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PRELIMINARY RECONNAISSANCE EXAMINATION

of

**THE HILLTOP CLAIM GROUP
Vekol Mountains, Pinal County, Arizona**

for

INTERNATIONAL MINING COMPANY S. A.

June 1961

by

**HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671 TUCSON, ARIZONA**

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INTRODUCTION

At the request of Mr. R. J. Harrold of International Mining Co., S.A., Magdalena, Sonora, Mexico, Heinrichs Geoexploration Company of Tucson, Arizona agreed to examine the Hilltop Claim group of unpatented mining claims. These claims are located in Sections 7 and 18, T10S, R3E and Sections 12 and 13, T10S, R2E, G.&S.R.B.&M., Pinal County Arizona and form a contiguous group.

Mr. E. G. Heinrichs and Mr. J. W. Marlatt of GEOEX, on June 12, 13 & 14, 1961 made a reconnaissance examination of the property sufficient in scope that some general preliminary conclusions could be drawn and recommendations be made which would aid and guide Mr. Harrold and International Mining Company in further evaluation of the property. Mr. Ira Wagon and Mr. Abner Walker acted as guides and their assistance, comments and cooperation is gratefully acknowledged.

CONCLUSIONS

There is mineralization in sight in many places on the claim group. It was observed in place in mine workings, in surface exposures, in prospect holes and cuts, in stockpiled rocks, on dumps and in float rock. Types, kinds and occurrences are discussed in a later part of this report. However, very little was seen that could be considered as economically

producable grade or tonnage (ore) today, and where the mineralization was of good grade it was erratic in occurrence as small pods, lenses, veinlets, blebs, stringers, etc. Specific recommendations as to how this claim group and surrounding ground can be investigated in the hopes of finding minable ore are given in the next section of this report. Our basic conclusion is that what is now exposed will not make an economic mine of any size, although the possibility exists that there may be sizable tonnages of ore in the district.

Before any mining attempt is started on the Hilltop Group the following items must be carefully investigated in detail.

1. From sampling of present exposures, does it appear that grade, percentage and metallurgical problems can be economic? (Doubtful)
2. From geologic inference is it likely that sufficient minimum tonnage can be expected? (Doubtful)
3. What about availability of water? Cost of road building? Haulage of ore to mill, smelter or railhead?

RECOMMENDATIONS

One of the first considerations is that better ore, both grade and tonnage, probably would be found in places in the district other than on the Hilltop Group. It is our understanding that negotiations have been instigated toward acquiring more property. Any such should include consideration of the Copperosity,

the Reward and the Republic mines and several sections of Indian land such as Sections 10, 11, 12, 13, 14 and 15 of T10S, R2E, Sections 27, 28, 29, 32, 33, 34 of T9S, R3E and Sections 3, 4, 5, 6, 7, 8, 9, 16, 17, 18, 19 and 20 of T10S, R3E. The amount of Indian land to be obtained will be dictated by the terms of the lease that can be negotiated and type of exploration approach envisioned.

The area is one of complex geology and some detailed geologic mapping will be a must so as to work out potential ore horizons and faulted extensions of ore bodies. In the long run the cheapest way to obtain this would be to have low level aerial photos made and a geologic map prepared by a competent photo geologist. Ground checks can then be limited to areas of apparent importance.

The application of geophysical technique would have little value over the Hilltop Claim Group but would be of definite value in the areas of the Copperosity and Reward mines where sulfides are known and magnetic associations exist. Magnetic work (which could be done by air when photos are taken) as the cheaper and faster method, should be done first, followed by electrical methods such as induced polarization, self potential and electromagnetics.

On the Hilltop area specifically, after detailed geologic mapping has indicated possible favorable zones, it will be

advisable to test the potential both by accurate sampling of exposures and by penetration methods. A portable gasoline hammer can be used for channeling across surface showings. To sample possible extensions to depth either a group of angled diamond drill holes from one site can be used, or extensions of present underground workings can be made. A 900 ft. extension of the Golden West tunnel would penetrate the mountain and emerge at the No. 1 and No. 2 workings, and cross cutting from the Golden West to the north would emerge at Paul's cuts and the No. 3 workings. Or, a drill station could be cut in the Golden West for drilling toward these target zones.

Since present ore showings are of complex mineralization and a metallurgical problem may exist, one of the first things to be done is to ship the high grade ore stockpiled near the old cabin to ascertain shipping costs and total recoverable values of high grade so as to determine some comparison figures of ore values necessary for profitable operation.

GEOLOGY

It was not within the scope of this investigation to work out detailed geology, but since knowledge of geologic environment is essential to understanding any ore deposit, it is important to consider the claims in this light.

The Vekol Mountains are composed of a thick stratigraphic section of sedimentary rocks, the metamorphic Pinal schist,

various dikes and sills (mainly diabase, dacite and andesite) and intrusive granite and monzonite. In the Hilltop claims area the stratigraphic sequence from the pre-Cambrian Pinal schist to the Devonian Naco limestone is well exposed. There is complex faulting both regionally and as local shearing. Dips in general are steep, usually 40° to 60° but in other places are found to be either more or less steep. The general attitude is of beds dipping westerly and northwesterly but this is quite variable both from block to block and even intra-block.

Probably the granite intrusion to the east caused the first folding and faulting. Regional faulting followed, including the Copperosity fault zone that passes through the north part of the Hilltop claims. Finally igneous intrusions of diabase and andesite occurred. At what period or periods mineralization took place we cannot, without much detailed mapping, even guess.

MINERALIZATION

In general the mineralization noted was copper and lead oxides and sulfides with the oxides predominant. Chrysocolla is dominant, of the copper ores, with some malachite, chalcopyrite, chalcocite and occasional azurite. There is also an unidentified black copper ore that may be melaconite. Lead minerals include galena, anglesite, cerrusite and massicot (?) with the oxides dominant. High silver and gold assays are reported from various workings and this would be expected from the other mineral

associations. A little zinc mineralization was noted but as the oxidation products of many zinc minerals are difficult to identify in the field we feel that probably considerable zinc is present. Pyrite is extremely scarce as is secondary quartz and gypsum. Crystallized calcite was fairly strong in at least two areas.

Mineralization may be roughly divided into three areas. At the northeast part of the claim group, especially on the Hilltop Extension No. 4 there are good showings of oxidized copper minerals in what is probably the Dripping Springs quartzite. This appears to be a small remnant on a hill, bounded on the west and north by faults and having little depth or thickness. Even if sampling should indicate commercial grade, there would appear to be small tonnage. Along the fault and igneous intrusive dike to the west of this there are some minor lead showings.

In the west part of the claim group there are old workings, mainly the Lela and Golden West tunnels that were reportedly worked for gold. This appears likely as they are on small slips and shears with oxidized iron and minor copper showings. Even if the values were (or are) rich, the zones are small and narrow in width. They cut across bedding planes and formation changes.

The better showings of copper and lead mineralization (with reportedly good silver assays) are at Paul's cuts, Walker's workings, No. 1, 2 and 3 workings and Slim's tunnels. These are

mainly all in a quartzite bed that as near as we could determine lies between the Naco and Escabrosa limestones. There is a distinct shale marker bed overlying it in several places that may be the base of the Naco. The mineralization is in fractures, short veinlets, pods, blebs, stringers, etc. in the quartzite. Outward appearance is that during some period of faulting the quartzite was mineralized for a short distance. If a mine is to be developed on the Hilltop group it likely will be on this horizon if the quartzite is mineralized to depth. The beds dip westerly and an extension of the Golden West tunnel, or drilling from it, could test if the quartzite bed is extensive and if it is mineralized.

The overlying and underlying beds show little, if any, alteration or mineralization and therefore little mineral penetration or replacement of them is expected. The possibility that depth, or faulting at depth, would change this picture is also felt to be unlikely in this immediate area. This may not be true of other beds at lower horizons.

Mineral deposition appears to have been along faults and dikes by ascending weak hydrothermal solutions, and was localized in permeable channels along slips and fractures rather than large scale replacement as would be expected from quantities of stronger solutions.

Gallium was mentioned to us with some enthusiasm. We know of no actual gallium mineral as all production in this country is a byproduct recovered from zinc and aluminum processing. Current demand is small and production is adequate to meet it. Known reserves as byproducts from other metals is large so it is extremely unlikely that in the near future any gallium on the Hilltop claims would be of value.

PROCEDURES

Field work consisted of three days of walking over the area looking at mineral outcrops and old workings and gaining impressions of geologic formations and structures. Brief visits off the property were made to the Copperosity and Reward mine areas for correlation purposes. Hand sampling gear was taken along but no samples were cut for assay purposes as it was found that no accurate channels could be made across widths that would be truly representative. This should be done with a power tool. Grab samples from ore piles and exposed faces were taken for office study. Available maps and publications on the area were procured for office correlation with what was seen in the field. The most pertinent of these are J. B. Tenny's "Economic Geological Reconnaissance of Casa Grande Mining District", Bureau of Mines R.I. 3975 "Exploration of the Reward Zinc Deposit" and Robert H. Carpenter's thesis "Geology and Ore Deposits of the Vekol Mountains".

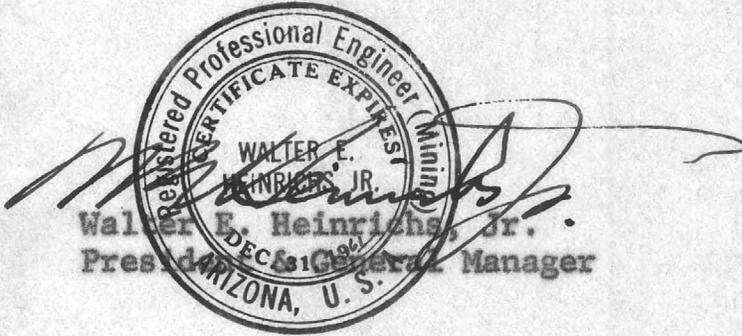
A base map was prepared showing topography, claims, and Carpenter's geology. High level aerial photos were borrowed and studied in stereo view. Some major fault trends noted in this study were plotted on the map.

Respectfully submitted,

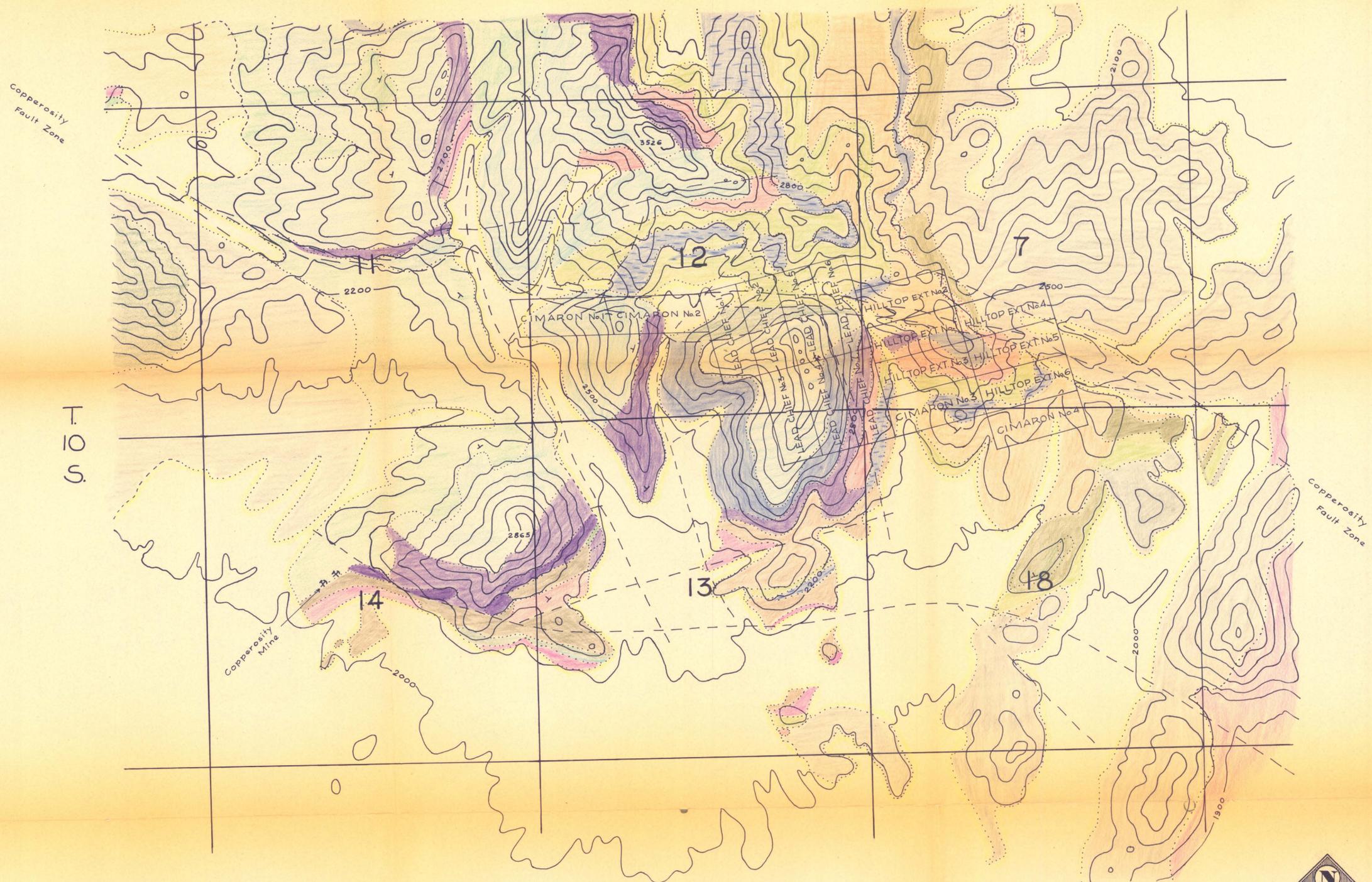
HEINRICHS GEOEXPLORATION COMPANY

J. W. Marlatt

J. W. Marlatt, Geologist



June 20, 1961
P. O. Box 5671
Tucson, Arizona



Alluvium	Qal
Gila Conglomerate	Qg
Pyroclastics	Qp
Andesite	Ta
Dacite Porphyry	Tcd
Rhyolite Porphyry	Tp
Granite	Tg
Apache Basalt	Ab
Cretaceous Red Beds	KRb
Naco Limestone	Cn
Escabrosa Limest.	Ca
Lower Ouray Form.	DLo
Abrigo Formation	Ea
Santa Catalina Form.	Cac
Troy Quartzite	Et
Mescal Limestone	Pm
Dripping Spgs. Quartzite	Pda
Barnes Conglomerate	Pb
Pioneer Shale	Pps
Diabase	Ed
Pinal Schist	Ps

Geology from Robert H. Carpenter thesis.
 - - - - Major faults.

HEINRICH'S GEOEXPLORATION COMPANY P.O. Box 5671 Tucson, Arizona		
GEOLOGIC & TOPOGRAPHIC MAP of part of the VEKOL MTS. FOR INTERNATIONAL MINING CO., S.A.		
HILLTOP CLAIM GROUP		
SCALE: 1" = 1000'	CONTOUR INTERVAL: 100 ft.	REVISIONS
DATE: JUNE 1961	SHEET OF	
DRAWN BY: I.B.	DRAWING NO.:	FILE:

NOTE: LEAD CHIEF NO. 1-7 & HILLTOP 1-2
Were Surveyed June 1944 By T.N. Stevens

D106058



T105 R2E
T105 R3E
← Casa Grande 36 Miles

CLAIM MAP
LITTLEFIELD, Quincy, Co., S.A.
HILLTOP GAROLIP
CASA GRANDE MINING DISTRICT
PINAL COUNTY, ARIZ.
MAY 1, 1930
SCALE 1/4" = 200 FT. R.B.M.