

INVESTIGATION OF QUARTZ BY UTILIZING GEOPHYSICAL RESISTIVITY SELF-POTENTIAL (SP) AND REGULAR ELECTRICAL FIELD METHODS (NEF) IN GUDUR REGION, TIRUPATHI, ANDHRA PRADESH, INDIA

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ABSTRACT

Investigation of quartz is one of the basic strategies to figure out the veins in the review region. Quartz shaped in the vein of the store, and crystallization of quartz in the last stage. In the current review region, quartz is shaped under the territorial transformation, where pegmatite schist is accessible and quartz veins are framed. According to Bowen's response, quartz is the last framed mineral. Self-potential demonstrates the thickness variety of the ground. Most of the quartz accessibility region thickness is perhaps 50 to 60 mV, feldspars are 40 to 60 mV, and there are negative qualities (- 10,- 15), which shows the mica gathering of minerals. Gudur provenance significantly mineral stores are arranged in N-S heading, i.e., called strike and dunk course might be in the west. The regular electromagnetic strategy ascertain the upward profundity of the mineral stores and study region the mineral stores are shaped surface 3.5 m up to the profundity of 100m after the cellar rock was framed. The mineral unearthing in the review region utilizes the repetition opening mining strategy, and each 15 feet vertical seat has a point of 1:18 degree slant. In general, the review region shows the granular quartz assortment, which demonstrates the sluggish cooling pace of quartz mineralization, and it is financially high worth. This examination recommends the investigation of quartz shaped in the shallow profundity, feldspar at moderate profundity, and mica framed in the significant profundity.

KEYWORDS: Self-potential graphs, Natural electromagnetic sounding graphs, and study area map

INTRODUCTION

The QUARTZ word is derived from the German word QUARZ; at room temperature, quartz is a member of the trigonal crystal system; beyond 573 °C (846 K; 1,063 °F), it is a member of the hexagonal crystal system. The perfect crystal form is a prism with six sides that end with six-sided pyramids at either end. In the wild, quartz crystals are frequently twisted, twinned (with matching left- and right-handed crystals), or so intergrown with neighboring quartz or other mineral crystals that they only partially display their original shape. They can sometimes look huge and lack any discernible crystal faces.

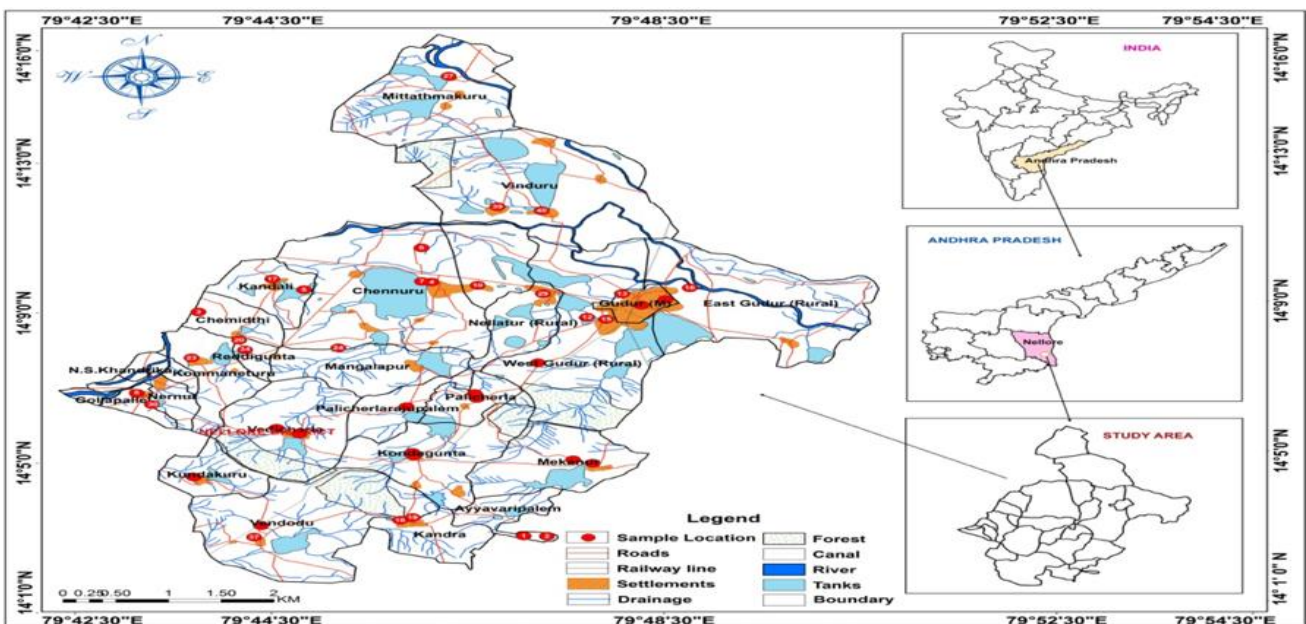


Figure 1.0 The location map of the study area

STUDY AREA

Gudur is a small town, gudur Mandal, in Tirupathi District of Andhra Pradesh State, India. It belongs to the Andhra region. It is located 100 km South of the District headquarters in Tirupathi .it receives rainfall during the months of November and December. This is one of the richest mineral belts in dendritic to sub-dendritic patterns.

GEOLOGY OF THE STUDY AREA

The pegmatite schist and quartzite predominately occupied the geology of the study area. These are the last stages of crystallization. It is composed of minerals like quartz, feldspar, mica, beryl, and tourmaline [1,2,3] .The study area almost moderate slope to plain land.

METHOD OF EXPLORATION

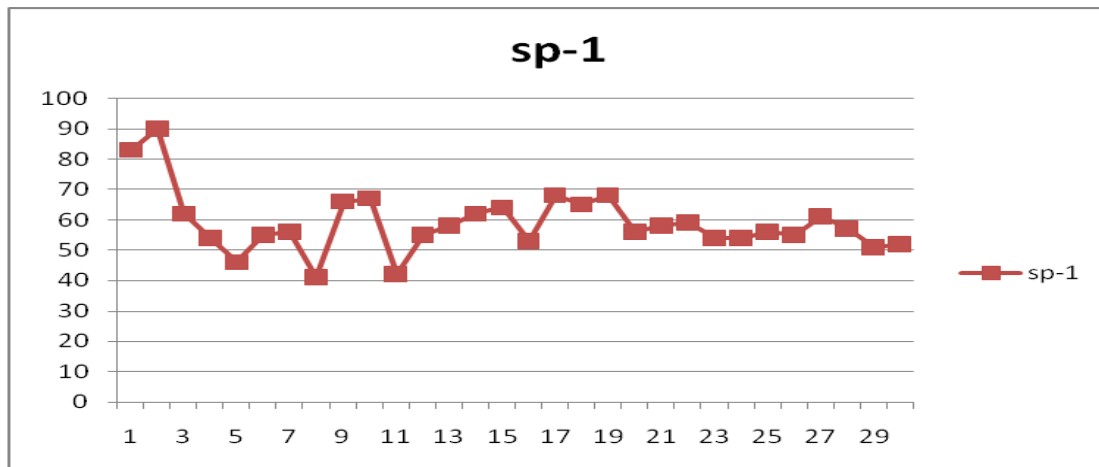
The present study area is widely used in two types of methodology like geophysical; one is self-potential, and the second is vertical electrical sounding (natural electrical filed)[4,5,6]

DATA INTERPRETATION

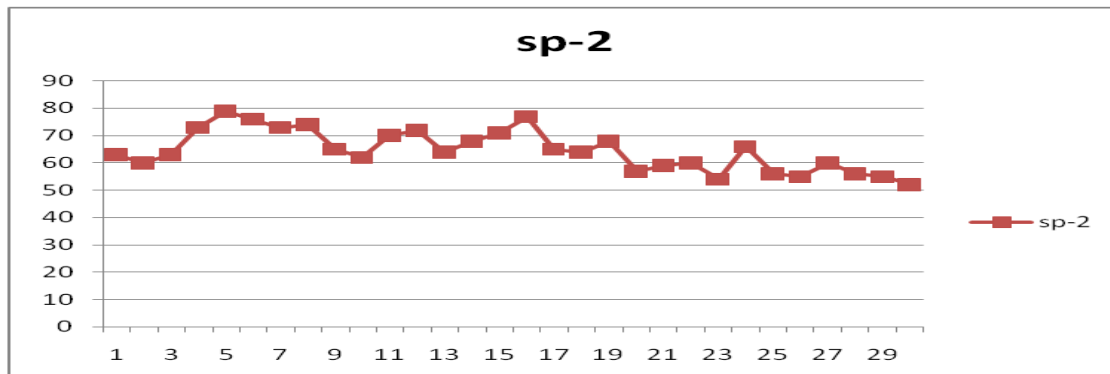
In the study area, 11 sp data points and 20 to 40 Ves(natural electromagnetic difference) data were captured and processed in different software, and graphs were produced. In these graphs, the bell type cures express the anomaly like quartz starts with 0.1 values whereas the remaining feldspar shows 0.04 to up to 1 values and mica indicates the negate values like -1[7]

GRAPHPLOTS DISTANCE VS SELF POTENTIAL

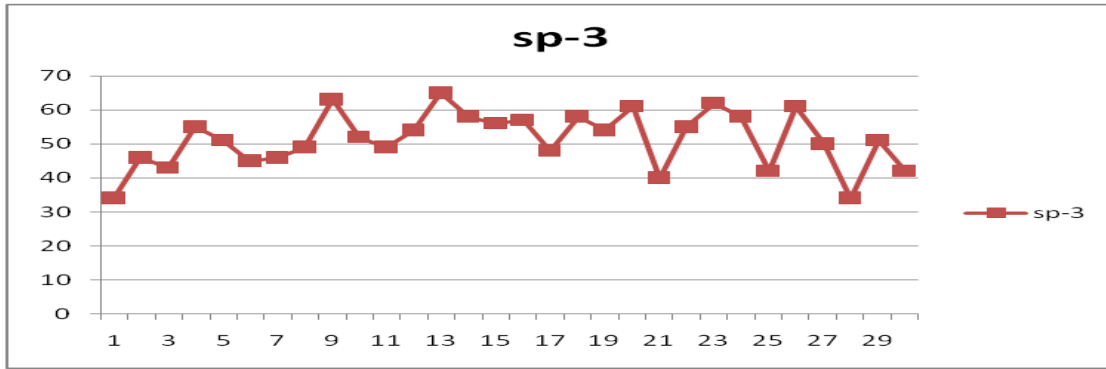
SP-1(14.221730, 79.787410) (NORTH WEST)



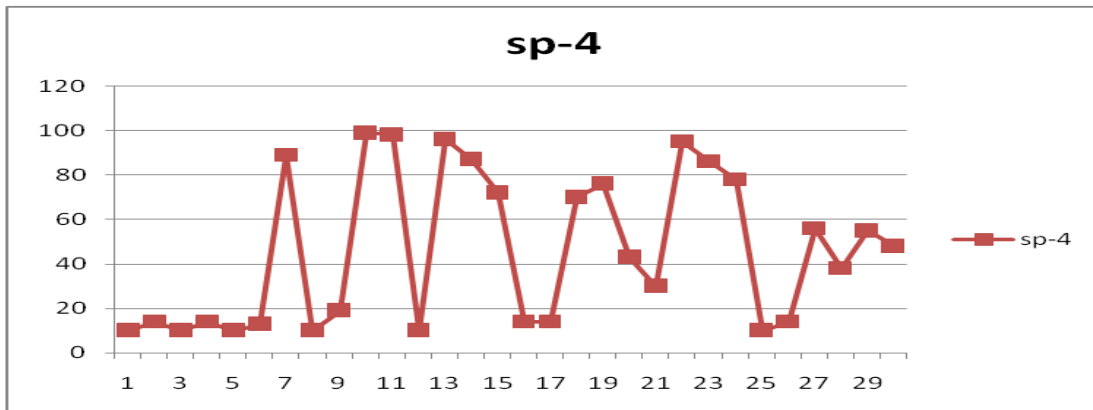
SP-2(14.222453, 79.787598) NORTHWEST



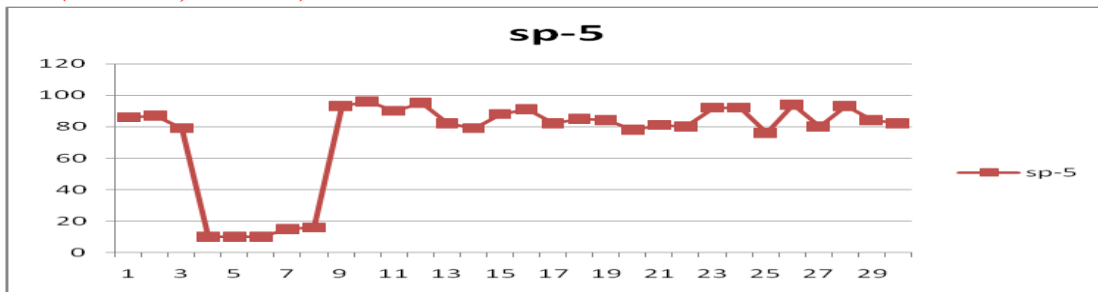
SP-3(14.220547,79.787851)NORTH WEST



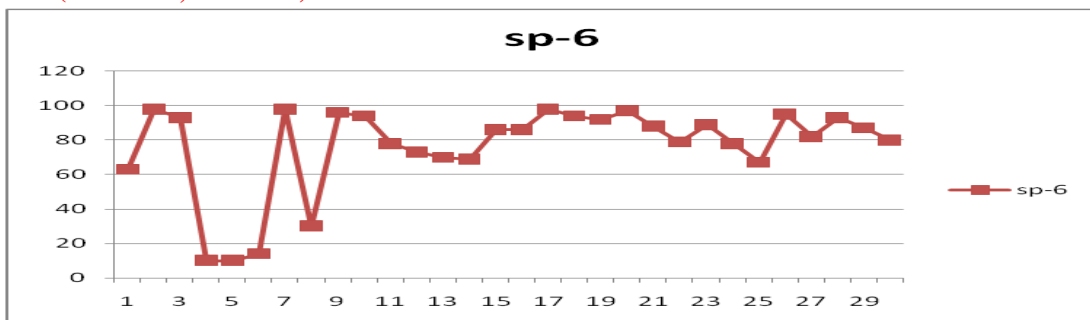
SP-4(14.219388, 79.788327) NORT WEST



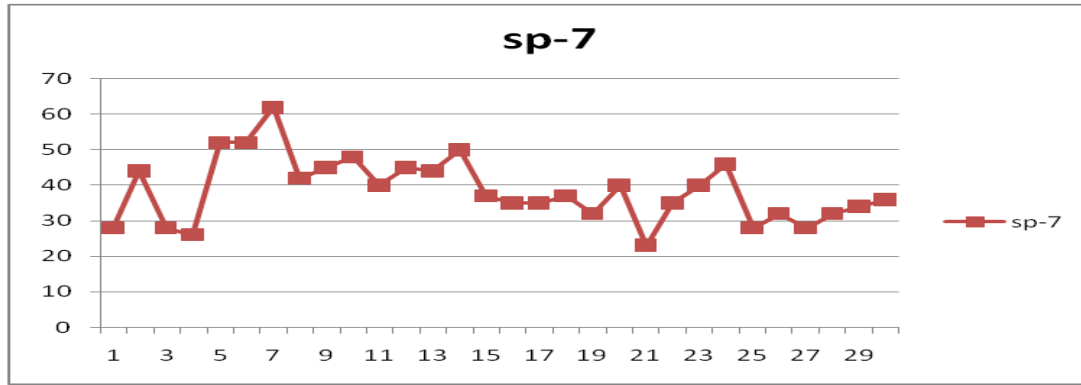
SP-5(14.219247,79.788334) NORT WEST



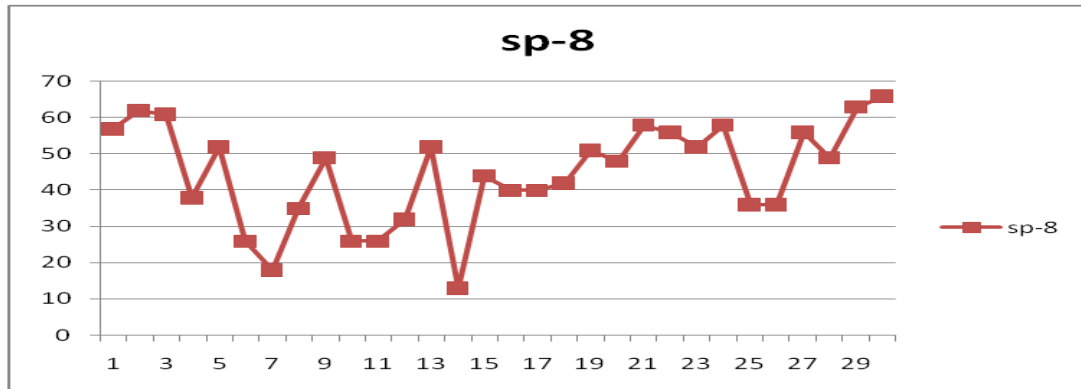
SP-6(14.219343,79.787637) NORT WEST



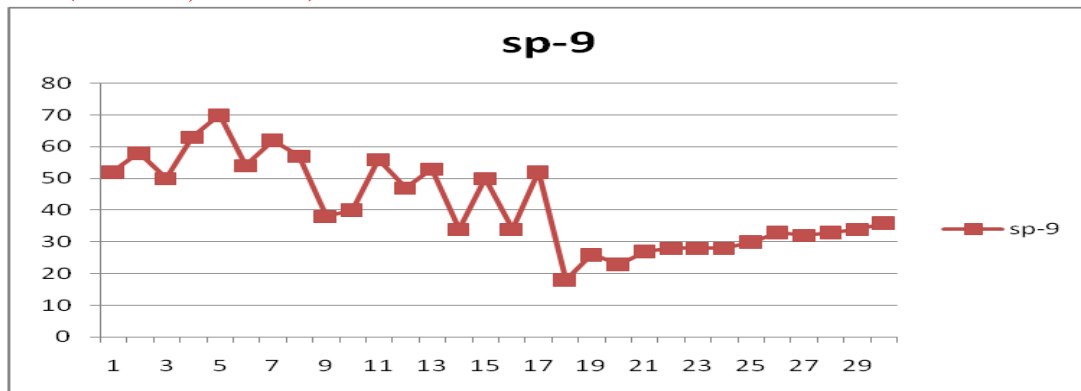
SP-7(14.219544,79.787239) SOUTH WEST



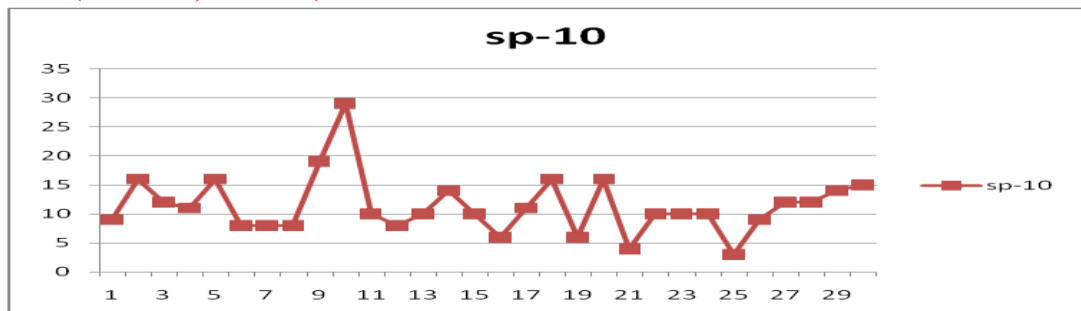
SP8(14.219677,79.787168) SOUTH WEST



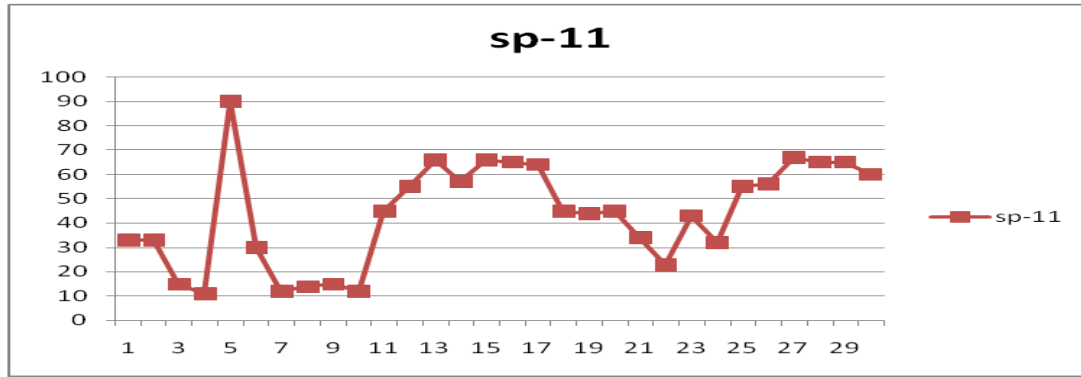
SP-9 (14.219272,79.788506) SOUTH WEST



SP-10(14.219281,79.788526) SOUTH WEST



SP-11(14.217995, 79. 788329) (SOUTH WEST)



The self-potential values area exhibits the trend of the ore body only. The targeting area the quartz contains self-potential lies in b/w 55 mv to 70 mv where, whereas the horn blend schist contains 10 mv to 30 mv, and the ore body only moves in NW and SW directions.

VERTICAL ELECTRICAL SOUNDING DATA MAPPING PLOTS

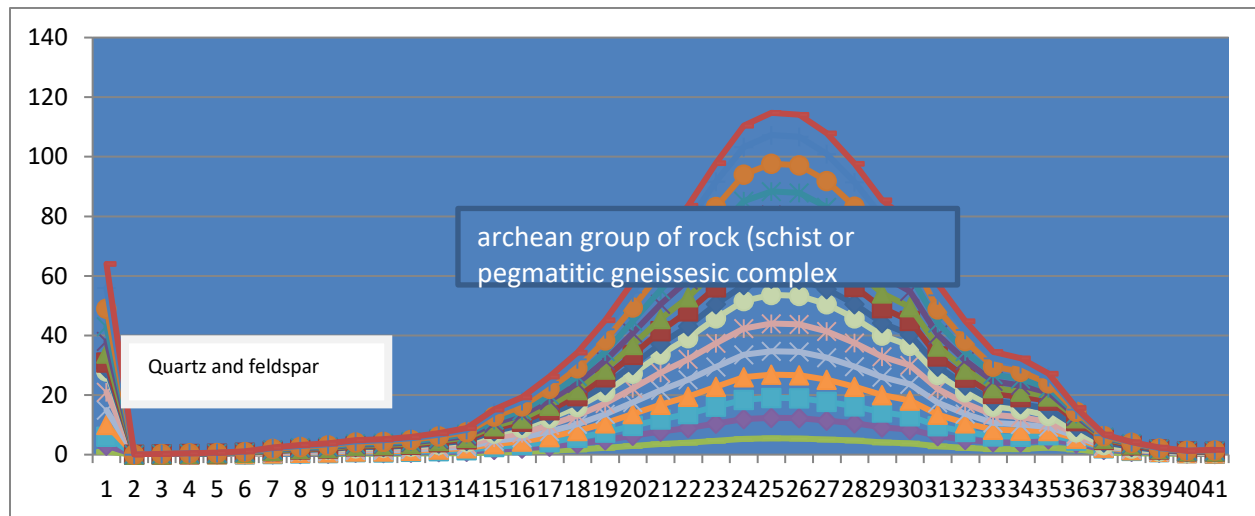


Figure 2.0a Quartz and feldspar resistivity profile map 1(14.221730, 79.787410)

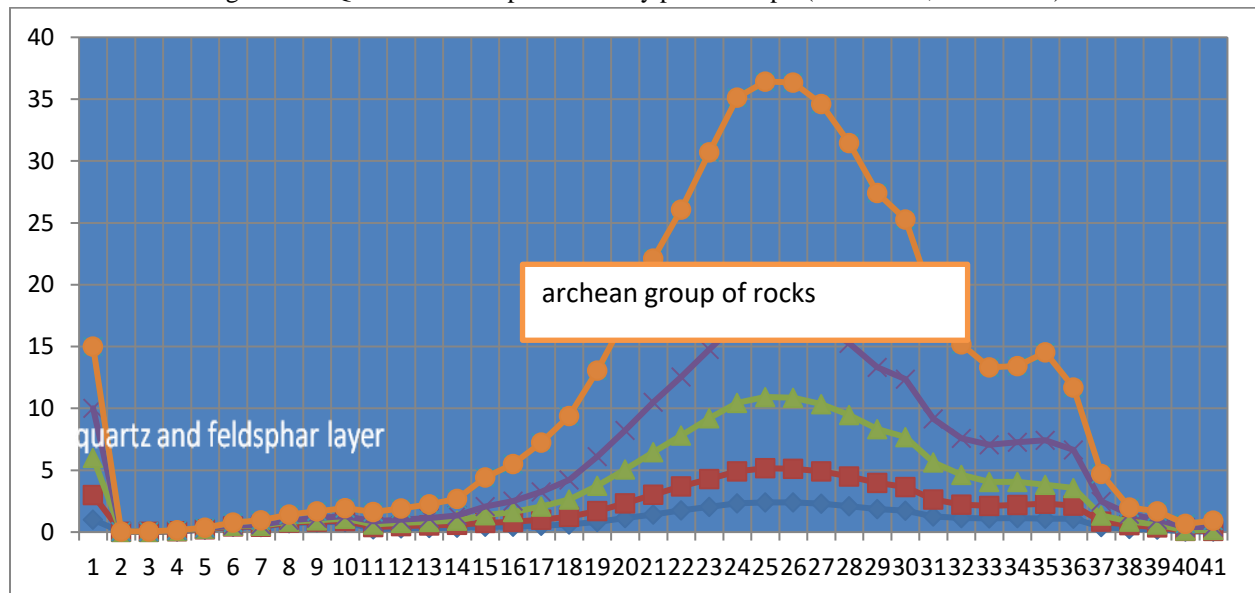


Figure 2b. Quartz and feldspar resistivity profile map (14.219272, 79.788506)

RESULTS

The research concluded that Self-potential indicates density variation of the ground. The majority of the quartz availability area density is maybe 50 to 60 mV, feldspars are 40 to 60 mV, and negative values (-10,-15) indicate the mica group of minerals. Gudur provenance majorly mineral deposits are oriented in N-S direction, i.e., strike and dip direction may be west. The natural electromagnetic method calculates the vertical depth of the mineral deposits and study area. The mineral deposits are formed on a surface of 3.5 m up to a depth of 100m after the basement rock was formed. The VES data mainly supports the vertical ore body formation in the study area. The above graphs are expressed in the study area quartz, and feldspar may be extended downward up to 120 feet to 150 feet. Based on the natural electrical map, the values rise from the seventh point to 40 frequency, so the targeting (mineral body) has become extinct. Before that, the mineral body may present ($7 \times 7.5 \times 3.25 = 170$ feet). This research will be helpful for mining geologists, mining engineers, and mineralogists.

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