PROPOSAL FOR PRELIMINARY EXPLORATION (G3) FOR PHOSPHORITE IN KACHALDARA EAST BLOCK, TEHSIL-THANDLA, DISTRICT- JHABUA, MADHYA PRADESH

(5.6 Sq. Km.)

COMMODITY: PHOSPHORITE

BY

MINERAL EXPLORATION AND CONSULTANCY LIMITED
DR. BABASAHAB AMBEDKAR BHAWAN
SEMINARY HILLS
NAGPUR, MAHARASHTRA

PLACE: NAGPUR
DATE: 12.09.2022

SUMMARY OF BLOCK FOR THE PROPOSAL OF PRELIMINARY EXPLORATION (G3) FOR PHOSPHORITE IN KACHALDARA EAST EAST BLOCK, TEHSIL- THANDLA, DISTRICT- JHABUA, MADHYA PRADESH, UNDER NMET (5.6 SQ.KM)

GENERAL INFORMATION ABOUT THE BLOCK

<table>
<tr><th></th><th>Features</th><th>Details</th></tr>
<tr><td></td><td>Block ID</td><td>Kachaldara East Block</td></tr>
<tr><td></td><td>Exploration Agency</td><td>Mineral Exploration and Consultancy Limited (MECL)</td></tr>
<tr><td></td><td>Commodity</td><td>Phosphorite</td></tr>
<tr><td></td><td>Mineral Belt</td><td>Aravalli Group</td></tr>
<tr><td></td><td>Budget & Time Schedule</td><td>Rs. 290.27 Lakhs & 15 months</td></tr>
<tr><td></td><td>Objectives</td><td>The objectives of current program would be:
1. Preparation of Geological map at 1:5,000 Scale.
2.To prove the mineralized zones by sampling from outcrops and trenches.
3.To check the Phosphorite occurrence up to the vertical depth of 60m below ground level.
4.To estimate the Inferred Mineral Resources for phosphorite in the block as per UNFC and MEMC-2015.
5. To facilitate the State Govt. for auctioning of the block.</td></tr>
<tr><td></td><td>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</td><td>Work will be carried out by the proposed agency (i. e. MECL).</td></tr>
<tr><td></td><td>Name/Number of Geoscientists</td><td>2 Nos. of Geoscientist (For Field)</td></tr>
<tr><td></td><td>Expected Days For Geologist/ Geophysicst/Surveyor</td><td>Geologist: 01 HQ (60 days)
Geologist: 02Field (180 days)
Surveyor: 01 (45)</td></tr>
<tr><td>1.</td><td>Location</td><td>The proposed block area for G-3 falls under Survey of India Toposheet number 46J/5. The block area falls in and around the villages Kachaldara East, Khatama, Rupakheda and Kajlidungri, Tehsil- Thandla Dist- Jhabua, Madhya Pradesh.</td></tr>
<tr><td></td><td>Latitude and Longitude</td><td>
<table>
<tr><th>Sl No</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>A</td><td>22° 57' 44.936" N</td><td>74° 26' 0.828" E</td></tr>
<tr><td>B</td><td>22° 57' 49.443" N</td><td>74° 26' 49.088" E</td></tr>
<tr><td>C</td><td>22° 56' 15.036" N</td><td>74° 27' 8.237" E</td></tr>
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		F	22° 55' 29.235" N	74° 27' 0.619" E
		G	22° 56' 30.350" N	74° 25' 56.991" E
		H	22° 56' 41.542" N	74° 25' 51.820" E
		I	22° 56' 41.575" N	74° 26' 1.017" E
		J	22° 56' 58.448" N	74° 26' 0.743" E
		K	22° 56' 58.440" N	74° 26' 10.684" E
		L	22° 57' 19.881" N	74° 26' 0.709" E
	Villages	Kachaldara, Khatama, Rupakheda and Kajlidungri		
	Tehsil/Taluk	Thandla		
	District	Jhabua		
	State	Madhya Pradesh		
2.	**Area (hectares/ square kilometres)**			
	Block Area	5.6 sq.km		
	Forest Area	Reserved Forest falls in the Block area		
	Government Land Area (Bilanam)	Data not available		
	Charagaha	Data not available		
	Private Land Area	Data not available		
3.	**Accessibility**			
	Nearest Rail Head	Meghnagar Railway Station (20 Kms.) in SE Direction, Dahod Railway Station (in Gujrat 35 Kms.) in SW Direction and Indore Railway Station (200 Kms.) in E direction.		
	Road	The Indore-Ahemdabad national highway NH-47 passes about 16 km south of the block. Motorable/ metaled roads are available in the area to approach the proposed block.		
	Airport	Indore Airport is around 200 km in SE direction from the block.		
4.	**Hydrography**			
	Local Surface Drainage Pattern (Channels)	There is dendritic pattern of drainage forming few seasonal nalas in the flat areas within the block having a general slope towards east. While in the hills, combination of Radial and Dendritic drainage pattern can be observed. Anas River is marking the South western limits of the block area.		
	Rivers/ Streams	Anas River (South western part of the block).		
5.	**Climate**			
	Mean Annual Rainfall	Average annual rainfall is 1000 to 1225 mm		
	Temperatures (December) (Minimum) Temperatures (June) (Maximum)	Minimum temperatures up to 12^0C (Jan) Maximum temperatures up to 42^0C (May-June)		
6.	**Topography**			
	Toposheet Number	46 J/5		

	Morphology of the Area	The block contains undulating terrain. Highest elevation of 310 m above MSL is located in the southern part of the block. While the lowest elevation is observed in the central part of the block of 255m above MSL.
7.	**Availability of baseline geoscience data**	
	Geological Map (1:50K/25K)	Not available
	Geochemical Map	Not Applicable
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	Not available
8.	**Justification for taking up Preliminary Exploration/G3**	i) The team from Geological Survey of India (GSI) includes R.L. Munshi (Jr. Geologist) and H.H. Khan (Jr. Geologist) has carried out exploration for Phosphorite associated with the stromatolitic chert-limestone horizons within the limestone-chert formation extending from Amlamal to South of Rambhapur within the Aravalli Group of rocks were located during the course of mapping in toposheets no. 46 J/5 and 9 in the Thandla Tahsil of Jhabua district during the field season 1972-73. They have identified 8 blocks in this region namely Amla Block, Amlamal Block, Kelkua Block, Kelkua Nala, Khatamba North Block, Khatamba South Block, Rassori Block and Piploda Block. These phosphatic horizons occur as discontinuous lenticular, elongated bodies and lenses both small and big, varying in thickness from few metres to 100 m and are traceable from few metres to about 1200m along strike. Based on the geochemical result it was recommended for detailed exploration by mapping/large scale pitting, trenching and drilling in Amlamal, Kelkua and Khatamba blocks. ii) Further exploration carried out during 1972-73 by GSI in Kekua Block, Kelkua nala block and Khatamba south block. A total 3223200 tonnes indicated and 231000 tonnes of inferred reserves of phosphorite with average grade of 18 % P2O5 was estimated by detailed mapping includes drilling, trenching etc. iii) During field seasons 1973 – 78 by GSI, detailed investigation in the Khatamba North Block was taken up by large scale mapping, pitting, trenching and exploratory drilling on regional scale. A total 0.6 sqkm

		area were mapped at 1:1000 scale, 39 trench (2500 r.m.) excavated and 1302m in 42 boreholes drilled. 2 million tonnes of 28% P2O5 grade phosphorite ore have been proved in the western phosphorite body. Further work in the eastern carbonate phosphorite body and the areas covered by brown chert cappings in the block was recommended. iv) Detailed exploration of these bodies by GSI, by exploratory drilling, trenching and pitting between 1973 and 1979 has resulted in the delineation of sizeable reserves of the phosphorite (7.53 million tonnes) which are being mined by open cast methods by MP State Mining Corporation since 1974 with an annual production of 70,000 tonnes to 80,000 tonnes. v) MECL has carried out detail exploration by pitting and exploratory drilling in Khatamba block during 1992. Total 50 no. of boreholes (5011.40 m) drilled and reserve estimated with different type cut offs grade 14.68 Million/t @ P2O5 5% cut offs 12.10% av grade, 8.17 Million ton @ P2O5 10 % Cot offs 15.86% av grade, 4.39 million to @ P2O5 15% cut offs 19.53% av grade, 1.57 million ton @ P2O5 20% cut offs 24.20% av grade. vi) Further MECL has carried out detailed exploration in Kelkua Nala block in 1995-97 with objective of assessment of quality, grade and reserves of phosphorite lenses. Total 33 no. of boreholes (2449.25m) drilled and reserve estimated with different type of cut offs grade 10.332 million ton resource at 5% P2O5 cut off with AV grade 14.97%, 7.155 million ton resource at 10% P2O5 cut off with AV grade of 17.66%, 5.499 million ton resource at 15% P2O5 cut off with AV grade of 21.34% and 2.801 million ton resource at 20% P2O5 cut off with AV grade of 25.51%.. vii) Based on this earlier exploration work carried out in the northern part of proposed block, same litho unit is continuing in this block. Hence, proposed block may be taken for further level of exploration to prove the continuity of the ore body and to be establish the resources for auction this block.

		viii) The Exploration will be helpful in estimation of Inferred mineral resources (333) of Phosphorite and other accessory minerals in the block area.

PROPOSAL FOR PRELIMINARY EXPLORATION (G3) FOR PHOSPHORITE IN KACHALDARA BLOCK, TEHSIL-THANDLA, DISTRICT- JHABUA, MADHYA PRADESH (5.6 SQ.KM)

1.0.0 Preamble

Agriculture, including its allied sector, is the largest source of income in India. The agricultural sector's success largely depends on the fertiliser industry, which manufactures some of the most important raw materials required for production of crops. Phosphate rock is processed to produce phosphorous, which is one of the three main nutrients most commonly used in fertilizers (the other two are nitrogen and potassium). India's dependency on import at present is to the extent of 90% in case of phosphates either as raw material or finished fertilizers. The increasing demand of phosphorus in the country could be eased with the exploration of new phosphorus deposits of economic importance.

1.1.0 India's phosphate demand

1.1.1 There is no substitute for phosphorus in agriculture. The reserves/resources of chemical and fertilizer grades apatite and rock phosphate in India are very limited. Till the domestic resources of these two minerals are improved, the country has no alternative but to depend on imports. Only about 10-15% requirement of raw material for phosphate fertilizer production is met through indigenous sources. The remaining requirement is met through imports in the form of rock phosphate, phosphoric acid and direct fertilizers. Demand for phosphatic fetilizer is expected to increase gradually in tandem with the growth in population and corresponding increase in food requirements.

1.1.2 India aims to be self-reliant in overall fertiliser production by 2023 as the government is constructing new manufacturing units to reduce dependency on imports. "India to explore indigenous deposits of phosphatic rock, a step towards becoming AatmaNirbhar in fertilizer production," informed Minister of Chemicals and Fertilizers, Mansukh Mandaviya in the Parliament on Monday, July 26. In addition, the government is likely to spend Rs. 1.19 trillion (US$ 15.97 billion) in FY2021 in the form of subsidy components to the farmers for the fertilizers.

1.2.0 Background

1.2.1 The production of phosphorite/ rock phosphate in India was reported from four State Public Sector mines. Out of these, Chhatarpur, Sagar and Jhabua districts of Madhya

Pradesh have one mine each, while Udaipur district of Rajasthan has the fourth mine. Rajasthan continued to be the principal producing State contributing 92% of the total production and the remaining 8% share was contributed by Madhya Pradesh. Of the total reserves/ resources, 34% are in Jharkhand, 31% in Rajasthan, 19% in Madhya Pradesh, 8% each in Uttar Pradesh & Uttarakhand, respectively. (Indian Minerals Yearbook 2019)

1.2.2 In order to improve the availability of phosphatic fertilisers and to reduce the dependence on imports by making India truly Aatmnirbhar in fertilisers, the present proposal is being put up for Reconnaissance Survey. Consequent upon positive outcome, the exploration programme shall follow G3/G2, which may facilitate state government for auctioning of the block.

2.0.0. Introduction

2.1.0. Block Description

The Kachaldara East Block area falls majorly in Survey of India Toposheet No. 46J/5, and covers an area of 5.6 sq.km, in and around villages Kachaldara East of district Jhabua, in the State Madhya Pradesh. The block location in toposheet is given in PLATE-I. The Co-ordinates of the corner points of the block area both geodetic and UTM are given in Table 2.1.

Table 2.1 Co-ordinates of Corner Points of Kachaldara East (G-3) Block.

Kachaldara East Block, District- Jabhua, Madhya Pradesh Toposheet No. 46J/5, (Area 5.6 sq.km)				
Sl No	Latitude	Longitude	X	Y
A	22° 57' 44.936" N	74° 26' 0.828" E	441934.0128	2539478.554
B	22° 57' 49.443" N	74° 26' 49.088" E	443308.7906	2539611.904
C	22° 56' 15.036" N	74° 27' 8.237" E	443843.25	2536706.773
D	22° 56' 9.810" N	74° 26' 49.865" E	443319.3739	2536548.023
E	22° 55' 54.705" N	74° 27' 1.073" E	443636.8745	2536082.355
F	22° 55' 29.235" N	74° 27' 0.619" E	443620.9995	2535299.187
G	22° 56' 30.350" N	74° 25' 56.991" E	441815.9011	2537185.397
H	22° 56' 41.542" N	74° 25' 51.820" E	441669.939	2537530.128
I	22° 56' 41.575" N	74° 26' 1.017" E	441931.8771	2537530.128
J	22° 56' 58.448" N	74° 26' 0.743" E	441926.0753	2538049.007
K	22° 56' 58.440" N	74° 26' 10.684" E	442209.18	2538047.684
L	22° 57' 19.881" N	74° 26' 0.709" E	441927.6628	2538708.085

2.2.0 Location and Accessibility

2.2.1 The proposed block is located about 35km north west from Jhabua, which is the district headquarter. The nearest railway station is Meghnagar Railway Station located 20 km in SE Direction and Indore Railway Station 200 Kms. in E direction. The nearest town is Dahod (30 kms.) and Jhabua (35 kms.). The Indore-Ahemdabad national highway NH-47 passes about 16 km south of the block. Motorable/ metaled roads are available in the area to approach the proposed block. Indore Airport is around 200 km in SE direction from the proposed block.

2.3.0 Physiography

2.3.1 The block contains undulating terrain. Highest elevation of 310 m above MSL is located in the southern part of the block. While the lowest elevation is observed in the central part of the block of 255m above MSL.

2.3.2 There is dendritic pattern of drainage forming few seasonal nalas in the flat areas within the block having a general slope towards east. While in the hills, combination of radial and dendritic drainage pattern can be observed. Anas river is marking the south western limits of the block area.

2.3.3 The area has a moderate semiarid/sub-tropical climate, which is characterized by a very hot dry summer and cold winter. The area experiences hot climate during summer and cold during winter with temperature generally ranging from 12° to 21°C in winter (January) and 32° to 45° C in summer (May-June) average temperature is 32°C. Monsoon is active during June to September. The average annual rainfall in the area is 1000 to 1225 mm. Average relative humidity is 58%

2.4.0. Flora & Fauna

2.4.1. The flora of the area is of the tropical dry deciduous type comprising mixed forest range. Babul (*Acacia Nilotica*), Khair (*Acacia Catechu*), Palas (*Butea monosperma*), Ber (*Zizyphus varieties*) Tendu (*Diospyros melaonxylon*) and kardhai (*Anogeissus pendula*), Salai (*Boswellia serrate*) Seesham (*Dalbergia sissoo*), Dhau (*Anogeissus latifolis*) Jamun (*Syzizium*) Seja, the karaundha (*Carissa spinarum*) shrubs and occasional teak

are found in the area. Other common varieties of trees found are Dhawda, Bija, Tendu and Mahua.

2.4.2. All wild animals have become a rare sight in the area. However spotted dear, wild boar, wild dog, jackal, wolf, hyena and bison are spotted in the area.

3.0.0 Regional Geology

3.1.0 Geologically the area forms a part of Aravalli Group of rocks represented by phosphate bearing dolomitic limestone-chert, quartzite, phyllite, feldspathised quartzite, gneissose feldspathic rocks and quartz veins. The dolomitic limestone-chert formation generally exhibits stromatolitic structures which are stratiform (equivalent to Weedia, Walcott, 1914), columnar, spheroidal irregular and indefinite in form. A tentative identification of the columnar and spheroidal stromatolites revealed that they belong to the forms represented by Colonnella, Baicalia callenia symmetrical, conophyton, Kussiella and oncolite (Munshi & Khan, 1973). The structural set up of the area has been worked out by Munshi and Khan (1973). The Geological formations may broadly be classified as follows:

Table No. 3.1
Regional Litho-stratigraphic sequence of the area (After GSI)

(?) ECOCENE	Deccan Trap	Basalt flows
(?) UPPER CRETACEOUS	Bagh beds	Sandstone and limestone sequence.
PRECAMBRIAN (ARAVALLI)	Phosphate bearing dolomitic limestone horizon	Powdery/soft limestone
		Phyllite
		Brown chert
		Carbonate/chert phosphorite
		Phosphate limestone and chert
		Brown chert
		Quartzo-feldspathic rock
		Dolomitic limestone
		Phosphatic limestone/phosphorite
		Dolomitic limestone
	Feldspathised quartzite & gneissose feldspathic rock	
	Quartzite	
	Phyllite	

3.1.0 **Structure:** Structurally the rocks exhibit regional overturned plunging folds with comparatively open anticlines and close synclines. On the basis of the outcrop pattern

of the quartzite and limestones it is envisaged that the phosphorite bearing limestonechert horizon forms part of a doubly plunging fold in the eastern limb of the regional synclinal structure with its culmination near Kachaldara. The axis of the fold in the north of Kachaldara plunge in NNW direction whereas in the south of Kachaldara the fold axis plunge towards SSE direction. The axis of the regional folds in the northern part is roughly in N-S direction but southwards it swerves to NNW-SSE direction. The axial planes of the folds dip at 70° towards west. The general trend of foliation in the phyllites and gneisses swings between N-S and NNW-SSE. The bedding in the quartzite and in phosphate bearing dolomitic limestone-chert horizon dips steeply westwards, and locally vertically or eastwards, forming the eastern limb of a syncline. The thick chert bands with minor limestone exposed between villages Dhebar-Demara are inferred to be the west limb of the same syncline, and represent the same limestone-chert horizon. The other associated metasediments of Aravalli Group are quartzite and highly quartzose phyllitic rocks and limestones. They represent a shallow water marine environment. The geological set up is about the same as those of Maton, Jhamarkotra and other phosphorite deposits of Udaipur district, Rajasthan.

3.2.0. Geology of the Block

3.2.1 Dolomitic limestone is the most important formation with which all the known phosphate bodies in the area are associated. Prominent outcrops of this formation are noticeable between Amlamal and Rambhapur over a strike length of 12 km along NNW-SSE direction. The surface width of such outcrops varies between a few meters to about 800m. These dolomitic containing an older inter-bedded phosphate horizon are at places overlain by younger formations including another younger phosphate horizon, brown cherts, phyllites and powdery limestones.

Table No. 3.2

Block Litho-stratigraphic sequence of the area (After GSI)

Age	Super Group	Group	Formation	Lithology
PRECAMBRIAN	ARAVALLI	Megh Nagar Lunavala	Kalinjara	Phyllite, Meta-Subgravwacke and Mica Schist
				Quartzite
				Dolomite
				Biotite Gneiss

This dolomite is generally very fine grained, massive compact and exhibit elephant-skin-weathering. It ranges in colour from dirty white to dark grey and brown to pink. Stromatolitic structures are also associated with these dolomitic limestones. Phyllites are widely distributed in the area and exhibit wide variation in colour, from grey, Khaki, buff, purple and light green.

Quartzites are compact, massive and grey to light pink in colour. Manganiferous bodies in association with the quartzite occur inter banded with the phyllites at many places in the area.

Phyllite, Meta-Subgravwacke and Mica Schist rocks occur mainly to the eastern and western part of the dolomite in the Amlamal, Kelkua and Khatamba areas. In general, phyllites are generally containing much larger proportion of quartz compared to other constituents like chlorite, biotite and carbonates.

The biotite gneiss rock is foliated with alternate salic and mafic bands, grey to light brown and pink in coloure. The banding is generally parallel to the foliation of the other rock units in the area. The Precambrian rocks are covered by basaltic flows of Deccan traps towards north and north east.

4.0.0. Previous Work / Background information

4.1.0 Prospecting operations for phosphorite in the area were commenced by GSI in 1972. Activities and results of the initial period are documented in the published reports of "A Report on Preliminary Investigation of Phosphorite Occurrences in Amlamal-Piploda Area, Thandla Tahsil, Jhabua District, Madhya Pradesh" by R.L. Munshi, junior geologist, and H. H Khan junior geologist. They have identified 8 blocks in this region namely Amla Block, Amlamal Block, Kelkua Block, Kelkua Nala, Khatamba North Block, Khatamba South Block, Rassori Block and Piploda Block. These phosphatic horizons occur as discontinuous lenticular, elongated bodies and lenses both small and big, varying in thickness from few metres to 100 m and are traceable from few metres to about 700m along strike. Based on the geochemical result it was recommended for detailed exploration by mapping/large scale pitting, trenching and drilling in Amlamal, Kelkua and Khatamba blocks.

4.1.1 H.H. Khan, N. Balasubramanian, M.K. Soni and Arun Sonakia from G.S.I. had further carried out the detailed exploration for the phosphorite during the period from 1972 to 73 in Kekua Block, Kelkua nala block and Khatamba south block. A total 3223200

tonnes indicated and 231000 tonnes of inferred reserves of phosphorite with average grade of 18 % P2O5 was estimated by detailed mapping includes drilling, trenching etc.

4.1.2 During field seasons 1973 – 78 by GSI, detailed investigation in the Khatamba North Block was taken up by large scale mapping, pitting, trenching and exploratory drilling on regional scale. A total 0.6 sq km area were mapped at 1:1000 scale, 39 trench (2500 r.m.) excavated and 1302m in 42 boreholes drilled. 2 million tonnes of 28% P2O5 grade phosphorite ore have been proved in the western phosphorite body. Further work in the eastern carbonate phosphorite body and the areas covered by brown chert cappings in the block was recommended.

4.1.3 Detailed exploration of these bodies by GSI, by exploratory drilling, trenching and pitting between 1973 and 1979 has resulted in the delineation of sizeable reserves of the phosphorite (7.53 million tonnes) which are being mined by open cast methods by MP State Mining Corporation since 1974 with an annual production of 70,000 tonnes to 80,000 tonnes

4.1.4 Mineral Exploration and Consultancy Limited (Formerly Mineral Exploration Corporation Limited) has carried out detail exploration in Khatamba block during the year of 1992. Total 50 no. of boreholes (5011.40 meterage) drilled and 14.81 million ton reserve estimated with 12.17 grade of P2O5.

4.1.5 Further MECL had explored Kelkua Nala block in 1995-97 with objective of assessment of quality, grade and reserves of phosphorite lenses. Total 33 no. of boreholes (2449.25m) drilled. 10.332 million ton with 5% P2O5 cut off grade, 7.155 million ton with 10% P2O5 cut off grade, 5.499 million ton with 15% P2O5 cut off grade and 2.801 million ton with 20% P2O5 cut off grade.

5.0.0. Justification

In 1972 GSI had identified phosphorite zones in Aravalli super group of rock within the stromatolitic dolomitic limestone- chert formation. They have identified 8 blocks in this region namely Amla Block, Amlamal Block, Kelkua Block, Kelkua Nala, Khatamba North Block, Khatamba South Block, Rassori Block and Piploda Blocks. GSI and MECL had explored the northern part of proposed blocks i.e. Khatamba Block and Kelkua Nala block which was auctioned by state DGM. The proposed block is adjacent of pervious explored block and falling in the extension of phosphorite bearing cherty dolomite rock. Hence, proposed block may be taken for further level of exploration to prove the continuity of the ore body.

6.0.0. Objective:

The exploration is proposed with the following objectives:

a) Preparation/Updation of Geological map (1:10,000 Scale) and topographical survey at 1:2000 scale.

b) To check the strike continuity of Phosphorite in the block.

c) To check the Phosphorite occurrence up to the vertical depth of 60m below ground level.

d) To estimate the Inferred Mineral Resources for phosphorite in the block as per UNFC and MEMC-2015.

e) To facilitate the state govt. for auctioning of the block.

7.0.0 Proposed Exploration Scheme

In accordance to the objective set for Kachaldara East Block, the following scheme of exploration has been formulated. The details of different activities to be carried out are mentioned below.

7.1.0 Geological Map

The geological map (1:5,000 scale) will be prepared based on structural data, surface samples, borehole locations, trenches etc. carried out during G3 stage. This map will be used as base map for future work.

7.2.0 Surface Samples (BRS/Channel Samples):

During the large scale mapping 100 nos. of bed rock/channel samples will be collected from phosphorite bearing rocks.

7.3.0 Surveying

Topographical Survey and contouring at 2m interval of the entire area will be done on 1:5000 scale. DGPS survey will be done for the block boundary demarcation and for all the borehole locations.

7.4.0 Exploratory Mining (Trenching)

After surface mapping a provision of shallow trenching of 300 cubic meters has been kept at suitable location to establish the strike continuity of the mineralized zone. Locations of trenches on ground will be decided by field geologist based on field observations. On the basis of results, boreholes in those section lines will be drilled. Trenching shall be done for correlation of mineralized zone on surface up to a depth of 1-2 m after removal of soil/weathered column in the area. A provision of 200 no's of primary & check (5% Internal +10% External) trench samples is kept for analysis of P2O5.

7.5.0 Surface Drilling

During the F.S. 1972 -79 Geological investigations were carried out by GSI to explore for phosphorite mineralization in the norther part of area shows promising zones of P2O5%. GSI

has drilled 42 boreholes with 1302 meterage in Khatamba North Block. MECL has drilled total 50 no. of boreholes (5011.40 meterage) and 14.81-million-ton reserve estimated with 12.17 grade of P2O5 in Khatamba block and in Kelkua Nala block total 33 no. of boreholes (2449.25m) drilled and reserve estimated 0.332 million ton with 5% P2O5 cut off grade, 7.155 million ton with 10% P2O5 cut off grade, 5.499 million ton with 15% P2O5 cut off grade and 2.801 million ton with 20% P2O5 cut off grade.

7.6.0 The present exploration scheme is prepared by proposing drilling at 400m interval with total core drilling of 600 m in 10 boreholes (PBH-1 to PBH-10). Vertical boreholes are planned to establish the extension of phosphorite zones. The drilled boreholes are vertical in the blocks previously explored by MECL situated in the north. Hence all the boreholes consider as vertical for correlation purpose. The details of proposed boreholes in the Kachaldara East G3 block are given below:

Sl. No.	Section Line No.	Proposed BH	Proposed Meterage (m)	Inclination
1	S1-S1'	PBH-01	60.00	Vertical
2	S2-S2'	PBH-02	60.00	Vertical
3	S3-S3'	PBH-03	60.00	Vertical
4	S4-S4'	PBH-04	60.00	Vertical
5	S5-S5'	PBH-05	60.00	Vertical
6	S6-S6'	PBH-06	60.00	Vertical
7	S7-S7'	PBH-07	60.00	Vertical
8	S8-S8'	PBH-08	60.00	Vertical
9	S9-S9'	PBH-09	60.00	Vertical
10	S10-S10'	PBH-10	60.00	Vertical
		Total	**600**	

Note: Proposed Borehole depth and Location of the BH is tentative and may vary subject to the geological and drilling conditions in the study area. Additional 3 borehole will be drilled conditional where the total proposed meterage will be 780m.

7.7.0 Drill Core Logging and Sampling

7.7.1 Geological core logging will be carried out systematically by recording carefully the minute details and physical/lithological characters of the rock formations including colour, core recovery, grain size, weathered zone, texture, banding, mineralogical composition, micro-structural/structural details, lithological variations along with visual estimate in respect of P_2O_5 content encountered in boreholes. "A SHAPIRO SOLUTION" will be used at field for identification of Phosphorite bearing zones in the drill cores during logging. Rock quality designation (RQD) shall also be carried out, while logging drill cores. On the basis of these parameters, grade of Phosphorite can be broadly assessed and it will also be helpful in sampling/demarcating the Phosphorite zones.

7.8.0 Core Sampling:

7.8.1 Entire drill core of one of the boreholes is proposed to be sampled at 1 m length in order to demarcate Phosphorite bearing horizons. In the remaining boreholes, samples will be restricted to Phosphorite zones demarcated based on Shapiro's solution results. The samples will be drawn at 1 m interval depending upon the change in lithology and core recovery.

7.8.2 Drill cores will be splited into two equal halves in case of wet drilling for collection and preparation of primary samples. The other half portion of the sample will be kept as duplicate half for specific gravity determination, petrographic/mineragraphic studies and for future reference. The whole quantity of half portion of the sample as marked while logging will be crushed to (-) 120 mesh and 500gm representative sample of (-) 120 mesh will be drawn by coning and quartering method of gradual reduction. Two samples weighing 100gm each will be drawn, one of which will be sent to MECL, Chemical Laboratory, Nagpur for Primary Chemical analysis for 5 radicals and the other will be kept for the purpose of check analysis. The remaining 300gm will be kept for preparation of Composite samples.

7.8.3 Each sample should be marked at every 1m length in case of continuance of similar mineralogical composition down the borehole and no sample length should exceed 1m. The sample length towards the floor marked by non-ore zone needs also to be adjusted as per variations of the litho-units. Even if the floor is distinctly differentiated by the presence of non-mineralized zone, at least two nos. samples after the Phosphorite zone need to be drawn to mark the floor of the Phosphorite zone decisively.

7.8.4 5% of the total primary samples need to be analyzed for 5 radicals as internal check analysis and 10% of the total primary samples need to be analyzed from any other NABL accredited laboratory as external checks to test the reliability of sampling and analytical data.

7.8.5 After receipt of Primary analytical results of the borehole core samples, mineralized zones will have to be marked at 5% P2O5 cut off for each of the boreholes. For each of the Phosphorite zones encountered in boreholes, composite samples will have to be prepared by combining each primary sample within the respective zone in their length proportions and reducing the sample by coning and quartering method for drawl of final sample. The BH-core composite samples will be analyzed for 14 radicals.

7.9.0 Chemical Analysis:

7.9.1 **Primary Samples-** All the primary (500 nos) and check samples (75 nos) will be analyzed for 5 radicals i.e., P_2O_5%, SiO_2%, Al_2O_3%, Fe_2O_3%& LOI%. Out of 90 nos. of check samples 50 nos. (10% of primary samples) will be sent to NABL accredited laboratory as external check samples for analysis of 5 radicals i.e., P_2O_5%, SiO_2%, Al_2O_3%, Fe_2O_3% & LOI%. While, 25 nos. (5% of primary samples) will be analysed as internal check samples for analysis of 5 radicals i.e., P_2O_5%, SiO_2%, Al_2O_3%, Fe_2O_3% & LOI%.

7.9.2 **Composite samples-** Around 125 composite samples will be analyzed for 14 radicals i.e. P_2O_5%, SiO_2%, Al_2O_3%, Fe_2O_3% & LOI%, CaO%, MgO%, TiO_2%, Na_2O%, K_2O%, F%, Cl%, V_2O_5% and organic carbon%.

7.9.3 ICP-MS studies will be carried on 20 nos of composite samples to know the presence of trace elements.

7.9.4 XRD studies will be carried on 10 nos of composite samples to know the presence of trace elements.

7.10.0 Petrological, Mineralogical studies & Specific Gravity determination

7.10.1 Petrological Studies: Petrological studies will be done on around 20 nos of drill core specimen.

7.10.2 Mineragraphic Studies: Mineragraphic studies will be done on around 10 nos of drill core specimen.

7.10.3 Specific Gravity Determination: Specific Gravity will be determined on 10 nos drill core specimen.

8.0.0 Quantum of Work

8.1.0 The details of quantum of work block in Kachaldara East G-3 Block has been furnished below:

Proposed Quantum of Work for Preliminary Exploration (G-3) for Phosphorite in Kachaldara East Block, District: Jhabua, Madhya Pradesh			
Sl. No.	**Item of Work**	**Unit**	**Proposed Quantum of work**
1	**Geological Mapping** (on 1:5,000 Scale)	Sq km	5.6
	Bore Hole Fixation	Nos	13
	RL & Coordinate Determination	Nos	13
	DGPS Survey of Block Boundary (Actual Basis)	Nos	13
2	**Geochemical Sampling**	Nos.	100
	Bed rock sampling/channel sampling		
3	**Exploratory Mining**		
	Excavation (Trenching)	Cu. m.	300
4	**Drilling (coring)**	**m**	**600 m (10 Bhs) +180 = 780m in 13 BH**
5	**Laboratory Studies**		
	A. Surface samples (Bed rock sampling/channel sampling)		
	i) Chemical Analysis; Primary for 5 radicals i.e. P_2O_5, SiO_2, Al_2O_3, Fe_2O_3 and LOI	Nos.	100
	ii) Internal Check samples (5% of Primary samples) for analysis of 5 radicals i.e. P_2O_5, SiO_2, Al_2O_3, Fe_2O_3 and LOI	Nos.	5
	iii) External Check sample (10 %of Primary samples) for analysis of 5 radicals i.e. P_2O_5, SiO_2, Al_2O_3, Fe_2O_3 and LOI	Nos.	10
	B. Trench samples		
	i) Chemical Analysis; Primary for 5 radicals i.e. P_2O_5, SiO_2, Al_2O_3, Fe_2O_3 and LOI	Nos.	200
	ii) Internal Check samples (5% of Primary samples) for analysis of 5 radicals i.e. P_2O_5, SiO_2, Al_2O_3, Fe_2O_3 and LOI	Nos.	10
	iii) External Check sample (10 %of Primary samples) for analysis of 5 radicals i.e. P_2O_5, SiO_2, Al_2O_3, Fe_2O_3 and LOI	Nos.	20
	C. Primary samples for Borehole		

Proposed Quantum of Work for Preliminary Exploration (G-3) for Phosphorite in Kachaldara East Block, District: Jhabua, Madhya Pradesh			
	i) Chemical Analysis; Primary for 5 radicals i.e. P_2O_5, SiO_2, Al_2O_3, Fe_2O_3 and LOI	Nos.	270
	ii) Internal Check samples (5% of Primary samples) for analysis of 5 radicals i.e. P_2O_5, SiO_2, Al_2O_3, Fe_2O_3 and LOI	Nos.	14
	iii) External Check sample (10 %of Primary samples) for analysis of 5 radicals i.e. P_2O_5, SiO_2, Al_2O_3, Fe_2O_3 and LOI	Nos.	27
	D. Composite Samples for Borehole		
	i) composite samples will be analyzed for 14 radicals i.e. P_2O_5, SiO_2, Al_2O_3, Fe_2O_3, LOI, CaO, MgO, TiO_2, Na_2O, K_2O, F, Cl,, V_2O_5 and organic carbon	Nos.	50
6	**Physical Studies**		
7	Trace element study by IC-PMS (34 elements)	Nos.	20
8	XRD studies	Nos	10
9	Petrographic Studies	Nos	10
10	Mineragraphic Study	Nos	10
11	Specific Gravity Determination	Nos	15
12	Whole rock analysis	Nos.	10
13	Report Preparation (Digital format)	Nos.	1 No.

9.0.0 Cost Estimate

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 NMET Funded Projects. The total estimated cost is Rs. 316.20 Lakh. The summary and details of cost estimates is given below.

9.1.0 Summary of Cost Estimate

Sl. No.	Item	Estimated Cost (Rs.)
1	Exploratory Drilling	10,668,100
2	Geology & Survey	5,106,400
3	Laboratory	7,685,071
	Sub Total (1 to 3)	**23,459,571**
4	Exploration Report	750,000
5	Exploration Proposal	380,000
6	Peer Reviwer Charges	10,000
	Grand Total	**24,599,571**
7	GST 18%	4,427,923
	Total:	**29,027,493**
	Say Rs. in Lakhs	**290.27**

Detail cost is given as an Annexure-I

10.0.0 TIME SCHEDULE

The proposed exploration programme envisages surveying, updating of geological mapping exploratory drilling, deviation survey, sample preparation and laboratory studies, which will be completed within 12 months by deploying 1 drill rigs, geological report preparation will consume 4 more months with one month overlapping. Therefore, a total of 15 months is planned for completion of the entire programme.

TIME SCHEDULE /ACTION PLAN FOR PRELIMINARY EXPLORATION (G3) FOR PHOSPHORITE IN KACHALDARA BLOCK DISTRICT: JHABUA, MADHYA PRADESH PRADESH

Sl. No.	Activities	Unit	MONTHS														Total	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
1	Camp Setting	Month																1	1 month
2	Geological Mapping	Sq. Km																3	2 months
3	Trenching	Cu.M																300	300 Cu. M
2	Core Drilling (1 rigs)	m.																600	600m (in 10 Bhs)
3	Survey Party days	day																45	45 days
4	Geologist Party days (2 Party)	day																180	180 days
5	Sampling Party days, Core Sampling (1 Party)	day																105	105 days
6	Camp Winding	Month																1	1 month
7	Laboratory Studies	Nos.																1105	1105 Nos (Primary/ Check/ Composite/Oths)
8	Beneficiation Study																	2	2 month
9	Geologist Party days (1 Party), HQ	day																60	60 days
10	Report Writing / Peer review	Month																4	4 month

* Commencement of project will be reckoned from the day the exploration acreage is available along with all statutory clearances

*Time loss on account of monsoon/agricultural activity/forest clearance/ local law & order problems will be addition to above time line.

PLATES:

S.No	Description	Plate No.	Scale
1	Location map of Kachaldara East G-3 Block	I	Not to Scale
2	Regional Geological Map(Source: Bhukosh)	II	1:50,000
3	Block Geology Map (Source:Bhukosh- zoom map)	III	1:2000
4	Geological Plan with Proposed boreholes	IV	1:2000
5	Geological Cross Sections Showing Proposed Boreholes	V	1:2000

11.0.0 References:

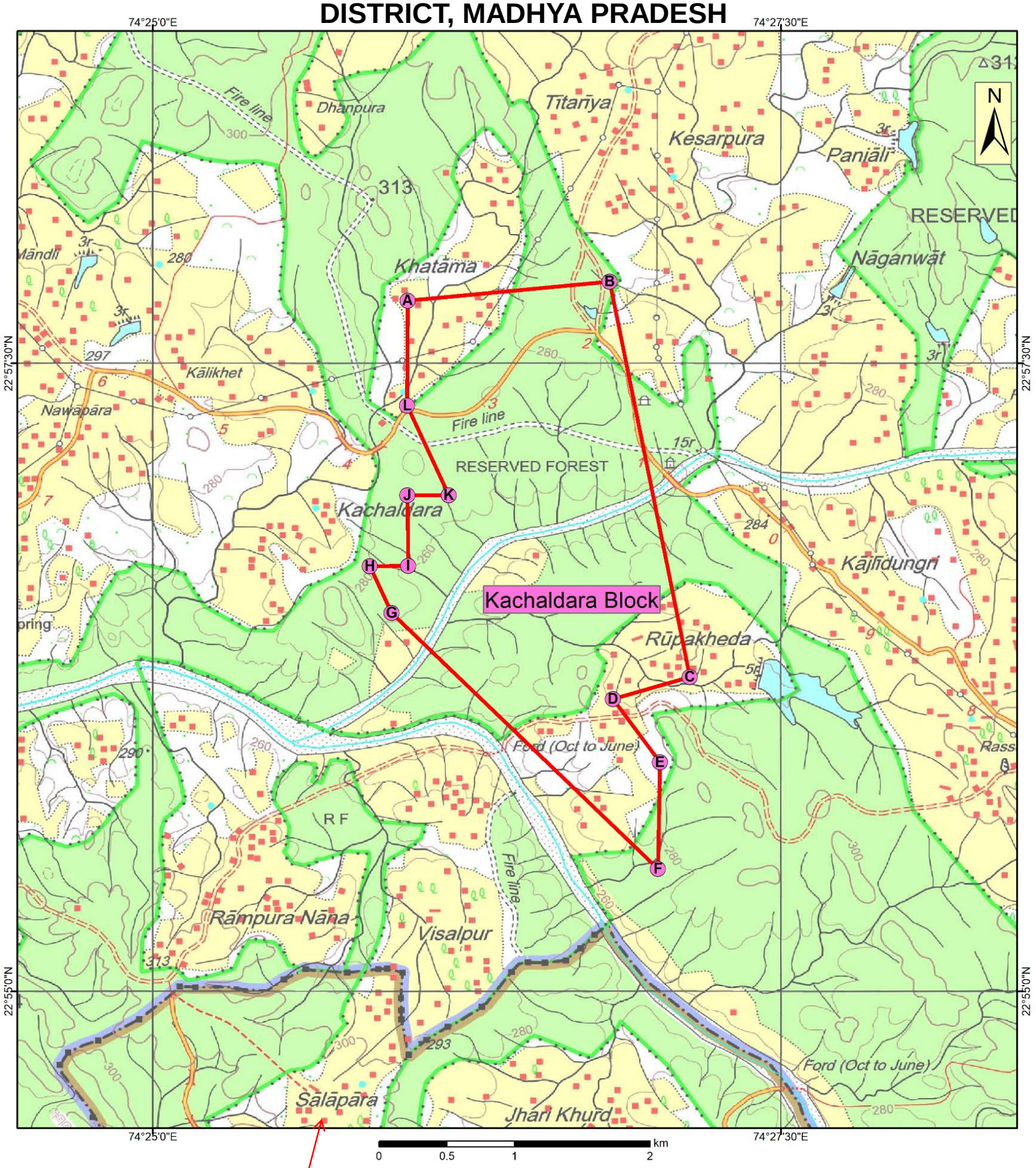
R.L. Munshi and H.H. Khan (Field seasons 1972 & 1973): A Report on Preliminary Investigation of Phosphorite occurences In Amlamal-Piploda Area, Thandla Tahsil, Jhabua District, Madhya Pradesh

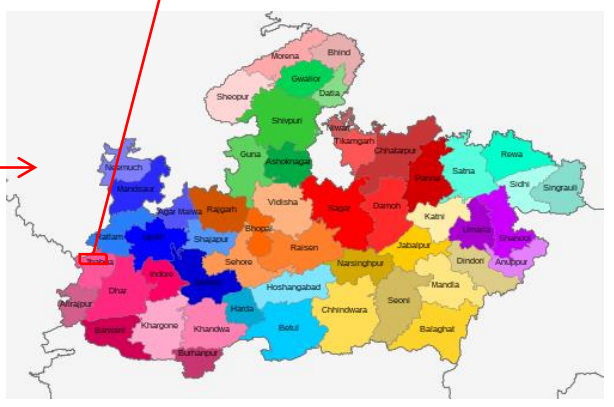
Bhukosh website, Hosted by GSI, Ministry of mines, Government of India

H.H. Khan (Field seasons 1973 & 1978): Report on Phosphorite Investigation Jhabua District, Madhya Pradesh Khatamba North Block

Indian Mineral Yearbook 2019 (Part-III : Mineral Reviews) 58th Edition, Apatite and Rock Phosphate, Government of India Ministry of Mines, Indian Bureau of Mines.

PROPOSED PRELIMINARY EXPLORATION (G3) BLOCK (KACHALDARA EAST BLOCK) LOCATION MAP OF THE PHOSPHORITE IN JHABUA DISTRICT, MADHYA PRADESH





Kachaldara Block, District- Jabhua, Madhya Pradesh Toposheet No. 46J/5, (Area 8.8 sq.km)				
Sl No	Latitude	Longitude	X	Y
A	22° 57' 44.936" N	74° 26' 0.828" E	441934.0128	2539478.554
B	22° 57' 49.443" N	74° 26' 49.088" E	443308.7906	2539611.904
C	22° 56' 15.036" N	74° 27' 8.237" E	443843.25	2536706.773
D	22° 56' 9.810" N	74° 26' 49.865" E	443319.3739	2536548.023
E	22° 55' 54.705" N	74° 27' 1.073" E	443636.8745	2536082.355
F	22° 55' 29.235" N	74° 27' 0.619" E	443620.9995	2535299.187
G	22° 56' 30.350" N	74° 25' 56.991" E	441815.9011	2537185.397
H	22° 56' 41.542" N	74° 25' 51.820" E	441669.939	2537530.128
I	22° 56' 41.575" N	74° 26' 1.017" E	441931.8771	2537530.128
J	22° 56' 58.448" N	74° 26' 0.743" E	441926.0753	2538049.007
K	22° 56' 58.440" N	74° 26' 10.684" E	442209.18	2538047.684
L	22° 57' 19.881" N	74° 26' 0.709" E	441927.6628	2538708.085

Plate - I

मिनरल एक्सप्लोरेशन एंड कंसल्टेंसी लिमिटेड
MINERAL EXPLORATION AND CONSULTANCY LTD.
(Formerly Mineral Exploration Corporation Ltd.)
Govt of India Enterprise, A Miniratna PSE

REGIONAL GEOLOGICAL MAP OF THE BLOCK (SOURCE: BHUKOSH)

74°22'30"E
74°25'0"E
74°27'30"E
74°30'0"E
23°0'0"N
22°57'30"N
22°55'0"N

N

A
B
C
D
E
F
G
H
I
J
K
L

Legend

Oriented Structure Plane

Corner Points

Kachaldara G3 Proposed Block

Lithology

- BASALT FLOW
- BASALT
- BASALT (UNCLASSIFIED)
- SANDSTONE
- LIMESTONE
- LIMESTONE AND NODULAR LIMESTONE
- CONGLOMERATE/LIMESTONE/SANDSTONE
- MARBLE
- META-CONGLOMERATE
- META-SUBGRAYWACKE, PHYLLITE AND MICA SCHIST
- AMPHIBOLITE
- IMPURE DOLOMITIC MARBLE
- DOLOMITE
- CHERTY DOLOMITIC MARBLE
- QUARTZITE
- PHYLLITE, META-SUBGRAYWACKE AND MICA SCHIST
- PHYLLITE
- BIOTITE GNEISS
- GRANITE
- GRANITE GNEISS

0 0.75 1.5 3 4.5 6 km

GEOLOGICAL MAP OF THE BLOCK (SOURCE: BHUKOSH)

74°25'0"E

74°27'30"E

22°57'30"N

N

70

50

A
B
C
D
E
F
G
H
I
J
K
L

Legend

Oriented Structure Plane

Corner Points

Kachaldara G3 Proposed Block

Lithology

DOLOMITE

QUARTZITE

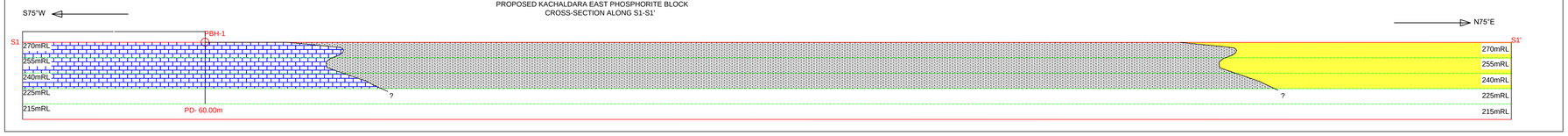
PHYLLITE, META-SUBGRAYWACKE AND MICA SCHIST

BIOTITE GNEISS

GRANITE GNEISS

0 0.325 0.65 1.3 1.95 2.6 km

PROPOSED KACHALDARA EAST PHOSPHORITE BLOCK
CROSS-SECTION ALONG S1-S1'

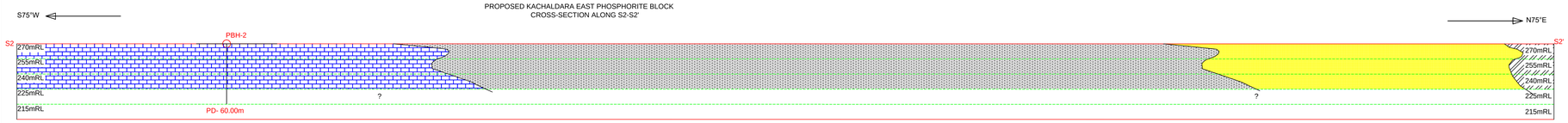


DOLOMITE
BIOTITE GNEISS
QUARTZITE
PHYLLITE

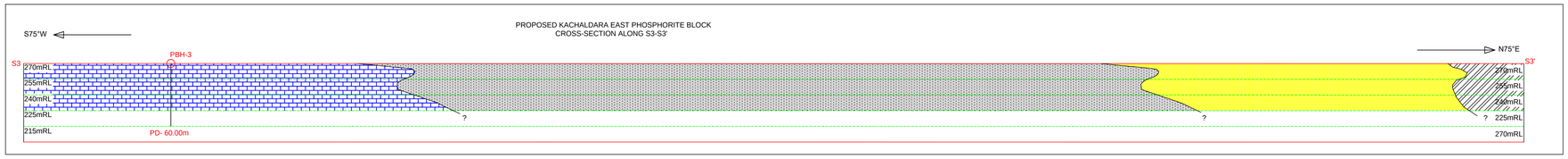
PBH-9
PD- 60.00m
PROPOSED BOREHOLE WITH PROPOSED DEPTH

MINERAL EXPLORATION AND CONSULTANCY LIMITED
GEOLOGICAL CROSS SECTION
PROPOSED KACHALDARA EAST PHOSPHORITE BLOCK
DISTRICT : JHABUA STATE : MADHYA PRADESH
RF, 1:2000

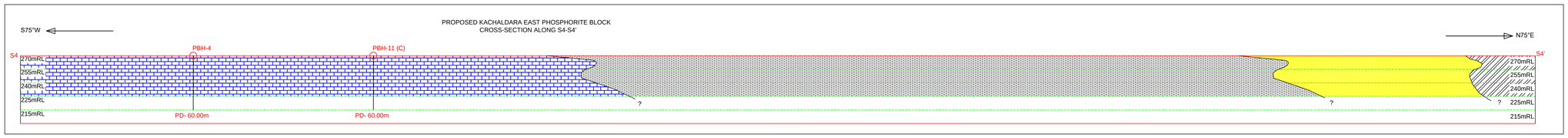
PROPOSED KACHALDARA EAST PHOSPHORITE BLOCK
CROSS-SECTION ALONG S2-S2'



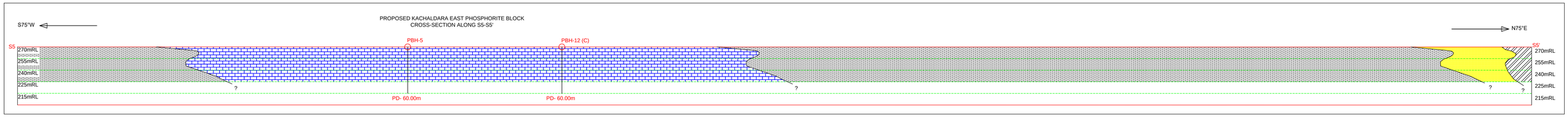
PROPOSED KACHALDARA EAST PHOSPHORITE BLOCK
CROSS-SECTION ALONG S3-S3'



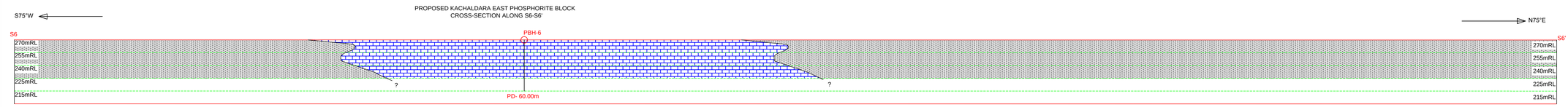
PROPOSED KACHALDARA EAST PHOSPHORITE BLOCK
CROSS-SECTION ALONG S4-S4'



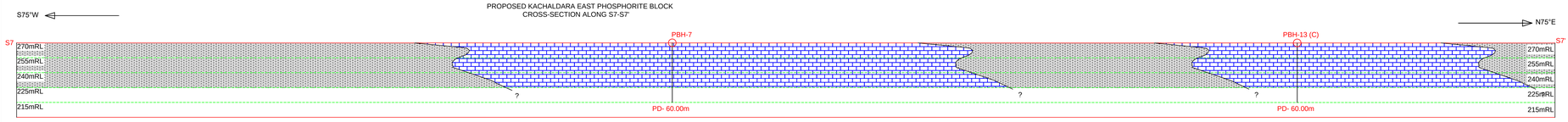
PROPOSED KACHALDARA EAST PHOSPHORITE BLOCK
CROSS-SECTION ALONG S5-S5'



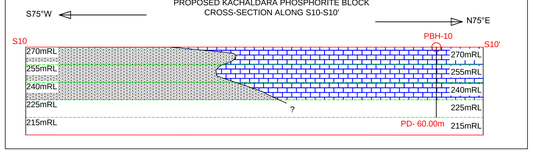
PROPOSED KACHALDARA EAST PHOSPHORITE BLOCK
CROSS-SECTION ALONG S6-S6'



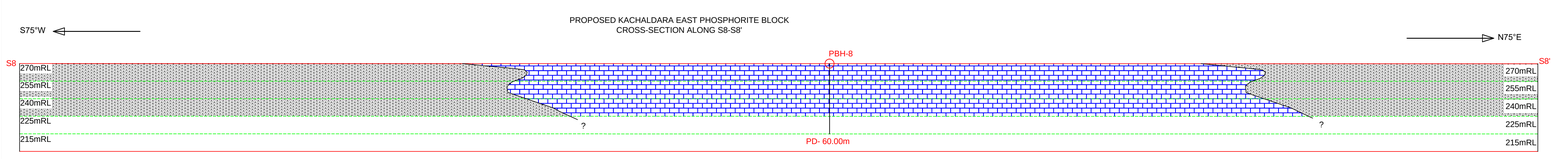
PROPOSED KACHALDARA EAST PHOSPHORITE BLOCK
CROSS-SECTION ALONG S7-S7'



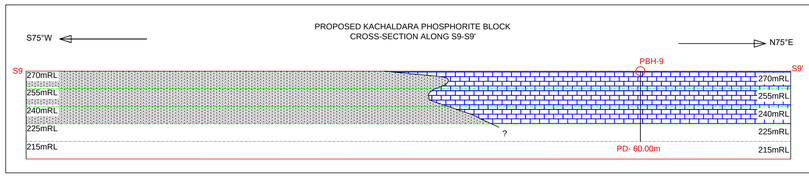
PROPOSED KACHALDARA PHOSPHORITE BLOCK
CROSS-SECTION ALONG S10-S10'

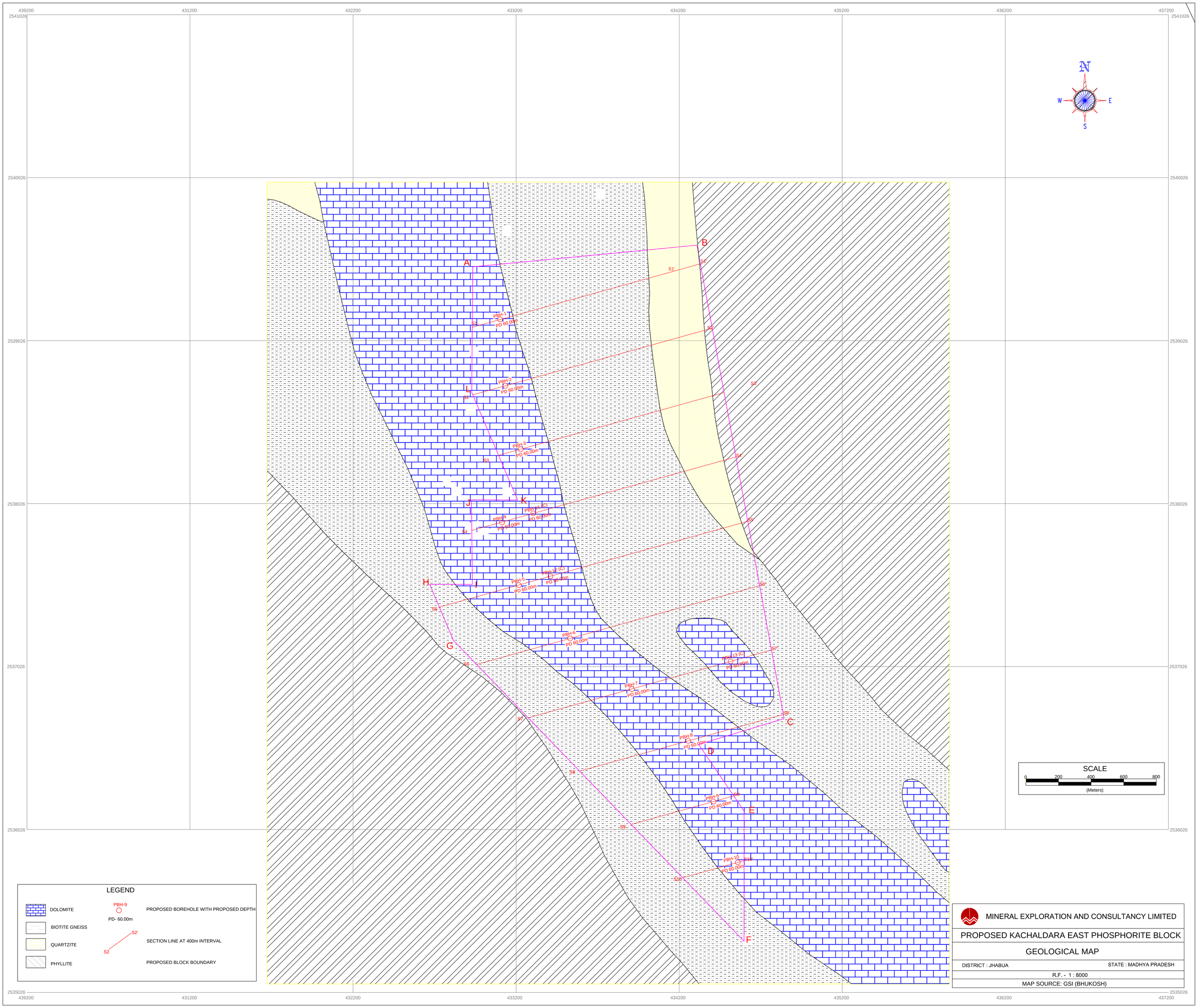


PROPOSED KACHALDARA EAST PHOSPHORITE BLOCK
CROSS-SECTION ALONG S8-S8'



PROPOSED KACHALDARA PHOSPHORITE BLOCK
CROSS-SECTION ALONG S9-S9'




439200
431200
432200
433200
434200
435200
436200
437200
2541026
2540026
2539026
2538026
2537026
2536026
2535026
N
W
E
S
A
B
C
D
E
F
G
H
I
J
K
L
S1
S1'
S2
S2'
S3
S3'
S4
S4'
S5
S5'
S6
S6'
S7
S7'
S8
S8'
S9
S9'
S10
S10'
PBH-1
PBH-2
PBH-3
PBH-4
PBH-5
PBH-6
PBH-7
PBH-8
PBH-9
PBH-10
PBH-11 (C)
PBH-12 (C)
PBH-13 (C)
PD 60.00m
SCALE
0
200
400
600
800
(Meters)
LEGEND
DOLOMITE
BIOTITE GNEISS
QUARTZITE
PHYLLITE
PBH-9
PD- 60.00m
PROPOSED BOREHOLE WITH PROPOSED DEPTH
S2'
S2
SECTION LINE AT 400m INTERVAL
PROPOSED BLOCK BOUNDARY
MINERAL EXPLORATION AND CONSULTANCY LIMITED
PROPOSED KACHALDARA EAST PHOSPHORITE BLOCK
GEOLOGICAL MAP
DISTRICT : JHABUA
STATE : MADHYA PRADESH
R.F. - 1 : 8000
MAP SOURCE: GSI (BHUKOSH)

COST SHEET FOR PRELIMINARY EXPLORATION (G-3) FOR PHOSPHORITE IN KACHALDARA EAST BLOCK
DISTRICT: JHABUA, MADHYA PRADESH
Total Area - 8.8 Sq Km; Nos. of Borehole - 10; Borehole depth range - 60m ; Completion Time - 15 Months

S.N	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Total Amount (Rs)	
A	**GEOLOGICAL WORK**						
1	**Mapping (1:5,000),Borhole logging,sampling & report writing**						
a	Charges for one Geologist per day at HQ	day	1.3	9,000	60	5,40,000	
b	Charges for two Geologists per day at field	day	1.3	11,000	180	19,80,000	
c	Labour for Geologist (2 Nos) Base rate - 443	day	5.7	443	360	1,59,480	Amount will be reimbursed 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	80	4,08,000	
e	Labours for Sampling works (4 Nos) Base rate - Rs. 443	day	5.7	443	320	1,41,760	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
2	**EXCAVATION**						
1	Trenching	per Cu.m	2.1.1	3,330	300	9,99,000	
3	**SURVEY (on 1:2000 Scale)**						
a	Block Boundary Demarcation and Bore Hole Fixation and determination of co-ordinates & Reduced Level of the boreholes by DGPS	Per Point of observation	1.6.2	19,200	30	5,76,000	16 Points for Block Boundary (On actual Basis) + 13 BH Points+1 Base station
b	Charges of one Surveyor (1 Party)	one surveyor per day	1.6.1a	8,300	30	2,49,000	
c	Labours (4 Nos) Base rate - Rs.443	day	5.7	443	120	53,160	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
	Sub-Total A					**51,06,400**	
B	**DRILLING**						
1	Drilling up to 300m (Hard rock)	m	2.2.1.4a	11,500	780	89,70,000	
2	Borehole deviation Survey by multishot camera	m	2.2.6	330	-	-	
3	Land / Crop Compansation (in case the BH falls in agreecultural Land)	per BH	5.6	20,000	13	2,60,000	Amount will be reimbursed as per actuals or max. Rs. 20000 per BH with certification from local authorities
4	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	13	26,000	
5	Transportation of Drill Rig & Truck associated per drill	Km	2.2.8	36	1,200	43,200	
6	Monthly Accomodation Charges for drilling Camp (2 Rigs)	month	2.2.9	50,000	5	2,50,000	
7	Drilling Camp Setting Cost	Nos	2.2.9a	2,50,000	1	2,50,000	
8	Drilling Camp Winding up Cost	Nos	2.2.9b	2,50,000	1	2,50,000	
9	Road Making (Flat Terrain)	Km	2.2.10a	22,020	5	1,10,100	Road Making will be considered as per the requirement and Road Making Charges will be reimbursed accordingly.
10	Drill Core Preservation	per m	5.3	1,590	320	5,08,800	
	Total - B					**1,06,68,100**	
C	**LABORATORY STUDIES**						
i)	**Primary samples (Bedrock/Channel samples)**						
	a. For 5 radicals i.e. P2O5, SiO2, Al2O3, Fe2O3 and LOI	Nos	4.1.3	9,805	100	9,80,500	
ii)	**Check samples Internal (5%) and External(10%)**						
	a. For 5 radicals i.e. P2O5, SiO2, Al2O3, Fe2O3 and LOI	Nos	4.1.3	9,805	15	1,47,075	
ii)	**Primary samples (Trench samples)**						
	a. For 5 radicals i.e. P2O5, SiO2, Al2O3, Fe2O3 and LOI	Nos	4.1.3	9,805	200	19,61,000	
iii)	**Check samples Internal (5%) and External(10%)**						
	a. For 5 radicals i.e. P2O5, SiO2, Al2O3, Fe2O3 and LOI	Nos	4.1.3	9,805	30	2,94,150	
iv)	**Primary samples (BH Core)**						
	a. For 5 radicals i.e. P2O5, SiO2, Al2O3, Fe2O3 and LOI	Nos	4.1.3	9,805	270	26,47,350	
v)	**Check samples Internal (5%) and External(10%)**						
	a. For 5 radicals i.e. P2O5, SiO2, Al2O3, Fe2O3 and LOI	Nos	4.1.3	9,805	41	3,97,103	

S.N	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Total Amount (Rs)	
vi)	**Composite Samples**						
	a. For 5 radicals i.e. P2O5, SiO2, Al2O3, Fe2O3 and LOI	Nos	4.1.3	9,805	50	4,90,250	
	b. Trace element study by ICP-MS (34 elements) Ti, V, Cr, Ni, Ga, Cr, Co, Cu, Pb, Zn, Ba, Sr, Rb, Zr, Y, Nb, Ce, Nd, Ta Cd, Sb, Sc, As, Th, U	Nos	4.1.14	7,731	20	1,54,620	
	c. XRD study	Nos	4.5.1	4,000	13	52,000	
vii)	**Petrological samples (Bh Core Samples)**						
i	Preparation of thin section	Nos	4.3.1	2,353	15	35,295	
ii	Study of Thin Section	Nos	4.3.4	4,232	15	63,480	
viii)	**Mineragraphic Study**	Nos					
i	Preparation of polished section	Nos	4.3.2	1,549	15	23,235	
ii	Study of polished section	Nos	4.3.4	4,232	15	63,480	
iii)	**Digital Photographs**	Nos	4.3.7	280	30	8,400	
ix)	**Specific Gravity**	Nos.	4.8.1	1,605	20	32,100	
x)	**Beneficiation Study**	Nos	N.A	3,35,033	1	3,35,033	will be reimbursed as per actual
	TOTAL - C					**76,85,071**	
E	**Sub Total (A to C)**					**2,34,59,571**	
F	**Geological Report Preparation**		5.2	**For the projects exceeding Rs. 150 Lakhs but less than Rs. 300 Lakhs: A Minimum of Rs. 7.5 lakhs or 3% of the work whichever is more.**	1	**7,50,000**	
G	**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**	
H	**Peer review Charges**		As per EC decision			**10,000**	
I	**Total Estimated Cost without GST**					**2,45,99,571**	
J	**Provision for GST (18% of GST)**	**%**				**44,27,923**	GST will be reimbursed as per actual and as per notified prescribed rate
K	**Total Estimated Cost with GST**					**2,90,27,493**	
				or Say Rs. In Lakhs		***290.27***	

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 execusion of the project by NEA on its own, a Certifiate regarding non outsourcing of any component/project is required.

TIME SCHEDULE /ACTION PLAN FOR PRELIMINARY EXPLORATION (G3) FOR PHOSPHORITE IN KACHALDARA EAST BLOCK
DISTRICT: JHABUA, MADHYA PRADESH PRADESH

Sl. No.	Activities	Unit	MONTHS														Total	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
1	Camp Setting	Month																1	1 month
2	Geological Mapping	Sq. Km																3	2 months
3	Trenching	Cu.M																300	300 Cu. M
2	Core Drilling (1 rigs)	m.																780	780m (in 13 Bhs)
3	Survey Party days	day																30	30 days
4	Geologist Party days (2 Party)	day																180	180 days
5	Sampling Party days, Core Sampling (1 Party)	day																80	80 days
6	Camp Winding	Month																1	1 month
7	Laboratory Studies	Nos.																789	789 Nos (Primary/ Check/ Composite/Oths)
8	Beneficiation Study																	2	2 month
9	Geologist Party days (1 Party), HQ	day																60	60 days
10	Report Writing / Peer review	Month																4	4 month

*** Commencement of project will be reckoned from the day the exploration acreage is available along with all statutory clearances**

***Time loss on account of monsoon/agricultural activity/forest clearance/ local law & order problems will be addition to above time line.**