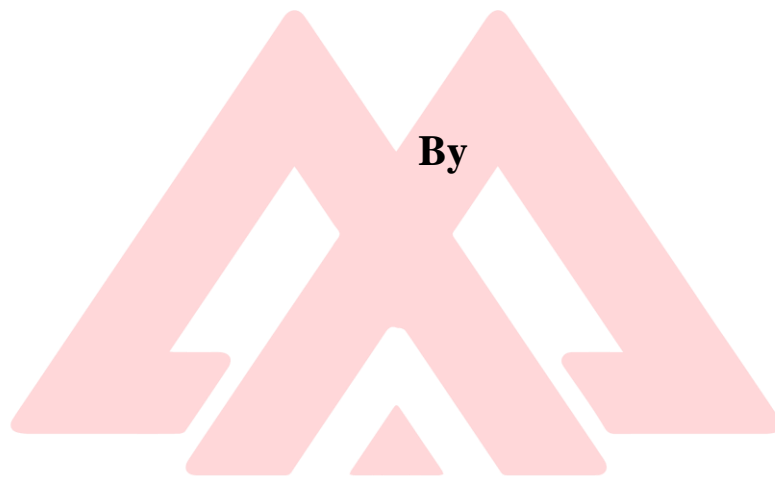


Proposal for Preliminary exploration (G3 Stage) of limestone in Sabalgarh, Morena District, Madhya Pradesh State under NMET.

Commodity: Limestone



By

Maheshwari Mining Pvt. Ltd.

Maheshwari

Place: Kolkata

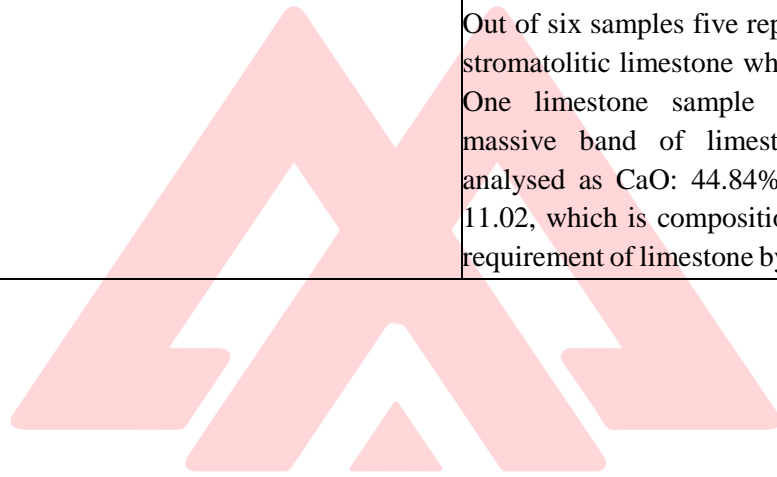
Date: 10/06/2025

Summary of the Block for Preliminary exploration (G3 Stage) General information about the block

S.No	Features	Details		
1.	Block ID	Sabalgarh Block		
2.	Exploration Agency	Maheswari Mining Pvt. Ltd.		
3.	Commodity	Limestone		
4.	Mineral Belt	Lakheri formation, Bhandar group Vindhya Supergroup		
5.	Completion Period with entire Time schedule to complete the project	10 months		
6.	Objectives	<ol style="list-style-type: none"> 1. Geological mapping on 1:4000 scale and demarcating Limestone occurrence with the structural features i.e. strike, dip, etc., for medium to high grade Limestone deposit. 2. Based on the outcome of the geological mapping, bedded stratiform regular deposit drilling with 800 m and closer spacing will be done, 6 nos. of vertical boreholes with total 300m depth. Each borehole is planned with a maximum depth of 50m. 3. Chemical Analysis of core samples and surface samples. 4. Grade-wise determination of dimension of Limestone deposits and estimation of tonnage & grade in G3 stage as per ammended version 2021) of Minerals (Evidence of Mineral Contents) Rules (2015). 		
7.	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	Work will be carried out by Maheshwari Mining Pvt. Ltd.		
8.	Name/ Number of Geoscientists	In field: Two Geologists. At Headquarters: Two Geologists.		
9.	Expected Field days (Geology)	Item execution duration 10 Months and actual field days of field geologist 160 days for two Geologist and 60 days for HQ.		
10.	Geological Party Days			
11.	Location	Point_ID	Easting	Northing
		S-1	737960	2904850
		S-2	739087	2904850
		S-3	739172	2903650
		S-4	741394	2903680
		S-5	741459	2902790
	S-6	738009	2902710	
	Villages	Sabalgarh		
	Tehsil/ Taluk	Sabalgarh Tehsil		
	District	Morena district		
	State	Madhya Pradesh		

12.	Area (hectares/ square kilometres)	
	Block Area	4.50 sq km
	Forest Area	xx
	Government Land Area	xx
	Private Land Area	xx
13.	Accessibility	
	Nearest Rail Head	Sabalgarh Rly Station on Morena-Sabalgarh-Birpur, North Central Railway track.
	Road	NH- 552
	Airport	Gwalior 110 kms
14.	Hydrography	
	Local Surface Drainage Pattern (Channels)	All natural streams are flowing northerly or northwesterly.
	Rivers/ Streams	All northerly flowing streams join with Chambal Right Main Canal, which flows from west to ENE, along northern part of the area.
15.	Climate	
	Mean Annual Rainfall	The area has tropical monsoon climate, faces long spells of dry seasons with very low rainfall (100cm).
	Temperatures (June) (Maximum) Temperatures (December) (Minimum)	The maximum and minimum temperature in this area is 45° and 5° C respectively.
16.	Topography	
	Toposheet Number	54F/8
	Morphology of the Area	Sabalgarh village is located in a valley to the northwest corner of the area. Villages Babupura, Jugopura and Nayagaon are located along a ENE-WSW valley. The southeast corner of the area shows a hilly tract.
17.	Availability of baseline geoscience data	
	Geological Map (1:50K/ 25K)	1:50K map is available
	Geochemical Map	1:50K Geochemical Map is not available
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	Not Available
18.	Justification for taking up Reconnaissance Survey / Regional Exploration	<p>The area exposes the sedimentary lithounits of Bhandar Group of Vindhyan Supergroup. Ganurgarh Shale of Bhandar Group is overlain by Lakheri Limestone, which can be divided into two members like lower massive thinly laminated limestone and upper stromatolitic limestone. These two limestones are separated by a thin blue shale.</p> <p>During 1989 to 1992, DGM, M.P. carried out investigations for limestones in parts of Garhi and Sabalgarh, Morena District, Madhya Pradesh. Ahmad and Ahmed (2015-16), GSI worked in this area and identified three potential blocks with cement grade limestone viz. Garhi-Upcha block, Badretha block and</p>

		<p>Hirawale block and resources estimated 159.45 million tonnes with 38.38 to 47.29% CaO, 129.5 million tonnes with 34.65 to 46.03% CaO and 20.57 million tonnes with 37.68 to 38.99% CaO respectively.</p> <p>Ahmad and Ahmed (2015-16) recommended that the adjoining areas look potential to add to the resources further.</p> <p>Recently a team of geologists of Maheshwari Mining Pvt. Ltd. visited the area. This team has collected a few samples during their reconnoitry traverses. The analytical results of six samples are given below:</p> <p>CaO ranges from 27.38 to 44.84%, MgO ranges from 1.16 to 17.28%, SiO₂ ranges from 3.72 to 11.02%.</p> <p>Out of six samples five represent composition of upper stromatolitic limestone which is siliceous in character. One limestone sample collected from the lower massive band of limestone from Sabalgarh area analysed as CaO: 44.84%, MgO: 1.169% and SiO₂: 11.02, which is compositionally more suitable for the requirement of limestone by cement industry.</p>
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Maheshwari

Mining & Mineral Resources Pvt. Ltd.

Detailed description:

1. Block Summary

Physiography: The area is undulated with a north- south trending broad valley along which the roads and clusters of houses of villages are seen. Either sides of the main valley are marked by highlands and spurs which are above 110m above the floor of the valley. All the streams are flowing towards north along the broad valley and those are joining with Chambal Right Main Canal. The canal is flowing from west to east northeast along the northernmost part of the area.

2. Background Geology (Regional Geology, Geology of the Block):

In the present area the Vindhyan are exposed by the lithounits of Bhander Group of rocks. Ganurgarh Shale is overlain by Lakheri Limestone, which can be divided into two types, one is massive variety with thin siliceous laminations and other one is stromatolitic limestone. The younger stromatolitic limestone is separated from the massive one by a thin blue band of shale.

The regional stratigraphy of the area is as follows:

by Kumar, 2001; Prasad, 1984		
	Group	Formation
Upper Vindhyan	Bhander Group	Dholpura Shale
		Bhalwan Limestone
		Maihar Sandstone
		Sirbu Shale
		Bundi hill Sandstone
		Samaria Shale
		Lakheri Limestone
		Ganurgarh Shale
		Govindgarh Sandstone
	Rewa Group	Jhiri Shale
		Indergarh Sandstone
		Panna Shale
	Kaimur Group	Akoda Mahadev Sandstone
		Badanpur conglomerate
		Chittorgarh Fort Sandstone
	Sand subgroup	Palri Shale
		Sewa Sandstone
	Satola Subgroup	Bhagwagpura Sandstone
		Khairdeola limestone
Khairmalia Andesite		
-----Unconformity-----		
	Berrach Granites/ Bhilwara metamorphics	Granite, metamorphic rocks

Description of lithounits:

In study area the litho-package is undeformed, limestone is subhorizontally disposed and overlain by shale which in turn is capped by sandstone beds. Amount of dip varies from 10-15° recorded in numbers of places. The later tectonic events in the form of upliftment of the area along the weak planes and adjustment resulted in the deep incision of quaternary alluvial deposits and development of bad land topography along Chambal River and tributaries.

Ganurgarh Shale: It is the most common lithology of the area, exposed from Upcha in the south to Shahpura in the north. Broadly based on physical appearance it can be divided into three categories viz.

- I) **The lower ferruginous shale**, exposed only in south of Garhi with a thickness of 05 meters. The shale is thinly bedded, dark red in color due to higher iron content. It underlies the Sabalgarh Limestone, indicating the transition from deep seated basin to shallow basin deposit.
- II) **The blue shale** overlies the Sabalgarh limestone with thickness 05m exposed in Kharipora and 04m around Upcha village. This shale is compact, hard, well bedded of splintery nature and easily splits along the fissile planes as hexagonal plates of 1-2cm thickness. The blue color indicates a continental slope environment of deposition.
- III) **Variiegated shale** separates massive Sabalgarh limestone from the overlying stromatolitic limestone. The shale is soft, loose and easy to get powdered when rubbed in hands. Variiegated shale represents changes in depositional environment and change in source during sedimentary input in the basin. The colour changes from grey, purple, white, yellow and red colour with thickness varies from 8-25 meters as measured in different sections during the large scale mapping in this area.

Lakheri Limestone: Limestone occurs as a horizontal to subhorizontal unit starting from the ground level. The limestone is chemically precipitated cryptocrystalline, with thin lamellae intercalations of siltstone and mud, which range in thicknesses from 2mm to 2cms. Partings are more frequently occurring in the lower and upper part of limestone unit, the central 5 m of limestone unit are more massive with fewer partings of silt and mud.

- I) **Stromatolitic Limestone** is a marker horizon, exposed throughout the area, overlies the massive limestone; both are separated by a blue shale horizon. This limestone is hard and compact due to chert impurity and silicification along the growth rings of stromatolites rendering it to low grade. The iron content is also higher as the weathered surface bears imprint of iron leaching. Since it is a thin stratigraphic unit and is underlain by a thick pile of overburden of shale and sandstone.

3 Mineral potentiality based on geology, geophysics, ground geochemistry etc.:

During 1989 to 1992, DGM, M.P. carried out investigations for limestones in parts of Garhi and Sabalgarh, Morena District, Madhya Pradesh. Ahmad and Ahmed (2015-16), GSI worked in this area and identified three potential blocks with cement grade limestone viz. Garhi-Upcha block, Badretha block and Hirawale block and

resources estimated 159.45 million tonnes with 38.38 to 47.29% CaO, 129.5 million tonnes with 34.65 to 46.03% CaO and 20.57 million tonnes with 37.68 to 38.99% CaO respectively.

Ahmad and Ahmed (2015-16) recommended that the adjoining areas look potential to add to the resources further.

4 Scope for proposed exploration:

As Sabalgarh area of Morena District is located within Vindhya with same geological set up mentioned in the blocks of Garhi Upcha, Badretha and Hirawale as studied from available reports and observations recorded by limited field checks by the geologists of Maheshwari Mining Pvt. Ltd an exploration of G3 stage is proposed to study the potentiality of the area.

- I) The objective of this project is to estimate the resource of Limestone in the area and demarcation of Limestone extension.
- II) Borehole planning on the basis of previous data and present work; chemical analysis of trenching and pitting in the potential areas to delineate the lithological thickness of Limestone deposits and to determine the associated stratigraphic sequences in the area.

5 Previous Work

Previous investigation of Limestone in Morena district was carried out by Ahmad and Ahmed (2015-16). In this area they identified three potential blocks with cement grade limestone viz. Garhi-Upcha block, Badretha block and Hirawale block and resources estimated 159.45 million tonnes with 38.38 to 47.29% CaO, 129.5 million tonnes with 34.65 to 46.03% CaO and 20.57 million tonnes with 37.68 to 38.99% CaO respectively.

6 Block description

Point_ID	Easting	Northing
S-1	737960	2904850
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S-3	739172	2903650
S-4	741394	2903680
S-5	741459	2902790
S-6	738009	2902710

7 Planned Methodology:

In accordance to the objectives set for preliminary exploration (G3 stage) for Limestone in Sabalgarh, Morena District, geological mapping in 1:4000 scale, pitting, core drilling, core sampling, chemical studies, petrological and mineralogical studies are proposed in the block. The exploration will be carried out as per Minerals (Evidence of Mineral contents) Amended Rules-2021. Accordingly, the details of different activities to be carried out are presented in subsequent paragraphs.

7.1 Topographic Surveying

Topographic survey will be carried in the area (4.50 sq. km) and all the surface features will be marked in the 1:4000 scale plan. The block boundary will be surveyed by DGPS / total station in WGS-84 Datum and

demarcation of the boundary pillars to enable the block auctionable. The reduced level and coordinate of the boreholes would be surveyed by DGPS/ total station.

7.2 Geological Mapping

Geological mapping on 1:4000 scale in the area (4.50 Sq. Km) will be carried out by taking geological traverses. The contacts of different formations, surficial lithology, structural features, etc. will be noted in detail. The geological map on 1:4000 scale will be generated based on the details gathered during the field visit.

7.3 Borehole plan:

Vertical bore holes are to be planned in 800 m spacing.

7.4 Core Drilling

Based on **the outcome of the geological mapping**, after review for bedded stratiform regular deposit drilling with 800m spacing, 6 nos. of vertical boreholes with 300 m total depth of core drilling is being proposed over the area 4.50 sq. km. The maximum depth will be 50 m for each bore hole.

7.5 Core Logging

The drill cores would be logged systematically viz. details of litho-units, colour, structural feature, texture, mineralization, beside the recovery, rock quality designation and type of ore would be recorded.

7.6 Core Sampling

The drill core will be split into two equal halves and one part would be preserved in the core box. The other half will be powdered to 120 mesh size and the same would be divided into four parts (250 g each) through coning and quartering. One part of 250 g sample will be sent to chemical laboratory for analysis, second part to be preserved in the camp as duplicate sample, third part to be utilized for preparing composite sample for individual ore band and the fourth part would be kept as either check sample or sample to be used for any other specific purpose.

The length of each sample will be kept 0.50 m-1.0m depending upon the width of particular types of limestone band and its physical character. The primary core samples will be analyzed for Total CaO, MgO, SiO₂, MnO, K₂O, Fe₂O₃, Al₂O₃, Na₂O, TiO₂, SO₃, P₂O₅, Cr₂O₃, ZnO, V₂O₅ & LOI by XRF methods.

7.7 Petrographic & Mineralographic Studies

Thin sections will be prepared from outcrop samples and the core samples and those will be studied for detailed petrographic and mineralographic characteristics. These samples will be drawn from ore zones and associated rocks. A provision of 10 nos. specimens for petrographic and 10 nos. specimens for petrochemical studies is kept for the proposed area.

7.8 Bulk Density Determination

In addition, bulk density determination of 3 nos. of samples will be carried out for the proposed block

8 Nature Quantum and Target

Quantum of work for Preliminary Exploration (G3 Stage) of Preliminary Exploration (G3 Stage) of Limestone in Sabalgarh, Morena District, Madhya Pradesh			
Sl No.	Item of work	Unit	Quantity
A	Detailed Geological Mapping		
1	on 1:4000 Scale	sq. km	4.50
B	Survey Work by surveyor days		
1	Topographic Survey and surface contouring 1:4000 scale	sq. km	4.50
2	Demarcation of proposed boundary, Fixation of Borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes by DGPS	Per point of observation	6 (cardinal point)+ 6 BH= 12
C	Surface sampling		
1	Bed rock sample	Nos	50
E	Trenching/pitting		
2	Pitting	Cu.m	50
D	Drilling		
1	Core drilling	m	300
2	Borehole Pillaring (12"x12"x30")	nos	6
E	Chemical Analysis		
i)	Surface samples + Pit samples/trench samples+ 10% Check Samples complete analysis for limestone by XRF	nos	50+50=100 External check =10
ii)	Core samples+ 10% Check Samples complete analysis for limestone by XRF.	Nos	250 External check = 25
F	Petrological Analysis	nos	
1	Preparation of standard thin section of rock	nos	10
2	Complete Petrographic Studies	nos	10
3	Petro chemical analysis.	Nos	10
G	Bulk Density Determination	nos	3
H	3D ore body modelling using compatible software		
I	Report Preparation (as per MEMC Amendment Rule 2021/UNFC)	nos	1

9 & 10. Manpower deployment and break up of expenditure for Sabalgarh area (G3 stage)

Cost Estimate - Title Preliminary Exploration (G3 Stage) of Limestone in Sabalgarh, Morena District, Madhya Pradesh Area 4.5 sq. km, No.of BH: 6 , Borehole depth range- 300 m; Schedule & timeline- 12 months Review: After 4 Months							
S. No.	Item of Work *	Unit *	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item No. *	Rates as per SoC * (a)	Qty. (b)	Total Amount (Rs) (a*b)	
A	Geological Mapping Other Geological Work & Surveying						
	Detailed Geological mapping, (1:4000 scale) & Trenching , drilling work						
i	a. Charges for Geologist per day (Field) for geological mapping & trenching work, drilling work	day	1.3 b	11,000	160	17,60,000	2 Geologist at field for Mapping, piting Drilling and core sample supervision
ii	b. Labours Charges; Base rate	day	5.7	526	320	1,68,320	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher.
	c. Charges for Geologist per day (HQ)	day	1.3 a	9,000	60	5,40,000	
	d. Charges for one Sampler per day (1 Party)	one sampler per day	1.5.2	5,100	45	2,29,500	
	e. Labours (4 Nos)	day	5.7	526	180	94,680	
Sub Total- A						27,92,500	

B	Survey work						
a	DGPS Survey for BH fixation & RL determination and lease boundary demarcation	Per Point of observation	1.6.2	19,200	12	2,30,400	6 cardinal points + 6 BH points
b	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.	one surveyor per day	1.6.1 a	8,300	45	3,73,500	
c	Labours Charges for survey work;	day	5.7	526	180	94,680	
Sub-Total B						6,98,580	
C	Trenching/Pitting						
	a) Excavation of Pitting	per cu.m	2.1.2	3,800	50	1,90,000	
Sub-Total C						1,90,000	
D	DRILLING IN HOUSE (after review)						
1	Systematic Drilling up to 300m (soft Rock)	m	2.2.4 a	6,290	6	37,742	
2	Borehole deviation Survey by Multishot Camera	m	2.2.6	330	-	-	
3	Land / Crop Compansation (in case the BH falls in agricultural Land)	per BH	5.6	20,000	6	1,20,000	
4	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	6	12,000	
5	Transportation of Drill Rig & Truck associated per drill (1	Km	2.2.8	36	2,306	83,016	1153*2 km to and fro for one rig

	rigs)						
6	Monthly Accomodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	1	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	
10	Drill Core Preservation	per m	5.3	1,590	250	3,97,500	
Sub-Total D						13,10,358	
E	LABORATORY STUDIES						
1	Chemical Analysis						
i)	complete analysis of limestone BRS:50, PIT: 50, BH CORE: 200	per sample	4.1.9	2,900	300	8,70,000	BRS:50, PIT: 50, BH CORE: 200
ii)	complete analysis of limestone (10% External)	per sample	4.1.9	2,900	30	87,000	
2	<u>Physical & Petrological Studies</u>					-	
i	Preparation of thin section	Nos	4.3.1	2,353	10	23,530	
ii	Study of thin section	Nos	4.3.4	4,232	10	42,320	
iii	Digital Photographs	Nos	4.3.7	280	10	2,800	
iv	petro chemical studies	Nos	4.1.15a	4,200	10	42,000	
v	Sp. Gravity	Nos	4.8.1	1,605	3	4,815	
Sub-Total E						10,72,465	
F	3D Ore Body modeling						

						8,00,000		
	Total A to F					68,63,903		
G	Geological Report Preparation	5 Hard copies with a soft copy	5.2	5.2 (i/ii/iii/iv)		3,43,195	Reimbursement will be made after submission of the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.	
H	Peer review Charges		As per EC decision			30,000		
I	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 less		1,37,278	EA will be reimbursed after submission of 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.	
J	Total Estimated Cost without GST					73,74,377		
K	Provision for GST (18%)					13,27,388	GST will be reimburse as per actual and as per notified prescribed rate	
L	Total Estimated Cost with GST					87,01,764		
				or Say Rs. In Lakhs		87.02		
N	Ma h e s h w a r i							
ot								
e:								
1								Strict adherence to the Ministry of Finance's and GFR guidelines is mandatory. Every transaction must adhere to GFR rule 21.
2								In case of delay/non- performance, the appropriate action will be taken by competent authority against delinquent agency as per prevailing govt. of India rules/guidelines on procurement.
3								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 excusion of the project by NEA on its own, a Certifiante regarding non outsourcing of any component/project is required.
4	Necessary efforts should be made to minimize any adverse impact on the environment during exploration activities.							
5	Any item of work not mentioned above shall be added as per SoC.							
*	SoC Item No, Unit and Rate for each item of work must be as mentioned in the SoC.							

Timeline: Title Preliminary Exploration (G3 Stage) of Limestone in Sabalgarh, Morena District, Madhya Pradesh
Area 4.5 sq. km, No.of BH: 6 , Borehole depth range- 300 m; Schedule & timeline- 12 months Review: After 4 Months

S. No.	Item of work	Months												
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Camp Setup	█												
2	Detailed Mapping (1:4000)	█	█											
3	Bed Rock Sampling	█	█	█										
4	Pitting		█	█	█									
5	Chemical analysis of surface samples			█	█									
6	systematic drilling (800X800m)					█	█							
7	Core sampling and its preparation					█	█	█						
8	Chemical analysis of Core Samples							█	█					
9	Processing of Analytical data								█	█				
10	3D ore body modeling									█	█			
11	Preparation of geologial report									█	█	█	█	
12	Peer review												█	
13	final submission													█

REVIEW

11. References:

- (i) Ahmad,S.A. and Ahmed, A. (F.S. 2015-16): Assessment of limestone resources in Bhandar Group of rocks exposed in Sabalgarh-Garhi area, Morena District, M.P.; Progress Report of GSI (unpublished).

List of Plates

Plate 1:Proposed block boundary over topographic map on 1:50,000.

Plate 2: Proposed block boundary over Geological map sample location on 1:50,000.

Plate 3 : Tentative Proposed Borehole location

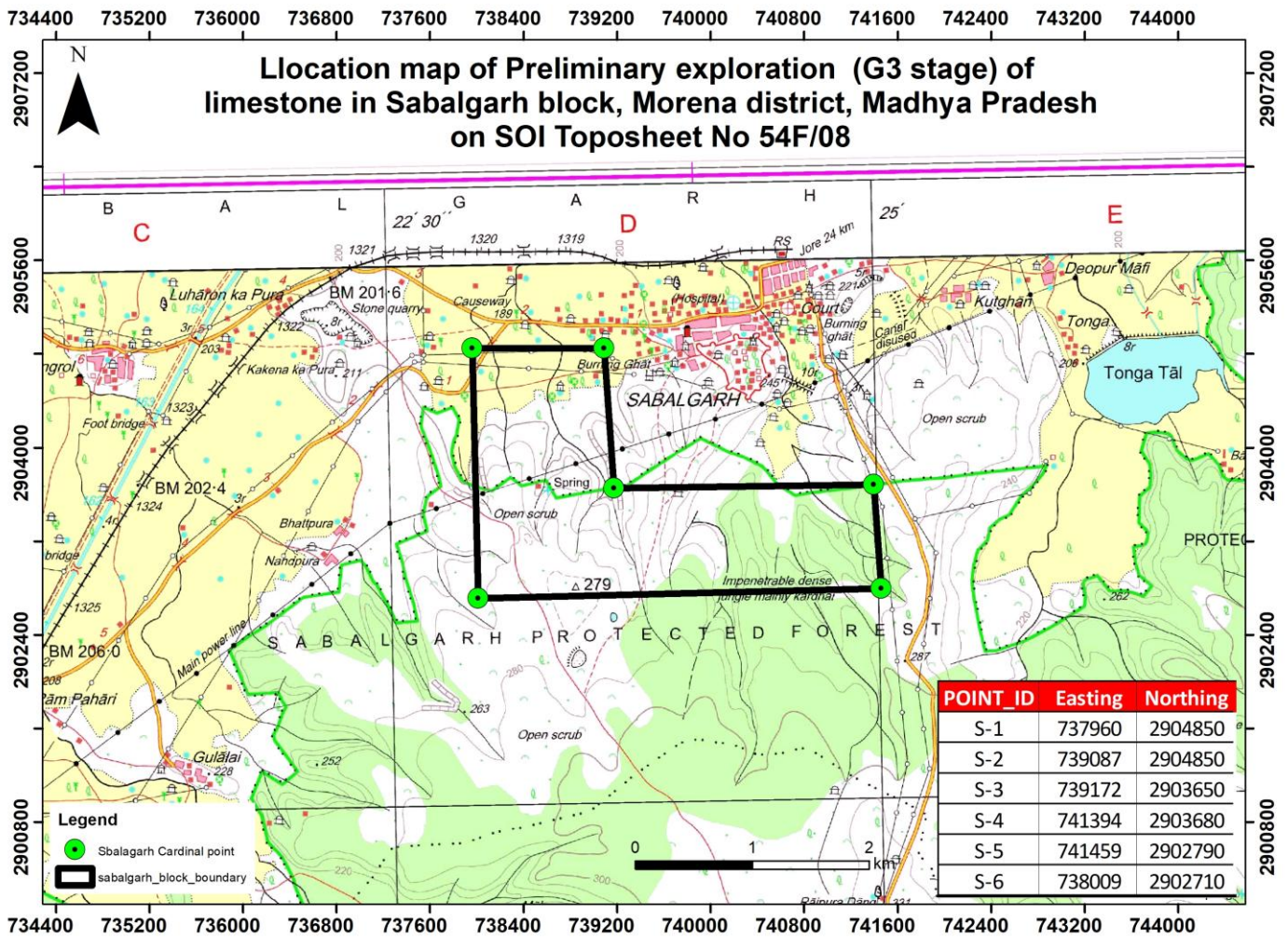


Plate 1: Proposed block boundary over topographic map on 1:50,000.

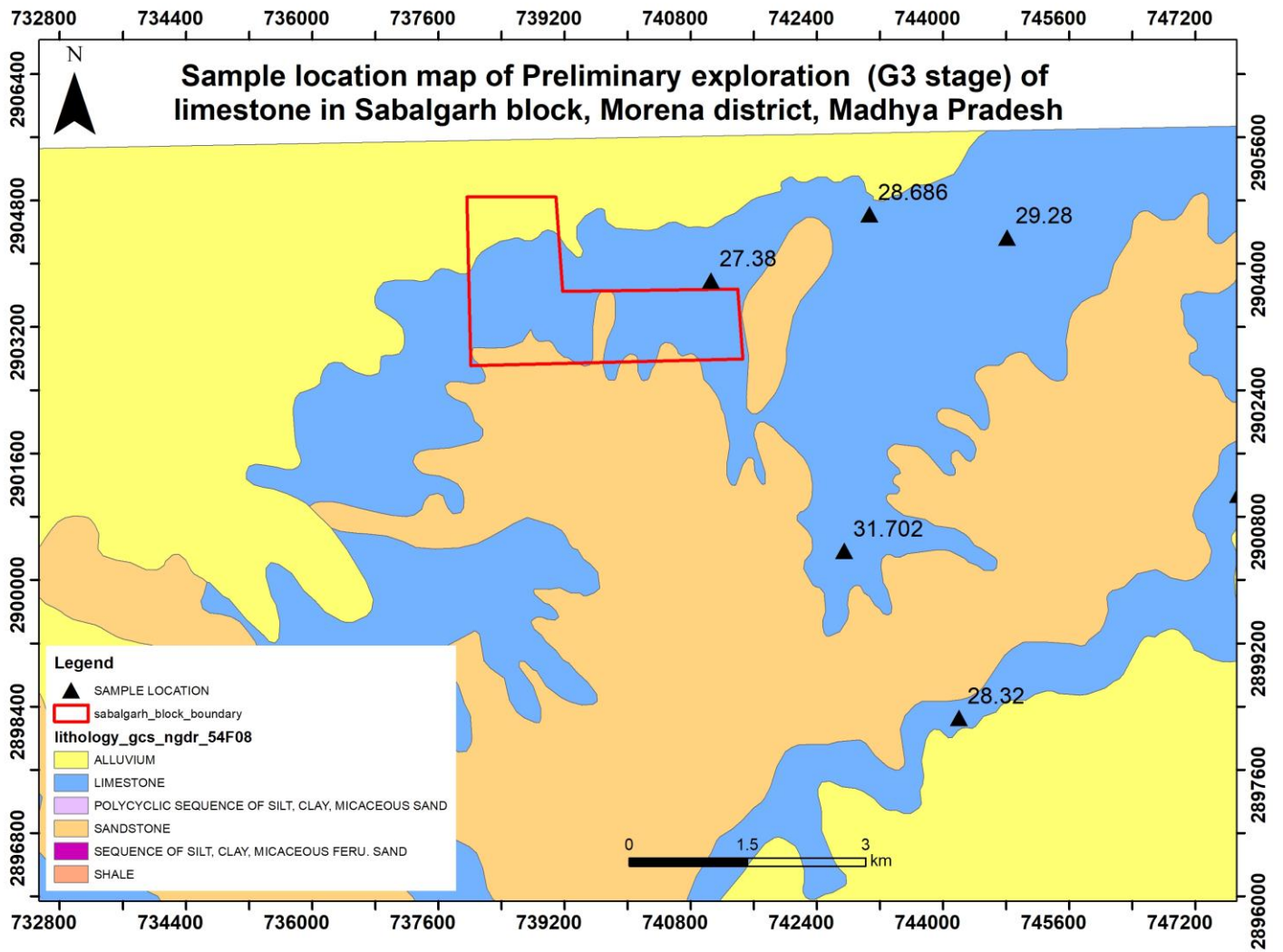


Plate 2 Proposed block boundary over Geological map on 1:50,000.

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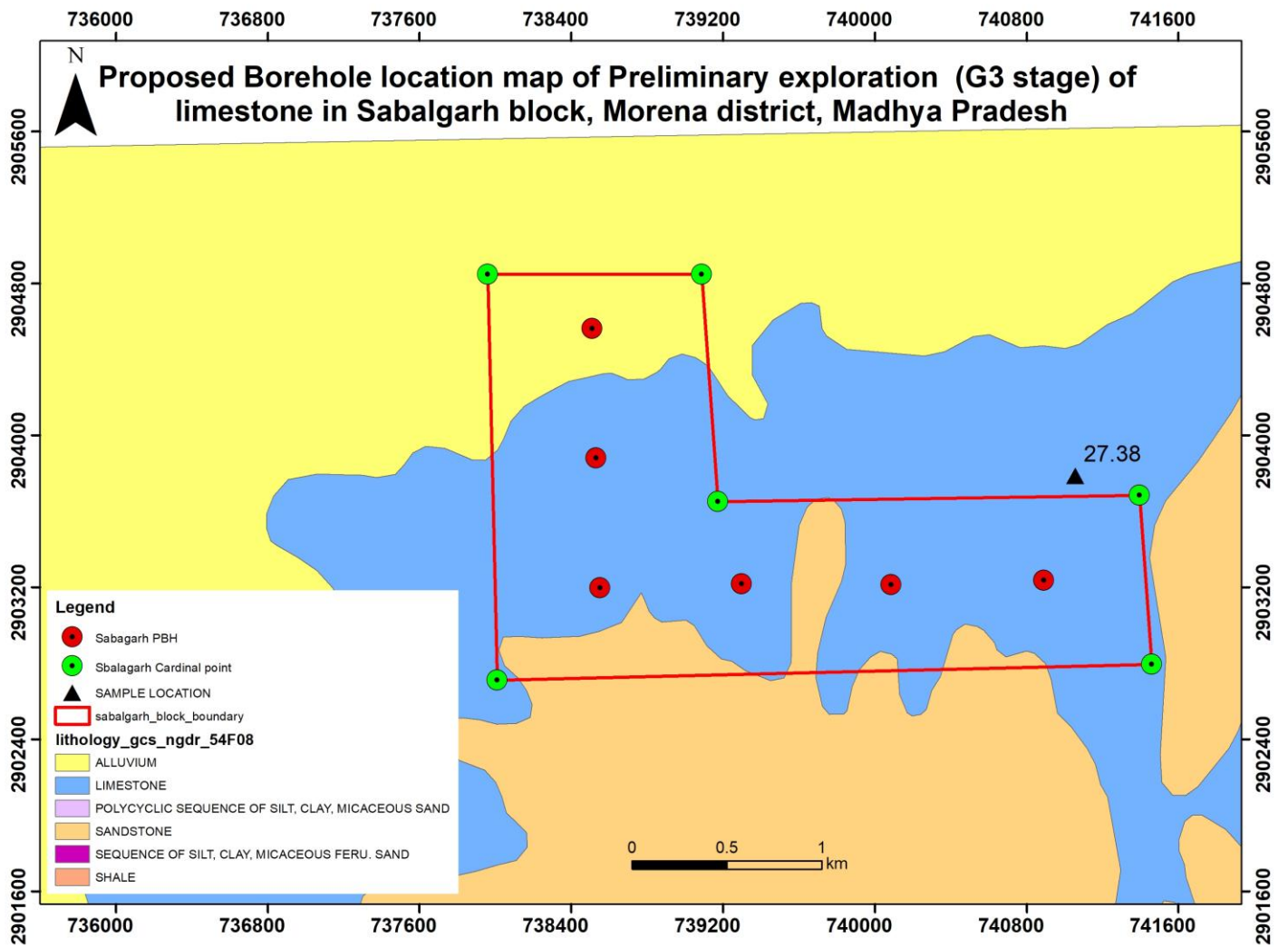


Plate 3: Tentative Proposed Borehole location

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