APPRAISAL REPORT ON QUARTZ MINERAL DEPOSIT

GEOPHYSICAL ELECTRICAL PROSPECTING TECHNOLOGY – SP SCANNING METHOD
TO FINDOUT HIDDEN QUARTZ MINERAL (PEGMATITE) IN SUB SURFACE LEVEL
OVER AN EXTENT OF 31.13ACRES IN SY.NO. 47 TO 51 OF ERRABOTLAPALLI (V), KONDAPURAM (M), SPSR NELLORE (DT), AP, INDIA.

IN FAVOUR OF

SRI G. SUMAN, NELLORE

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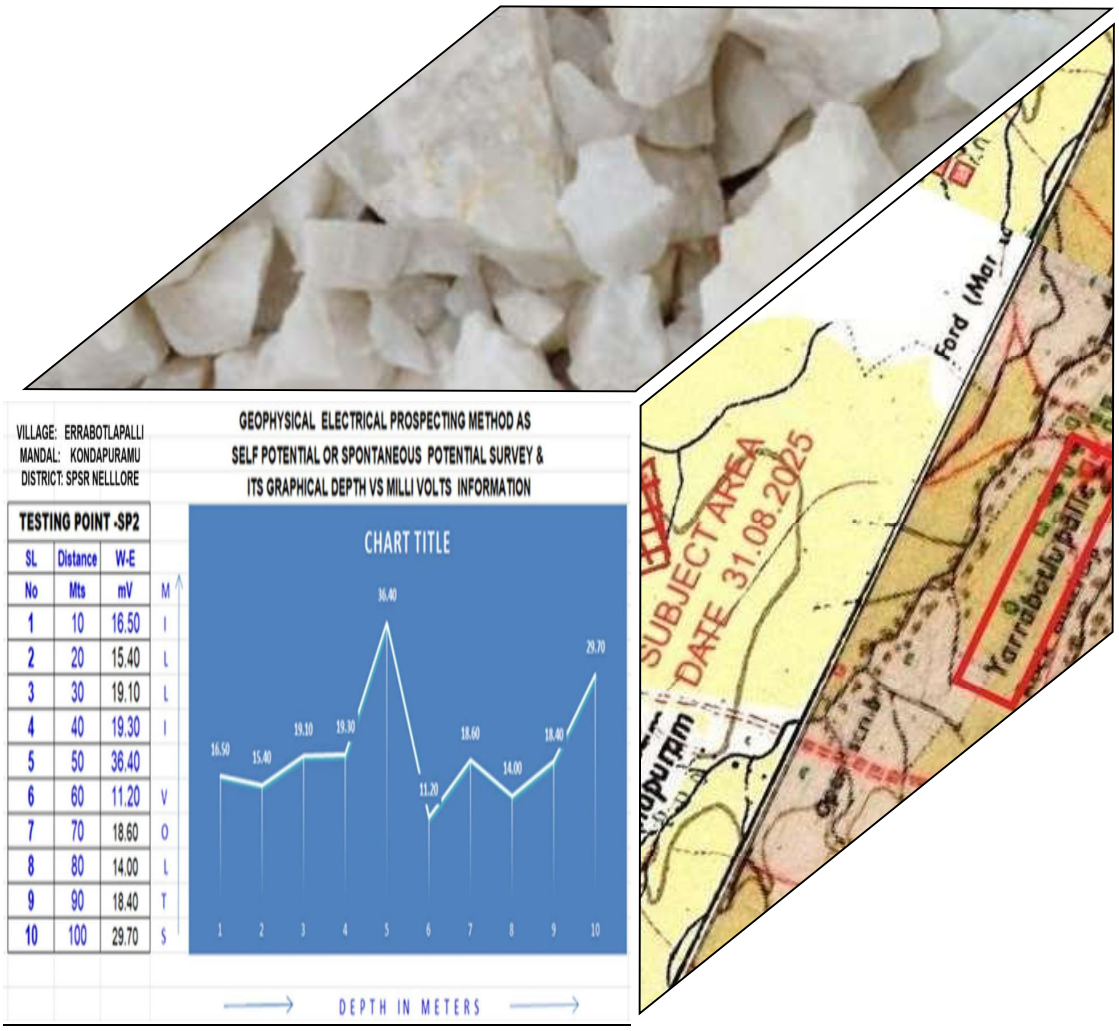

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1. INTRODUCTION

A brief predictive with field facts report on Quartz Mineral deposit, based on geologically in and around the existing quarries experience, result oriented way- to find out hidden Quartz Mineral deposit, in sub-surface level SP scanning survey report. The investigation carried out on dated 31.08.2025, proposed Quarry Lease area over an extent of 31.13 Acres in Sy. Nos. 47 TO 51 of Errabotlapalli Village, Kondapuram Mandal, SPSR Nellore District, AP. The land comes under govt. land which is not forest land.

Location of SP Scan testing subject area is situated (East 500m of Narasimhapuram) NW 2.5 KM of the Errabotlapalli Village, topographically which comes under Survey of India Toposheet No. 57 N/12 Q:1A and 57 N/9 Q:3A of 1:50K scaled maps. The village and subject area, geo coordinates are located –

Errabotlapalli Village North Latitude: 14° 59' 41.40", East Longitude:79° 31' 28.14"
SP Scan testing area North Latitude: 15° 00' 46.89", East Longitude:79° 30' 40.72".

These coordinates place the subject area on the low-relief interfluve zone between seasonal drainage lines Vuppu Vāgu and Pillaperu Vāgu, with direct terrain expression visible on Toposheet 57 N/12. the toposheet overlay indicates the subject area lies south of Turpu Rompidodla and west of Challavāripalle, in a region marked as open scrub, gently undulating terrain, and minor drainage gullies. The geological domain corresponds to the Charnockite / Khondalite Complex (CK) adjoining patches of Granite Gneiss (GN) important for mineral exploration correlation.

2. GEOLOGY AND EXPLORATION

The area is essentially a Nellore Schist traversed by Quartz veins deposit which comes to geologically known as Guduru Pegmatite Deposit

i. Regional Geology:

The Nellore schist belt trends NNE-SSW, N-S, and NNW-SSE for nearly 200KM from Darsi to south ward through kanigiri in Prakasam District and in Nellore District of Duttaluru, Udayagiri and Gundemadakala of Vinjamuru Mandals consisting of two assemblages of rocks the high-grade metamorphic rocks in the eastern and southern parts of the belt and low grade green schist facies rocks with associated lower amphibolites facies (HBL-Schist-amphibolite developed in the western part). The lowgrade schist of the west comprises of current bedded Quartzite, Quartz-schist, chloritic schist, phyllite and meta basalt. They are unaltered where they are in contact with migmatite and devoid of pegmatite intrusions. The green schist assemblages are younger than the lower grade assemblages.

STRATIGRAPHIC SEQUENCE	
Recent Period	Soil cover, alluvium and kankar
	Quartz veins, Pegmatite vein and Quartz veins.
	Basic Dykes
Granite (equivalent to Granite)	Granite and Apatite
Gneiss Complex (equivalent to peninsular Gneiss)	Granite-Gneiss and migmatite
Gneiss Schistose Group (Dharwars)	Chlorite schists with associated lenses of Hornblende - schist and amphibolites. Quartzite-schists and Quartz schist and
Ferruginous Schistose Group (Dharwars)	Quartz Mica schist / phyllite, staurolite-Kyenite- mica schist.
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Geologically the area belongs to Nellore schist belt formed it northern extention in the area of Pamuru, P.C Palli, and Kanigiri mandals in Prakasam District and southern extended parts of Duttaur, Vinjamuru & Udayagiri mandal in Nellore District, AP. Schist folding in hill, ranges and trending NNW-SSE and in northern area it has NE-SW direction

Structural setting (important for hidden/quartz deposits)

The Nellore Schist Belt is structurally complex: multiple folding phases, shear zones and thrusts. Mineralizing pegmatites and quartz veins commonly localize along shear zones, fold hinges and contacts between schist/gneiss/pegmatite bodies. Expect variable strike/dip; mapping and oriented trenching/core are needed.

ii. LOCAL GEOLOGY OF THE SUBJECT AREA

The subject area (near Narasimha puram – Errabotlapalli) lies within the southern Nellore Schist Belt (NSB) and adjoining Eastern Dharwar Craton margin, dominated by high-grade metamorphic rocks and younger intrusive bodies. Based on SOI Toposheets, APSAC geology layers, field characteristics, and SP-scanning response, the local geology comprises:

- **Lithological Units Present**

Khondalite / Charnockite Suite (CK)
Garnet–sillimanite–quartz gneiss
Quartz–feldspar–hypersthene charnockite
Medium to coarse-grained
Hard, competent basement rock
Granite Gneiss (GN)
Biotite granite gneiss
Locally migmatitic
Strong quartz-rich bands (vein–stringer type)
Common host for pegmatites and quartz veins
Pegmatite / Quartz Veins (Minor Intrusives)
NW–SE and NE–SW trending discordant bodies
Width: 0.5 m – 5 m
Length: 50 m – 200+ m
High-purity milky quartz occurrences likely
Weathered Zone / Overburden
Sandy soil + lateritic patches
Thickness varies from 1 m to 6 m
Fractured Zone / Sheet Rock
Partially weathered charnockite & gneiss
High SP anomalies indicating fracture-controlled quartz veins

- **STRUCTURAL GEOLOGY**

General Region
Dominant structural trends: NE–SW, NW–SE
Lineaments intersect near the site (from SP test interpretation)
Favourable setting for tension quartz veins

2.2 Site-Specific Structural Features
Based on SP curves, slopes, and anomalies:
Positive SP bulges → Indicate resistive zones (quartz veins / sheet rock)
Negative troughs → Indicate fractures / clay-filled planes / contact zones

High gradient zones → Possible feeder zones for quartz emplacement
Intersecting anomalies between Test Points SP–3, SP–5, SP–7, SP–9 suggest a quartz-bearing shear zone

- **GEOLOGICAL CROSS-SECTION (Schematic)**

(Representative cross-section drawn from NW to SE across SP survey line)

NW ----SE
Elevation Foot Level
Soil / OB (1–3 m)
Partly Weathered Zone / Sheet Rock (3–8 m)
Fractured Zone (Quartz-Bearing Zone)
Quartz Veins (0.5–3 m width; lensoidal)
Fresh Basement (Charnockite / Gneiss)

Cross-Section Interpretation
Surface cover thin (1–3 m)
Sheet rock at shallow depth (3–6 m)
Fractured quartz-bearing zone at 6–12 m
Quartz veins occur as stringers and lenses, controlled by fractures
Good sign for mineable quartz pockets at shallow depth

- **QUARTZ POTENTIAL PERCENTAGE RATING**

Based on:
✓ SP Scanning Curve Response
✓ Geological Setting
✓ Structural Favourability
✓ Existing quartz mining in ~2–4 km radius
✓ Lineament intersections
✓ Resistivity-like behaviour from SP anomalies

Quartz Potential Classification

Rating %	Interpretation
0–20%	Very Low – no structural support
20–40%	Low – weak veins, isolated pockets
40–60%	Moderate – localised veins, possible small deposit
60–80%	High – strong structural control, continuous veins likely
80–95%	Very High – strong SP anomalies + fracture system + host rock favourable
95–100%	Confirmed Deposit (after drilling/pitting only)

- **QUARTZ POTENTIAL FOR THE SUBJECT AREA (Final Rating)**

Based on SP Survey Interpretation + Geological Evidence:
Strong positive SP anomalies at multiple test sites
Sharp inflection zones indicating fracture-controlled vein emplacement
Favourable host rocks: Gneiss + Khondalite
Known quartz/pegmatite workings within 1–3 km radius
Lineament intersection zone increases fertility

Final Quartz Potential Estimate:
☆ Quartz Potential: 72–85% (High to Very High Probability) Implication
There is high likelihood of subsurface quartz veins (stringer to lensoidal type) within 6–15 m depth, with potential for small-to-medium scale quarrying after verification via:
Trial pits (3–5 m)
Two confirmatory DTH boreholes (15–20 m)
Trenching along SP anomaly lines

3. GEOPHYSICAL ELECTRICAL RESISTIVITY TECHNOLOGY – SPONTANEOUS POTENTIAL (SP) SCANNING / SELF POTENTIAL SURVEY METHOD:

The Spontaneous Potential (SP) or Self Potential method is a passive geophysical electrical technique used to investigate subsurface mineral deposit formations. It is particularly effective for identifying hidden mineral bodies, both horizontal and vertical, by mapping natural electrical potentials generated within the ground.

Survey Principle

The SP method employed in this study follows the dipole configuration, using one fixed (stable) electrode and one mobile electrode. Field data were acquired using a DDR-2 Resistivity Meter (IGIS Geo Sensors, Hyderabad).

Spontaneous-potential or self potential

means one of the geophysical electrical surveying methods refers to used as electrical anomalies in the ground electrical resistivity exploration responses of the spontaneous potential (SP). The Non- Polarized electrodes were carried out with different altitudes and electrode spacing in the field. The aim of the exploration was to obtain characteristic signatures that may be diagnostic of similar geological targets.

Data were received across the mineral zone and the obtained data were used to generate graphs as " depth in Mts against the Potential in mV ". The results denote SP profiles delineate the electrical resistivity giving in the subject area, information on the magnitude and direction of inclination, and quantitative estimation of the depth of burial. It is primarily used in mineral exploration, groundwater source selection surveys, archaeological prospection and basic knowledge for oil & gas presence. Streaming-potential values are varying due to dissolved minerals or hydrocarbons moving in the ground as an electrolyte. Variation in SP values for each new spacing of electrode.

Result and discussion of application

The field data denotes in survey depth in meters below ground level and observed potential in Milli Volts obtained from the investigation. SP values of ground with varies in the observed potential values and its change each new spacing of electrode which gives an idea regarding the presence of aim / target (Quartz or ground water structural information, archaeological prospection and development of hydrocarbons as oil & gas reconnaissance survey) result indicates as an anomaly of SP method. Most commonly, *SP* used for shallow investigations, from characterizing sacrificial materials to investigating resistivity down to depths as great as 1 to 2 km, although greater depths of investigation are possible with some techniques and under some conditions.

This method is primarily used to interpret the vertical variation of subsurface lithological layers, by plotting:

*Horizontal distance (m) → equivalent to depth of investigation,

*Measured potential (millivolts) → representing natural electrochemical variations.

Potential anomalies visible on the SP curves indicate lithological boundaries, structural disturbances, fractures, fault zones, and mineralized zones. Interpretation integrates both technical knowledge and field experience to identify subsurface mineral prospects with good reliability.

Electrode Layout and Depth of Investigation

Copper electrodes were used in the survey, installed either in charged copper rods, or porous pots filled with copper sulphate solution or activated carbon for stability.

The electrode separation (horizontal distance) was systematically increased, allowing deeper penetration. The maximum electrode separation was 150 m, providing an approximate depth of investigation up to 150 m Below Ground Level (depending on local geology and potential gradient strength).

Field Survey Details

A total of 12 SP scanning test points were conducted within the subject area. The site contains existing mineral workings / pits, providing helpful geological control.

All 12 SP test points and the land boundary stones were georeferenced using a Garmin eTrex 20 handheld GPS, based on WGS-84 Datum. All test locations, coordinates, SP curves, and interpreted tables are provided in the corresponding Annexures.

Survey Layout Summary

Trench-1 (across dip direction): 5 SP test points were conducted to study variations across the mineral trend. (Refer: 5m interval each SP Scan Tests across dip direction 1 to 5 graphs)

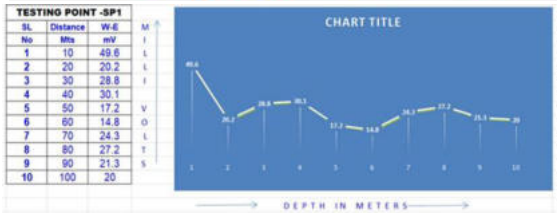
Pit-2 (along strike direction): 4 SP test points were collected to map the continuity of the mineralized zone along strike.(Refer:10m interval SP Scan Tests along strike direction: 6 to 9 graphs)

Dump yard / open cleared area (dip direction): 3 SP test points were taken to confirm structural disposition and lateral extension. (Refer: Every 20m Test on dip direction 10 to12 graphs)

GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP1

SL No	Distance Mts	W-E mV
1	10	49.6
2	20	20.2
3	30	28.8
4	40	30.1
5	50	17.2
6	60	14.8
7	70	24.3
8	80	27.2
9	90	21.3
10	100	20

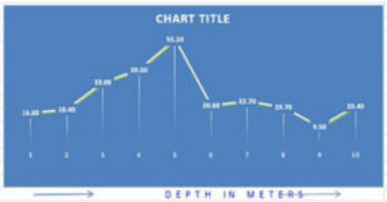


TESTING POINT -SP2

SL No	Distance Mts	W-E mV
1	10	16.50
2	20	15.40
3	30	19.10
4	40	19.30
5	50	36.40
6	60	11.20
7	70	18.60
8	80	14.00
9	90	18.40
10	100	29.70

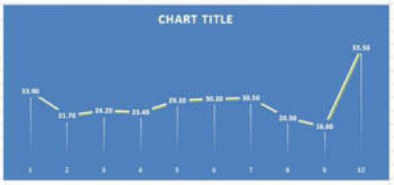
TESTING POINT -SP3

SL No	Distance Mts	W-E mV
1	10	16.80
2	20	18.40
3	30	33.00
4	40	39.50
5	50	55.20
6	60	20.60
7	70	22.70
8	80	19.70
9	90	9.50
10	100	20.40



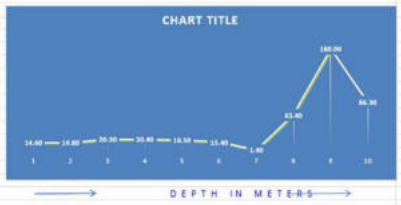
TESTING POINT -SP4

SL No	Distance Mts	W-E mV
1	10	33.90
2	20	21.70
3	30	24.20
4	40	23.40
5	50	29.20
6	60	30.20
7	70	30.50
8	80	20.50
9	90	16.60
10	100	55.50



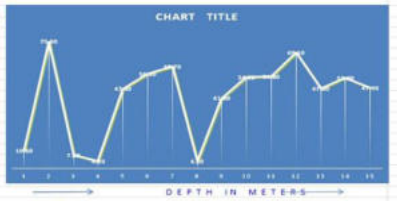
TESTING POINT -SP5

SL No	Distance Mts	W-E mV
1	10	14.60
2	20	14.80
3	30	20.30
4	40	20.40
5	50	18.50
6	60	15.40
7	70	1.40
8	80	63.40
9	90	180.00
10	100	86.30



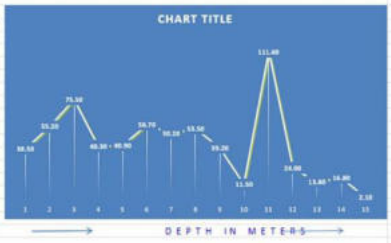
TESTING POINT -SP6

SL No	Distance Mts	W-E mV
1	10	10.60
2	20	75.60
3	30	7.80
4	40	4.20
5	50	47.40
6	60	56.20
7	70	60.70
8	80	4.20
9	90	41.80
10	100	54.20
11	110	54.80
12	120	69.10
13	130	47.60
14	140	53.90
15	150	47.90



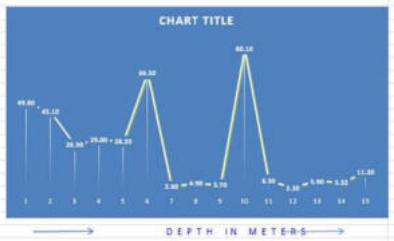
TESTING POINT -SP7

SL No	Distance Mts	W-E mV
1	10	38.50
2	20	55.20
3	30	75.50
4	40	40.30
5	50	40.90
6	60	56.70
7	70	50.20
8	80	53.50
9	90	39.20
10	100	11.50
11	110	111.60
12	120	24.00
13	130	13.80
14	140	16.80
15	150	2.10



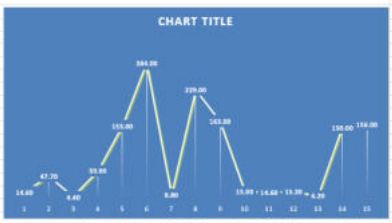
TESTING POINT -SP8

SL No	Distance Mts	W-E mV
1	10	49.80
2	20	45.10
3	30	26.30
4	40	29.00
5	50	28.20
6	60	66.50
7	70	2.80
8	80	4.90
9	90	3.70
10	100	80.10
11	110	6.30
12	120	2.30
13	130	5.90
14	140	5.32
15	150	11.20



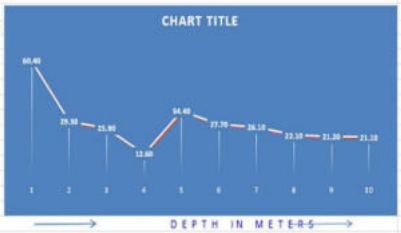
TESTING POINT -SP9

SL No	Distance Mts	W-E mV
1	10	14.60
2	20	47.70
3	30	4.40
4	40	59.00
5	50	153.00
6	60	264.00
7	70	8.80
8	80	229.00
9	90	163.00
10	100	15.00
11	110	14.60
12	120	15.20
13	130	6.20
14	140	150.00
15	150	156.00



TESTING POINT -SP10

SL No	Distance Mts	W-E mV
1	10	60.40
2	20	29.30
3	30	25.90
4	40	12.60
5	50	34.40
6	60	27.70
7	70	26.10
8	80	22.10
9	90	21.20
10	100	21.10

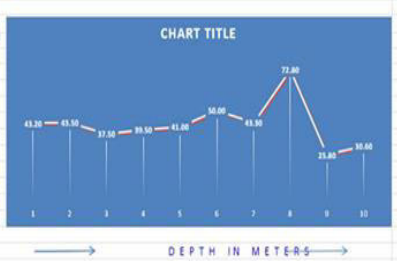


TESTING POINT -SP11

SL No	Distance Mts	W-E mV
1	10	32.30
2	20	33.90
3	30	36.00
4	40	34.50
5	50	36.00
6	60	27.50
7	70	35.20
8	80	38.70
9	90	40.90
10	100	32.30

TESTING POINT -SP12

SL No	Distance Mts	W-E mV
1	10	43.20
2	20	43.50
3	30	37.50
4	40	39.50
5	50	41.00
6	60	50.00
7	70	43.30
8	80	72.80
9	90	25.80
10	100	30.60



CULCULATED DEPTHS IN BELOW GROUND LEVEL INFORMATION														
WIDTH WISE : DIP DIRECTION							LENGTH WISE :STRIKE DIRECTION							
DEPTH	PIT - 1, DIRECTION, WIDTH WISE					**DEPTH**	PIT - 2, DIRECTION, LENGTH WISE				**DEPTH**	DUMP AREA, WIDTH WISE		
IN MTS	SP-1	SP -2	SP - 3	SP - 4	SP - 5	**IN MTS**	SP-6	SP -7	SP - 8	SP - 9	**IN MTS**	SP-10	SP -11	SP - 12
3						**3**	**QTZ**				**3**			
6						**6**	**QTZ**	**QTZ**			**6**			
9			**QTZ**			**9**	**QTZ**	**QTZ**			**9**			
12		**QTZ**	**QTZ**			**12**	**QTZ**	**QTZ**		**QTZ**	**12**			
15		**QTZ**	**QTZ**			**15**	**QTZ**	**QTZ**	**QTZ**	**QTZ**	**15**			
18		**QTZ**	**QTZ**			**18**	**QTZ**	**QTZ**	**QTZ**	**QTZ**	**18**			
21					**QTZ**	**21**	**QTZ**	**QTZ**	**QTZ**	**QTZ**	**21**			**QTZ**
24					**QTZ**	**24**	**QTZ**	**QTZ**		**QTZ**	**24**			**QTZ**
27		**QTZ**		**QTZ**	**QTZ**	**27**		**QTZ**	**QTZ**	**QTZ**	**27**			**QTZ**
30		**QTZ**		**QTZ**	**QTZ**	**30**	**QTZ**		**QTZ**	**QTZ**	**30**			
33		**QTZ**		**QTZ**	**QTZ**	**33**	**QTZ**		**QTZ**		**33**			
36						**36**	**QTZ**				**36**			
39						**39**				**QTZ**	**39**			
42						**42**				**QTZ**	**42**			
45						**45**				**QTZ**	**45**			

The professional interpretation denotes acc.to SP (Self-Potential) survey sheets, contour sketches, and the depth-wise QTZ occurrence table as well combination of dip and strike SP profiles properties of the subsurface character, identifying lithological contacts, structural disturbances, depth of weathered/overburden zone, fractured rock zones, and the potential mineral-bearing beds. The details of the following point have explained in annexure part-

- Interpretation of each SP Scan / Station (SP-1 to SP-12)
- Recommended Depth of Mining / Quartz Zone Thickness
- Expected Recovery %
- Tonnage Estimation Formula + Approximate Tonnage Range

4. RECOMMENDATIONS & ESTIMATION OF THE MINERAL DEPOSIT:

Tonnage formula:

Tonnage=Area×Thickness×Bulk Density

= * * 2.6 t/cbm

Testings of SP1- SP 5 in DIP direction

Tonnage=Area×Thickness×Bulk Density

= (60M*20M) Sq.M * 20 M * 2.6 t/cbm

= 62400 M.Tons (Starts from 9M to 33M @ Stop)

Testings of SP 6- SP 9 in Strike direction

Tonnage=Area×Thickness×Bulk Density

= (200M*20M) Sq.M * 33 M * 2.6 t/cbm

= 343200 M.Tons (Starts from 3M to 36M @ Stop)

Toal Availability of Quartz Mineral is expecting 405600 M.Tons

Recovery = 80% - 60%

= 324480 M.Tons – 243360 M Tons

Average = 283920 M.Tons

5. SUGGESTIONS

• Before preparing the mine execution plan, a few boreholes should be drilled to confirm the subsurface formations identified through the geophysical SP Scanning Survey.
This step is essential for accurate ore estimation.

• After completing the trial boreholes, the geophysical data should be reinterpreted by correlating the SP results with the borehole logs. If required, additional SP tests may be conducted to delineate the mineralized boundaries more precisely.

Accuracy and Variation in Quality & Quantity:

The confirmation of the mineral deposit-its quality, quantity, and overall accuracy—can only be validated through direct core drilling. Therefore, core drilling is mandatory for establishing the reliability of the mineral deposit.

(**NOTE:** After confirming formations with the SP survey results- the best drilling sequence typically includes the following steps:

Start with CORE drilling at selected key locations indicated by the SP anomalies to verify lithology and mineralization zones. This helps confirm subsurface conditions quickly and cost-effectively.

Once, to do drill as core drilling to obtain continuous and detailed samples for geological, mineralogical, and grade analysis. Core drilling provides the highest data quality for assessing variations in mineral Quality and Quantity.

Drill additional boreholes along geophysical anomaly margins or transitional zones to better delineate boundaries and ore body geometry. This infill drilling enhances the resolution and accuracy of the mineral resource model.

Use the borehole logging data to reinterpret SP survey results and refine drilling locations as needed to optimize coverage and target high-potential areas effectively.

This sequence balances cost, data quality, and spatial coverage, optimizing mineral resource estimation and mine planning accuracy. As Trial DTH drilling confirms broad formation characteristics, followed by precise core drilling for detailed reserve evaluation and boundary definition. Infill drilling after initial cores improves resource confidence and reduces variability risk.

This approach has become standard practice in mineral exploration following geophysical surveys like SP scanning for reliable confirmation and characterization of ore bodies before mine execution planning.)

6.LIMITATIONS

i) The subsurface lithology interpreted from the SP Scanning Survey is inferred solely from the electrical properties of the underlying formations, and may not always represent the exact geological conditions.

ii) A total of 12 SP scan test points were recorded along the profiles/traverses. Each test location was spaced at 10-20 m intervals, with an acquisition accuracy of approximately ±1.5 m.

DATE: 10.09.2025

EXECUTIVE GEOLOGIST & RQP

STATION: ONGOLE

(N. KRISHNA SASTRY)
RQP/DMG/HYD/069 / 2003

N.KRISHNASASTRI

GEOCONSULTANCY & GROUNDWATER & MINERALS INVESTIGATION
N. KRISHNA SASTRY
Geologist
RQP DMG HYD-069/2003
GWD LI No. 1958/
Hyd/SVB3 Dt 02.07.1998
ONGOLE

Subject Compliance Notice Status

All applicable Acts and Regulations have been observed in the subject area. If further permissions are needed, the relevant person, contractor, or beneficiary should contact appropriate authorities, including forest department authorities, marine or port departments as necessary.

Statutory Advice

SP (Self-Potential) exploration results and related geophysical data & geological data from this area should be re-confirmed using drilling methods such as DTH (Down-The-Hole) or core drilling, with professional oversight from a qualified exploration geologist.

Disclaimer

Our service provides scientific field data in a clear pictorial report with result-oriented recommendations, as far as practicable. GEOCONSULTANCY (tn10.09.2025t winrock.com, geo enviro consultants) strives to deliver reliable and accurate data and interpretations, backed by over 42 years of experience.

DATE: 10.09.2025

EXECUTIVE GEOLOGIST & RQP

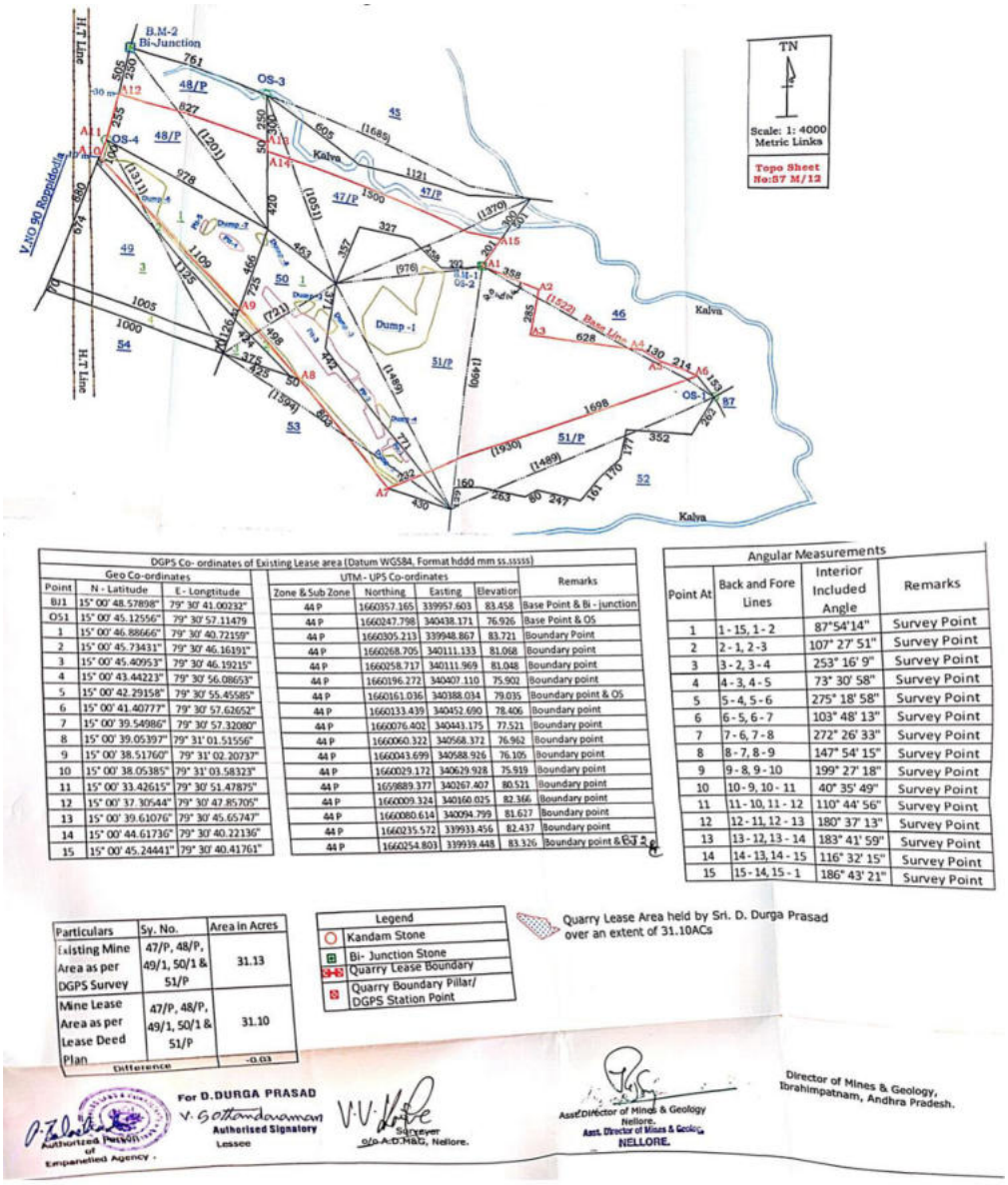
STATION: ONGOLE

N. KRISHNASASTRI

ANNEXURE

ORIENTATION OF THE SUJECT AREA

THE SUJECT AREA



DGPS Co- ordinates of Existing Lease area (Datum WGS84, Format hddd mm ss.sssss)

Point	Geo Co-ordinates N - Latitude	Geo Co-ordinates E - Longtitude	UTM - UPS Co-ordinates Zone & Sub Zone	Northing	Easting	Elevation	Remarks
BJ1	15° 00' 48.57898"	79° 30' 41.00232"	44 P	1660357.165	339957.603	83.458	Base Point & Bi - junction
OS1	15° 00' 45.12556"	79° 30' 57.11479	44 P	1660247.798	340438.171	76.926	Base Point & OS
1	15° 00' 46.88666"	79° 30' 40.72159"	44 P	1660305.213	339948.867	83.721	Boundary Point
2	15° 00' 45.73431"	79° 30' 46.16191"	44 P	1660268.705	340111.133	81.068	Boundary point
3	15° 00' 45.40953"	79° 30' 46.19215"	44 P	1660258.717	340111.969	81.048	Boundary point
4	15° 00' 43.44223"	79° 30' 56.08653"	44 P	1660196.272	340407.110	75.902	Boundary point
5	15° 00' 42.29158"	79° 30' 55.45585"	44 P	1660161.036	340388.034	79.035	Boundary point & OS
6	15° 00' 41.40777"	79° 30' 57.62652"	44 P	1660133.439	340452.690	78.406	Boundary point
7	15° 00' 39.54986"	79° 30' 57.32080"	44 P	1660076.402	340443.175	77.521	Boundary point
8	15° 00' 39.05397"	79° 31' 01.51556"	44 P	1660060.322	340568.372	76.962	Boundary point
9	15° 00' 38.51760"	79° 31' 02.20737"	44 P	1660043.699	340588.926	76.105	Boundary point
10	15° 00' 38.05385"	79° 31' 03.58323"	44 P	1660029.172	340629.928	75.919	Boundary point
11	15° 00' 33.42615"	79° 30' 51.47875"	44 P	1659889.377	340267.407	80.521	Boundary point
12	15° 00' 37.30544"	79° 30' 47.85705"	44 P	1660009.324	340160.025	82.366	Boundary point
13	15° 00' 39.61076"	79° 30' 45.65747"	44 P	1660080.614	340094.799	81.627	Boundary point
14	15° 00' 44.61736"	79° 30' 40.22136"	44 P	1660235.572	339933.456	82.437	Boundary point
15	15° 00' 45.24441"	79° 30' 40.41761"	44 P	1660254.803	339939.448	83.326	Boundary point & OS

Angular Measurements

Point At	Back and Fore Lines	Interior Included Angle	Remarks
1	1 - 15, 1 - 2	87°54'14"	Survey Point
2	2 - 1, 2 - 3	107° 27' 51"	Survey Point
3	3 - 2, 3 - 4	253° 16' 9"	Survey Point
4	4 - 3, 4 - 5	73° 30' 58"	Survey Point
5	5 - 4, 5 - 6	275° 18' 58"	Survey Point
6	6 - 5, 6 - 7	103° 48' 13"	Survey Point
7	7 - 6, 7 - 8	272° 26' 33"	Survey Point
8	8 - 7, 8 - 9	147° 54' 15"	Survey Point
9	9 - 8, 9 - 10	199° 27' 18"	Survey Point
10	10 - 9, 10 - 11	40° 35' 49"	Survey Point
11	11 - 10, 11 - 12	110° 44' 56"	Survey Point
12	12 - 11, 12 - 13	180° 37' 13"	Survey Point
13	13 - 12, 13 - 14	183° 41' 59"	Survey Point
14	14 - 13, 14 - 15	116° 32' 15"	Survey Point
15	15 - 14, 15 - 1	186° 43' 21"	Survey Point

Particulars	Sy. No.	Area in Acres
Existing Mine Area as per DGPS Survey	47/P, 48/P, 49/1, 50/1 & 51/P	31.13
Mine Lease Area as per Lease Deed Plan	47/P, 48/P, 49/1, 50/1 & 51/P	31.10
Difference		-0.03

Legend
- Kandam Stone
- Bi- Junction Stone
- Quarry Lease Boundary
- Quarry Boundary Pillar/ DGPS Station Point

Quarry Lease Area held by Sri. D. Durga Prasad over an extent of 31.10ACs

For D.DURGA PRASAD
V. Gottandaraman
Authorised Signatory
Lessee

Surveyor
S/o A.D.M&G, Nellore.

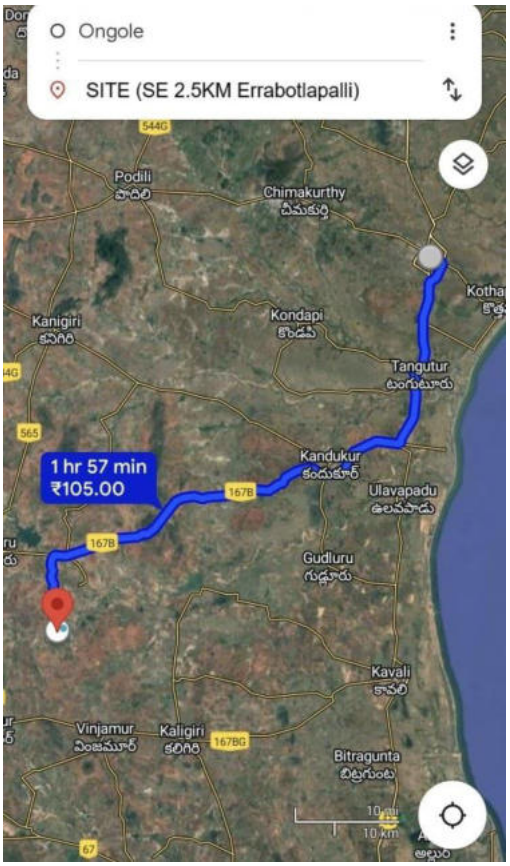
Asst.Director of Mines & Geology
Nellore.
Asst. Director of Mines & Geology
NELLORE.

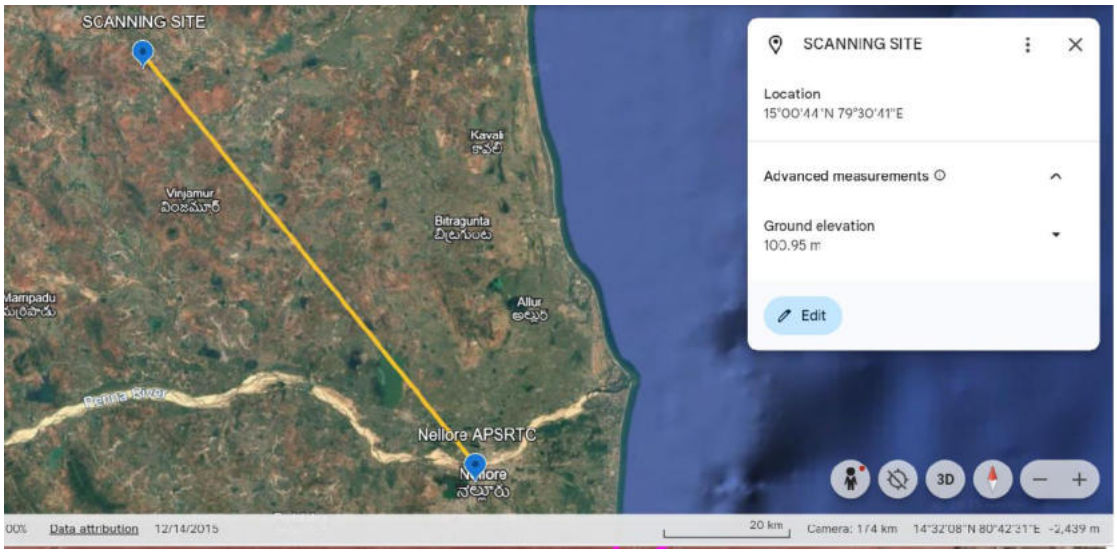
Director of Mines & Geology,
Ibrahimpatnam, Andhra Pradesh.

GEOPHYSICAL ELECTRICAL PROSPECTING TECHNOLOGY –
SCANNING METHOD OF 'SP' SURVEY TO FINDOUT QUARTZ MINERAL
(PEGMATITE) IN SUB SURFACE LEVEL AS HIDDEN MINERAL

SITE@: SY.NO. 48 & 51 OF ERRABOTLAPALLI (V),
KONDAPURAM (M), SPSR NELLORE, AP, INDIA.
IN FAVOUR OF SRI G. SUMAN, NELLORE

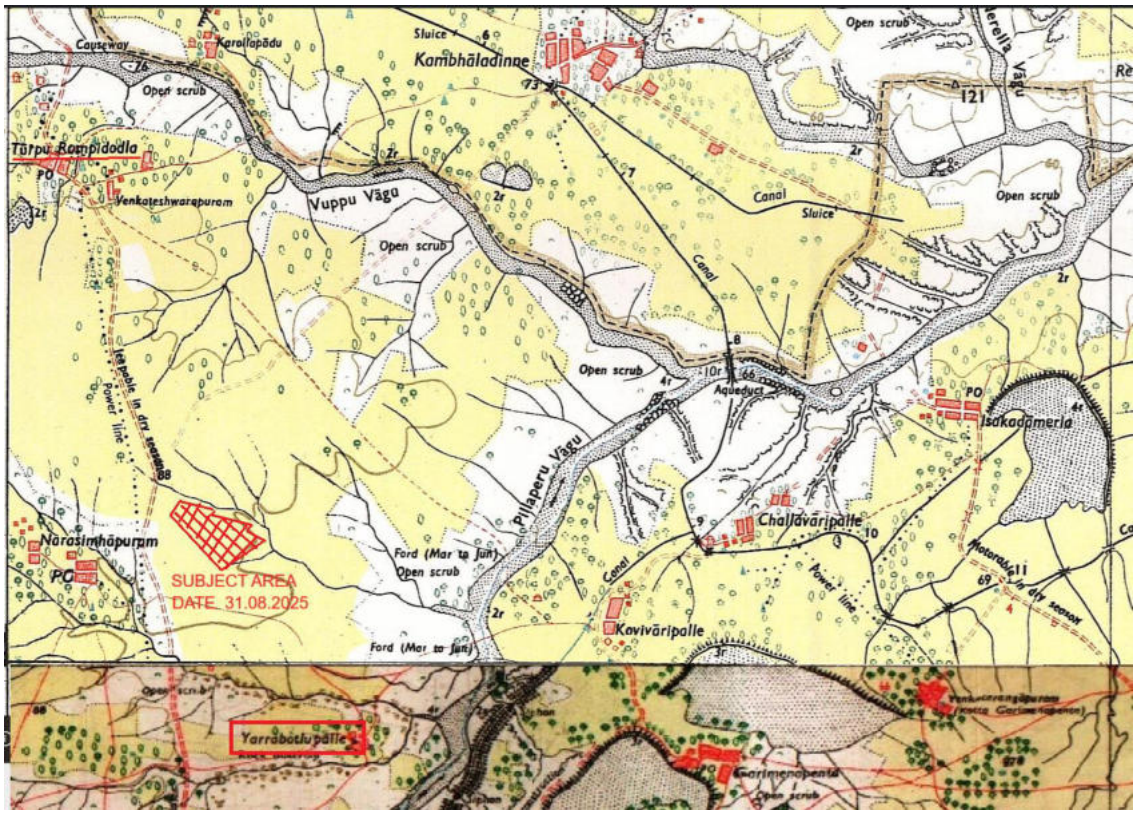
SUBJECT AREA ROUTE MAP



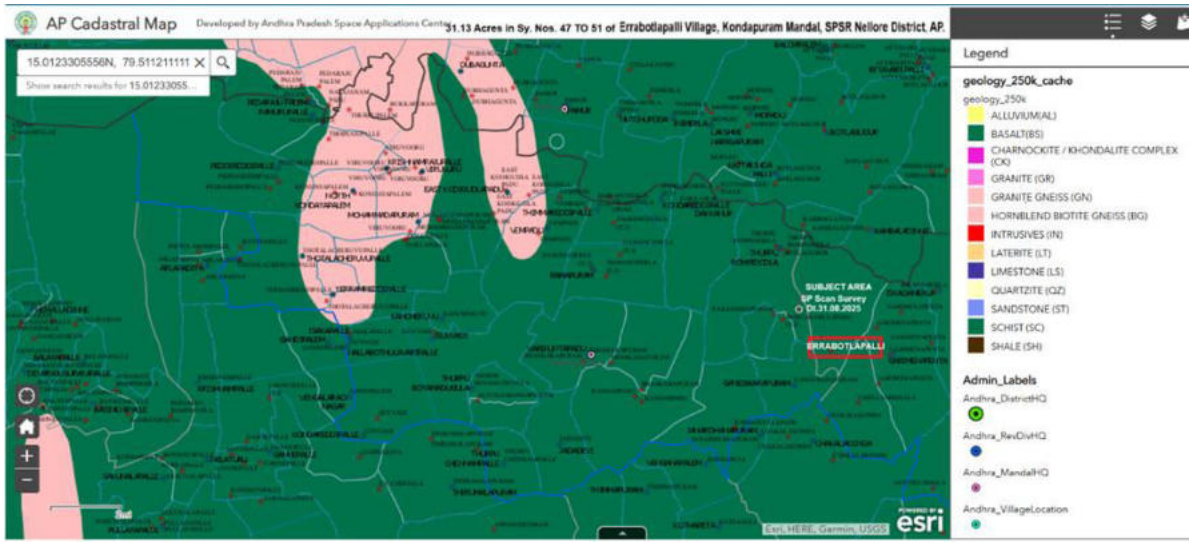


TOPOSHEET OF THE SUBJECT AREA

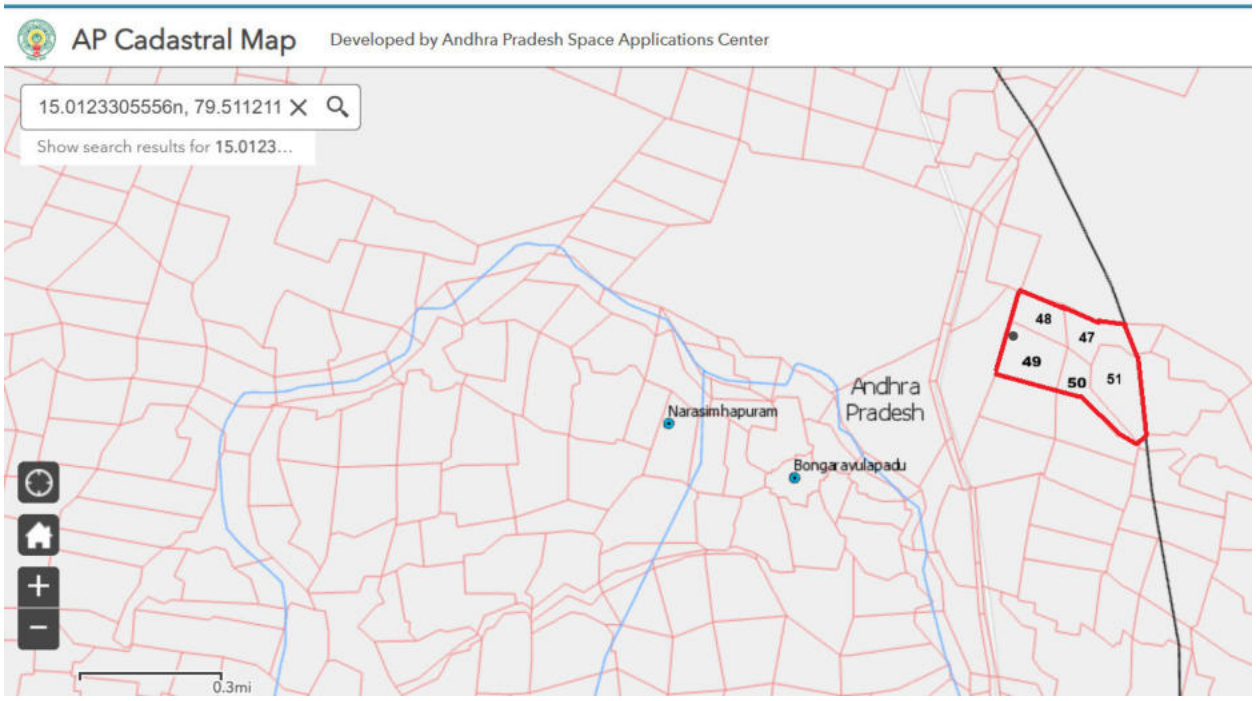
Errabotlapalli Village N. Lat: 14º 59' 41.40", E. Long:79º 31' 28.14" (57 N/9 Q:3A)
SP Scan testing area N. Lat: 15º 00' 46.89", E. Long:79º 30' 40.72" (57 N/12 Q:1A)



GEOLOGY OF THE AREA



VILLAGE MAP WITH SURVEY NOS OF THE SUBJECT AREA



GEOPHYSICAL ELECTRICAL TECHNOLOGY- AS SPONTANEOUS POTENTIAL / SELF POTENTIAL / SP POTENTIAL METHODOLOGY

Spontaneous-potential or self potential

means one of the geophysical electrical surveying methods refers to used as electrical anomalies in the ground electrical resistivity exploration responses of the spontaneous potential (SP). The Non- Polarized electrodes were carried out with different altitudes and electrode spacing in the field. The aim of the exploration was to obtain characteristic signatures that may be diagnostic of similar geological targets.

Data were received across the mineral zone and the obtained data were used to generate graphs as " depth in Mts against the Potential in mV ". The results denote SP profiles delineate the electrical resistivity giving in the subject area, information on the magnitude and direction of inclination, and quantitative estimation of the depth of burial. It is primarily used in mineral exploration, groundwater source selection surveys, archaeological prospection and basic knowledge for oil & gas presence. Streaming-potential values are varying due to dissolved minerals or hydrocarbons moving in the ground as an electrolyte. Variation in SP values for each new spacing of electrode.

Result and discussion of application

The field data denotes in survey depth in meters below ground level and observed potential in Milli Volts obtained from the investigation. SP values of ground with varies in the observed potential values and its change each new spacing of electrode which gives an idea regarding the presence of aim / target (Quartz or ground water structural information, archaeological prospection and development of hydrocarbons as oil & gas reconnaissance survey) result indicates as an anomaly of SP method. Most commonly, SP used for shallow investigations, from characterizing sacrificial materials to investigating resistivity down to depths as great as 1 to 2 km, although greater depths of investigation are possible with some techniques and under some conditions.

SP POTENTIAL METHODOLOGY

The geophysical Electrical Self Potential SP) method is a passive field survey technique that measures naturally occurring voltage differences in the ground, providing valuable information on subsurface features such as groundwater movement, sulfide mineralization, and seepage paths.

Overview of SP Field Procedure:

The SP method typically involves placing two non-polarizing electrodes—one stationary (base electrode) and one mobile (roving or leading electrode)—at different points on the ground surface. These electrodes are connected via a well-insulated, low-resistance wire to a sensitive voltmeter or potentiometer

Step-by-Step Field Process

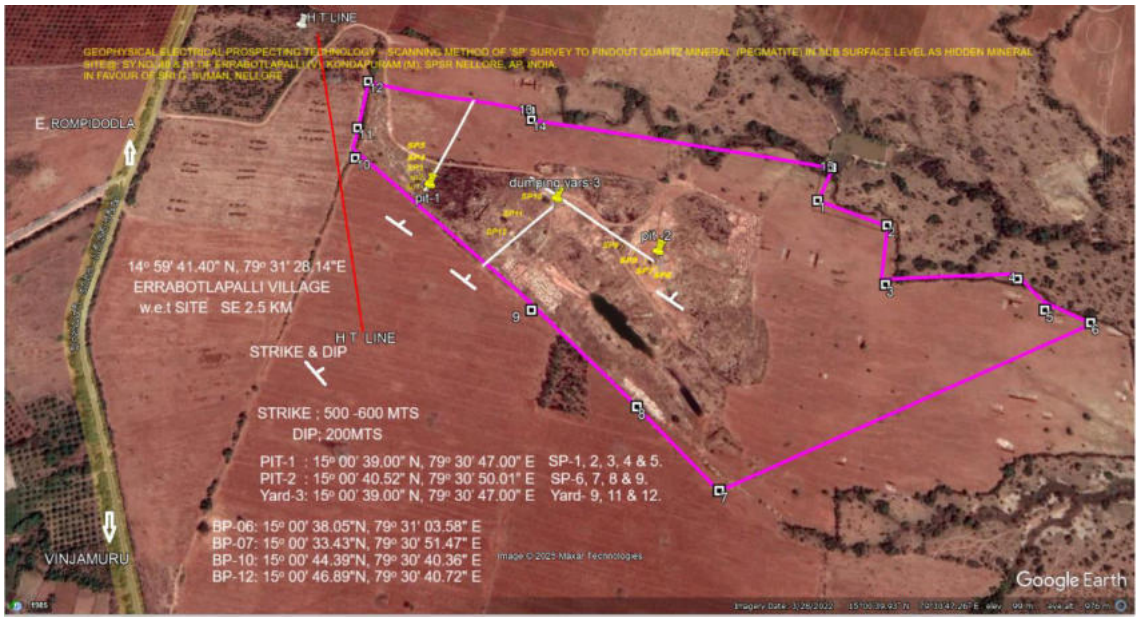
- Select a survey line or grid over the area of interest and set up a base (stationary) electrode in a geologically quiet, electrically stable location.
- Connect the stationary electrode to the voltmeter or potentiometer via an insulated wire.
- Use the mobile electrode to measure potential differences at each station along the survey line/grid, periodically returning to the base location to check for drift or instrument error.
- For larger areas, a gradient (leapfrog) technique can be used, where the mobile electrode progresses from station to station, measuring differences between adjacent points, reducing the need for long wires.
- Use non-polarizing electrodes—often copper-copper sulphate or similar—to minimize noise and ensure stable readings, especially in soils with low natural potentials.
- Record SP values at each station, noting environmental conditions and electrode positions.

Key Considerations

- SP anomalies can be influenced by environmental "noise," local geology, and man-made stray currents, so careful baseline and repeat measurements are important.
- Data analysis involves plotting potential values along survey lines to identify negative or positive anomalies that suggest zones of groundwater flow, mineralization, or other subsurface features.
- Interpretation is qualitative—strong contrasts can signal ore bodies, fluid migration pathways, or faults, but additional geophysical data (e.g., resistivity profiles) may be needed for confirmation.

The SP field procedure is relatively straightforward, low-cost, and widely applied in groundwater, mineral exploration, and environmental studies where mapping natural electrical potentials and related subsurface phenomena is valuable.

THE SUBJECT AREA CUM SP SCAN TESTING AREA
SP SCAN TEST PIN POINTS ORIENTATION ACC. TO. DIP & STRIKE OF THE THE PIT-1 & PIT-2 AS WELL CLEARED DUMP AREA



1. INTERPRETATION OF EACH SP SCAN (SP-1 to SP-12)

Quartz (QTZ) is indicated where electrical potential anomalies show a conductive-resistive contrast—typical of quartz veins.

PIT-1, Dip Direction – SP Testings 1 to 5, Graphs & Its Interpretation

➤ PIT-1 Direction (Width-wise / Dip Direction) – SP-1 to SP-5

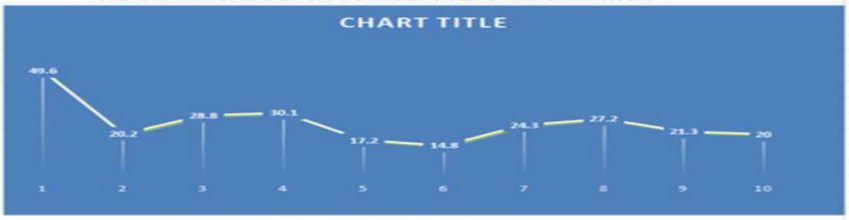
Station	Interpretation	Depth Range of QTZ
SP-1	No QTZ signature	None
SP-2	Weak SP anomaly	12–18 m
SP-3	Medium SP low (typical quartz signature)	9–18 m
SP-4	Strong anomaly peak (clear quartz vein)	12–27 m
SP-5	Moderate anomaly	27–33 m

Interpretation:
The quartz body in PIT-1 trends from SP-2 → SP-4 → SP-5, dipping deeper eastwards.
Maximum continuity: **~9–33 m** depth.

GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP1

SL No	Distance Mts	W-E mV
1	10	49.6
2	20	20.2
3	30	28.8
4	40	30.1
5	50	17.2
6	60	14.8
7	70	24.3
8	80	27.2
9	90	21.3
10	100	20



GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP2

SL No	Distance Mts	W-E mV
1	10	16.50
2	20	15.40
3	30	19.10
4	40	19.30
5	50	36.40
6	60	11.20
7	70	18.60
8	80	14.00
9	90	18.40
10	100	29.70

GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

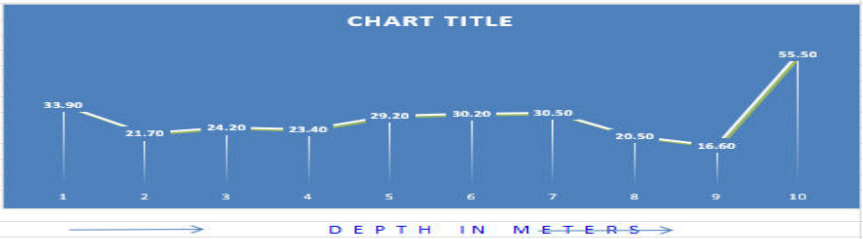
TESTING POINT -SP3

SL No	Distance Mts	W-E mV
1	10	16.80
2	20	18.40
3	30	33.00
4	40	39.50
5	50	55.20
6	60	20.60
7	70	22.70
8	80	19.70
9	90	9.50
10	100	20.40

GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP4

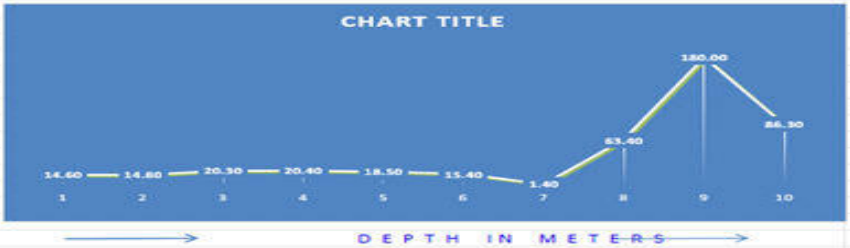
SL No	Distance Mts	W-E mV
1	10	33.90
2	20	21.70
3	30	24.20
4	40	23.40
5	50	29.20
6	60	30.20
7	70	30.50
8	80	20.50
9	90	16.60
10	100	55.50



GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP-5

SL No	Distance Mts	W-E mV
1	10	14.60
2	20	14.80
3	30	20.30
4	40	20.40
5	50	18.50
6	60	15.40
7	70	1.40
8	80	63.40
9	90	180.00
10	100	86.30



PIT-2, STRIKE, Direction – SP Testings 6 to 9, Graphs & Its Interpretation

➤ PIT-2 Direction (Length-wise / Strike Direction) — SP-6 to SP-9

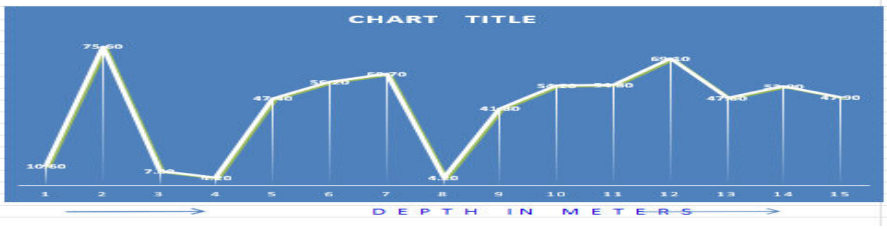
Station	Interpretation	Depth Range
SP-6	Strong, continuous anomaly	9–33 m
SP-7	Very strong anomaly (high-grade quartz)	9–30 m
SP-8	Steep SP lows (wide quartz body)	12–33 m
SP-9	Persisting anomaly	18–33 m

Interpretation: This line shows **the strongest and thickest quartz zone**, continuous across all stations.
Depth continuity: **9–33 m**, best quality around **15–30 m**.

GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP-6

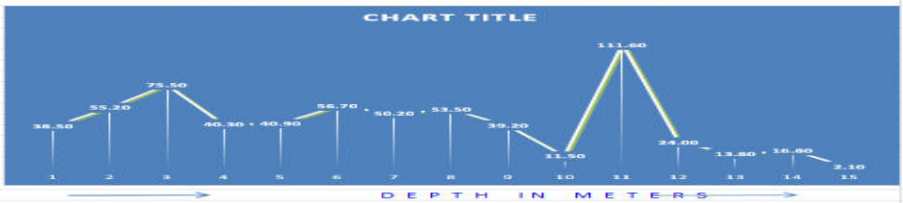
SL No	Distance Mts	W-E mV
1	10	10.60
2	20	75.60
3	30	7.80
4	40	4.20
5	50	47.40
6	60	56.20
7	70	60.70
8	80	4.20
9	90	41.80
10	100	54.20
11	110	54.80
12	120	69.10
13	130	47.60
14	140	53.90
15	150	47.90



GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP-7

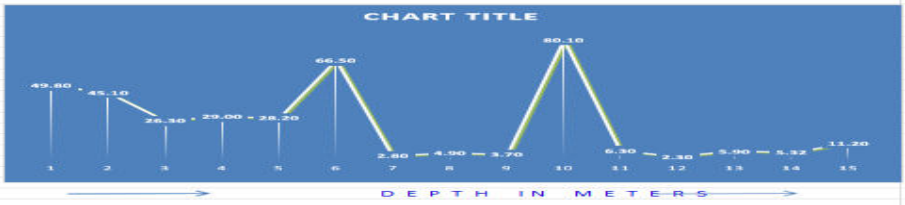
SL No	Distance Mts	W-E mV
1	10	38.50
2	20	55.20
3	30	75.50
4	40	40.30
5	50	40.90
6	60	56.70
7	70	50.20
8	80	53.50
9	90	39.20
10	100	11.50
11	110	111.60
12	120	24.00
13	130	13.80
14	140	16.80
15	150	2.10



GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP-8

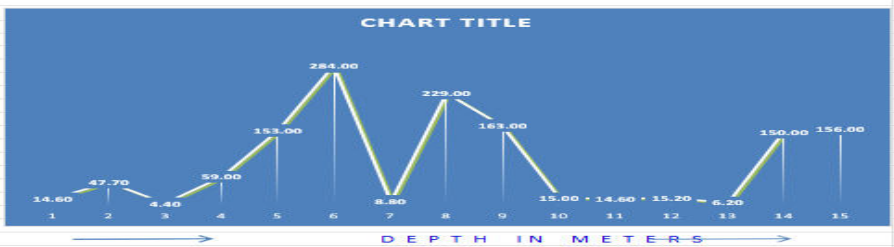
SL No	Distance Mts	W-E mV
1	10	49.80
2	20	45.10
3	30	26.30
4	40	29.00
5	50	28.20
6	60	66.50
7	70	2.80
8	80	4.90
9	90	3.70
10	100	80.10
11	110	6.30
12	120	2.30
13	130	5.90
14	140	5.32
15	150	11.20



GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP-9

SL No	Distance Mts	W-E mV
1	10	14.60
2	20	47.70
3	30	4.40
4	40	59.00
5	50	153.00
6	60	284.00
7	70	8.80
8	80	229.00
9	90	163.00
10	100	15.00
11	110	14.60
12	120	15.20
13	130	6.20
14	140	150.00
15	150	156.00



DUMP AREA DIP Direction – SP Testings 10 to 12, Graphs & Its Interpretation

➤ Dump Area (Width) – SP-10 to SP-12

Station	Interpretation	Depth
SP-10	Late anomaly	21–33 m
SP-11	Moderate anomaly	24–33 m
SP-12	Clear QTZ signature	24 m

Interpretation:

Quartz zone is deeper here, limited to 21–33 m.

GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP-10		
SL No	Distance Mts	W-E mV
1	10	60.40
2	20	29.30
3	30	25.90
4	40	12.60
5	50	34.40
6	60	27.70
7	70	26.10
8	80	22.10
9	90	21.20
10	100	21.10

GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP-11		
SL No	Distance Mts	W-E mV
1	10	32.30
2	20	33.90
3	30	36.00
4	40	34.50
5	50	36.00
6	60	27.50
7	70	35.20
8	80	38.70
9	90	40.90
10	100	32.30

GEOPHYSICAL ELECTRICAL PROSPECTING METHOD AS SELF POTENTIAL OR SPONTANEOUS POTENTIAL SURVEY & ITS GRAPHICAL DEPTH VS MILLI VOLTS INFORMATION

TESTING POINT -SP-12		
	Distance	W-E
No	Mts	mV
1	10	43.20
2	20	43.50
3	30	37.50
4	40	39.50
5	50	41.00
6	60	50.00
7	70	43.30
8	80	72.80
9	90	25.80
10	100	30.60

2. CONSOLIDATED DEPTH ASSESSMENT

Quartz Zone Begins:

- **9 m BGL** (shallowest – SP-3, SP-6, SP-7)

Quartz Zone Maximum Depth:

- **33 m BGL** (most stations)

Average Recommended Mining Depth:

→ 12 m to 30 m BGL

3. RECOVERY % ESTIMATION

From SP response strength + table continuity:

Location/Line	Quality	Estimated Recovery %
PIT-1 (SP-2 to SP-5)	Medium	45–60%
PIT-2 (SP-6 to SP-9)	High grade quartz vein	65–80%
Dump Area (SP-10 to SP-12)	Medium–Low	35–55%

Overall Average Quartz Recovery: ≈ 55–70%

4. TONNAGE ESTIMATION (QUARTZ)

Tonnage formula:

Tonnage=Area×Thickness×Bulk Density

{Tonnage} = text {Area} \ times \ text {Thickness} \ times \ text {Bulk Density}

Tonnage=Area×Thickness×Bulk Density

Typical quartz density: 2.55–2.65 t/m³

From contours:

- Shallow Zone Area ≈ 1500–1800 m²
- Deep Zone Area ≈ 900–1200 m²

- Average Thickness = 20 m (12–32 m)

Estimated Total Quartz Tonnage Range

250,000 tons to 380,000 tons250,000 \text{ tons} \; \text{to} \; 380,000 \text{ tons}

250,000 tons to 380,000 tons

5. FINAL SUMMARY

Best Quartz Zone

- SP-6 to SP-8
- Depth: 12–30 m
- Highest recovery: 70–80%

Moderate Quartz Zones

- SP-3 to SP-5, SP-10 to SP-12
- Depth to Start Mining
- Begin at 9 m
- Stop at 30–33 m

Total Extractable Quartz

≈ 2.5 to 3.8 lakh tons