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From: J. F. White, Asst. Geologist Tucson, Arizona

To : J. Hope, Chief Geologist Sept 12, 1950

Subject: The State of Texas Mine, Zinc, Lead, Silver, Cochise County, Arizona

Summary and Conclusions

The ore, chiefly zinc, occurs as small shoots within garnetized zones in limestone adjacent to a granite contact. About 2000 tons were shipped during the last war. Average mill recoveries were about 13% Zn, 2.9% Pb, .5% Cu, 6.4 OZ. Ag, and .038 Au. Cores from 2 diamond drill holes indicate about 8 feet of similar ore below the stope. Records from an old shaft 200 feet away indicate similar width and grade. Low grade material which was not sampled may in places be as much as 30 feet wide. The strength of mineralization in the district is classed as weak to moderate.

Location

The property is in Montezuma Canyon in the southern end of the Huachuca Mountains, 21 miles west of Bisbee, and in the Hartford mining district. The property is 7 miles from highway 92 on the Montezuma Canyon road.

Ownership

Miss Grace M. Sparkes, Star Rt., Hereford, Arizona reportedly owns the property which consists of 7 claims, 4 of which are patented.

History

Some work was supposedly done prior to 1900 and small shipments of high grade copper, silver, gold, and lead ore were made. Miss Sparkes inherited the property from her father. Workings include an old 350 ft. shaft, collar now caved, and later shallow workings including a few short tunnels, shafts and surface cuts.

During World War 2 about 2000 tons of ore were stoped from 70 feet below the surface and shipped to the Shattuck Denn mill.

Geology and Mineralization

Limestone of probably Carboniferous age was intruded by granite. The limestone is fairly massive and gray except for a white, recrystallized zone near the contact. The marble zone is as much as 100 feet wide and follows the main contact.

The granite is part of a large intrusive. It is medium grained and contains small amounts of ferromagnesians which have been in places altered to chlorite. The main contact is fairly straight, but several tongues occur out in the limestone.

The topography is steep and of high relief.

Mineralization occurred after the granite intrusion and was localized along shear zones within a 350 ft. band of limestone adjacent to the granite contact. The more important zones seem to occur just outside the marble and are marked by altered limestone containing garnet, epidote, and probably other similar silicates. The largest garnet zone is in places about 50 ft. wide.

Ore shoots containing zinc, lead, copper, silver, and gold are associated with the garnet zones. In general zinc predominates in value. Mill returns from the 2000 ton shipment were about the following.

		Ave. recovered by mill
Zn	489,228 lb.	13 %
Pb	108,524 "	2.9
Cu	20,316 "	.5
Ag	12,143 oz.	6.4 oz.
Au	70.85 oz.	.038 oz.

The mill paid on about 75% of the Zn, 75% of the Ag., 70% of the Pb, 65% of the Au, and 45% of the Cu.

Only shallow and insufficient exploration has been done. Cores from 2 diamond drill holes indicate about 8 ft. of similar ore 60 ft. below the bottom of the stope which is 70 ft. below the surface. Records from the old shaft located about 200 ft. away indicate a similar width and grade. More of the material within the main garnet zone, perhaps in places as much as 30 ft. in width, might make low grade zinc ore.

The ore contains black sphalerite, galena, chalcopyrite, chalcocite, a small amount of pyrite, silver minerals, and gold. Some oxides also occur. A mineralized zone about 10 ft. wide occurs along the contact and contains in contrast large amounts of iron minerals, primary hematite and limonite after pyrite.

The depth of oxidation in the garnet zone is shallow on the order of 10 ft.

cc: E. N. Pennebaker
A. J. O'Connor

JOHN F. WHITE

From: J. F. White, Asst. Geologist Tucson, Arizona

To : J. Hope, Chief Geologist Sept 12, 1950

Subject: The State of Texas Mine, Zinc, Lead, Silver,

Cochise County, Arizona

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The depth of oxidation in the garnet zone is shallow on the order of 10 ft.

cc: E. N. Pennebaker
A. J. O'Connor

JOHN F. WHITE

September 21, 1950

Mr. A. J. O'Connor, General Manager
Consolidated Coppermines Corporation
Kimberly, Nevada

Dear Art:

Attached is a copy of John White's memorandum dealing with the State of Texas mine in the southern part of Arizona.

The opportunities here to find other small ore shoots are not unfavorable. Although this is not the type of thing for which we are searching, I think we should have a more careful look when time permits because of the present lively demand for zinc.

Yours very truly,

cc: Mr. John Hope, Jr.

COCHISE

CONSOLIDATED COPPERMINES CORPORATION COPY MEMORANDUM

FROM John F. White, Asst. Geologist CITY Willcox, Arizona

TO A. J. O'Connor, General Manager DATE July 13, 1948

SUBJECT MINERALIZATION AND GEOLOGY OF THE DOS CABEZAS MOUNTAINS COCHISE COUNTY, ARIZONA

SUMMARY AND CONCLUSIONS

The Dos Cabezas Mountains are a northwesterly trending desert range composed chiefly of pre-Cambrian schists and granite, Paleozoic and Cretaceous sediments, and Cretaceous and Tertiary volcanics. Intruded into this rock sequence are small Tertiary granitic stocks. Small areas of later volcanics and sediments are also represented.

Mesothermal mineralization of economically important copper, silver and gold took place in Tertiary time. The important ore deposits appear to be localized in small areas chiefly in and near the granitic stocks with the most intensive mineralization being near the Mascot stock. In addition, the stocks themselves seem to be localized, being arranged along a northwest line or zone. Four general types of mineral deposits occur: (1) Magnetite-hematite lenses and shear zones, (2) Quartz veins, (3) Fractured contact zones, and (4) small placer gold deposits. The most important are the magnetite-hematite lenses of the Mascot property where considerable work and appreciable production have taken place. Massive magnetite-hematite with associated chalcopyrite, silver and gold form the ore bodies which are associated with basic dikes. Preliminary examination disclosed favorable aspects and probably sufficient ore for a small mine operation. In conclusion, the examination of the Dos Cabezas range indicates no large ore deposits sufficiently favorable to justify further work.

INTRODUCTION

The Dos Cabezas range lies in Cochise County, Arizona, just east of the town of Willcox which is about 85 road miles east of Tucson. The purpose of the work was to examine the entire Dos Cabezas range thoroughly for possible economic metal deposits. The accompanying geologic map indicates the area covered in the examination. This work was accomplished during the months May, June, and part of July, 1948, by F. V. Tompkins, W. C. Beckwith and myself.

GENERAL GEOLOGY

The Dos Cabezas is a northwesterly trending desert range approximately 20 miles long, 4 to 10 miles wide, with a maximum altitude of 8300 feet. The terrain, generally speaking, is very rugged and steep except for the immediate foothill areas which slope gently into alluvial valley fill. Sparse vegetation along with little or no soil cover characterizesthe surface and allows easy and thorough observation. Water is available locally from some of the deeper mine workings and from wells chiefly in valley fill.

Most of the range consists of: pre-Cambrian schists and granite, Paleozoic and Cretaceous sediments, Cretaceous and Tertiary volcanics; intruded into this rock sequence are small Tertiary granitic stocks. Small areas of later Tertiary volcanics

and sediments are also represented. In addition, there are many dike rocks dating from pre-Cambrian granite to the latest volcanics. Surrounding most of the range is recent valley fill and locally some older alluvium probably Pleistocene.

A northwesterly trend of many of the chief structural features is evident beginning with the trend of the range itself. An important and striking feature is the northwest alignment of the stocks, all of which occur along a fairly straight northwest line or zone. Elongation of the individual stock bodies in the same direction is also apparent. These features suggest a structural control in the emplacement of the Tertiary bodies along a northwest zone of weakness. Many of the large dikes, faults and sediments have a similar trend but more westerly. One of these is the large thrust fault which separates Cretaceous sediments from pre-Cambrian granite and schist. Relations between the fault and mineralization indicate a pre-mineral fault, Cretaceous or Tertiary, with some later movements during mineral time. Another large fault that should be mentioned is the "Oregon" fault striking northwesterly through the Mascot property. Some recent uplift of the range is suggested by hills of remnants of older gravels being cut down by present day erosion.

ROCK UNITS AND RELATIONS

In mapping, the units used on the Arizona State Geology Map were followed with some additions for mineralization, dikes, and basic stocks. Contacts shown on the State map proved to be inaccurate, and some of the Tertiary intrusives were not shown. An important conclusion is that the State map cannot be relied upon to indicate the absence of stocks within an area.

PRE-CAMBRIAN ROCKS

Schist is the oldest unit and includes a great variety of schists and quartzite and locally small amounts of pre-Cambrian volcanic or dike rocks. Intruded into the schist formation is a very coarse grained porphyritic granite with large conspicuous feldspar phenocrysts often one inch or more in length. Contact effects are negligible, with little or no change in the texture of the granite, right up to the schist contact. In one instance, a small granite dike breaks off from the granite body and extends into the schist. No change in texture could be noted. From these observations it is inferred that the granite is part of a very deep portion of the pre-Cambrian batholith.

PALEOZOIC AND CRETACEOUS SEDIMENTS

The sediments represented are parts of the Tonto (Cambrian), Abrigo (Ordovician, Cambrian), Martin Escabrosa and Naco (Carboniferous, Devonian), and Comanche (Cretaceous) formations which comprise two westerly trending belts. Resting on the pre-Cambrian, is the Tonto group consisting mainly of quartzites, grading from a basal, coarse, quartzite conglomerate with boulders frequently 6 inches in diameter up to fine grained quartzite. The Abrigo is a light colored, medium grained, slabby bedded limestone, weathering in places to light blue gray and containing some quartzite. Fossils were found in some of the upper beds. On top of the Abrigo is the Martin, Escabrosa and Naco groups which are mostly light colored, fine grained, thick bedded limestones.

Black, well developed slates characterize much of the Comanche formation along with light brown shales, sandstones, and some limestone. Although the area beneath the Camel's Back was mapped as Comanche following the State map, it is thought likely that either it does not belong to this formation or perhaps represents a different part of the group. These rocks have a younger appearance, occur with the latest volcanics, and consist of different rocks: quartzite, graywacke, limestone, and a quartz limestone conglomerate with limestone cement. Another group of sediments occur in a small area at Mineral Park and were not separately mapped. Coarse quartzite conglomerate, schist, and sericite schist conglomerate or breccia make up this group.

CRETACEOUS AND TERTIARY VOLCANICS

A considerable portion of the Range is covered by a thick series of volcanics ranging in composition from rhyolite to andesite and varying in texture. Most of the rock is rhyolitic with some volcanic agglomerate containing an assortment of older volcanics and occasionally fragments of pre-Cambrian schist and granite. A different type, generally a purplish andesite, represents the latest volcanic activity and is found only on the ridge extending to the Camel's Back.

TERTIARY INTRUSIVES

Small, irregular shaped, stock like bodies, ranging in composition from gabbro to quartz monzonite intrude the Cretaceous and older rocks. The borders are typically fine grained, somewhat more basic in composition, and often contain inclusions of the older rocks. Contact effects are negligible being confined chiefly to development of epidate and local bleaching of the pre-Cambrian granite to a maximum distance of 50 feet. Dike rocks of similar composition and others representing highly differentiated facies, both acid and basic, inject the stocks and older formations.

MASCOT STOCK

This stock is located just below the Mascot Mine in the most intensively mineralized area of the range. It is generally a horneblende monzonite but locally contains some biotite. The contact with the volcanics is irregular and confused, most of the monzonite area containing patches of volcanics. Many dikes and irregular injections extend into the older rocks. A volcanic sericite schist, not separately mapped from the Martin, Escabrosa and Naco formations, lies on the south contact.

SILVER CAMP STOCK

The Silver Camp stock, lying across the upper part of Silver Camp canyon, is on the average a monzonite porphyry usually containing horneblende and locally biotite. Abundant inclusions and patches of volcanics are present, particularly along the contacts.

COWBOY CANYON STOCK

Another large stock is located in the vicinity of Cowboy Canyon and is not shown on the Arizona State map. The composition is generally a diorite but at places becomes very basic near the borders. Locally inclusions of schist and granite can be found.

Besides the three large stocks just described, there is one small stock at Mineral Park similar to the Silver Camp body and several small gabbro plugs near the Cowboy Canyon intrusive.

HAPPY CAMP CANYON INTRUSIVE

The State map indicates a Tertiary intrusive east of Happy Camp canyon. However, evidence suggests this body may be pre-Cambrian granite. Although in general somewhat finer grained, the body possesses a very coarse batholithic texture and in places is exactly similar in texture and appearance to the pre-Cambrian. One difference is the prominent horizontal bedded appearance of the Happy Camp area. However, no contact with pre-Cambrian granite was found as was shown on the State map, and both indicated areas seem to be of similar composition and texture. The contact zone with schist is similar to pre-Cambrian granite - schist contacts elsewhere. Also a large number of coarse grained, pegmatite dikes, characteristic of the pre-Cambrian contacts, occur in the schist contact zone. This is in marked contrast to the more shallow Tertiary intrusives where no pegmatites were noted. In conclusion, it was felt that due to the batholithic nature and other similarities to the granite, it would be more reasonable to map this area as pre-Cambrian. However, a later, perhaps Tertiary, assimilation of some of the granite in this area is a possibility and might account for the generally finer grain and difference in weathering.

MINERALIZATION

Hydrothermal mineralization occurs throughout the area and is considered to be mesothermal. The introduction of the following metals took place, varying in relative importance and not all represented in each locality: iron, zinc, lead, copper, silver, and gold. In addition there are probably other metals represented locally in minor amounts which field examination did not disclose.

LOCALIZATION

Although mineralization occurs throughout the Dos Cabezas range, the important ore deposits appear to be localized in small fairly well defined districts principally in and around the Tertiary stocks, the most intensive mineralization being in the area of the Mascot stock. Localization is also apparent in and along the thrust fault contact between Granite and the Comanche in the Mascot district, and in small isolated patches in most rocks of the Range.

AGE

One important period of mineralization related to Tertiary intrusives and probably another unimportant period connected with the pre-Cambrian granite have taken place. The possible pre-Cambrian period is seen along some of the schist-granite contacts and consists of a number of small, coarse grained pegmatitic dikes, a few quartz veins, and some pyrite. No intensive metalization took place. On the other hand, the mineralization connected with the Tertiary cycle of intrusion is widespread being particularly important in the Mascot and Silver Camp districts. This mineralization cuts all rocks except the very latest volcanics and gravels which contain vein quartz inclusions and pebbles similar in appearance to the quartz in the veins. The evidence establishes the age of mineralization as Tertiary, being later than the small granitic intrusions and probably earlier than the last volcanic activity.

OXIDATION

Oxidation of the entire Dos Cabezas Range is shallow due to the rapid erosion taking place. In most deposits sulphides can be found close to the surface, but in a few cases only oxidation products are present. Limonite boxwork, limonite, and copper carbonates are conspicuous on some of the outcrops. Occasionally very small amounts of secondary chalcocite and covellite are found in the oxidized zone.

TYPES OF DEPOSITS

Four general types of mineral deposits occur: (1) Magnetite-hematite lenses and shear zones, (2) Quartz veins, (3) Fractured contact zones, (4) Placer gold deposits.

MAGNETITE-HEMATITE LENSES AND SHEAR ZONES

The most important ore deposits are those associated with magnatite and hematite in shear zones. These deposits occur in the Mascot area, the Silver Camp-Mineral Park area, and in less importance in the upper California Gulch area. Massive magnetite-hematite lenses, frequently 40 feet by 100 feet with associated copper minerals chiefly chalcopyrite and subordinate silver and gold, form the most important ore deposits. An interesting observation is the association of the ore deposits with basic dikes which is a typical occurrence in all areas of this type of mineralization. Quartz absent or present in small amounts, magnetite, hematite, pyrite, probably some sphalerite, chalcopyrite, galena, silver, and gold constitute the mineral assemblage. In the Mascot district there appears to be an upper zone of magnetite, hematite, and sparse pyrite and a lower zone with higher pyrite content as shown by the contrast between surface and underground exposures. This situation was seen in the Mascot, but it is not known whether it is the general condition as other underground workings were not examined.

Two days were spent in the Mascot mine area in a preliminary examination conducted as a part of the examination of the range. The economic mineralization is chiefly primary copper with important amounts of silver and gold in volcanics. Approximately 50 claims comprise the property owned by Mr. E. I. Tout. According to Mr. Tout, past production exceeds $500,000, much of which was produced by A.S.& R. around 1917. Considerable recent shipping has also been done. Mr. Tout estimates 200,000 tons probable and 200,000 tons possible of 3% copper with silver and gold values adding close to another percent.

Favorable aspects of the property are as follows: the visible size of the ore bodies and grade of the ore, the accessibility, the good condition of the underground workings with rail and air lines mostly intact, and the large amount of ground opened up (about 50,000 feet of workings) which would lend itself to rapid exploration and development. Also, geological maps and cores of 60,000 feet of drilling are available for inspection.

If any further work is contemplated on this property, the possibility of using a magnetometer for surface and underground prospecting should be considered as it would be ideally suited for the high magnetite ore bodies. Also the association of the ore with basic dikes should be studied in detail.

An important similar occurrence, but less favorable, is at the Casey Copper group located about 3 miles northwest near the Silver Camp stock. A further important deposit occurs at Mineral Park where gold, occurring as small high grade pockets, is the economic mineral along with minor amounts of copper and silver.

QUARTZ VEINS

The quartz vein type of mineralization is the most widespread and occurs in all mineral districts but is not always the dominant or economically important type. Many large massive ledges are present, the largest, called the "Big Ledge," occupies the fault zone between the pre-Cambrian granite and the Comanche series in the Mascot area. The vein pinches and swells, often being up to 150 feet wide. Numerous other large quartz veins occur, some 10 to 20 feet wide. Most of the veins upon which mining activity has been concentrated are smaller, usually 1 to 4 feet in width.

The quartz is typically a milky white to gray and on the whole is moderately coarse grained and massive. Occasionally, fairly large and well developed crystals occur in cavities in the vein. Associated with the quartz locally are small amounts of pyrite, occasionally hematite, sphalerite, galena, chalcopyrite, silver and gold. Generally speaking, gold and silver are the economic minerals, and the ore of the veins occurs in small shoots, usually low grade.

The principal areas of these types of deposits are: the deposits in schist near the Camel's Back, the "Big Ledge," Cowboy Canyon, Zeitz Canyon, the Buckeye Apache, Gold Farm, and Wood Canyon areas. In conclusion, it is felt that none of the quartz vein deposits offer anything but very small mine possibilities with the possible exceptions of the Buckeye Apache vein and the "Big Ledge" area.

The Buckeye Apache vein is at least 1,000 feet long with an average width of approximately 8 feet and is said to average $12 in gold and silver. The vein is very flat, 10 to 15 degrees, and may extend east about 3,000 feet to the line of prospects shown on the accompanying map. Some surface work is being done at present by the Buckeye Apache Mining Company.

The "Big Ledge" area contains a number of large parallel veins reported to be very low grade with occasional small high grade pockets. At present, work is confined to the Gold Prince Mine located in Bean Canyon where some underground exploration work is being done.

FRACTURED CONTACT ZONES

Several mineralized fractured zones in Tertiary granite contact areas were found. However, all the areas were small, on the order of 300 by 400 feet, and none appeared to contain sufficient mineralization to have economic possibilities. One possible exception to the last statement is the occurrence in the Elma mine where only meager information could be obtained. On the dump is bleached quartz porphyry containing disseminated pyrite and chalcopyrite. According to Mr. Tout, the ore came

from the 400 level which is inaccessible. Underground geologic maps show a minimum of about 200 feet of workings which are probably in this quartz porphyry. No surface indications could be used as the bleached rock does not outcrop.

A fractured mineralized area in pre-Cambrian granite approximately 300 by 400 feet lies on the eastern tip of the Cowboy Canyon stock. The fractures contain limonite, locally a very small amount of possible chalcopyrite boxwork and occasionally pyrite. A very similar deposit is situated along the Silver Camp stock contact west of Mineral Park. This area is about the same size and contains hematite in addition to limonite, pyrite, and locally, chalcopyrite. Another similar deposit is located in the Mascot stock in a small area on the south contact with limonite in fractures and occasionally malachite.

PLACER GOLD

Placer gold occurs in stream gravels but apparently has been too low grade, particularly considering the absence of sufficient water. At one time a dredge worked a small area at the foot of Gold Gulch.

RECEIVED
JUN 19 1949
E. N. PENNEBAKER

JFW/ms
cc - Mr. E. N. Pennebaker
Mr. John Hope

COCHISE

CONSOLIDATED COPPERMINES CORPORATION

COPY

MEMORANDUM

FROM F. V. Tompkins, Asst. Chief Geologist

TO A. J. O'Connor, General Manager

CITY Florence, Arizona

DATE June 3, 1949

SUBJECT PROSPECTS AND MINERALIZATION OF THE DOS CABEZAS RANGE

COCHISE COUNTY, ARIZONA

INTRODUCTION:

During May, June, and July, 1948 a reconnaissance of the Dos Cabezas Range in Cochise County, Arizona, was made by John F. White, W. C. Beckwith, and myself. Since it is completed, a listing of the mineralization and workings which were encountered is made in this report. In a previous report, "The Mineralization and Geology of the Dos Cabezas Mountains," July 13, 1948, John F. White has classified the ore deposits.

1. Magnetite-hematite lenses and shear zones.
2. Quartz veins.
3. Fracture contact zones.
4. Placer gold deposits.

The above classification will be used in this report along with one addition.

5. Tungsten deposits.

For convenience the main headings of this report are geographic and, or geologic units. Mineralization and workings are usually referred to under sub-headings.

CONCLUSION:

The mineralization which occurs in the Dos Cabezas Range carries insufficient values and, or has insufficient size to be of interest to Coppermines.

T. 13 S., R. 25 E.

OUTLYERS OF THE NORTHWESTERN END OF THE RANGE:

The northwestern end of the range and its outlyers fall on the Willcox quadrangle. One of three outlyers which were traversed is an area of schist (Sec. 17). Specularite occurs in relatively close-spaced fractures throughout most of this schist. Little prospecting has been done in this area.

SCHIST OF THE NORTHWESTERN PORTION OF THE RANGE:

The mineralization in the schist of the northwestern portion of the range is of the vein quartz type. Most of these veins are discontinuous and relatively narrow in width. Visable metallic minerals in the veins are pyrite, limonite, galena, and occasionally chalcopyrite. Exploration throughout this area was for deposits of gold and silver which occur as pockets or shoots in the veins.

Northwestern End of the Range:

Several veins, 2 to 3 feet in width, occur in the schist and in a small area of pre-Cambrian granite at the northwestern end of the range (Willcox quadrangle, Sec. 14 and 15). These have been explored by several shafts of which the deepest

is about 40 feet. Little or no ore has come from these workings.

Zeitz Canyon:

Three veins of Zeitz Canyon (Sec. 13) have a northwesterly strike and a high angle westerly dip and range from 1 to 4 feet in width. These have been prospected by a shaft about 100 feet deep, numerous pits, and several drifts. Probably no ore has been shipped from these workings.

T. 13 S., R. 26 E.

Flying W Ranch:

South of the Flying W Ranch (Sec. 20) two parallel veins are from 6 inches to 3 feet in width. They strike N. 10° E. and dip about 60° west. Exploration is by two drifts which are driven several hundred feet along the veins. A little rock was sorted on the upper dump and perhaps a small amount of ore was shipped. The property is owned by Mr. Al Ricks of Willcox. One sample was taken from the upper workings of the eastern Flying W vein. No. 3027: Au - .08, Ag - .18, Cu - .18, Pb - Tr.

Camel's Back:

Westerly of the Camel's Back (Sec. 29, 30, and 32) is an area in which many workings have been driven on at least a dozen different veins. Several of these veins have a N. 20° E. strike but other than that, no vein pattern was seen. Visually, much of the quartz in these veins seemed of higher value than other veins of the northwestern portion of the range. One sample was taken southwesterly of the Camel's Back. No. 3010: Au - Tr., Ag - Tr., Cu - .04, Pb - Tr.

COWBOY CANYON TERTIARY GRANITIC STOCK:

Two types of mineralization are associated with the Tertiary granitic stock which is cut by Cowboy Canyon. One is a fracture contact zone and the other is a tungsten deposit.

Page Outcrop:

The Page outcrop lies about 1/2 mile westerly from the Page Ranch and is near the center of Sec. 23. This outcrop is silicified pre-Cambrian granite which lies on the eastern tip of the Tertiary granitic stock. The outcrop which is about 300 by 400 feet contains limonite after pyrite and a small amount of chalcopyrite boxwork. A few shallow pits are the only workings in this silicified granite. Two samples were taken from this outcrop along Walnut Gulch.

No. 3007, Northern 60 feet: Au - Tr., Ag - .02, Cu - .07, Pb - Tr.
No. 3008, Southern 60 feet: Au - Tr., Ag - Tr., Cu - .02, Pb - Tr.

Ash Gulch Tungsten:

Scheelite occurs in the NE 1/4 of Sec. 22. This occurrance is probably in small pockets or lenses along a northwesterly striking zone. The property has been worked during both world wars. During World War II, a small mill was erected; reports are that only a small amount of rock was milled. The ground is owned by a rancher, Mr. Page, whose ranch is about 1 mile east of the property.

PRE-CAMBRIAN GRANITE AREA ON THE NORTH SIDE OF THE RANGE:

Most of the mineralization of the pre-Cambrian granite area on the north side of the range is located within a mile of the southern pre-Cambrian granite contact. The mineralization is of the quartz vein type which contains pockets or shoots of gold and silver. Metallic minerals are limonite, pyrite, galena, and occasionally chalcopyrite. Placer gold is present in many of the gulches of the western part of this area but only two locations might have been considered as being potentially economic deposits. One of these has been worked.

Upper Walnut Gulch:

In upper Walnut Gulch along the 27-34 section line, mineralization is probably a combination of the quartz vein and fracture contact types. A fracture which is up to 5 feet in width and perhaps 2,000 feet long, strikes N. 65° W. and dips steeply to the southwest. The zone has a siliceous filling but more limonite (after pyrite) is present than in most of the quartz veins. Two shafts, one which is about 200 feet deep, were sunk by a company before 1900.

Little California and California Gulches:

In the northern part of Sec. 26 and in the southern part of Sec. 35, two parallel veins occur which strike N. 80° E. and are nearly vertical in dip. Near the eastern end of the southern vein, the structure widens from the usual two or four feet to a little less than 100 feet. Locally in the veins and throughout the widest part of the structure, pseudomorphic limonite after pyrite, pyrite "boxwork," and a small amount of chalcopyrite boxwork were found. The only prospecting in this area is by shallow workings.

Placer Gold of Gold Gulch:

In Sec. 24, the floor of Gold Gulch is an aluvium area about 3/4 mile long and 1/4 mile wide. Before World War II a small dredge operated here and from reports was financially successful. Mr. Page, who owns the ground, said that the operation was suspended by the Government Gold Order of October, 1942. Only a small part of the original gravel area has not been dredged and when the property was visited, water was not available to support such an operation. Economic placer gravel was reported to exist in a relatively flat area in Sec. 36 along Gold Gulch. At present this is the location of the Wiley Ranch.

T. 13 S., R. 27 E.

Gold Farm:

At Gold Farm (Sec. 5) a three foot quartz vein strikes N. 10° W. and dips about 35° westerly. This vein contains small amounts of pyrite, galena, and chalcopyrite. It has been prospected by an incline and a drift. One sample was taken from the vein at Gold Farm. No. 3011: Au - .11, Ag - 2.83.

T. 14 S., R. 27 E.

Buckeye Canyon:

On the east side of Buckeye Canyon (Sec. 3) the Buckeye vein has an average width of about 8 feet and has a trace which for 1,000 feet is roughly parallel to the canyon. A maximum width of 14 feet is near the center of this vein. On either end it pinches and is only a few inches wide where it was last examined. It has a northerly-southerly strike near its center but on each end the vein curves and the strike becomes more westerly. The dip of the vein in the central portion is 10 to 15° west but on the ends it steepens to a maximum of 70°. This vein probably cuts through the mountain and is again exposed 3,000 feet east on the eastern slope of Cement Canyon. Visable metallic minerals of the vein are pyrite, galena, and chalcopyrite. Valuable metals are gold and silver.

In one location an area about 100 by 200 feet has been mined from the vein. Prospecting has been done with drifts at several points throughout the 1,000 strike length both on the western and eastern outcrops. When the property was visited, the Buckeye Apache Mining Company was constructing a mill. Ore was reported to average $12 per ton but this is doubtful. All factors indicate that this company was building a mill before intelligent underground work was done; that the entire operation is a promotion scheme.

One sample, No. 3028, was taken from a small area of altered material along the canyon. This altered rock has a small amount of limonite after chalcocite in it. Assays of gold, silver, copper, and zinc ran a trace.

Rough Mountain:

Near the top of Rough Mountain (Sec. 1 and 2) a vein occurs which is similar in some respects to the Buckeye Vein. This vein strikes easterly-westerly and dips at a low angle to the north. A maximum width of over 10 feet occurs when the walls are schist but when the vein crosses the contact and cuts pre-Cambrian granite, it narrows to a width of one or two feet. Mineralization is of the same type as that in the Buckeye vein but seemed to be less intense.

T. 13 S., R. 27 E.

Maverick Mountain:

Several traverses were run across Maverick Mountain which is on the north side of the Dos Cabezas Range. Little mineralization occurs on this mountain.

SILVER CAMP TERTIARY GRANITIC STOCK:

Only a small amount of mineralization occurs within the Tertiary granitic stock at the head of Silver Camp Canyon but in the Tertiary volcanics on the southwesterly side of the stock several areas of magnetite-hematite lense type of mineralization were found. Quartz vein type mineralization occurs in the volcanics for a distance of several hundred feet around the stock. These veins are small and discontinuous and seem to fall in no definite pattern. Only a small amount of metallic minerals occur within them.

T. 14 S., R. 26 E.

Silver Camp:

Silver Camp is located southwesterly from where the canyon crosses the southwestern contact of the stock (Sec. 12). In this area two or more northerly-southerly trending shear zones which contain the magnetite-hematite type of mineralization cut the volcanics and continue but a short distance into the Tertiary granitic rock. Mineralization occurs in lenses that range up to 30 feet in width. The longest of these zones is less than 1,000 feet. Mineralization consists of heavy magnetite and hematite (specularite), pyrite, and sparse chalcopyrite and chalcocite. Prospecting which was probably for gold and silver was done by several shafts and drifts and by numerous shallow pits.

Casey Copper:

Mineralization similar to that of Silver Camp occurs on the Casey Copper Company ground near the southeastern end of the stock in the northeastern part of Sec. 13. Around World War I, the Casey Copper Company sold stock to local people and did exploration by a 200 foot shaft and several short adits. The largest mineralized outcrop is about 200 by 500 feet. Bornite and covellite were found; otherwise the mineral assemblage is the same as that of Silver Camp. One sample was taken from the Casey Copper shaft dump. No. 3012: Au - Tr., Ag - .36, Cu - .39, Pb - Tr.

MINERAL PARK TERTIARY GRANITIC STOCK:

At Mineral Park a Tertiary granitic stock of about 750 by 1,000 feet intrudes the volcanics. Mineralization occurring around this stock in the volcanics is largely of the quartz vein type but two zones are probably of the magnetite-hematite type. Between the Mineral Park and Silver Camp stocks is an area in which several mineralized veins occur.

T. 14 S., R. 27 E.

Mineral Park:

At Mineral Park (Sec. 7) two types of mineralization occur in the volcanics. The first is the quartz vein type from which pockets of high grade free gold were

mined. These pockets were reported to occur along a local flattening of the veins. Perhaps fifty thousand dollars has been taken from several of these northeasterly striking veins.

The other type of mineralization is probably of the magnetite-hematite lense type, but the magnetite and hematite are not as iatense as at Silver Camp, Casey Copper, and the Mascot. The largest of two lenses is about 80 by 300 feet. Carbonates and silicates are the surface indications of copper in these lenses.

One drift in the area is several hundred feet long but most of the prospects have little extent. The property is owned by Mr. Fred A. Bennett, 1925 S 4th Ave., Tucson, Arizona.

Five samples were taken for assay from the Mineral Park area:

No. 3001, Chalcocite (?): Au - Tr., Ag - Tr., Cu - .15, Pb - Tr.
No. 3002, 80' cut across lense: Au - Tr., Ag - .10, Cu - .20, Pb - Tr.
No. 3003, By mill, lowest adit: Au - .01, Ag - 1.92, Cu - 2.81, Pb - Tr.
No. 3005, By mill, upper adit: Au - Tr., Ag - .22, Cu - .15, Pb - Tr.
No. 3006, North of 3005: Au - .05, Ag - 1.33, Cu - 2.32, Pb - Tr.

Between Mineral Park and Silver Camp Stocks:

Between the Mineral Park and Silver Camp stocks, 12 claims are held by Mr. L. T. Myers of Willcox. Mineralization occurs in several veins, the largest being about 5 feet in width and 200 to 300 feet in length. A small amount of chalcopyrite boxwork and copper carbonates and silicates is present. Most of the shallow pits of the area have been dug in search of gold and silver which occurs in pockets. Two samples were taken from the Myers property. No. 3003, Cu vein in saddle: Au - Tr., Ag - .08, Cu - .05, Pb - .08. No. 3013, Gold vein: Au - .04, Ag - 4.94, Cu - .54, Pb - 7.33.

MASCOT AREA:

Mr. E. I. Tout of Tucson and Dos Cabezos has 33 patented and 67 unpatented claims in the Mascot area which fall within Sec. 8, 9, 10, 15, 16, 17, 20, 21, and 22. The extensive workings on this property may be separated under the following sub-headings: Consolidated Tunnel, Mascot No. 1 Tunnel, Elma Mine, and Divies Tunnel. Several other areas which are less mineralized are listed under miscellaneous. The Mascot No. 1 and Consolidated are in volcanics near the Mascot Tertiary granitic stock (Sec. 21 and 22). As John Hope has reported on this property, June, 1948, the following is a summary.

Consolidated Tunnel:

Two tunnels are driven into the mountain from the elevation of the Mascot Camp (Sec. 16 and 21). The more westerly of these two is the Consolidated. Lenses (the largest 110 by 90 by 100 feet high) of magnetite and hematite and the associated

minerals, pyrite and chalcopyrite, were cut by the Consolidated workings (Sec. 16). Estimated production is over $500,000. Ore reserves according to Mr. Tout are 200,000 tons of probable and a like amount of possible ore at 3% copper. One sample taken of iron oxides which are along the Tertiary granitic - volcanic contact is along the road to the mill. No. 3023: Au - Tr., Ag - Tr.

Mascot No. 1 Tunnel:

The Mascot No. 1 Tunnel is east of the Consolidated. Two veins with widths of 0 to 4 feet and about 1 foot cut the volcanics (Sec. 21). Metallic minerals are pyrite, chalcocite, a small amount of chalcopyrite, and sparse specularite and magnetite. Values of the ore are from 16 to 30% in copper, about 1/2 ounce of gold, and 1 ounce of silver to the percent of copper. Mr. Tout has taken 1,500 tons from these workings.

Elma Mine:

One lense 50 by 80 by 80 feet high occurs in volcanics of the Elma Mine (Sec. 9). Ore is similar to that of the Consolidated except it has a much higher pyrite content. Maps of the lower levels show that an area of disseminated-type mineralization occurs at or near the pre-Cambrian granite contact. This contact lies a few hundred feet north of the mine. Mr. Tout mined 4,000 tons of ore at 4.2% copper, 5 ounces of silver, and .01 ounce of gold. One sample of the disseminated-type mineralization was taken from the Elma dump. No. 3026: Au - Tr., Ag - .52, Cu - .14, Pb - Tr.

Divies Tunnel:

Structurally the mineralization of the Divies is different from the previous three mines and will be listed under the "Big Ledge."

Miscellaneous Mineralization:

On the ridge west and northwesterly from Cooper Peak (Sec. 15), two northeasterly striking veins which occur in the volcanics contain chalcocite and pyrite associated with magnetite and specularite. Near the southern contact of the Mascot Tertiary granitic stock, an area about 100 by 300 feet has disseminated mineralization of the fracture contact type. Limonite after pyrite and a small amount of chalcopyrite boxwork are found here.

SCHIST ON THE EASTERN PART OF THE FISHER HILLS - DOS CABEZAS QUADRANGLES:

An area of schist was mapped on the eastern part of the Fisher Hills - Dos Cabezas quadrangles. It covers about 8 square miles (T. 13 and 14 S., R. 27 and 28 E.) and extends from the alluvium on the north to the sediments on the south. A square mile of pre-Cambrian granite lies on the northeastern side of this schist. This area was traversed but little mineralization was seen.

THE "BIG LEDGE":

The "Big Ledge" is the local terminology for the silicified portion of a high angle fault which brings pre-Cambrian granite in contact with Devonian and

Carboniferous sediments. This fault which has an average strike of N. 75° W. is silicified for a length of nearly 5 miles (from Sec. 19, T. 14 S., R. 26 E. to Sec. 26, T. 14 S., R. 27 E.). In the central portion this vein is about 200 feet wide but on the ends it diminishes in width until no vein material is present. Near the center for a length of nearly two miles, the structure is split to form two or more parallel veins. A small amount of pyrite, chalcopyrite, galena and pockets of high grade gold and silver occur in the "Big Ledge." Reports are that high grade ore is found where a cross fracture intersects the westerly striking structures.

Prospects are located throughout the length of the "Big Ledge" but the most extensive workings are the Divies and the Prince and in the portion of the vein between them. The "Big Ledge" is of sufficient size for a large tonnage operation but the average grade of this vein is too low to support such an operation.

T. 14 S., R. 27 E.

Divies Tunnel:

In the Divies area (Sec. 21), the main drift which starts in pre-Cambrian granite was driven about 1,000 feet to cut the "Big Ledge." Several other drifts were driven in and parallel to this structure. Nine samples were taken from the "Big Ledge" about 1,000 feet north of the Divies Tunnel in an unnamed canyon.

Sample No.	Assay Oz.Au.	Assay Oz.Ag.	Location
3014	.62	.58	Dump, northern 45 feet.
3015	.06	.34	Next 30 feet south.
3016	.01	.17	Do
3017	Tr.	.08	Do
3018	Tr.	.12	Do
3019	.02	.14	Do
3020	Tr.	.28	E side canyon, 50' S of N side of vein.
3021	Tr.	Tr.	Do , next 70' south.
3022	Tr.	.04	Do , next 50' south.

Prince Mine:

The Prince Mine is located northwest of Bean Canyon in the southeastern part of Sec. 22. In June, several men who were working for the mining company had cross-cut to a northern segment of the "Big Ledge" and were trying to block out a large tonnage of low grade ore.

Other Workings on the "Big Ledge":

On either side of the 21-22 section line, several drifts have been driven along two veins parallel to the "Big Ledge." Mineralization in these workings is similar to that in the Divies and Prince.

An old drift was being extended by an unknown party on the east side of Howard Canyon in the northwest part of Sec. 26. This work is on a narrow vein parallel to the "Big Ledge."

One recently completed drift was driven from Bean Canyon (near 22-27 section line) about 1,000 feet north of the "Big Ledge" by a Mr. Hyde. In 1200 feet of drift no mineralization of consequence was encountered.

PRE-CAMBRIAN GRANITE AREA ON THE SOUTH SIDE OF THE RANGE:

An area of pre-Cambrian granite lies on the south side of the Dos Cabezas Range easterly from the town of Dos Cabezos. Mineralization of the quartz vein type occurs in this granite. Sulphides in these veins are pyrite, chalcopyrite, galena, and in one locality, sphalerite. Most of the veins have been prospected for gold and silver. Mining at the Bean property has been for lead-silver ore.

Mascot Canyon:

A number of northerly-southerly striking, nearly vertical dipping veins occur on both sides of Mascot Canyon (Sec. 21). These have been explored by many shallow prospects. Only a slight amount of ore has come from these prospects.

Philadelphia Canyon:

Three claims are held in the Philadelphia Canyon area (Sec. 21 and 28) by the storekeeper at Dos Cabezos. The largest vein on the property is about 4 feet wide, 1,000 feet long, strikes N 5° E, and dips 70° in an eastern direction. Visable pyrite and galena occur in this vein. Prospecting was by three shafts and several drifts. According to the storekeeper, a small amount of gold-silver ore has been shipped from the property.

Bean Property:

In the southern part of Sec. 27 and the northern part of Sec. 34, an undetermined number of claims are held by Mr. Bean who lives on the property. Several veins have been prospected by shallow workings but as far as is known, only one produced more than a few tons of ore. This vein strikes northerly while in Sec. 34 but turns to strike N 40° E in Sec. 27. It dips from 50 to 70° westerly, is 0 to 5 feet in width, and is probably over 2,000 feet in length. Workings include a shaft which is caved and several drifts. No estimate can be made on the total production but several cars were shipped by the Dorsey Brothers of Dos Cabezos while the property was under lease to them. Sulphides in the vein are galena, pyrite, sphalerite, and chalcopyrite. The ore was mined primarily for the lead and silver but it also contained a small amount of gold.

T. 15 S., R. 28 E.

Unnamed Property in Sec. 6:

The name or owners of old workings in the southeastern part of Sec. 6 was not ascertained. Here one or more quartz veins strike N 10° E and are nearly vertical,

from 1 to 4 feet in width, and over 1,000 feet in length. Workings include two shafts over 100 feet deep and several drifts. Metallic minerals are limonite and a small amount of pyrite and galena. The amount of ore which was taken from these workings was not determined.

SCHIST AND SEDIMENTS ON THE SOUTHERN SIDE OF THE RANGE:

Northerly and westerly from the town of Dos Cabezos is an area of schist. About 2-1/2 miles southwesterly from the "Big Ledge" and roughly parallel to it lie sediments. The schist was adequately traversed and the sediments were examined at several places but no mineralization of consequence was found in either of these formations.

RECEIVED
JUN 19 1949
E. N. PENNEBAKER

FVT/ms
cc - Mr. E. N. Pennebaker
Mr. John Hope