

**PROPOSAL FOR PRELIMINARY EXPLORATION (G3) FOR IRON ORE IN
SITAPUR BLOCK, TEHSIL-PAKHANJUR,DISTRICT-UTTAR BASTAR KANKER,
CHHATTISGARH (AREA 3.50 Sq. Km)**

**Under
National Mineral Exploration and Development Trust**

COMMODITY: IRON ORE

**BY
KARTIKAY EXPLORATION AND MINING SERVICES PRIVATE LIMITED**

DATE: 09th September 2024

**SUMMARY OF THE BLOCK FOR PRELIMINARY EXPLORATION(G3)FOR
IRON ORE IN SITAPUR BLOCK, TEHSIL-PAKHANJUR, DISTRICT- UTTAR
BASTAR KANKER, CHHATTISGARH (AREA 3.50 Sq. Km)**

Features	Details
Block ID	SITAPUR BLOCK
Exploration Agency	KARTIKAY EXPLORATION AND MINING SERVICES PRIVATE LTD
Commodity	IRON ORE
Mineral Belt	Sitapur Block is a part of extension of Bailadila iron ore belt in Bengpal group of rock formations. And falls in the Survey of India Topo sheet nos. 64-D/12.
Time schedule to complete the project	12 Months
Objectives	a) To carry out geological and structural mapping at a 1:4000 scale for the demarcation of iron ore with structural features to identify surface manifestations and determine the lateral and vertical disposition of mineralized zones. b) To assess the quality of the iron ore by collecting surface samples, which will inform the future course of exploration. c) To establish the surface continuity of the mineralization, concealed below the soil cover, by conducting pitting and trenching. d) Based on the outcomes of the above activities, to conduct drilling of boreholes in a systematic grid pattern to establish the mineralization both vertically and laterally, along with qualitative and quantitative assessments. e) To estimate the Inferred Mineral Resource (333) and grade for iron ore in the block as per MEMC Rule-2015 (amendments-2021).
Status of Area	• Free hold area • Unexplored block for iron ore
Whether the work will be carried out by the proposed	Work will be carried out by the applicant agency.

agency or through outsourcing and details thereof. Components to be out sourced and name of the outsource agency	
Name/Number of Geoscientists	Nos. of Geologists: 2
Expected Field days (Geology, Geophysics, surveyor)	Geologist Party days: 180 days (At field) & 60days at HQ Survey Party days: 90days

1. Location				
Block Boundary Corner points	Corner Points	Geographic Co-ordinate in DMS		
		LATITUDE	LONGITUDE	
		A	20°9'55.27"N 80°36'49.56"E	
		B	20°9'47.42"N 80°37'29.73"E	
		C	20°9'0.40"N 80°37'39.99"E	
		D	20°8'24.72"N 80°37'13.36"E	
	E	20°9'16.29"N	80°36'29.40"E	
Villages	Sitapur			
Tehsil/Taluk	Pakhanjur			
District	Uttar Bastar Kanker			
State	Chhattisgarh			
2. Area(hectares/square kilometres)				
BlockArea	3.50 sq. km.			
Forest Land	Forest area			
GovernmentLand	Data not available			
Charagaha	Data not available			
PrivateLand	Data not available			
3. Accessibility				
NearestRailHead	Bhanu pratappur Railway Station, which is approximately 50 Kilometers away from the block.			
Road	Block can be approached through Dalli Rajhara to Bhanupratappur-Pakhanjur Road to Bhondia village to Sitapur village.			

	Airport	Raipur Airport
4.	Hydrography	
	Local Surface Drainage Pattern (Channels)	Dendritic drainage pattern.
	Rivers/ Streams	Near by river is Matholi River and the near by water body is Khairketta Reservoir. The Khairketta Reservoir, also known as the Pakhanjur Reservoir
5.	Climate	
	Mean Annual Rainfall	Average annual rain fall is
	Temperatures(December) (Minimum) Temperatures(June) (Maximum)	Pakhanjur, Chhattisgarh, experiences a tropical savanna climate. • Summer (March to May): Summers are hot, with temperatures often exceeding 40°C (104°F). The average high is around 42°C (108°F), and the average low is about 28°C (82°F). • Monsoon (June to September): The monsoon season brings heavy rainfall to the region, with an average of about 1,200 mm (47 inches) annually. This period is crucial for agriculture. • Winter (October to February): Winters are mild, with temperatures ranging from 10°C to 25°C (50°F to 77°F). The average high is around 24°C(75°F), and the average low is about 12°C (54°F).
6.	Topography	
	Toposheet Number	Survey of India Topo sheet No-64D/12
	Morphology of the Area	The area represents a rugged topography and comprises hills having 1 st and 2 nd order streams. The elevation of the block area ranges from highest 537m to lowest 360 m above the MSL.
7.	Availability of baseline geoscience data	
	Geological Map (1:50K/25K)	Geological Map of GSI is available at 1:50000 scale.
	Geochemical Map	Geochemical Map Not Available
	Geophysical Map	Geophysical Map Not Available
8.	Justification fortaking up G3 stage of Exploration	• In view of MMDR Amendments & Mineral Auction Rule, 2015, we have identified this block for exploration of Iron Ore to take up the work under NMET funding. • The proposed block area is part of a 10A2b block, which was Applied for a prospecting license by various steel industries

		prior to 2015. However, due to amendments in the new MMDR Act, the block area was not granted to anyone for the exploration of Iron Ore. - Neither the previous lessee nor any other agency has carried out exploration activities in this area for iron ore. However, the GSI has reported gold occurrences in the area. - The Iron ore mineralization's associated with Banded Iron Formation (BIF) and ferruginous Phyllites are recorded in the area, during geological traverses by the team. - During field traverse in the block area, total 10 nos of sample have been collected from the block. Sample wise chemical analysis report is below mentioned- <table border="1"> <thead> <tr> <th>Sl. No.</th><th>Sample ID</th><th>Fe%</th></tr> </thead> <tbody> <tr><td>1</td><td>SS-01</td><td>48.15</td></tr> <tr><td>2</td><td>SS-02</td><td>44.64</td></tr> <tr><td>3</td><td>SS-03</td><td>43.59</td></tr> <tr><td>4</td><td>SS-04</td><td>43.60</td></tr> <tr><td>5</td><td>SS-05</td><td>59.86</td></tr> <tr><td>6</td><td>SS-06</td><td>42.09</td></tr> <tr><td>7</td><td>SS-07</td><td>44.01</td></tr> <tr><td>8</td><td>SS-08</td><td>59.39</td></tr> <tr><td>9</td><td>SS-09</td><td>43.19</td></tr> <tr><td>10</td><td>SS-10</td><td>1.09</td></tr> </tbody> </table>	Sl. No.	Sample ID	Fe%	1	SS-01	48.15	2	SS-02	44.64	3	SS-03	43.59	4	SS-04	43.60	5	SS-05	59.86	6	SS-06	42.09	7	SS-07	44.01	8	SS-08	59.39	9	SS-09	43.19	10	SS-10	1.09
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- Based on the chemical analysis reports of the collected samples and the geological settings of the block area indicates the positive mineralization of iron ore. Hence, Preliminary Exploration has been proposed by geological and structural mapping, surface sampling, drilling to prepare a auctionable block.

**PROPOSAL FOR PRELIMINARY EXPLORATION (G3) FOR IRON ORE IN
SITAPURBLOCK, TEHSIL-PAKHANJUR, DISTRICT-UTTARBASTARKANKER,
CHHATTISGARH (AREA 3.50 Sq. Km)**

1. INTRODUCTION

Large deposits of excellent quality iron ores are found in the Bastar, Durg, and Dantewara districts of Chhattisgarh. Smaller deposits occur in Raigarh, Raipur, Bilaspur, Rajnandgaon, Kanker, and Jashpur districts. The majority of the iron ore deposits in the Bastar and Durg districts are associated with the Bailadila Iron Ore Series of Archaean age. These series of rocks resemble the iron ore series of Singhbhum-Keonjhar-Bonai in Orissa and Jharkhand.

The Bastar craton of the central Indian peninsular shield comprises high-grade metamorphic rocks, which include metasediments, metabasites, charnockites, and the gneiss-migmatite complex referred to as the Bengpal group. This Bengpal group is overlain by a Banded Iron Formation-greenstone sequence, known as the Bailadila group. The Bailadila iron ore series occur as a synclinorium with a north-south axis and a central eroded anticline flanked by two synclines, forming ridges with significant bands of iron ore. Most of these iron deposits are composed of hematite ore, with a few small deposits of magnetite ore.

The iron formations in this region have similarities in lithological association and tectonomorphic history with those in other belts. The Bailadila group, which contains the bulk of the iron formations, comprises quartz-sericite schist and arkosic quartzite at the base, followed by Banded Iron Formation associated with shale-siltstone, carbonaceous shales, and interbedded tuffs, intruded by greenstones and granites.

The Pakhanjur area in Chhattisgarh is also known for its iron ore occurrences, primarily associated with Banded Iron Formations (BIFs).

2. BACKGROUND

This Bengpal group is overlain by a Banded Iron Formation-greenstone sequence, known as the Bailadila group. In Pakhanjur area, Bengpal Group of rock formations shows the presence of banded iron formation. The proposed block area is unexplored for iron ore. Keeping in view, the present proposal has been prepared and being put up for Preliminary Exploration (G-3 Stage) for NMET funding and execution.

3. LOCATION AND ACCESSABILITY

Sitapur Block is situated in the Sitapur village, Pakhanjur Tehsil, Uttar Bastar Kanker district of Chhattisgarh State. Block is bounded by Latitude 20° 8'24.72"N to 20° 9'55.27"N and Longitude 80°36'29.40"E to 80°37'39.99"E. Block falls in the Survey of India toposheet nos. 64D/12.

The block area is well connected with Dalli Rajhara Town and Bhanupratappur towns by State Highway and accessible throughout the year, which is about 79 km from Bhanupratappur (via Pakhanjur Road) and 86 Km from Dalli Rajhara Town (via. NH-930).

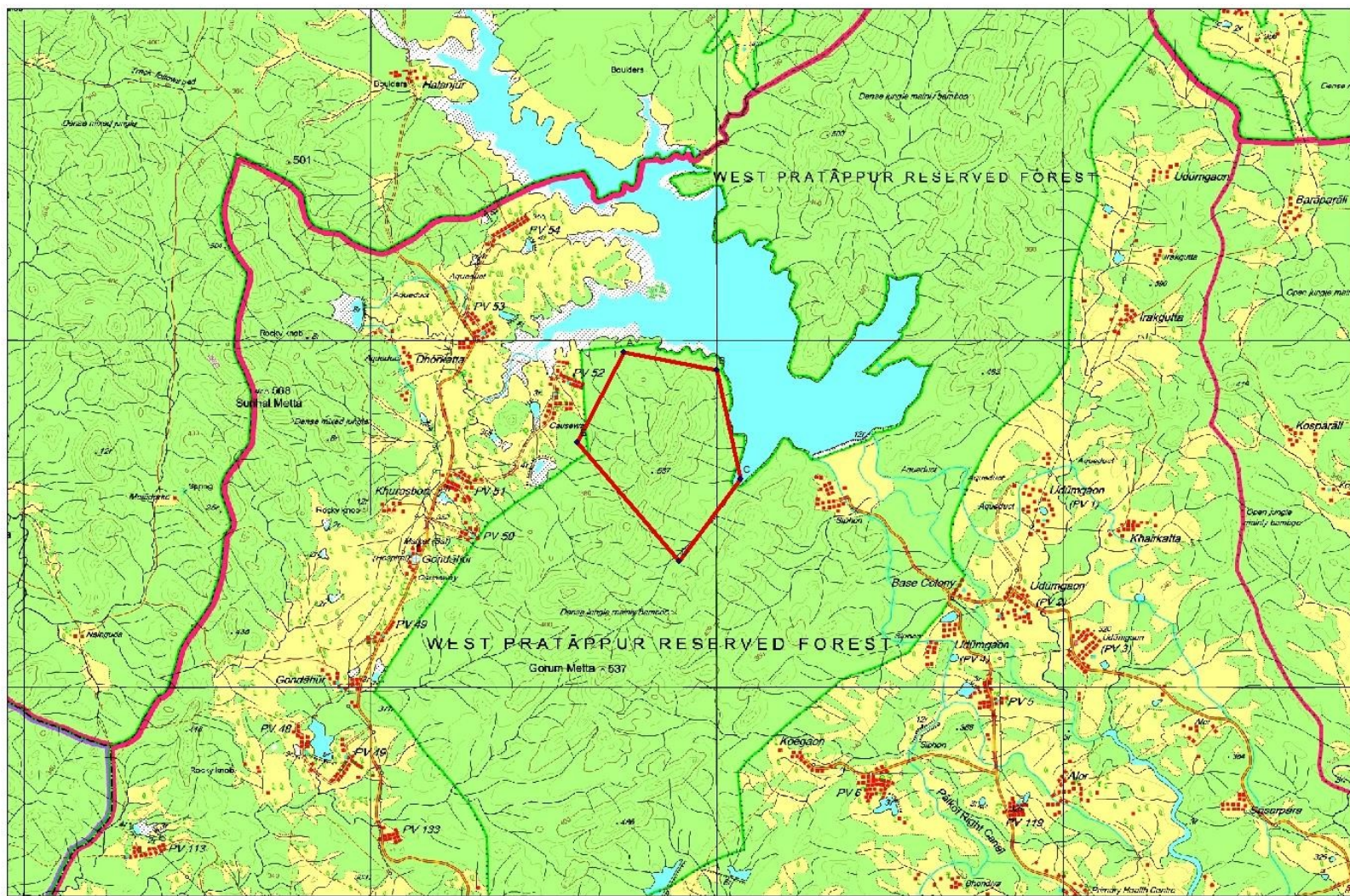
Nearest railway station is Dalli Rajhara Railway Station, which is approximately 86 kilometers away from the block. Block can be approached through Dalli Rajhara to Bhanupratappur-Pakhanjur Road to Bhondia village to Sitapur village.

Raipur Airport is the nearest airport of the block which is approximately 235 km from the proposed block area.

Block boundary corner points of Sitapur Block is given below:

Corner Points	Geographic Co-ordinate DMS	
	Latitude	Longitude
A	20°9'55.27"N	80°36'49.56"E
B	20°9'47.42"N	80°37'29.73"E
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LOCATION MAP OF SITAPUR BLOCK, TEHSIL-PAKHANJUR, DISTRICT-UTTAR BASTAR KANKER, CHHATTISGARH (AREA 3.50 Sq. Km)



1:50,000
0 0.5 1 2 3 4 Kilometers

Legend

- | | |
|---|-----------------------------|
| SITAPUR BLOCK BOUNDARY | PART OF TOPOSHEET NO-64D/12 |
| • POINT | RGB |
| | Red: Band_1 |
| | Green: Band_2 |
| | Blue: Band_3 |

4. PHYSIOGRAPHY AND DRAINAGE

The block area lies in the West Pratappur Reserve Forest area, characterized by linear arcuate hill ridges extending from northeast to southwest. It features rugged topography with hills containing first and second order streams. The elevation of the block area ranges from maximum 537 meters to minimum 360 meters above Mean Sea Level (MSL).

Overall area is covered with denudational hills and valleys of Proterozoic rocks.

The drainage pattern in the area is dendritic, with the region being drained through first and second order streams. The Pakhanjur Reservoir is located near the northern and northeastern parts of the block area.

5. CLIMATE

The climate of the area is tropical monsoon type.

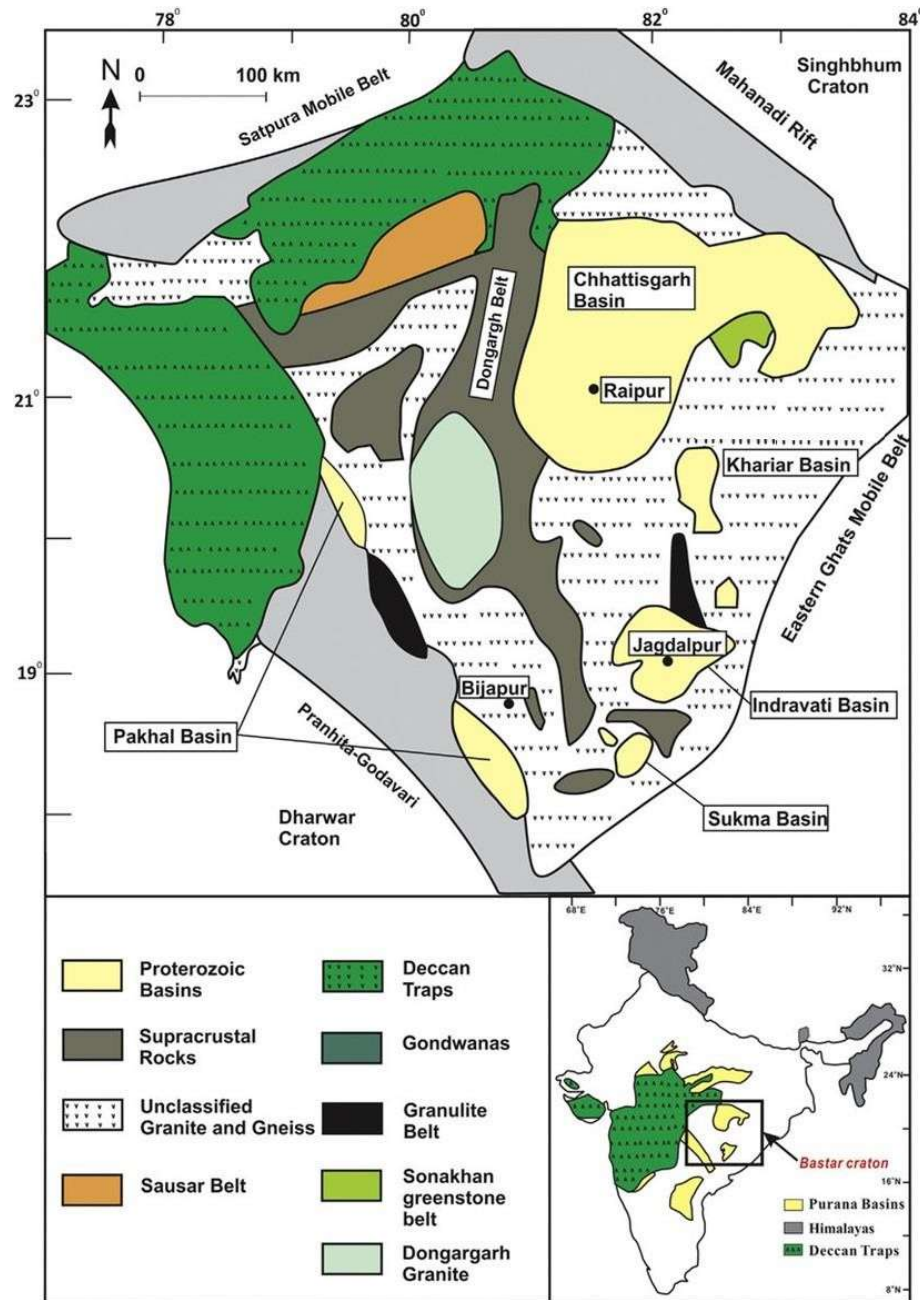
- Summer (March to May): Summers are hot, with temperatures often exceeding 40°C (104°F). The average high is around 42°C (108°F), and the average low is about 28°C (82°F).
- Monsoon (June to September): The monsoon season brings heavy rain fall to the region, with an average of about 1,200 mm (47 inches) annually. This period is crucial for agriculture.
- Winter (October to February): Winters are mild, with temperatures ranging from 10°C to 25°C (50°F to 77°F). The average high is around 24°C (75°F), and the average low is about 12°C (54°F).

6. REGIONAL GEOLOGY & STRUCTURE

The Bastar craton of the central Indian peninsular shield comprises high-grade metamorphic rocks, which include metasediments, metabasites, charnockites, and the gneiss-migmatite complex referred to as the Bengpal group. This Bengpal group is overlain by a Banded Iron Formation-greenstone sequence, known as the Bailadila group. The Bailadila iron ore series occur as a synclinorium with a north-south axis and a central eroded anticline flanked by two synclines, forming ridges with significant bands of iron ore. Most of these iron deposits are composed of hematite ore, with a few small deposits of magnetite ore.

The iron formations in this region have similarities in lithological association and tectonomorphic history with those in other belts. The Bailadila group, which contains the bulk of the iron formations, comprises quartz-sericite schist and arkose quartzite.

at the base, followed by Banded Iron Formation associated with shale-siltstone, carbonaceous shales, and interbedded tuffs, intruded by greenstones and granites.



Generalized geological map of the Bastar Craton showing the location of Proposed Iron Ore Block, Pakhanjur Tehsil, Uttar Bastar Kanker District of Chhattisgarh. Inset map shows the generalized geology of the Indian subcontinent and the location of the Bastar Craton.

(Modified after Meert et al., 2010)

The Pakhanjur area in Chhattisgarh is also known for its iron ore occurrences, primarily associated with Banded Iron Formations (BIFs).

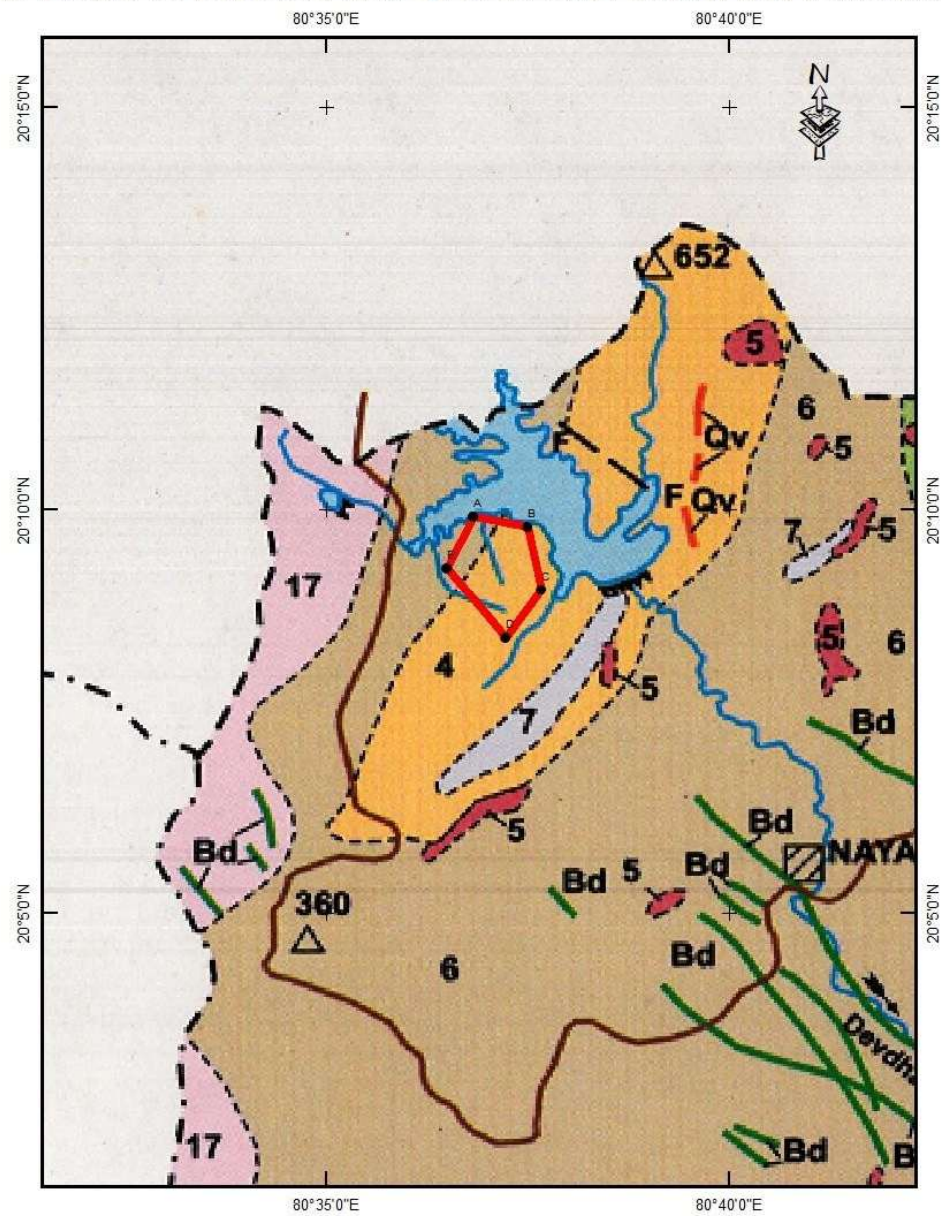
The regional stratigraphic sequence of the area (After GSI) is as follows:

CHHATTISGARH SUPER GROUP				
-----Unconformity-----				
Gabbro dyke Masapur Trap - Basalt				

K	A	G	- Patkasa	- Siltstone, shale, sandstone
O	B	R	Formation	and conglomerate
T	H	O	-----Unconformity-----	
R	U	U	Linear gabbro bodies	
I	J	P	and basic dykes.	
S	M		Madanbera	- Coarse porphyritic granite,
U	A		Granite	granite porphyry, rhyolite porphyry
P	R		(Dongargarh	
E			Granite)	
R	-----Intrusive contact-----			
G	A	G	- Mendra	- Basalt and basaltic
R	I	R	Formation	pyroclastic rocks
O	N	O		
U	H	U	Kurse	- Porphyritic acid
P	U	P	Kohri	volcanics, pyro-
	R		Formation	clastic rocks,
↓				
-----Disconformity-----				
Pachangi				
Formation				
- Sandstone, shale,				
conglomerate, rhyolite				
and acid pyroclastics				
-----Unconformity-----				
NW - SE trending mafic dyke swarms in the basement				
-----Intrusive contact-----				
LATMARKA Banded Iron - BIF, ferruginous and cherty shale/phyllite, metagreywacke,				
BAILADILA) Formation talc-schist, quartzite				
GROUP				
-----Unconformity-----				
BENGAL Hanker Complex - Granite gneiss with enclaves of BMQ, quartzite,				
GROUP metapelite, amphibolite, meta-ultramafites etc.				

The southern half of the Bastar Craton is occupied by Archaean Gneissic complex (AGC) which is known as Hanker Complex or Bengpal Group containing meta-sedimentary and meta-igneous enclaves within gneissic complex. This is followed upward in stratigraphy by the rocks of Bailadila Group that rests unconformably on the Bengpal Group. The Bailadila Group which forms the basement for Kotri Supergroup, also marks the eastern boundary of Kotri Supergroup as overturned eastern limb of Bailadila BIF forming N-S trending linear ridges.

REGIONAL GEOLOGICAL MAP OF SITAPUR BLOCK, TEHSIL-PAKHANJUR, DISTRICT- UTTAR BASTAR KANKER, CHHATTISGARH



Legend

• POINT

SITAPUR BLOCK BOUNDARY

PART OF DISTRICT RESOURCE MAP KANKER

RGB

Red: Band_1

Green: Band_2

Blue: Band_3

- | | |
|---|--|
| 7 | Chlorite schist, phyllite, talc-tremolite schist, hornblende schist, meta-volcanic and altered ultramafic |
| 6 | Granitic gneiss, migmatite, paragneiss, streaky gneiss, augen gneiss, hornblende gneiss & biotite gneiss with thin schistose bands |
| 5 | Banded magnetite quartzite (BMQ), banded grunerite quartzite, tremolite-actinolite schist |
| 4 | Fuchsite quartzite |

1:100,000

0 1.25 2.5 5 7.5 10 Kilometers

7. GEOLOGY OF THE BLOCK AREA

Block area falls in the Bengpal group of rock formations. This Bengpal group is overlain by a Banded Iron Formation-greenstone sequence, known as the Bailadila group. Most of these iron deposits are composed of hematite ore, with a few small deposits of magnetite ore.

As per the District Resource Map of Geological Survey of India, block area containing Bengpal group of rock formations fuchsite quartzite and granitic gneiss, migmatite, paragenesis streaky gneiss, augen gneiss, hornblende gneiss and biotite gneiss with thin schistose bands of Archean Age.

- Fuchsite quartzite is pale green in color, medium to coarse grained, very hard and compact quartzite with fuchsite mica.
- Gneiss is Greyish white to brownish grey in color, fine to coarse grained rock with crude foliations.
- Migmatite is comprises with leucosome bands (quartz and feldspar) and melanosome bands (biotite and hornblende).

During field traverse in the block area, total 10 nos of sample has been collected. Sample wise chemical analysis report is below mentioned-

8. PREVIOUS WORK

P.N. Bose (1890-1900) was first to carry out geological survey in Bastar region. Crookshank and Ghosh (1932-38) mapped the southern part of the Bastar. Crookshank (1963) classified the metamorphics of south Bastar into Sukma, Bengpal and Bailadila Groups. In recent years a number of workers have carried out detailed study in various parts of the district, viz. Dutta (1956-57), Prasad and Banerjee (1962), Krupanidhi (1960-62), Ramakrishna and Dutta (1970), Narain, Pandhare and Pal (1972), Mishra, Dutta, Kanchan and Sisodiya (1970). As a result of these recent

Studies the metasediments of the bastar have been classified in to a composite bengpal Group and Bailadila Group.

Gurwandi and adjoining areas (Part of the Toposheet No- 64 D/12) were mapped by Shri R. K. Sharma and G.G.S. Satyanarayana in the year 1965. Later it was mapped on scale 1:63,360 by Dr.V. P. Mishra et al. during 1980-1982. As a part of second generation mapping on 1:25,000 scale, during 1989-1990, S/Shri V. P. Mishra, N. K. Dutta, J. G. Ghosh et al. reported primary gold mineralisation in a sheared rhyolite, exposed west of Gurwandi (20°10'N: 80°45'E). It was associated with pyrite, pyrrhotite, arsenopyrite and chip samples which on analysis gave gold value ranging from <0.10 to 1.23 g/t, over a zone of 18m width.

Subsequently, detailed mapping aided by trenching and sampling (Shri D.P. Das and M. R. AsokaKumar 1990-1991 and M. C. Patel and M. R. AsokaKumar 1991-1992) helped in recording the presence of gold over wide zones along the contact of rhyolite and rhyolitic tuffs.

No previous work carried out for the exploration of iron ore in the Toposheet No- 64D/12.

9. OBJECTIVE

The exploration is proposed with the following objectives-

1. To carry out geological and structural mapping at a 1:4000 scale for the demarcation of iron ore with structural features to identify surface manifestations and determine the lateral and vertical disposition of mineralized zones.
2. To assess the quality of the iron ore by collecting surface samples, which will decide the future course of exploration.
3. To establish the surface continuity of the mineralization, concealed below the soil cover, by conducting pitting and trenching.
4. Based on the outcome of the above activities, to conduct drilling of boreholes in a systematic grid pattern to establish the mineralization both vertically and laterally, along with qualitative and quantitative assessments.
5. To estimate the Inferred Mineral Resource (333) and grade for iron ore in the block as per MEMC Rule-2015 (amendments) 2021.

10. PROPOSED SCHEME OF EXPLORATION

- ✓ **Geological Mapping:** The total block area will be mapped at a 1:4000 scale, highlighting the outcrops of iron ore in the block area along with the structural details on a plan before commencement of activities like drilling, sampling, and pitting. A geological plan featuring topographical contours, borehole points, pits, surface features, etc., at a 1:4000 scale is to be prepared.
- ✓ **Topographical Survey:** The topographical survey in the block will be carried out in 1:4000 scale. The survey work will be carried out for fixation of boreholes and determination of coordinates of block boundary and other topographical features surface contouring, Road, water bodies, Village boundaries etc. within the block during the entire exploration program. DGPS survey will be conducted to determine the coordinates and reduced levels (RL) of all block boundary corner points and borehole locations, along with base points. The data collected during exploration Program will be used in preparation of Topographical Map on 1:4000 scale.
- ✓ **Surface Sampling:** To infer the surface manifestation of the mineral, 50 nos of bedrock samples will be collected from the iron ore potential zone from the proposed block area. Which will be analyzed in NABL accredited laboratory.
- ✓ **Trenching/Pitting:** To uncover the mineral potential, beneath the soil cover area, a total of 200 cubic meters trenching/pitting is proposed. The depth of the trench/pits will be 2m (max) or upto the encountering of bedrock (<2m).
- ✓ **Drilling:** Based on the outcome of the geological mapping (1:4000 scale), analytical results of surface grab samples, 6 nos. of scout/test boreholes of 150 meters each i.e. a total of 900m of core drilling is being proposed over the area to intersect the mineralized zone. The boreholes will be judiciously closed by the field geologist after encountering of non-mineralized zone. The proposed locations and depths of the boreholes are tentative, with the final decisions on their placement and closure to be made by the field geologist based on site conditions. Tentative locations and depths have been provided for each block, but these parameters may vary depending on the geological and drilling conditions encountered in the study area.
- ✓ **Core Logging:** Geological core logging will be carried out systematically by recording the lithological and structural characters of the formations, with its

color, texture, grain size, core recovery, banding, mineralogical composition, micro-structural/structural details, lithological variations along with visual estimate in respect of iron ore encountered in the boreholes. As per the requirement the Rock Quality Designation (RQD) shall also be carried out, while logging drill cores. On the basis of these parameters, grade of iron ore can be broadly assessed.

- ✓ **Core Sampling:** The mineralized part of the drill core sample will be sampled as Primary Samples. For the preparation of samples, the borehole core will be splitted into two equal halves by using core splitter. One half will be powdered to 100 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 will be kept as reference sample half for future reference. The length of each sample will be kept 0.50m to 1.0m depending upon the width of particular types of iron ore and its physical character (like lumpy, powdery, friable, massive, etc.) within the mineralized zone. Primary core samples of mineralized zone will be analyzed for 07 radicals, i.e. Fe, Mn, SiO₂, Al₂O₃, P, S & LOI.

The mineralized zone including the cores of footwall and hanging wall rocks (5 meters length each) would be sampled at 1.0 m interval, as far as possible depending upon the intensity of mineralization, change in litho types and core recovery etc. It is envisaged that:

- i It will generate about 600 nos primary samples from drill cores.
- ii In addition to this, 10% of primary samples will be prepared as External Check samples that will be sent to NABL Lab for analysis.
- iii Composite samples will be prepared borehole wise based on the analytical results of primary sample at every 8m interval (considering 8m bench height). Composite samples shall be prepared from the entire borehole in which iron ore will be intersected. Each sample should be marked at every 1m length in case of continuance of similar mineralogical composition down the borehole. The sample length towards the floor marked by non-ore zone needs also to be adjusted as per variations of the litho-units as mentioned above.

- ✓ **Chemical Analysis:** All the primary samples will be analyzed for 07 radicals, i.e. Fe, Mn, SiO₂, Al₂O₃, P, S & LOI). About 10% of primary samples will be sent to NABL external laboratory as check samples for analysis of 7 radicals, i.e. Fe, Mn, SiO₂, Al₂O₃, P, S & LOI. Composite samples will be analyzed for 7 radicals, i.e. Fe, Mn, SiO₂, Al₂O₃, P, S & LOI.

- ❖ **Total Primary Samples**-600+150=750 nos
- ❖ **Total External Check Samples**-75 nos
- ❖ **Total Composite Samples**-75nos

- ✓ **XRD Study:** To know the different mineral phases, for recovery of iron, XRD study will be performed in 20 samples of iron ore samples.

- ✓ **Petrographic & Minerographic Studies:** Thin and polished section studies of the out-crop samples and the core samples will be studied for detailed Petrographic and Minerographic characteristics. These samples will be drawn from ore zones and associated rocks of the block. A provision of 10 specimens for Petrographic and 10 specimens for Minerographic studies has been kept for the proposed area.

- ✓ **Determination of Lump:Fines:** To determine the lump and fines ratio of iron ore, 10 cubic meters of different types of iron ore samples will be collected, which will help for the future planning of the block.

- ✓ **Determination of specific gravity/Bulk density:** To estimate the mineral resource, volume of the orebody need to be multiplied with a density factor or specific gravity factor. Hence, 10 nos. of samples from the different types of iron ore will be collected for the determination of specific gravity/ Bulk density.

11. QUANTUM OF WORK

- ✓ The following quantum of work have been proposed for preliminary exploration for Iron Ore in Sitapur Block:

Sl. No.	Item of Work	Unit	Proposed
1	Geological Mapping (1:4000scale)	Sq. Km	3.5
2	Topographical Survey (1:4000scale)	Sq. Km	3.5
3	DGPS Survey for block boundary corner points, boreholes and base point fixation	Nos.	12
4	Surface Sampling(Bedrock)	Nos.	150
5	Trenching/Pitting	Cum	200
6	Core Drilling	m.	900
7	Primary Samples (Surface Samples, Trenching/Pitting Samples, Core Samples)	Nos.	750
8	Check Samples (Surface Samples, Trenching/Pitting Samples, Core Samples) for 7 radicals, i.e. Fe, Mn, SiO ₂ , Al ₂ O ₃ , P, S & LOI.	Nos.	75
9	Chemical Analysis (Composite) for 7 radicals, i.e. Fe, Mn, SiO ₂ , Al ₂ O ₃ , P, S & LOI.	Nos.	75
10	Trace Element (34 element analysis)	Nos.	25
11	Petrographic Studies	Nos.	10
12	Mineralogical Studies	Nos.	10
13	XRD Study	Nos.	10
14	Determination of Fine:Lump ratio in Iron Ore	Nos.	10
15	Determination of Specific Gravity	Nos.	10
16	Geological Report Preparation	Nos.	1

12. TIMELINE SCHEDULE AND ESTIMATED COST FOR THE EXECUTION OF PROPOSED EXPLORATION PROGRAM

- ✓ The proposed exploration programme involved geological mapping, core drilling, sample preparation laboratory studies and preparation of geological reports, which will be completed within 12 months of time period.

Time Schedule/Action Plan (in months) for Preliminary Exploration (G3) for Iron Ore in Sitapur Block, Tehsil-Pakhanjur, District- Uttar Bastar Kanker, Chhattisgarh													
Item of Works	1	2	3	4	5	6		7	8	9	10	11	12
Base Camp Setting							W						
Geological Mapping							O						
Topographical Survey, DGPS							R						
Core Drilling							K						
Geologist days (Field)							R						
Sampling Days, Core Sampling							E						
Base Camp Setting							V						
Analytical Work							I						
Geologist days (Office)							E						
GR Preparation with Peer Review							W						

Estimated Cost of the proposed exploration block
Rate as per NMET SOC 2020-21

Cost Estimate for Preliminary Exploration (G3) for Iron Ore in Sitapur Block, Tehsil-Pakhanjur, District- Uttar Bastar Kanker, Chhattisgarh							
S.No.	Item of Work	Unit	Rates as per NMET SOC 2020-21		Estimated Cost		Remarks
			SoC-Item -S/No.	Rates as per SoC	Qty.	Amount(Rs)	
A	GEOLOGICAL WORK (1:4000 scale)						
1	Charges for one Geologist-Field	day	1.2	11,000	180	19,80,000	
2	Charges for one Geologist per-HQ	day	1.2	9,000	60	5,40,000	
3	2labours/party	day	5.7	526	360	1,89,360	As per rates prescribed by Central Labour Commission rates or respective State Govt. Whichever is higher
4	Sampling Party Days -1 Sampler. (Labour charge not included)	day	1.5.2	5,100	95	4,84,500	
5	4labours/party	day	5.7	526	380	1,99,880	As per rates prescribed by Central Labour Commission rates or respective State Govt. Whichever is higher
6	Charges of one qualified surveyor with Total Station for carrying out topographical survey in different RF and surface contouring at different interval, fixation of borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes with total station etc	Charges for one Surveyor per day	1.6.1a	8,300	90	7,47,000	
7	4labours/party	day	5.7	526	360	1,89,360	As per rates prescribed by Central Labour Commission or respective State Govt. Whichever is higher
	SubTotal-A					43,30,100	
B	PITTING AND TRENCHING						
1	Pitting/Trenching	Cum	2.1.2	3,330	200	6,66,000	
	SubTotal-B					6,66,000	
C	DRILLING						
1	Drilling upto 300m (Very Hard Rock)	m	2.2.1.5a	12650	900	1,13,85,000	BHQ, BMQ
2	Land/Crop Compensation	Per BH	5.6	20,000	6	1,20,000	As per actuals as certified by local authorities subject to a maximum of 20,000 per bore hole
3	Construction of concrete Pillar (12"x12"x30")	Per borehole	2.2.7a	2,000	11	22,000	Boreholes+Boundary Corner Points

**Cost Estimate for Preliminary Exploration (G3) for Iron Ore in Sitapur Block,
Tehsil-Pakhanjur, District- Uttar Bastar Kanker, Chhattisgarh**

S.No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost		Remarks
			SoC-Item -S/No.	Rates as per SoC	Qty.	Amount (Rs)	
4	Transportation of Drill Rig & Truck associated per drill (To & from Headquarter/Previous drill site)	Km	2.2.8	36	520	18,720	
5	Monthly Accommodation Charges for drilling Camp	month	2.2.9	50,000	4	2,00,000	
6	Drilling Camp Setting Cost	Per drill	2.2.9a	2,50,000	2	5,00,000	
7	Drilling Camp Winding Cost	Per drill	2.2.9b	2,50,000	2	5,00,000	
8	Approach Road Making (Flat Terrain)	Km	2.2.10a	22,020	5	1,10,100	Road Making will be considered as per the requirement.
9	Demarcation of lease boundary, Fixation of borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes by DGPS.	Nos	1.6.2	19,200	12	2,30,400	Boreholes + Boundary Corner Points + Base Point
10	Drill Core Preservation: One complete borehole plus mineralised cores of all the BHs of the Block/Prospect to be preserved in GICore boxes and subsequently transported to the notified Core Repository.	m	5.3	1,590	650	10,33,500	Considering 100m iron ore mineralisation zone to be encountered in each boreholes.
	Sub Total-C					1,41,19,720	
D	LABORATORY STUDIES						
1	Chemical Analysis						
	(Surface Samples + Core Samples + Check Samples)						
1	a) Primary samples for major oxides (i.e. Fe, Mn, SiO ₂ , Al ₂ O ₃ , P, S & LOI)	Nos	4.1.15a	4,200	750	31,50,000	600 samples from boreholes and 150 Surface Samples including pit/trenches samples.
	b) External Check sample (10% of Primary samples) (i.e. Fe, Mn, SiO ₂ , Al ₂ O ₃ , P, S & LOI)	Nos	4.1.15a	4,200	75	3,15,000	
	c) Composite Samples Analysis (i.e. Fe, Mn, SiO ₂ , Al ₂ O ₃ , P, S & LOI)	Nos	4.1.15a	4,200	75	3,15,000	Considering 8m length for 1 sample. (600/8)
	d) Trace element (34 element)	Nos	4.1.14	7,731	25	1,93,275	10% of Primary samples
	e) Analysis for Gold by Fire assay	Nos	4.1.5a	2,380	10	23,800	
2	Preparation of thin section	Nos	4.3.1	2,353	10	23,530	
3	Preparation of polished thin section of rock/ wafer	Nos	4.3.2	1,549	10	15,490	
4	Complete petrographic study report	Nos	4.3.4	4,232	10	42,320	
5	Digital Photographs	Nos	4.3.7	280	10	2,800	
6	XRD analysis for identification of minerals	Nos	4.5.1	4,000	10	40,000	

7	Determination of Fine:Lump ratio in Iron Ore	Per cu.m	4.9	6,523	10	65,230	
Cost Estimate for Preliminary Exploration (G3) for Iron Ore in Sitapur Block, Tehsil-Pakhanjur, District- Uttar Bastar Kanker, Chhattisgarh							
S.No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost		Remarks
			SoC-Item -SI No.	Rates as per SoC	Qty.	Amount (Rs)	
8	Bulk Density Determination	Nos	4.1	3,540	10	35,400	
	Sub Total-D					42,21,845	
E	Total A to D					2,33,37,665	
F	Geological Report Preparation	Cost per 5 Hardcopies of report along with soft copies	5.2			7,50,000	Exceeding ₹150 lakh but less than 300 lakh: A Minimum of ₹7.5 lakh or 3% of the work whichever is more and ₹3000/- per each additional copy.
G	Peer review Charges					30,000	
H	Preparation of Exploration Proposal (5 Hard copies with a soft copy)		5.1			4,66,277	2% of the Cost or Rs. 5.0 Lakhs whichever is lower
I	Total Estimated Cost without GST					2,45,83,942	
J	Provision for GST (18% of I)					44,25,109.56	GST will be reimburse as per actual and as per notified prescribed rate
K	Total Estimated Cost with GST Rs.					2,90,09,051	Rs. 290.090 Lacs