forest land under this approval shall be for a period co-terminus with the period of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended in 2015 and the Rules framed there-under;

(viii) The User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;

(ix) The State Govt. and the user agency shall ensure that the land surrender schedule may be implemented in accordance with the approved mine plan and progressive mine closure plan;

(x) The State Govt. shall ensure that the State Forest Department shall implement the approved Regional Wildlife Management Plan and Site Specific Wildlife Management Plan from the funds **of Rs. 6,77,1,680 and 2,57,00,000 /- respectively deposited in Ad-hoc CAMPA account** by the user agency;

(xi) The State Govt. and the user agency shall ensure that no labour camp shall be established on the forest land;

(xii) The User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;

(xiii) The State Govt. and the user agency shall ensure that the boundary of the diverted forest land, mining lease and safety zone, as applicable, shall be demarcated on ground at the project cost by the user agency, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, distance from pillar to pillar and GPS co-ordinates;

(xiv) The State Govt. and the user agency shall ensure that the mining may be carried out in a phased manner after taking due care for reclamation of the mined over area. The concurrent reclamation plan as per the approved mining plan shall be executed by the User Agency from the very first year, and an annual report on implementation thereof shall be submitted to the Nodal Officer, Forest (Conservation) Act, 1980, in the concerned State Government and the concerned Regional Office of the Ministry. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the User Agency, the Nodal Officer or the Addl. Principle Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities area satisfactorily executed.;

22.6.18

(xv) The State Govt. and the user agency shall ensure that the layout plan of the mining plan/ proposal shall not be changed without the prior approval of the Central Government;

(xvi) The State Govt. and the user agency shall ensure that the forest land shall not be used for any purpose other than that specified in the proposal;

(xvii) The State Govt. and the user agency shall ensure that the forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government;

(xviii) The State Govt. and the user agency shall ensure that no damage to the flora and fauna of the adjoining area shall be caused;

(xix) The State Govt. and the user agency shall ensure that any tree felling shall be done only when it is unavoidable and that too under strict supervision of the State Forest Department;

(xx) The State Govt. and the user agency shall implement the applicable recommendations of the State Government at the project cost;

(xxi) Following activities, as per approved plan / schemes, shall be implemented by the User Agency at their cost and State Govt. shall ensure that compliance report of all these activities are submitted to MoEF&CC regularly. User agency shall follow the direction of concerned DFO to implement all such activities as per plan:

(a) Mitigative measures to minimize soil erosion and choking of stream shall be implemented within a period of three year with effect from the issue of Stage-II clearance in accordance with the approved Plan of **Rs. 12,98,000/- by the user agency at their cost** in consultation with State Forest Department;

(b) Planting of adequate drought hardy plant species and sowing of seeds, in the appropriate area within the mining lease to arrest soil erosion in accordance with the approved scheme of **Rs. 15,67,985/- by the user agency at their cost** in consultation with State Forest Department;

(c) Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour in accordance with the approved scheme of **Rs. 26,05,750/- by the user agency at their cost** in consultation with State Forest Department;

(d) Stabilize the overburden dumps by appropriate grading/benching, in accordance with the approved scheme, so as to ensure that angles of repose at any given place is less than 28° In this regard the approved scheme **of Rs. 65,71,600/-** shall be implemented by the user agency at their cost in consultation with State Forest Department

(e) No damage shall be caused to the top-soil and the user agency will follow the top soil management plan.

(xxii) The State Govt. shall ensure that the user agency will implement scheme for de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies in accordance with **approved scheme of Rs. 26,89,228/- at their cost in consultation with State Forest Department**, whenever required ;

22.6.11

(xxiii) The State Govt. shall ensure that all mitigative measures, as well as provisions of other plans which are stipulated to be done by user agency at their own cost are monitored regularly and its compliance are sent to MoEF&CC regularly. User agency to follow the direction of concern DFO to implement all such activities as per approved plan/scheme.

(xxiv) The State Govt. shall ensure that the User Agency shall submit the annual self compliance report in respect of the above stated conditions and also to the conditions stipulated in Stage-I Clearance to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly;

(xxv) Any other condition that the concerned Regional Office of this Ministry may stipulate, from time to time, in the interest of conservation, protection and development of forests & wildlife;

(xxvi) The user agency shall comply all the provisions of the all Acts, Rules, Regulations, Guidelines, NGT Order(s) &Hon'ble Court Order (s) pertaining to this project, if any, for the time being in force, as applicable to the project; and

Yours faithfully,

(Sandeep Sharma)

Assistant Inspector General of Forests (FC)

Copy to:

1. The Principal Chief Conservator of Forests, Government of Odisha, Bhubaneswar.
2. The Nodal Officer (FCA), Government of Odisha, Bhubaneswar.
3. The Addl. Principal Chief Conservator of Forests (Central), Regional Office (Eastern Zone), Bhubaneswar.
4. User Agency.
5. Monitoring Cell, FC Division, MoEF, New Delhi.
6. Guard File.

(Sandeep Sharma)

Assistant Inspector General of Forests (FC)

Annexure IV

Mining Plan approval letter

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

Phone: 0674-2352463,
TeleFax. 0674-2352490;
eMail:
ro bhubaneshwar@ibm.gov.in
Plot No.149, Pokhariput
BHUBANESWAR-751020

No. MPM/FM/25-ORI/BHU/2017-18 / 2815 Date: 14.02.2018

To

Shri C. R. Ray, Nominated Owner,
M/s IMFA Limited, At- IMFA Building,
Rasulgarh, Bhubaneswar, Pin-751010, Odisha.

Sub: Approval of Modification of Review of Mining Plan of Sukinda Mines (Chromite) over an area of 116.76 ha in Jajpur district of Odisha of M/s Indian Metals & Ferro Alloys Limited submitted under Rule-17 (3) of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Ref: -

i. Your letter no. IMFA/MPC/18/6 dated 10.01.2018.
ii. This office letter of even no. dated 15.01.2018.
iii. This office letter of even no. dated 15.01.2018 addressed to the Director of Mines, Govt. of Odisha, copy endorsed to you.
iv. This office letter of even no. dated 25.01.2018.
v. Your letter no. IMFA/MPC/18/15 dated 06.02.2018.

Sir,

In exercise of the power delegated to me vide Gazette Notification No. S.O. 1857(E) dated 18.05.2016, I hereby **Approve** the Modification of Review of Mining Plan including Progressive Mine Closure Plan of Sukinda Mines (Chromite) over an area of 116.76 ha of M/s Indian Metals & Ferro Alloys Limited in Jajpur district of Odisha State submitted under Rule 17 (3) of Mineral Concession Rules, 2016. This approval is subject to the following conditions:

I. The Modification of Review of Mining Plan is approved without prejudice to any other law applicable to the mine area from time to time whether made by the Central Government, State Government or any other authority and without prejudice to any order or direction from any court of competent jurisdiction.
II. The proposals shown on the plates and/or given in the document is based on the lease map /sketch submitted by the applicant/ lessee and is applicable from the date of approval.
III. It is clarified that the approval of aforesaid Modification of Review of Mining Plan does not in any way imply the approval of the Government in terms of any other provision of Mines & Minerals (Development & Regulation) Act, 1957, or the Mineral Concession Rules, 2016 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986 or the rules made there under, Mines Act, 1952 and Rule & Regulations made there under.
IV. Indian Bureau of Mines has not undertaken verification of the mining lease boundary on the ground and does not undertake any responsibility regarding correctness of the boundaries of the leasehold shown on the ground with reference to lease map & other plans furnished by the applicant / lessee.
V. At any stage, if it is observed that the information furnished, data incorporated in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.

Contd. Page-2

VI. If this approval conflicts with any other law or court order/ Direction under any statute, it shall be revoked immediately.

VII. Validity of this document shall expire on 31.03.2019.

VIII. Next financial assurance shall be due for submission on 31.03.2019.

भवदीय / yours faithfully,

14/02/18

(HARKESH MEENA)
क्षेत्रीय खान नियंत्रक / Regional Controller of Mines

Encl: - One copy of approved
Modification of Review of Mining Plan

Copy for kind information to:-

1. The Director of Mines, Directorate of Mines, Government of Odisha, Heads of the Department Building, New Capital, Bhubaneswar– 751001, Odisha along with one copy of Modification of Review of Mining Plan by ***REGISTERED PARCEL***.

2. Shri A. K. Samantray, Shri M. J. Raju and Shri P. Behera, Qualified Person, M/s Indian Metals & Ferro Alloys Limited, At- IMFA Building, Bomikhal, Rasulgarh, Bhubaneswar-751018, Odisha.

(HARKESH MEENA)
क्षेत्रीय खान नियंत्रक / Regional Controller of Mines

Annexure V

CGWA clearance letter & the application for renewal

भारत सरकार
केन्द्रीय भूमि जल प्राधिकरण
जल संसाधन, नदी विकास
और गंगा संरक्षण मंत्रालय

Government of India
Central Ground Water Authority
Ministry of Water Resources,
River Development & Ganga Rejuvenation

File No:- 21-4/838/OR/MIN/2016 - 727

NOC No:- CGWA/NOC/MIN/ORIG/2016/2166

Dated :- 07/04/2016
06 MAY 2016

To,

M/s Indian Metals and Ferro Alloys Limited,
IMFA House, Bamikhal, Rasulgarh,
Bhubaneswar, District Khordha,
Odisha – 751010

Sub:- NOC for ground water withdrawal to Sukinda Chromite Mines of M/s Indian Metals And Ferro Alloys Limited located at Village Kaliapani, Block Sukinda, Village Kaliapani, Block Sukinda, District Jajapur, Odisha – reg.

Refer to your application on the above cited subject. Based on recommendations of Regional Director, Central Ground Water Board South Eastern Region, Bhubaneswar vide their recommendations dated 17/03/2016 and further deliberations on the subject, the NOC of Central Ground Water Authority is hereby accorded to **Sukinda Chromite Mines of M/s Indian Metals and Ferro Alloys Limited located at Village Kaliapani, Block Sukinda, Village Kaliapani, Block Sukinda, District Jajapur, Odisha .** The NOC is, however subject to the following conditions:-

1. The firm may abstract **240 cu.m/day** of ground water through proposed **one (1)** borewell The firm at its own cost shall install piezometers at suitable locations both in core and buffer zone and execute ground water regime monitoring programme in and around the project area on regular basis in consultation with the and **3260 cu.m/day** through dewatering the mine seepage on account of mining intersecting the water table. The total withdrawal should not exceed **3500 cu.m/day (not exceeding 12,77,500 cu.m/year)**. No additional dewatering and no additional ground water abstraction structures to be constructed for this purpose without prior approval of the CGWA. Firm to submit computation of mine seepage and utilization of mine dewatering after requisite treatment as the mine water **may contain hexavalent chromium.**
2. The dewatering structure as well borewell to be fitted with water meter by the firm at its own cost and monitoring of ground water abstraction to be under taken accordingly on regular basis, at least once in a month. The ground water quality to be monitored twice in a year during pre- monsoon and post- monsoon periods.
3. **M/s Indian Metals and Ferro Alloys Limited,** shall, in consultation with the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar, implement ground water recharge measures atleast to the tune of **47,717 cu.m/year** as proposed, for augmenting the ground water resources of the area within six months from the date of issue of this letter. No part of the dewatered mine water should be used in any way to recharge the aquifer or even allowed to seep back to the aquifer

system. Because of the presence of Hexavalent Chromium the firm should take adequate measures and utmost care and protection against any chances of contamination to the aquifers.

4. The photographs of the recharge structures after completion of the same are to be furnished immediately to the Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar for verification and under intimation to this office.

5. The firm at its own cost shall install 8 to 10 piezometers fitted with automatic water level recorders at suitable locations both in core and buffer zone and execute ground water regime monitoring programme in and around the project area on regular basis in consultation with the Central Ground Water Board, South Eastern Region, Bhubaneswar. The monitoring report to be submitted within six months of the issuance of this letter.

6. The ground water monitoring data in respect of S. No. 2 & 5 to be submitted to Central Ground Water Board, South Eastern Region, Bhubaneswar on regular basis at least once in a year. Ground water monitoring in core and buffer zones

7. The firm shall ensure proper recycling and reuse of waste water after adequate treatment.

8. Action taken report in respect of S. No. 1 to 7 may be submitted to CGWA within one year period.

9. The permission is liable to be cancelled in case of non-compliance of any of the conditions as mentioned in S. No. 1 to 8.

10. This NOC is subject to prevailing Central/State Government rules/laws or Court orders related to construction of tubewell/ ground water withdrawal/ construction of recharge or conservation structures/ discharge of effluents or any such matter as applicable.

11. This NOC does not absolve the applicant / proponent of his obligation / requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.

12. The NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and be taking decisions independently of the NOC.

13. This NOC is valid till 06/04/2018.

Member Secretary

Copy to:

1. The Director, Ministry of Environment and Forests (I. A. Division), Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi-110003.
2. The Member Secretary, Orissa State Pollution Control Board, Odisha, A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012, Odisha.
3. The District Collector, District Jajapur, Odisha
4. The Regional Director, Central Ground Water Board, South Eastern Region, Bhubaneswar. This has reference to your recommendation dated 17/03/2016.
5. TS to the Chairman, Central Ground Water Board, Bhujal Bhawan, Faridabad, Haryana.
6. Guard File 2016-17.

Member Secretary

CC - M.M - SMC

D/c Env.

17/5/16

CGWB/SPEED POST

No. 5-22/SER/CGWA/2017-18 - 770

Govt. of India
Ministry of Water Resources, RD & GR
Central Ground Water Board
South Eastern Region
Bhujal Bhawan
NH – V, Khandagiri
Bhubaneswar –751030.

Date: 18-07-2018

To

The Member Secretary
Central Ground Water Authority
Ministry of Water Resources, RD & GR
West Block – 2, Wing – 3(Ground Floor)
Sector – 1, R. K. Puram
New Delhi-110 066

Sub: Forwarding of application for renewal of CGWA NOC in respect of SUKINDA MINES CHROMITE OF M/S INDIAN METALS AND FERRO ALLOYS LIMITED ,Village: Kaliapani , Block: SUKINDA Dist.: Jajpur, State: Odisha

Ref : 1.CGWA NOC granted to SUKINDA MINES CHROMITE OF M/S INDIAN METALS AND FERRO ALLOYS LIMITED -Vide Chq Letter No. 21-4/838/OR/MIN/2016 - 727 dated 06-05-2016 and subsequently modified
2.Renewal Application submitted by the firm Online 21-4/838/OR/MIN/2016 (1st Renewal)

Sir,

Enclosed please find evaluation report of the online renewal application submitted in respect of **SUKINDA MINES CHROMITE OF M/S INDIAN METALS AND FERRO ALLOYS LIMITED ,Village: Kaliapani , Block: SUKINDA Dist.: Jajpur, State: Odisha** seeking renewal of its existing NOC for abstraction of groundwater to the tune of 3500 cum/day. Rs. 500/- is paid through Bharatkosh (Trans ref no. 0504180001177 dated 05/04/2018). The online evaluations are being forwarded herewith with due recommendations for your kind perusal and necessary action please.

Yours faithfully,

Encl: **Evaluation Report**

(Dr Utpal Gogoi)
Regional Director

Copy to:

1) **M/S IMFA LTD , IMFA BUILDING, BOMIKHAL,RASULGARH BHUBANESWAR,ODISHA, PIN- 751010,**

2) Guard File

19/7/18

(Dr Utpal Gogoi)
Regional Director

Annexure VI

Authenticated Past Production

OFFICE OF THE DEPUTY DIRECTOR MINES, JAJPUR ROAD CIRCLE:
JAJPUR ROAD.

No. 776 /Mines Dated 15/05 /18

From

The Deputy Director Mines,
Jajpur Road.

To

The Mines Manager,
Sukinda Mines Chromite &
Mahagiri Chromite Mines,
M/s. IMFA Ltd.

Sub: Authentication of production figure from Sukinda Mines(Chromite) & Mahagiri Mines(chromite) of IMFA Ltd.

Ref: Your letter No.IMFA/MPC/18/46 & 47 Dt. 09.05.18.

Sir,

With reference to the subject cited above I am enclosing herewith the production of Chrome ore in respect of your Sukinda Mines Chromite and Mahagiri Chromite Mines M/s. IMFA Ltd. for the year 1999-2000 to 2017-18 for information and necessary action.

Yours faithfully,

15/5/18

I/C. Deputy Director Mines,
Jajpur Road.

Memo No. No._____/Mines Dated_____/18

Copy to the Director ,Ministry of Environment Forest & Climate Change Govt. of India Indira Paryavaran Bhawan Jor Bagh Road, Jor Bagh, New Delhi 110003 for favour of information and necessary action.

I /C. Deputy Director Mines,
Jajpur Road.

Statement showing the production of Chrome ore for the year from 1999-2000 to 2017-18 in respect of Sukinda Mines Chromite,M/s/ IMFA Ltd.

	Year	Name of Minerals	Production (in MT)	Remarks
1	2	3	4	5
1	1999-2000	Chrome Ore	46665.420	
2	2000-01	Chrome Ore	144802.450	
3	2001-02	Chrome Ore	214315.685	
4	2002-03	Chrome Ore	188376.994	
5	2003-04	Chrome Ore	309615.046	
6	2004-05	Chrome Ore	243584.963	
7	2005-06	Chrome Ore	259925.112	
8	2006-07	Chrome Ore	235466.681	
9	2007-08	Chrome Ore	295817.660	As per Annual Return in Form No -H/4 submitted by the Lesseee.
10	2008-09	Chrome Ore	284753.459	
11	2009-10	Chrome Ore	218618.000	
12	2010-11	Chrome Ore	251995.000	
13	2011-12	Chrome Ore	350168.000	
14	2012-13	Chrome Ore	296635.940	
15	2013-14	Chrome Ore	348568.510	
16	2014-15	Chrome Ore	258580.350	
17	2015-16	Chrome Ore	273548.830	
18	2016-17	Chrome Ore	350512.000	
19	2017-18	Chrome Ore	350571.560	

15/5/18

I/C. Deputy Director Mines.
Jajpur Road

Annexure VII

Letter submitted to MoEF dated 20.08.2018

INDIAN METALS & FERRO ALLOYS LIMITED

IMFA Building
Bhubaneswar-751010
Odisha, India

Corporate Identity No.
L27101OR1961PLC000428

TEL +91 674 3051000
+91 674 2580100
FAX +91 674 2580020
+91 674 2580145

mail@imfa.in

www.imfa.in

To
Director (EAC Non-Coal Mining),
IA Division
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhavan,
Aliganj, Jorbagh Road,
New Delhi-110003

Dated 17th August 2018

Subject: Environmental Clearance of Sukinda Mines (Chromite) of M/s Indian Metals & Ferro Alloys Limited located in Village: Kaliapani, Tehsil: Sukinda, District- Jajpur, Orissa (MLA: 116.76 Ha)- **Regarding deferment of meeting scheduled on 23rd August, change of environmental consultant and Extension of validity of TOR**

Reference: ToR Letter no. J-11015/204/2015-IA.II(M), dated 24.08.2015
Proposal no. IA/OR/MIN/28526/2015

Dear Sir,

With reference to above, we would like to bring to your kind notice that our project was granted TOR for enhancement in production from 3.51 Lakh TPA to 6.0 Lakh TPA, change in technology from opencast to both opencast & underground mining and establishment of Chrome Ore Beneficiation plant of 40 TPH feed capacity from your good office vide letter no. J-11015/204/2015-IA.II(M), dated 24.08.2015. As per TOR Condition, Public Hearing was conducted on 23rd June 2017 and Final EIA for appraisal was uploaded on portal on 18.09.2017. EDS was sought by Ministry on 04.05.2018. Reply of which was submitted on 07.07.2018. Now, our case has been listed on 23 August 2018 at Agenda no.2.1 for appraisal. In the meantime, due to the change in our environment consultant (from Bhagavathi Ana Labs Pvt. Ltd. to Perfact Envirosolutions Pvt. Ltd., New Delhi), we are not in a position to attend the meeting scheduled on 23rd August, 2018.

We will be submitting the revalidated EIA and other documents by October 2018. Since our TOR is going to be expired on 23rd August, 2018, hence it is requested you to kindly grant us extension in the validity of the TOR as per OM no. J-11013/41/2006-IA-11(I) dated 29th August, 2017.

Kindly allow us to submit the TOR extension at MoEF&CC portal.

Thanking you.

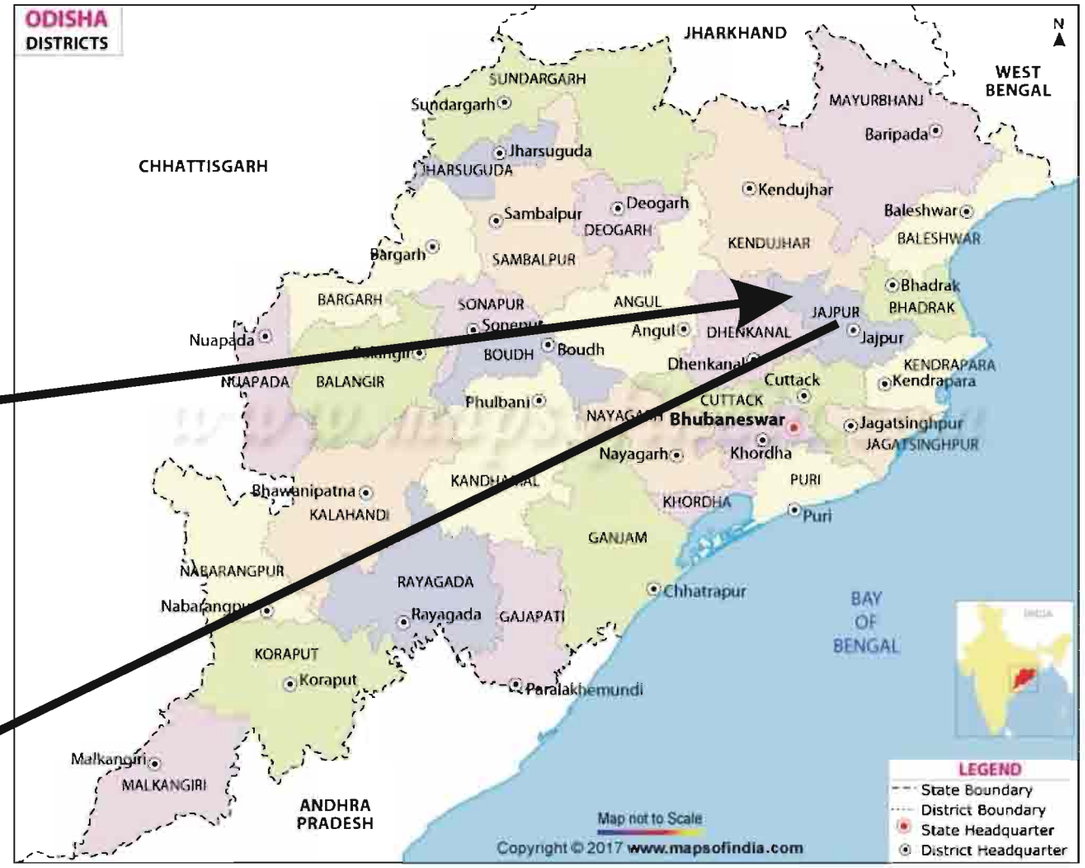
Yours faithfully,
for **Indian Metals & Ferro Alloys Ltd.**

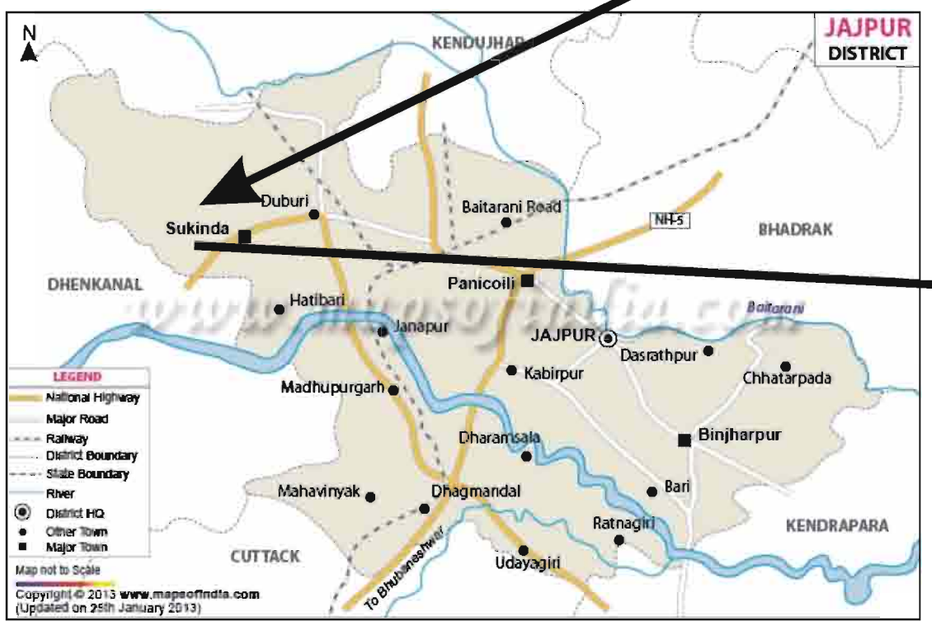
(Sanjeev Das)
Sr. Vice President,
Head-Mining BU.

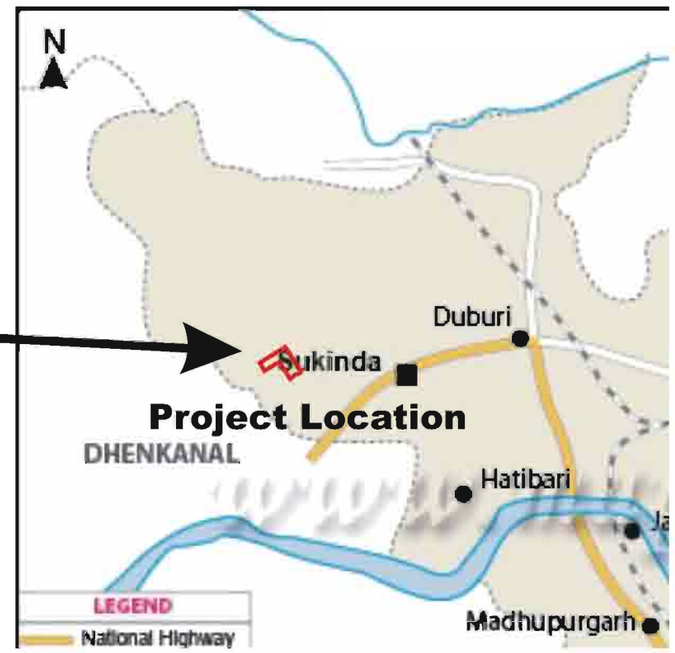
Annexure VIII

Location Map

Location Map







Annexure IX

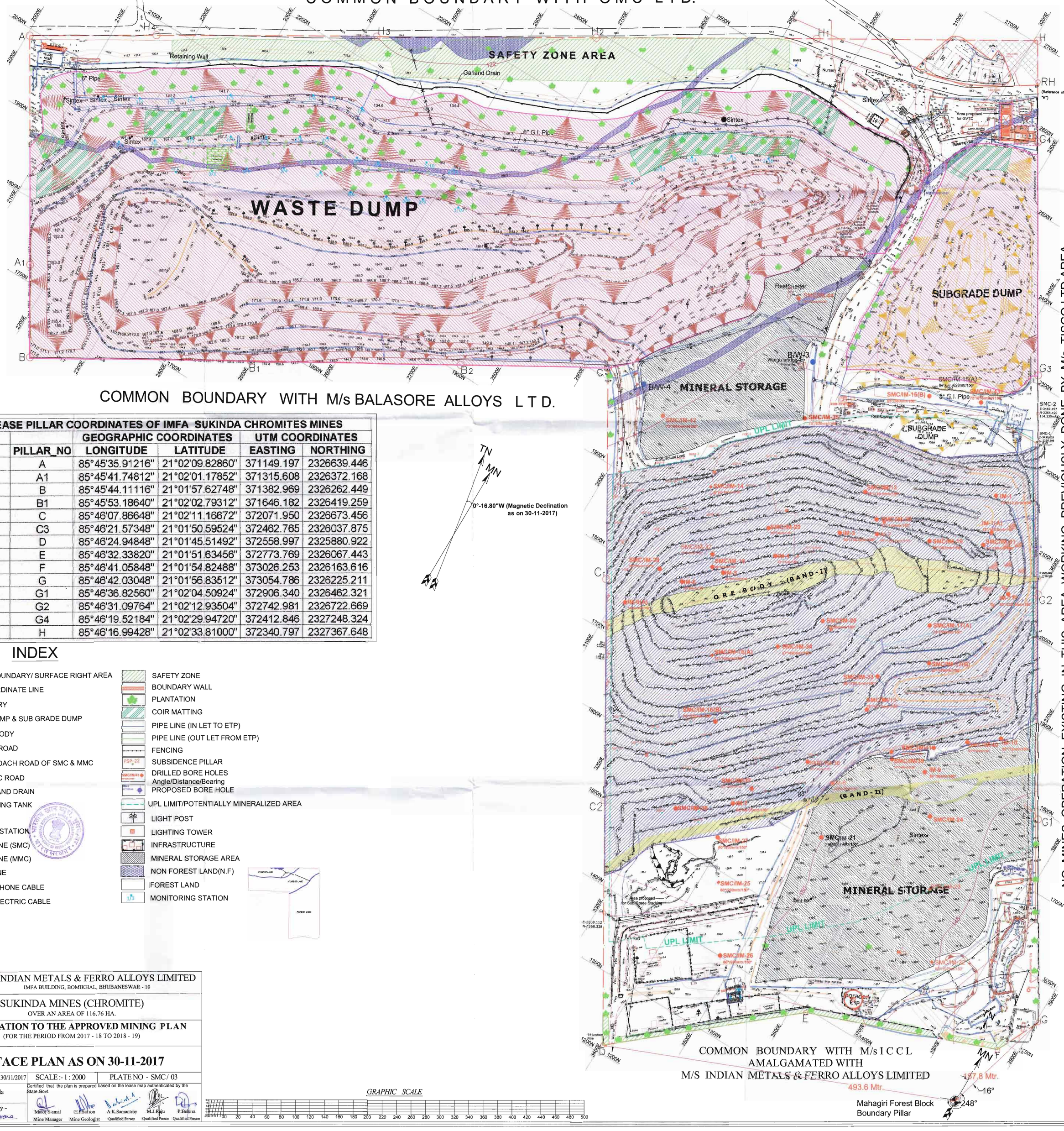
TOPOGRAPHICAL MAP

TOPOGRAPHICAL MAP-10KM RADIUS AREA SUKINDA MINE, VILL- KALIAPANI, SUKINDA, JAJPUR, ODISHA

Annexure X

SURFACE PLAN

COMMON BOUNDARY WITH OMC LTD.



COMMON BOUNDARY WITH M/s BALASORE ALLOYS L T D.

NO MINES OPERATION EXISTING IN THIS AREA WORKING PREVIOUSLY DONE BY M/s TISCO LTD.AREA HELD BY GOVT. OF ODISHA

LEASE PILLAR COORDINATES OF IMFA SUKINDA CHROMITES MINES					
		GEOGRAPHIC COORDINATES		UTM COORDINATES	
SL NO	PILLAR_NO	LONGITUDE	LATITUDE	EASTING	NORTHING
1	A	85°45'35.91216"	21°02'09.82860"	371149.197	2326639.446
2	A1	85°45'41.74812"	21°02'01.17852"	371315.608	2326372.168
3	B	85°45'44.11116"	21°01'57.62748"	371382.969	2326262.449
4	B1	85°45'53.18640"	21°02'02.79312"	371646.182	2326419.259
5	C	85°46'07.86648"	21°02'11.16672"	372071.950	2326673.456
6	C3	85°46'21.57348"	21°01'50.59524"	372462.765	2326037.875
7	D	85°46'24.94848"	21°01'45.51492"	372558.997	2325880.922
8	E	85°46'32.33820"	21°01'51.63456"	372773.769	2326067.443
9	F	85°46'41.05848"	21°01'54.82488"	373026.253	2326163.616
10	G	85°46'42.03048"	21°01'56.83512"	373054.786	2326225.211
11	G1	85°46'36.82560"	21°02'04.50924"	372906.340	2326462.321
12	G2	85°46'31.09764"	21°02'12.93504"	372742.981	2326722.669
13	G4	85°46'19.52184"	21°02'29.94720"	372412.846	2327248.324
14	H	85°46'16.99428"	21°02'33.81000"	372340.797	2327367.648

INDEX

- M.L.BOUNDARY/ SURFACE RIGHT AREA
- CO-ORDINATE LINE
- QUARRY
- OB DUMP & SUB GRADE DUMP
- ORE BODY
- HAUL ROAD
- APPROACH ROAD OF SMC & MMC
- PUBLIC ROAD
- GARLAND DRAIN
- SETTLING TANK
- SUMP
- PUMP STATION
- H.T. LINE (SMC)
- H.T. LINE (MMC)
- L.T. LINE
- TELEPHONE CABLE
- U/G ELECTRIC CABLE
- SAFETY ZONE
- BOUNDARY WALL
- PLANTATION
- COIR MATTING
- PIPE LINE (IN LET TO ETP)
- PIPE LINE (OUT LET FROM ETP)
- FENCING
- SUBSIDENCE PILLAR
- DRILLED BORE HOLES Angle/Distance/Bearing
- PROPOSED BORE HOLE
- UPL LIMIT/POTENTIALLY MINERALIZED AREA
- LIGHT POST
- LIGHTING TOWER
- INFRASTRUCTURE
- MINERAL STORAGE AREA
- NON FOREST LAND(N.F)
- FOREST LAND
- MONITORING STATION

M/S INDIAN METALS & FERRO ALLOYS LIMITED
IMFA BUILDING, BOMIKHAL, BHUBANESWAR - 10

SUKINDA MINES (CHROMITE)
OVER AN AREA OF 116.76 HA.

MODIFICATION TO THE APPROVED MINING PLAN
(FOR THE PERIOD FROM 2017 - 18 TO 2018 - 19)

SURFACE PLAN AS ON 30-11-2017

DATE OF SURVEY - 30/11/2017	SCALE :- 1 : 2000	PLATE NO - SMC / 03

Drawn by - P. K. Panda

Surveyed and checked by - J.Maharana

Certified that the plan is prepared based on the lease map authenticated by the State Govt.

Manoj Samal, Mine Manager | H.P.Sahoo, Mine Geologist | A.K.Samantray, Qualified Person | M.J.Raju, Qualified Person | P.Behera, Qualified Person

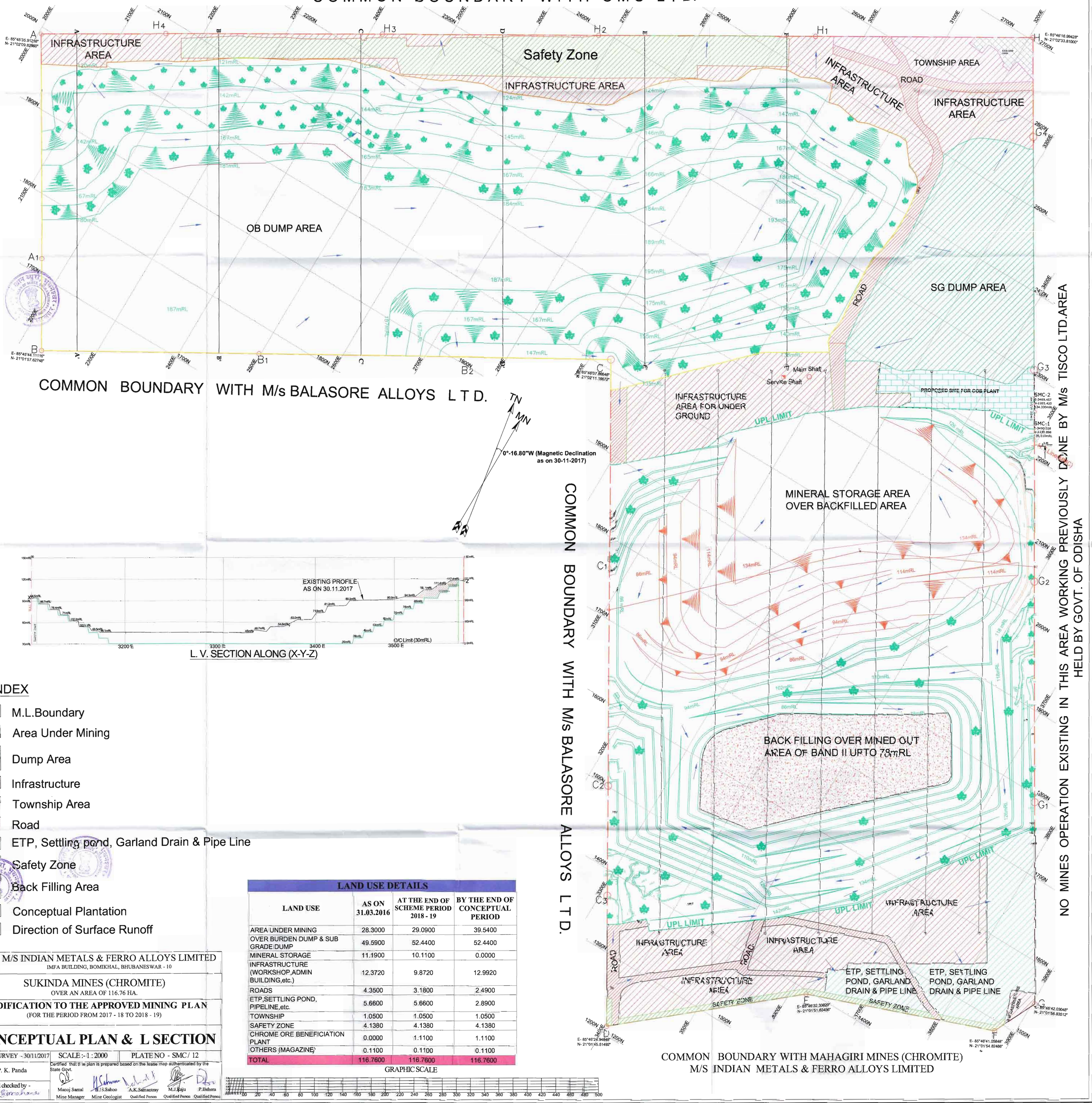
GRAPHIC SCALE

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500

Annexure XI

CONCEPTUAL PLAN & SECTION OF CONCEPTUAL PLAN

COMMON BOUNDARY WITH OMC LTD.



COMMON BOUNDARY WITH M/s BALASORE ALLOYS L T D.

COMMON BOUNDARY WITH M/s BALASORE ALLOYS L T D.

COMMON BOUNDARY WITH MAHAGIRI MINES (CHROMITE) M/S INDIAN METALS & FERRO ALLOYS LIMITED

NO MINES OPERATION EXISTING IN THIS AREA WORKING PREVIOUSLY DONE BY M/s TISCO LTD.AREA HELD BY GOVT. OF ODISHA

TN MN

0°-16.80"W (Magnetic Declination as on 30-11-2017)

L. V. SECTION ALONG (X-Y-Z)

INDEX

- M.L.Boundary
- Area Under Mining
- Dump Area
- Infrastructure
- Township Area
- Road
- ETP, Settling pond, Garland Drain & Pipe Line
- Safety Zone
- Back Filling Area
- Conceptual Plantation
- Direction of Surface Runoff

LAND USE DETAILS

LAND USE	AS ON 31.03.2016	AT THE END OF SCHEME PERIOD 2018 - 19	BY THE END OF CONCEPTUAL PERIOD
AREA UNDER MINING	28.3000	29.0900	39.5400
OVER BURDEN DUMP & SUB GRADE DUMP	49.5900	52.4400	52.4400
MINERAL STORAGE	11.1900	10.1100	0.0000
INFRASTRUCTURE (WORKSHOP,ADMIN BUILDING,etc.)	12.3720	9.8720	12.9920
ROADS	4.3500	3.1800	2.4900
ETP,SETTLING POND, PIPELINE,etc.	5.6600	5.6600	2.8900
TOWNSHIP	1.0500	1.0500	1.0500
SAFETY ZONE	4.1380	4.1380	4.1380
CHROME ORE BENEFICIATION PLANT	0.0000	1.1100	1.1100
OTHERS (MAGAZINE)	0.1100	0.1100	0.1100
TOTAL	116.7600	116.7600	116.7600

GRAPHIC SCALE

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500

imfa

M/S INDIAN METALS & FERRO ALLOYS LIMITED
IMFA BUILDING, BOMIKHAL, BHUBANESWAR - 10

SUKINDA MINES (CHROMITE)
OVER AN AREA OF 116.76 HA.

MODIFICATION TO THE APPROVED MINING PLAN
(FOR THE PERIOD FROM 2017 - 18 TO 2018 - 19)

CONCEPTUAL PLAN & L SECTION

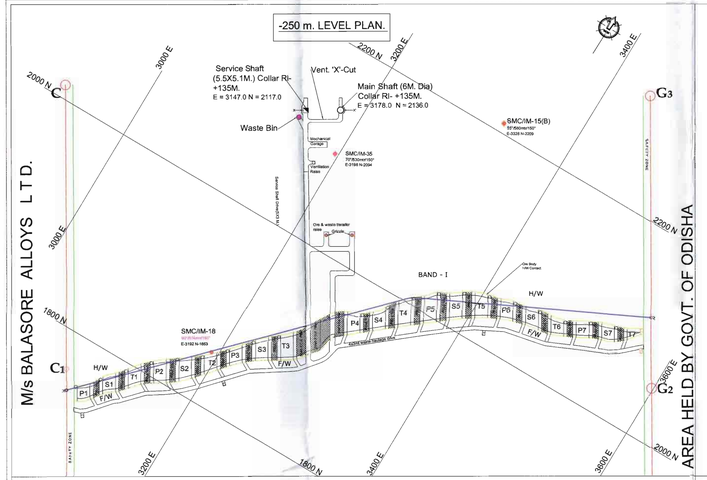
DATE OF SURVEY - 30/11/2017	SCALE :- 1 : 2000	PLATE NO - SMC / 12

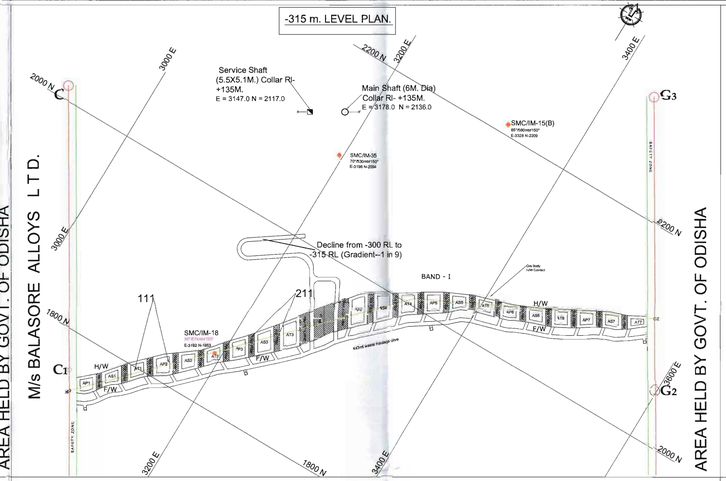
Drawn by - P. K. Panda

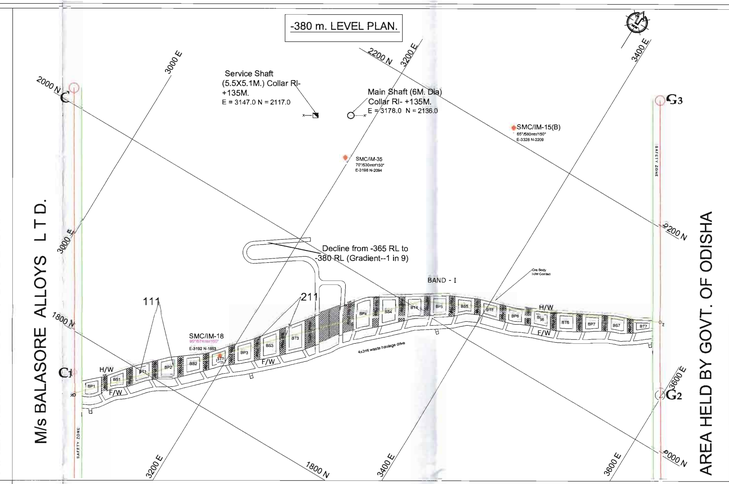
Surveyed and checked by - J.Maharana

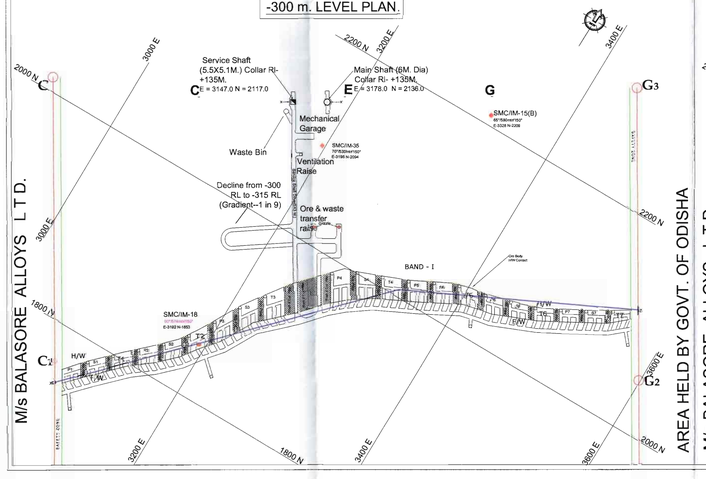
Certified that the plan is prepared based on the lease map authenticated by the State Govt.

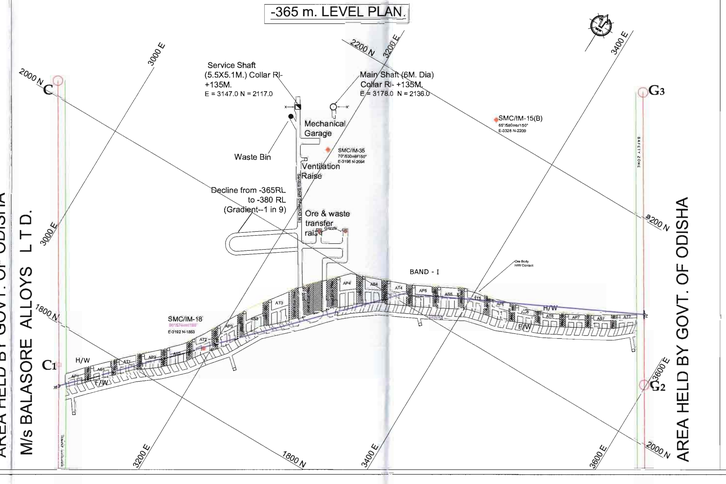
Manoj Samal	B.S.Sahoo	A.K.Samantray	M.J.Raju	P.Behera
Mine Manager	Mine Geologist	Qualified Person	Qualified Person	Qualified Person

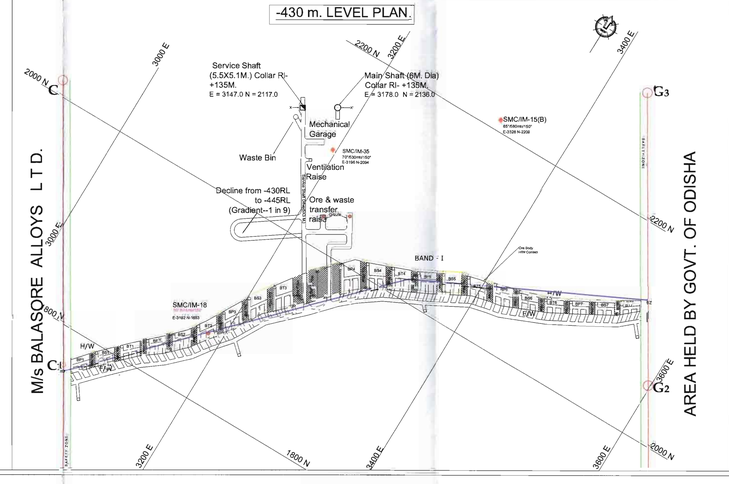












Legend

- Stope Block Development During the conceptual period
- Ore Body
- Shaft X-Cut Pillar
- Rib Pillar

M/S INDIAN METALS & FERRO ALLOYS LIMITED
IMFA BUILDING, BOMIKHAL, BHUBANESWAR - 10

SUKINDA MINES (CHROMITE)
OVER AN AREA OF 116.76 HA.

MODIFICATION TO THE APPROVED MINING PLAN
(FOR THE PERIOD FROM 2017 - 18 TO 2018 - 19)

U/G CONCEPTUAL PLAN

DATE OF SURVEY - 30/11/2017	SCALE :- 1 : 2000	PLATE NO - SMC/ 16

Drawn by - P. K. Panda

Surveyed and checked by - J.Maharana / Ranchharana

Certified that the plan is prepared based on the lease map authenticated by the State Govt.

Manoj Samal	H. Nayak	A.K.Samantray	M.S.Negi	P.Behera
Mine Manager	Mine Geologist	Qualified Person	Qualified Person	Qualified Person