Detailed Proposal Report (DPR) for Preliminary Exploration (G-3) for REE and associated Rare Metals in the NB 14 block [2.42 Sq. Km.] of the northern part of the Siwana Ring Complex, Balotra District, Rajasthan
Toposheet No-45C/06

COMMODITY: REE and Associated Rare Metals

BY

Gemcokati Exploration Pvt. Ltd
E-77, MIDC, Ghughus Road,
Chandrapur, Maharashtra- 442406

Place: Chandrapur
Date: 21st November 2025

E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra - 442406
www.gemcokati.com; Ph no: 07172-287200; Mail: subrata.sarkar@gemcokati.com

FOR SUBMITTING PROPOSAL FOR UNDERTAKING PRELIMINARY EXPLORATION

Chandrapur, dated the 21st November 2025

From:
Subrata Sarkar,
Vice President (Projects & Planning),
Gemco Kati Exploration Private Limited
E-77, MIDC Road,
Near Nyara Petrol Pump,
Chandrapur- 442406.
Email ID- subrata.sarkar@gemcokati.com
M: 7044208900

To:
The Director & HoD,
National Mineral Exploration Development Trust Secretariat,
Ministry of Mines,
Room No-325 & 326, Wing-F, Udyog Bhawan,
Rafi Ahmed Kidwai Road,
Rajpath Area, Central Secretariat
New Delhi – 110011.
Email Id: nmet-mines@gov.in

Sir,

I/we am/are submitting the following details for granting 'in-principle' approval by NMET on the proposal of reconnaissance or prospecting surveys to NMET under the "Scheme for Engagement of Notified Private Exploration Agencies in Mineral Exploration directly through National Mineral Exploration Trust issued by Ministry of Mines vide OM No.F.No.6/3/2015- NMET/176, New Delhi, dt 27th June'2024.

	1. Name and address of the Applicant	
(a)	Name	**GEMCO KATI EXPLORATION PVT.LIMITED**
(b)	Postal address	E-77, Ghugus Road, Chandrapur-442406, Maharashtra.
(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 Re-accreditation	23rd April'2025.
(d)	Date of expiry of Re-accreditation	22nd April'2028
(e)	Date of Notification under the proviso to Section 4 (1) of the MMDR Act.	7th April'2022
(f)	Date of expiry of notification	6th March'2025
(g)	Date of Re-notification	18th July 2025
(h)	Date of expiry of Re-notification	22nd April 2028
(i)	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	Rajasthan
(b)	District(s)	Balotra
(c)	Nearby village(s)	Kerli ki Pahari, Diggi
(d)	Survey of India (SOI) Toposheet No (s)	**45C/06**
(e)	Area in Sq. Km	2.42 Sq. Km
(f)	Boundary co-ordinates of the Proposed Block (in Decimal Degree)	**NB14 Block (G3)**

	LONGITUDE			**LATITUDE**		
A	72°	21'	41.51"	25°	43'	58.05"
B	72°	22'	12.40"	25°	44'	11.15"
C	72°	22'	36.78"	25°	43'	26.18"

		D	72°	22'	25.15"	25°	43'	20.48"
		E	72°	22'	48.66"	25°	42'	37.21"
		F	72°	22'	28.33"	25°	42'	28.55"

	4. Mineral Potential of the area	
(a)	Name of Mineral(s) identified/expected in the area/block	REE and Associated Rare Metals
(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 google map. 2.Location of the proposed block demarcated on Survey of India (SOI) & Toposheet(s) 45C/06 3. Block area on Geological Map.
	5. **Documents to be enclosed with the application**	
(i)	Location of the proposed block demarcated on Survey of India (SOI) Toposheet (s) **45C/06**	
(ii)	Documents mentioned in items 4 (C) above	

Place: - Chandrapur

Date – 21.11.2025

Signature of the applicant

E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
www.gemcokati.comPh no: 07172-287200Mail: subrata.sarkar@gemcokati.com

Detailed Proposal Report (DPR) for Preliminary Exploration (G-3) for REE and associated Rare Metals in the NB 14 block [2.42 Sq. Km.] of the northern part of the Siwana Ring Complex, Balotra District, Rajasthan
Toposheet No-45C/06

COMMODITY: IRO REE and Associated Rare Metals

BY

Gemcokati Exploration Pvt. Ltd
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Chandrapur, Maharashtra- 442406

Place: Chandrapur
Date: 21.11.2025

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Summary of the Block for G3 stage exploration

	Features	Details
	Block ID	**NB14 BLOCK**
	Current Exploration Agency	GEMCO KATI EXPLORATION PVT.LTD.
	Previous Exploration Agency	GSI
	G4 stage Geological Report (Previous stage Geological Report)	Report on "Reconnaissance survey (Stage: G4) for Rare Earth Elements mineralization in and around Chhappan-ka-Pahar, Siwana Ring Complex (SRC), Siwana area, Barmer district, Rajasthan". Toposheet No.: 45C/06
	Commodity	REE and Associated Rare Metals
	Mineral Belt	Siwana Ring Complex
	Completion Period with entire Time schedule to complete the project	12 Months
	Objectives	• To map the block area of 2.42 sq.km in 1:2,000 scale through DGPS and total station • Carry out trenches for delineating the continuity of REE & RM Zones • Geophysical logging in thin mineralized zones that might be missed in core for Gradational or diffuse enrichment zones with Structural and lithological boundaries important for REE & RM host rocks • To drill at the identified locale as per MEMC rules 2015 to decipher its depth persistent and subsurface continuity. • 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 Rajasthan for auctioning of the block. • Demarcate zone of various zones REE & RM zone, if any & estimate grade wise resource in the study area as per MEMC norms from G-3 level of exploration.
	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. Gemco Kati Exploration Pvt. Ltd Not applicable
	Name/Number of Geoscientists	Two Geologist (2 G) Surveyor (02)
	Expected Field days (Geology, Geophysics, Surveyor)	Geologist-200 days + 60 days HQ, Surveyor – 60 days
1.	**Location**	
	Latitude	25° 42' 28.5552"- 25° 44' 11.148"

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	Longitude	72° 21' 41.508"- 72° 22' 48.6588"
	Villages	Kerli ki Pahari, Diggi
	Tehsil/Taluk	Siwana
	District	Balotra
	State	Rajasthan
2.	**Area (hectares / square kilo meters)**	
	Block Area	2.42 Sq. Km.
	Forest Area	No area of the block falls under any forest cover.
	Government Land Area	NA
	Private Land Area	The block falls under private land.
3.	**Accessibility**	
	Nearest Rail Head	Balotra Junction (35 Km)
	Road	The block is well connected with National Highway (NH) 325 which connects Balotra and Sanderao
	Airport	Jodhpur Airport (120 Km)
4.	**Hydrography**	
	Local Surface Drainage Pattern (Channels)	Braided River
	Rivers/Streams	Luni River to the North of the proposed block
5.	**Climate**	
	Mean Annual Rainfall	250mm-300mm
	Temperatures (December) (Minimum) Temperatures (May) (Maximum)	2^{o}C 46^{o}C-51^{o}C
6.	**Topography**	
	Toposheet Number	**45C/06**
	Morphology of the Area	Physiography of the area is characterized by arcuate ridges as well as isolated hillocks which are arranged in a semicircular fashion around Siwana. Sand dunes and sand sheets occur in the area occupying all intervening areas among hills and ridges. The minimum and maximum elevations of the block are 182m and 384m respectively.
7	**Availability of base line geosciences data**	
	Geological Map (1:50 K/25 K)	1:12,500 Scale Geological Map is available in public domain.
	Geochemical Map	N/a
	Geophysical Map (Aero-geophysical, Ground geophysical, Regional as well as local scale GP maps)	Aero-magnetic map is available in the Detail Proposal Report [DPR].
8.	Justification for taking up G3 stage mineral exploration	The 4th Joint Meeting of the Technical Cum-Cost Committees (TCC-I and TCC-II) of the National Mineral Exploration and Development Trust (NMEDT) was convened on 10 November 2025 in hybrid mode to consider the allocation of 15 exploration blocks carved out by the Geological Survey of India (GSI) within the Siwana Ring Complex (SRC), Rajasthan, for funding under the NMEDT. The Committee was informed that the Siwana Ring Complex, located across the Barmer and Balotra districts of Rajasthan, covers an area of approximately 750 sq. km. The exploration blocks delineated by GSI are each about 2 sq. km in size and

E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
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		are situated in the northern part of the Siwana Ring Complex, an area identified as prospective for further mineral exploration. After detailed deliberations on the geological potential, scope of work, and capability of the implementing agencies, the Committee allocated NB-14 Block to M/s Gemcokati for undertaking exploration activities through NMEDT funding. The decision was based on the technical competence of the agency and its suitability for executing the proposed exploration program in the designated block. The NB-14 block, located in the northern periphery of the Siwana Ring Complex (SRC) of the Malani Igneous Suite (MIS), demonstrates substantial evidence for REE–rare metal mineralisation and satisfies the requirements for upgrading the investigation to **G3 (preliminary exploration)** as per UNFC/standard mineral exploration protocols. The justification is as follows: **1. Favourable Geological Setting for REE–RM Mineralisation** **1.1 Magmatic Architecture of Siwana Ring Complex** The SRC represents a well-defined **peralkaline volcanic–plutonic ring complex**, comprising: • **Phase-1:** Bimodal volcanism (dominantly acidic) • **Phase-2:** Peralkaline granite intrusions (arfvedsonite–riebeckite–aegirine bearing) • **Phase-3:** Younger felsic intrusives (rhyolite, microgranite, felsite, and andesite dykes) (Kumar & Sharma, 2020) Such multistage, highly evolved peralkaline systems are globally recognised as prime hosts for **LREE–HREE and rare metal (Nb–Ta–Zr–Hf–U–Th)** enrichment (Pollard, 1995; Dostal, 2017). The Siwana Complex fits this metallogenic model exceptionally well. **1.2 Regional Magmatic Fertility** The Western Indian Craton and MIS suite (750–850 Ma) are characterised by extensive A-type granites, peralkaline magmatism and felsic volcanism—ideal settings for REE mineralisation. The Siwana system, in particular, has repeated peralkaline signatures and late-stage differentiates, enhancing REE fertility. Thus, NB-14 block occurs in a **proven, fertile magmatic province**.

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2. Strong Existing Geochemical Evidence of REE Enrichment

Multiple campaigns by GSI and researchers have consistently recorded **high ΣREE+Y values** from rhyolites, felsic dykes, microgranite, and granite phases:

2.1 Previous Regional & Block-Scale Studies

- Rastogi & Mukherjee (2015): **1334–3319 ppm ΣREE**
- Bidwai et al. (2014): High LREE, Zr, Nb, Th, U, Ag
- Kumar & Sharma (2020):
  - Plagioclase-rich granite: **0.029–0.70% ΣREE+Y**
  - Younger intrusives: **0.019–2.66% ΣREE+Y**
  - Felsic volcanics: **0.015–0.96% ΣREE+Y**
  - Enclaves: **0.022–1.27% ΣREE+Y**

LREE:HREE ratio ≈ **4:1**, typical of peralkaline granite–rhyolite systems.

Trace metals also show highly anomalous values: **Zr (0.1–1.1%), Nb (up to 1039 ppm), U (up to 124 ppm), Th (up to 481 ppm), Hf (up to 828 ppm)**.

These values strongly exceed crustal averages and confirm robust magmatic fractionation.

2.2 Specific Evidence from NB-14 Area (Lal & Ghosh, 2021)

NB-14 contains numerous REE-enriched rhyolitic flows (Flow Nos. 14, 15):

- Rhyolite flows: **91.76–9764.68 ppm ΣREE+Y** (avg. 1844.84 ppm)
- Felsic/rhyolite dykes: **144.77–7678.75 ppm ΣREE+Y** (avg. 1400.14 ppm)
- Channel samples: **261.73–6224.81 ppm ΣREE+Y**
- Flow No. 15: up to **8027.71 ppm ΣREE+Y**
- Flow No. 14: up to **7528.11 ppm ΣREE+Y**

HREE values are also significant, suggesting potential for both LREE and HREE deposits—rare in many Indian REE systems.

These values clearly exceed threshold levels for G3 exploration targeting REE deposits.

E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
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3. Mineralogical Indicators of REE Potential

Work by Barman & Neog (2018) confirms REE-bearing mineral phases in both plutonic and volcanic rocks:

- **Carbonates:** Parisite
- **Phosphates:** Monazite
- **Oxides:** Zircon, Ilmenite, Hematite

The presence of parisite and monazite—primary REE carriers—indicates **primary magmatic and hydrothermal REE concentration**, justifying the need for subsurface probing (G3).

4. Geophysical and Remote Sensing Evidence Supporting Continuity

Remote Sensing & Aerial Surveys (GSI, 2017–18):

- Aeromagnetic data shows **regional continuity of magnetically susceptible peralkaline and volcanic units**, even under cover.
- Radiometric K and Th anomalies **align with REE-bearing felsic units**, especially in the NB-14 region.

These signatures confirm that favourable lithologies continue beyond surface exposures, meeting G3 requirement for identifying subsurface extensions.

5. Establishing Geological Continuity — Requirement for G3

The available data confirms:

1. **Multiple, laterally continuous REE-rich rhyolitic flows (≥32 flows mapped)**
2. **Consistent geochemical enrichment across flows and associated dykes**
3. **Geophysical support for subsurface continuity**
4. **Presence of mineral phases indicative of magmatic-hydrothermal REE concentration**

Together, these satisfy the criteria for **G3 investigation**, which aims to delineate mineralised zones with limited subsurface data (pitting, trenching, scout drilling).

6. Potential for Economic REE Resource

The combination of:

- Extremely high ΣREE+Y values (up to **≈1%** in several units)
- High-value LREE (La–Ce–Nd–Pr)

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		• Significant HREE (Dy–Y–Er) • Associated strategic metals (Nb, Zr, Hf, U, Th) • Presence of mineral hosts (monazite, parisite, zircon) • A-type peralkaline volcanic–plutonic architecture collectively indicates that NB-14 block has **high potential to evolve into an economically viable REE-rare metal deposit**, thus warranting G3 exploration investment. **Conclusion** Based on the integration of geological, geochemical, mineralogical, and geophysical datasets, the NB-14 block clearly exhibits the attributes of a prospective REE-rare metal system. The presence of exceptionally high ΣREE+Y values, favourable host lithologies, identified REE minerals, and supportive aeromagnetic/radiometric anomalies provide compelling justification for upgrading the area to **G3 Stage Exploration**. **Therefore, taking the NB-14 block into G3 exploration is strongly justified.**
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) 45C/06 3. Block area on Geological Map.

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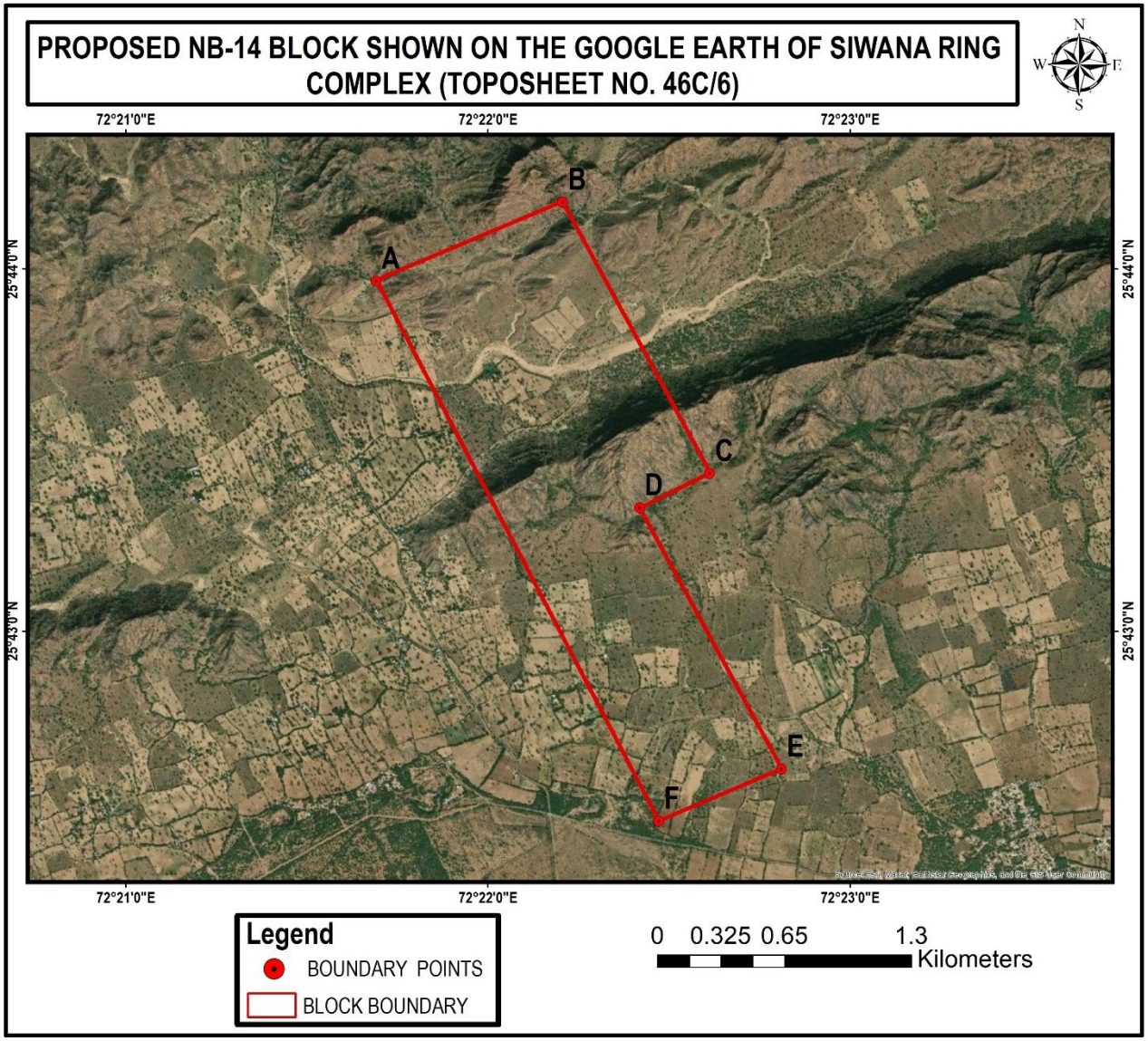
1-NB-14 BLOCK ON GOOGLE EARTH MAP



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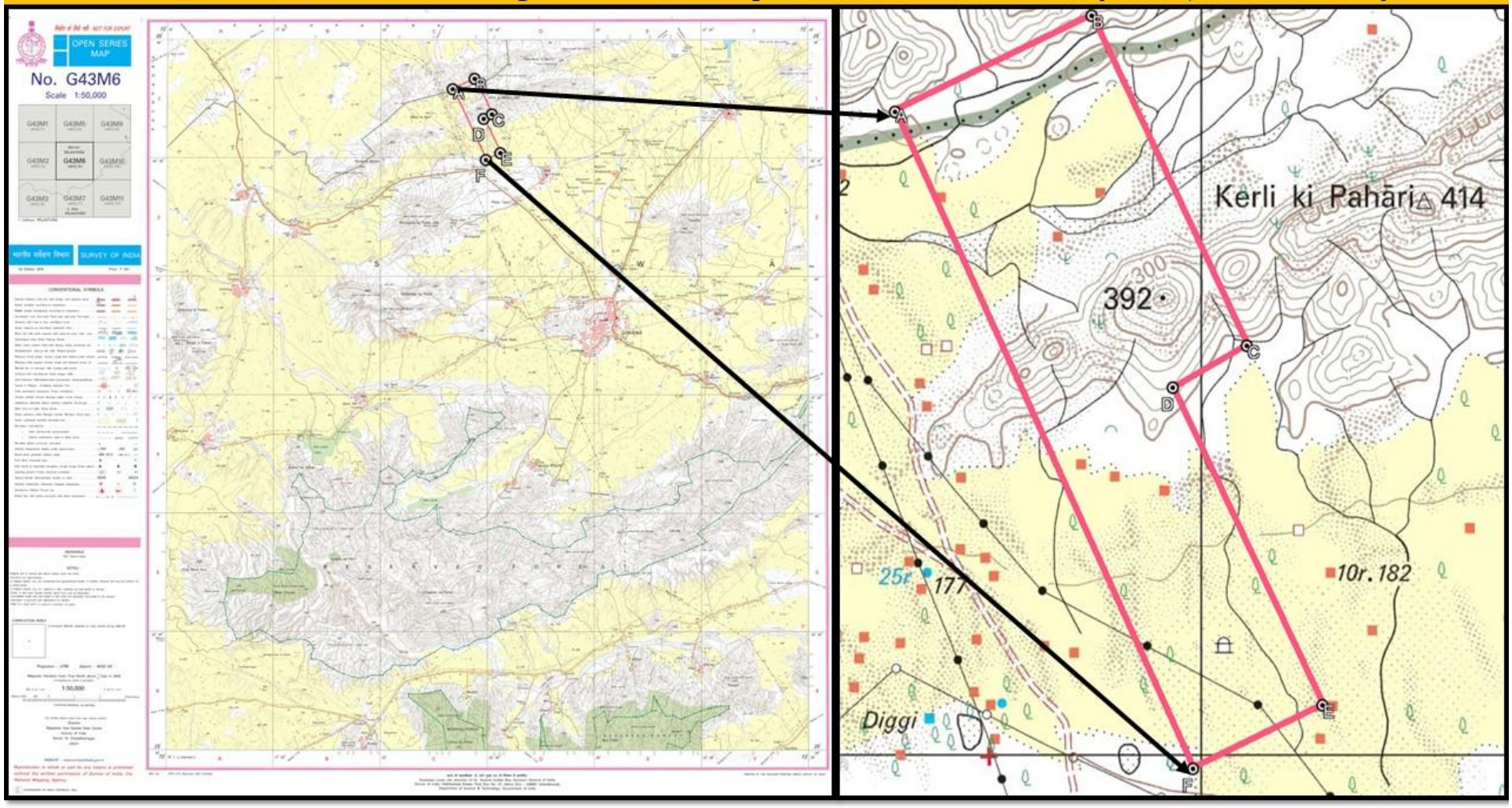
2-LOCATION OF THE PROPOSED NB-14 DEMARCATED ON SURVEY OF INDIA (SOI) TOPOSHEET45C/06.

NB-14 Block on Survey of India Toposheet No. 45C/6(1:50,000 scale).



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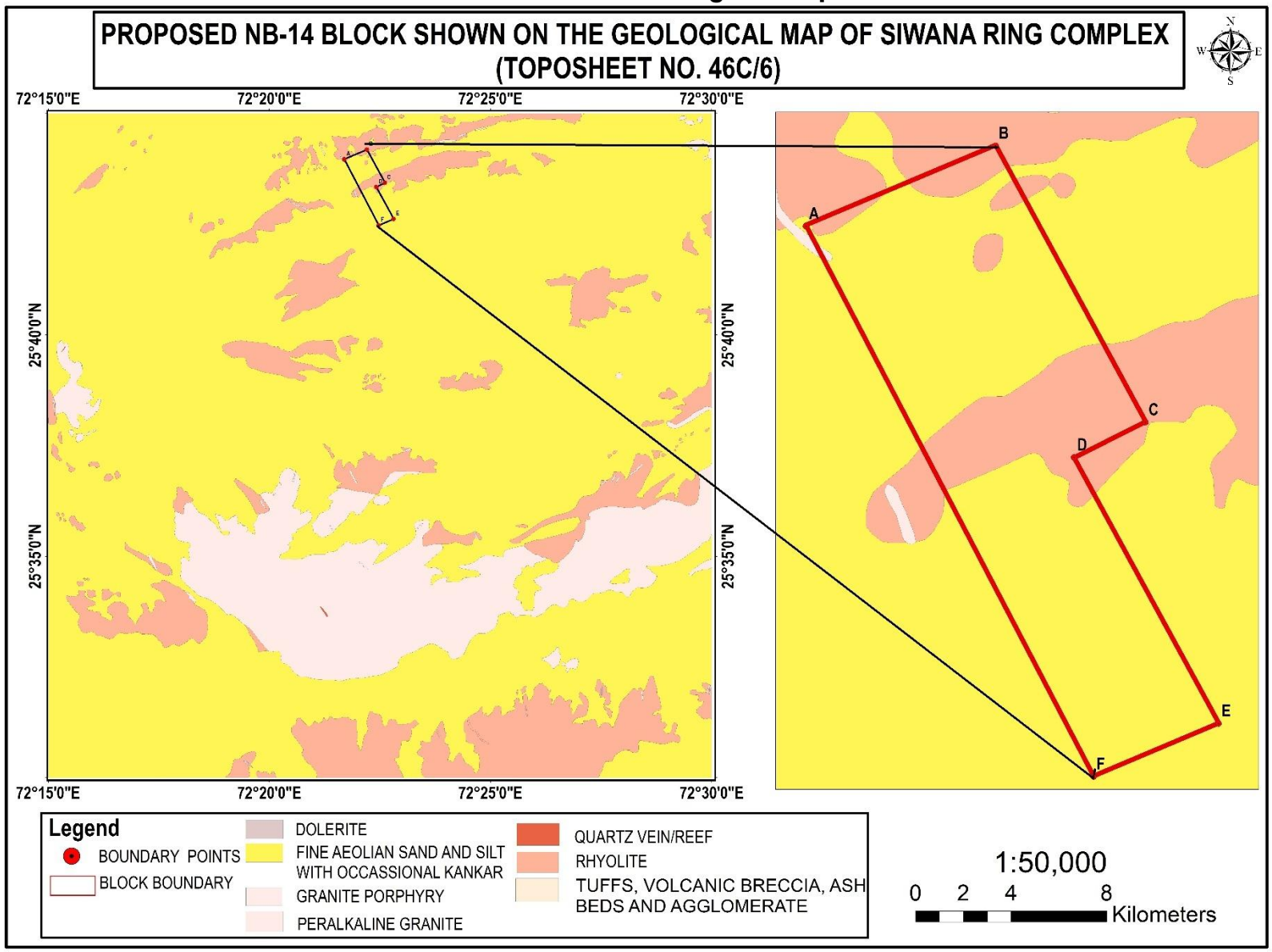
3-Block area on Geological Map



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Detailed Project Report [DPR]

1. BLOCK SUMMARY:

1.1 Physiography: Physiography of the area is characterized by arcuate ridges as well as isolated hillocks which are arranged in a semicircular fashion around Siwana. Sand dunes and sand sheets occur in the area occupying all intervening areas among hills and ridges. The minimum and maximum elevations of the block are 182m and 384m respectively.

1.2 Back Ground Geology & Regional Geology of the Block:

1.2.1 Regional Geology

The magmatic evolution of Siwana Ring Complex, part of Neoproterozoic Malani Igneous Suite (MIS); ca. 771±2 Ma (Torsvik et al. 2001), 745 Ma (Dhar et al., 1996; Rathore et al., 1999) can be divided into three phases (Kumar and Sharma, 2020). First phase is represented by bimodal volcanism of acid and basic flows (acid flows > basic flows). It is intruded by second, plutonic phase comprising arfvedsonite-reibeckite-aegirine bearing per-alkaline Siwana Granite. The third phase being later intrusive phase includes rhyolite, microgranite, andesite and felsite dykes. All these three phases host anomalous ΣREE+Y concentration and the third phase is more enriched (Kumar and Sharma, 2020). Peralkaline igneous rocks, carbonatites, feldspathoid bearing rocks are the main source of REE minerals (± HFSE, U & Th etc) and therefore are suitable host for targeting REE/RM mineralisation. Peralkaline granites, volcanics and associated zoned pegmatoids are considered to be storehouse of REE and rare metals (Nb–Ta, Zr–Hf, Sn, W, Be) (Pollard, 1995) and in layered intrusions, the mineralisation mostly appears in the more evolved parts of the complexes (Dostal, 2017).

In the Western Indian Craton of Rajasthan, basement rocks and overlying supracrustal belts of Aravalli and Delhi Supergroups have witnessed magmatic events of volcanics and granitoids of Palaeo- to Neo-Proterozoic ages. Granitoids of different ages (~ 1.8 Ga, ~1.7 Ga, ~1.4 Ga, ~ 1.1Ga and 850-750 Ma) have intruded these belts. MIS magmatism occurred during Neoproterozoic age and comprises peralkaline (Siwana), metaluminous to mildly peralkaline (Jalore) and peraluminous (Tusham and Jhunjhunu) granites with cogenetic carapace of acid volcanics (welded tuff, trachyte explosion braccia and perlite) and is characterised by volcano-plutonic ring structure and radial dykes (Singh and Vallinagayam, 2009). Three phases in Siwana magmatic activity is widely observed: i) the basal peralkaline (lower 24 flows), ii) middle meta-aluminous (top 21 flows), and iii) reappearance of peralkaline phase as intrusives (Siwana granite) at the end (Chittora and Bhushan, 1994).

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The stratigraphic sequence of the lithological formations exposed in the region is presented in the following table

Super Group	Group	Formation	Magmatic Phase	Age	Lithology
Marwar Supergroup	(Jodhpur Group)	-	-	Vendian to lower Cambrian	Sandstone, shale, limestone and evaporates
----------Unconformity----------					
Malani Igneous Suite	Dyke swarms	Basic dyke Acid dykes Trachyte porphyry Andesite and Porphyry Dykes Aplite and Diorite plugs	Intrusive dyke Phase – III	Neo- Proterozoic	Gabbro, dolerite, basalt, granite rhyolite porphyry Trachyte porphyry andesite porphyry porphyritic/non porphyritic Dyke &boss and aplite veins.
	Granitoid plutonism	Malani granite, Siwana granite Jalor granite	Intrusive phase-II		Hornblende granite riebeckite Aegirine granite biotite/ Hornblende granite
	Bimodal volcanism	Rhyolite, Trachyte and Basalt flow	Extrusive phase-I		Rhyolite, dacite, trachyte and rhyodacite flows, Basalt and trachyandesite flows
----------Unconformity----------					
Delhi Supergroup (Basement)				Meso- to Neo-proterozoic	

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1.2.2 Lithological description

Delhi Super Group (DSG): The rocks of Delhi Supergroup (DSG) form the basement for Malani Igneous Suite. Lithologically it is mainly composed of granites, phyllite and quartzites. A volcanoclastic conglomerate near Kankani represents a distinct angular Unconformity between the rocks of DSG and the overlying pyroclastics of Malani Igneous Suite observed 30 km south of Jodhpur. At Siyana (Jalore dist.) the rhyolite of MIS overlies the Abu Granite & Erinpura which have been dated around 800Ma- 745 Ma.

Malani Igneous Suite (MIS): The Malani Igneous Suite (MIS) exposes a great variety of igneous rocks comprising acid, intermediate, basic, ultrabasic and alkaline intrusives and extrusives besides sedimentaries. The beginning of Malani eruption possibly took place after the emplacement of the Erinpura and Abu granite dated as 745 My It comprises mainly acid volcano-plutonic rocks with minor amounts of basic rocks. They are characterized as A-type, anorogenic granite and owes its origin to hotspot tectonics. The polyphase magmatism of the MIS commenced with an initial extrusion of predominantly felsic volcanics (in places with associated basalt), followed by emplacement of granitic plutons. The granites are crosscut by a host of dyke swarms (mainly rhyolitic) that mark the end of the magmatic cycle. Two distinct geochemical types of acidic magmatic rocks have been identified i.e., peraluminous (Jalor-type) and peralkaline (Siwana-type). The volcano-plutonic rock association of the MIS have three episodes of igneous activity. They are (a) Extrusive phase-I; (b) Intrusive phase-II; (c) Intrusive dyke Phase – III. First phase is represented by bimodal volcanism of acid and basic flows (acid flows > basic flows). It is intruded by second, plutonic phase comprising arfvedsonite-reibeckite-aegirine bearing per-alkaline Siwana Granite. The third phase being later intrusive phase includes rhyolite, microgranite, andesite and felsite dykes.

Marwar Super Group: The sedimentary package of Marwar Surpergroup unconformably overlies the rocks of Malani Igneous Suite(MIS). Lithologically they are arenites, carbonates and evaporites of Neoproterozoic to Eocambrian in age.

1.2.3 Geology of the Block

The area comprises three major geological units arranged in a stratigraphic succession from oldest to youngest: **Delhi Supergroup (DSG)** basement, the **Malani Igneous Suite (MIS)**, and the overlying **Marwar Supergroup** sedimentary cover.

Basement: Delhi Supergroup (DSG)

The DSG forms the **basement complex** for the Malani Igneous Suite. It is represented by **granites, phyllites, and quartzites**, which are exposed sporadically within the region. A distinct **angular unconformity** is observed near Kankani, where **volcaniclastic conglomerate** separates the deformed DSG rocks from the overlying pyroclastics of MIS.

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The rhyolites of the MIS rest unconformably on **Abu Granite and Erinpura Granite**, dated at **~800–745 Ma**, confirming that MIS magmatism postdates these basement granitoids.

Malani Igneous Suite (MIS)

The MIS overlies the DSG with pronounced unconformity and constitutes the dominant igneous province of the block. It includes a diverse suite of **acid, intermediate, basic, ultrabasic and alkaline extrusives and intrusives**, along with minor sedimentaries.

MIS represents a **polyphase, anorogenic, A-type magmatic cycle** associated with **hotspot tectonics**, commencing around **745 Ma**, after the emplacement of the Erinpura–Abu granitoids.

Magmatic Phases

A. **Extrusive Phase (Phase–I)**
   - Dominated by **bimodal volcanism**, consisting mainly of **felsic flows** with subordinate **basaltic units**.
   - These volcanic rocks locally include pyroclastics, marking the earliest phase of Malani activity.

B. **Plutonic Intrusive Phase (Phase–II)**
   - Emplacement of granitic plutons, including:
     - **Peralkaline Siwana Granite** containing arfvedsonite–riebeckite–aegirine assemblages.
     - **Peraluminous Jalor-type granites** representing a distinct geochemical suite.

C. **Dyke Intrusive Phase (Phase–III)**
   - Swarms of **rhyolite, microgranite, felsite, and andesite dykes**, which crosscut earlier granites and terminate the magmatic cycle.

The MIS forms a widespread volcano-plutonic terrain, often resting directly over the DSG basement.

Marwar Supergroup

The **Marwar Supergroup** unconformably overlies the MIS, marking the transition from igneous-dominated Neoproterozoic terrain to **sedimentary Ediacaran–Early Cambrian basins**.
Lithologies include:

- **Arenites (sandstones),**
- **Carbonates,**
- **Evaporites**,

representing deposition in mixed continental to shallow marine environments.

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1.3 Mineral potentiality based on geology

The Siwana Ring Complex (SRC) of western Rajasthan exhibits significant potential for Rare Earth Elements (REE), rare metals, and associated critical minerals, as demonstrated by multiple geological, geochemical and geophysical studies carried out by the Geological Survey of India and other researchers.

1.3.1 REE Enrichment

Across plutonic and volcanic units of the SRC, REE concentrations are consistently anomalous and often highly enriched:

Early GSI sampling (2013–14) indicated ΣREE values of **1334–3319 ppm**, confirming the presence of anomalous REE zones.

Kumar & Sharma (2020) documented ΣREE+Y enrichment across various litho-units:

- Plagioclase-rich granite: **0.029–0.70 wt%**
- K-feldspar–rich granite: **0.047–0.66 wt%**
- Younger intrusives: **0.019–2.66 wt%**
- Felsic volcanic units: **0.015–0.96 wt%**
- Enclaves/Restites: **0.022–1.27 wt%**

These values indicate **multi-percent level enrichment in certain intrusive bodies**, placing them in the category of **highly prospective REE-bearing alkaline granites**.

1.3.2 Light REE Dominance

Across all studies, the area is characterized by **strong LREE enrichment (LREE ≫ HREE):**

- LREE vary between **86 ppm to 1.93 wt%,**
- HREE from **23.9 ppm to 0.26 wt%,**
- Giving a characteristic **LREE:HREE ratio of ~4:1.**

This pattern is typical of peralkaline A-type granites, known globally for economically significant LREE mineralization (e.g., Ilímaussaq, Lovozero).

1.3.3 Presence of REE-bearing Minerals

Mineralogical studies identify **primary REE host phases**, including:

- **Carbonates:** Parisite
- **Phosphates:** Monazite
- **Other accessory minerals:** Zircon, Hematite, Ilmenite

These mineral assemblages confirm that the REE are held in stable, extractable mineral phases, supporting the economic potential of the system.

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www.gemcokati.comPh no: 07172-287200Mail: subrata.sarkar@gemcokati.com

1.3.4 High tREE Values in Plutonic and Volcanic Units

Barman & Neog (2018) documented:

- **Granites: 182–8611 ppm (avg. ~2007 ppm)**
- **Volcanics: 142–8503 ppm (avg. ~2008 ppm)**
- **Notably enriched zones: tREE up to**
  - **2901 ppm** (microgranite dyke)
  - **2121 ppm** (alkali feldspar granite)
  - **2996 ppm** (andesite)

These values indicate widespread REE enrichment across multiple litho-units, increasing the size and continuity of the metallogenic province.

1.3.5 Highly Enriched Rhyolitic Flows

Detailed mapping by Lal & Ghosh (2021) identified **32 rhyolitic flows**, many of **which are substantially enriched in REE:**

- **Rhyolite flows: ΣREE+Y = 91–9765 ppm (avg. ~1845 ppm)**
- **Felsic/rhyolite dykes: 144–7679 ppm**

Exceptional high-grade flows:

- **Flow 14: ΣREE+Y 6944–7528 ppm**
- **Flow 15: ΣREE+Y 2213–8028 ppm**
  - **Max LREE: 5079 ppm**
  - **Max HREE: 992 ppm**

These values confirm **localized high-grade REE pockets**, which are highly favorable for resource evaluation.

1.3.6 Associated Rare Metals and Critical Elements

The SRC is also enriched in Zr, Nb, Th, U, Hf, Ba, Zn, with ranges including:

- **Zr: 0.1–1.1 wt%**
- **Nb: 2.5–1039 ppm**
- **U: 0.61–124 ppm**
- **Th: 2–481 ppm**
- **Hf: 4.5–828 ppm**

Such enrichment is characteristic of **NYF (Niobium–Yttrium–Fluorine) type alkaline magmatic systems**, globally known for REE–Nb–Zr mineralization.

1.3.7 Geophysical Evidence

Remote sensing and airborne geophysics (RSAS, 2017–18) support the subsurface continuity of the mineralized system:

- **Aeromagnetic data** delineate extensive magnetically susceptible alkaline units beneath soil cover.
- **Potassium and thorium spectrometric anomalies** correlate with REE-rich granitic and volcanic units.

This confirms that mineralized **bodies extend beyond surface** exposures, offering **significant subsurface resource potential.**

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www.gemcokati.comPh no: 07172-287200Mail: subrata.sarkar@gemcokati.com

Overall Mineral Potentiality Assessment

Based on the integrated geological, geochemical, mineralogical, and geophysical evidence, the **Siwana Ring Complex holds high potential for:**

I. Rare Earth Elements (REE)

- Especially **LREE-dominant systems** enriched in Ce, La, Nd, Pr.
- Localized zones exhibit **high-grade REE concentrations** comparable to known economic alkaline complexes worldwide.

II. Rare Metals (RM)

Significant potential **for Nb, Zr, Hf, Th, and U**, consistent with peralkaline granite–rhyolite complexes functioning as critical metal provinces.

III. Multi-litho-unit Mineralization:

REE enrichment is documented in:

- Granites (plagioclase-rich, K-feldspar-rich)
- Younger intrusive phases
- Felsic volcanic units
- Rhyolitic flows
- Dyke systems

This points to a **large, long-lived magmatic-hydrothermal system** capable of generating **voluminous mineralized bodies**.

IV. Exploration Potential

The combination of:

- High-grade zones,
- Wide areal distribution,
- Favourable mineralogy,
- Supporting geophysical anomalies, indicates that the area is **highly favourable for G-3 to G-2 stage exploration for REE and associated rare metals.**

1.3 Recommendations

Based on the chemical analysis data from previous studies, along with the remote sensing and aerial survey maps presented in this report, the **NB-14 Block** is recommended for **G3-stage** exploration.

1.4 Objectives

- To map the block area of 2.42 sq.km in 1:2,000 scale through DGPS and total station
- Carry out trenches for delineating the continuity of REE & RM Zones
- Geophysical logging in thin mineralized zones that might be missed in core for Gradational or diffuse enrichment zones with Structural and lithological boundaries important for REE & RM host rocks
- To drill at the identified locale as per MEMC rules 2015 to decipher its depth persistent and subsurface continuity.
- Carry out mineral exploration as per Minerals (Evidence of Mineral Contents) Rule-2015, Mineral

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(Auction) Rules-2015 and MMDR Amendment act- 2015, which in turn to facilitate the Government of Rajasthan for auctioning of the block.

- Demarcate zone of various zones REE & RM zone, if any & estimate grade wise resource in the study area as per MEMC norms from G-3 level of exploration.

2.0 PREVIOUS WORK:

Preliminary sampling of the rhyolites and associated tuffs of Siwana Ring Complex, Balotra district, carried out by GSI during 2013-14, indicated anomalous REE values with ΣREE ranging from 1334 to 3319ppm ΣREE (Rastogi & Mukherjee, 2015). Bidwai et al., 2014, reported the presence of high LREE, Zr, Nb, Th and U along with Ag in surface samples in the Siwana Ring Complex. Das et al., 2015, carried G4 investigation in Siwana eastern and central block. Kumar and Sharma, 2020, carried out G-4 investigation and reported ∑ REE+Y ranges in various lithiounits are i) Plagioclase rich granite (n=79) ∑ REE+Y = 0.029%-0.70%. ii) K-feldspar rich granite (n=116) ∑ REE+Y= 0.047%-0.66%. iii) Younger Intrusives (n=146) ∑ REE+Y= 0.019%-2.66%. iv) Felsic volcanic (n=43) ∑REE+Y = 0.015%-0.96% and v) Enclave/Restite (n=19) ∑REE+Y = 0.022%-1.27%. LREE/HREE ratio indicates that LREE>>HREE in the area and LREE values ranges between 86.45ppm to 1.93%, however, HREE values ranges between 23.94ppm to 0.26%. LREE:HREE ratio in Siwana area is 4:1 approximately. Apart from REE, rare metals and some trace elements also indicate very encouraging results, Zr (0.1% to 1.1%), Nb (2.5ppm to 1039ppm), Ba (25ppm to 3948ppm), Zn (120ppm to 1258ppm), U (0.61ppm to 124ppm), Th (2ppm to 481ppm) and Hf (4.52ppm to 828.18ppm).

Barman and Neog, 2018 mapped the peralkaline – peraluminous granite (A type) and in the Siwana area extending from Mokalsar in the east to Siner in the west through Mawri, Gugrot, Piplun, Goliyan Bhairan and Kalur Ka Danta area. REE bearing carbonates (perisite) and phosphates (monazite) were identified in both plutonic and volcanic rock types. In addition to REE bearing mineral phases, haematite, ilmenite and zircon are also identified from both plutonic and volcanic phases. The granite recorded values ranging from 182.77 ppm to 8611.11 ppm and the average being 2006.95 ppm (count=84). The volcanic recorded values ranging from 142.3 ppm to 8502.50 ppm, average value being 2008.03 ppm (count=116). Sukleswar Ka Mandir (G3) block yields tREE upto 2901ppm in microgranite dyke, 2121 ppm in alkali feldspar granite and 2996ppm in andesite.

Lal and Ghosh, 2021 carried out large scale geological mapping (1:12,500 scale) at the northern periphery of the Siwana Ring Complex, stretching from Sainji ki Beri to Meli area. They marked 32 nos. of rhyolitic flows along with several felsic dykes in the area. Several flows are found to be highly enriched in tREE concentration. Chemical analysis data from rhyolite samples of study area yielded ΣREE+Y values ranging from 91.76ppm to 9764.68ppm, with average value of 1844.84ppm. ΣHREE/ΣLREE ratio of the same is 0.15. 22 BRS samples from felsic/rhyolite dykes yielded ΣREE+Y values ranging from 144.77ppm to 7678.75ppm, with average value of 1400.14ppm. ΣREE+Y value in channel samples ranging from 261.73 to 6224.81ppm, with ΣHREE/ΣLREE ratio of 0.19. Flow no. 14 and 15 are highly enriched REE flow of rhyolite in the area. In the proposed block ΣREE+Y in flow no. 15 ranges between 2213.43ppm to 8027.71ppm with maximum value of LREE 5079.52ppm and maximum value of HREE 992.05ppm. In flow no. 14, ΣREE+Y ranges between 6944.16ppm to

E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
www.gemcokati.comPh no: 07172-287200Mail: subrata.sarkar@gemcokati.com

7528.11ppm with maximum LREE 4848.19ppm and maximum HREE 941.11ppm. Remote Sensing and Aerial Survey for toposheet no. 45C/06 and 45C/10 were carried out by RSAS Division, GSI, Bangalore, during FS. 2017-18. Aeromagnetic maps help in delineating the regional continuity of magnetically susceptible lithounits of Siwana Ring Complex even under soil-covered terrain. Spectrometric maps of potassium and thorium further suggest that the proposed area possesses good potential for rare earth element (REE) mineralization in exposed area.

Based on these chemical data and the Remote Sensing and Aerial Survey maps **NB 14 Block** is recommended for G3 stage exploration.

BLOCK CO-ORDINATES:

NB-14 Block (G3)						
LONGITUDE				LATITUDE		
(A)	72°	21'	41.51"	25°	43'	58.05"
(B)	72°	22'	12.40"	25°	44'	11.15"
(C)	72°	22'	36.78"	25°	43'	26.18"
(D)	72°	22'	25.15"	25°	43'	20.48"
(E)	72°	22'	48.66"	25°	42'	37.21"
(F)	72°	22'	28.33"	25°	42'	28.55"

3.0 PLANNED METHODOLOGY

- **Detailed Geological Mapping:** Detailed mapping of 2.42 sq km area (on 1:2,000) is to be carried out for the item along with collection of surface samples to delineate REE & RM mineralised zones by DGPS & total station. The detailed geological map will be finalized by adding physical features beyond geological features, attitudes of beds, structural features etc. to be picked up and plotted during mapping.

- **Close space trenching:** Multiple trenches are to be excavated at 200meter interval in anomalous zone to collect channel samples, study & identify the PGE, Gold & base metal bearing zone

- **Drilling:** The depth continuity, grade and thickness of these zones will be checked by drilling about 24 vertical boreholes of 125m depth on a grid of 400m x 200m. Two deeper boreholes of 250m depth may also be drilled to check depth continuity of REE and RM mineralization in the area. Initially 4 to 5 boreholes will be drilled and respective core samples will be tested for REE and associated RM concentrations. If encouraging results are received the remaining drilling and core sampling will be done simultaneously.

- **Geochemical sampling:** Channel Samples, trench samples & Core samples etc. will be collected for analysis.

- **Chemical Analysis:** All the samples are to be analyzed by ICP-MS .

- **Petrographic and minerographic studies:** As most of the REE minerals are not identified by study of thin sections, 05 samples for EPMA and 05 samples for XRD studies are also proposed to identify the REE mineral phases

- **Exploration Report:** Generate a detailed report (Final G3 stage Report), identifying and establishing area worthy of being raised to a G-2 scheme as per MEMC-2015. Data generated from G-3 level works, shall be presented in the Report as per the laid guidelines.

E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
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4.0 NATURE, QUANTUM ANDT ARGET:

Proposed Quantum of Work			
Sr. No.	**Item of work**	**Unit**	**Proposed Quantum of work**
1	Geological Survey: Detail Mapping (Scale: 1:2,000)	sq. km.	2.42
2	Technological Survey: a) Subsurface Exploration: Drilling	m	3500 (24 BH of 125m depth & 2 deeper BHs of 250m)
3	Trenching	Cu. m	50 Cu. m
4	Geophysical Logging	m.	1100
5	**Sampling**		
a	Channel Samples	Nos.	100
b	Trenching Samples	Nos.	50
c	Core sample	Nos.	900
d	PS	Nos.	15
e	XRD	Nos.	5
f	EPMA	Nos.	5
6	Chemical Analyses (ICP-MS) *REEs, Y, Hf, Zr, Nb, Ta	Nos.	1050

Borehole Spacing

Type of deposit	Lenses, pockets, stockworks, irregular shaped modest to small sized bodies.
G3 stage	26 boreholes at 200m X 400m grid interval

5.0 Exploratory drilling

- The total block area is 2.42 sq.km. The area is proposed for exploration by drilling with 26 number of boreholes at grid interval of 200m X 400m in the Block area for G3 stage exploration with depth up to 100m.

E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
www.gemcokati.comPh no: 07172-287200Mail: subrata.sarkar@gemcokati.com

6.0 ESTIMATED COST

Estimate Cost for Preliminary Exploration (G-3) for REE and associated Rare Metals in the NB 14 block of the northern part of the Siwana Ring Complex, Balotra district, Rajasthan Area 2.42 sq. km, No. of BH:26, (2 x 250 m = 500 m & 24 x 125 m = 3000 m totalling to 3500 m); Schedule timeline- 12 months [Review: After 4 Months & 8 Months]									
Sl. No.	**Item of Work ***	**Unit ***	**Rates as per NMET SoC 2020-21**		**Estimated Cost of the Proposal**		**Remarks**	**PHASE I**	**PHASE II**
			SoC-Item No. *	**Rates as per SoC * (a)**	**Qty. (b)**	**Total Amount (Rs) (a*b)**			
A	**Geological Mapping Other Geological Work & Surveying**								
	Geological mapping, (1:2,000 scale) & Trenching , drilling work								
i	a. Charges for Geologist per day (Field) for geological mapping & trenching work, drilling work	day	1.3	11000	200	2200000			
ii	b. Labours Charges; Base rate	day	5.7	541	400	216400	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	9000	60	540000			
	d. Charges for one Sampler per day (1 Party)	one sampler per day	1.5.2	5100	132	673200			
	e.Labours Charges for survey work	day	5.7	541	528	285648			
	Sub Total- A					**39,15,248**			
B	**Ground Geophysical Survey**								
1	IP. Induced Polarization (I.P) cum Resistivity S.P and Magnetic (30 Lkm)	8-10 Line Km							
3	Geophysicist party days (Field)	per day							

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4	c. Labours Charges	day							
5	Geophysicist party days (HQ)	per day							
	Geophysical Borehole Logging					-			
	Sub Total- B					**-**			
C	**Survey work**								
a	DGPS Survey for BH fixation & RL determination	Per Point of observation	1.6.2	19,200	32	614400	6 Block Boundaries & 26 Boreholes		
b	Charges of Surveyor (1 party) for Geophysical survey layout work & Block boundary demarcation	one surveyor per day	1.6.1a	8,300	45	373500			
c	Labours Charges for survey work	day	5.7	541	180	97380			
	Sub-Total C					**10,85,280**			
D	**Trenching/Pitting**								
	a) Excavation of Trench	per cu.m	2.1.1	3,330	50	166500	10 Cu.m. x 5 each		
	Sub Total D					**1,66,500**			
E	**DRILLING (after review)**								
1	Drilling up to 300m (Hard Rock)	m	2.2.1.1b	11,500	3,500	4,02,50,000	(2 x 250 m = 500 m) + (24 x 125 m = 3000 m) = **3500 m**	(2 x 250 m = 500 m) + (3 x 125 m = 375 m) = 875 m	21 x 125 m = 2625 m
2	Borehole deviation Survey by Multishot Camera	m							
3	Land / Crop Compansation (in case the BH falls in agricultural Land)	per BH	5.6	20,000	26	520000	Borehole Points		
4	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	32	64000			
5	Borehole plugging by cement	per m	2.2.7b	150	3,500	525000	Boreholes	875m	2625m
6	Transportation of Drill Rig & Truck associated per drill (2 rigs)	Km	2.2.8	36	2,600	93600	To and Fro		
7	Monthly Accomodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	6	300000			
8	Drilling Camp Setting Cost	Nos	2.2.9a	2,50,000	1	250000			
9	Drilling Camp Winding up Cost	Nos	2.2.9b		1	250000			

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				2,50,000					
10	Road Making (Flat Terrain)	Km	2.2.10a	22,020	2	44040			
11	Drill Core Preservation	per m	5.3	1,590	900	1431000			
	Sub Total E					**4,37,27,640**			
F	**Borehole Geophysical Logging**	5 BHs of 350m each	3.12	10,88,941.00	1	**10,88,941**			
G	**LABORATORY STUDIES**								
1	**Chemical Analysis**								
i)	**Geochemical Sampling-Surface samples (Bedrock/Channel /Soil/Stream sediment)**								
	a. Au by Fire Assay	Nos							
	b. For Ag, Ni, Co, Cr, Cu, Pb, Zn, V, Ti by AAS Method	Nos							
	c. For PGE by Fire Assay	Nos							
ii)	**Surface Check samples (10% External)**								
	a. Au by Fire Assay	Nos							
	b. For Ag, Ni, Co, Cr, Cu, Pb, Zn, V, Ti by AAS Method	Nos							
	c. For PGE	Nos							
iii)	**Trench & Check Samples from Trench**								
	Trench samples								
	a. Au by Fire Assay	Nos							
	b. For Ag, Ni, Co, Cr, Cu, Pb, Zn, V, Ti by AAS Method	Nos							
	c. For PGE	Nos							
iv)	**Trench Check samples (10% External)**								
	a. Au by Fire Assay	Nos							
	b. For Ag, Ni, Co, Cr, Cu, Pb, Zn, V, Ti by AAS Method	Nos							
	c. For PGE	Nos							
v)	**BH Core samples**								

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	a. Au by Fire Assay	Nos							
	b. For Ag, Ni, Co, Cr, Cu, Pb, Zn, V, Ti by ICPMS-34 elements	Nos							
	c. For PGE	Nos							
vi)	**BH Core samples (10%External)**								
	a. Au by Fire Assay	Nos							
	b. For Ag, Ni, Co, Cr, Cu, Pb, Zn, V, Ti by AAS Method	Nos							
	c. For PGE	Nos							
vii)	**Major Oxide Analysis**								
	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)	per sample	4.1.15a	4200	0	0			
	b) Determination of insitu Bulk Density		4.10	3,540	10	35,400		3	7
	c) ICPMS Study	per sample	4.1.14	7,731	1,050	81,17,550	100 Channel Sample + 50 Trench Sample+ 900 Core Sample	100 Channel Sample + 50 Trench Sample+ 225 Core Sample	675 Core Sample
2	**Physical & Petrological Studies**								
i	Preparation of thin section	Nos	4.3.2	1,549	15	23,235			
ii	Study of thin section	Nos	4.3.4	4,232	15	63,480			
iii	Preparation of polish section	Nos	4.3.2	1549	0	-			
iv	study of polished section	Nos	4.3.4	4,232	0	-			
v	Digital Photographs	Nos	4.3.7	280	15	4,200			
vi	Sp. Gravity	Nos				-			
vii	XRD Studies	per hour	4.5.1	4,000	5	20,000			
viii	EPMA studies	per hour	4.4.1	8,540	5	42,700			

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	Sub Total G					**83,06,565**			
H	**Total A to G**					**5,82,90,174**			
I	**Geological Report Preparation**	**5 Hard copies with a soft copy**	**5.2**	**5.2 (i/ii/iii/iv)**		**20,00,000**	Reimbursement will be made after submission of the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.		
J	**Peer review Charges**		**As per EC decision**			**30,000**			
K	**Preparation of Exploration Proposal (5 Hard copies with a soft copy)**	**5 Hard copies with a soft copy**	**5.1**	2% of the Cost or Rs. 5.0 Lakhs whichever is less		**5,00,000**	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.		
L	**Total Estimated Cost without GST**					**6,08,20,174**			
M	**Provision for GST (18% of J)**					**1,09,47,631**	GST will be reimbursed as per actual and as per notified prescribed rate		
N	**Total Estimated Cost with GST**					**7,17,67,805**			
				or Say Rs. In Lakhs		**717.68**			
Note:									
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 execusion of the project by NEA on its own, a Certifiate 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.**								

E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
www.gemcokati.comPh no: 07172-287200Mail: subrata.sarkar@gemcokati.com

7.0 TIME SCHEDULE

Estimate Cost for Preliminary Exploration (G-3) for REE and associated Rare Metals in the NB 14 block of the northern part of the Siwana Ring Complex, Balotra district, Rajasthan Area 2.42 sq. km, No. of BH:26, (2 x 250 m = 500 m & 24 x 125 m = 3000 m totalling to 3500 m); Schedule timeline- 12 months [Review: After 4 Months & 8 Months]																
S. No.			**1**	**2**	**3**	**4**		**5**	**6**	**7**	**8**		**9**	**10**	**11**	**12**
1	Camp Setting	**Months/Days**														
2	Geological Mapping & Sampling	**days**														
3	Pitting/Trenching	**cu.m**														
4	Drilling	**m**														
5	Survey Party days	**days**					**1st Review**					**2nd Review**				
6	Sampler Man days	**days**														
7	Laboratory Studies	**Nos.**														
8	Camp Winding	**months**														
9	Report Writing with Peer Review	**months**														

Manpower Deployment Geologist party:

- 2 Geologist – 200 Field days + 60 HQ days

Survey party:

- **2** Surveyor - 60 days

E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
www.gemcokati.comPh no: 07172-287200Mail: subrata.sarkar@gemcokati.com

8.0 References:

- Barman, B.J and Neog, P. 2018. Reconnaissance survey for Rare Earth Elements Mineralization in Siwana area, Barmer district, Rajasthan. GSI, Unpublished Report, FS 2017-18.

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E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
www.gemcokati.comPh no: 07172-287200Mail: subrata.sarkar@gemcokati.com

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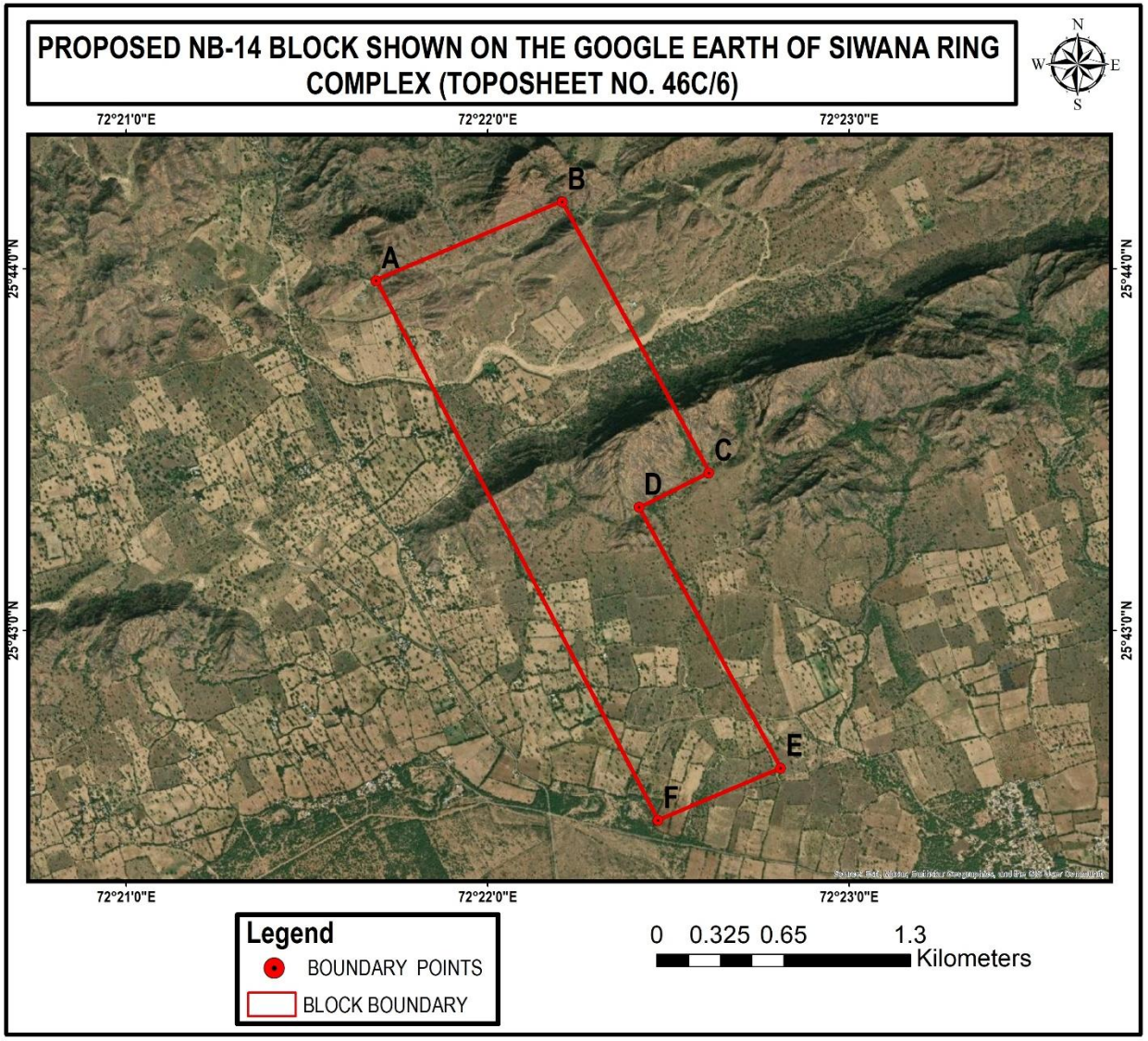
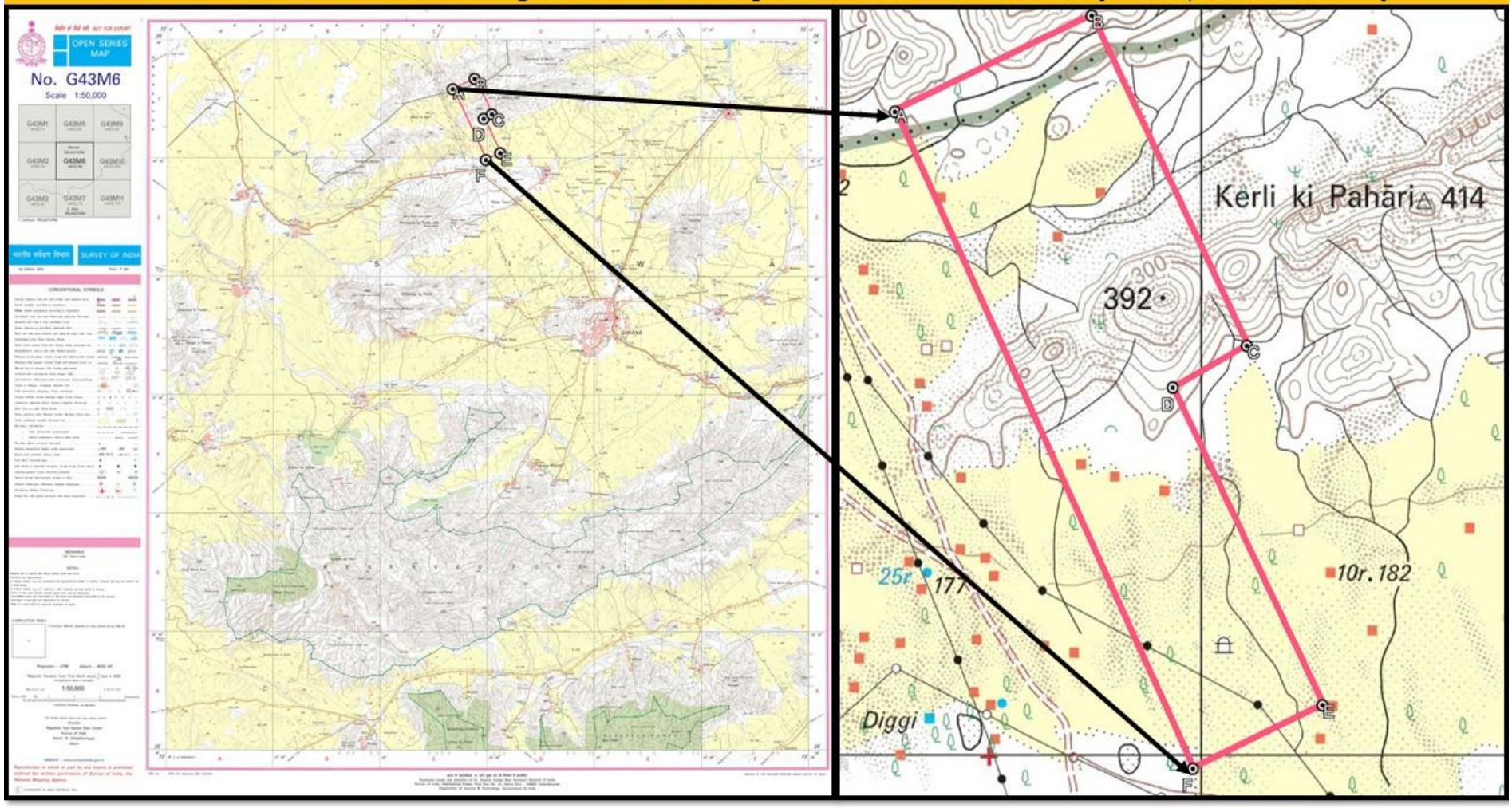
1-NB-14 BLOCK ON GOOGLE EARTH MAP.



E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
www.gemcokati.comPh no: 07172-287200Mail: subrata.sarkar@gemcokati.com

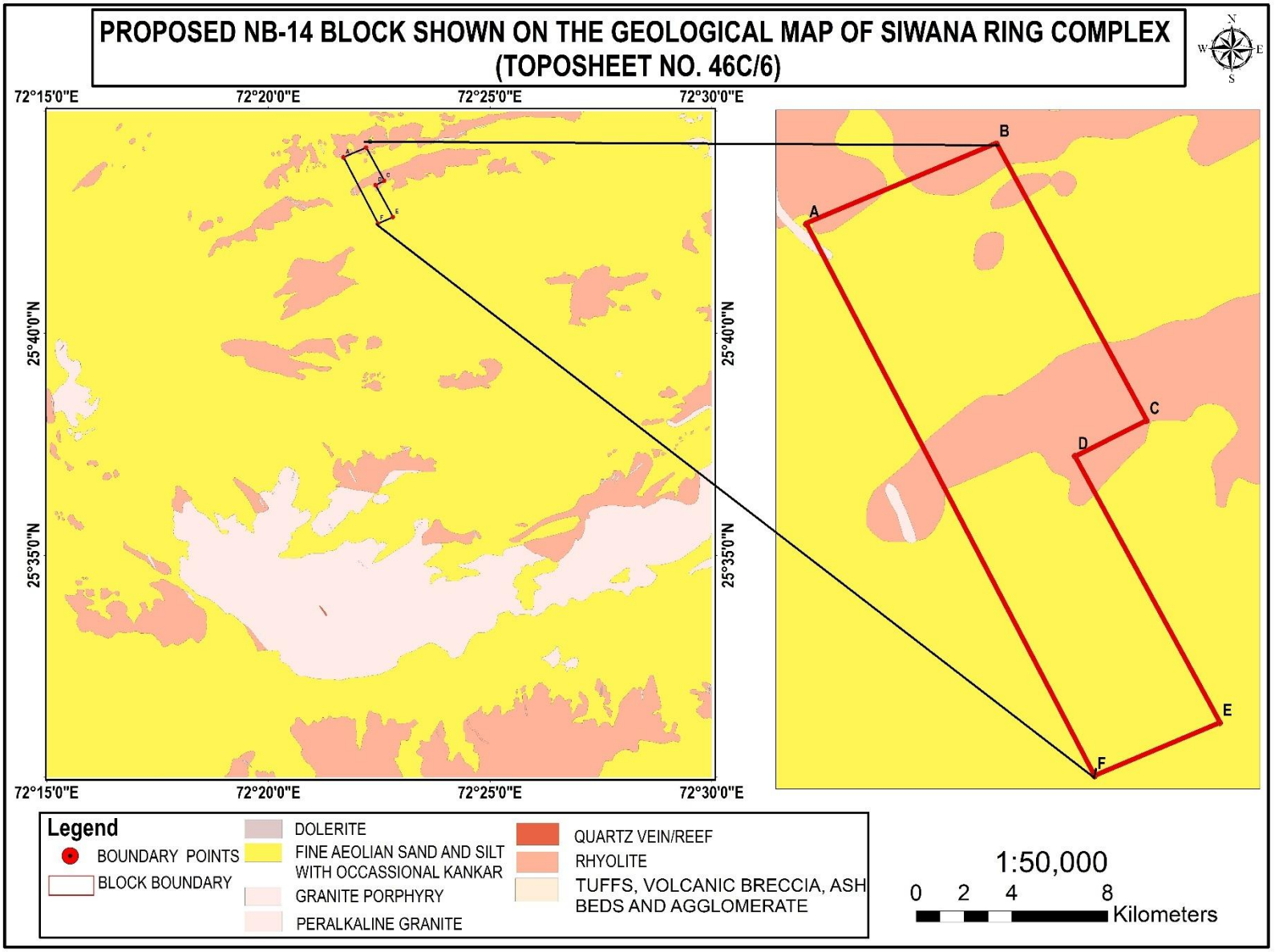
2-LOCATION OF THE PROPOSED NB-14 DEMARCATED ON SURVEY OF INDIA (SOI) TOPOSHEET45C/06.

NB-14 Block on Survey of India Toposheet No. 45C/6(1:50,000 scale).



E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
www.gemcokati.comPh no: 07172-287200Mail: subrata.sarkar@gemcokati.com

3-BLOCK AREA ON GEOLOGICAL MAP



E-77, MIDC, Ghughus Road, Chandrapur, Maharashtra- 442406
www.gemcokati.comPh no: 07172-287200Mail: subrata.sarkar@gemcokati.com

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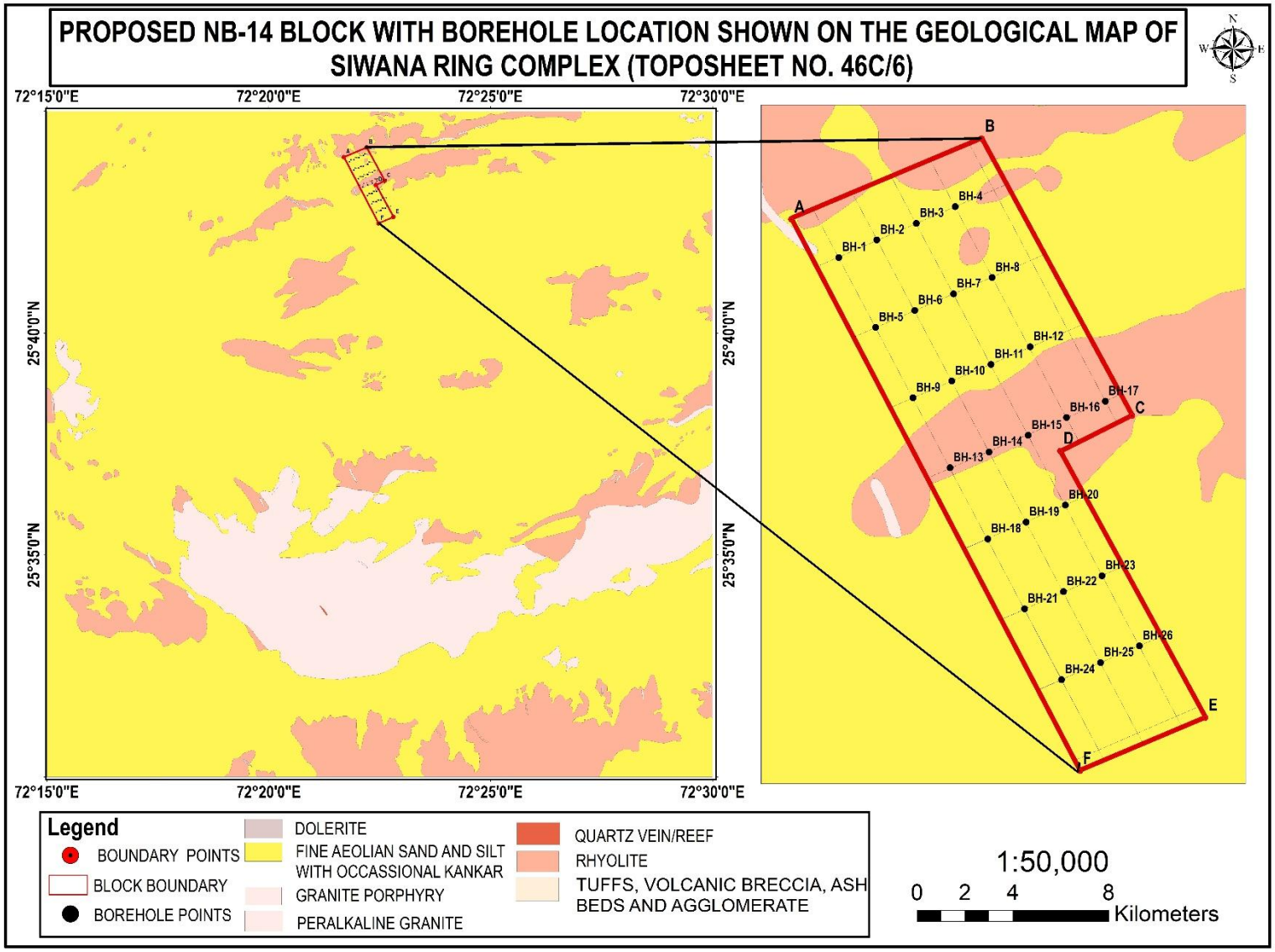
4-BORE HOLE LOCATION MAP ON GEOLOGICAL MAP



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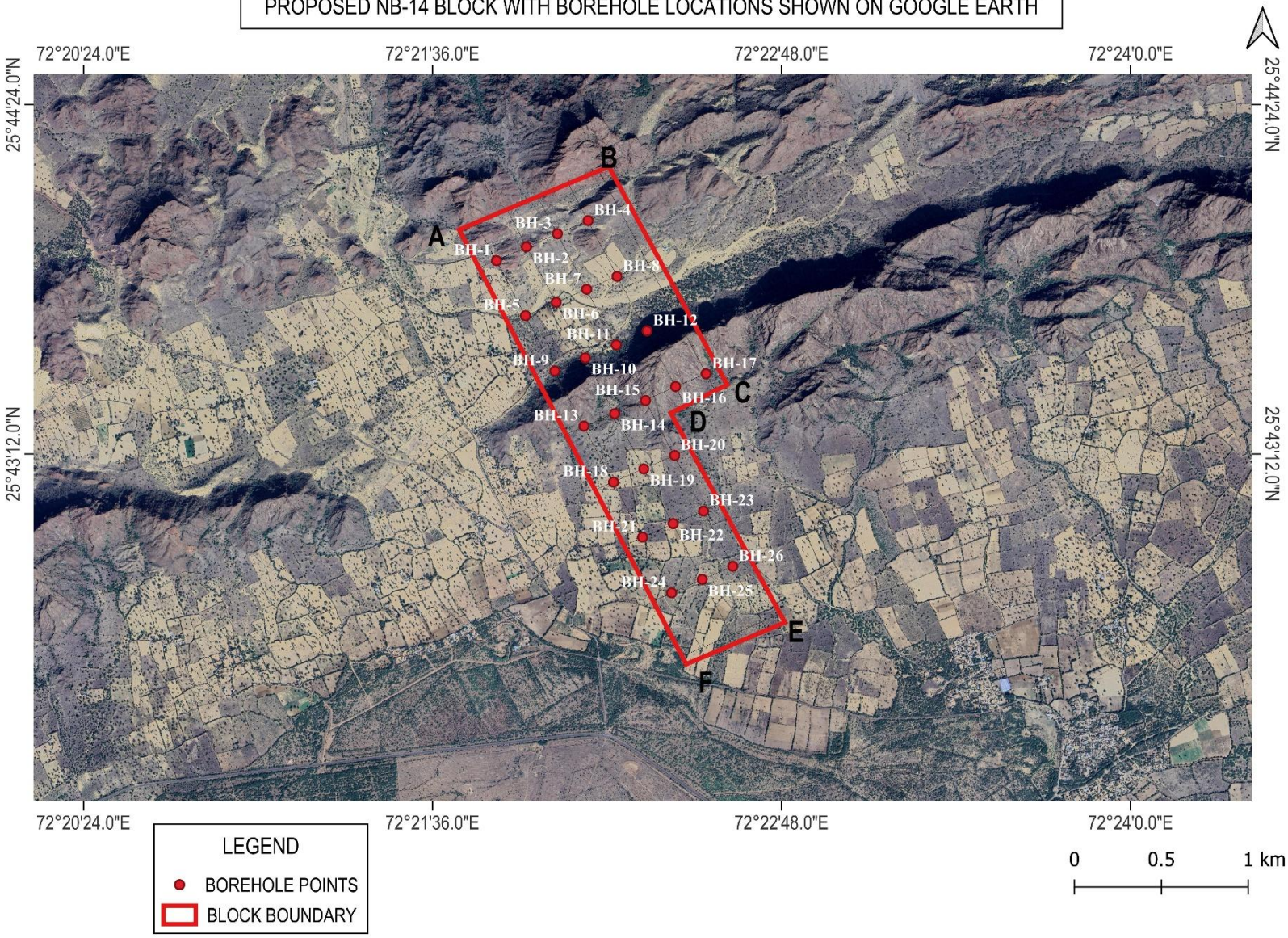
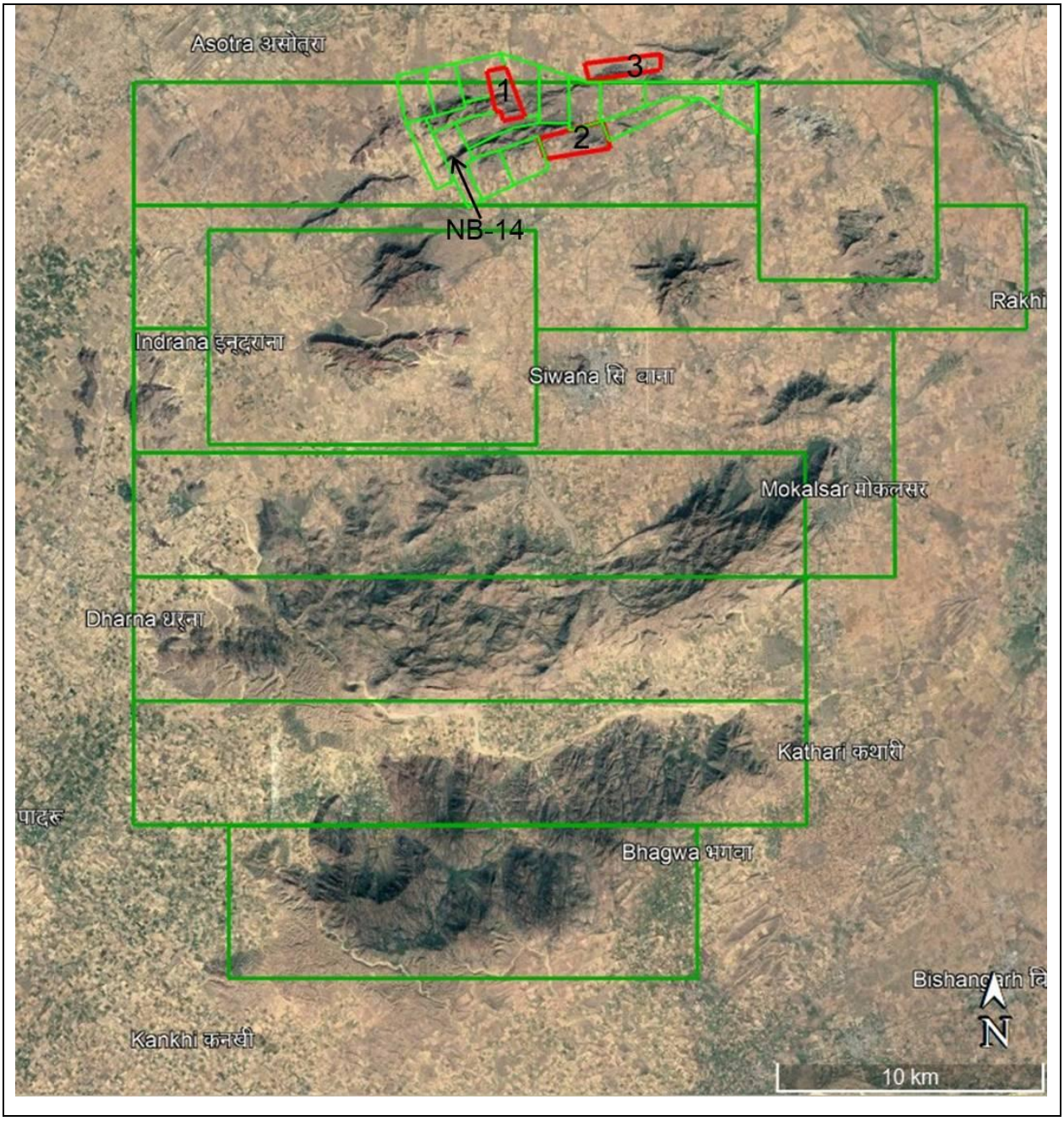
4(a)-BORE HOLE LOCATION MAP ON GOOGLE EARTH PRO

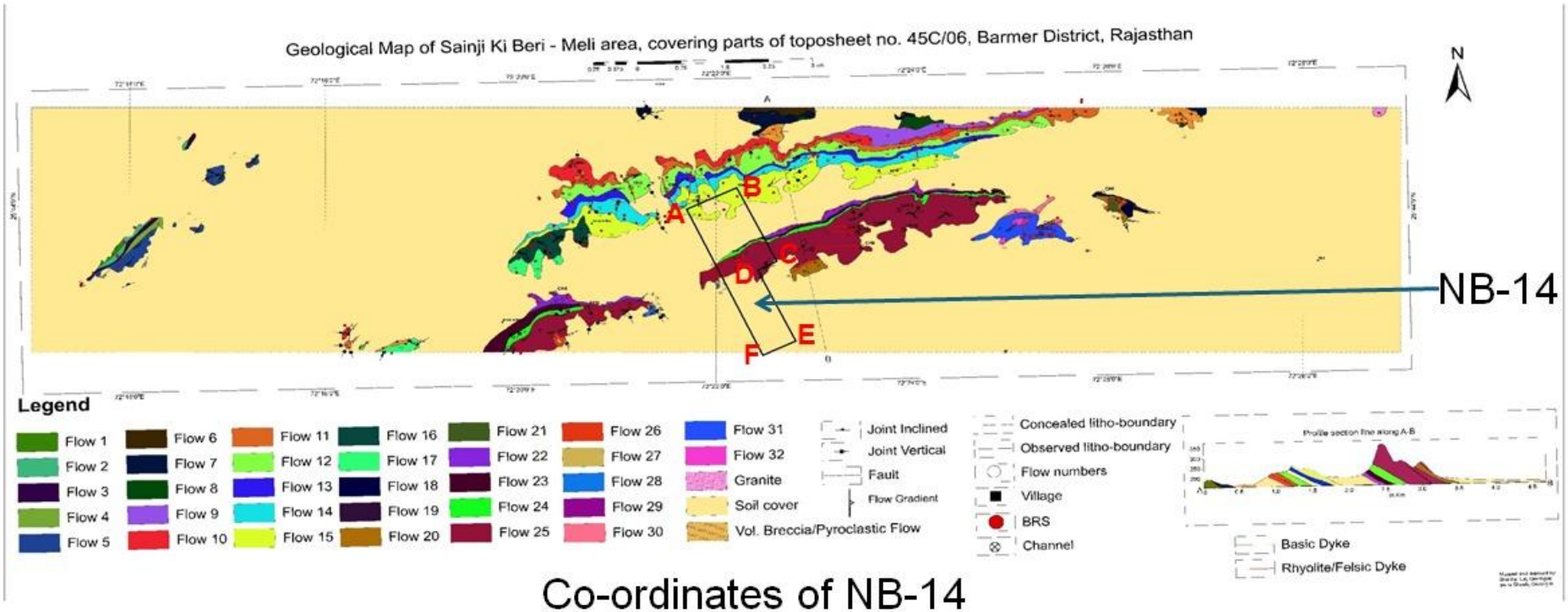
PROPOSED NB-14 BLOCK WITH BOREHOLE LOCATIONS SHOWN ON GOOGLE EARTH



5-Proposed NB-14 block shown on Google Image. Blocks in red are NPEA blocks (1 & 2 nos.) approved by TCC of NMET and Bhatikhera G2 block (3 no.) of AMD.



6- Proposed NB-14 block shown in black on the LSM of Scale 1:12,500 (Sainji ki beri-Meli G-4 block, FS 2021-22).



Co-ordinates of NB-14

	Lat.	Long.
A	25.732792°	72.361530°
B	25.736430°	72.370111°
C	25.723940°	72.376884°
D	25.722356°	72.373653°
E	25.710335°	72.380183°
F	25.707932°	72.374535°

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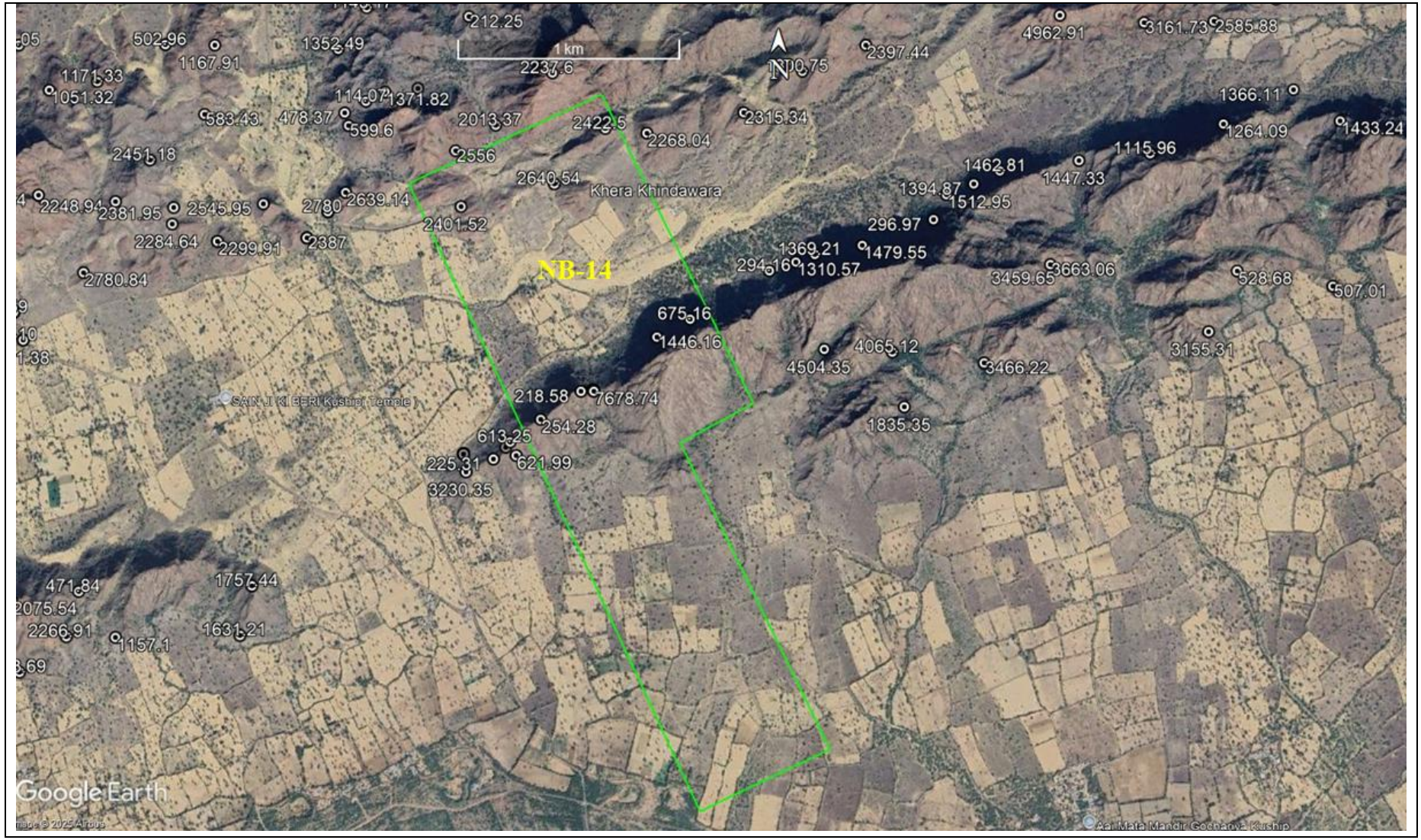
7-Proposed block NB-14 and TREE concentration in surface samples plotted on google earth image



8- Proposed block NB-14 shown on aeromagnetic Map.