

Proposal for General Exploration (G2) in Naila Ki Dhani Copper Block,
Eastern Khetri Copper Belt, Jhunjhunu District, Rajasthan State, under NMET.

Copper and Associated Minerals

By

Mineral Exploration Corporation Limited
(A Government of India Enterprise)
A Mini Ratna Company
Seminary Hills, Nagpur-440 006 Maharashtra

Place: Nagpur

Summary of the Block for G2Stage Exploration

Features	Details
Block ID :	Naila Ki Dhani Copper Block
Current Exploration Agency	MECL
Previous Exploration Agency	GSI
Geological Report (Previous stage Geological Report)	Progress Report for the Field Season 1995-96 and 1996-97 6 BHs ND-01 to N-06 total Drilling 1340.35m (Inclusive of RND -01 & 02)
Commodity :Copper	
Mineral Belt : Eastern Khetri Copper Belt	
Budget & Time Schedule to complete the project	-Rs. 807.59 Lakhs&16 months
Objectives:To assess and estimate the ore potential upto vertical depth of 200m.	
Whether the work will be carried out by the proposed agency or through outsourcing and details thereof. Components to be outsourced and name of the outsource agency: MECL	
Name/ Number of Geoscientists :	Geologist: 01 HQ (60 days) Geologist: Field (270 days)
Expected Field days (Geology, Surveyor)	Surveyor :60 days
1.	Location: The proposed Naila Ki Dhani area is 15 km. East of Khetri town and 18 km. ESE of Khetrinagar contiguous to the state highway connecting the copper town of Khetrinagar to the National capital New Delhi, which is 175 km. From the prospect. The nearest railhead is Nizampur, which is 12 km. East of the area on Rewari-Phulera section of Western Railway. The nearest airport is Indira Gandhi International Airport New Delhi which is 150 km. away from the area.
Latitude :	27° 58' 56" to 27° 59' 11"
Longitude:	75° 51' 38" to 75° 52' 56"
Villages :	Naila Ki Dhani
Tehsil/ Taluk :	Khetri
District :	Jhunjhunu
State :	Rajasthan
2.	Area (hectares/ square kilometres)
Block Area :	183.5 Ha
Forest Area :	-
Government Land Area	-
Private Land Area	-
3.	Accessibility
Nearest Rail Head : The nearest railhead is Nizampur, which is 12 km. East of the area on Rewari-Phulera section of Western Railway.	
Road : Khatri is 15 km.	
Airport : Indira Gandhi International Airport, New Delhi is 150 km.	
4.	Hydrography
The area has semiarid climate and water table is 10m to 12m. below the ground. The major part of the area is covered by alluvium and soil upto 3m. thick. Northeastery flowing nalah, on the eastern flank, marking a tributary of river Chandrawati represents the drainage of the area.	
Rivers/ Streams : Part of tributaries/water shed area of river Chandrawathi.	
5.	Climate
Mean Annual Rainfall : The average annual rainfall in the area is reported total about 38-50 cm mainly during June to August.	

Temperatures (November- December) (Minimum) 1 ⁰ C Temperatures (May-June) (Maximum) 47 ⁰ C	
6.	Topography
Toposheet Number : 45M/13	
The major part of the area is covered by alluvium and soil is 357m to 360m above mean sea level. The general slope of the ground is northeasterly.	
7	Availability of baseline geoscience data
Geological Map	on 1:2000 scale
Geochemical Map	55 Nos
Geophysical Map	Interpreted map of Magnetic, IP (Chargeability) and SP map of GSI, Field Season: 1993-94 report.
8.	Justification for taking up G2 stage mineral exploration Existed GSI drilled bore holes intersected considerable copper mineralisation in bore holes ND-01 (106.50 to 109.50 m, 3 m X 0.37 % Cu), ND-02 (58.45 to 60.75 m, 2.30 m X 0.51% Cu, 153 ppb Au and 5.59 ppm of Ag), ND-03 (45.95 to 52.10 m,. 6.15 m X 0.28 % Cu) and ND - 5 (147.50 to 150.40 m,2.90 m X 1.24 % Cu). NailakiDhani block and associated old workings are confined in the vicinity of Babai - Papurna - Rampura lineament (Eastern Khetri Copper Belt) on the regional scale. As the proposed study area is soil covered, the encouraging recommendation made by BRGM and geophysical data are significant for the planning of exploration work. Deep penetration IP survey in this block has delineated an elongated chargeability zone-V which almost follows the magnetic and SP zones

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1.0 INTRODUCTION

- 1.1. The exploration proposal was discussed in 54th SGPB meeting held at Jaipur on 17th February-2020. It was decided that, the area shall be explored through NMET fund. Same was intimated to the Additional Director, DMG, Khanij Bhavan, Jaipur, Rajasthan State, Lr.No. MECL/Expl/DMG-Raj/20-21/2793 dated 10.06.2020 with the subject as Action taken report on the minutes of the meeting held on 17.02.2020.
- 1.2. MECL prepared the proposal and submitted to 24th Technical-cum-Cost Committee (TCC) meeting held on 07th, 08th and 09th Oct, 2020 through videoconferencing at Geological Survey of India, DGO, A-II Pushpa Bhawan, New Delhi-62.
- 1.3. The proposal has been technically evaluated by the Committee for its various geological/geophysical components and their suitability in the G2 stage exploration. Committee suggested that the geological map of GSI may be used and bore holes may be planned along the borehole profiles of the drilled boreholes of GSI.
- 1.4. Committee also suggested that the geophysical survey, geophysical logging along with systematic drilling with maximum 200m vertical depth of intersection may be taken up by MECL.
- 1.5. Accordingly MECL revised the proposal and resubmitted to the Committee and Committee recommended the proposal for approval of General Exploration (G2) with estimated cost of Rs. 807.59 Lakhs including GST in time schedule of 16 months.

2.0 LOCATION AND ACCESSIBILITY

- 2.1. The study area Naila Ki Dhani Copper Block is situated under Naila Ki Dhani Village of Khetri Tahasil, Jhunjhunu District, Rajasthan. Northing 27° 58' 56" to 27° 59' 11" and Easting 75° 51' 38" to 75° 52' 56" falls in Survey of India Toposheet 45M/13.
- 2.2. The proposed Naila Ki Dhani area is 15 km. East of Khetri town and 18 km. ESE of Khetrinagar contiguous to the state highway connecting the Copper town of Khetrinagar to the National capital New Delhi, which is 175 km. from the prospect. The nearest railhead is Nizampur, which is 12 km. East of the area on Rewari-Phulera section of Western Railway. The nearest airport is Indira Gandhi International Airport New Delhi which is 150 km. away from the study area.

3.0 REGIONAL GEOLOGY AND STRUCTURE

- 3.1. The arenaceous and argillaceous metasediments of Alwar and Ajabgarh Groups belonging to Delhi Supergroup constitute the regional geological sequence of the area. The major rock types exposed in the area are arkosic quartzite, amphibole quartzite, phyllite with or without andalusite, garnet and staurolite biotite schist, flaggy and massive quartzite, garnetiferous amphibolites, amphibolites and marble. Metasomatic syngenetic granitic rocks along with antiformal cores have intruded the metasediments.

The geological succession of the Khetri belt after Heron (1923) and Dasgupta (1968) is as follows

Age	Formation	Rock types
P. E. O.	Post Delhi	Quartz Veins, Chert-Anirite Veins.

Intrusive	Thin amphibolites dykes, pegmatites granite aplitic-granite, amphibolites (metamorphosed) Upper arenaceous unit: Biotite Schist, feldspathised biotite gneiss and amphibole-biotite gneiss.
Ajabgarh Group	Upper pelitic unit: Phyllite, impure marble, calc-gneiss, amphibolites, amphibole quartzite, silicified phyllite, cherty carbonate rock. Middle arenaceous unit: Massive, thick bedded quartzite with rare intercalations of phyllite. Lower pelitic unit: Phyllite, sericite schist, biotite-chiastolite schist, feldspathic biotite schist, silicified schist, marble, carbonaceous phyllite, graphitic schist, quartzite, antholpyllite – cummingtonite rock and amphibolites.
Alwar Group	Arkosic quartzite, amphibole quartzite, amphibole-quartz gneiss, actinolite marble, amphibole-biotite quartzite, phyllite and mica schist.

- 3.2. The contact between Alwar Group and Ajabgarh Group is gradational and the copper mineralisation in the area is confined to amphibole quartzite, garnetiferous amphibolites and albitised fault zone of the aforesaid Delhi stratigraphy.
- 3.3. The area has been complexly deformed by multiple folding and regional scale faults or shears. Both non-diastrorphic and diastrorphic structures are preserved in the different rock types of area. Structure plays an important role in the control of mineralization in the Eastern Khetri Belt (EKB). The NE-SW trending Babai-Papurna-Rampura-Tonda lineament demarcates the South Eastern flank of the mineralized zones in the EKB i.e.; base metal mineralisation occurs on the North Western side of the lineament. The albitised fault zones are the favourable for the basemetal mineralisation in the EKB in general, unlike the main Khetri Belt, where synsedimentary copper mineralization is persistent within same geological unit.
- 3.4. The area has undergone three phase of deformations, the earliest deformation has resulted in the development of NE-SW trending and South Easterly dipping S1 schistosity, which is coplanar to S0-F2 folds have resulted in the development of S2 crenulation cleavage trending N-S to NE-SW with steep easterly dips. The open warps indicate third deformation, which has resulted in the change of trends of S1 and S2, at places.

4.0 GEOLOGY OF THE AREA

- 4.1 The outcrops in the prospect are sparse, (5% to 10% outcrop area), so the geology is inferred by interrelating the geology of adjoining areas, dug well data, bore hole data and geophysical data. Feldspathic quartzite garnetiferous amphibolites, garnet-staurolite-biotite schist, anthophyllite-cummingtonite rock and para-amphibolites belonging to Alwar and Ajabgarh group of Delhi Supergroup represent major lithounits of the area.

The generalized stratigraphic succession of the prospect is as follows:

Recent	Intrusives	Alluvium and soil Quartz veins Amphibolite dykes Ultramafics Basic Volcanics (?)
Delhi Supergroup	Ajabgarh Group	Garnet-Staurolite-Biotite Schist with bands of anthophyllite-cummingtonite rock, Garnetiferous para-amphibolites.
	Alwar Group	Amphibole-Biotite quartzite with bands of para-amphibolites. Feldspathic biotite quartzite basal arkose.

- 4.2 Arkose exposed in the North Eastern and South Western parts of the prospect is the oldest unit of the block. The basal arkose is fine to medium grained, has a granitic look on weathered surface, and shows feeble foliation trending NW-SE. The main mineral constituents identified are pink to white potash feldspar, quartz, biotite, hornblende, tremolite and magnetite. The felspathic quartzite overlies the basal arkose.
- 4.3 The felspathic quartzite unit occupies the hill in the north-western part of the prospect. The rock is pale to buff in colour, medium to fine grained and the feldspars are unaltered indicating nearness of granitic \ gneissic source of their origin. This unit is highly brecciated, silicified and shows signs of metasomatic albitisation. The felspathic quartzite gradually passes into overlying amphibole-biotite quartzite as recorded in the borehole sections. The amphibole-biotite quartzite is melanocratic due to presence of biotite and hornblende and is fine to medium grained. Sills of para-amphibolites were noticed in borehole sections as well as on surface outcrops. These para-amphibolites are grey to dark grey in color, 20 cm to 2.5m thick and show concordant relationship with the amphibole – biotite quartzite. This often gives an impression that the amphibole-biotite quartzite and para-amphibolites might be alternate bands of felsic and mafic volcanic [?].
- 4.4 The amphibole-biotite quartzite representing the top of the Alwar Group gradually passes into overlying garnetiferous para-amphibolites, garnet-staurolite-biotite schist with bands of Anthophyllite -cummingtonite rock of Ajabgarh Group.
- 4.5 The amphibolite dykes noticed in the northwestern segment of the prospect are represented as the late intrusives in the area. These amphibolite bodies can be differentiated from para-amphibolites by virtue of their criss-cross nature with the country rock, lesser metamorphism and absence of foliation. The quartz veins mark the last intrusive unit of the prospect (Sharma and Brij Kumar 1996).
- 4.6 **Structure:** The structure plays an important role for the exploration of base metals in the EKB in general and Naila-Ki-Dhani block in particular, as the mineralisation here is structurally controlled, unlike main Khetri belt, where it is more or less strata bound. The NW-SE trending fault at Naila-Ki-Dhani is associated with a transverse magnetic break and 6-channel gradual decay airborne electromagnetic anomaly [Ghosh 1983]. This fault is of regional scale and might extend from Ajitsagar in the northwest to Tonda in the southeast for strike length of over 3 km [Sharma 1984]. The earlier workers considered this fault to be vertical and planned the boreholes from northeast to southwest, however mapping of the area by the author during F.S. 1995 - 96 reveals that fault dips southwesterly with an angle of 65° to 70°. Taking into consideration the dip of the fault the boreholes were planned from southwest to northeast [which is the hanging wall of the fault]. The surface expressions of the fault were noticed at T.S.-7 and T.S.-21 in the form of silicified, brecciated, albitised and gossanised zone. The geophysical survey carried out during field season 1993-94 also supports the existence of the fault, as NW-SE trending strong IP, SP, and magnetic axes were recorded parallel to each other at Naila-Ki-Dhani block [Zone V], which oblique other geophysical anomaly axes [Zones I, II, ID, and IV].

5.0 MINERALISATION

- 5.1 As mentioned earlier the outcrop density in the prospect is poor, the surface manifestations of mineralisation are restricted to the hill in the northwestern flank of the area and outcrops of gossans in the southeastern side. The hill around T.S.7 has a zone of silicification, brecciation, and albitisation. This zone is 4m to 7m thick and has a strike of N50° W-S50°E and dips steeply south-westerly. It contains specks of sulfides which are partly oxidized and limonitised. The oxidation of chalcopyrite has imparted green malachite stains at many places in this zone. The original

metasediments in this zone of cataclasis have been highly feldspathised and silicified, leaving no trace of original constituents of the rock in this fault zone. This zone disappears below the soil near T.S.-1 and reappears in well dumps NW of Naila-Ki-Dhani village, where signs of sulfide mineralisation were noticed. The well dump contains specks of chalcopyrite, pyrite, and pyrrhotite in amphibole- biotite quartzite, which has analyzed 490 PPM of Cu and 390 PPM of Co [Gathania 1994]. A hand pump boring 20 m NW of this well has intersected non-potable water containing sulfur and has thus been abandoned by the local people for domestic use. Well dumps near T.S. 10 have recorded presence of pyrite, pyrrhotite, and magnetite, however no chalcopyrite was visually noticed in the well dump. The mineralized fault zone extends further southeast of Naila-Ki-Dhani village as specks of chalcopyrite, pyrite, and pyrrhotite were recorded in another well near T.S.-13. The mineralized zone reappears 600-m southeast of Naila-Ki-Dhani village near T.S.21 in the form of gossan. The gossan is dark brown to dark red in color, has a spongy texture but a high specific gravity due to secondary iron minerals. Fragments of quartz vein are mixed with hematite, goethite and maroon or red, brownish - yellow limonite. The gossan zone trends N50°W - S50°E and dips 68° southwesterly and contains malachite stains at places. A grab sample from this zone has assayed 3500 PPM of Cu and 195 PPM of Co [Gathania 1994]. A chain of old workings were recorded in the feldspathised silicified zone over a strike length of 200 m. These old workings are 2 to 3 m in diameter and 3 to 4 m deep, but appear to have been filled in with debris. An old working near T.S.-1 is quite deep [6 to 8 m] and is currently being used as an irrigation well and seems to represent an old vertical shaft. Large mine dumps are composed of brecciated albrased quartzite and at places contain reddish brown colored specks of oxidized sulfides. On the southwestern side of the area slag dumps were also recorded.

6.0 PREVIOUS WORK

- 6.1 The Khetri belt was mapped by Heron [1917] and Dasgupta [1968]. The exploration work in the Eastern Khetri Belt [EKB] was carried out by the Airborne Mineral Survey and Exploration (AMSE) wing from 1969 to 1975 and from 1980 to 1982, after the mineralized zones of Eastern Khetri Copper Belt (EKB) were emerged as targets for exploration using integrated Airborne Electro Magnetic (E.M.) anomaly zones indicated by the Geophysical Survey carried out in Rajasthan during 1967-68, under the project "Operation Hard Rock". During that period several smaller prospects have been located in Tonda, Naila-Ki-Dhani blocks along with Ajitsager, Rampura, Malwali, and Bokri blocks.
- 6.2 The geological concepts had been modified in late eighties and early nineties, as Gathania [1988] changed the monometallic [Cu] character of Khetri belt to polymetallic [Cu-Pb-Zn] character and the sequence had been marked by some workers [Chakraborty and Gupta.1993] as belonging to Pre-Delhi and Mangalwar Group in contrast to Delhi Group suggested by Heron [1923] and Dasgupta [1968]. Under the Geological Survey of India- BRGM collaboration programme an appraisal of copper mineralisation in the EKB and other areas of Khetri belt have been made, which included detailed geological, geophysical and geochemical work. The EKB had been mapped on 1:10,000 scale by Gathania [1997] and geophysical survey comprising IP; SP and Magnetic methods had been carried out during F.S. 1993-94. As the area under review is soil covered, the encouraging recommendation made by BRGM and geophysical data are significant for the planning of exploration work.
- 6.3 During the field seasons 1995-96 and 1996-97, an area of 0.6 sq.km on 1:2000 scale was mapped to delineate various geological features. 55 nos. soil geochemical samples were collected from the soil covered area and a total of six boreholes were drilled ND-01 to ND-06. The quantum of work done by GSI is as follows:



Detailed Mapping 1:2000 scale	0.6 sq.km
Geochemical sampling	55 nos.
Petrological sampling	18 nos.
Drilling (6BHs)	1340.35m
Core sampling	136 nos.

Details of BHs drilled by GSI in the Block									
BH No./ Section no.	RL (m)	Inclination from Horizontal	Azimuth	Details of Mineralised Zone			Total Depth (m)	Level of intersection	Remarks
				From (m)	To (m)	Thickness (m) and Grade (%)			
RND-1 (S-1)	363.75	40°	S30°W				111.15		
RND-2 (S-3)	356.79	45°	S30°W				140.50		
ND-1 (S-5)	355.99	40°	S30°W	106.50	109.50	3.00 x 0.37	294.00		
ND-5 (S-6)	364.00	48°	N30°E	147.50	150.40	2.90 x 1.24	178.70	250	
ND-6 (S-9)	356.87	78°	N30°E				79.55		
ND-4 (S-11)	356.00	50°	N30°E				146.50		
ND-2 (S-13)	356.59	45°	N30°E	58.45	60.75	2.30 x 0.51	249.00		
ND-3 (S-15)	355.36	60°	N30°E	45.95	52.10	6.15 x 0.28	140.95		
Total							1340.35		

7.0 SCOPE FOR PROPOSED EXPLORATION

- 7.1 In two field sessions GSI has completed 6 drill holes. Report reveals that, intersection thickness range from 2.30m to 6.15m and grade range from 0.28 to 1.24% Cu, 153 ppb Au and 5.59 ppm Agup to a maximum depth of 250mRL which is approximately 135m vertical depth.
- 7.2 In view of the above, MECL has planned to explore up to 200m vertical depth in 100m strike interval. Resource estimation shall be categorized as per UNFC and MEMC rules-2015.

8.0 OBJECTIVES

- 8.1 The surface manifestation of mineralization is less and oxidization depth is quite deep, 90% of the areas fall under soil cover. Based on the GSI exploration report following objects have fixed for exploration:
- To drill 18BHsfor intersection of mineralised zone at200m vertical depth and at 100mstrike interval.
 - To estimate geological resources of Copper under G-2 category (UNFC-333).
 - Ore resource would be estimated as per UNFC and MEMC rules-2015.

9.0 PLANNED METHODOLOGY

- 9.1 It is proposed to take up the investigation with intersection vertical depth of 200m (100mRL) since GSI drill holes maximum depth was 250mRL and suggested deeper holes to avoid oxidation on mineralized zones. Total 18BHs with 4140m of drilling proposed

The details of proposed drill holes are as follows:

Section No	PBH No	PROPOSED DEPTHTH (m)	AZIMUTH (°)	INCLINATION wrt Horizontal
S3-S3'	PBH-01	320.00	N30°E	60°
S4-S4'	PBH-02	310.00	N30°E	60°
S5-S5'	PBH-03	320.00	N30°E	60°
S6-S6'	PBH-04	320.00	N30°E	60°
S8-S8'	PBH-05	330.00	N30°E	60°
S9-S9'	PBH-06	330.00	N30°E	60°
S10-S10'	PBH-07	330.00	N30°E	60°
S12-S12'	PBH-08	330.00	N30°E	60°
S14-S14'	PBH-09	330.00	N30°E	60°
S8-S8'	PBH-10	330.00	N30°E	60°
S9-S9'	PBH-11	330.00	N30°E	60°
S10-S10'	PBH-12	330.00	N30°E	60°
S11-S11'	PBH-13	330.00	N30°E	60°
S12-S12'	PBH-14	330.00	N30°E	60°
S13-S13'	PBH-15	330.00	N30°E	60°
S14-S14'	PBH-16	330.00	N30°E	60°
S15-S15'	PBH-17	330.00	N30°E	60°
S16-S16'	PBH-18	330.00	N30°E	60°
TOTAL		4140.00		

10.0 BOREHOLE CORE LOGGING

- 10.1 Detailed drill core logging will be done with consideration of lithological details, structural features, e.g. joints, veins foliations, mineralization pattern, visual estimation of copper content and other associated minerals in percentage etc. for entire length of all the holes and determination of Rock Quality Designations (RQD) for entire length of each borehole.

11.0 BOREHOLE GEOPHYSICAL LOGGING

- 11.1 Borehole Geophysical logging including Induced Polarisation, Resistivity, SP& Spectral Gamma is proposed in all the boreholes in the Block.

12.0 PRIMARY SAMPLE

- 12.1 The borehole cores will be spitted into two equal halves by using core splitter. One half will be powdered to -200 mesh size and the other half will be kept for future studies. The powdered material will be mixed thoroughly and about 100 gram of samples will be taken for chemical analysis by successive coning and quartering as primary samples and rest of the material (-200 mesh size) will be kept as duplicate for future reference. This will generate about 1080 nos. of samples, which will be sent to MECL Lab. for analysis of copper.
- 12.2 Check samples will be prepared around 55 nos. and 5% samples analysis will be done at internal lab and 110 nos. (10%) sample analysis will be done at external laboratories for Cu.
- 12.3 Composite samples will be prepared zone wise based on primary sample data. This will generate about 50 nos. of composite samples which will be analysed for radicals such as Cu, Ni, Co, W and Mo.

13.0 PETROGRAPHY, MINERAGRAPY & SPECIFIC GRAVITY STUDIES

- 13.1 20 nos. samples for petrographic study by thin section 30 nos. of samples for mineragraphy studies through polished section are proposed at MECL Lab.
- 13.2 Total 20 nos. samples will be studied for specific gravity determinations.

14.0 GEO-TECHNICAL STUDIES

- 14.1 Geo-technical Studies viz., tensile strength, compressive strength, young's modulus, protodynakavo test, density etc., would be conducted on the cores of exploratory borehole cores from the mineralised zone along with foot wall and hanging wall at National Laboratory / NIT as to ascertain rock characteristics.

15.0 BULK SAMPLES FOR BENEFICIATION TEST

- 15.1 A representative bulk sample would be drawn from the duplicate half core samples of mineralised zones and would be sent for laboratory scale beneficiation studies in IBM Laboratory.

16.0 QUANTUM OF PROPOSED WORK

16.1 Nature and Quantum of proposed exploratory programme:

S.No.	Description and Nature of Work	Unit	Target
I	a) Topographic Survey (1:2000 Scale)	Sq.Km.	Update
	b) Geological Mapping (1:2000 Scale)	Sq.Km.	Update
II	Exploratory Drilling	m	4130 (18BHs.)
III	Laboratory Studies		
	a) Primary + Check Samples for Copper	Nos.	1245
	b) Composite Sample		
	i) For 5 radicals (Cu, Ni, Co, Mo and W)	Nos.	50
	c) Petrographic Studies	Nos.	20
	d) Mineragraphic Studies	Nos.	30
	e) Specific Gravity determinations	Nos.	20
IV	a) Geo-Technical Studies (on BHs)	Nos.	1
	b) Beneficiation Studies	Nos.	1

V	Geological Report preparation (Digital and Hard Copy Format)	Nos.	1

17.0 COST ESTIMATE

- 17.1 The cost has been estimated based on actual schedule of rates mandated in the circular OM No. 61/1/2018/NMET dated 31st March 2020 for promotional projects of MOM, which is Rs1672.93 Lakhs.

Summary of Cost Estimates

Sl. No.	Item	Estimated Cost INR (₹)
1	Exploratory Drilling	5,36,53,100
2	Geology & Survey	63,81,600
3	Borehole logging	20,12,040
4	Laboratory Studies	40,21,457
	Sub total	6,60,68,197
6	Report	19,82,046
7	Peer Review	10,000
8	Proposal Preparation	3,80,000
	Total	6,84,40,243
11	GST (18%)	1,23,19,244
	Total cost including 18% GST	8,07,59,487
	SAY, in Lakhs	807.59

18.0 TIME SCHEDULE

- 18.1 The proposed exploration programme envisages surveying, updation of geological mapping exploratory drilling, deviation survey, sample preparation and laboratory studies, which will be completed within 13 months by deploying 2 drill rigs, geological report preparation will consume 3 more months. Therefore, a total of 16 months is planned for completion of the entire programme.

19.0 JUSTIFICATION

- 19.1 GSI bore holes have intersected considerable copper mineralisation in various bore holes viz- ND-01 (106.50 to 109.50 m, 3 m X 0.37 % Cu), ND-02 (58.45 to 60.75 m, 2.30 m X 0.51% Cu, 153 ppb Au and 5.59 ppm of Ag), ND-03 (45.95 to 52.10 m, 6.15 m X 0.28 % Cu) and ND - 5 (147.50 to 150.40 m, 2.90 m X 1.24 % Cu).
- 19.2 This block and associated old workings are confined in the vicinity of Babai - Papurna - Rampura lineament (Eastern Khetri Copper Belt) on the regional scale.
- 19.3 As the area under review is soil covered, the encouraging recommendation made by BRGM and Geophysical data are significant for the planning of exploration work. Deep penetration IP survey in this block has delineated an elongated chargeability zone-V which almost follows the magnetic and SP zones

PLATES:

S.No	Description	Plate No.
1	Location map of Nail Ki Dhani	1
2	Regional Geological Map of North Khetri Copper Belt.	2
3	Geological and Topographical Map of Naila Ki Dhani Copper Block.	3
4	Longitudinal Vertical Section of Naila Ki Dhani Copper Block	4
5	Geological Cross Sections S1 to S19	5

REFERENCES:

1. Report on Geophysical Investigation for Base Metals in Rampura-Tonda and Kushalpur Areas, Khetri Copper Belt, Jhunjhunu District, Rajasthan, F.S. 1993-94. By L. N. Singh, Geophysicist (Jr.), S.L.Singh, Assistant Geophysicist, Murali Ram S.T.A (Geophysics).
2. Exploration for Base Metal in the Rampura-Tonda-Naila Ki Dhani Area, Eastern Khetri Copper Belt, Jhunjhunu District, Rajasthan Progress Report for Field Season 1995-96. by A.K. Sharma, Geologist (Sr), Brij Kumar, Geologist (Sr.).
3. Exploration for Base Metal in the Rampura-Tonda-Naila Ki Dhani Area, Eastern Khetri Copper Belt, Jhunjhunu District, Rajasthan Progress Report for Field Season 1996-97. by A.K. Sharma, Geologist (Sr)
4. Compendium on Khetri Copper belt, Rajasthan, Suggestions for future search of Ore by Mineral Exploration Corporation Limited (MECL).

Cost Estimate for General Exploration (G2) Proposal for Estimation of Copper Ore in Nalla Ki Dhani Copper Block Eastern Khetri Copper Belt, Jhunjhunu District, Rajasthan State Total Area - 1.83sq km ; Nos. of Borehole - 18 ; Borehole depth range - 90m to 300m ; Completion Time - 16 Months							
S.N	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item - SI No.	Rates as per SoC	Qty.	Total Amount (Rs)	
A	GEOLOGICAL WORK						
1	Borhole logging & sampling & report writing						
a	Charges for one Geologist per day at HHQ	day	1.3	9,000	60	5,40,000	
b	Charges for one Geologist per day at field	day	1.3	11,000	270	29,70,000	
c	Labour (2 Nos) Base rate - Rs.350 X 2 = 700	day	5.7	700	270	1,89,000	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
2	Survey (on 1:2000 Scale)						
a	Bore Hole Fixation and determination of co-ordinates & Reduced Level of the boreholes by DGPS.	Per Point of observation	1.6.2	19,200	18	3,45,600	
b	Charges of one Surveyor (1 Party)	one surveyor per day	1.6.1a	8,300	60	4,98,000	
c	Labours (4 Nos) Base rate - Rs. 350 x 4 = 1400/-	day	5.7	1,400	60	84,000	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
d	Charges for one Sampler per day (1 Party)	one sampler per day	1.5.2	5,100	270	13,77,000	
e	Labours (4 Nos) Base rate - Rs. 350 x 4 = 1400/-	day	5.7	1,400	270	3,78,000	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
	Sub-Total A					63,81,600	
B	Borehole Geophysical Logging						
1	Base log	Per m	3.11a	151	4,140	6,25,140	
2	Induced Polarosation (LP)	Per m	3.11p	93	4,140	3,85,020	
3	Resistivity	Per m	3.11c	39	4,140	1,61,460	
4	SP	Per m	3.11b	39	4,140	1,61,460	
5	Spectral Gamma	Per m	3.11o	164	4,140	6,78,960	
	Sub-Total B					20,12,040	
C	DRILLING						
1	Drilling (Medium Hard Rock)	m	2.2.1.4a	11,500	4,140	4,76,10,000	
2	Borehole deviation Survey by Multishot Camera	m	2.2.6	330	4,140	13,66,200	
3	Land / Crop Compensation (in case the BHI falls in agroecultural Land)	per BHI	5.6	20,000	18	3,60,000	Amount will be reimburse as per actuals or max. Rs. 20000 per BHI with certification from local authorities
4	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	18	36,000	
5	Transportation of Drill Rig & Truck associated per drill	Km	2.2.8	36	4,600	1,65,600	
6	Monthly Accomodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	8	4,00,000	
8	Drilling Camp Setting Cost	Nos	2.2.9a	2,50,000	2	5,00,000	
9	Drilling Camp Winding up Cost	Nos	2.2.9b	2,50,000	2	5,00,000	
10	Road Making (Flat Terrain)	Km	2.2.10a	22,020	15	3,30,300	Road Making will be considered as per the requirement and Road Making Charges will be reimbursed accordingly.
11	Drill Core Preservation	per m	5.3	1,590	1,500	23,85,000	
	Sub Total C					5,36,53,100	
D	LABORATORY STUDIES						
I	Chemical Analysis						
i)	Primary samples						
a.	for Cu	Nos	4.1.7a	2,506	1,080	27,06,480	
ii)	Check samples Internal (5%) and External(10%)						
	for Cu	Nos	4.1.7a	2,506	165	4,13,490	
iii)	Composite Samplet						
a)	For 5 Radicals (Cu, Ni, Co, W, Mo)	Nos	4.1.7a	2,506	50	1,25,300	
b)	Geo-Technical Sample	Nos	N.A	14,663	10	1,46,630	will be reimbursed as per actual
c)	Beneficiation Study *	Nos	4.7.2 as per IHM Rate	2,83,927	1	2,83,927	will be reimbursed as per actual
	Sub-Total -D					36,75,827	
E	Petrological samples (Surface & Bh Core Samples)						
i	Preparation of thin section	Nos	4.3.1	2,353	20	47,060	
ii	b) Study of Thin Section	Nos	4.3.4	4,232	20	84,640	
	Sub-Total -E					1,31,700	
F	Mineragraphic Studies (Surface & Bh Core Samples)						
a	Preparation of polished section	Nos	4.3.2	1,549	30	46,470	
b	Study of Polished Section	Nos	4.3.4	4,232	30	1,26,960	
c	Digital Photographs	Nos	4.3.7	280	30	8,400	
	Sub-Total -F					1,81,830	
G	Specific Gravity Determination						
	Specific Gravity Determination	No.	4.8.1	1,605	20	32,100	
	Sub-Total - G					32,100	
II	Total A to G					6,60,68,197	
I	Geological Report Preparation	5 Hard copies with a soft copy	5.2	For the projects having cost more than Rs. 300 Lakhs - A minimum of Rs. 9 Lakhs or 3% of the value of work whichever is more subject to Max. Rs. 10 lakhs		19,82,046	
J	Peer review Charges		As per EC decision			10,000	
K	Preparation of Exploration Proposal (5 Hard copies with a soft copy)	5 Hard copies with a soft copy	5.1	2% of the Cost or Rs. 3.8 Lakhs whichever is lower		3,80,000	EA has to submit the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC-NMET in its meeting while clearing the proposal.
L	Total Estimated Cost without GST					6,84,40,243	
M	Provision for GST (18% of L)	%				1,23,19,244	GST will be reimburse as per actual and as per notified prescribed rate
N	Total Estimated Cost with GST					8,07,59,487	
or Say Rs. 807.59 Lakhs							
Note - If any part of the project is outsourced, the amount will be reimbursed as per the Paragraph 3 of NMET SoC and Item no. 6 of NMET SoC. In case of execution of the project by NEA on its own, a Certificate regarding non outsourcing of any component/project is required.							

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S.N	Item of Work	Unit	Rate as per NMET SoC 2020 SoC-Item - SI No.	Estimated Cost 2020-21 Qty.	Estimated Cost 2020-21 Total Amount (Rs)	Estimated Cost 2021-22 Qty.	Estimated Cost of the Proposal Total Amount (Rs)	Remarks
iii)	For Cu	Nos	4.1.7a	-	-	165	413,490	
	Composite Samples							
	a) For 5 Radicals (Cu, Ni, Co, W Mo)	Nos	4.1.7a	-	-	50	125,300	
	b) Geo-Technical Sample	Nos	N/A	-	-	10	146,630	will be reimbursed as per actual
	4.7.2							
	e) Benitification Study *	Nos	283,927	-	-	1	283,927	will be reimbursed as per actual
	Sub-Total -D				250,600	-	3,425,227	
E	Petrological samples (Surface & Bh Core Samples)							
	i) Preparation of thin section	Nos	4.3.1	5	11,765	15	35,295	
	ii) Study of Thin Section	Nos	4.3.4	5	21,160	15	63,480	
	Sub-Total -E				32,925	-	98,775	
F	Minerographic Studies (Surface & Bh Core Samples)							
	a) Preparation of polished section	Nos	4.3.2	5	7,745	25	38,725	
	b) Study of Polished Section	Nos	4.3.4	5	21,160	25	105,800	
	c) Digital Photographs	Nos	4.3.7	5	1,400	25	7,000	
	Sub-Total -F				30,305	-	151,525	
G	Specific Gravity Determination							
	Specific Gravity Determination	No.	4.8.1	5	8,025	15	24,075	
	Sub-Total - G				8,025	-	24,075	
H	Total A to G				22,043,275	-	44,024,922	
I	Geological Report Preparation	5 Hard copies with a soft copy	5.2				1,982,046	
J	Peer review Charges	As per EC decision					10,000	EA has to submit the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC-NMET in its meeting while clearing the proposal.
K	Preparation of Exploration Proposal (5 Hard copies with a soft copy)	5 Hard copies with a soft copy	5.1		380,000		380,000	
L	Total Estimated Cost without GST				22,423,275		68,440,243	
M	Provision for GST (18% of L)	%			4,036,190		12,319,244	GST will be reimburse as per actual and as per notified prescribed rate
N	Total Estimated Cost with GST				26,459,465		80,759,487	
					264.59		807.59	
					543.00			

Note -

1. If any part of the project is outsourced, the amount will be reimbursed as per the Paragraph 3 of NMET SoC and Item no. 6 of NMET SoC. In case of execution of the project by NEA on its own, a Certificate regarding non outsourcing of any component/project is required.
2. Rates are calculated as per NMET SOC issued on 31st March 2020 without escalation. Although billing for subsequent financial years will be done as per the actual escalations as per RBI Indices.

TIME SCHEDULE /ACTION PLAN FOR GENEREAL EXPLORATION (G-2) IN NAILA KI DHANI COPPLER BLOCK, EASTERN KHETRI COPPER BELT, JHUNJHUNU DISTRICT, RAJASTHAN STATE.																				
Sl. No.	Activities	Unit	MONTHS																Total	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	1	
1	Camp Setting	Month	1																1	1 month
2	Core Drilling (2 rigs)	m.		500	500	500	500	500	500	500	500	140							4140	4140m (in 18 Bhs)
3	Borehole Geophysical Studies	m.		250	500	500	500	500	500	500	500	390							4140	4140m (in 18 Bhs)
4	Survey Party days	day		15	15						15	15							60	60 days
5	Geologist Party days (1 Party)	day		15	30	30	30	30	30	30	30	30	15						270	270 days
6	Sampling Party days, Core Sampling (1 Party)	day			30	30	30	30	30	30	30	30	30						270	270 days
7	Camp Winding	Month																	0	1 month
8	Laboratory Studies	Nos.				60	120	120	120	120	120	120	120	225	250				1375	1375 Nos (Primary/ Check/ Composite/Physical)
9	Geologist Party days (1 Party), HQ	day												10	10	15	15	15	65	65 days
10	Report Writing	Month												1	1	1	1	1	5	5 month

