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September 23, 1966

Mr. Heinzpickel
Horncohl Laboratory Corporation
867 - P. O.
Bakersfield, California 93302

Dear Mr. Heinzpickel:

Enclosed is our pulp of sample 8 and Southwestern Assayers 000331 dated September 8, 1966, for selenium. The result of the assay was nil as expected, and per your verbal request we are sending this pulp to you to do with it as you wish. I expect Mr. Strub may want to confirm the assay. If you like, we will forward on pulp, our sample 3. I expect that this should close the matter as far as we are concerned. Also enclosed is our brochure which you may find of interest.

Very truly yours,

HEINRICHS GEOEXPLORATION COMPANY

E. Grover Heinrichs
Vice President

P.S. If you do run the assays on sample 8, please send us a copy of the results, nil or otherwise. Thank you.

EGH:jc
Enclosure: Sample 8
Geoex
cc: Mr. Robert Strub

INVESTIGATION OF THE IRON AND COPPER-GOLD DEPOSITS ON LIME HILL, CIENEGA DISTRICT, NEAR PARKER, ARIZONA

For

Mr. Robert P. Strub
285 West Huntington Drive
Arcadia, California

August 1966

By

Heinrichs Geoexploration Company
P. O. Box 5671 Tucson, Arizona

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INTRODUCTION

On August 25 and 26, 1966, Heinrichs Geoexploration Company made a geological investigation of the iron and copper-gold deposits located a few miles northeast of Parker, Arizona. The field investigation, which is supported by laboratory analyses of samples and by library study of published information, was made by Dr. John N. Faick, for the account of Mr. Robert P. Strub of Arcadia, California.

The principal purpose of the examination was to find, isolate and identify, if possible, one or more rare or unusual elements occurring with the iron, and which are said to give the iron unusual properties. Investigation of the copper-gold ore was incidental to the examination of the iron ores simply because they occur together or in close proximity to each other.

Serving as guides to the property was Mr. Art Paul, owner, and Mr. Walter Moore, lessee. Mr. Paul is primarily interested in the copper-gold deposits whereas Mr. Moore is primarily interested in the iron which he believes has some unusual properties.

CONCLUSIONS AND RECOMMENDATIONS

Small irregular shaped ore bodies of hematite iron ore occur in massive limestone that underlies most of Lime Hill about 11 airline miles northeast of Parker, Arizona. Associated with these ore bodies are minor deposits of copper-gold ore which were thoroughly prospected and occassionally mined on a very small scale since the country was first explored about 1850. Some unusual properties have been claimed for the iron ore but spectrographic tests and chemical analyses failed to reveal anything unusual about the ore and it is believed that further tests are unwarranted. The ore bodies are relatively small, widely scattered and of difficult access, and it is thought that neither the iron nor the copper-gold could be mined commercially under present conditions. The total amount of iron ore is probably on the order of a couple hundred thousand tons and not sufficient to constitute a significant reserve. Probably these ores would not be competative with ore from other sources such as exist near Planet or Swansea, a few miles northeast of Bouse, Arizona. No further investigation of the Lime Hill deposits is recommended.

LOCATION, HISTORY AND OWNERSHIP

The property is situated about 11 airline miles northeast of Parker in an area locally known as Lime Hill, Cienega Mining District, Arizona. This is approximately in Section 16, T10N, R18W, at the head of Eagle Wash which drains westward to the Colorado River. The area of interest is about three-quarters of a mile wide from northwest to southeast and about one mile long from northeast to southwest. Within this area are numerous prospects and a few very small mines which represent frustrated efforts to develop the small deposits of iron, copper and gold.

The mineralized nature of the area has long been known and prospecting probably started in the 1850's or 1860's and continued sporadically since that early date. A little gold ore reportedly was packed to the Colorado River at Eagle Landing and shipped to Europe during the early days of mining and small amounts of ore probably were mined and shipped to domestic smelters at various times. All operations must have been on a small scale as there is little evidence to indicate that significant amounts of ore was mined in the area.

As far as I know, none of the property was patented and the principal owner at present is Mr. Art Paul who has eight unpatented claims, Redrock 1 through 8, and these claims are under lease and option to Mr. William Moore, who claims that the iron ore has unusually desirable properties.

GEOLOGY OF LIME HILL

Lime Hill is underlain by two principal rock types (1) a basement rock of schist and gneiss and (2) a very thick section of massive limestone. The schist and gneiss crops out in only a few places in Lime Hill. It probably represents the ancient Precambrian basement rocks that are widely exposed in Arizona. Resting unconformably upon an irregular erosion surface on the schist and gneiss is the thick zone of limestone of unknown but probably Paleozoic age. The schist and gneiss bear no apparent relationship to the iron-copper-gold deposits; which, in all exposures examined, are confined to the limestone.

In Lime Hill all of the known ore occurs in small irregular replacement bodies in intensely shattered and deformed massive limestone. The ore forms pods and lenses and irregular veins localized along fractures in the limestone. The larger lenses and pods of ore pinch and swell along the strike of the outcrops and in many places they are interconnected by "stringers" veins of hematite. The normal occurrence of most of the deposits is as irregular tabular deposits having a low angle of dip in various directions in the limestone but a few are along high angle fractures and a couple were observed on the contact between the schist and limestone.

Two periods of mineralization seem to be represented although these may be very closely related. The earliest mineralization formed the hematite deposits already described and the later formed deposits of copper and gold in approximately the same environment as in the iron ore. The copper-gold deposits consist primarily of the secondary copper minerals malachite and chrysocola in a quartz gangue. The copper-gold deposits form small irregular veins and pods that occur within the older iron ore bodies and also occur within the limestone where there is little or no iron. It is reported that some of these copper-gold deposits contain as much as three ounces of gold per ton and that free gold can be seen in the ore but none was found during this examination. The copper-gold deposits are too small and widely scattered to be considered as mineable sources of ore, and they were not carefully examined as we are mainly concerned with the iron ore.

An interesting observation is that the copper-iron-gold deposits at Lime Hill are similar in character to the well known copper-iron deposits near Planet and Swansea, situated a few miles northeast of Bouse, Arizona. The main difference is one of size, those at Lime Hill are very small whereas those near Swansea and Planet are relatively large.

CHARACTER OF THE IRON ORE

Rare and unusual qualities were claimed for this hematite ore, therefore, more than normal care was exercised in trying to determine its composition. To the unaided eye and under a microscope, the ore appears similar to others of its type.

Much of the ore is specular hematite; i.e., it is foliated and micaceous with a high metallic luster, but some of it is massive, dense or compact with a dull luster.

One of the properties claimed for this ore is that it had an unusually low melting point and that it would distill from a crucible at 3200°F. Another claim that Mr. Moore makes is that the ore only contains about 15% iron. It is implied that the remainder is some rare or exotic material. An attempt was not made to verify these claims but a check of the ore by normal procedures revealed nothing unusual about it.

Eight samples were collected from various places on the property and one sample of material previously processed by Mr. Moore was obtained from him for laboratory tests. The last mentioned sample consisted of a fine grayish green powder which had been roasted in a crucible but no details were received on how this was done.

All nine samples were submitted to the Arizona State Mineralogist for spectroscopic examination. As was expected these did not reveal any unusual properties or the presence of any unusual elements in the ore. The spectroscope indicated the presence of a little copper, calcium, sodium, aluminum and silica as minor impurities in the iron. These are fairly normal impurities in iron ore and are of little consequence except for copper which is sufficiently abundant in most places to ruin the material as a possible iron ore. It must be recognized that trace amounts of some elements might be missed by this method but that elements sufficiently abundant to impart unusual properties to the ore would be detected. In addition to these tests, four samples were submitted for chemical analyses to determine the total iron content which was found to be as follows:

Sample No.	Percent Iron	Description
1	63.42	Iron ore from east end of mineralized zone on Red Rock Claim 7 or 8.
3	64.12	Specular hematite from dump east of old surface tram.
5	62.42	Iron ore from dump of

		inclined shaft about 600' west of tram.
8	57.64	Iron ore float reportedly having unusual properties.

These samples are normal for this type of ore and do not indicate the presence of unusual elements. Theoretically pure hematite contains 70% iron and 30% oxygen but the slightly lower grade of the material analyzed can easily be accounted for by quartz and calcite impurities in the ore. The spectroscope revealed trace amounts of sodium, aluminum and magnesium which probably indicate the presence of silicate minerals in the rock, however, none were observed in the specimens. Trace amounts of copper are present in sample 5.

RARE ELEMENTS (SELENIUM)

It was suggested that the unusual properties claimed for the iron ore is caused by the presence of selenium but this seemed highly improbable as it would be an exceedingly unusual occurrence. Selenium is chemically closely related to sulfur and in nature is found in close association with minerals containing copper, silver, lead, mercury, bismuth, tellurium and thallium. About 25 minerals contain selenium but none are produced commercially and the most important source of selenium is as a byproduct from electrolytic refining of copper where it is recovered from the slimes ore residues.left after recovery of the copper. Some lead sulfide ores and pyritic ores of other metals often are relatively rich in selenium and are considered to be possible low-grade sources of this metal. In some areas soils are rich in selenium and it becomes concentrated in certain types of vegetation. The U. S. Bureau of Mines considers vegetation grown on these soils as a possible future source of selenium. Other possible sources of selenium are the volcanic tuffs in Wyoming and black shales in southwestern Wyoming and southeastern Idaho.

As selenium normally is associated with sulfide ores it probably would not be found with the specularite (iron oxide) ores at Lime Hill. Sulfide minerals probably occur in the primary zones of the copper-gold ore but the deposits are too small to be significant, and there is little reason to think selenium would occur with this ore.

At the present time there seems to be a shortage of selenium as the average domestic consumption is about 1,000,000 pounds per year whereas the annual production is about 900,000 pounds. On July 25, 1966 the ENGINEERING AND MINING JOURNAL Metal Market quotation for selenium was $4.50 per pound for standard grades and $6.00 per pound for high purity selenium. Ultra high purity selenium requiring special processing sells for $13.00 - $20.00 per pound. The principal use of selenium is in rectifiers and other electronic equipment.

ORE RESERVES

No serious attempt was made to estimate the ore reserves because it would have required an excessive amount of time. The ore bodies are small in size, very irregular, and widely scattered throughout a large area of rather difficult access. The ore occurs in numerous small bodies ranging in size from those containing only a fraction of a ton to several thousand tons. Probably in the aggregate there may be a couple hundred thousand tons of iron ore on Lime Hill but there is nothing to suggest very large reserves, and it would not be economically feasible to mine such ore as exists. These ore bodies probably would not be economically competative with larger, but similar, ore bodies in the Planet-Swansea area, a few miles northeast of Bouse, Arizona

Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

John N. Faick, Ph. D.
Registered Professional Geologist

September 2, 1966
P. O. Box 5671
Tucson, Arizona

REFERENCES

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SOUTHWESTERN ASSAYERS & CHEMISTS

REGISTERED ASSAYERS

FELIX K. DURAZO
WIL WRIGHT
ARIZONA REG. NO. 5875

P. O. BOX 7517
TUCSON, ARIZONA 85713

710 E. EVANS BLVD.
PHONE 602-294-5811

Mister John Faick

JOB # 000290
RECEIVED 8-29-66
REPORTED 8-29-66

SAMPLE NUMBER	GOLD OZ.	SILVER OZ.	LEAD %	ZINC %	COPPER %	Iron %	MOLYBDENUM %
1					X	63.42	
3						64.12	
5						62.42	
8						57.64	

REGISTERED ASSAYER
CERTIFICATE NO.
5875
WILBUR D.
WRIGHT
Date Signed 8/29
Arizona U. S. A.

CHARGE $ 12.00

SOUTHWESTERN ASSAYERS & CHEMISTS

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Mister John Peacock

JOB # 30[illegible]
RECEIVED 5-23-56
REPORTED 5-[illegible]-56

SAMPLE NUMBER	GOLD OZ.	SILVER OZ.	LEAD	ZINC	COPPER	[illegible]	MOLYBDENUM
1					X	3.12	
3						64.12	
5						2.[illegible]	
6						57.6[illegible]	

SOUTHWESTERN ASSAYERS & CHEMISTS

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Heindricks Geoexploration

Work Order 5558

JOB # 000331
RECEIVED
REPORTED 9-20-66

SAMPLE NUMBER	GOLD OZ.	SILVER OZ.	LEAD %	ZINC %	COPPER %	Selenium %	MOLYBDENUM %
No. 3						Nil.	
No. 8						Nil.	

REGISTERED ASSAYER
CERTIFICATE NO. 375
ARIZONA
U. S. A.

2 Selenium analysis @ $15.00= $ 30.00
2 calls to El Paso 5.09

CHARGE $ 35.09