A

J-11016/1026/2007 - IA. II(M)
Government of India
Ministry of Environment & Forests

Tel no. 24363073
E mail: plahujarai@yahoo.com
Paryavaran Bhavan, C.G.O. Complex,
Lodi Road, New Delhi-110003.
Dated the November 12, 2008

To

M/s Gogte Minerals
146, Tilakwadi
Belgaum 590 006
Belgaum, Karnataka

Fax no. 831-426487

Sub: Tiroda iron ore mine by M/s Gogte Minerals over an extent of 34.4812 ha at village Tiroda , Taluka Vengurla in district Sindhdurg in Maharashtra- reg environmental clearance

Sir,

The undersigned is directed to refer to your letter no. nil dated 20.09.2008 on the subject mentioned above. It is now proposed to consider the above-mentioned proposal during the next meeting of the Expert Appraisal Committee to be held on 2.12.2008 at Fazal Hall, SCOPE CONVENTION HALL, SCOPE COMPLEX, LODI ROAD, NEW DELHI-110003.

2. In this regard, you are requested to forward among the members of the committee a set of following project documents;

- Filled in Questionnaire
- The EIA/ EMP report containing the response to the issues emerged in the public hearing meeting
- A copy of public hearing report and objections received
- A copy of the approved mining plan and letter of IBM

3. The documents may be forwarded to the members of the Expert Appraisal Committee by courier/speed post so as to reach them well in time-(atleast 10 days prior to the meeting). Names and addresses of the members are enclosed for necessary action. Please, avoid delivery of documents by hand and seeking meeting with Members/Chairman, in this regard. A copy of this letter may be enclosed with the documents as a reference.

4. A brief write-up on the salient features of the project(s) is requested to be sent by e-mail. The write up shall consists of details of ML area (land use pattern), working depth of mine, ground water table, details of water bodies/lakes/rivers/nallahs, wildlife sanctuary/national parks/Heritage sites etc, location near CRZ, solid waste management and project appraisal status viz., forest clearance, IBM approval(Mining plan and mine closure plan) and public hearing etc.

5. Further, you are requested to depute your senior officer/consultant, who can explain the project and also respond to the queries/suggestions which committee may ask during the discussion and may make as well necessary commitments, to attend the meeting. The representatives would be required to make a presentation on the salient features of the project and the related environmental issues as may be envisaged based on the project profile and site details. Power point presentation shall be in accordance with Model TOR. A copy is enclosed. A line in confirmation regarding your participation in the meeting will be appreciated.

Yours faithfully,

P. Ahujarai

(Dr. P.L. Ahujarai)
Director

PROFORMA FOR ENVIRONMENTAL APPRAISAL OF MINING PROJECTS

PROJECT: TIRODA IRON ORE MINE

Tiroda village, Sawantawadi taluk, Sindhudurg Dist.,
MAHARASTRA STATE
(Extent : 34.4812 Ha)

PROPONENT

M/s. GOGTE MINERALS

Belgaum

Consultant

MINERAL ENGINEERING SERVICES

Mining & Environmental Engineers
25/XXV, Club Road, Bellary – 583 103.

Tel / Fax No. 08392 – 267421
Email: mes_msraju@yahoo.co.uk

PROFORMA FOR ENVIRONMENTAL APPRAISAL OF MINING PROJECTS (MINING SECTOR PROJECTS)

Note - 1 :	All information to be given in the form of Annex/s should be properly numbered and form part of reply to this proforma.
Note - 2 :	Please enter √ in appropriate box where answer is Yes / No
Note - 3 :	No abbreviation to be used - **Not available** or **Not applicable** should be clearly mentioned.
Note - 4 :	**Core zone** is the mining lease area. **Buffer zone** in case of ML area up to 25 ha. is to be considered as **5 km** all around the periphery of the core zone and for ML area above 25 ha. an area **10 km** all around the periphery of the core zone.
Note - 5 :	Adopt **Scoping process** in carrying out EIA study.
Note - 6 :	Please indicate source of data.

1. General Information

(a) Name of the project : **Tiroda Iron ore mine**

(i) Name of the proponent : **M/s. Gogte Minerals, Belgaum**

Mailing Address : 146, Tilakwadi, Belgaum-590006, Karnataka.,

E-mail : gogtetextiles@rediffmail.com

Telephone : Teli No. 91-831-2468917(3 lines)2424696

Fax No. : Fax No. 91-831-2426487

(b) Objective of the project : To obtain Environmental Clearance from MoEF, New Delhi as per the EIA Notification, 2006 to increase iron ore production to 4.0 lakh tonnes per annum.

(c) Location of mine (s)

S. No.	Mining Lease	Village(s)	Tehsil	District	State
1	34.4812 ha	Tiroda	Sawantawadi	Sindhudurg	Maharastra

(d) Does the proposal relate to

(i) New Mine — Yes [ ] No [√]

(ii) Expansion — Yes [√] No [ ]

• Increase in ML area	Yes		No	√
• Increase in annual production	Yes	√	No	
(iii) Renewal of ML	Yes		No	√
(iv) Modernisation	Yes	√	No	

(e) Site Information

(i) Geographical Location

• Latitude	73^0 42' 17" to 73^0 42' 56"
• Longitude	15^0 44' 46" to 15^0 44' 34.5"
• Survey of India Topo sheet No.	
• Elevation above Mean Sea Level	18 to 70 MSL
• Total lease Area (in ha.)	34.4812 ha

(ii) Dominant nature of terrain

• Flat	Yes		No	√
• Undulated	Yes	√	No	
• Hilly	Yes	√	No	

2 Land usage of the mining lease area (in ha.)

(a)	Agricultural	nil
(b)	Forest	nil
(c)	Waste land	nil
(d)	Grazing	nil
(e)	Surface water bodies	nil
(f)	Others (Specify) Roads, mine workings, Infrastructure,	34.4812 ha of private land

3 **Indicate the seismic zone in which ML area falls. In case of zone IV & V, details of earthquakes in last 10 years.**

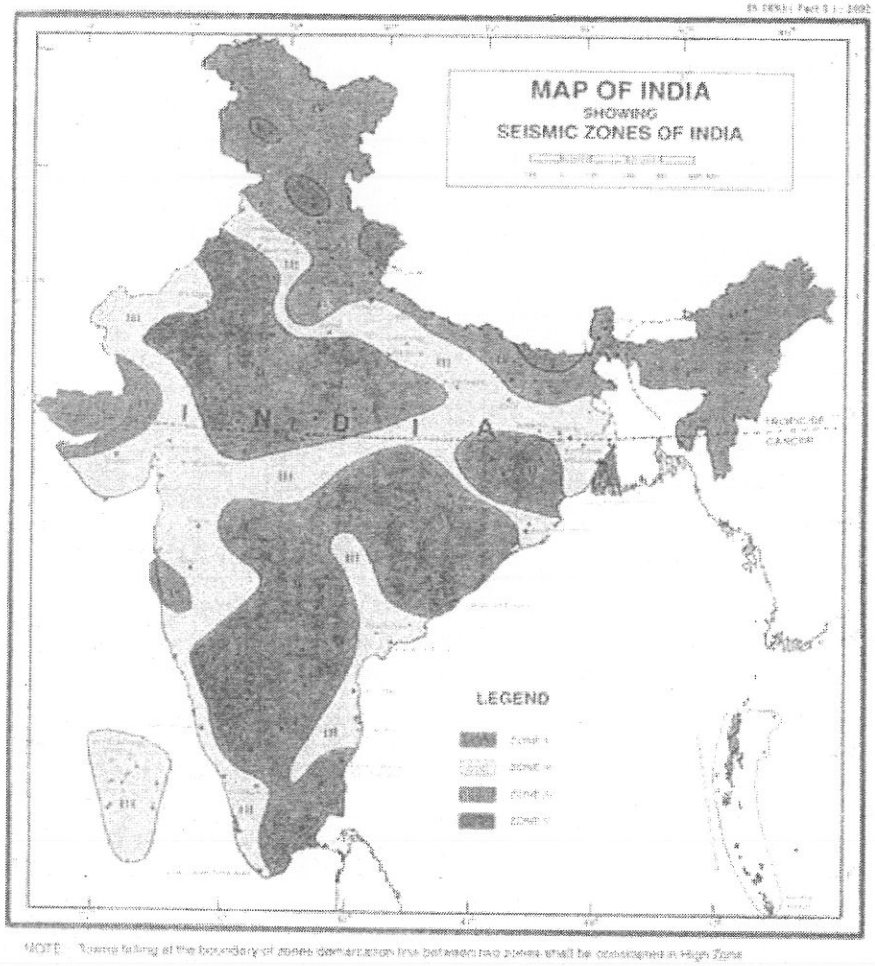
Zone III

(a) Severity (Richter Scale) — Not applicable

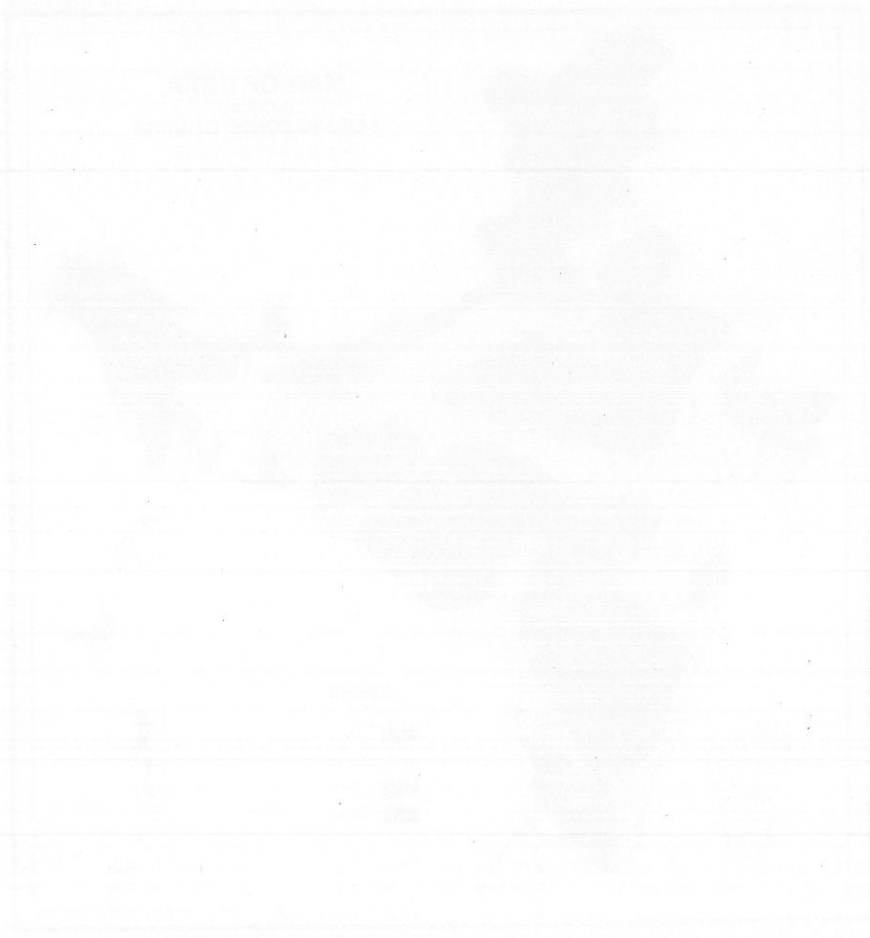
Not applicable

(b) Impact i.e. Damage to

• Life	Yes		No	✓
• Property	Yes		No	✓
• Existing mine	Yes		No	✓



NOTE Areas falling at the boundary of zones demarcation line between two zones shall be considered in High Zone



4. Break-up of mining lease area (in Ha.) as per approved Conceptual Plan:

Purpose	Mining lease Area				Total	Area acquired				Area to be acquired			
	Government		Private			Government		Private		Government		private	
	Forest	Others	Agri.	Others		Forest	Others	Agri	Others	Forest	Others	Agri.	Others
1. Area to be excavated (un filled Portion)		-	-	12.16	12.16		-	-	12.16				
2. Storage for top soil		-	-				-	-					
3. Overburden/ Dumps		-	-	5.98	5.98		-	-	5.98				
4. Mineral storage		-	-				-	-					
5. Infrastructure (Workshop, Administrative buildings) including check dams, retaining wall, settling tank		-	-	2.02	2.02		-	-	2.02				
6. Roads		-	-	1.08	1.08		-	-	1.08				
7. Railways		-	-				-	-					
8. Green belt (Environmental protective measures) & mined out area already reclaimed 9. Afforested virgin area		-	-	10.5	10.5		-	-	10.5				
10. Tailings pond		-	-	-	-		-	-	-				
11. Effluent treatment plant		-	-	-	-		-	-	-				
11.Coal handling plant/ mineral separation - screening plant		-	-	-	-		-	-	-				

12 Township area		-	-	-	-	-			-	-			-	
13. Others (Specify) a) Water Body- old pits converted into settling tank & water reservoir b) Agricultural Land c) Miscellaneous (For future Exploration) Virgin area left for barriers				0.1 2.6412		0.1 2.6412			- 	0.1 2.6412			- 	
TOTAL		-	-	34.4812		34.4812			-	34.4812			-	

5. **Township (outside mining lease)** **Not Applicable**

(a) Total Area (in ha.)

(b) No. of dwelling units

(c) Distance from mine site

6. **Distance of water bodies (in Km)**

Distance from	River bank*	Other water bodies * Sea/ creek/ lake/ nalla etc. (specify)
Mine lease boundary	Nanos Adjoining SW boundary	Shiroda creek- SW- 1.6 Redi port –W- 3.8 Arabian sea- W – 4.5 Kanyal Tank -SE – 2.85
Ancillary facilities	none	-

* From highest flood line / high tide line

7. **For projects falling within the Coastal regulation zone (CRZ)** **Not Applicable**

Whether the mineral to be mined is of rare nature and not available outside CRZ Yes ☐ No ☐

If Yes, annex a scaled location map showing low tide line (LTL), high tide line (HTL) duly demarcated by one of the authorized agencies* [*Director, Space Application centre, Ahmedabad: Centre for earth Sciences studies, Thiruvananthapuram: Institute of Remote sensing, Anna University, Chennai: Institute of Wetland Management 7 Ecological Designs, Kolkata: Naval Hydrographer's Office, Dehradun: National Institute of Oceanography, Panjim, Goa: and National Institute of ocean Technology, Chennai], boundary of mining lease area, distance of MI area from LTL and HTL CRZ boundary and CRZ classification of the project area as per the approved Coastal Zone Management plan, and settlements, sand dunes, mangroves, forest land/ patches, turtles breeding and nesting sites etc., if any, in the project area.

8. **Indicate aerial distance from the periphery of core zone / area from the periphery of the buffer zone to the boundary of following (upto 10 km):**

S. No.	Areas	Name	Aerial Distance (in km)	
			CORE *ZONE	BUFFER *ZONE
1.	National Park/ Sanctuary	None	-	
2.	Biosphere Reserve/ Tiger Reserve/ Elephant/ any other Reserve	Not Applicable	Not Applicable	
3.	Forest (RF/ PF/ unclassified)	Sawantwadi reserve forest	-	0.5
4.	Habitat for migratory birds	Not Applicable	Not Applicable	
5.	Corridor for animals of Schedule I & II of the Wild life (Protection Act 1972)	Not Applicable	Not Applicable	
6.	Archaeological sites • Notified • Others	Not Applicable	-	-

7.	Defense Installation	Not Applicable	Not Applicable	
8.	Industrial/ Thermal Power Plants	Tata Metallic Pig iron plant –	3.5	
9.	Other mines	Redi mines block1 & 2- NW New India Mining Co - NW Deccan Minerals Mining Co -W	1.5 km	
10.	Airport	Dabolim	40 km	
11.	Railway lines	Savantwadi		20 km
12.	National / **State Highways**	NH 17		6 km

[* Buffer zone in case of ML area up to 25 ha. is to be considered as **5 km** all around the periphery of the core zone and for ML area above 25 ha. an area **10 km** all around the periphery of the core zone].

9. Description* of flora & fauna in the core and buffer zones

[* Consult the Wildlife (Protection) Act, 1972 as amended subsequently and list of species with (1) common name (2) Scientific name and (3) Under which schedule of the Wildlife (Protection) Act, the identified species fall. Get the list authenticated by an Expert in the field / credible scientific institute / University / Chief Wildlife Warden office. **Information to be based on field survey.]**

A.	Flora	Core Zone	Buffer Zone
1.	Agricultural crops	none	Paddy, Jawar, Bajra, Tur dal
2.	Commercial crops	none	cashew, coconut & areca nut
3.	Plantation	none	cashew, Kokum, Banana, coconut & vegetables etc
4.	Natural vegetation / forest type	none	The buffer zone Savantwadi reserve forest area located beyond 0.5 km consists of fairly dense mixed jungle. Fairly dense cashew forest is located 1.0 km. Authenticated list of flora given in annexure- IX
5.	Grass lands	none	none
6.	Endangered species	none	none
7.	Endemic species	none	none

8.	Others (Specify)	Vegetation seen around the broken up area of core zone which is a private land are Shrubs & bushes The common verities of trees in the area are Anacardium occidental, Canophyllum inophyllum, Mangifera indica, Carea arborea, Syzigium cuminii, Bauhinia racemosa, Xylia dolabriformis, etc., shrubs are Catunaregum spinosa, Calycopteris floribunda, Vitex nigundo etc., and herbs like Eupatorium rapandum, Ocimum canum, Cassia tora, Mimosa pudica etc.	Most of the species exist in the core zone area also spread in the buffer zone area. In Sawantwadi reserve forest species like Amba, Phanas, Kaju, Kokam, Jambhool, Bhokar, Vad, Pimpal, Peru, sawar, bibba, Avla are present, There are no rare or endangered species of flora in the forest areas. Majority of mangrove species near the creek found are exocaria agallocha (Geva), Avicennia officianallis, Avicennia marina. Near the seashore mainly casurina equestifolia is found. The details of flora present in the area are given under paras 3.5.1.2 & 3.5.1.3 of REIA & EMP Report.
B.	**Fauna**		
1.	Total listing of faunal elements	In the core zone commonly found animals are Common Mongoose, Indian rat, and common mouse. The avifauna found are Jungle myna, Common myna, India Cuckoo, Koel, house crow and Bulbul, The reptiles found are Garden lizard, rat snakes.Cobra, common kite In the buffer zone, most of the core zone fauna also spread.	The other faunal animals observed in the forest area are Wild boar, Jackal. Hare. Monkey, Bhekar, Indian Porcupine, Fruit bat, Rat, King vulture, Common kite, Rock pigeon, Indian oriole, Weaver bird, Little egret and Pond heron. The reptiles are House lizard, rat snake, Cobra, Fresh water snake, Kraits, Pit viper,. List of fauna given under annexure IX, There are no rare or endangered species of fauna in the forest areas. Authenticated list furnished under annexure IX.
2.	Endangered species	none	none
3.	Endemic species	none	none
4.	Migratory species	none	none
5.	Details of aquatic fauna, if applicable	Not applicable	Not applicable

10. Details of mineral reserves (as per approved Mining Plan)

		Quantity in million tonnes as on 01-04-2008
(a)	Proven	1.085
(b)	Indicated including sub grades & mineral rejects	2.133
(c)	Inferred	2.080
(d)	Mineable reserves	5.3*

11. Major geographical formation / disturbances in the mining lease area

(a)	Geological maps submitted	Yes	√	No
(b)	Geological sections submitted	Yes	√	No
(c)	Contour map submitted	Yes	√	No
(d)	Whether the presence, if any, noted of			
	(i) Faults	Yes		No √
	(ii) Dykes	Yes	√	No
	(iii) Shear Zone	Yes		No √
	(iv) Folds	Yes	√	No
	(v) Other weak zones	Yes		No √
	(e) Source of data (indicate)	Borehole data & geology exposed in the present pit		

(Refer Figure Nos. 5 &6)

12.0 Production of mineral(s) and life of mine

(a) Rated capacity of mine mineral wise (Tonnes /annum) — 400000 T of iron ore

(b) Life of mine at proposed capacity (Years) — About 15 years*

*Anticipated increase in reserves in view of continued exploration.

(c) Lease period (Years)

Sr. No.	ML/ T. C. No.	Lease Period
1		20 years up to 03-04-2010

(d) Date of expiry of lease (D/ M/ Y)

Sr. No.	ML/ T. C. No.	Date of expiry of the Lease
1		03-04-2010

(e) Indicate in case of existing mines

(i) Date of opening of mine 1978

(ii) Production in the last 5 years from year 2002-03 to year 2006 September in million tonnes (Yearwise for the last 5years)

2002-03	2003-04	2004-05	2005-06	2006-07 till Sept 06
Nil	Nil	Nil	nil	nil

(iii) Projected production for the next 5 years from year 2007 to year 2011 in million tonnes

2007	2008	2009	2010	2011
0.2	0.299	0.399	0.4	0.4

(iv). Whether mining was suspended after opening of the mine? Yes [√] No [ ]

If yes, details thereof including last production Figure and reason for the same. Due to uneconomic reason as there was no market for low grades

(f) Whether plans & sections provided (Figure 5, 6, 7,8, 9 &10) Yes [√] No [ ]

13. Type and method of mining operations

TYPE		METHOD	
Opencast	[√]	Manual	[ ]
Underground	[ ]	Semi-mechanised	[ ]
Both	[ ]	Mechanised	[√]

14. Details of ancillary operations for mineral processing

(a) Existing: None

(b) Additional: none

15. Mine details

(a) Open-cast mines

(i). Stripping ratio (mineral in tonnes to over burden in m^3)	1 :1.7
(ii). Ultimate working depth (in m bgl)	-18m MSL, below the highest peak at 48m MSL i.e. 66m
(iii). Indicate present working depth in case of existing mine (in m bgl)	+30.43m MSL, below the highest peak at 48m MSL i.e. 18 m
(iv). Thickness of top soil (in m.)	Top soil cover is scanty and irregular
• Minimum	0.3
• Maximum	0.7
• Average	0.5
(v) Thickness of overburden (in m.)	Total OB thickness in the form of 3 intermittent bands
• Minimum	10
• Maximum	35
• Average	25
(vi). Mining Plan	
• Height and width of the bench in Overburden / waste.	6m & 10 to 15m
• Height & width of the bench in ore body / coal seam.	6m & 10 to 15m
• Proposed inclination / slope of the sides of the Opencast mine (separately for overburden, coal / Ore and overall slope of the pit sides) both while Operating the mine as well as at the time of Closure of the mine.	Overall slope 30^0.
• Whether transverse sections across the Opencast mine at the end of fifth year And at the end of the life of the mine Have been submitted?	Yes in Figs 9 & 9 A
(vii). Type of blasting, if any, to be adopted.	No blasting operations are proposed, Ripper dozer & hydraulic excavator shall be used.
(b) Underground mines	**Not Applicable**

(i) Seam / Ore body	Min. Depth (m)	Max. Depth (m)	Avg. thickness (m)

Rate of dip In degree	Direction of dip

(ii) Mode of entry into the mine

- Shaft
- Audit
- Incline

(iii) Details of machinery

- On surface
- At Face
- For transportation
- Others

(iv) Method of stoping (metalliferrous mines)

- Open
- Filled
- Shrinkage
- Caving
- Combination of above
- Others (Specify)

(v) Extraction method

- Caving
- Stowing
- Partial extraction

(vi) Subsidence

- Predicted max. subsidence (in m)
- Max. value of tensile strain (in mm/m)

- Max. slope change (in mm/m)
- Whether identified possible subsidence Area(s) superimposed on Surface Plan has been submitted?
- Major impacts on surface features Like natural drainage pattern, houses, Buildings, water bodies, roads, forest, Etc.
- Salient features of subsidence Management (monitoring and control).

16 Surface drainage pattern at mine site

(a) Whether the pre-mining surface drainage plan Submitted? Yes [ ] No [√]

(b) Do you propose any modification / diversion in the existing natural drainage pattern at any stage? If yes, when. Provide location map indicating contours, dimensions of water body to be diverted, direction of flow of water and proposed route/changes, if any, i.e. realignment of river/ nallah/ any other water body falling within core zone and its impact. Yes [ ] No [√]

17. Embankment and/ or weir construction

Nil. Since Nanos river with its estuary is passes along SW ML boundary, no mining activity is proposed within 100 m of Nanos river
To arrest the fall of boulders if any and the fall of scree into river Nonos, leaving about 10m width form the ML boundary, a trench of length about 350 m, 5m width and 2m depth shall be dug out along the SW boundary of ML. A layer of gravel shall be placed at the bottom of this trench. Along the outer edge of this trench a parapet masonry wall of 2.0m height & 1m width with good foundation shall be constructed. The space between the parapet wall and ML boundary shall be covered with green belt. The rain water collected in this trench shall be allowed to over flow into the natural drainage system

(a) Do you propose, at any stage, construction of

(i). Embankment for protection against flood? Yes [ ] No [√]

(ii). Weir for water storage for the mine? Yes [ ] No [√]

(b) If so, provide details thereof. --

(c) Impact of embankment on HFL and settlement Around. Not Applicable

(d) Impact of weir on down stream users of water. Not Applicable

18. Vehicular traffic density (outside the ML area)

	Type of vehicles	No. of vehicles per day
(a) Existing	Nil	
(b) After the proposed activity	10 tonne tippers	180

(c) Whether the existing road network is adequate? If no, provide details of alternative Proposal? Yes [√] No [ ]

19. Loading, transportation and unloading of mineral and waste rocks on surface:

(a)	Manual	Yes		No	√
(b)	Tubs, mine cars, etc.	Yes		No	√
(c)	Scraper, shovels, dumpers/ trucks.	Yes	√	No	
(d)	Conveyors (belt, chain, etc.)	Yes		No	√
(e)	Others (specify).	Not Applicable			

20. Mineral(s) transportation outside the ML area

	Qty. (in TPD)	Percentage (%)	Length (in km)
(a). Road	1820	100%	1.5 km
(b). Rail	nil		
(c). Conveyors	nil		
(d). Ropeway	nil		
(e). Waterways	nil		
(f). Pipeline	nil		
(g). Others (specify)	nil		
Total	1820	100%	1.5 km

21.0 Baseline Meteorological and Air Quality Data

(a) Micro-meteorological data

[Continuous monitoring through autographic instrument for one full season other than monsoon]

(i) Wind rose pattern for one full season (16 points of compass i.e. N, NNE, NE, ---) based on 24-hourly data. For coastal area also furnish day-time and night time data.

- Day time
- Night time
- 24 – hours period

Refer Figure No. 11

(ii) Site specific monitored data

Month	Wind Speed (kmph)			Temperature (°C)			Relative Humidity (%)			Rain fall * (mm)			Cloud Cover ** (Octas of sky)
	Mean	Max.	% of calm	Mean (Dry Bulb)	Highest	Lowest	Mean	Highest	Lowest	Total	24-hours highest	No. of rainy days	Mean
Mar	5.0	11.8	4.1	31	34	27	69	85.5	52	nil	nil	nil	Not recorded
Apr	6.0	11.0	4.0	31.5	35	27	70	88	50	nil	nil	nil	
May	6.0	1178	4.0	31	34.5	27	72	88	55	nil	nil	nil	

* 24-hours rainfall should be reported from 08:30 hrs. IST of previous day to 08:30 hrs. IST of the day.
* Rainy day is considered when 24 hrs. rainfall is > 2.5 mm.
* Visual observations of cloud cover should be recorded four times a day at regular intervals.

(iii) Indicate name and distance of the nearest IMD meteorological station from which climatological data have been obtained for reporting in the EIA report, if any. Dabalim airport 40 km

(b). Ambient air quality data* (RPM, SPM, SO_2 and NO_x)

[*Monitoring should be carried out covering one full season except monsoon – same season as in 21 (a) (i)]
[*Frequency of sampling: Sampling to be done twice a week for the entire season 24 hourly for SPM & RPM. For gaseous pollutants 24-hourly data be given irrespective of the sampling period.]

(i) Season and period for which monitoring has been carried out.
Period : Summer season, 2006

(ii) No. of samples collected at each monitoring station. 26

8 samples of 24 hours duration per month for measuring SPM and RPM at buffer zone locations.
8 hours duration of samples for measuring SO_2 and NO_x.

Name of monitoring equipment used			SPM			RPM			SO_2			NO_x			Pb**		
			Envirotech Pvt. Ltd.			Envirotech Pvt. Ltd.			Spectrophotometer			Spectrophotometer			--		
Equipment sensitivity			--			--			5 µg/ m^3								
Permissible AAQ standard (CPCB)	R		200 µg/m^3			100 µg/m^3			80 µg/m^3			80 µg/m^3			1.00 µg/m^3		
	I		500 µg/m^3			150 µg/m^3			120 µg/m^3			120 µg/m^3			1.5 µg/m^3		
	S		100 µg/m^3			75 µg/m^3			30 µg/m^3			30 µg/m^3			0.75 µg/m^3		
Monitoring Location	No. of Samples Drawn	Category* (R, I, S)	Min.	Max.	98% tile	Min.	Max.	98% tile	Min.	Max.	98% tile	Min.	Max.	98% tile	Min.	Max.	98% tile
Core Zone																	
ML area	26	I	39	117	113	15	52	50	7	13	13	7	16	15	Nil	Nil	Nil
Buffer Zone																	
Tiroda	26	R	37	152	150	13	60	60	7	14	13	7	15	13	Nil	Nil	Nil
Nanos	26	R	37	132	121	13	60	60	7	13	13	7	13	13	Nil	Nil	Nil
Redi	26	R	77	101	100	19	41	40	8	12	12	7	11	11	Nil	Nil	Nil
Shiroda	26	R	30	78	77	10	35	33	5	12	11	5	11	11	Nil	Nil	Nil

*R = Residential; I = Industrial; S = Sensitive
**Pb for mineral specific sites only.
Annex a location map indicating location of AAQ stations, their direction and distance with respect to project site.

22. Stack and emissions details, if any* **Not Applicable-**

(Frequency of stack monitoring should be as per CPCB guidelines)

Sl. No.	Process / unit of operation (e.g. DG Set, Boiler)	Height of stack (m)	Internal top dia (m)	Flue Gas Exit velocity (m/sec)	Emission rate (kg/hr)				Heat emission rate from top of stack (K.cal/hr)	Exhaust /Flue gas			
					SPM	SO_2	NO_x	CO		Temp ^0C	Density	Specific Heat	Volumetric flow rate (m^3/hr)

23. Details of fugitive emissions during mining operations*

Mine is not working. The predicted details of the same are incorporated in the report under para 3.1.1.9.

24. Air Quality Impact Prediction (AQIP)*

(a). Details of model(s) used for AQIP including grid size, terrain features and input meteorological data. Gaussian Plume Model has been used for assessing the impacts

(b). Maximum incremental GLC values of pollutants based on Prediction exercise

(in $\mu g/m^3$)

Sr. No.	Pollutants	Incremental value	Ambient air quality	Resultant air quality
1.	SPM(within ML area)	002	117	117.02
2.	Tiroda	0.02	152	152.02
3	Nanos	0.16	132	132.16
2**.	SO_2	Not Applicable		
3**.	NO_x	Not Applicable		

[*Question Number 22, 23 & 24 need not be filled-in for mines having ML area of **25 ha. or less.**]

[**Information on item no. 2 & 3 to be provided in cases with captive power generation of 500 KVA and above]

25.0 Water requirement (m^3/day)

Purpose	Avg. Demand	Peak Demand
A. Mine Site		
1. Mine operation	nil	nil
2. Land reclamation	nil	nil
3. Dust suppression	200	240
4. Drinking	8	8
5. Green belt/plantation	14	18
6. Benefication	nil	nil
7. Washeries	nil	nil
8. Fire Service	nil	nil
9. Others (specify)	nil	nil
B. Township	Nil	Nil
1. Green belt		
2. Domestic		
3. Other (Specify)		
TOTAL	222	266

26.0 Source of water supply *

Sr. No.	Source	M^3/day
1	River (name)	Nil
2	Ground water	8
3	Mine water (sump/ pit)	214-258
4.	Other surface water bodies (specify)/ public water supply –	nil

[*Annex a copy of sanction letter/ permission from the concerned authority (Central Ground Water Authority in case of ground water abstraction is from notified area / State Ground Water Board in case of non-notified area / State Irrigation Department for surface water pumping) for drawing water.]

27.0 Lean season flow in case of pumping from river / nalla (cumecs) Not Applicable

28. Ground water potential of the study area

28.1 Ground water availability

(a) Range of water table (m bgl) – **General ground level of the area is about +3 mMSL**

(i) Pre-monsoon (April/May) Below general ground level

- Core Zone 5.93m
- Buffer zone 5.93m

(ii) Post-monsoon (November) Below general ground level

- Core Zone: 4.72m
- Buffer Zone: 4.72m

(b) Total annual replenish able recharge (million m^3/ year)

- By ground water table fluctuation method: 0.5663
- By rainfall infiltration factor method: 3.2152

(c) Annual draft excluding estimated draft through mine discharge (million m^3/ year): 0.12394

(d) Estimated draft through mine discharge (million m^3/ year): 0.1500

(e) Net annual ground water availability (million m^3/ year): 0.58246

(f) Stage of ground water development in %: 47.03%

28.2 Water demand – Competing users of the water source - Not Applicable (Public water supply)

S. No.	Usage	Present Consumption (m^3/day)		Additional proposed as per local plan (m^3/day)		Total (m^3/day)	
		Surface	Ground	Surface	Ground	Surface	Ground
1	Domestic	27	106	nil	nil	27	106
2	Irrigation	7333	1833	nil	nil	7333	1833
3	Industry	3000	0.00	nil	nil	3000	0.00
4	Mining	0.00	20	nil	nil	0.00	20
5	Others (specify)	nil	nil	nil	nil	nil	nil
Total		10360	1959	nil	nil	10360	1959

29 Water quality*

(a) Annex physico-chemical analysis of water at intake point**
Enclosed as Annexure VII

(b) In case of existing mine, annex report on quality of water discharge i.e. complete physico-chemical analysis**
Enclosed as Annexure VII

[*For non-discharging mines at least four ground water samples to be taken preferably from downstream direction of the mine in pre-monsoon and post-monsoon periods and analysed. For discharging mines six samples are to be analysed]
**All parameters as per BIS 10500. Indicate name of Methodology, Equipment used for analysis, and Detection Level (DL) for each parameter.
***Wherever any analytical parameter is below detection level, "BDL" (Below Detection Level) should be written instead of 'NIL'.

30. Impact on ground water regime / stream / lake / springs due to mine dewatering* -

(a) Radius of influence (in m) 156 m
[To be estimated based on analysis of pumping test data and application of empirical formula]

(b) Whether saline water ingress will take place? (applicable to coastal areas) Yes [ ] No [√]

(c) Impact on stream / lake / springs – **No negative impacts are reported**

[*Provide a comprehensive hydro-geological assessment report if the average mine dewatering is more than 100 m^3/day and or going below water table in non-monsoon period. The report should be based on preferably latest one year pre-monsoon and post-monsoon baseline data covering information on ground water situation, aquifer characteristics, water level conditions (April – May and November), estimate of ground water resources, predicted impact of the project on ground water regime and detailed remedial/ conservation measures such as artificial recharge of ground water etc. The report should be based on actual field inventory out of existing wells, at least 30 observation wells in the buffer zone with supplementary information from secondary sources (mention name). For estimation** of ground water resource (refer question no. 28 above) be designated study area of the buffer zone may be sub-divided into command and non-command areas, watershed-wise (in case of hard rock / consolidated formations / block-wise / mandal-wise in case of alluvial / unconsolidated formations)]

Copy of hydro-geological report of the area is enclosed under appendix IV

[**For estimating ground water resources in the area follow the Ground water Estimation Committee recommendations of 1997]

31. Waste Water Management –There shall be no Waste water discharge

(a) Daily discharge (m^3/day) from different sources

(i) Mine discharge during

- Lean period 500
- Monsoon period 500

(ii) Workshop	nil
(iii) Domestic (mine site)	nil
(iv) Beneficiation/ washeries	nil
(v) Coal Handling Plant	nil
(vi) Tailings pond	nil
(vi) Others (specify)	nil
Total	500

(b) Waste Water treatment plant; flow Sheet for treatment process attached. Yes [ ] No [√]

(c) Quantity of water recycled / reused / to be recycled in

(i) Percentage — Not Applicable

(ii) m^3/day — Not Applicable

(d) Point of final discharge — Excess pit water after sedimentation shall be supplied for irrigation in near by villages

Final point	Quantity discharged (in m^3/day)
1. Surface	
(i) Agricultural land	nil
(ii) Waste land	nil
(iii) Forest land	nil
(iv) Green belt	For green belt & Dust suppression 258 cum
2. River / nallah	nil
3. Lake	nil
4. Sea	nil
5. Others (specify)	Excess pit water supplied for irrigation in near by villages - 242
Total	500

(e) Users of discharge water — Nearby villagers for irrigation

(i) Human	Yes		No	√
(ii) Livestock	Yes		No	√
(iii) Irrigation	Yes	√	No	
(iv) Industry	Yes		No	√
(v) Others (specify)	Not Applicable			

(f) Details of the river / nalla, if final effluent is/ will be discharged (cumecs) — Not Applicable

(i) Average flow rate

(ii) Lean season flow rate

(iii) Aquatic life

(iv) Analysis of river water 100 meters upstream and 100 meters downstream of discharge point submitted. — Yes [ ] No [√]

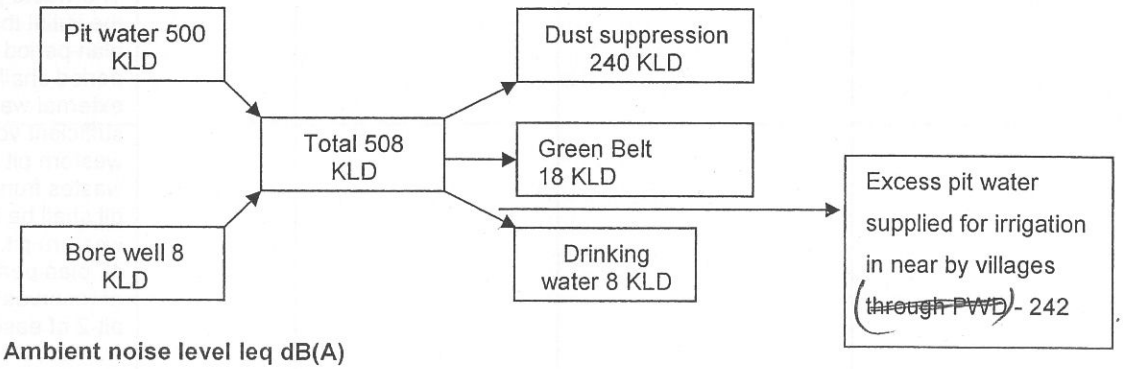
Township Not Applicable

(a) Waste water generation from Township (m^3/day)

(b) Are you planning to provide sewage Treatment plant? Yes ☐ No ☐

(c) Usage of treated water

32. Attach water balance statement in the form of flow diagram indicating input source(s), consumption (Section - wise) and output. –
This water balance shall be when the pit bottom reaches the water table i.e. from 6th year of production onwards



33. Ambient noise level leq dB(A)

Location of sampling station	Noise level			
	Day Time		Night Time	
A Core Zone	L_{max}	L_{min}	L max	Lmin
ML area	55	48	48*	38.*
*The mine shall work for single day shift only; therefore there shall be no noise generation from the mine during the night and what ever noise observed in the night shall be the background noise from the nearby villages.				
B Buffer Zone				
Redi	58	50	52	38
Shiroda	58.4	45	48	40
Terekhol	59	48	50	39
Kanyalvadi	65	42	55	38
Nanos	59	45	53	37

34. Solid Waste

(a) Top soil and Solid waste quantity and quality

Name (Lump/ fines/ slurry/ sludge/ others)	Composition	Quantity (m^3/month)	Method of disposal
Mining activity*			
a. Top soil	Loamy clay to silty clay, Neutral, high permeability, low nutrient content	Sporadic	Used in afforestation after mulching, mixing with soil stabilizers, manures and by growing leguminous plants
b. Overburden	Laterite, Phyllitic/Limonitic Clay	16700	The mine shall be worked in three independent pits, one in western block ant two in eastern block. The waste generated during the initial three years of 1st plan period & part of 2ND plan period shall be dumped as external waste dumps till sufficient void is created in western pit after which the wastes from pit 1 of eastern pit shall be back filled in this western pit. During the 3rd & 4th plan periods after exhaust of reserves in pit -1 of eastern, pit-2 of eastern block shall be worked, the wastes of which shall be backfilled in pit-1 of eastern block. The external waste dumps are erected within ML area covering 5.98 ha, to a maximum height 0f 30 m, in built up form with intermittent berm with overall slope of 28^0.
c. Others (specify)	nil		
Effluent Treatment Plant (sludge)	Not Applicable		

[*Annex layout indicating the dump sites]

(b) (i) Does waste(s) contain any Hazardous/ toxic substance/ Radioactive materials or Heavy metals? Yes [ ] No [√]

(ii) If yes, whether details and precautionary measures provided? Yes [ ] No [√]

(c) Recovery and recycling possibilities — Present proposal for increase in production is inclusive of the low grades & mineral rejects recovered from the wastes as they got market value at present

(d) Possible user(s) of the solid waste — None

(e) (i) Is the solid waste suitable for backfilling? Yes [√] No [ ]

(ii) If yes, when do you propose to start backfilling. Commencing from 2nd production plan

(in million m^3)

Solid waste (s)	Already accumulated (A)	To be generated (B)	% of A & B to be back filled	
			A	B
Overburden	About 0.5	~~3.00~~ 9.4	100	80
Others (Specify)	nil			

Land reclamation Plan

(f) In case waste is to be dumped on the ground, indicate

(i) Associated environmental problems — Wash off & wind erosions, aesthetics

(ii) Number & type of waste dumps

- No. of external dumps — One
- Max. projected height of dumps (in m) — from 24m MSL to 44m MSL in stages along hill slope.
- No. of terraces and height of each stage — one
- Overall slope of the dump (degree) — 28^0
- Proposed reclamation measures — Surrounded by Retaining wall with garland drain, simultaneous afforestation on slopes with mulches and initial reclamation crop leguminous plants followed by plantation of shrub & bushes & tree plantation over the level surfaces

(iii) Section of the waste dump in relation to the adjacent ground profile attached. Yes [√] No [ ]

35. Fuel / energy requirements*

[*To be furnished for mines having ML area more than 25 ha. or captive power generation of 500 KVA and above]

(a) Total power requirement (in MW)

S. No.		Mine site	Township (Office)	Others (specify)	Total
1	Present	Power is required for lighting purpose only during the night 0.2 KVA	Nil	Nil	0.2 KVA
2	Proposed/ additional	nil	nil	nil	Nil
Total		0.2 KVA	-	-	0.2 KVA

(b). Source of power (in MW)

S. No.		SEB/Grid*	Captive power plant	DG sets
1	Present		Nil	Nil
2	Proposed	0.2	Nil	Nil
Total		0.2		

[*Annex a copy of the sanction letter from the concerned authority]

(c) Details of fuels

S. No.	Fuel	Daily consumption (kld)		Calorific value (Kcals/ kg)	% Ash	% Sulphur
		Existing	Proposed			
1	HSD	nil	5	10.8 to 11 $X10^3$	0.01	0.22
2	LSHS	-	-	-	-	-
	Other (specify)	-	-	-	-	-

36. Storage of inflammable / explosive materials

S. No.	Name	Number of storages	Consumption (in TPD)	Maximum quantity at any point of time
1	Fuels	1	2.5 kld	3.0 kld
2	Explosives	No blasting operations are involved	nil	nil

37. Human Settlement

	Core Zone	Buffer Zone
Population*	Nil	29443
No. of villages	Nil	32
Number of households village-wise	Nil	-

[*As per 2001 census record or actual survey]

38. Rehabilitation & Resettlement (R & R) Plan* **Not Applicable**

[*Provide a comprehensive rehabilitation plan, if more than 1000 people are likely to be displaced, Other-wise a summary plan]

(a) Villages falling within the study area **Not Applicable**

	Villages	
	Number	Name
Core zone		
500 m from the blasting site (s)		
Buffer zone		
Township site		

(b) Details of village(s) in the core zone **Not Applicable**

S. No.	Village name	Population		Average Annual Income
		Tribal	Others	

[*As per 2001 census/ actual survey]

(c) Population to be displaced **Not Applicable**

Name of village (s) falling within	Number of oustees		
	Land (only)	Homestead (only)	Land and Homestead (both)
Mining Lease			
Township Site			

(d) Whether R & R package has been finalised? **Not Applicable**
If yes, salient features of R & R plan for oustees.

(i) Site where the people are proposed to be resettled & facilities existing/ to be created.

(ii) Funds earmarked for compensation package.

(iii) Agents /Authority responsible for their resettlement

(iv) Time of commencement of resettlement of Project Affected People (PAP).

(v) Period by which resettlement of PAP will be over.

39 Lease-wise plantation details

		Existing	New Mine
(a)	Lease area (in ha.)		
	(i) Area broken up	2.39	NA
	(ii) To be broken up	29.45	
	(iii) Area not to be broken-up –barriers	2.6412	
(b)	Township area (in ha.)	nil	

(c) Area afforested and proposed (in ha.)

	Peripheral	Dumps	Road	Township	Others
(i) Existing	nil	-	-	-	-
(ii) Proposed	10.5 includes roads	5.98	-	nil	Back filled area 10.0

(d) No. and type of trees planted & proposed

Species selection for plantation over waste dumps and backfilled area is proposed with local species like grasses like Hemata, Dub grass (Cyndon dectylon), Cejosia Argentea and leguminous plants like Soya been, tree varieties like Anacardium occidental (Kaju), Terminialia tomentosa (Ain), Lanea grandis (Moya), Carea arborea (Kumbha), Terminalia paniculata (Kinjal), Xylia dolabriformis (Jambha), Garcinia indica (Kokam), Tectona grandis (Sag), Strycnos nux-vomica (Kajra), Discoria bulbifera (Karanda), Shrub varieties like Calycopteris floribunda (Ukshi), Jangli Vangi), Calycopteris floribunda (Ukshi), Catunareregam spinosa (Gela), Climbers like Dioscoria bulbifera (Karanda) shall be planted in the backfilled areas and along the level surfaces of waste dumps. Further, fruit species like Anacardium occidental (Cashew), Mangifra indica (Mango), Artocarpus intergrifollia (Jack fruit), Carica papaya (Papaya), Annona squamosa (Sitapal), Annona reticulata (Rampal), Achrus sapota (Chiku), Psidium guava (Peru), Musa paradisica (Banana), Syzygium cuminii (Jambhul) are planted in the proposed orchard yards within the ML area. Further, Phyto-absorber plants for noxious gases like Neem and Mango plants shall be included in the afforestation work. The final selection of species shall be done as per the advice of the local forest authority.

(i) Existing

- When plantation was started? Month / Year: nil

No. of plant species planted	Number of saplings (per ha.)

Survival rate %

(ii) Proposed

68980	80%	About 1600 tree saplings / Ha with in between shrubs under growth

** Type of Species: given above

40. Environmental health and safety

(a)	What major health and safety hazards are anticipated?	Nil
(b)	What provisions have been made / proposed to be made to conform to health and safety requirements?	➢ Pre-employment and Periodical Medical Checkup ➢ Provision of residential doctors, dispensary with all emergency medicines, first aid & ambulance ➢ Periodic medical check up for the nearby rural population ➢ Provision of safe drinking water ➢ Dust suppression through water spray and green belts ➢ Regular maintenance of roads ➢ Periodic preventive maintenance of equipment ➢ Provision of protective equipment ➢ Training to the workers, machine operators &vehicle drivers ➢ Covered vehicles for transport
(c)	In case of an existing mine	
	(i). Comprehensive report on health status of the workers as under the Mines Act	Yes [ ] No [√] Mine is not under operation

As per Rule 29 (B) of Mines Rules 1955. every mine workers is medically examined periodically, including pre placement examination. The baseline health status, their habits are being recorded and a log book will be maintained and the same shall be updated every quarter. The preliminary screening tests involved are studies on pulmonary impairment & disability evaluation.
The Following tests will be carried out.
!. Clinical – Including general development & health, Height, weight, Eyes- visual activity, night & colour blindness, Respiratory system, Circulatory system, Nervous system, Locomotor/Musculo-skeletal system, skin Hernia, Hydrosol, Blood pressure, Diabetic history, or any other abnormality
2. Blood grouping, blood sugar & HIV test
3. Urine test- including reaction, Albumin,
3 Lung function tests, chest X-rays –PA view, Audiometry.
Pulmonary Impairment and Disability Evaluation

- Degree of dyspnea
- Amount of cough and sputum, wheezing
- Smoking age started, pack/day, age stopped
- Past pulmonary illnesses
- Concurrent medical conditions
- Medications
  Occupational and environmental exposures
- Chest physical examination findings
- Chest roentgenogram
- Pulmonary function studies

Noise Impairment

- Baseline Audiograms
- Annual Audiograms

Thus, a baseline condition shall be established for all the workers and the records are maintained in order to evaluate any occupational diseases due to mining activity or aggravation of the existing condition due to mining.

(ii). Mineralogical composition of RPM (dust)

• Free silica	Free silica (<2.5%) of total RPM
• Chromium* (Total as well as Hexavalent)	Not Applicable
• Lead**	Not Applicable

[*Only for Chromite mines]

[**Only for Base Metal mines]

(d) Information on radiation protection measures, if applicable. Not Applicable

41. Environmental Management Plan

Salient features of environmental protection measures

S. No.	Environmental issues*	Already practiced, if applicable	Proposed
1	Air pollution	Green belt are being developed surrounding the ML area.	Water is sprayed regularly at the mine workings, stack yards and on the haulage roads No drilling & blasting operations are involved. Abatement barrier of height 3m along with wide green belt shall be erected immediately along ML boundary near the school area located adjoining the northern ML boundary Regular maintenance of Transport equipment and mining machinery shall be done Inactive dumps faces & backfilled areas shall be simultaneously afforestated Haul roads are maintained regularly & Permanent approach roads will be blacktopped Trucks will not be overloaded and the ore loaded trucks are covered with tarpaulin. Wide green belt along with Phyto-absorber plants will be developed surrounding the mine workings, dump yard, School area and along the main transport roads. Where ever necessary dust masks will be provided to the workers Surrounding Village roads shall be repaired and maintained with green belts along the road sides To carry out air quality surveys during different seasons at the mine.

2	Water pollution		To prevent pollution of river Nanos, mine workings are restricted to 100m distance from the bank of the river. To arrest the fall of boulders if any and the fall of scree into river Nonos, leaving about 10m width form the ML boundary, a trench of length about 350 m, 5m width and 2m depth shall be dug out along the SW boundary of ML. A layer of gravel shall be placed at the bottom of this trench. Along the outer edge of this trench a parapet masonry wall of 2.0m height & 1m width with good foundation shall be constructed. The space between the parapet wall and ML boundary shall be covered with green belt. The rain water collected in this trench shall be allowed to over flow into the natural drainage system Provision of garland drains and check dams with gully plugs in all major valley portion/ drainage system Provision of retaining wall and extension of preset retain wall, with a garland drain & growth of vegetation in between Provision of settling tanks with baffles and addition of coagulants Built up waste dumps, with intermittent bunds, with overall slope angle of 28^0 Afforestation over the inactive waste dumps with initial reclamation crop followed by bush, shrub plantation and tree plantation over the level surfaces and backfilled areas after developing the initial reclamation crop.. Provision of grease traps for vehicle washing Hydro-geological study conducted has revealed that there shall be no adverse effect due to mine dewatering on the ground water regime in the catchment area To carry out water qualitative & quantitative surveys during different seasons at the mine.

3	Water conservation	Mine discharge is partly used for dust suppression & afforestation and the balance is supplied for irrigation in nearby villages	Water accumulated in the pit percolates to ground water system thus acting as recharge wells. The check dams erected promotes the ground water recharging and restricts the losses due to runoff water which ultimately joins the sea thus getting wasted.
4	Noise pollution	plantation of thick green belt	Blasting operations which generated impulsive noise are completely avoided Abatement barrier of height 3m along with wide green belt shall be erected immediately along ML boundary near the school area Timely maintenance and tuning of transport vehicles &mining machinery would be ensured to reduce undesirable noise, with limiting speed of tippers. Wide green barriers shall be developed surrounding the mine workings, screening plant and along the haul roads to screen the noise levels. Protective devices like acoustic wool, earplugs and earmuffs will be provided to the workmen in noise prone zones in the mine if necessary Selection of suitable machinery and equipment, proper mounting of equipment, providing noise insulation/padding wherever practicable and machinery fitted with properly designed silencers. Innovative approaches of using improvised plant and machinery designs, with in-built mechanism to reduce sound emissions like improvised silencers, mufflers and closed noise generating parts Proper gradient of haul roads to reduce cumulative noise levels. To carry out noise surveys during different seasons at the mine.

5	Solid waste/ Tailings – No Tailings are generated		Provision of garland drains and check dams with gully plugs in drainage system Provision of two retaining walls with a garland drain & growth of vegetation in between at toe end of the dump. The runoff from these drains is allowed to pass through settling tanks before their final discharge in to out side ML area. Built up waste dumps, with intermittent burms, with overall slope angle of 28^0. Afforestation over the inactive waste dumps with initial reclamation crop followed by bush, shrub plantation and tree plantation over the level surfaces Back filling of the waste in the worked out portions of the pit.
6	Land degradation	So far about 1.34 ha of land covering green belts is developed	The waste dump shall be simultaneously afforested. Exhausted mine workings are back filled and afforested. No external waste dumping after 7^{th} year of production and thereafter the waste is backfilled. Massive afforestation programme is proposed covering an area of 26.48 ha 77% of ML area. As far as possible the mined out area shall be backfilled and afforested. The unfilled portions of the quarry is converted into water reservoir, which shall also act as recharge well. The abandoned pit's top benches shall be excavated and the muck shall be spread into the workings to have a flat slope The abandoned workings shall be fenced off. (Ref. Annexure-I enclosed for stagewise land use and reclamation)

7	Erosion & Sediment		Provision of garland drains and check dams with gully plugs in all major valley portion/ drainage system Provision of two retaining walls with a garland drain & growth of vegetation in between Provision of settling tanks with baffles and addition of coagulants Built up waste dumps, with intermittent bunds, with overall slope angle of 28^0 Dead waste dumps and backfilled area are afforested Afforestation over the inactive waste dumps with initial reclamation crop followed by bush, shrub plantation and tree plantation over the level surfaces and backfilled areas after developing the initial reclamation crop..
8	Top soil	Top soil present within the ML area is less and it's nutrient value is less	The lateritic soil also used for afforestation after improving the quality. It shall also be removed separately, stacked to height not more than 3m with a retaining wall, mulched and planted with leguminous plants and immediately reused in the afforestation work mixes with soil stabilizers and manures.
9	Ground vibration	No blasting operations are proposed and therefore there shall be no generation of ground vibrations	

10	Wildlife conservation	Though the ML area does not fall under any forest area the less shall duly contribute for the wildlife conservation Lessee propose to spend Rs 30 lakhs for wild life conservation plan during the life of the mine i,e., 15 years.	Source for wild life is Savantvadi reserve forest located beyond 10.5 km distance from core zone which shall have no impact due to mining activity Salt licks and water holes shall be provided in the buffer zone forest area as per the advice of local forest officials. Discharge of solid suspension free runoff water to the surrounding environment, by providing check dams, gully plugs retaining walls. Garland drains and settling tank Creation of artificial water reservoir Three Nos of check dams shall be constructed to act as storage for rain water. Fruit bearing trees around these check dams to attract birds and animals Agave suckers shall be planted around valleys (For binding loose soil & prevent erosion)
11	Forest protection	It is a non forest area	As this project is planned to have Forestry & development of Orchards as the ultimate goal for the rehabilitation of the affected land and for this purpose intensive plantation keeping bio-diversity is proposed with water storage facility, so as to improve upon the existing eco system and leave a congenial environment for immigration of wildlife. Thus this area shall add to the aesthetic beauty and can be converted into a picnic spot. (Ref. Annexure – 1 enclosed for proposed plantation details)
12	Others (specify)	Nil	

[*As applicable]

42. Compliance with environmental safeguards (For existing units)

(a) Status of the compliance of conditions of Environmental clearance issued by MoEF, If any, enclosed. — Yes [ ] No [√]

(b) Status of the compliance of 'Consent to Operate' issued by SPCB, if any, enclosed. — *Yes [ ] No [√]

(c) Latest 'environmental statement' enclosed. — *Yes [ ] No [√]

43. Scoping of EIA

Whether environmental impact assessment of the project has been carried out by following scoping process?	Yes	√	No	
If yes, a copy of scoping of EIA annexed.	Yes	√	No	

44. Mine closure - Progressive Mine closure

(a) Have you planned mine closure?	Yes	√	No	
(b) Submitted a conceptual mine closure plan.	Yes	√	No	
(c) If yes, indicate estimated amount for implementing the same (in Rs. lakhs)	Rs 51 lakhs per annum for progressive reclamation & rehabilitation & pollution control measures & socio-economic development			

45. Capital cost of the project (in Rs. Lakh) (Based on latest estimate) 20 lakhs

46. Cost of environmental protection measures

(in Rs. lakhs)

Sl. No.	Activity	Capital cost		Annual recurring cost	
		Existing	Proposed	Existing	Proposed
1	Pollution Control (Separately provide break-up) -- Air -- Water -- Noise	-	16	nil	4.0 2.0 1.0
2	Pollution Monitoring (Separately provide break-up)	-	-	nil	3.0
3	Occupational Health	-	-	nil	10.0
4	Green Belt • Mine • Township	-	-	nil -	3.0 -
5	Reclamation/ Rehabilitation of mined out area**	-	-	nil	2.0
6	Others (specify) socio-economic Wild life protection Land acquisition Compensation to farmers along transport rout R&D cost	- - 50		-	20.0 2.0 6.896 5.0

** Cost inclusive of loading and hauling of waste

47. Amount earmarked for socio-economic welfare measures for the nearby villages other than R & R plans. **Rs 20 lakhs per annum**

48. Public Hearing *

(a)	Date of Advertisement	06-06-2008
(b)	Newspaper in which the advertisement appeared	Tarun Bharat, Sakal
(c)	Date of public hearing (DD/ MM/ YY)	28-08-2008
(d)	Public Hearing Panel chaired by & members present	Deputy Collector, Sindhudurg, Maharastra & 2
(e)	No of people attended the public hearing meeting and number of people from the lease area	About 150 / Tiroda & near by villages
(f)	Summary/ details of public hearing in tabular form	**Enclosed under Appendix I**

Issues raised by public	Response/ Commitment of the project proponents	Suggestions made by the Public Hearing Panel

49. Whether the following approvals * (wherever applicable) have been obtained?

(i)	Site Clearance from MoEF	no
(ii)	'Consent for Establishment' from the State Pollution Control Board	no
(iii)	NOC from Atomic Mineral Division	no
(iv)	Mining Plan approval from IBM/ Ministry of Coal	yes
(v)	In case of existing mines, mining scheme approval from IBM	no
(vi)	Forestry Clearance under FCA, 1980	no
(vii)	NOC from Chief Controller of Explosives	no
(viii)	Commitment regarding availability/ pumping of water from the concerned Authorities	no

[*Annex copies of approvals and number them]

50. Was / is there any court case relating to the project or related activities? If so, provide details present status. None

Verification: The data and information given in this Performa are true to the best of my knowledge and belief.

For GOGTE MINERALS

G. Karkare

Date: 19.11.2008
Place: Tiroda

Annexure - 1

Project : Tiroda iron Ore Mine
Subject : Iron ore production @ 0.4 million tonnes per annum

ENVIRONMENTAL IMPACT
Stage-wise land use and reclamation area (Ha.)

Sl. No.	Land use Category	Present	End of plan period	Conceptual
1	Top soil dump	Nil	Nil	Nil
2	Waste dumps (external)	0.74	5.98	5.98
3	Excavation (voids only)	0.81	5.1	2.16
4	Roads	0.82	0.58	1.08
5	Built up area & for pollution control measures	0.02	2.02	2.02
6	Afforestation	-	3.0	10.5
7	Reclamation (backfilled)		-	10.0
8	Existing old workings converted settling tanks & water reservoir	-	0.1	0.1
9	Undisturbed area foe future exploration	-	17.7012	
10	Vacant land	32.0912	-	2.6412
TOTAL		**34.4812**	**34.4812**	**34.4812**

ENVIRONMENTAL MANAGEMENT
Post Mining (Conceptual) land use pattern of ML area (Ha.)

Sl. No.	Land use category	Land use (Ha.)				Total
		Plantation	Water body	Public use	Undisturbed area	
1	Top soil dump	-	-	-	-	-
2	Waste dumps (external)	5.98				5.98
3	Excavation (voids only)		2.26			2.26
4	Roads			1.08		1.08
5	Built up area– for pollution control, screening plant etc			2.02		2.02
6	Reclamation (backfilled & green belt)	20.5				20.5
7	Undisturbed area				2.6412	2.6412
	TOTAL	**26.48**	**2.26**	**3.1**	**2.6412**	**34.4812**

Ecology : Stage-wise cumulative plantation
Requirement of plants for Afforestation / Reclamation

Year	Worked out pit (Voids)		Worked out pit (backfilled)		Vacant land Green belt		Dumps		Total	
	Area (Ha.)	Trees	Area (Ha.)	Trees	Area (Ha.)	Trees	Area (Ha.)	Trees	Area (Ha.)	Trees
End of 1st plan	-	-	-	-	3.0	4800	2.00	3200	5.00	8000
End of 10th year	-	-	3	4800	5.0	8000	3.98	6370	11.98	19170
End of 15th year	-	-	7	11200	2.5	4000	-	-	9.50	15200
Total			**10**	**16000**	**10.5**	**16800**	**5.98**	**9570**	**26.48**	**42370**

FORM 1
APPENDEX I
(See Paragraph-6)

(I) Basic Information

Name of the Project	:	Tiroda Iron Ore Mine
Location/site alternatives under consideration	:	Tiroda village, Vengurla Taluk, Sindhudurg District Maharashtra State.
Size of the Project	:	34.4812 Ha. (Private land)
Expected cost of the project	:	Rs. 350 Lakhs
Contact Information	:	M/s GOGTE MINERALS. 146,.Tilakwadi., Belgaum,, 590006
Screening Category	:	Yes Mining lease area – 34.4812 Ha. Iron ore production @ 0.4 mtpa

Capacity corresponding to sectoral activity (such as production capacity for Manufacturing, mining lease area and production capacity for mineral Production, area for mineral production, area for mineral exploration, length for linear transport Infrastructure, generation capacity for power generation etc.,)

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.)

SL. 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 in intensity of land use (with respective local land use plan)	Yes	The land use of mining lease area changes due to mining operations. The land use is given below: Excavation 4.80 Ha Waste dumps 5.98 „ Mineral storage/ Sub grade stock 0.00 Infrastructure 0.01 „ Roads 0.58 „ Future exploration 23.1012 „ Township area 0.0100„ --- 34.4812 Ha ---
1.2	Clearance of existing land, vegetation and buildings?	Yes	Private land – 34.4812 Ha.
1.3	Creation of new land uses?	No	-
1.4	Pre-construction investigations e.g. bore holes, soil testing?	Yes	From the explored data estimated ore reserve are in the tune of 0.838 million tonnes
1.5	Construction works?	No	-
1.6	Demolition works?	No	-
1.7	Temporary sites used for construction works or housing of construction workers?	No	-
1.8	Above ground buildings, structures or earth works including linear structures, cut & fill or excavations.	No	-
1.9	Underground works including mining or tunneling?	No	-
1.10	Reclamation works?	Yes	Reclamation of worked outpit by backfilling & afforestation.
1.11	Dredging?	No	-
1.12	Off shore structure?	No	-
1.13	Production & manufacturing processes?	Yes	The iron ore is won by operations such as ripping & dozing and loading & unloading.
1.14	Facilities for storage of goods or materials?	Yes	ROM ore produced shall be suitably blended sold to locally & exported.

1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	A total of 1.604 million tonnes waste shall be generated during entire life of the mine shall be temporarily dumped and a protective bund shall be constructed at the toe of the dump.
1.16	Facilities for long term housing of operational workers?	No	-
1.17	New road, rail or sea traffic during construction or operation?	No	-
1.18	New road, rail, air water borne or other transport infrastructure including new or altered routes & stations, ports, air ports etc?	No	-
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	-
1.20	New or diverted transmission lines or pipe lines?	No	-
1.21	Impoundment, damming, culverting realignment or other changes to the hydrology of water courses or aquifers?	No	-
1.22	Stream crossings?	No	-
1.23	Abstraction or transfers of water form ground or surface waters?	No	-
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	The natural drainage system will be maintained by implementing garland drains.
1.25	Transport of personal or materials for construction, operation or decommissioning?	No	-
1.26	Long-term dismantling or decommissioning or restoration works?	No	-
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	-
1.28	Influx of people to an area in either temporarily or permanently?	Yes	No settlements are existing within the ML area and hence no influx of people.
1.29	Introduction of alien species?	No	-

1.30	Loss of native species or genetic diversity?	No	The area is private dry agriculture land. Conceptually the area shall be reclaimed by backfilling worked out pits and afforested with suitable local plant species. After exhaust of reserves the land shall be utilized for cultivation.
1.31	Any other actions?	No	-

2. Use of Natural resources for construction or operation of the project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply).

SL.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 area is private revenue.
2.2	Water (expected source & competing users) unit:KLD	Yes	From nearby bore wells in the villages, about 85 KLD.
2.3	Minerals (ML)	Yes	To produce iron ore @ 0.4 million tonnes per annum
2.4	Construction material-stone, aggregates, & /soil (expected source-MT)	No	-
2.5	Forests and timber (source –MT)	No	-
2.6	Energy including electricity & fuels (source, competing users) unit: fuel (MT),energy (MW)	Yes	Diesel 5.0 t/day
2.7	Any other natural resources (use appropriate standard units)	No	-

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.

SL.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	No blasting shall be conducted and hence no explosives used and stored.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	-
3.3	Affect the welfare of people e.g. by changing living conditions?	No	-
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	-
3.5	Any other causes	No	-

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

SL.No.	Information / Checklist confirmation	Yes/No	Details thereof (with approximate quantities / rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	Yes	The solid waste comprises of Limonitic Clay, Phyllitic clay, Manganiferous Clay, Siliceous clay and altered intrusives. The solid waste shall be generated @ 0.734 million tonnes / annum (max.).
4.2	Municipal waste (domestic and or commercial wastes)	No	-
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	No	-
4.4	Other industrial process wastes	No	-
4.5	Surplus product	No	-
4.6	Sewage sludge or other sludge from effluent treatment	No	-
4.7	Construction or demolition wastes	No	-
4.8	Redundant machinery or equipment	No	-
4.9	Contaminated soils or other materials	No	-
4.10	Agricultural wastes	No	-
4.11	Other soil wastes	No	-

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

SL.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	SO_2, NOx
5.2	Emission from production processes	Yes	SO_2, NOx & SPM
5.3	Emissions from materials handling including storage or transport	Yes	SO_2, NOx & SPM
5.4	Emissions from construction activities including plant and equipment	No	-
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	Yes	The dust generated during mining operations to a tune of 112 kg/hr
5.6	Emissions from incineration of waste	No	-
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	-
5.8	Emissions from any other sources	No	-

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

SL.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	The noise is produced from operation of heavy earth moving m/c's & movement of tippers.
6.2	From industrial or similar processes	No	-
6.3	From construction or demolition	No	-
6.4	From blasting or piling	Yes	In this mining project no drilling & blasting shall be practiced.
6.5	From construction or operational traffic	No	-
6.6	From lighting or cooling systems	No	-
6.7	From any other sources	No	-

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

SL. 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	No	-
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	No	-
7.3	By deposition of pollutants emitted to air into the land or into water	No	-
7.4	From any other sources	No	-
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	No	-

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

SL.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	No	Not applicable, no blasting shall be conducted.
8.2	From any other causes	No	-
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	No	-

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

SL.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. ities, ancillary development or development stimulated by the project which could have impact on the environment e.g.:	No	
	• Supporting infrastructure (roads, power supply, waste or waste water treatment, etc)	No	
	• housing development	No	
	• extractive industries	No	
	• supply industries	No	
	• other	Yes	Dust emitted from mining operations.
9.2	Lead to after-use of the site, which could have an impact on the environment	Yes	After completion of mining activities the land shall be reclaimed by afforestation and handover to land owners & State Government.
9.3	Set a precedent for later developments	No	-
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	-

(III) Environmental Sensivity

Sl.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	No	-
2	Areas which are important or sensitive for ecological reasons –Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains forests	Yes.	Nanos nallah flow south of ML area
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	No	-
4	Inland, coastal, marine or underground waters	No	-
5	State, National boundaries	Yes/Goa	4.5 Kms towards south
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	-
7	Defence installations	No	-
8	Densely populated or built-up area	No	-
9	Areas occupied by sensitive man-made land uses (hospital, schools, places of worship, community facilities)	Yes	Corezone – Nil Bufferzone – 32 villages fall within 10 km radius.
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	No	-
11	Areas already subjected to pollution or environmental damage.(those where existing legal environmental standards are exceeded)	No	-
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)	No	-

(IV) TERMS OF REFERENCE

The following Terms of Reference shall be followed for preparing REIA &EMP.

Chapter No.	EIA Structure	Contents
1	**Introduction**	• Genesis of the Project • Brief description of nature, size, location of the project and its importance to the region and the country • Scope of study – Details of regulatory scoping carried out (as per Terms of Reference)
2	**Project Description**	• Description of the Project • Location : Latitude, longitude and elevation of the site (maps showing general location, specific location, project boundary and project site layout) • Topography • Mining lease area and mining dimensions, year-wise mining plan and generation of overburden and O.B. dump sites, mining closure plan • Production capacity : present and planned • Size and magnitude of operation • Overburden ratio • Tonnage handled per hour : excavation, crushing and transport • Project details including drawings showing project layout, components of project, schematic representations of feasibility drawings • Condensed description of those aspects of the project (based on project feasibility report) likely to cause environmental effects • Process description (technology to be adopted) and proposed schedule of mining
3	**Baseline Data : Description of Environment**	The details of baseline data to be collected from core zone and buffer zone with respect to different components of environment viz., air, noise, water, land, biology and socio-economic are given in **Table 1.** The air quality and noise are to be monitored at all environmental / ecological sensitive areas. The details are given below :

3.1	**Ambient Air Quality Monitoring**	• Climate and Meteorology : • Location (distance and direction) of monitoring stations, wind rose to be considered in choosing the stations • Land use map to be provided along with Air quality monitoring stations • Air pollutants : SPM, SPM, SO_2, NOx, CO, trace heavy metals in SPM in core zone and buffer zone (24 hourly monitoring) and proposed measures to regulate them to desired level, if required. • 98 percentile of air quality data and applicable air quality standards • Dust fall rate at select locations • Fugitive emissions around the mining operations, ore processing operations and ore beneficiation plant as also along the transportation routes.
3.2	**Noise Environment**	• Locations of monitoring stations with direction and distance • Land use map to be provided along with noise quality monitoring stations • Noise levels i.e., Leq (day) and Leq (night) for each station in core zone and buffer zone viz., industrial area, commercial area, residential area, and silence zones. • Applicable noise standards • Noise levels due to mining activity, ore processing units, beneficiation plant and transportation routes • Vibrations caused due to blasting operations
3.3	**Water Environment**	• Locations of monitoring stations with direction and distance • Physico-chemical including toxic heavy metals, biological and bacteriological characterization of surface and groundwater resources for assessment of water quality. • Delineation of water sheds and water drainage pattern in study area • Surface water balance of river in study area and withdrawal of surface water for project activity • Hydrogeology and Aquifer Characteristics of the area • Ground water potential of the area : Groundwater recharge and balance available for present and future use. • Water requirement ore processing & beneficiation plant and other facilities ; • Rainwater harvesting to reduce impact on ground

		water as the main source.
3.4	**Land Environment**	• Location of monitoring stations with direction and distance • Collection of soil samples from monitoring stations and their physicochemical and microbiological characterization • Fertility status of soil samples at different sampling stations • Study of landuse pattern, cropping pattern, vegetation cover etc., using secondary data sources • Study in relation to the trend of change in land use pattern for the next 5th stage and conceptual stage. with and without EMP for mining activity. • Determination of leaching properties of overburden samples to define the load of heavy metal pollutants in run-off water.
3.5	**Biological Environment**	• Observations on biodiversity of aquatic biological component • Assessment of plant species with respect to density, frequency, abundance, diversity index, similarity index, Importance Value Index etc. within the study area in different ecosystems. • Collection of primary / secondary data on forest and non-forest flora in impact zone with respect to above parameters and forest area and floristic structure, rare and endangered species, endemic species, ethno-botanical aspects, medicinal plants, major & minor forest produce, afforestation / social forestry, migratory avi-fauna, migratory corridors, breeding places etc., • Information on avi-fauna and wildlife in study area • Collection of secondary data on fishery resource in study area • Collection of secondary data on agricultural activity, crops and their productivity and irrigation facilities • Estimation of number of trees and shrubs, which would be cut during deforestation for mining activity and other facilities.
3.6	**Socio-Economic and Health Component**	• Collection of baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety & security of workers and surrounding population. • Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.

		• Collection of information on sensitive habitants of historical, cultural, and ecological importance
3.7	**Occupational Health**	• Number of workers to be employed and category of hazardous jobs assigned and the duration • List of hazardous operations/activities • The existing practices adopted for assessment of occupational health including the details of medical examination and the facilities.
4	**Anticipated Environmental Impacts & Mitigation Measures**	
4.1	**Air Environment**	• Prediction of impacts on ambient air quality using appropriate mathematical models • ISCST or FDM Model be used for Air Quality Impact Prediction (AQIP) • Brief description of model • Predictions for fugitive dust emission due to mining activities, crushing plant and transportation activity road, rail or conveyor • Input requirement and how they are derived with references if any • Output of model • 24 hourly concentrations at all monitoring stations • Isopleth distribution of major pollutants of concern over 10 km radius study area • Representation of SPM, RSPM, SO_2 and NOx in a tabular form given below.
		• Mitigation measures to lower the emission of pollutants • Primary / secondary data with respect to impact of fugitive emissions on flora and fauna • Scientific mining methods to reduce the dust emission from point and line sources • Alternate solutions to road transport of ore
4.2	**Noise Environment**	• Impact of vibrations on the surrounding environment including damage to materials/structures • Prediction of noise levels through modeling at different monitoring stations • Impacts due to noise levels generated by existing and proposed activities in relation to human environment and wild life • Impacts due to present and future transportation activity • Impact of noise levels on occupational health • Identification of mitigation measures for noise abatement including noise barriers for point sources

		and line sources • Evaluation of adequacy of the proposed pollution control devices to minimize occupational exposure and suggest modifications, if required.
4.3	**Water Environment**	• Impacts of water withdrawal on surface water / groundwater resources • Optimum exploitation of surface / groundwater resources • Rainwater harvesting to maintain rainwater harvesting • Impact of mining on hydrogeology and mitigation measures to conserve the water resource • Delineation of proper planning for withdrawal of surface / groundwater below the threshold level of replenishment • Impact of mining activity Including tailings pond on surface and groundwater quality • Model study for prediction of groundwater contamination and suggestion of mitigation measures to minimize the pollution level • Creation or conservation of water holes in forest for wildlife • Scientific mining methods for management of wastewater from mining area and OB dumps.

4.4	**Land Environment**	• Estimation of anticipated impacts of proposed mining activity on topography, water drainage pattern, land use pattern with respect to agriculture, forestry and fisheries • Scientific mining methods to mitigate the impacts of mining activity on land resource • Delineate Mining Closure Plan to rehabilitate the mined out land to match its surrounding land use including removal, storage and reuse of top soil from mining area to cover reclaimed area. • Impacts of leachate water from overburden on surface and groundwater quality and mitigation measures for stabilization of overburden dumps • Study of the problem of landslides, and assessment of soil erosion potential and their impact • Impact of mining activity on the fertility status of soil in the study area • Prediction of ground water pollution due to seepage of pollutants through soil column • Impact of mining on the top fertile soil cover in mining area • Impact of mining on local biodiversity, and forest

		cover • Model study for potential soil erosion from core and buffer zone • Management plan for checking soil erosion and soil loss in core and buffer zone • Methods for treatment and disposal of domestic solid waste • Selection of suitable local plant species for greenbelt development at and around mine sites, ore processing plant and beneficiation plant and also on overburden dump sites and mined out areas and for avenue plantation in workers colony.

4.5	**Biological Environment**	• Loss of forest resource, economically important plants, medicinal plants, and threat to rare and endangered species due to deforestation • Mitigation measures to compensate the loss of forest cover • Assessment of likely damage to flora and fauna due to air emissions, noise and vibrations, wastewater discharges, change in landuse pattern, anthropogenic impact and delineation of guidelines to minimize adverse impacts • Impact of mining activity on fishery resource and agricultural production • Habitat fragmentation and blocking of migratory corridors due to project activities • Identification of rare plants of economic importance including medicinal plants and wildlife species which require protection and conservation • Improvement of biodiversity, wildlife and forest cover due to adoption of scientific mining and other management methods • Stabilization of mining benches and overburden by development of vegetation cover over them • Afforestation of reclaimed mined out areas • Development of green belt around mining benches, crushing plant, beneficiation plant, sewage treatment plant • Implementation of pollution control measures to minimize the pollutants that have impact on biotic environment • Identification of measures for protection and conservation of flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc., • Compensatory afforestation to compensate the

		deforested forest area and loss of biodiversity. Identification of suitable native tree species specially fruit bearing trees for compensatory afforestation, green belt in & around mine lease areas, crushing plant, ore beneficiation plant and for avenue plantation along haul roads involving local people specially women with appropriate monetary incentives to nurture the trees and often vegetations.
4.6	**Socio-economic Environment**	• Assessment of aesthetic impairment • Projection of anticipated changes with respect to the above parameters and delineation of guidelines to minimize the adverse impacts • Prediction of impacts on project affected people • Preparation of Rehabilitation Action Plan (RAP) for the project-affected population covering aspects such as compensation, employment generation, compensation for loss of livelihood, resettlement site, cattle grazing ground, collection of minor forest products, provision of infrastructural facilities etc., • While preparing the rehabilitation action plan, emphasis should be given on the interest of the poorer section of the population who will be more affected due to the nearness of their habitation to the mine site. • Local people especially the women and women self help groups should be involved in selecting alternative vocation to be made available to the affected people • In plantation work, local species specially fruit bearing trees should be planted to provide a regular source of income. • Nature of tenure of landholdings specially for the poorer section of the people indicating if such people are land owners or share croppers • In case, the mining activity displaced the habitation, in addition to the above rehabilitation action plan, the project authorities should also give a scheme of resettlement of the oustees.
4.7	**Occupational Health**	The project proponent shall assess the adverse impact and indicate the proposed mitigating steps to abate the likely adverse impact relating

5	**Environmental Management Plan and Post-project Monitoring Programme**	
		• Description of the administrative and technical set-up for ensuring that mitigative measures are implemented and their effectiveness monitored after environmental approval from the Impact Assessment Agency. • Examine the effectiveness of adopted EMP and scientific mining measures to enable to take corrective actions. • Delineate Technical aspects of environmental monitoring • Post project hydrogeological monitoring for the entire mine life, restrictive monitoring thereafter during reclamation for collection of hydrogeological and hydrological data Plantation monitoring programme during post project period for ensuring survival and growth rate of plantations in reclaimed area.
6	Additional studies	• Public consultation • Risk assessment & Disaster Management Plan Risk assessment should cover the following aspects- - Surface subsidence, inundation, surface fire (electrical and oil), possible danger due to storage of fuels, accident due to heavy earth moving machinery, failure of mine benches etc.

Date : 23/08/2007
Place : Redi

For GOGTE MINERALS

(Authorised Signatory)

FEASIBILITY REPORT OF TIRODA IRON ORE MINE OF M/s.Gogte Minerals, Belgaum, Karnataka.

CHAPTER – 1

1.0 Project Description :

The Tiroda Iron ore mine is an existing mining lease belongs to M/s.Gogte Minerals, Belgaum, Karnataka state.

The subject mine falls in the village Tiroda, Vengurla taluk, Sindhudurg district of Maharashtra State. The total extent of the lease area is 34.4812 Ha in private land.

Presently due to the increase of demand for iron ore in the local and international market even for low grade iron ore, lessee wishes to produce iron ore from this mine.

For producing iron ore @ 0.4 million tonnes per annum, the lessee has to obtain Environmental Clearance from New Delhi as per the EIA Notification 2006.

Opencast mechanised mining operations shall be adopted in which mine faces are gradually advanced sideward lowering benches to win ore from lower levels. To suit the method and mode of mining, height of active mine faces shall be kept 6 meters high whereas bench width shall be maintained at 10 to 12 meters with a pit slope of 34^0 to 36^0.

Adequate number of loading equipment, hydraulic excavators, wheel loader and tippers will be deployed for loading, unloading and hauling the proposed quantities of ore and waste. Drilling and blasting shall be avoided by deploying ripper & dozer for removal of hard laterite capping and also dyke formations.

2.0 GEOLOGY AND ORE RESERVES :

2.0 Geology & Mining :

2.1 General Geology :

Rock formations in this area is Dharwar Series. Iron ore was formed due to leaching of Banded Hematite Quartzite (BHQ) and Banded Hematite Schist's (BHS).

2.2 Local Geology :

The general dip of the ore body is 42^0 to 50^0 towards NE. Dip direction is varying from N to NE. Ore body tentatively extends over a strike length of 1 kms in the NE- SW direction

Reserves :

The exploration was conducted by drilling 27 boreholes confirming the lateral extension and quality of the ore.

Proved reserves	0.838 million tonnes
Probable reserves	--
Possible reserves	--

Further it is proposed to explore the un-explored portion of the lease by drilling 37 nos. of boreholes during the next 2 years to prove additional reserves.

3.0 COST BENEFIT ANALYSIS:

Steel is essential for the infrastructural development of any nation. There is much demand for steel in both domestic and international market. The rapid expansion of the steel sector and private sector and small units contribution in steel manufacture has resulted in the demand for iron ore in the country and export market and hence iron ore production is need of the hour. Research & development in steel manufacture has resulted in demand for low grade iron ore and fines.

- From this mine proved category of iron ore reserves is estimated as 0.838 million tonnes.
- ROM which is produced sold to buyers or exporters. The processed ore after blending to required grade will be ultimately exported to overseas buyers.
- So, the present target of production i.e., 4 lakh tonnes per annum is economically feasible for this mine.

Annexure I shows the detailed calculations of the economic viability after taking into consideration cost of production for mining, cost incurred on environmental works, Industrial health and safety, peripheral development and compensation paid to the land oustees etc.,

It shows that the net profit accrued per year shall be of the over of Rs. 36.449 million for the proposed production of 0.4 million tonnes per annum.

4.0 MINING:

The conventional opencast mechanized mining operations shall be adopted in which mine faces are gradually advanced sideward lowering benches to win lower level ores. To suit the method and mode of mining, height of active mine faces are kept 8m high with a pit slope 34^0 to 36^0. Also in developmental areas, 10 – 12 m bench width is maintained to ensure easier movement of heavy duty dumpers. On an average road gradient is maintained at 1 : 16.

Adequate number of loading equipment will be deployed. For hauling the proposed quantities of ore and waste, the requirement is met with tippers of 10 tonnes capacity.

With the induction of 4 hydraulic excavators at this mine, they can handle ore and waste material. In addition to above three heavy duty ripper dozers will be deployed to remove the hard strata. No drilling and blasting shall be conducted at this mine.

The projected average annual handling includes ore and waste rock to an extent of 0.535 million tonnes (avg.). The proposed maximum ore production is 0.4 million tonnes and maximum waste rock is 0.734 million tonnes. The anticipated life of the mine shall be more than 3 years at the proposed rate of production.

Details of mining machineries to be used for different mining operations for the proposed rate of production of 0.4 million tonnes per annum are given in the following table No. 1.

Table No.1 : List of equipment deployed at Tiroda Iron Ore Mine

Sr. No.	Name of Equipment	Model	H.P.	Bucket Capacity	Working Capacity	No. of Units	Effective utilisation	Annual handling capacity
1.	Ripper Dozer	D-9	410		8 H/day	1	80%	
2.	Hydraulic excavator	Ex200/CK90	180-200	0.9 M^3	200 T/H	4	80%	0.3 million tonnes/Unit
3.	Wheel loader			1.5 M^3	200 T/H	1	80%	For dump leveling + loading
4.	Water Tanker			8000 ltrs		2	80%	10 trips a day
5.	Trucks			10 Tonnes		50		

5.0 CONCEPTUAL MINING PLAN :

It is proposed to produce 0.4 million tonnes per annum of iron ore and maximum waste shall be 0.734 million tonnes.

Conceptually, there shall be pits formed which shall be backfilled with the waste generated from advancing waste benches. Dump area shall be reclaimed by afforesting with suitable species. Engineering constructions such as settling pond and filter beds and retention wall shall be constructed. The retention wall/bund shall be constructed all along the toe of the dump to guard against the wash off of the silt.

6.0 REIA & EMP :

i) Baseline data :

Baseline data has been generated during summer, 2006 covering three months i.e., March, April and May covering 10km radius of buffer zone area.

Baseline information regarding the existing environment quality in respect of parameters like meteorology, ambient air quality, water quality, noise levels, soil quality and socio economic studies have been conducted. Air quality data in core zone and buffer zone stations are within the permissible limits of CPCB norms. Surface and ground water (from buffer zone) samples collected are analysed to know the baseline quality. The analysis results show that all parameters are within the permissible limits of IS : 10500 norms for ground water and IS : 2296 norms for surface water samples. Noise levels in core zone and buffer zone stations were recorded and the values are below the permissible limits of ILO Code Practice and CPCB respectively.

(ii) Implementation & Environment cost :

The mine authorities shall put into practice all the management measures required to mitigate the adverse impacts of various mining operations which shall dwelt upon elaborately in the REIA & EMP report.

The important parameters that are likely to be affected are SPM & RPM in air, colour, suspended solids in water, noise pollution due to running of loaders & tippers. The adverse effects are mitigated by dust suppression and afforestation measures.

A time bound budgetary cost allocated for the environmental works at the proposed rate of production is as given in the following Table No. 2.

Table No.2 : Cost of Environmental works at Tiroda Iron Ore Mine

(Rs. In lakhs)

Sl. No.	Activity	Capital cost	Annual recurring cost
		Proposed	Proposed
1	**Pollution Control ***	15.00	6.00
2	**Pollution monitoring**	Nil	3.00
3	**Engineering constructions**	Nil	1.00
4	**Green Belt**		
	• Mine	Nil	2.00
	• Township	--	--
5	**Reclamation/Rehabilitation of mined out area**	Nil	2.00
6	**Wildlife protection**	Nil	2.00
	TOTAL	**15.00**	**16.00**

7.0 PROJECT BENEFITS :

a) Improvements in the physical infrastructure :

The rapid expansion of the steel sector and opening up of private sector avenues has resulted in the demand for iron ore in the country. Added to the export demand, the need for a quantum leap in iron ore production is the need of the hour. Hence the project proponent has decided to contribute to the extent possible to meet this demand. This will add to the overall growth of the region and the country.

b) Improvements in the social infrastructure :

Improvement in infrastructural facilities of the area and also the living style of the people due to increased participation of the lessee in social development such as education, transportation, communication, road repair, ambulance facilities and sanitation facilities. Also increase of employment opportunities to the nearby villagers.

The amount earmarked for socio-economic welfare measures for the nearby villagers is Rs. 12 lakhs/annum as recurring cost.

For MINERAL ENGINEERING SERVICES

(M. S. RAJU)
Consultant

Place : Bellary
Date : 21.08.2007