सत्यमेव जयते

Director, Geology and Mining, Nagpur
27, Khanij Bhavan, Cement Road, Shivaji Nagar, Nagpur-440010
Email-director@mahadgm.gov.in **Telephone No.0712-2228788**

Tech/1846/2023/ 872 Date: 14 MAR 2024

To,

Superintending Geologist,
National Mineral Exploration Trust,
Ministry of Mines,
F-114, Shashtri Bhavan,
New Delhi-110001
Email: nmet-mines@gov.in

Sub: Proposal submitted by Gemko-Kati under NMET namely Sawalhira and Rupapeth, Dist-Chandrapur

Ref: Our letter no Tech/1726/2019 subfile/540 dated16.02.2024

Respected Sir,

With reference to above subject, this is to inform you that, the two Limestone proposals namely Sawalhira and Rupapeth, Dist- Chandrapur sent by Gemcokati Exploration Private Limited, Dist-Chandrapur have been approved for NMET funding, after confirming the overlapping issues with GSI and MECL. There is great demand for Limestone in cement industry and we don't have any block ready in hand for auctioning. The proposed blocks to Gemco Kati along with Savalhira block of DGM will be brought under auctioning by this yearend itself to bridge the gap between demand and supply availability.

This is for your kind perusal and further necessary action.

Thank You.

[Draft approved by hon'ble DGM]

Yours,

Sr. Geologist
(Sanjay Joshi)
Directorate of Geology and Mining
Government of Maharashtra, Nagpur

SANWALHIRI (EAST) BLOCK FOR LIMESTONE EXPLORATION (G3), CHANDRAPUR DISTRICT, MS

Gemcokati Exploration Pvt. Ltd

Plot No-34, Postal Colony, Bapat Nagar,
Chandrapur-442401, Maharashtra.

PLOT NO. 34, POSTAL COLONY, BAPAT NAGAR, CHANDRAPUR 442401, MAHARASHTRA
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PROPOSAL FOR UNDERTAKING PRELIMINARY EXPLORATION

Nagpur, dated the 16th August'2023

To
The Director,
Directorate of Geology and Mining, (DGM)
Plot N0-27, Khanij Bhawan,
Cement Road, Shivaji Nagar,
Nagpur-440010, Maharashtra.

Sir,

I am submitting the following details for granting **'in-principle' approval** of the State Govt. for submitting the scheme of reconnaissance to NMET under Mode-'A' of the Scheme for Engagement of Notified Private Exploration Agencies in Mineral Exploration, issued by Ministry of Mines vide order No. **M.VI.16/15/2021.Mines VI dated 12th August'2021.**

	1) Name and address of the Applicant							
(a)	Name	**GEMCO KATI EXPLORATION PVT.LIMITED**						
(b)	Postal address	Plot No-34, Bapat Nagar, Chandrapur-442401, MS						
(c)	Telephone No (Office)	07172 - 287200						
(d)	Fax No (Office)	07172 – 287200/230562						
(e)	Mobile No	**+91 7044208900**						
(f)	Telephone No (Residence)							
(g)	E-mail address	**subrata.sarkar@gemcokati.com**						
	2) Detail of Accreditation as Private Exploration Agencies and Notification under the proviso to Section 4 (1) of the MMDR Act.							
(a)	Date of accreditation granted by QCI-NABET	16th March'2022						
(b)	Date of expiry of accreditation	6th March'2025						
(c)	Date of Notification under the proviso to Section 4 (1) of the MMDR Act.	7th April'2022						
(d)	Date of expiry of notification	6th March'2025						
(e)	Category of the Exploration agency (Category A or B) under Notification	Under category 'A' Exploration Agency.						
	3) Location details of the area proposed							
(a)	State	Maharashtra						
(b)	District(s)	Chandrapur						
(c)	Nearby village(s)	Korpana						
(d)	Survey of India (SOI) Toposheet No (s)	**56I/14**						
(e)	Area in Sq. Km	5 Sq. Km						
(f)	Boundary co-ordinates of the Proposed Block (in Decimal Degree)	**Sanwalhiri (East) block (G3)**						
			LONGITUDE			**LATITUDE**		
		(A)	78°	58'	36.67"	19°	41'	43.83"
		(B)	79°	00'	00"	19°	41'	42.35"
		(C)	79°	00'	00"	19°	40'	48.92"
		(D)	78°	59'	14.25"	19°	40'	47.20"
		(E)	78°	58'	56.32"	19°	40'	6.90"
		(F)	78°	58'	36.79"	19°	40'	27.61"

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	4) Mineral Potential of the area	
(a)	Name of Mineral(s) identified/expected in the area/block	Limestone
(b)	Basis on which mineral potential of the area has been identified	Please refer enclosed “Summary proposal”
(c)	List of documents/references relied upon in support of item (b) above	1-Block area on goggle map.
	5) **Documents to be enclosed with the application**	
(i)	Location of the proposed block demarcated on Survey of India (SOI) Toposheet (s)	
(ii)	Documents mentioned in items 4 (C) above	

Place: - Chandrapur

Date – 17.08.2023

Signature of the applicant

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Preliminary Project Report [PPR]

Proposal for Preliminary Exploration of Cement grade Limestone in Sanwalhiri (East) Block (G3) [5 sq.km], District, Chandrapur, Maharashtra State

COMMODITY: LIMESTONE

BY

Gemcokati Exploration Pvt. Ltd
Plot No-34, Postal Colony, Bapat Nagar,
Chandrapur-442401, Maharashtra.

Place: Chandrapur

Summary of the Block for G3 stage exploration

	Features	Details
	Block ID	**SANWALHIRI EAST BLOCK (G3) FOR LIMESTONE**
	Current Exploration Agency	GEMCO KATI EXPLORATION PVT.LTD.
	Previous Exploration Agency	GEOLOGICAL SURVEY OF INDIA
	G4 stage Geological Report (Previous stage Geological Report)	Bedded deposit with cement grade Limestone, proposing for directly to G3.
	Commodity	LIMESTONE
	Mineral Belt	P-G Valley, Penganga Group Limestone.
	Completion Period with entire Time schedule to complete the project	**10 Months.**
	Objectives	1. To delineate the surface outcrop (5 sq km) of limestone by detailed geological mapping (DM) in **1:5000** scale with, exploratory drilling. 2. To drill the limestone body **(8 boreholes)** on definite grid pattern 800mX800m as per MEMC rules 2015 to decipher its depth persistent and subsurface continuity to establish the different zones of high-quality limestone. 3. To estimate the in-situ resources of different Grade of limestone for **G3 Stage** of exploration (333), and preparation of Geological Report (GR). 4. Carry out mineral exploration works as per Minerals (Evidence of Mineral Contents) Rule-2015, Mineral (Auction) Rules-2015 and MMDR Amendment act-2015. 5. In turn to facilitate the Government of Maharashtra for auctioning of the block.
	Whether the work will be carried out by the proposed agency or throughout sourcing and details thereof. Components to be out sourced and name of the outsource agency	Work will be carried out by the proposed agency i.e. Gemcokati Exploration Pvt. Ltd Not applicable
	Name/Number of Geoscientists	Two Geologist (2 G) & Surveyor (01)
	Expected Field days (Geology, Geophysics, Surveyor)	Geologist-120 days + 75 days HQ Surveyor – 30 days Sampler-43 days.
1.	**Location**	
	Latitude	**19°40'6.90'' -- 19°41'43.83"**
	Longitude	**78°58'36.67"– 79°00'.00"**
	Villages	Sanwalhiri (East)
	Tehsil/Taluk	Korpana
	District	Chandrapur
	State	Maharashtra
2.	**Area (hectares / square kilo meters)**	
	Block Area	5 Sq. Km.
	Forest Area	Major Part of the area is falling under Manikgarh

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		Reserved Forest Area. [Except one rest seven BHs are falling within Forest area]
	Government Land Area	Forest
	Private Land Area	Northern strip is under agricultural area
3.	**Accessibility**	
	Nearest Rail Head	Gadchandur (30 km)
	Road	2.5 km from Korpana on Adilabad-Korpana Highway; 200-meter local Tar Road
	Airport	Nagpur (205 km)
4.	**Hydrography**	
	Local Surface Drainage Pattern (Channels)	The Penganga River forms the main drainage in the study area into which many minor streams coalesce. The drainage pattern is mostly dendritic in nature.
	Rivers/Streams	Penganga
5.	**Climate**	
	Mean Annual Rainfall	1420 mm
	Temperatures (December)(Minimum) Temperatures (May)(Maximum)	2.8ºC 49ºC
6.	**Topography**	Almost the entire area is represented by vast undulating topography with small, isolated mounds.
	Toposheet Number	**56I/14**
	Morphology of the Area	Physiographically, the area under exploration, exhibits region of low-level plateaus with low relief. The general slope of the area is towards North. The lowest point in the area is 235 m whereas the highest point is 295m.
7	**Availability of base line geosciences data**	
	Geological Map (1:50 K/25 K)	1:50,000 Scale Geological Map is available in public domain and was downloaded from GSI Portal (Bhukosh).
	Geochemical Map	N/a
	Geophysical Map	N/a
8.	Justification for taking up G3 stage mineral exploration	(A) The Geologists of the Exploration Wing of Gemcokati Exploration Pvt Ltd. have visited the area on 04th and 8th & 18th August 2023 respectively. During their visit few grab samples were drawn from the block areas for chemical analysis, analyzed to **(+) 40%-52% CaO**.

Sample No	**CaO%**	MgO%	SiO2%
SH-1	**51.98**	0.69	5.41
SH-2	**45.8**	1.19	11.61
SH-3	**41.16**	0.92	20.42
SH-4	**34.74**	1.13	27.49
SH-8	**46.95**	1.26	10.35
SH-9	**44.87**	1.65	13.31
SH-10	**40.5**	1.43	19.53

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		(B) The area in the west is recently explored (G3), by **DGM, MS** under NMET funding being analyzed between **46% to 50 % CaO**. The block name is **Savalhira.** (C) Few Cement Factories and dolomite mines are situated in the vicinity of this block area also suggest the potentiality of the area. (D) Under the prevailing situation, this block is proposed to be explored under G3 norm of UNFC due to bedded deposit under bulk commodity for making it auctionable block within next 10 months.
	9-Documents to be enclosed with the application	1. Block area on google map. 2.Location of the proposed block demarcated on Survey of India (SOI) & Toposheet(s) 56I/14 3. Block area on Geological Map.

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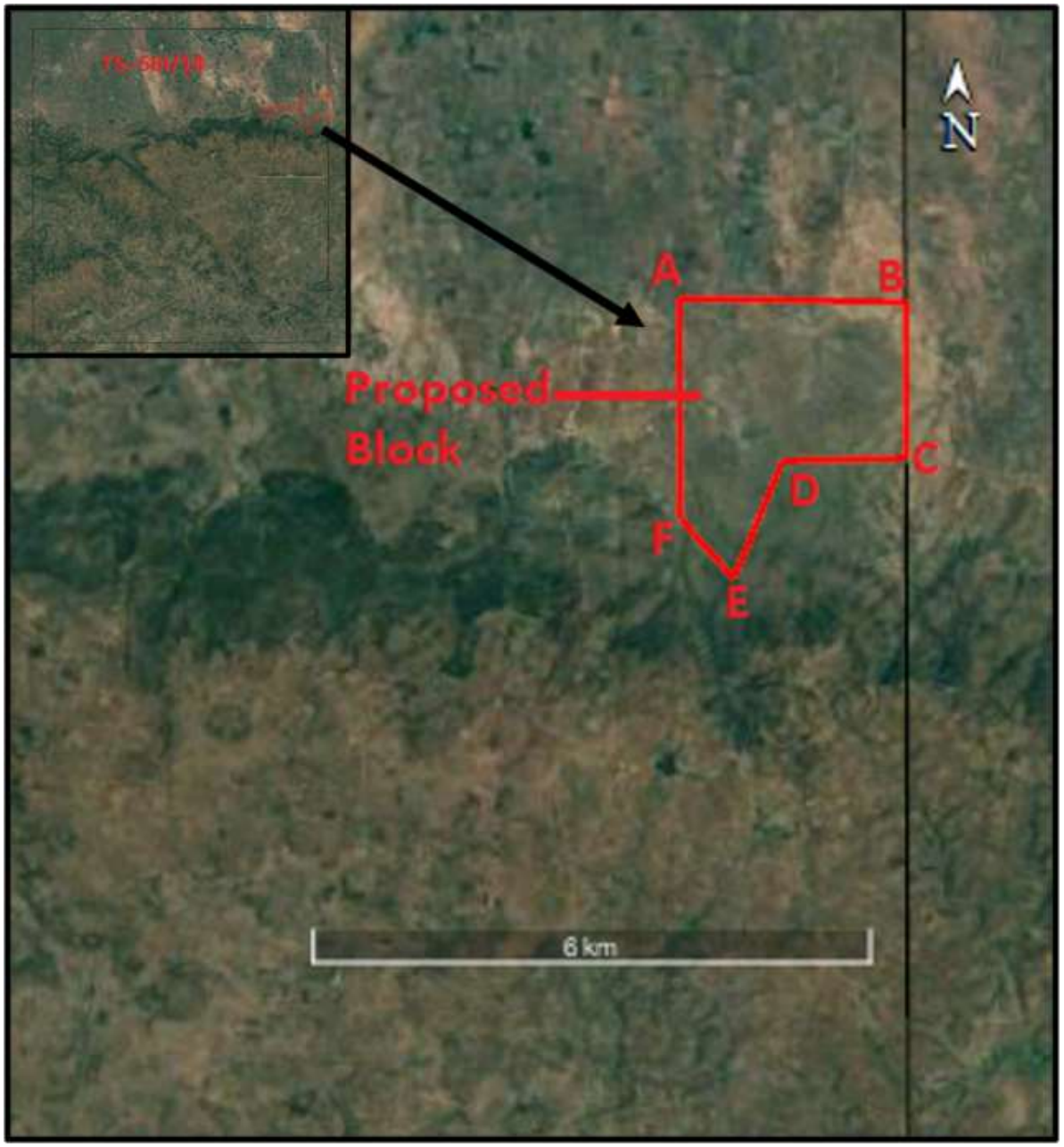
1-Sanwalhiri (E) Block area on google map. [Toposheet-56I/14]



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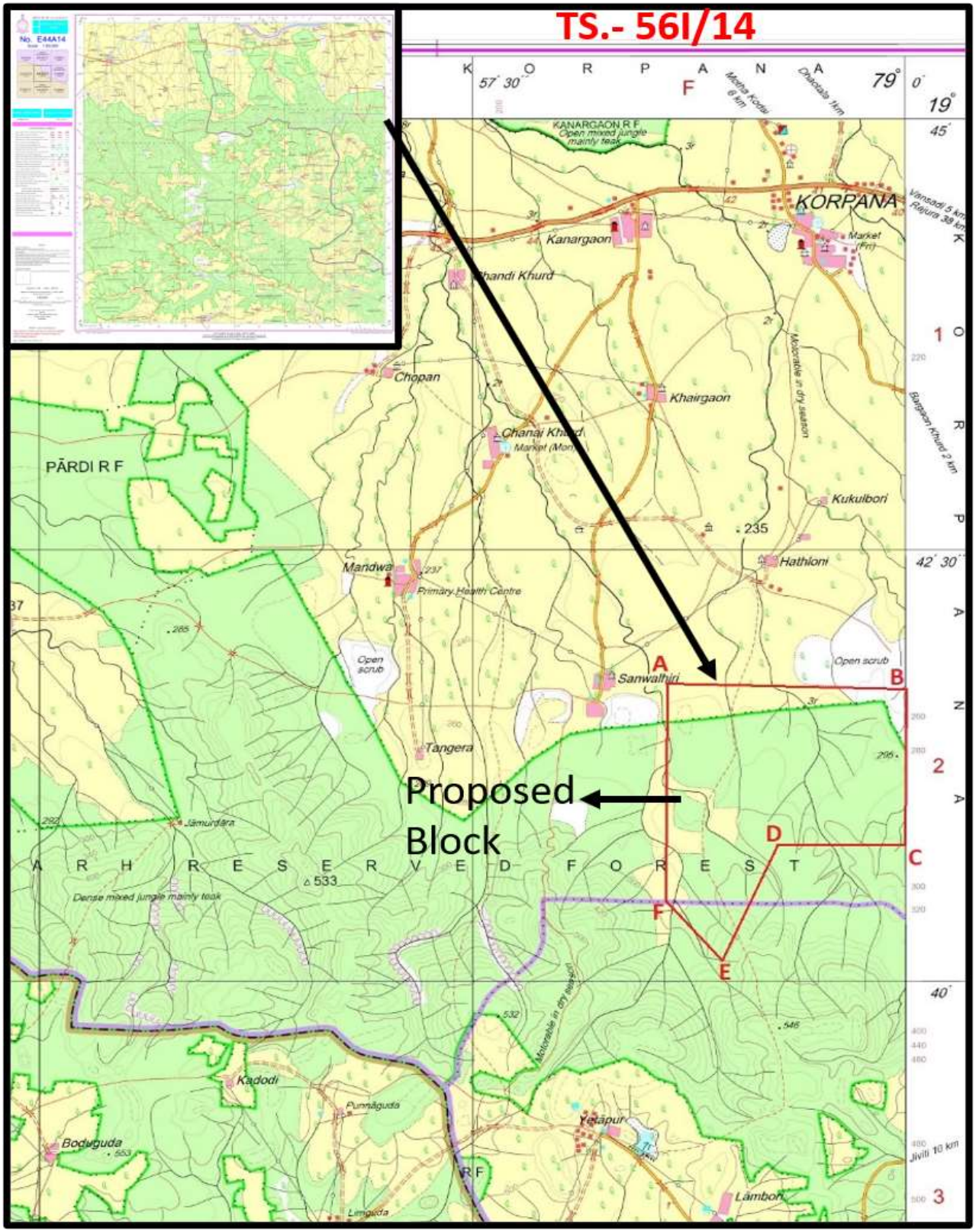
2. Location of the proposed Sanwalhiri (E) block demarcated on Survey of India (SOI) Toposheet(s) 56I/14.



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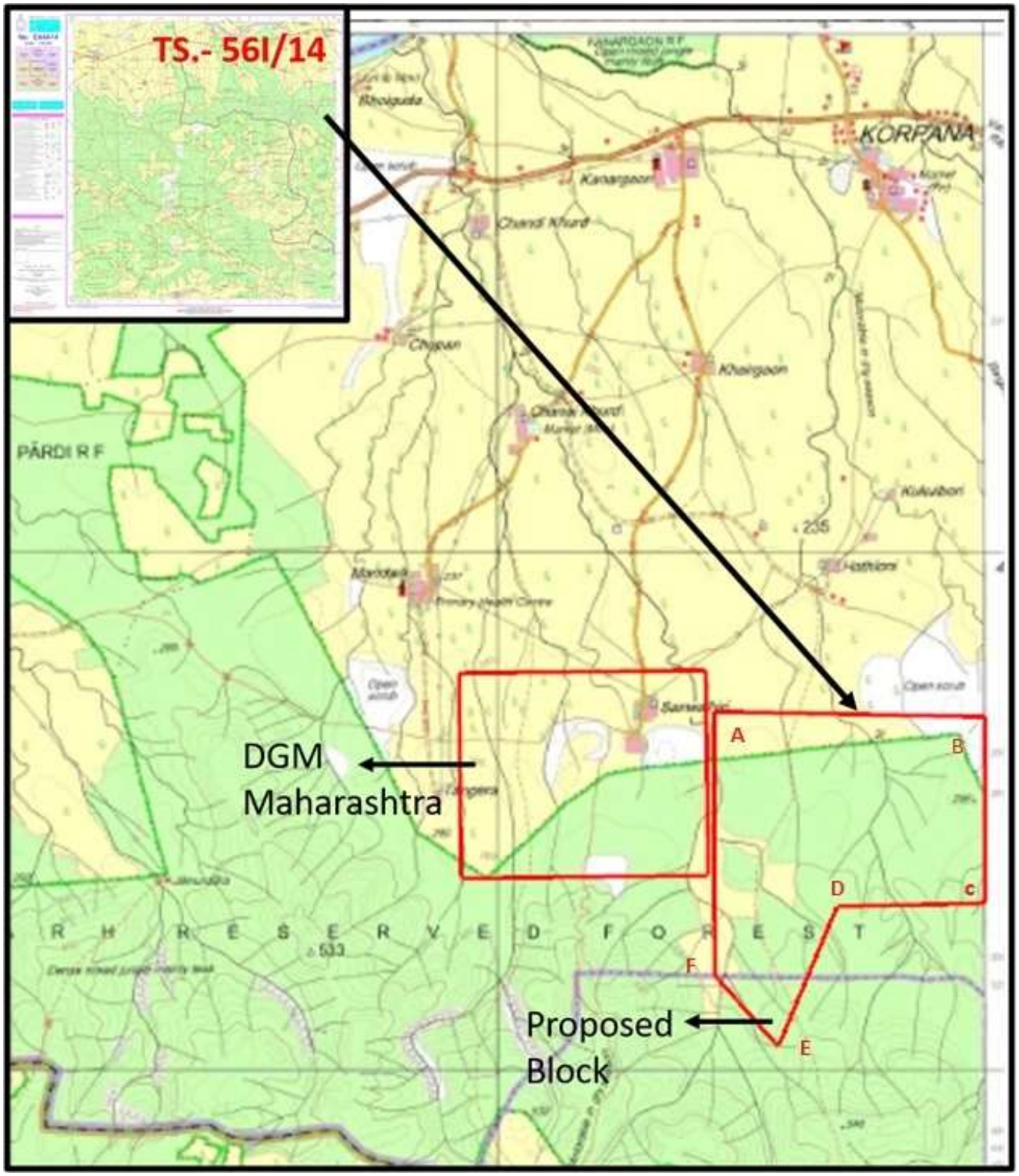
3. NMET funded G3 Limestone Savalhira block of DGM, MS under execution vis-à-vis proposed Sanwalhiri (E) block.



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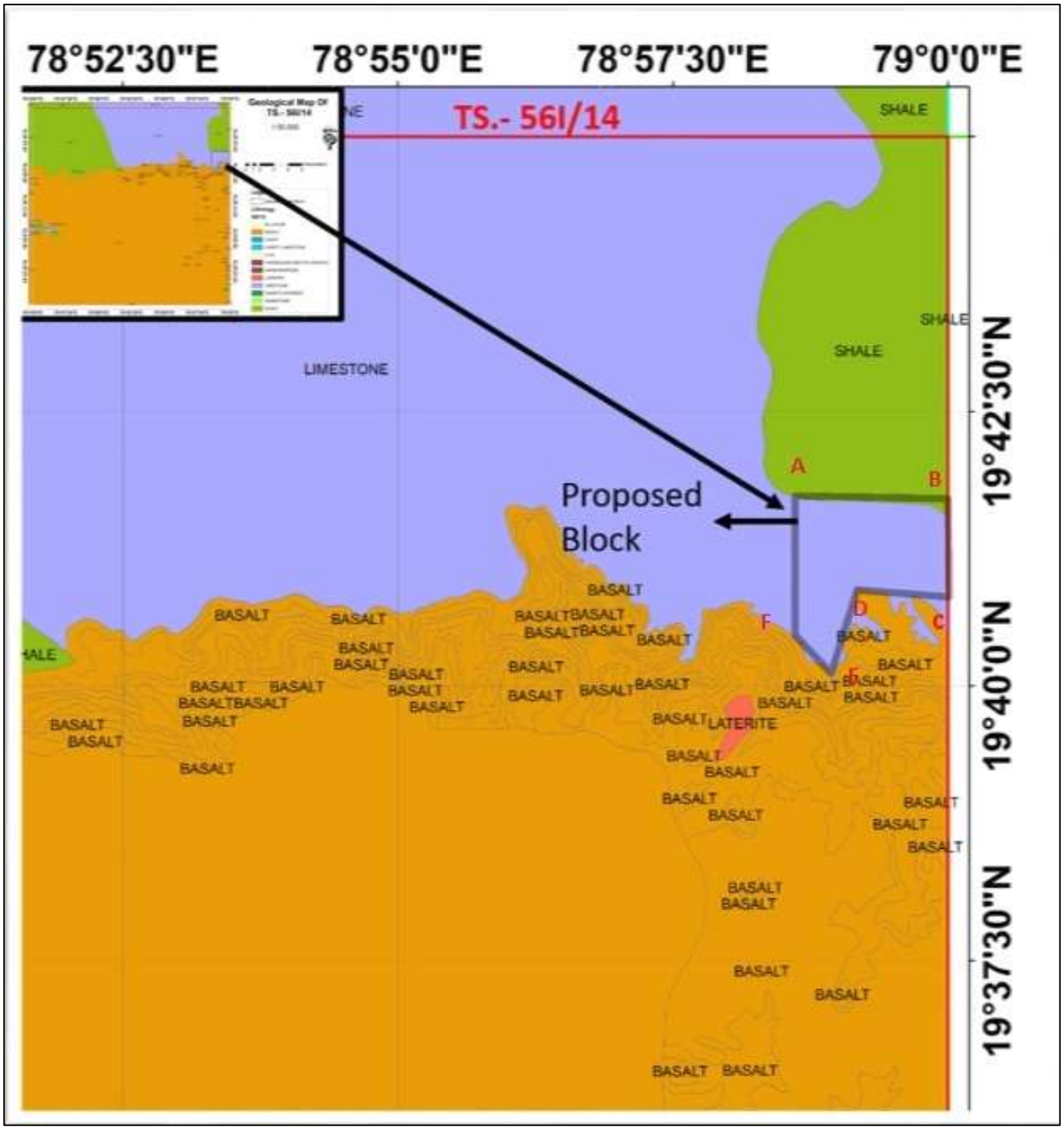
4. Block area on Geological Map.



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Detailed Project Report [DPR]

1. BLOCK SUMMARY:

1.1 Physiography: The area proposed for prospecting is mostly a plain terrain with low relief. The general slope of the area is towards north. The lowest contour in the area is 235m whereas the highest contour is 295m towards south of the block.

1.2 Back Ground & Regional Geology of the Block:

1.2.1 Regional Geology

Geologically, Chandrapur district presents a variety of geological units right from Archean to Recent. The Proterozoic Pakhal basin extends in NW-SE direction for ~350km along the Pranhita-Godavari valley from Telangana state in SE to Maharashtra in NW. The Proterozoic sedimentary rocks in the Pranhita-Godavari (PG) valley are exposed along two NW-SE trending parallel belts separated by a median strip of Gondwana rocks. The south-western belt extends from Khammam in the southeast to Adilabad in the northwest and extends further into Maharashtra state. The north-eastern belt extends from the north of Bhadrachalam in the southeast to beyond Chandrapur, Maharashtra in the north-west

Heron (1949) defined the succession that straddles the northern part of the outcrop belt along the southwestern flank of the valley as Pengnaga Series. Mukhopadhyay & Chaudhuri (2003) redefined it as Penganga Group, and established its stratigraphic succession in the type area around Adilabad (Table 1) The Penganga group comprises of a shallow-marine siliciclastic and a deep-water carbonate-shale dominated succession in the vicinity of Adilabad town, and has been classified in to three formations, the Pranhita sandstone, Chanda Limestone and the Satnala shale, in the ascending order (Mukhopadhyay & Chaudhuri 2003). The Pakhal basin includes unmetamorphosed and un-fossiliferous sediments of the Pakhal supergroup, unconformably overlain by the rocks of Penganga and Sullavai groups. Conglomerates, arkose, shale, dolomite and quartzites characterize the Pakhals, while arkose and limestone characterize the Pengangas and sandstone, the Sullavai's.

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Table1.Regional Lithostratigraphic succession of Penganga Group

(after Joydip Mukhopadhyay *et. al*., 2003)

Formation	Member	Interval	Dominant Lithology Within Penganga Group
SATNALA SHALE			Thin-bedded, monotonous chocolate brown shale, intercalated off-white layers
CHANDALIMESTONE	Brown Heterolithic member (15m)		Alteration between reddish brown shale and Thin beds of brown limestone. Shale content and thickness of beds increase upwards.
	Bilari Member	Upper steel-grey Limestone	Medium to thin bedded steel-grey limestone.(30m)
		Black Limestone (30m)	A heterolitic unit of thin-bedded black lime mudstone and marl.
		Lower steel-grey Limestone	Massive, medium to thick bedded (10to30cm)(20m) steel grey lime mudstone with stratiform Stylolites.
	Ramai Member	Grey siliceous limestone	Siliceous limestone, cream to grey, hard, (105m) resistant limestone, medium to thin bedded Lime mudstone, lime clast conglomerates, calcarenites, and pebbly mudstone with at least two horizons of interstratified bedded chert and mn ore, lower 25m is light grey to cream lime mudstone with a few mixed carbonate siliciclastic debris flow beds.
	Bhimsari Member	Pink Limestone 45m)	Massive, medium to thick-bedded pink, dolomitic lime mudstone with stratiform stylolites. Stratiform dolomites formed locally. A few beds of mass-flow lime-clast conglomerates.
		Brown Limestone (62m)	Massive, medium to thick-bedded Lime mudstone with stratiform stylolites, lower few meters with dcm-scale brown limestone-shale heterolithic and brown shale. A few beds of mass-flow conglomerates. A lenticular body of glauconitic sandstone of mass-flow origin at the lower part.
PRANHITA SANDSTONE		Shale member (15m)	Thin laminated green mudstone grading Upwards to brown shale.
		Sandstone member (20m)	Cross-stratified, well sorted subarkose
UNCONFORMITY			
Granitic Basement			

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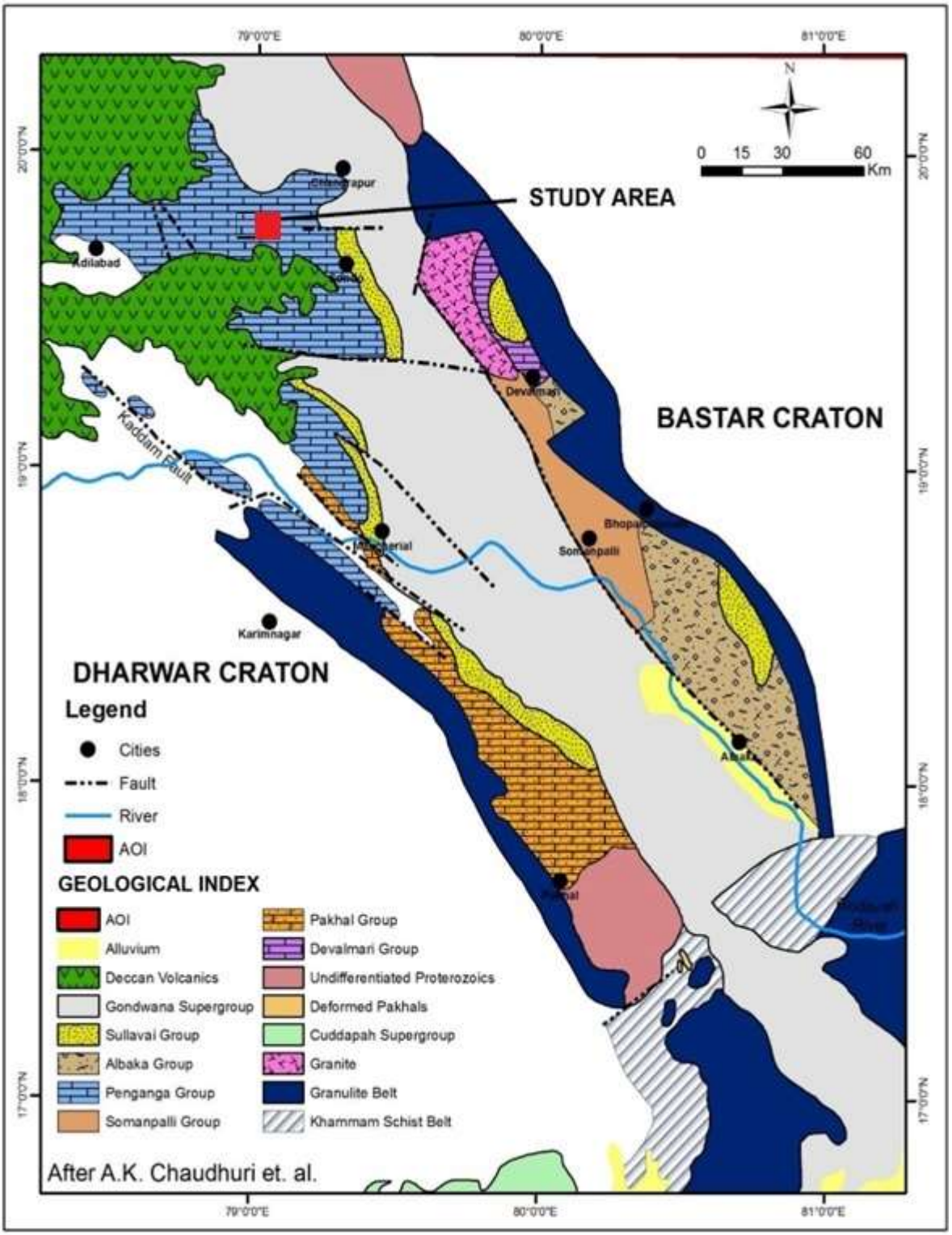

Fig2- Regional Geological Map of P-G Valley showing study area

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1.2.2 Geology of the block:

The area is located in the western flank of PG valley ~220km from Nagpur city. The area exposes Deccan traps in the southern part. Mostly the study area is dominated by Penganga group of Meso to Neo Proterozoic age. The Rb Sr age determination from the lower part of the succession yielded two results 770 ±30 Ma and 790±30 Ma (Chaudhurietal.1989). The major lithologies observed in the area are Chanda Limestone and Satnala Shale. The Chanda limestone formation (limestone, dolomitic limestone and dolomites) is predominantly a bedded lithographic limestone (Chauduri et al., 1989; Bose and Sarkar, 1991; Bandopadhyay, 1996 and Mukhopadhyay et. al., 1997). The limestone grades upwards to thinly laminated brown shale, the Satnala Shale. The Satnala Shale formation is the thickest of all units in this group, and attains a thickness of about 2000m at some profiles.The shale is devoid of any siliciclastics coarser than mud and lacks wave/current generated structures suggesting its deposition in deep basinal condition (Mukhopadhyay et.al.,2003).The stratigraphic sequence of lithounits based on field observations and co-relation of lithounits found in field with various literature studies available is given below:

Table 1.2 Local Geology of Block

Group/ supergroup	Formation	Member	Lithology	Geological Age
Alluvium	Alluvium	-	Gravels, sand, silt and clay	Quaternary
DeccanTrap	Unclassified Basaltic Lava Flows	-	Dark grey to grey, fine grained, amygdaloidal, massive hard compact basalt	Cretaceous to Paleogene
Penganga Group	Satnala Shale	Chocolate brown shale	Thin-bedded, monotonous chocolate brown shale, intercalated off-white layers	Meso to Neo Proterozoic
	Chanda Limestone	Bilari Member	Massive, medium to thick bedded steel grey lime mudstone with stratiform Stylolites	
		Pink Limestone	Massive, medium to thick-bedded pink, dolomitic lime mudstone with stratiform stylolites. Stratiform dolomites formed locally.	
		Brown Limestone	Massive, medium to thick-bedded Lime mudstone, brown limestone- shale. A few beds of mass-flow conglomerates. A lenticular body of glauconitic sandstone of mass-flow origin at the lower part	
	Pranhita Sandstone	Shale member	Thin laminated green mudstone grading upwards to brown shale.	

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1.3 Mineral potentiality based on geology

Agarwal R.K. And V Subbarao of Geological Survey of India had mapped the part of Toposheet no 56I/14 during field season1984-85. Limestones and dolomitic limestones in the area had been chemically analysed and the study of their results suggested the presence of cement grade limestone near Chopan, Savalhira, area of T.S. 56I/14.

The Geologists of the Exploration Wing of Gemcokati Exploration Pvt Ltd. have visited the area on 04th and 8th August'2023 respectively. During their visit few grab samples were drawn from the block areas for chemical analysis, analyzed for **(+) 40%-52% CaO**.

Table - 3

Sl. No.	Customer Code	SiO2	Al2O3	S	P	MnO	TiO2	MgO	CaO	Na2O	K2O	Fe2O3	SO3	BaO	LOI
1	SH-1	5.41	1.28	0.02	<0.01	0.09	0.06	0.69	51.98	<0.08	0.25	0.57	0.05	<0.05	39.46
2	SH-2	11.61	2.15	0.06	<0.01	<0.05	0.12	1.19	45.8	<0.08	0.94	1.2	0.15	<0.05	36.71
3	SH-3	20.42	3.47	0.03	<0.01	0.13	0.18	0.92	41.16	0.14	0.67	1.22	0.08	0.06	31.48
4	SH-4	27.49	4.89	0.03	0.02	0.12	0.26	1.13	34.74	0.18	1.13	1.88	0.07	0.05	27.95
5	SH-8	10.35	1.73	0.09	<0.01	<0.05	0.1	1.26	46.95	<0.08	0.66	0.96	0.23	<0.05	37.64
6	SH-9	13.31	1.64	0.1	<0.01	<0.05	0.1	1.65	44.87	<0.08	0.64	0.97	0.25	<0.05	36.46
7	SH-10	19.53	2.92	0.03	<0.01	<0.05	0.17	1.43	40.5	<0.08	1.21	1.35	0.08	<0.05	32.66

Above results confirmed the presence of cement grade limestone from Sanwalhiri (East) block.

The area seems to be promising for direct prospecting under G3 stage.

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1.4 Scope for proposed exploration

Sr.No	Nature of Work	Proposed Work
1	Detailed Mapping (1:4000)	5 sq km
2	Trenching	20 cu m
3	No. of Boreholes	08
4	No. of Rigs to be deployed	01
5	Total Drilling	520 m [7x60 +1x100=520]
6	Average Borehole Depth	60 m
7	Drill Core samples	346 (approx.@ 1 samples from 1.5 m vertical log ie @ 2 samles per run) + 34 Check samples=380
8	Trench samples	20 +2 (check)=22
9	Bed Rock Samples	20 +2 (check) =22
10	Chemical Analysis (Major Oxide) using 4 KW WD XRF through Borate Fusion Bead	424.(CS-380+BRS-22+PTS-22)
11	Determination of in-situ Bulk density	5
12	Category of Land	Under forest and partly Private Land
13	Geological Personnel	Geologist (02)
14	Period of Scheme	10 months

1.5 Recommendations

- On the basis of positive chemical analysis of grab samples of Limestone in the Sanwalhiri (East) Block collected during Recconaitory traverses taken by the Geologists of M/s Gemcokati Exploration Pvt. Ltd, Chandrapur, are of opinion that the area can be directly taken for G3 stage of exploration.

Objectives

- To map the block area of 5 sq.km in1:5000 scale through total station and DGPS.
- To drill the limestone body (8 boreholes) on definite grid pattern 800m X 800m as per MEMC rules 2015 to decipher its depth persistent, subsurface continuity and to establish the different zones of good quality limestone.
- Carry out mineral exploration as per Minerals (Evidence of Mineral Contents) Rule-2015, Mineral (Auction) Rules-2015 and MMDR Amendment act- 2015, which in turn to facilitate the Government of Maharashtra for auctioning of the block.
- Demarcate zone of various grades of limestone and estimate grade wise resource in the study area as per MEMC norms from G-3 level of exploration.

2.0 PREVIOUS WORK:

- The geology of the area was first studied by Sir. T.W.H. Hughes, in the year 1877 who mapped the limestone bands as Penganga beds in south of Yavatmal district as Vindhyans. B.N. Sinha mapped the toposheet no 56 I/13. Later workers like A.K.R. Hemmady (1964) considered the Penganga beds to be representing transitional state between Vindhyan and Cuddapah. R.K. Agarwal and V Subba Rao Geologist (Jr) of Geological Survey of India, carried out systematic geological mapping in parts of toposheet no 56I/09, 56I/13 and 56I/14 in field season 1984-85 and mapped the limestone bands as Penganga beds.

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- Report for Preliminary Investigation of cement grade limestone in Savalhira block (G3) [4.04 sq.km], district, Chandrapur, Maharashtra state by DGM,MS (Not yet been submitted).

3.0 BLOCK DESCRIPTION:

	LONGITUDE			LATITUDE		
(A)	78°	58'	36.67"	19°	41'	43.83"
(B)	79°	00'	00"	19°	41'	42.35"
(C)	79°	00'	00"	19°	40'	48.92"
(D)	78°	59'	14.25"	19°	40'	47.20"
(E)	78°	58'	56.32	19°	40'	6.90
(F)	78°	58'	36.79	19°	40'	27.61

4.0 PLANNED METHODOLOGY

- **Detailed Geological Mapping:** The geological mapping on a 1:5000 scale is to be carried out in and around 5 sq km area by taking traverses with the help of DGPS and ETS. The geological map would be prepared by adding geological features, attitudes of beds, structural features etc. to be picked up and plotted during mapping.

- **Drilling:** A total of 08 vertical boreholes with an average depth of 60 m would be drilled to interpret the lithological contacts from borehole data of Gemcokati between various lithologies and groups encountered and to be plotted on the geological map. A total of 520 m of drilling meterage shall be executed in the said scheme. (Borehole Location shown in map)

- **Core Logging and Sampling:** Core logging provides the basic information regarding the litho-assemblages, rock forming minerals, core recovery and recovery percentage. The limestone Grades within a single borehole will be marked during logging. Core recovery, core recovery percentage, unit length, extrapolated length along with the mineralogical and lithological features shall be recorded run wise in the logging book. The borehole cores are to be run-wise logged as per litho-units, structural features (fractures, laminations) and rock types. Samples will be collected according to the required sample length @ average one sample in 1.5 meters ie.two samples per run using a measuring tape, placing them in a book pattern and shall be marked appropriately by a marker. Consequently, an estimated 346 number of drill core samples and additionally 10 % check samples ie.34 along with 20 (2) Bed rock samples and 20 (2) trench samples, totaling to **424 nos** shall be collected for chemical analysis.

- **Chemical Analysis:** The collected samples shall be analyzed by WD XRF through Borate Fusion Bead for radicals like CaO, MgO, SiO_2, MnO, K_2O, Fe_2O_3, Al_2O_3, Na_2O, TiO_2, SO_3, P_2O_5, Cr_2O_3, ZnO, V_2O_5 & LOI etc. including 10% of the primary samples shall be analyzed as check samples as well, totaling to = 424 samples from different laboratory. In addition, Bulk Density 5 nos will be carried out.

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- **Exploration Report:** Generate a detailed report (Final G3 stage Report) along with a Geological Map identifying and establishing the deposit with quantity and quality of resources worthy of being raised to a G-3 scheme of exploration as per MEMC-2015.Data generated from G-3 level works, shall be presented in the Report as per the guidelines laid down in provisions of MINERAL (EVIDENCE OF CONTENTS) RULES-2015 in the NMET prescribed format for Peer Review.

5.0 NATURE, QUANTUM ANDT ARGET:

Proposed Quantum of Work			
Sr. No.	**Item of work**	**Unit**	**Proposed Quantum of work**
1	Detailed Mapping (on1:4000 Scale)	sq. km.	5
2	Trenching	Cu.m	20
3	Core Drilling	m.	520
4	Laboratory Studies	Nos.	424 [CS-380+BRS-22+PTS-22]
A	Primary samples		
	i) Chemical Analysis: Primary for CaO, MgO, SiO_2, MnO, K_2O, Fe_2O_3, Al_2O_3, Na_2O, TiO_2, SO_3 P_2O_5, Cr203, ZnO, V_2O_5 & LOI	Nos.	386[346 +20+20]
	ii) Check samples (10% of Primary samples) for analysis of CaO, MgO, SiO_2, MnO, K_2O, Fe_2O_3, Al_2O_3, Na_2O, TiO_2, SO_3, P_2O_5, Cr203, ZnO, V_2O_5 & LOI	Nos.	38[34+2 +2]
5	Bulk Density Determinations	Nos.	5
6	Report Preparation	Nos.	1

Borehole Spacing (as per MEMC 2015)

Type of deposit	Bedded Stratiform and Tabular deposit of regular habit (Limestone)
G3 stage	800 m X 800 m

6.0 Exploratory drilling

- The total block area is 5 sq.km. The area is proposed for exploration by drilling with 8 number of boreholes at 800 X 800m grid interval with meterage of 520 m with an average vertical depth of 60 m across the strike length of the limestone body as per MEMC 2015 guidelines for G3 stage exploration with a stratigraphic borehole upto 100m to prove the depth continuity of limestone bed.

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7.0 TIME SCHEDULE

Item of Work	1	2	3	4	5	6	7	8	9	10
1. Forest clearance										
2- Detailed Mapping (1:5,000), Surface Sampling and Chemical analysis										
3 – PTS & Chem analysis										
4 – Drilling & Chem analysis										
5- Review										
6 – Interpretation of analytical data, finalization of lithologs, plates										
7 – Review & report preparation / Peer review										
8-Final submission										

Manpower Deployment Geologist party:

- 2 Geologist - 120 Field days + 75 HQ days

Survey party:

- **1** Surveyor - 30 days

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8.0 Break up of expenditure

Sr.No.	Item of work	Target	unit	SOC	Base Rate	Cost
A	Drilling					
1	Surface Drilling (1Rig)	520	m	2.2.1.1b	5242	27,25,840
	Sampler for sample processing work	43	day	1.5.2	5100	2,19,300
	Labour (4nos) charge	172	day		500	86,000
	BH pillaring: Construction of concrete pillar	8	nos	2.2.7a	2000	16,000
	Borehole plugging by cement	520	meter	2.2.7b	150	78,000
	Monthly accommodation charges for drilling camp	3	months	2.2.9	50000	1,50,000
	Drilling Camp setting cost	1	per Drill	2.2.9a	250000	2,50,000
	Drilling Camp winding cost	1	per Drill	2.2.9b	250000	2,50,000
	Land /crop compensation	1	BHs	5.6	20000	20,000
	Road making (flat terrain)	2	per km	2.2.10a	22020	44,040
	Transportation of drilling rig (to & from)	1050	per km	2.2.8	36	37,800
	Trenching	20	Cu.m.	2.1.1	3330	66,600
	Sub Total A					**39,43,580**
B	Geological Work					
	Survey Party (1party) without labourer	30	day	1.6.1a	8300	2,49,000
	Labour (4nos) charge for survey work	120	day	5.7	500	60,000
	Fixation of lease boundary, BHs, co-ordinates & RL through DGPS	13	points	1.6.2	19200	2,49,600
	Geologist (Field days)	120	day	1.3	11000	13,20,000
	Field labourer	240	days	5.7	500	1,20,000
	Geologist (HQ days)	75	day	1.3	9000	6,75,000
	Sub Total B					**26,73,600**
C	Laboratory Studies					
1	Chemical analysis					
	i) Primary Samples & Check samples					
	a) Estimation of major oxides by XRF/whole rock analysis for primary samples (CaO, MgO, SiO2, Al2O3, LOI, Na2O, Fe2O3, MnO, K2O, TiO2, SO3, P2O5, Cr203, ZnO, V2O5)	386	per sample	4.1.15a	4200	16,21,200
	Estimation of major oxides by XRF/whole rock analysis for check samples	38	per sample	4.1.15a	4200	1,59,600
2	Physical Analysis					
	i) Bulk Density determination	5	Nos	4.8.3	3,540	17,700
	Sub Total C					**17,98,500**
D	Preservation of core					
	Core preservation charges	**240**	**Nos**	**5.3**	**1590**	3,81,600
	Sub Total D					**3,81,600**
	Total A+B+C+D					**87,97,280**
E	Preparation of Exploration Proposal: 2%			5.1		**1,75,946**
F	Geological Report Preparation: 5%			5.2		**4,39,864**
G	Additional 4 copies	4	copy	5.2	3,000	**12,000**
	Total E+F+G					**6,17,590**
H	**Total A to G**					**94,14,870**
I	**GST@18%**					**16,94,677**
J	**Grand Total**					**1,11,09,547**

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10. References:

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2. Guntiwar V.S., Samji R.N. 1986, Report on prospecting for limestone in Jawra -Tulsi area, Tah Rajura, Chandrapur District Maharashtra, Directorate of Geology and Mining, Maharashtra
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4. Agarwal R. K., Subba Rao V,1985, “Geology of parts of Yavatmal and Chandrapur District, Maharashtra”, Journal Geological Survey of India
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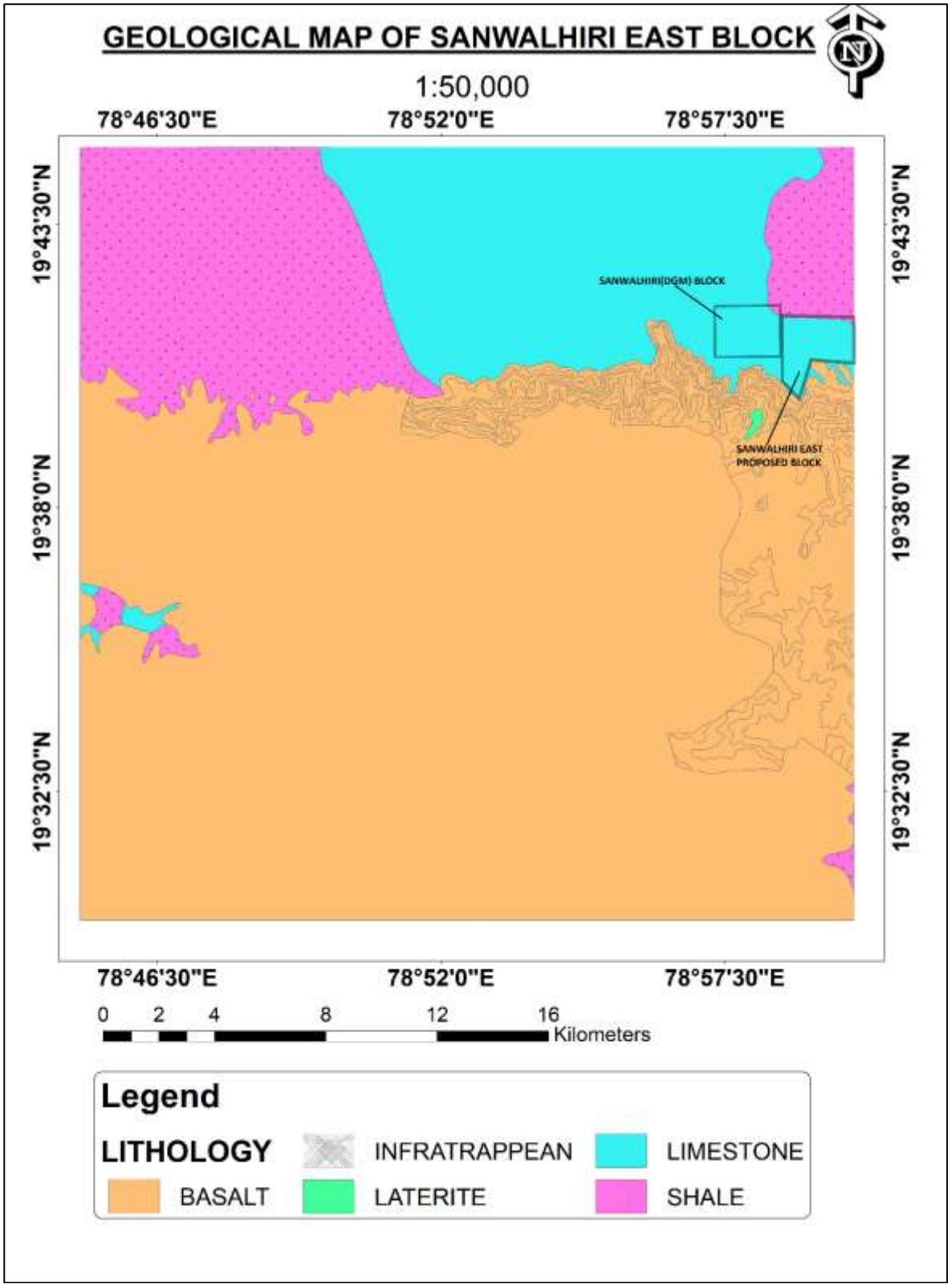
1. **Map showing proposed blocks together with ongoing DGM Block**



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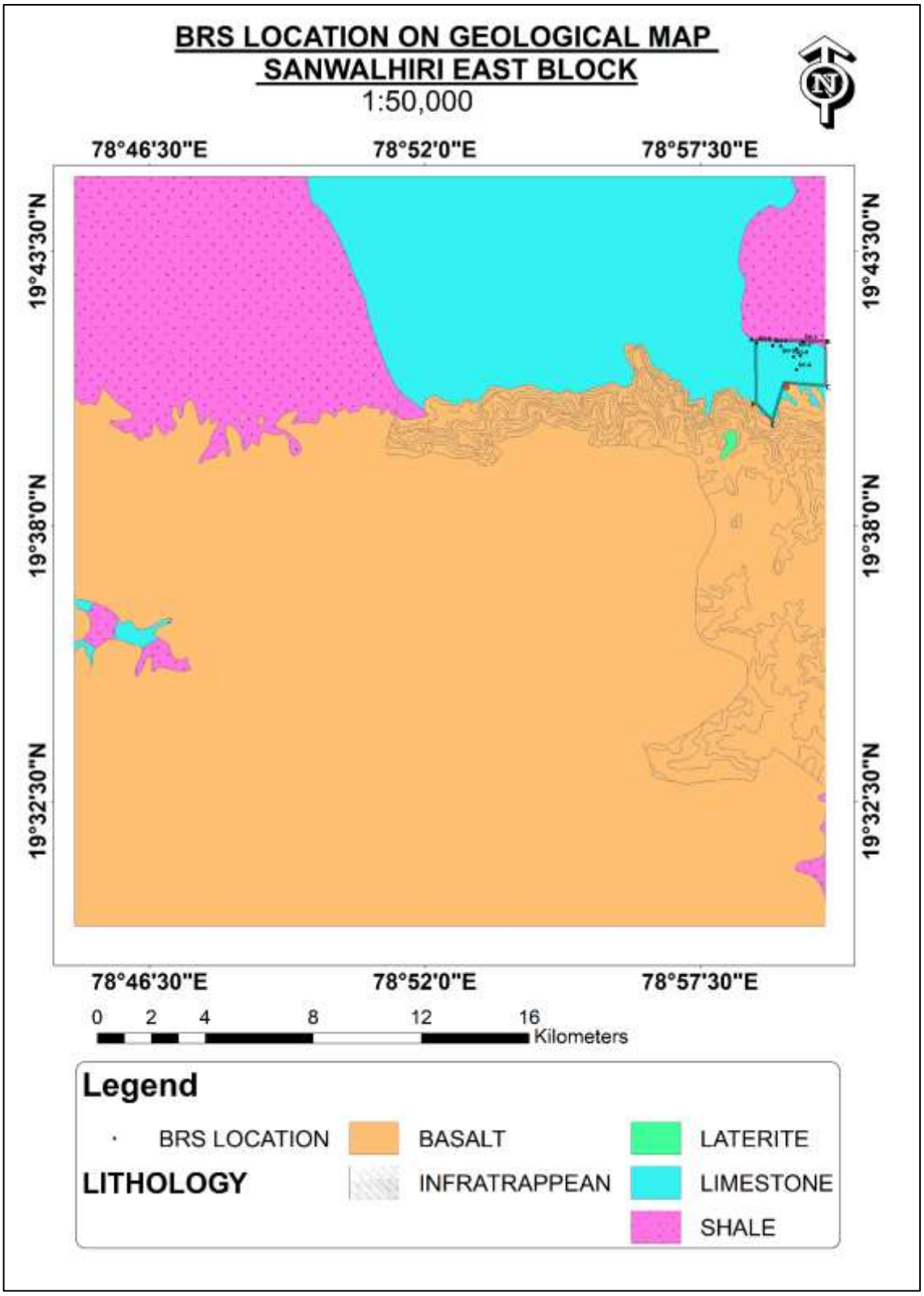
2. Geological map of T.S- 56I/14



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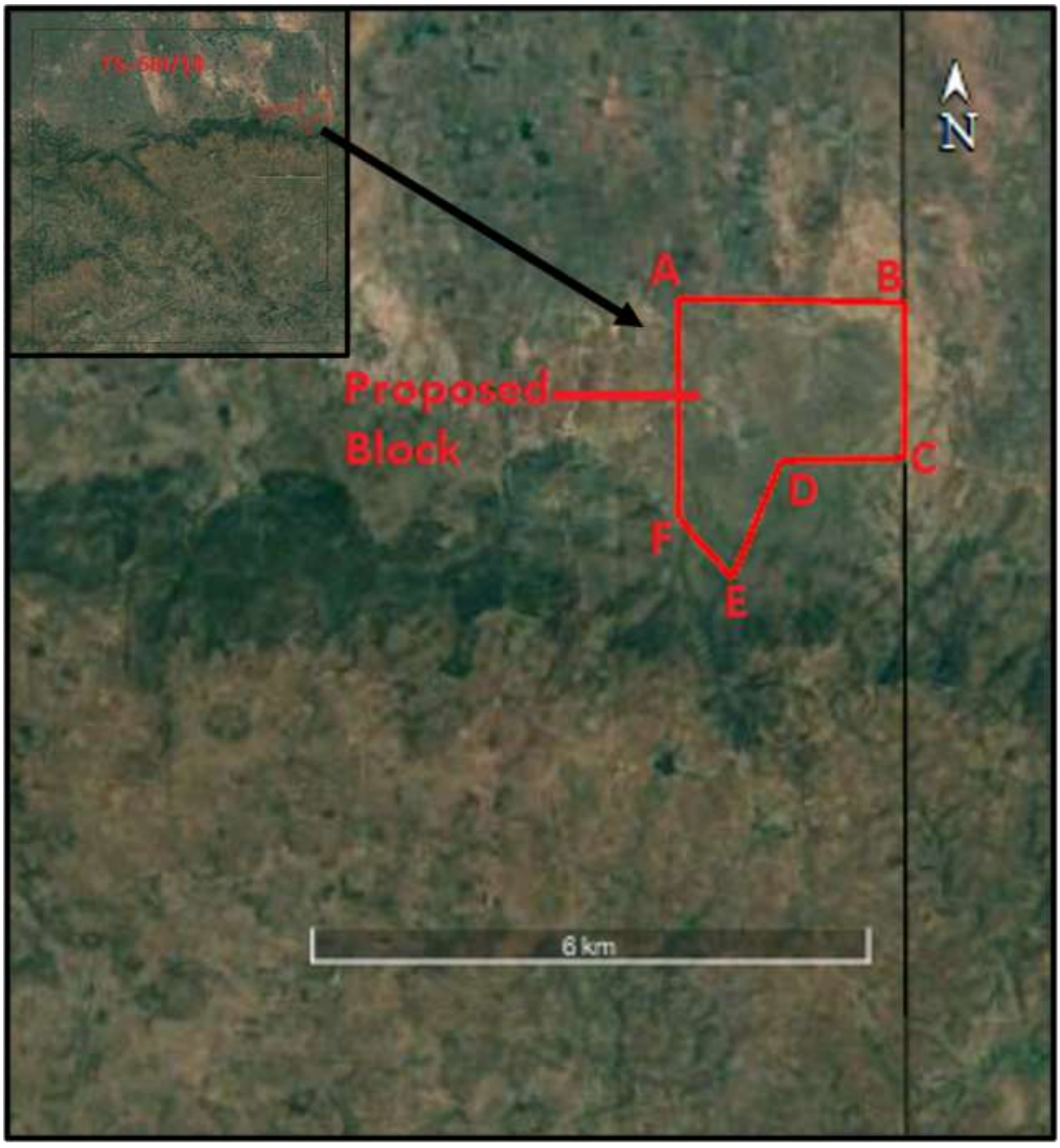
3. **Block area on google map.**



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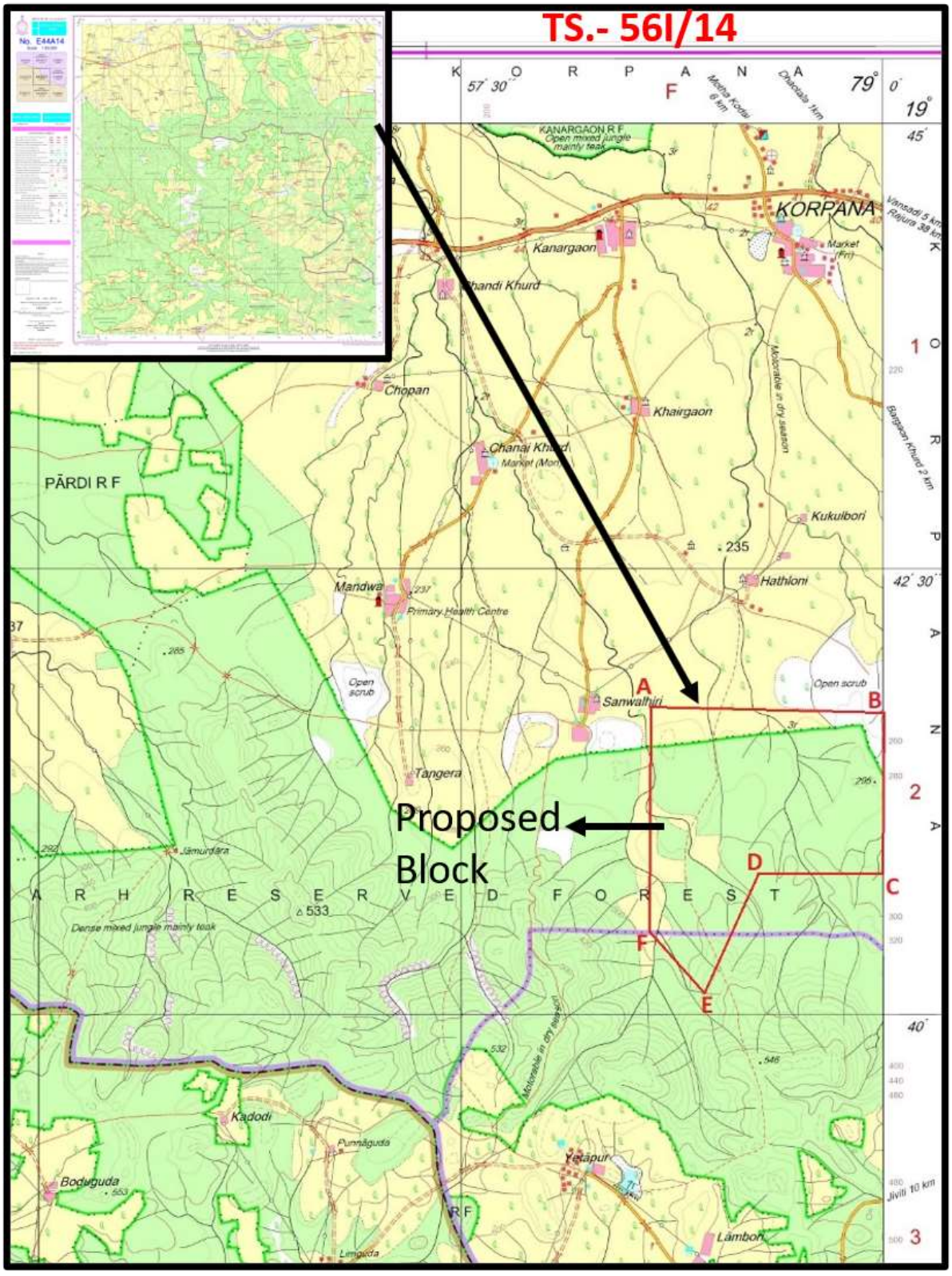
4. **Location of the proposed block demarcated on Survey of India (SOI) Toposheet(s) 56I/14.**



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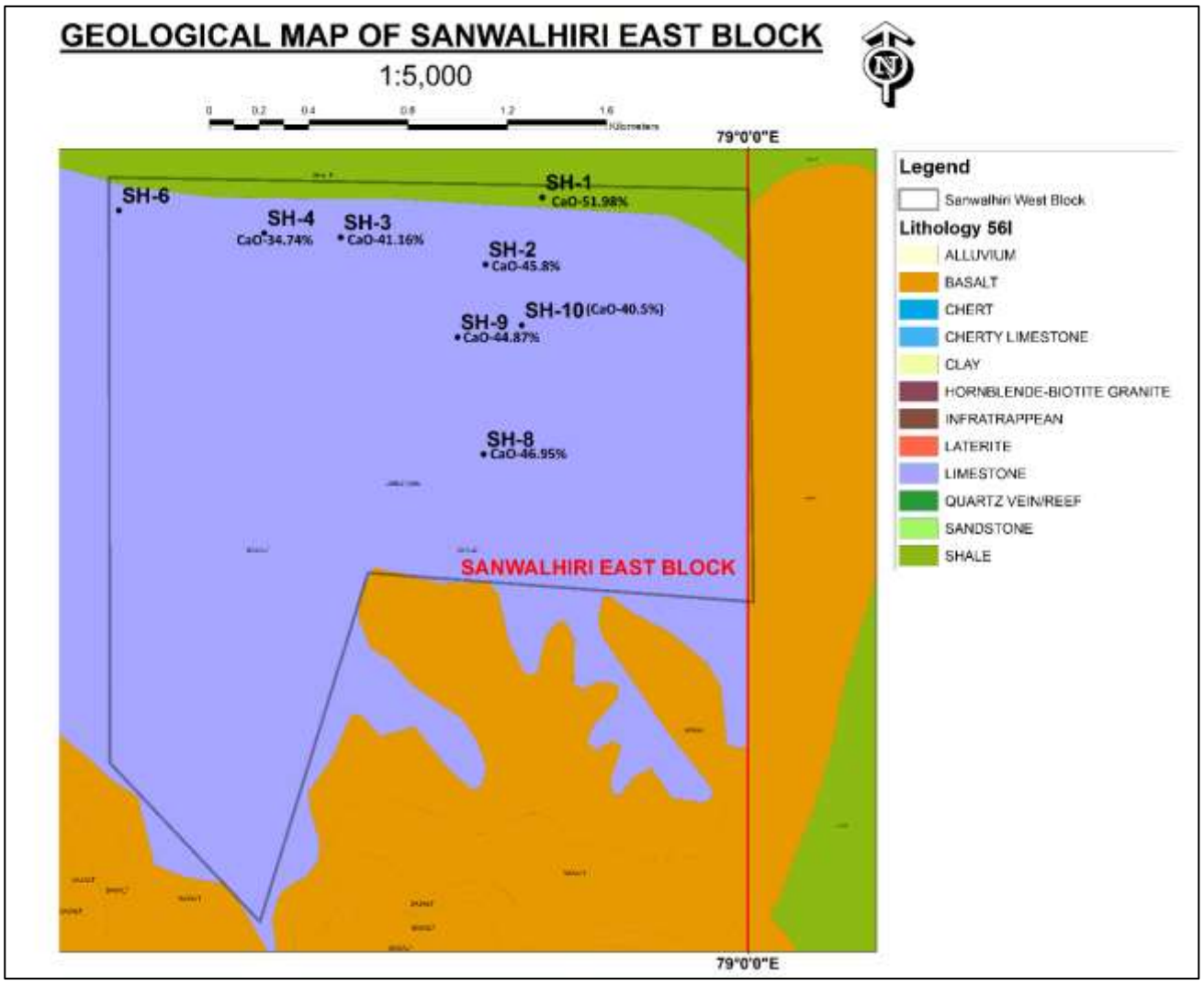
5. Block area on Geological Map.



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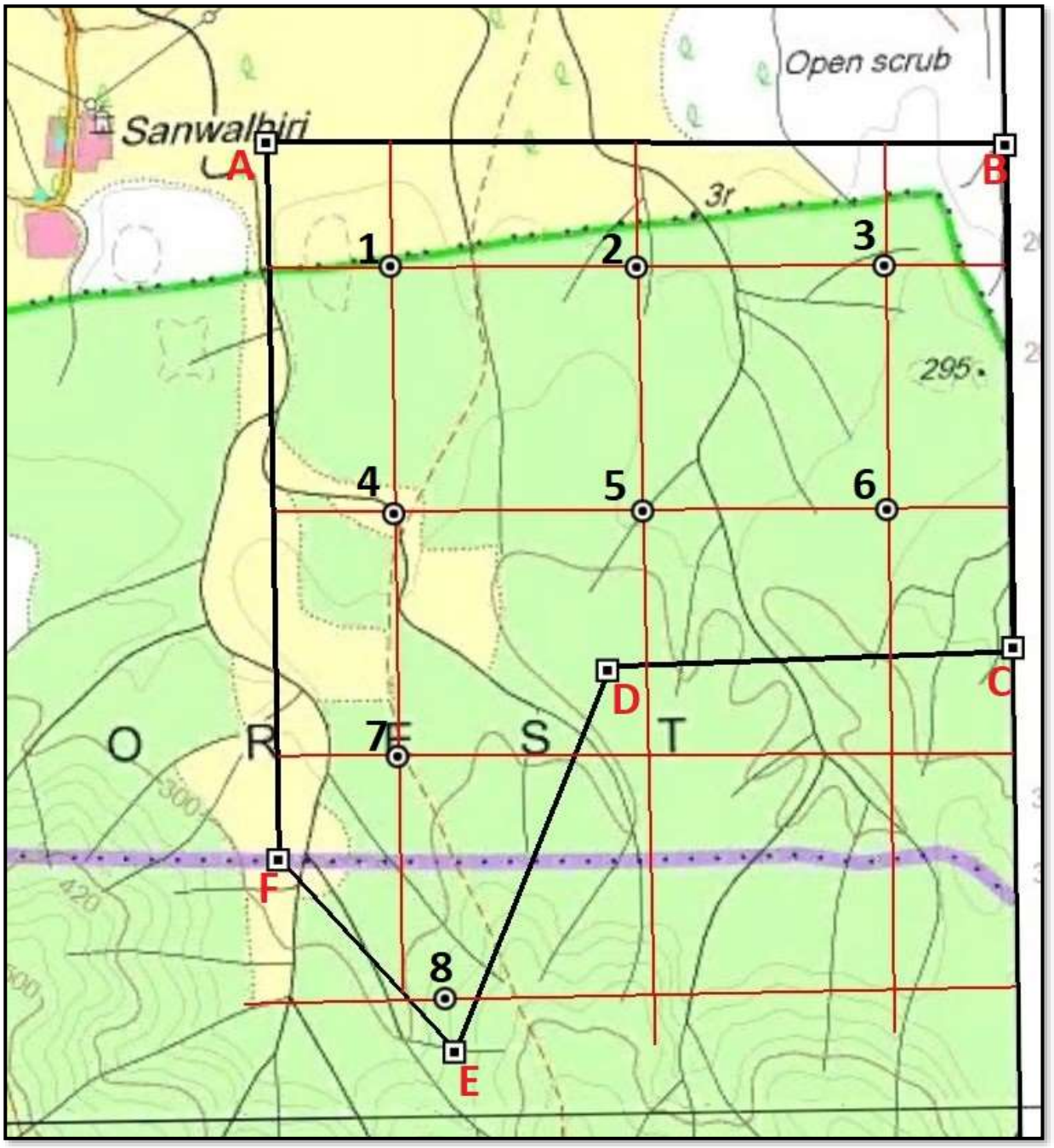
6. Bore Hole Location Map



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PHYSICAL CHARACTER OF BOREHOLE LOCATION POINTS.				
BHs	Co-ordinates		Physical Character	Modifications
	Latitude	Longitude	Area type	Suitability/Modification
1	19°41'30.50"N	78°58'50.48"E	200m away from road, point located in slopy area	Forest permission is required.
2	19°41'30.00"N	78°59'18.23"E	200m away from road, point located in slopy area	
3	19°41'29.75"N	78°59'46.17"E	Forest area	
4	19°41'4.20"N	78°58'50.43"E	Inside forest area	Only non-forest area.
5	19°41'4.07"N	78°59'18.50"E	Inside forest area, near temple	Forest permission is required.
6	19°41'3.82"N	78°59'46.03"E	300m away from Singarpathar road & located in slopy area	
7	19°40'38.40"N	78°58'50.44"E	Not Visited	
8	19°40'12.60"N	78°58'55.36"E	Not Visited	

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FIELD PHOTOGRAPH

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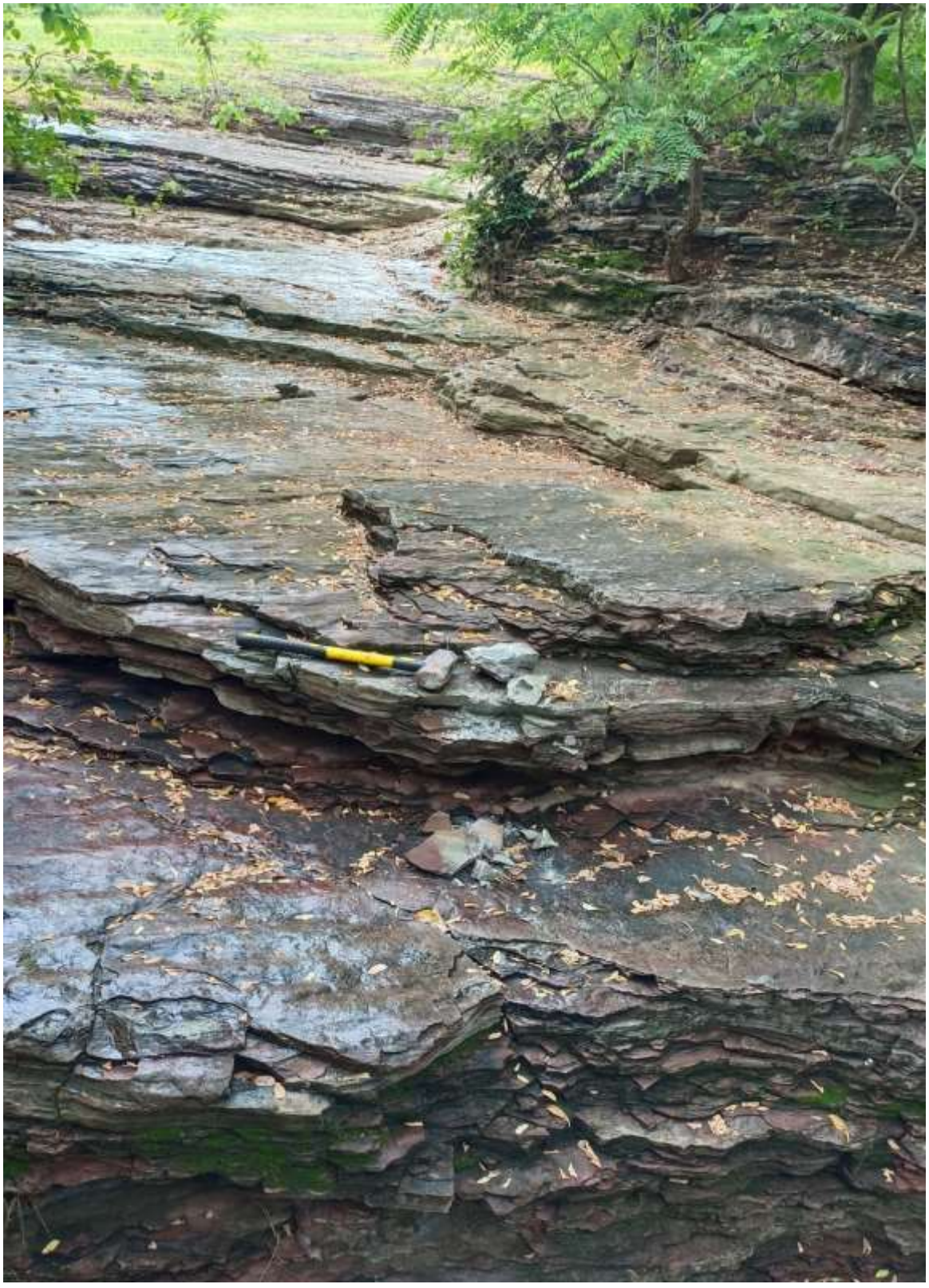

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