UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Technical Letter
Saudi Arabian Mineral
Exploration - 9
Prepared April 3, 1965
Issued August 20, 1965

Dr. Fadil K. Kabbani
Deputy Minister for Mineral Resources
Directorate General for Mineral Resources
Ministry of Petroleum and Mineral Resources
Jiddah, Saudi Arabia

Dear Dr. Kabbani:

Transmitted herewith are 10 copies of:

TECHNICAL LETTER NUMBER 9
REPORT OF FIELD TRIP FEBRUARY 24 TO APRIL 2, 1965, IN PART OF THE NORTHEASTERN HIJAZ QUADRANGLE, SAUDI ARABIA

by

Charles L. Hummel* and Hashim Hakim**

Sincerely,

Glen F. Brown

Glen F. Brown, Chief
Saudi Arabian Mineral Exploration Project

* U. S. Geological Survey, Jiddah, Saudi Arabia

** Directorate General for Mineral Resources, Jiddah, Saudi Arabia

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Another 13,750 square kilometers (5,250 square miles) of the Northeastern Hijaz Quadrangle (I-205) was examined in reconnaissance fashion for mineral deposits during a field trip lasting from February 24 to April 2, 1965; excluding travel time to and from the area, nearly all the work was done in March. In addition, Hashim Hakim spent about a week each in the Nugrah and Musaynah districts developing similar information at somewhat larger scale. The reconnaissance surveys entailed 2,800 km (1,750 mi.) of daily traverse at a rate of about 75 km (45 mi.) per day.

Six vehicles - 2 lorries, 3 pickups, and a Landrover - and nine men - 6 drivers, a guide, a cook and a mechanic - were utilized to support the activities of two independent parties under the direction of the two geologists.

Original plans called for finishing all of the Shield area in Quadrangle 205 lying south of Wadi Ar Rimah (26°00) and east of 40° Longitude to Hanakiyah (25°00) during February, and that between Latitudes 24°00' and 25°00' during March. Because of the late start in February, the plan for the present field trip was reduced to the former only (see monthly report February); however, in the end, a part of even this reduced area equivalent to three-fourths of one of the 1:100,000 scale mosaic sheets was not finished.

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As a consequence, future field plans now call for doing as much as possible of the area remaining east and south of Hanakiyah during April and May, 1965 and the areas around Khaybar and west of Medina in Fall, 1965.

During the recent field trip several new kinds of mineral deposits were found in the region surveyed as well as numerous new occurrences of known types and a number of previously unknown ancient mines on both types. The new types include bedded siliceous iron ore deposits, massive magnetite replacement deposits, pegmatites, sulfide-bearing quartz veins, and quartz-fluorite veins and fluorite-bearing marble. New occurrences of known types of deposits were found of the bedded copper-iron deposits common in the Musaynah district and of quartz-sulfide-gold? veins of the Jazabat al Ufar district.

Large deposits of low-grade siliceous, iron ore (jasper, in part) are interbedded with rocks of the Shammar formation north and south of Al Huwayit. Hand-picked specimens of the best ore from these deposits yielded respectively, 30% and 8% Fe. (Assayer: M. Fourut).

Numerous small, irregularly-shaped deposits of massive magnetite were found in marble beds southwest and south of Hulayfah. The deposits are closely associated with several small granite plutons and appear to be of contact or subjacent contact metasomatic replacement origin. The deposits lie within the area of the Hulayfah aeromagnetic survey and it should be re-examined for evidence of larger, buried deposits.

A great number of small, zoned pegmatites composed mainly of quartz, feldspar, and hematite occur throughout Jabal Tuwalah. None of these is present in any of them in commercial quantities, however, many of the pegmatites have been sampled to determine whether they contain other minor constituents of economic importance.

Closely associated with the pegmatites, and probably genetically related to them, are equally great numbers of sulfide-bearing quartz veins. Most of the veins are too small to be of interest but close-spaced composite systems of these

veins and a few very large silicified breccia veins are present at several places and are large enough to be of economic importance.

Numerous quartz-fluorite veins, some very large, were found at several places in Jabal Kurayziah. Some of the veins have ancient workings and were probably worked for fluorite to smelt the nearby Musaynah copper ores. Fluorite was also identified as fracture-fillings in marble beds near Jabal Wasman just north of Hulayfah. If the fluorite mineralization also included significant replacement of the marble, the resulting deposits could be of economic importance.

Numerous new occurrences of the small, bedded (or bedded-replacement), hematite-copper-sulfide deposits which are characteristic of the Musaynah and Nugrah districts were found in these districts and in the region between them. As with all of the deposits in these districts, the new occurrences are in rocks of the Haliban formation. An ancient copper mine on one of these was relocated north of Bir Arja.

Finally, many sulfide (and gold?)-bearing quartz veins like those at Jazabat al Ufar were found in the area around it. Although none of them was of economic size, their distribution greatly extends the known dimensions of the al Ufar district. An ancient copper mine was relocated in the district near Ar Rhodat.