LOCAL GEOLOGY OF MALIKHERA-MOKANPURA AREA OF DARIBA-RAJPURA-BETHUNMI POLYMETALLIC SULPHIDE BELT RAJASTHAN

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ABSTRACT: For the present concern the Malikhera-Mokhanpura area have been considered as part of Bhilwara Supergroup following Geological Survey of India (1977). As per GSI, the area comes under RajpuraDariba Group of Bhilwara Supergroup and consisting of metasediments younger to Banded Gneissic Complex (including Mewar Gneisses) and are equivalent to Jahajpur, Pur-Banera and Sawar groups.

INTRODUCTION

The Malikhera-Mokanpura area is adjacent area to the Rajpura mineralized block of Dariba-Rajpura-Bethunmi polymetallic sulphide mineralized belt. The belt is almost 17 kms. long with Dariba as its southern end and Bethunmi as its northern end. The proposed area of study is northern extention of well known Rajpura-Dariba polymetallic sulphide deposit. The Malikhera-Mokanpura area (Latitude 74°07 to 74°11' and Longitude 24°57' to 25°00') is part of Survey of India Toposheet No. 45 K/4 and 45 L/1. The area is part of newly created Rajsamand district. Earlier, it was part of Udaipur district In fact it is a junction of three political districts, Rajsamad, Chittorgarh and Udaipur within the radius of 15 kms.The topographical map of the area has been prepared by the author (Fig. 1) which has served as base map to prepare a geological map of the area. The Geological map of the area prepared by the author has been presented as Fig. 2. The area has also been shown in the form of cross section in Fig. 3Local Lithostratigraphic succession of the area have been presented in table 1.1. The major units and their petrology has been presented in this paper.

Table 1.1. Local Stratigraphic Succession at Malikhera-Mokhanpura area

Lithounit		Charactrs and Distribution
Gossan/Soil/Blown Sand	:	Recent to subrecent. Blown sand typical of semiarid climate and soil are present. Varying box work structures and colours are present as leached sulphide outcrops.
Ferruginous Breccia	:	Ferruginous matrix inclosing angular fragments of milky white Quartz. Weathered to produce orange yellow, red, brown maroon colours in rock and soil.
Metachert and quartzite	:	Metachert and Quartzite bands constituting core of symmetrical distribution of meta sediments; alternating with chlorite schist. Bold topography representing metachert and Quartzites constituting the central ridge.
Graphitic-Garnetiferous-Mica Schist	:	Dark gray coloured soft rock, also containing Kyanite in outer parts of symmetrical distribution treating metachert and Quartzites as core and still outer part towards village Shivpura Staurolite is also present.
Dolomitic marbles	:	Creamish white coloured recrystallized dolomitic marbles showing concordent Amphibolite bands at few places. Exposed symmetrically at both sides of GraphiticGarneteferous mica schist. Better Exposed at Malikhera, Bera Ka Khera and Mokhanpura.
Banded Gneissic Complex	:	Garnet biolite gneiss (with phyllites bands) exposed at eastern part of the area, around villages Sunariyakhera, Chauthpura and Amarpura.

BANDED GNEISSIC COMPLEX

Eastern part of the study area, as shown in the Geological map, have been covered by Banded Gneissic Complex rocks. The contact between Banded Gneissic Complex and rest of the metasediments is available at village Sunariyakhera. Banded Gneissic Complex is consisting of calcareous garnetiferrous biolite schist interbedded with Granite Gneiss which is not only migmatised but also penetrated by Quartz veins and Pligmas. It is interesting to record more accumulation of garnets and muscovite at the contact between the BGC and

Dolomitic marble of the study area. The accumulation of garnets, although is available all along the eastern contact but is better visible around village sunariyakhera. The size of garnets is moderate, neither uncommonly small nor big.

The BGC contact with the metasediments of the study is also available with Garnet-Kyanite-Graphitic micaschist. It is again interesting to record that staurolite have been developed in Garnet-Kyanite-Graphite mica schist only where BGC is very close.

DOLOMITIC MARBLES

Creamish white dolomitic marble is present symmetrically at both sides of the Garneteferous-Graphitic mica schist (±. Kyanite and ± Staurolite). Excellent exposures of dolomitic marble are available at Malikhera, Bera Ka Khera and Mokhanpura villages. The contact between Garnet-Graphite mica schist and dolomitic marble is very sharp and distinct. The contact between Banded Gneissic Complex and dolomitic marble, as mentioned, showing accumulation of garnets at BGC side.

Dolomitic marble is hard and compact rock. Attempt have also made to use it as dimentional building stone. Dolomitic marble have been penetrated by melenocratic concordant intrusives. These amphibolite sills have been better observed at village Malikhera, where breccia is making a contact with dolomitic marble and at Mokhanpura village. A regular pattern with detached continuity of sills have been noted in between villages Mokhanpura and Sunariyakhera. The thickness of Amphibolite sills is varying from half a meter to one meter and totally following dip and strike directions of the host dolomitic marble. Dolomitic marble has shown presence of stromatolites, specially near villpge Malikhera at one end and Mokanpura at another.

GRAPHITIC GERNETIFEROUS MICA SCHIST

Ash gray colored graphitic-garnetiferous mica schist is the major constituent among rock types of the study area. Like dolomitic marble, graphitic-garnetiferous-mica schist is also present at both sides, East and West, symmetrically treating elongated quartzite ridge as central topographic feature. Exposures of graphitic-garnetiferous mica schist are available at the slope of both sides of the ridge and along nallah cuttings at very low reaches.

Graphitic-garnetiferous-mica schist is soft rock susceptable to weathering, thus has produced enough ash gray soil in the region. Invariable graphite and garnet can be identified in this rock even in the field and hand specimen. Rock soils with hand because of presence of graphite. Size of garnet varies from very small to moderate, around one tenth of a milimeter Garnets are of pink colour Among micas, biotite and muscovite are the representative minerals.

Presence of mineral kyanite and staurolite in graphitic-garnetiferous mica schist is not omni but restricted to certain areas. Kyanite is absent, in general, in the central parts below the quartzite ridge and staurolite has shown its presence only towards Shivpura part of the rock. Possibly, temperature and pressure are the factors controlling these distributions. In the field and handspecimen, mineral kyanite showing radial development of its blades. Staurolite is distinct not only because of its columnar appearence but also because of its cross twinning.

METACHERT AND QUARTZITE

Hard and bold metachert and quartzite are of off white colour with some gray diffusing bands in between. Quartzite constituting the only bold topography of the area. The central ridge is showing some such quartzite bands alternating with schist. Most of these schists are biotite-chlorite schist which may gradually transit to graphitic mica schist without any sharp boundary. Possibly the gray band in the quartzites are representing original bedding. Good exposures of quartzite and metachert bands are available at the central ridge and also at few isolated detached hillocks near Rajpura village. Both quartzites and interbedded schists have been effected by local faults, thus have been shifted.

FERRUCIINOUS BRECCIA

Near village Malikhera, there is one exposure of highly ferruginous rock containing fragments of milky white quartz, possibly derived from a quartz vein. The exposure as mapped shows a trend that is in accordance with the host dolomitic marble. The exposure of ferruginous breccia is also showing some pattern of preservation of first generation folding. Ferruginous breccial, at one contact (western), showing amphibolite band which is metamorphic derivetive of a basic intrusion. Possibly, ferruginous breccia is of volcanic origin.

GOSSANS

Leached sulphide outcrops in the form of gossans are available as cap over metachert and quartzite ridge at Rajpura village. Gossan capings are almost continuous over all the three hillocks. Gossans show both box work structures and various shades of iron oxides including yellow, orange, brown, red maroon and there combinations Colourations have also been recorded over main metachert-quartzite ridge in very small quantity and over ferruginous breccia.

BLOWN SAND AND SOIL

Lower reaches of the area are crop fields. Away from central ridge Mokhanpura Sunariyakhera, Chothpura, Amarpura and Shivpura are better covered by soil. Being semi-arid, the region is also showwing enough blown sand specially during summer

CONCLUSION

The Dariba-Rajpura is one of the most important polymetallic sulphide deposit of the world. It remained an important lapse as far as geological studies are concern, not to establish, a reliable age of the deposit. The author's work was confined to an small part of the area thus it remained beyond the scope of the present work. It is author's suggestion that better attempts should be made to understand the stratigraphic age of the belt. Obiously, it must be useful not only to understand the mineralization but also its possible extension within the belt and the belts of equivalent age like Sawar, Jahazpur etc.

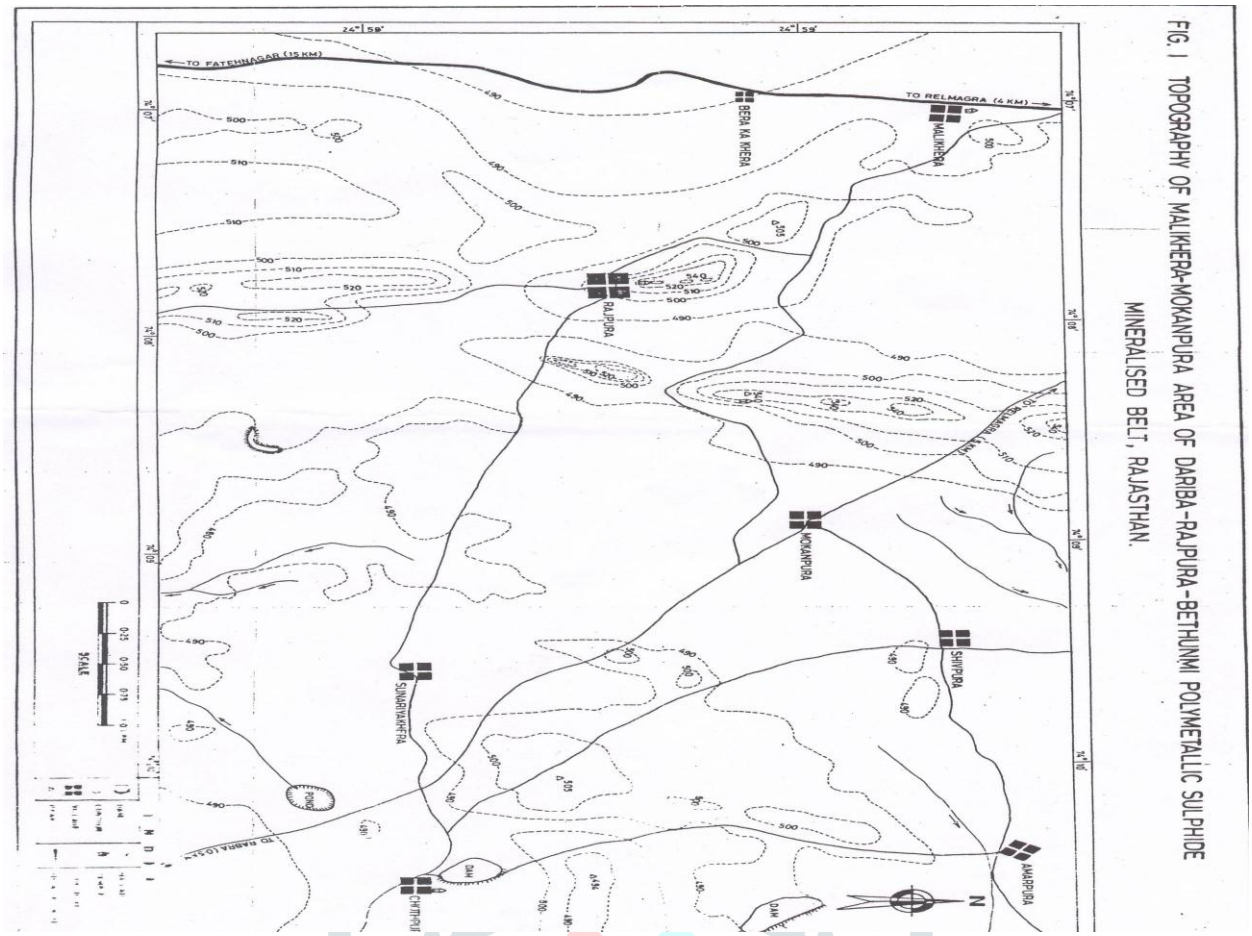

FIG. 1 TOPOGRAPHY OF MALIKHERA-MOKANPURA AREA OF DARIBA-RAJPURA-BETHUNMI POLYMETALLIC SULPHIDE MINERALISED BELT, RAJASTHAN.

FIG. 2 GEOLOGICAL MAP OF MALIKHERA-MOKANPURA AREA OF DARIBA-RAJPURA-BETHUNMI POLYMETALLIC SULPHIDE MINERALISED BELT NORTHWEST INDIA

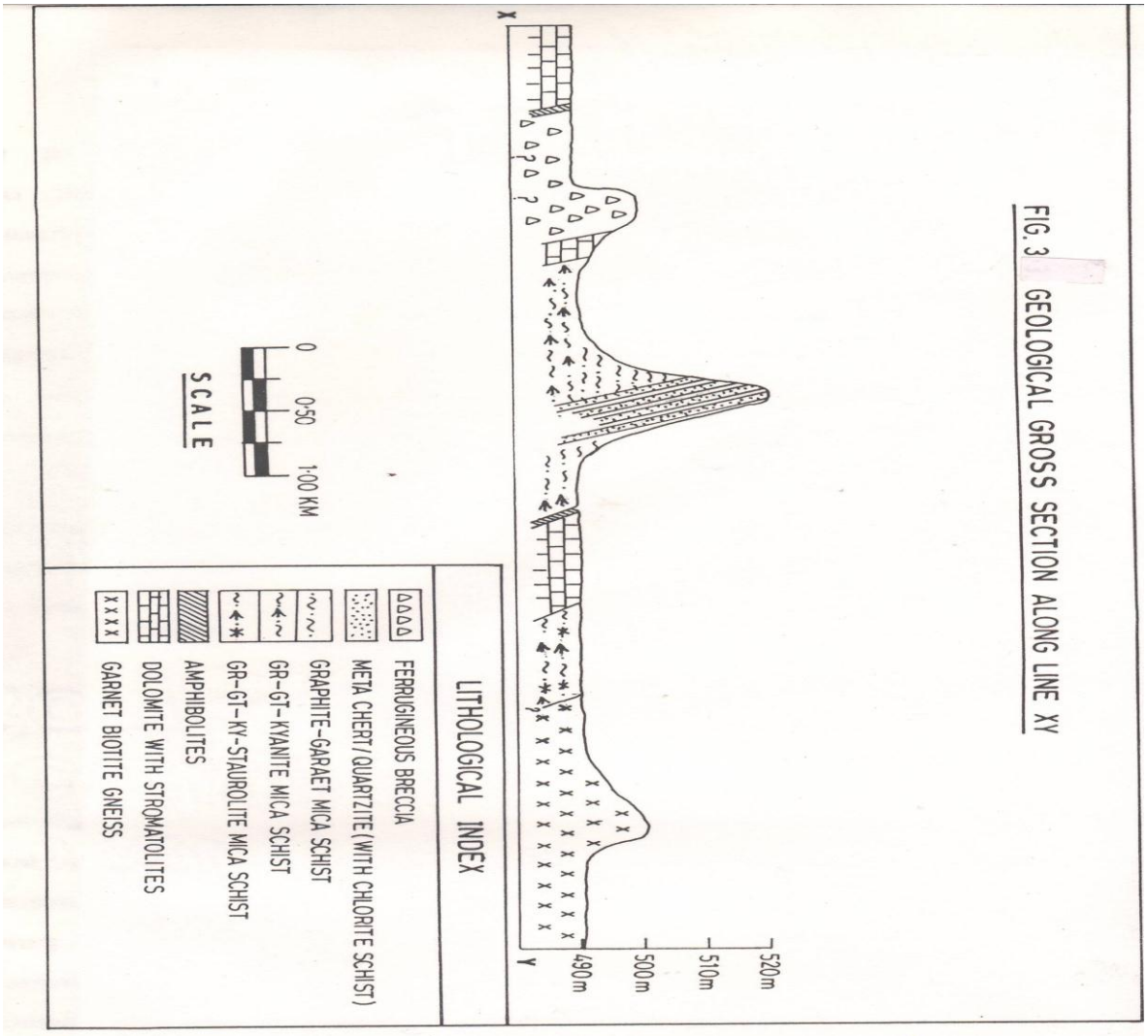

FIG. 3 GEOLOGICAL GROSS SECTION ALONG LINE XY

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