

**DETAILED EXPLORATION PROPOSAL FOR IRON ORE IN PURHEIBAHAL-
CHANDIPOSHI-BARHA INDIPUR BLOCK
DISTRICT – SUNDARGARH, ODISHA**

SYNOPSIS

- 1 Mineral : Iron**
- 2 Location :**
- A) Purheibahal Sub-Block:** This sub-block is bounded by latitude 21°55'16.3" and longitude 85°17'33.9" in SW corner, latitude 21°55'4.6" & long 85°17'54.8" in SE corner, latitude 21°55'24" & long 85°18'6.5" in NE corner and latitude 21°55'35.8" & long 85°17'45.7" in NW corner.
- B) Chandiposi Sub-Block:** This sub-block is bounded by latitude 21°53'28.9" and longitude 85°17'23" in SW corner, lat. 21°53'20.6" & long 85°17'47" in SE corner, lat. 21°53'58" & long 85°18'2" in NE corner and lat. 21°54'5.9" & long 85°17'38.3" in NW corner.
- C) Barha Indipur Sub-Block:** This sub-block is bounded by latitude 21°54'13.3" and longitude 85°17'49.8" in SW corner, lat 21°54'7" & long 85°18'5.9" in SE corner, lat 21°54'36.4" & long 85°18'21" in NE corner and lat 21°54'42.8" & long 85°18'48" in NW corner.
- The area investigated falls in parts of Survey of India Toposheet Nos 73 G/5. Being one of the most important iron and manganese mining centers of Orissa, the area is well communicated with other parts of the State as well as with the neighboring State of Jharkhand. National Highway No.215 connecting Panikoili on National Highway No.5 with Rourkela via Kendujhar, Joda, Barbil and Koira passes through the area. The other important mining centers in the vicinity are Kalta, Tensa and Barsuan. The nearest rail head is Barbil, lying 30km away, on Tatanagar-Barbil section of the South-Eastern Railway.
- 3 Exploiting Agency : National / Private**
- 4 Background :** In view of MMDR Amendment Act 2015 & Mineral Auction Rule 2015, Government of Odisha requested MECL to carry out exploration for Iron & Limestone in the state for auctioning of Blocks. MECL submitted Cost estimates to DMG Odisha for exploration of Iron, Bauxite Limestone & Manganese for a total of 11 Blocks. On examination of exploration data DMG suggested three Blocks for which detailed exploration is to be taken up. Purheibahal, Chandiposi & BarhaIndipur Blocks for detailed exploration for Iron is one of the Block for which exploration proposal is prepared and is put up for approval of Technical Sub Committee of NMET.

GSI carried out exploration work in the area falling within lat. 21°52'30"-22°00'N and long. 85°15' – 85° 22'30"E in Survey of India Topo Sheet No 73 G/5/NW, during FS 2002-2003 & 2003-2004. The exploration work carried out by GSI included the detailed mapping (3.14 sq km), pitting-trenching (53.5 cu m), drilling operation (2455.05 m) & sampling (884 nos of core samples & 122 nos of pit samples) in the Purheibahal, Chandiposi & Barha Indipur sub-blocks.

GSI estimated Iron ore resources a total of 26.99 m.t. of additional resources with average grade of 61.76% Fe have been identified during the FS: 2001-04

Table showing Iron Ore Resources Estimated by GSI in different blocks

Type of Resource	Name of the Block	Quantity (in Million tonnes)	Grade	% of total Resource
Indicated (G2)	Chandiposhi	7.90	60.61% Fe	29.27%
	Barha Indipur	1.46	60.78% Fe	5.41%
	Purheibahal	17.63	60.76% Fe	65.32%
Total Resource		26.99		100%

The low level iron ore deposits of the above blocks satisfy the G3 norm of the UNFC classification system for resources of mineral deposits and fall under the category of probable resources with assigned code (333).

DMG, Odisha handed over the Investigation report of GSI **in respect of Purheibahal- Chandiposhi - Barha Indipur** blocks to MECL for upgradation of level of exploration. Accordingly MECL formulated exploration scheme for detailed exploration and put up for approval of Technical Committee of NMET. The proposal was put up for Technical Evaluation to Technical Committee of NMET during its 1st Meeting held on 01-04-2016 & 02-04-2016 at GSI, Central Region Nagpur. The Committee after detailed discussion & deliberations has approved a total of 1470m of drilling in 19 Boreholes with slight modifications in planning of boreholes and recommended for approval of Executive Committee of NMET.

- 5 Objectives :** The present exploration programme has been formulated to fulfil the following objectives:-
- The detailed drilling proposal has been made with the sole objective to upgrade the resources from G-3/G-2 estimated by GSI to G-2 / G-1 category of United Nations Framework classification of Mineral Reserves / Resources.
 - To upgrade earlier estimates at higher confidence level as per UNFC norms Minerals (Evidence of Mineral Contents) Rules 2015.

6 QUANTUM OF EXPLORATORY WORK PROPOSED IN THE BLOCK					
Sl. No.	Item of work	Unit (m)	Proposed Quantum of Work		Total
			Purehei Bahal Block	Chandiposi Block	
1	<u>Survey (1:2000)</u>				
	a) B.H. fixation (Hilly Terrain)	Nos.	6	13	19
	b) R.L. & coordinate determination	Nos.	6+ GSI Bhs	13 + GSI Bhs	19 + GSI Bhs
	c) Traverse	Line km	10.00		
	d) Contouring (2m Contour Interval)	Sq. Km	0.48	0.87	1.35
	e) DGPS Survey (Demarcation of Block Boundary points)	Sq. Km	0.48	0.87	1.35
2	Drilling (RC)	m	530m (6 Bhs.) at 200mx100m grid	940 (13. Bhs) 200m x100m grid	1470m (19 Bhs) 200m x100m grid
3	<u>Geological work</u>				
	a) Geological Core Logging	m	530m (6 Bhs.)	940 (13. Bhs)	1470m (19 Bhs)
	b) Sampling (Primary+ Check) for 3 radicals Fe%, SiO ₂ % & Al ₂ O ₃ %,	Nos.	900	1600	2500
	c) Composite sample for 7 radicals (Fe%, SiO ₂ %, Al ₂ O ₃ %, P%, Mn%, S% & V ₂ O ₅ %)	Nos.	100	200	300
4	<u>Chemical Analysis</u>				
	a) Primary + Check samples for 3 radicals (Fe%, SiO ₂ % & Al ₂ O ₃ %.	Nos.	900	1600	2500
	b) Composite sample 7 radicals (Fe%, SiO ₂ %, Al ₂ O ₃ %, P%, Mn%, S% & V ₂ O ₅ %)	Nos.	50	100	150
5	XRD – Studies	Nos.	5	5	10
	Spectroscopic Studies (15 elements)	Nos.	5	10	15
6	Petrological Samples	N0s	5	10	15
7	Mineragraphic Studies	N0s	5	10	15
8	Specific gravity Determination	Nos.	10	20	30
9	Bulk Density Determinations	Nos	5	5	10
10	Lump Fine Ratio Determinations	Nos			
9	Report Preparation [As per Mineral (Evidence of Mineral Contents) Rule-2015]	N0s	1	1	2

7 Time Schedule & Cost : 11 Months; Rs 265.33 Lakhs Estimate

- 8 Justification**
- i In view of MMDR Amendment Act and Mineral Auction Rule 2015, DMG Odisha requested MECL to take up the detailed exploration in this block .MECL decided to take up the work under NMET funding.
 - ii The mineralized zones intersected in GSI boreholes are open in strike direction, hence the continuity of the zones requires further proving.
 - iii Enhancement of level of confidence of resources estimated by GSI by drilling few boreholes in the data gap areas.
 - iv Augmentation of resources by drilling in the strike continuity area.

COST ESTIMATE FOR PURHEIBAHAL - CHANDIPOSHI BLOCK, DISTT: SUNDARGARH, ODISHA					
SL. NO	ITEM	UNITS	UNIT COST	PROPOSED QUANTUM of Work	TOTAL COST (IN Rs.)
1	Topographical Survey (on 1:2000 SCALE)				
	a) BH fixation, RL & Co-ordinate Deterrmination	BH	45208	19	858952
	b) Topogrphical Survey (2 m contour Interval)	Hect.	18907	135	2552445
	Total 1				3411397
2	DRILLING				
	b) RC (Non Coring)	Mtr.	8130	1470	11951100
	c) Mobilisation & Demobilisation of Machinery & Tools	Rig	712610	1	712610
	d) Accomodation Charges for office & MECL perssonnels			Lump sum	10000000
	Total- Drilling Activity (2)				22663710
3	GEOLOGICAL WORK				
	a) Core Logging, Sampling , Analysis instruction & follow up, Sample Transportation	Mtr.	2560	1470	3763200
	b) Sample Crushing Charges (Coring at 1m length & RC 0.50m length)	Nos	414	2500	1035000
	c) Geological Mapping (on 1:2000 Scale)	Hect.	24865	135	3356775
	Total Geological Work (3)				8154975
4	CHEMICAL ANALYSIS				
	a) Primary+Check+external Chemical For 3 Radicals (Fe%,SiO ₂ % & Al ₂ O ₃ %)	Nos.	2981	2500	7452500
	b) Composite Samples of 7 Radicals (3 radicals+additional 4 radicals)	Nos.	6917	150	1037550
	c) X- Ray Diffraction Studies (XRD)	Nos.	5948	10	59480
	d) Spectroscopic Studies	Nos.	6324	15	94860
	e) Petrological Samples (preparation of ThinSection)	Nos.	568	15	8520
	f) Petrological Samples	Nos.	1505	15	22575
	g) Preparation of Polished Section	Nos.	568	15	8520
	h) Mineragraphic Studies	Nos.	2124	15	31860
	i) Specific gravity Determination	Nos.	205	30	6150
	j) Bulk Density Detrminations	Nos	139	10	1390
	Total Analytical Work (4)				8723405
5	Report Prepartion Upto 3000m	Nos.	3077	1470	4523190
	TOTAL (1+2+3+4+5)				47476677
				Say Rs 474.77 Lakhs	
Note	There is no provision of Rate for Iron in the MoM schedule of Rates hence the matter was discussed in the Meeting of Technical Committee of NMET and the committee agreed for Karnataka DMG rates on Adhoc basis.				
		18			

Table-7.2 Cost Estimate for Iron Ore Mineralisation in Purheibahal - Chandiposhi Block, District- Sundargarh, Odisha								
SL. NO.	Item of Work	Unit	Base Rate 1.4.90	Escalated rates (2016-17)			Grand Total	
				Esc. Rate (Rs)	Qty.	Amount (Rs)	Qty.	Amount (Rs)
A	DRILLING							
1	Surface Drilling (1 rig)							
	a) RC Drilling	m	8130	8130	1470	11951100	1470	11951100
2	Transportation	Km	8.8	34.0	3000	102000	3000	102000
3	Accomodation (One time/ Drill)		185925	709899	1	709899	1	709899
4	Camp Setting / Winding	- do-	68606	261951	2	523902	2	523902
5	Road Making (Flat Terrain)	Km	5200	19855	15	297825	15	297825
	Sub Total A					13584726		13584726
B	GEOLOGICAL WORK							
1	Survey Party days (2 party)	day	1180	6197	240	1487280	240	1487280
2	Geologist Party days (2 party)	day	1541	8267	300	2480100	300	2480100
3	Core Sampling Party days (2 party)	day	525	2967	200	593400	200	593400
4	Bulk Sampling Party Days	days	2566	14727	30	441810	30	441810
	Sub-Total C					5002590		5002590
C	LABORATORY STUDIES							
1	Chemical Analysis							
	i) Primary & Check samples							
	a. For3 radical (Fe%, SiO2% & Al2O3%,.)	Nos	262 (110+76x2)	1454	2200	3198800	2200	3198800
	b) Check Samples for 3radical (Fe%, SiO2% & Al2O3%)	Nos	262 (110 +76x2)	1454	250	363500	250	363500
	d) External Check Samples from NABL Labs for 3radical (Fe%, SiO2% & Al2O3%)	Nos	414(110 +76x4)	1454	50	72700	50	72700
	ii) Composite Samples							
	a) Composite Samples for 7 Radicals (Fe%, SiO2%, Al2O3%, P%, Mn%, S% & V2O5%).	Nos	268	3154	150	473100	150	473100
2	Physical Analysis							
	i) a) X-RD Studies on composite	Nos	1137	5948	10	59480	10	59480
	ii) b) Spectroscopic studies (15 elements- Cd,Sn,W,Sb,Mi,Ce,Nb,Ba,La,Bi,Co & Ni	Nos	1173	6324	15	94860	15	94860
	iii) Preparation of thin section	Nos	100	568	15	8520	15	8520
	iv) Petrographic Studies	Nos	228	1505	15	22575	15	22575
	v) Preparation of polished section	Nos	100	568	15	8520	15	8520
	vi) Mineragraphic Studies	Nos	364	2134	15	32010	15	32010
	vii) Specific Gravity determination	Nos	32	199	30	5970	30	5970
	viii) Bulk Density	Nos	24	141	10	1410	10	1410
	ix) Transportation of Beneficiation Samples	Km	8.8	34	1000	34000	1000	34000
	x) Benificiation Study	Rs	280900*	280900	2	561800	2	561800
	Sub-Total C					4937245		4937245
	Total A+B+C					23524561		23524561
D	EXPLORATION REPORT - 1% of (A+B+C)					235246	1	235246
E	Environmental Studies							
1	Satellite Imagery Study	Scene	99697	508006	1	508006	1	508006
2	Baseline data collection (10km radius area)		151273	770812	1	770812	1	770812
3	Chemical Analysis	Nos	257400**	659974	1	659974	1	659974
4	Report writing	Nos	50000	50000	1	50000	1	50000
	Sub-Total E					1988792		1988792
F	a) Core Preservation Charges in GI	Nos	2000	2000	375	750000	375	750000
	b) Transportation Charges of Core	Km	8	34	1000	34000	1000	34000
	Total F					784000		784000
	Grand Total : A to F					26532599		26532599
						Say Rs 265.33 Lakhs		
Note:								
1	Goel Committee rates for Iron ore are not available , hence Copper rates are taken on actual escalation as per RBI Indices as on 31-03-2015 and provisional escalation of@ 20% points for drilling and 25% points for Geological & Laboratory Studies for subsequenet years.							
2	** Nityanand Committee Rates with actual escalation as per RBI Index as on 31.3.2015 and provisional escalation @10% for subsequent year .							
			24					

235246

Table- 7.1 Time Schedule / Action Plan for Detailed Exploration Proposal for Iron Ore in Purheibahal-Chandiposi BLocks, District-SUNDARGARH, ODISHA

Sl. NO.	Activities	Unit	Financial Year 2016-17											Total
			1	2	3	4	5	6	7	8	9	10	11	
			05 /16	06 /16	07 /16	08 /16	09 /16	10 /16	11 /16	12 /16	01 /17	02 /17	03 /17	
1	Camp Setting	Month	←→											1 month
2	Surface Drilling RC Drilling (1 rigs)	m.		←→										1470 m (in 19BHs)
3	Survey Party days (2 Party)	day		←→										240
4	Geologist Party days (2 Party)	day		←→										300
5	Sampling Party days, Core Sampling (2 party)	day			←→									240
ii.	Bulk Sampling (1 party)	day						←→						60
6	Laboratory Studies	Nos.			←→									2325
9	Camp Winding	Months							←→					1 month
10	Report Writing (Including Peer Review of Report)	Months							←→					5 months
							17							

Government of India
Ministry of Mines
National Mineral Exploration Trust

F.No. 6/1/NMET-2015

New Delhi, 16th August, 2016

OFFICE MEMORANDUM

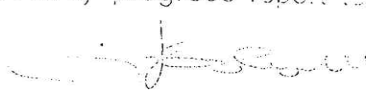
Sub: - Approval of mineral exploration projects in 13 blocks

On the recommendations of the Technical Committee of NMET, the Executive Committee in its second meeting held on 9.5.2016 has approved thirteen (13) mineral exploration projects in six states at a cost of Rs. 2292.16 lakhs.

2. Consequent to dropping of one project of bauxite in Jharkhand on the request of State Government, the number of approved projects under NMET now stands at twelve (12) in five states, at a cumulative cost of Rs. 21,61,29,777.00 (Rupees twenty one crore, sixty one lakhs, twenty nine thousand, seven hundred seventy seven paise).

3. The above exploration projects will be funded by NMET as per the plan recommended by the Technical Committee and approved by the Executive Committee. MECL will undertake exploration in these twelve blocks under Tripartite Agreement among (Ministry of Mines (NMET), MECL and the respective State Governments) and complete the same as per the approved work plan and time schedule.

5. The execution of work will be continuously monitored and periodically reviewed by the NMET Technical Committee and MECL will submit monthly progress report to NMET Secretariat.


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To

The Chairman-cum-Managing Director, MECL, 10, Dr. B.R. Ambedkar Bhawan,
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List of Mineral Exploration Projects approved in the 2nd meeting of the Executive Committee held on 09.05.2016

Sl. No.	Name of the Block	Mineral	Area of the Block	Work already done in the block	Work proposed in the block	Estimated cost of the project in Rs. lakh
1.	Jumka-Pathriposhi Block, Distt. Sundargarh, Odisha	Iron	1.71 Sq. Km.	G-3	G-2	772.68
2.	Purheibahal-Chandiposhi Block, Distt. Sundargarh, Odisha	Iron	1.35 Sq. Km.	G-3	G-2	265.33
3.	Mandri-Panchala Block, Distt. Nagpur, Maharashtra	Manganese	2.50 Sq. Km.	Virgin Area	G-4	130.31
4.	Lanjera-Futala Block, Distt. Nagpur, Maharashtra	Manganese	8.00 Sq. Km.	Virgin Area	G-4	148.98
5.	Ranigaon-Gondaiya Block, Distt. Bilaspur, Chhattisgarh	Limestone	5.00 Sq. Km.	G-4	G-3	100.52
6.	Nahardih-Madhaipur Block, Distt. Raipur, Chhattisgarh	Limestone	5.45 Sq. Km.	Virgin Area	G-4	27.89
7.	Sendurkhar Block, Distt. Kabirdham (Kawardha), Chhattisgarh	Bauxite	2.90 Sq. Km.	Virgin Area	G-4	45.13
8.	Saraipani-Dadar Block, Distt. Kabirdham (Kawardha), Chhattisgarh	Bauxite	0.80 Sq. Km.	Virgin Area	G-4	44.66
9.	Ghumchihi Block, Distt. – Satna, Madhya Pradesh	Limestone	5.00 Sq. Km.	Virgin Area	G-4	57.75
10.	Naubasta-Kolard Block, Distt. Satna, Madhya Pradesh	Limestone	15.00 Sq. Km.	Virgin Area	G-4	59.49
11.	Jamodi-Mahanna Block, Distt. Satna, Madhya Pradesh	Limestone	30.00 Sq. Km.	Virgin Area	G-4	65.36
	Total cost					1718.10