

AN ALBUM OF GEOPHYSICAL RESPONSES FROM BASE METAL BELTS OF RAJASTHAN AND GUJARAT. Compiled by A. G. B. Reddy, I. C. Madhusudan and T. K. Sharma. Miscellaneous Publication, No. 51, Geological Survey of India, Calcutta 1982. Folio, pp. 8+vii+41 plates. Price: Inland Rs 20; U. K. £ 2.90; U. S. A. \$ 9.00.

This album is a rather rare instance of a publication giving in a concise manner the results of Geophysical Exploration. This compilation of 41 plates sets forth the geological background, and geophysical responses in the shape of anomaly curves. The results of drilling in the respective areas explored are also indicated in the Plates. The Rajasthan and Gujarat belts have been investigated for base metals from time to time since the past three decades, employing different electrical and magnetic methods and the Album under review incorporates all the results obtained up to 1980.

S. P. and Magnetic Surveys began in Rajasthan belt in the fifties. In the late sixties, both the Rajasthan and Gujarat belts formed part of a very large area of 170,000 sq km covered by Aeromagnetic Surveys. Since that time, a considerable extent of follow-up ground surveys has been carried out. In this Album the results of S. P. resistivity, single and dual frequency Sligram, three frequency Turam, AFMAG, Time and Frequency domain I. P. and Magnetic investigations have been presented. In addition, the authors have also furnished some results of Temperature measurements in bore holes 2 to 3 m deep.

In the introduction by the authors, a succinct account of the relative performance of the different geophysical methods has been furnished and suggestions are also offered regarding the future programme of investigations in these areas.

Regarding the electro-magnetic (E.M.) methods, it has been pointed out that most of the high response indications noted have been found to be due to electrolytic conductors at geological contacts or sheared formations, and also in places due to graphite and a little extent of sulphides. The Induced Polarization (I.P.) responses have been found effective in resistive and moderately resistive areas; but in conductive environment, the high background polarizability militates against the efficacy of this method. Regarding Spontaneous Polarization (S.P.) and Magnetic Surveys, the authors say that these two methods have done '*remarkably well*' due to the favourable conditions in these areas. S. P. surveys have been strikingly successful in five of the areas involving a fairly wide range of background resistivities (50 to 250 ohmm). The anomalies noted are said to be sharp and diagnostic in these five areas. It is worth remembering that the S.P. method is actually the oldest geophysical method, and also the least expensive one. Together with the Magnetic method it has proved to be an effective tool to locate sulphide ores in many regions. Even in modern times when we have so many methods, it seems expedient to use this cheapest method first.

Regarding the Temperature Surveys in Rajasthan and Gujarat Belts, the authors note that significant higher temperatures (3° to 5°C) were registered over known sulphide ore bodies. This method holds some promise for exploration of sulphide ores.

In respect of the overall results obtained so far, the authors state that 'extensive drilling has proved mostly low grade mineralization, pointing to the high probability of meeting such occurrences commonly even in the future'. By and large, massive sulphides, especially those containing copper, occur only under very favourable geological environment. Our ores mostly occur in thin veins and stringers which could be economically exploited if such mineralisations are found to extend over sufficient width and strike length. For the location of such bodies, the geophysical methods, particularly S.P., E.M. and Magnetic methods are quite effective.

To sum up, the publication of the Album under review is to be greatly welcomed and the authors deserve to be congratulated for the splendid presentation of such a large volume of data in such a succinct form.

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