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05/04/87

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: BLACK JACK MINE

ALTERNATE NAMES:

LA PAZ COUNTY MILS NUMBER: 338

LOCATION: TOWNSHIP 2 S RANGE 22 W SECTION 13 QUARTER SW
LATITUDE: N 33DEG 14MIN 47SEC LONGITUDE: W 114DEG 35MIN 22SEC
TOPO MAP NAME: HIDDEN VALLEY - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
MANGANESE

BIBLIOGRAPHY:

KEITH, S.B., 1978, AZBM BULL. 192, P. 180
ADMMR BLACK JACK FILE
USBM IC 7843, P 81
GEOEXPLORERS INTERNATIONAL VOL. 6 (ADMMR GEOL
OGY FILE)

The manganese deposits on the property were found within an extensive zone of brecciated lava. The zone, striking northeast and dipping steeply west, was as much as 450 feet wide and was traceable for over 600 feet. Within the central part of this brecciated area, three or more separate ore bodies had been discovered and developed. The principal ore bodies were roughly parallel and were spaced 150 to 200 feet apart. The eastern ore body had been explored by a shallow opencut about 50 feet long. The central deposit was developed by 2 shafts, 30 and 50 feet deep, and by 150 feet of lateral work. The western ore body was opened by an adit that followed the mineralization for 160 feet along the strike. The face of the adit was about 60 feet below the surface. The minable ore exposed in these openings occurred in a series of lenticular shoots ranging from 2 to 8 feet in width and from 20 to over 100 feet in length. The ore shoots were separated by intervals of poorly mineralized material.

The chief manganese minerals were pyrolusite and psilomelane. The gangue was composed largely of calcite and brecciated fragments of the wall rocks.

The ore was mined underground in open stopes. The walls of the ore bodies were strong and needed very little support. Wheelbarrows were used in place of cars and track for tramming the broken ore. Compressed air for the air-leg-type rock drills was supplied by portable gasoline-driven compressors. Small gasoline hoists were in use at the shafts.

Production from the property in May 1954 was at the rate of about 250 tons of ore a month. This was expected to be increased materially upon completion of the new road. The mine camp was a short distance west of the workings.

Andrus Claims

The Andrus group of two unpatented claims is on top of a prominent ridge about half a mile north of the Black Diamond group.

The claims were located in 1954 by V. A. Andrus, of Blythe, Calif. When the area was visited in May 1954, two men employed by Andrus were exploring the deposit. About 50 tons of sorted ore had been mined, but none had been shipped. An aerial tramway was under construction to facilitate the removal of the ore from the top of the ridge.

Manganese mineralization, largely psilomelane, occurred in bunches and veinlets along a fracture zone in volcanic rocks. The work at the time of the visit was limited to a few scattered surface cuts and pits, which did not indicate the extent of the deposit.

Montoya Claims (Black Jack)

Two unpatented claims owned by Ernesto Montoya, of Blythe, Calif., are about 3 miles northwest of the Black Diamond group. The deposit was discovered and located shortly before the area was visited in May 1954.

Manganese mineralization, consisting of the common oxides, occurs in a lenticular ore shoot within a fracture zone trending north and cutting volcanic rocks. The deposit was exposed in an opencut for about 50 feet along the strike. The higher grade ore ranges from 1 to 3 feet in width and appears to dip 35° W. Three men were employed, and a few tens of tons of sorted ore had been produced. Other disconnected manganese outcrops were evident along the trend of the fracture zone.

ABC Claims (Self Mine)

The ABC claims, known as the Self mine, comprise a group of 6 unpatented claims on the eastern slope of the Trigo Mountains about 5.5 air miles northeast of the Black Diamond deposit. The property is in SW¼ sec. 1, T. 2 S., R. 22 W., and can be reached over 12 miles of a road that branches south from the Cibola road about 12 miles west of State Route 95.

The claims were located in 1948 by Carl and Harvey L. Self, of Yuma, Ariz. During the following 2 years the Self brothers operated the property and produced several hundred tons of sorted ore averaging slightly over 40 percent manganese. This ore, the first produced from west central Yuma County, was trucked to Blythe, Calif., and shipped by rail to different steel manufacturers. Early in 1954 the property was leased to E. H. Cockrum and T. H. McNelly. When visited in May 1954, the lessees had shipped about 34 tons of ore containing some 41 percent manganese to the Wenden purchase depot.

The manganese deposits on the property occur in two parallel veins cutting volcanic rocks. The veins are about 150 feet apart, strike north, and dip steeply west. The ore in both veins had been mined in opencuts that reached a maximum depth of about 20 feet below the surface. The higher grade ore exposed in the cuts ranged from 1 to 3 feet in width and had evidently been mined more or less continuously along the strike of both veins for about 125 feet. At the time of the visit the lessees were starting a shaft on the north end of the west vein, from which they intended to develop the deposit at greater depth.

Psilomelane was the predominating manganese mineral. The gangue consisted largely of brecciated fragments of wall rock.

Fools Folly

The Fools Folly parts of the north property is in Ariz. It is on a road that branches off about 10 miles from the poor road on Route 95 in Ariz.

The claim was produced early in 1954. It produced a few tons of sorted manganese in May.

Two men visited the property in May. The ore was being mined in a mill recently built near Cibola Lake.

Manganese was exposed along a steep east in volcanic rocks more or less along the strike about 500 feet developed. The deposit was explored by a shaft that intersected the fracture face. These workings were not visited. Only small quantities of ore were produced in the area in the past. The ore remained in place, but the late eastern deposit shaft said to be exposed in the area and 2 to 6 feet from the east end of the vein and largely fill still exposed in the area also in its west.

Pyrolusite was the principal mineral. The gangue consisted largely of brecciated fragments of wall rock.

Metate

The Metate group is on the west side of the property. It contains in sec. 22, T. 2 S., R. 22 W., and is accessible over a road that branches off about 10 miles from the poor road on Route 95 in Ariz.

ABM Bull 192

Trigo Mountains (Cibola) District, Table 4 Cont.

MINING DISTRICT AND MINES	LOCATION T. R. Sec.	MINERAL PRODUCTS	GEOLOGY	TYPE OF OPERATION AND PRODUCTION	REFERENCES
1. ABC mine (Self, Cockrum & McNelly)	2S 22W SE $\frac{1}{4}$ 1 Protracted	Mn	Psilomelane in brecciated wall rock in parallel shear veins in Tertiary andesitic volcanics.	Open cut operations, worked in 1948-1950 and in 1954-1955, producing some 400 long tons of about 41% Mn.	Farnham & Stewart, 1958, p. 81 ABM Bull. 150, p. 219 ABM file data
2. Andrus claims (M & A; Tenny, Western Exploration & Development Co.)	2S 22W SE $\frac{1}{4}$ 20 Protracted	Mn	Psilomelane in bunches and veinlets along a fracture zone in Tertiary andesitic volcanics.	Open cut and pit operations. Some 50-100 long tons of sorted 40% Mn ore shipped and 3000 long tons of low grade Mn ore sent for experimental concentration.	Farnham & Stewart, 1958, p. 81 ABM file data
3. Black Diamond mine group (Myrtle; Gibson, Todd & Smith, J. P. Stewart & Associated, Todd & Allen, Western Exploration & Development Co.)	2S 22W E Cen 29 Protracted	Mn, Pb-, Zn-	Pyrolusite and psilomelane, mixed with calcite and brecciated rock, in lenticular shoots along an extensively brecciated shear zone in Tertiary andesite porphyry. Trace amounts of lead and zinc.	Open cut, shaft, and adit operations. Worked from 1953 through 1959, producing some 4600 long tons of plus 40% Mn and 9000 long tons of about 30% Mn.	Mining World, Vol. 19, Dec. 1957, p. 55 Farnham & Stewart, 1958, p. 80-81 ABM file data
4. Black Jack mine (Montoya, Ceflack, J. P. Stewart & Associates, Western Exploration & Development Co.)	2S 23W SW $\frac{1}{4}$ 13 Protracted	Mn	Manganese oxides in disconnected, lenticular shoots, with calcite and brecciated rock, along a fracture zone in Tertiary andesitic volcanics.	Open cut and shaft operations. Worked from 1954 through 1959, producing some 650 long tons of plus 40% Mn sorted ore.	Farnham & Stewart, 1958, p. 81 ABM file data
5. Cibola No. 1 mine (N. & J. F. Powers)	3S 23W N Cen 2 Protracted	Mn	Pyrolusite with some manganite and psilomelane, mixed with calcite and quartz, in lenticular shoots, fracture fillings, and narrow seams cementing brecciated wall rock along an extensive and wide, brecciated zone at the fault contact between Mesozoic granitic schist and Tertiary andesitic volcanics.	Incline shaft operations. Worked from 1953 through 1954, producing some 2000 long tons averaging about 30% Mn.	Mining World, Vol. 19, Dec. 1957, p. 55 Farnham & Stewart, 1958, p. 79 ABM file data
6. Cibola No. 3 mine (N. & J. F. Powers, Mangane- se Mg. & Millg. Co.)	2S 23W S Cen 35 Protracted	Mn	Pyrolusite with manganite and psilomelane, mixed with quartz and calcite, in irregular shoots in a lensing brecciated zone in Tertiary andesitic volcanics.	Adit and shaft operations. Worked from about 1953 through 1958, producing some 500 tons of 30-40% Mn ore.	Farnham & Stewart, 1958, p. 79 ABM file data
7. Cibola No. 7 mine (J. F. Powers)	2S 23W SW $\frac{1}{4}$ 25 Protracted	Mn	Pyrolusite mixed with wall rock breccia and calcite in a steeply dipping fracture zone with disconnected, lenticular, mineralized lenses in Tertiary andesitic volcanics.	Shaft, tunnel, and open cut operations. Worked from 1955 into 1959, producing some 4000 long tons averaging about 30% Mn.	ABM file data
8. Cibola No. 8 mine (N. & J. F. Powers)	2S 23W SW $\frac{1}{4}$ 25 Protracted	Mn	Pyrolusite with calcite, other carbonates, and wall rock breccia in discontinuous, lenticular shoots along a strong fracture zone cutting Tertiary andesitic volcanics.	Shaft and open stope operations. Worked from 1953 to 1956, producing some 3000 long tons of 25-30% Mn ore.	Farnham & Stewart, 1958, p. 79-80 ABM file data
9. Fools Folly mine (Snipers, Smith, Jarroll, and Richardson) (Not shown on district map)	1N 21W W Cen 1 E Cen 2	Mn	Pyrolusite mixed with brecciated wall rock in shoots along a fracture zone in Tertiary andesitic volcanics.	Shaft, adit, and open cut operations. Worked as early as 1930 and later in 1954-1955, producing some 300 long tons averaging about 20% Mn.	Farnham & Stewart, 1958, p. 82
10. Grand Central mine (Mexican operators, Hardt)	1S 23W Cen 36 Protracted	Au, Ag-	Spotty, high-grade gold with minor silver, with banded quartz, iron oxides, ferruginous calcite, pyrite crystals and bunches, in cavities and fracture fillings along a fault zone cutting Mesozoic schist, intruded by granite porphyry dikes. Other similar deposits 1 to 2 miles to south (Jupiter, Boardway).	Shaft and open cut operations. Worked sporadically in early to late 1890's and again in 1930's. Total estimated and reported production from all the deposits would be some 52 tons of ore averaging better than 1 oz. Au/T and minor silver.	Wilson, 1933, p. 72; 1934 (rev. 1967), p. 14 ABM file data
11. H. H. and L. mine group (Cassa, New Year Nos. 2 & 3; Hess, Hess & Lilly, Kirk & Lea)	3S 23W NW $\frac{1}{4}$ 3, NE $\frac{1}{4}$ 4	Mn	Psilomelane and pyrolusite in irregular, disconnected masses and veinlets in brecciated and silicified Tertiary andesitic volcanics along fault zones.	Open pit operations. Worked in 1953 and 1954, producing some few hundred long tons of 20-40% Mn ore.	Farnham & Stewart, 1958, p. 80 Parker, 1966 ABM file data
12. Peggy B mine (Brown)	3S 23W NE $\frac{1}{4}$ 3	Mn	Pyrolusite, mixed with calcite and brecciated wall rock, in lenticular shoots along a fracture vein in Tertiary andesitic volcanics.	Shaft operation. Worked in 1954-1955, producing some 100 long tons of 20-30% Mn ore.	Farnham & Stewart, 1958, p. 80 Parker, 1966
13. Trigo gold placers (Various operators)	2S 23W 1 & 2	Au	Spotty gold placer deposits in stream beds draining from small gold quartz veins in Mesozoic schist.	Dry placer operations on small scale, and intermittently, from as early as 1860's into 1940's. Possibly as much as some 323 ounces of gold were recovered containing a few ounces of silver.	Wilson, 1961, p. 25 Johnson, 1972, p. 75-76 ABM file data
14. Triple H mine group (Rosie, J. P.; Bishop, Brown, Western Exploration & Development Co.)	2S 23W SE $\frac{1}{4}$ 39, SW 35	Mn	Manganese oxides, with calcite and brecciated wall rock, in irregular bunches and lenses along strong fracture zones in Tertiary andesitic volcanics.	Open cut and adit operations. Worked intermittently from 1954 through 1959, producing some 2000 long tons of low grade Mn ore for concentration.	Farnham & Stewart, 1958, p. 80 ABM file data
XXIX. Yuma District (Yuma area)	8S- 23W --- 9S	Au, Ag, Fe	Gold-bearing quartz veins and stringers along fault and fractures in Mesozoic or Laramide granitic gneiss.	One mine operation as noted below.	Wilson, 1933, p. 221 ABM file data
1. Jude mine group (Silverfields; Hedgepeth, Timmons & Gutchmaker, Burton, Fay Mg. Co.) Figure 2	8S 23W N Cen 34	Au, Ag, Fe	Gold-bearing, iron-stained quartz, with local pyrite and pockets of limonite, in stringers and veins along fractures and faults in Mesozoic or Laramide gneiss.	Shaft and open cut operations. Worked originally in early 1900's and later in 1939-1940, and 1947, producing some 450 tons of ore averaging about 0.3 oz. Au T with minor Ag.	

NAME OF MINE: BLACK JACK ✓
OWNER:

COUNTY: Yuma
DISTRICT:
METALS: Mn

W

OPERATOR AND ADDRESS

MINF STATUS

Date:	OPERATOR AND ADDRESS	Date:	MINF STATUS
1/5/45	Al Stoval, clone ✓ 2433 E. Van Buren, Phoenix	1/45	Shipping

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Black Jack Mine (old Montoya) Date May 6, 1959
District Cibola-Trigo District, Yuma County Engineer Lewis A. Smith
Subject: Mine Visit by Lewis A. Smith

Operators: ✓ Lew Smith, 400 North Willow Street, Blythe, California
✓ Jack Stewart, Stewart Enterprises, 800 N. Central, Phoenix
Lew Smith supervises the operation.

Owner: Ernesto Montoya, Blythe, California (1954)

Work: The mine is developed by two side hill bulldozer cuts each of which is over 75 feet in length and 15 feet deep at the face. A bin, capped by a grizzly (10" spacing), is used to store ore for the 20 ton haulage truck. The haul to the Western Mill is about 8-2/3 miles by dirt road. Wagon drills are used to drill the ore which, when full operation is reached, will amount to about 450-500 tons per day. The ore will average 8-10% manganese over a width of 3-20 feet, and is believed to be physically good for milling. The south cut is equipped with an RD8 Cat, 3/4-ton shovel, a yard-capacity trackcavator and two five yard Ford trucks. The north cut has just reached the ore zone. Lew Smith believes this ore will concentrate to well over 40% manganese.

Geology: Topographically the deposit lies on the fork of a narrow wash lying between two high and rugged ridges which are typical of the Trigo mountains. The rip, in which the ore occurs, is more resistant than the bordering andesite flows and therefore stands 40 to 100 feet above the forked stream bottom.

The ore occurs on the footwall side of a resistant band, which appears to be a dike, in a series of intimate shears which parallel the resistant band over a width of at least 20 feet. The west or hanging wall side of the dike (?) is epidotized out for 35-40 feet. Some silica accompanies the epidote. The ore is mainly psilomelane and manganite lying within the shear fractures. The dike (?) follows a crescent-like trend ranging from north on the south to N 70° W, further north. The flow series is very thick and is composed of andesites, agglomerates and rhyolitic welded tuffs. No thickness was determinable for this series, but above the wash it is roughly about 600 feet to the ridge crests. How far the flows are present below the wash is not known, since no deep workings are present near or in the mine area. The dike (?) rock was tentatively called a biotite andesite porphyry but due to its resistance to erosion it may be more acid in character, and it's different in character compared to the surrounding rocks. The ore depth is unknown since no bottom has been reached. The dike (?) and the shear continues to the south for a considerable distance (at least 2 miles). The contact metamorphism on the hanging wall side of the band strongly suggests that the band is a dike.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Montoya

Date May 27, 1954

District Silver - *Yuma Co.*

Engineer Mark Gemmill

Subject: Preliminary Examination

OWNERSHIP

Ernesto Montoya, Blythe, Calif. owner and operator

LOCATION

About 4 miles slightly north of east from Cibola Lake. By road it is about 12 miles from Cibola Lake

GEOLOGY

Volcanic country, with north and south vein in brecciated zone. Vein dips to the west at about 45° and shows along the surface for about 200 ft.

DEVELOPMENT

Several open cuts and an incline shaft about 25 ft. deep from which they are now mining. Width of ore being mined 2' to 3'

PRODUCTION

Several small shipments have been made to the Wenden depot of ore reported to run better than 40% *✓*

EQUIPMENT

Gas Compressor

COMMENT

Very little work has been done on the property. Although the vein is narrow the grade of the ore is good.

Office
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CHARLES H. DUNNING
Mining Engineer
Phoenix, Arizona

Residence
1635 W. Earl Dr.
Phone AMherst 5-1132

To: Mr. Jack Stewart & Associates,
800 No. Central Ave.,
Phoenix, Ariz.

Manganese Mines Near Cibola.

Following your request I have made a new examination of the manganese properties you hold near Cibola, Arizona. A previous examination and report was made in July, 1955. Reference is made to that report for some details, such as the geological treatise, and same will not be repeated here. This report will be mostly confined to the changes that have taken place in the past two years.

You have several separate properties, or manganese deposits, and they are all within a ten mile radius of your centrally located mill. A brief description of each will follow:

GIBSON. The Gibson deposit was not owned at the time of my previous examination, although it was visited then. I understand that it has since been purchased. It consists of two large orebodies with a narrower neck connecting them. The northern part was formerly called the Allen. A sharp canyon, over 100 feet deep separates the two parts. An open pit has been started on the northern segment and promises well.

Bore holes put down in the north orebody, together with the croppings in the canyon below, give reasonable assurance that the ore continues for over 100 feet in depth. The south orebody is being mined now with a 2 $\frac{1}{2}$ yard power shovel, starting in the canyon over 100 feet below the ore apex, as shown in the picture.

Altogether these two orebodies comprise an area at least 500 by 300 feet, which at 100 foot depth, would furnish over 1,000,000 tons. A test run was made on ore produced by the shovel, and some 650 tons produced over 100 tons of concentrates. This ratio of 6 $\frac{1}{2}$ to 1 is probably a little better than would be maintained in mining the entire orebody, but an expected ratio of 9 to 1 would seem conservative.

May it be explained here that it has become the custom to speak of the grade and character of the crude ore in terms of its concentration ratio. No matter what the grade of the ore may be, the grade of the concentrates is quite uniform at about 42% Mn. Better or poorer ore simply makes more or less concentrates. Such concentrates are worth \$90.00 per ton. Therefore if an ore yields concentrates at a ratio of 9 to 1, the gross value of the crude ore is \$10.00 per ton.

M-A DEPOSIT. This deposit is on the strike of the Gibson, about one-half mile north. It has only been slightly opened up. It appears to be another orebody

similar to either body of the Gibson, and will furnish large tonnage by open pit methods.

Centrally located near the Gibson and the M & A you have facilities for hand sorting the crude ore from the pits. There, approximately 30% of the bulk is removed in the form of coarse chunks of waste. This waste is quite clean of manganese, and the expense of hauling to the mill, and milling, is thus reduced. This is good practice and should be continued.

BLACK JACK AND MYRTLE. These deposits are nearer the mill, seven and eight miles, respectively. They are vein-like orebodies along a vertical wall, which is a fault. The vein averages 10 to 30 feet wide. The ore is considerably higher grade than the general average, concentrating about 5 - 1. Mining will be more expensive although a slusher drag line could be used for awhile. The 5 to 1 ratio might well support the extra cost of underground mining. No very large tonnage is indicated.

JOHN P and TRIPLE H. These properties of nine and four claims, respectively, were not revisited, as little had been done there since my last visit. They do have large potentialities and when needed could furnish considerable tonnage.

MILL. The mill results have been greatly improved and the capacity increased several fold. These improvements include a heavy-media plant, several more concentrating tables, and adequate crushing equipment. You should now have no trouble in handling 1000 tons of ore per day. Extraction has apparently been brought up to around 75%, which is very good considering that andesite gangue minerals, such as hornblende, usually carry manganese, which would be quite impossible to separate by any mechanical means. It would be interesting to sample various bands of tailings as they come off the tables, to determine whether some bands, such as the coarsest and the finest, carry a preponderance of the lost values. If so, some further recovery might be easily made. However, it may not be worth while to go into such refinements until you have finished more essential things.

GENERAL DISCUSSION and RECOMMENDATIONS. Ordinarily I am very insistent on the positive proving by drilling or development of adequate tonnage before making other heavy expenditures. But your case is now different, and in my opinion you have sufficient proof of tonnage to warrant the expenditures necessary for you to reach a high plane of efficiency and economy.

Although your ore does not meet the strict interpretation of proved or developed ore, I believe you have reasonable assurance of over 1,000,000 tons, and probably double that. This opinion is based on the wide diversification amongst your several orebodies, and the way they act or "shape-up" on development. It is of course a pleasure to note that the geological deductions and opinions expressed in my previous report have been so well born out. There have been no disappointments - in fact wherever development has progressed, results have been a bit better than anticipated.

Petty troubles, causing production delays, are the bane of most small mine operations. Weak points, causing such delays, should be sought out, anticipated,

and eliminated. I could not give your operation sufficient study to make an extended list of suggestions, but the following are apparent:

- (1) General improvement in getting the ore from the pit to the mill is needed. This requires improvement in road conditions, and acquiring better trucking facilities.
- (2) Better camp facilities, so you can acquire and retain a more dependable labor force.
- (3) Adequate power with stand-by facilities to prevent shutdowns.

Assuming an operation of 1000 tons per day on a 10 to 1 ore, you would produce 100 tons of concentrates per day, worth \$9,000.

My estimate of costs to do so are as follows:

<u>Mining</u> 1300 tons by shovel, including necessary deadwork	1000.
<u>Sorting</u> out 300 tons of coarse waste near mine (4 men)	80.
<u>Hauling</u> 1000 tons, including road maintenance	700.
<u>Milling</u> 1000 tons, including upkeep, repairs, and improvements	1000.
<u>Shipping</u> 100 tons, concentrates, via Ripley	100.
<u>Prospecting</u> and development on other properties	200.
<u>General Overhead</u> , inc: Management, engineering, basic taxes, camp losses, accounting, assays, legal, etc.	250.
<u>Contingencies.</u> Unexpected items	<u>170.</u>
Total expected daily expense	3500.

Analysis of above:

Profit per day	\$5500.
Profit per ton 5500/1300	4.20
Cost per unit Mn. 3500/4000	.87

It is evident from the above that you have a very large potential profit. The important point is get your operation in shape to produce it, and keep it so doing.

Respectfully Submitted,

Aug. 13, 1957

Charles H. Dunning

(SEAL)

Reference IC 743 p 80

PRELIMINARY EXAMINATION
OF
CLAIMS & SURFACE FACILITY
of
J. P. STEWART & ASSOCIATES

LOCATION - Trigo Mountains, Yuma County, Arizona

TYPE OF EXAMINATION - Visual Preliminary

DATE OF VISIT - September 16 and 17, 1958

EXAMINATION CONDUCTED BY: Jack Pierce - A. W. Jeffers - B. R. Waples, Jr.

I. INTRODUCTION

General Extent of Examination:

In the company of Mr. Lew Smith, the representative of J. P. Stewart and Associates, Messrs. Jack Pierce, A. W. Jeffers and B. R. Waples, Jr. visited the sintering plant, milling facilities, and the Black Diamond, M & A, Black Jack and Fools Folly claims on September 16th. In the company of Mr. Hermanson, the representative of J. P. Stewart and Associates, Mr. A. W. Jeffers and B. R. Waples, Jr. visited the Triple H, JP Jr. #1 and #2, Rosie, and 3 other claims on September 17th. No samples were taken and no maps or records were available during this examination.

All grades of ore bodies, ratios of concentration, assays of concentrates, production figures, and costs were by verbal communication.

II. MINES

A. Black Diamond Group (Gibson Pit)

1. Location

This group of four claims is located 9 miles east of the

concentrator, and is reached over a fair dirt road. This region is about the center of the Trigo Mountains, and the range has a general Northwest-Southeast strike.

2. Geology

The group consists of Andesite breccia that has been cemented with psilomelane. Steeply dipping stringers cut the area in a general NW-SE direction with some local bending. A large horse of Andesite cuts off the SE end, an east west fault with a limey bed cuts off the stringers on the north, and a large center horse of Andesite gives the pit the shape of the letter "C" with the open ends pointing south. The east and west sides of the "C" form the sides of steeply rising hills, and the center of the "C" is in a canyon, possibly a fault, that has a general north-south strike. It is approximately 450 feet across the pit and 150 feet in depth.

3. Mining

The general mining method follows, although indications show in the pit that poor management has hurt production. The pit is set up for 20 ft. benches, and the benches are drilled with a Gardner Denver Wagon drill using a 2 $\frac{1}{4}$ " bit. Toe holes are drilled for relief and fragmentation. Very little secondary blasting was reported. Trucks are loaded with a 2 $\frac{1}{2}$ yd. Northwest Diesel shovel and ore is hauled about a mile to an up-grading grizzly. The reported stripping ratio was 1 waste to 3 ore. All mining is being done on a contract basis by the Wells Cargo Trucking Firm that handles the haulage of both ore to the mill and concentrates to the railroad.

Experimentation in the pit on blasting powders has been limited, and at present Government surplus TNT and some nitrate fertilizers are being used. The holes are primed with 80% Geletin and fired electrically. No stemming is used.

A 50KW International TD 18000 generator supplies lights and power to run a conveyor belt at the grizzly.

The up-grading grizzly consists of bars set at 3", the minus product loading into a truck for mill shipment; the plus 3" is conveyed away - drops to the ground and is dozed over the waste dump. A man picks any large lumps of ore from the belt. In this way the general 3% pit ore is up-graded to 6% for delivery to the mill. The waste dump runs about 1%.

The general pit condition is poor; benches have been blasted off, and shovel access is limited. The stripping ratios as reported are unrealistic; as for any future mining, the stripping ratio may climb to as high as 4 waste to 1 ore for the remainder of the ore body. It appears the pit is bottomed and the life of the Gibson pit will be short.

B. M & A (Andrus)

1. Location

This group of four claims lies just to the west of the Gibson Pit and can use the same up-grading grizzly for its ore.

2. Geology

The ore occurrence is the same as on the Gibson; however the NW-SE striking stringers in the ore zone run thru the top of a steep hill. The ore zone appears to be 20 to 30 feet wide and its length is doubtful, possibly 500 to 800 feet.

3. Mining

About 3000 tons reportedly have been removed and indications at the crest show some work. If the ore is continuous, one cut could be taken thru the hill at reasonable cost. Additional cuts will require high stripping ratios on the sides. The general grade is reported the same as the Gibson, and the up-grading possibilities look to be the same.

The ore grade and poor continuity of the ore zone makes this a poor prospect for consideration as an underground property.

C. Black Jack

1. Location

This claim lies about 3 miles west of the Gibson Pit and just off the road from the pit to the mill.

2. Geology

In general, the area is similar to the Gibson and M & A. The stringers have the NW-SE strike but are more pronounced and wider. The zone is dipping to the west and a high grade streak that varies from 4 inches to 3½ feet in width lies against the hanging wall. In general the ore zone runs along a ridge with a NW-SE strike, and the ridge falls off

into a deep canyon to the east and into a shallow saddle to the west. The ore zone is approximately 8 feet wide but the grade is higher than either the Gibson or M & A.

3. Mining

About 1200 tons have been mined from this claim. The ore zone was shot and the cut loaded out with a front end loader. The east footwall side has been leveled out while the stronger hanging wall side remains in place. Stripping ratios will climb as the cuts are taken out, but the visible faces looked good. Considerable exploration would be required to determine reserves. The grade looks good, but the overall ore body is probably small.

D. Fools Folly

1. Location

This 2-claim group is located near the north end of the Frigo Mountains, and is reached over a dirt road that parallels the Colorado river for 17 miles, then a very poor road turns to the east for 4 miles into the claims. The mine to mill total distance is 21 miles.

2. Geology

This area typifies the entire region with the same stringer structure. The Andesite in this area however is cemented with manganite and the character of the stringers have a darker appearance, very fine grained, and a metallic lustre on a fresh surface. The NW-SE stringers cut into the east side of a steep hill and parallel the side of the canyon.

The stringers are not continuous thru the hill, and the ore body in plain view has the shape of an ellipse. The ore zone is approximately 50 feet wide by 100 feet long. The depth is approximately 60 feet. Parallel to this zone, but separated by a 150 ft. wide Andesite horse, is another ore zone on the west side of the hill. The visible out-cropped stringers are about 6 feet wide and the zone runs for about 50 feet in length along the strike.

3. Mining

All the mining has been done on the east elliptical-shaped ore zone. Some underground mining was done on the major stringers in this zone. A small adit is visible near the south end of the zone. No records are available concerning this work. Recent mining has been of the open pit nature but little production has come from the claim. The overall ore body is small.

E. Triple H - J. P. Jr. #1 & 2, Rosie and 3 other Boundary Claims

1. Location

This group of 7 claims is located in the south central portion of the Trigo Mountains. The claims are reached by driving south from the mill $6\frac{1}{2}$ miles, then turning east over $3\frac{1}{2}$ miles of bulldozed trails up stream bottoms. Altho it was reported that this road was operational during the mining of this group, the present condition is very bad.

2. Geology

The general structure is again typical in this region.

The strike of the stringers in most cases follows a NW-SE trend, altho some right angle fracturing is evident.

Stringers on the western-most portion form the Rosie ore zone. In the center are the J. P. Jr. #1 & 2 which show some cross fracturing, and the most easterly claim is the Triple H which has a NW striking zone that is flat dipping to the west.

3. Mining

The Rosie ore zone is about 14 feet wide. It has been mined about 30 feet along the strike; the cut has left a steep overhanging wall on the west that will require considerable stripping for further work. Underground methods appear impractical.

The J. P. Jr. #1 & 2 are situated on the top of a peak and a mining bench has stripped away part of the side and one stringer was followed into the mountain. About 50 feet below the summit a raise broke the surface and ore from the bench was transferred down the raise and drawn out thru an adit in the side of the mountain. The adit mouth was about 150 feet from the summit. Any remaining ore would prove costly and reserves would require a more extensive examination. The Triple H follows the Rosie pattern and further development will be costly.

GENERAL INFORMATION

The general opinion of mining men and geologists is that the ore zones within the area are shallow in nature, 100 to 150 feet will be the maximum depth, and the cemented breccia's will continue only to that depth. Possible ore horizons below this depth are not considered good.

The rich pockets are small and the lower grade fringe zones tend to be high in silica and iron that are penalizing factors in the sale of the finished product. For a one year operation, enough ore of millable quality is available, but for a long range continuous operation more time for exploration and examination would be required. This preliminary report covers only visual observations of a small section of the area.

III. PRODUCTION

Production figures obtained were slight, but from verbal reports, production from the various mines appears to be within the following limits:

1. Gibson

Most production this year was from this mine, but increasing silica content in the concentrate has forced purchase of high grade fines to be added to this concentrate to make marketable grade. No definite figures were reported on tonnage.

2. M & A

Approximately 3000 tons were produced for experimentation in concentration.

3. Black Jack

No production this year; however, last year they shipped about

1000 tons of ore to the mill to produce 2 cars of concentrate. Previously the original owner had mined about 240 tons to make 1 car of concentrate.

4. Myrtle

Mr. Smith was vague about the Myrtle, but apparently there has been no commercial production this year.

5. Fool's Folly

On an experimental basis this year they shipped 137 tons of ore to the mill to produce 11 tons of concentrate.

6. Rosie, J. P. Jr. and Triple H

Mr. Hermanson reported that no ore was hauled from these three properties this year. During 1956 some ore was hauled to the mill. Apparently silica content from these properties was lower than from the Gibson and M & A mines.

IV. CONCENTRATION

Three steps of concentration are practiced on ore from these mines:

1.) grizzly concentration at the mine whereby the grade is raised from 3% manganese to 6-7% by rejecting plus 3 inch size on a grizzly at the mine loading ramp; 2.) milling which includes crushing to 1 inch, followed by Heavy Media separation of the 1 inch to 1/8 inch size and tabling of the minus 1/8 inch material; and 3.) sintering of mixed heavy media concentrate and table concentrates.

CONCENTRATOR

The coarse crushing plant consists of a primary 15 x 28 Pacific

jaw crusher which reduces the ore to approximately 2 inch size. This is followed by a screen set at 1 inch. The undersize goes to the fine ore storage; the oversize goes to a 3' Traylor secondary crusher in open circuit to the belt feeding fine ore storage. The fine ore is stockpiled over a feed belt to the scalping screen of the Heavy Media Plant.

The minus 1/2 inch undersize from the scalping screen, amounting to 33% of the feed, goes to 4 roughing tables which make a finished table concentrate of from 40 to 46% manganese. Middling from the roughing tables goes to two cleaning tables, which produce a concentrate of about 38% manganese.

Oversize from the scalping screen goes to a 7' cone of a Wemco Mobil Mill for heavy media separation at 3.20 specific gravity. Ferrosilicon consumption is reported to be 3/4 pound per ton of feed to the plant.

The concentrator is rated at 1000 tons per day. Power is supplied by a D 17000 Caterpillar Diesel Generator.

Eleven men per day are employed at the mill. On day shift there is a boss, two maintenance men, one chemist, one crusherman, and two operators. Afternoon and night shifts consist of two operators each.

From 1000 tons feed per day of 7% ore it was reported the mill produces from 60 to 90 short tons of combined heavy media and table concentrates. Tailing from the heavy media section is reported to contain from 1.5 to 3% manganese, and tailing from the table section contains 6% manganese.

Calculations based on 90 tons of 40% concentrate from 1000 tons of ore at 7% manganese indicate mill recovery is 51%.

SINTERING PLANT

The sintering plant, located at Ripley, California, eighteen miles from the mill, is capable of producing 60 tons of sintered concentrate per 24 hours. It consists of a blender, a storage bin, and a 4-hearth down-draft batch sintering plant. Two men are employed on each of the three shifts.

V. MISCELLANEOUS

Labor

Sufficient labor is available at Blythe, California for milling and sintering operations. Some of the men who worked for Stewart and Smith as operators are still in the area and are available. Labor rate is \$1.50 per hour, and operator rate is \$2.00 per hour. Heavy equipment operator rate is \$2.50 per hour. The men are not unionized.

Housing

Living conditions at the mine and mill are poor. Some personnel live in trailers. Housing should be available at Blythe, which is about 28 miles away.

Transportation

Wells Cargo from Las Vegas, Nevada has trucking and mining contracts. Ore is mined and delivered to the mill at \$2.00 per ton. Ore haulage alone is 63 cents per ton from the mines to the mill. Concentrate haulage from the mill to the sintering plant is \$1.40 per ton.

Toll Bridge

At Cibola there is a toll bridge across the Colorado River. Toll fares are \$1 per car each way, and \$2 per truck each way. Stewart and Associates pay a flat fee of \$4000 per year to cover all their traffic across the bridge.

Government Inspection

A government inspector from Wenden, Arizona visits the sintering plant twice a week to sample concentrates. Cars can be grouped into ten car lots to average out silica and iron irregularities, but no averaging has been allowed to cover excessive fines. The government accepts the concentrate at the sintering plant.

Publication

Attached is an Information Circular from the U. S. Bureau of Mines on "Manganese Deposits in Western Arizona". It contains the history of this area through 1954, showing the relationship between the various mines.

A. W. JEFFERS

B. R. WAPLES, JR.