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PROPERTY MAP
CAMPO BONITO
(MAUDINA TUNGSTEN MINE)

T.10 S. R.16 E. SECS.17,18,20,21. 563.486 ACRES

NEAR ORACLE, ARIZONA

SCALE: 1:6000, 1"=500'. CONTOUR INTERVAL, 40'

BASE FROM USGS MAP

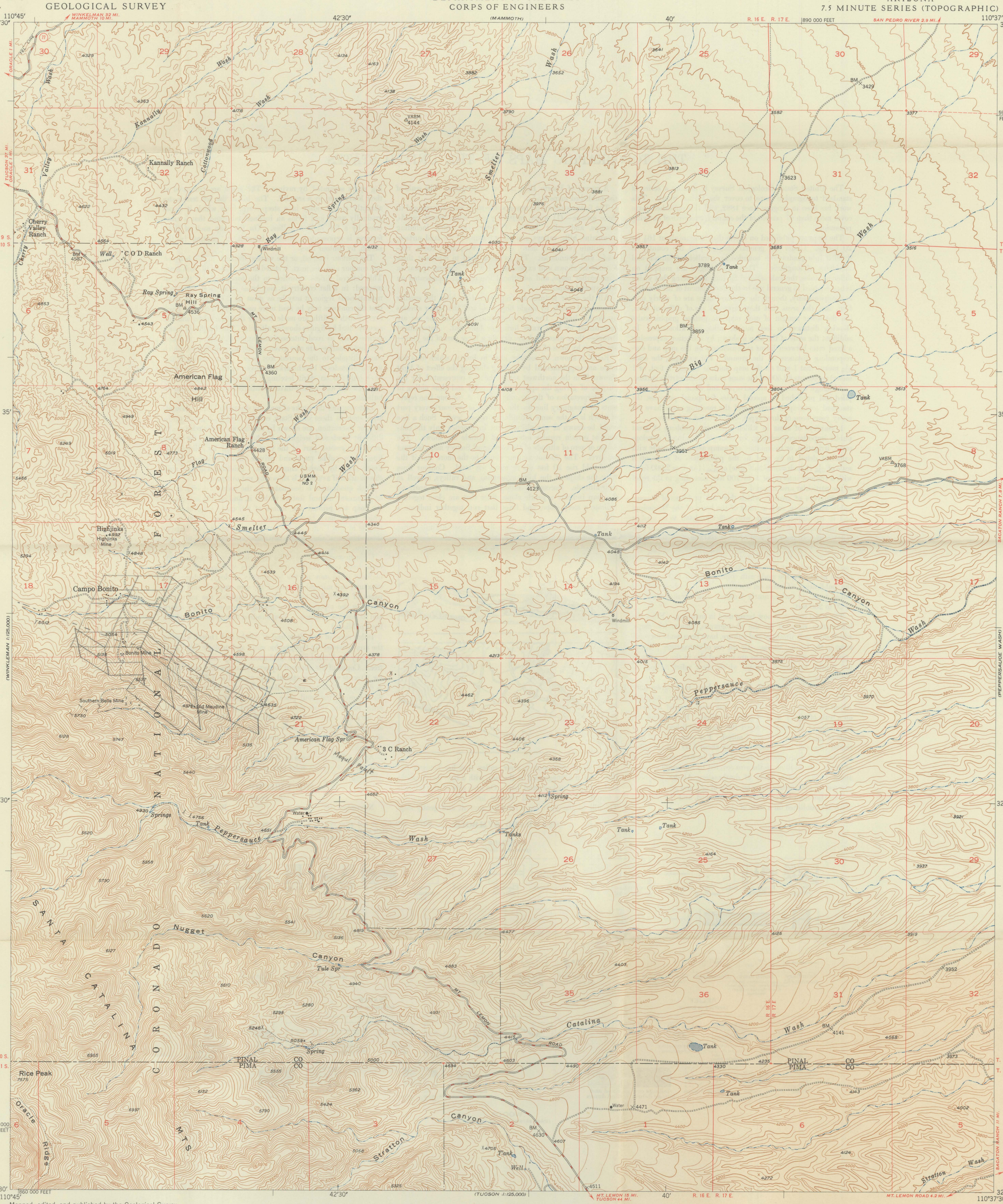
CLAIMS FROM T.N.STEVENS, MINERAL SURVEYOR, G.L.O., MAP.

E.H.M.'61.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

CAMPO BONITO QUADRANGLE
ARIZONA
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by multiplex methods
Aerial photographs taken 1945. Field check 1948

Polyconic projection. 1927 North American datum
10,000-foot grid based on Arizona coordinate system, central zone

Dashed land lines indicate approximate location

Unchecked elevations are shown in brown

TRUE NORTH
MAGNETIC NORTH
14°
APPROXIMATE MEAN DECLINATION, 1948

SCALE 1:24000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS

FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON 25, D. C.

ROAD CLASSIFICATION

HARD-SURFACE ALL WEATHER ROADS		DRY WEATHER ROADS
Heavy-duty	4 LANE / 2 LANE	Improved dirt
Medium-duty	4 LANE / 2 LANE	Unimproved dirt

Loose-surface, graded, or narrow hard-surface

U. S. Route — State Route

CAMPO BONITO, ARIZ.
N3230-W11037.5/7.5

EDITION OF 1949

THE TOPOGRAPHIC MAPS OF THE UNITED STATES

The United States Geological Survey is making a series of standard topographic maps to cover the United States. This work has been in progress since 1882, and the published maps cover more than 47 percent of the country, exclusive of outlying possessions.

The maps are published on sheets that measure about 16½ by 20 inches. Under the general plan adopted the country is divided into quadrangles bounded by parallels of latitude and meridians of longitude. These quadrangles are mapped on different scales, the scale selected for each map being that which is best adapted to general use in the development of the country, and consequently, though the standard maps are of nearly uniform size, the areas that they represent are of different sizes. On the lower margin of each map are printed graphic scales showing distances in feet, meters, miles, and kilometers. In addition, the scale of the map is shown by a fraction expressing a fixed ratio between linear measurements on the map and corresponding distances on the ground. For example, the scale $\frac{1}{62,500}$ means that 1 unit on the map (such as 1 inch, 1 foot, or 1 meter) represents 62,500 of the same units on the earth's surface.

Although some areas are surveyed and some maps are compiled and published on special scales for special purposes, the standard topographic surveys and the resulting maps have for many years been of three types, differentiated as follows:

1. Surveys of areas in which there are problems of great public importance—relating, for example, to mineral development, irrigation, or reclamation of swamp areas—are made with sufficient detail to be used in the publication of maps on a scale of $\frac{1}{31,680}$ (1 inch = one-half mile) or $\frac{1}{24,000}$ (1 inch = 2,000 feet), with a contour interval of 1 to 100 feet, according to the relief of the particular area mapped.

2. Surveys of areas in which there are problems of average public importance, such as most of the basin of the Mississippi and its tributaries, are made with sufficient detail to be used in the publication of maps on a scale of $\frac{1}{62,500}$ (1 inch = nearly 1 mile), with a contour interval of 10 to 100 feet.

3. Surveys of areas in which the problems are of minor public importance, such as much of the mountain or desert region of Arizona or New Mexico, and the high mountain area of the northwest, are made with sufficient detail to be used in the publication of maps on a scale of $\frac{1}{125,000}$ (1 inch = nearly 2 miles) or $\frac{1}{250,000}$ (1 inch = nearly 4 miles), with a contour interval of 20 to 250 feet.

The aerial camera is now being used in mapping. From the information recorded on the photographs, planimetric maps, which show only drainage and culture, have been made for some areas in the United States. By the use of stereoscopic plotting apparatus, aerial photographs are utilized also in the making of the regular topographic maps, which show relief as well as drainage and culture.

A topographic survey of Alaska has been in progress since 1898, and nearly 44 percent of its area has now been mapped. About 15 percent of the Territory has been covered by maps on a scale of $\frac{1}{500,000}$ (1 inch = nearly 8 miles). For most of the remainder of the area surveyed the maps published are on a scale of $\frac{1}{250,000}$ (1 inch = nearly 4 miles). For some areas of particular economic importance, covering about 4,300 square miles, the maps published are on a scale of $\frac{1}{62,500}$ (1 inch = nearly 1 mile) or larger. In addition to the area covered by topographic maps, about 11,300 square miles of southeastern Alaska has been covered by planimetric maps on scales of $\frac{1}{125,000}$ and $\frac{1}{250,000}$.

The Hawaiian Islands have been surveyed, and the resulting maps are published on a scale of $\frac{1}{62,500}$.

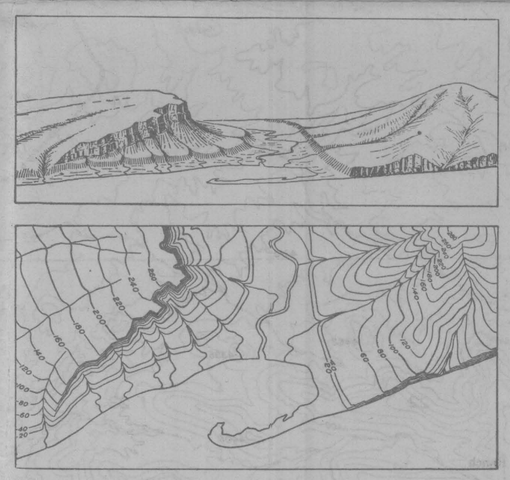
A survey of Puerto Rico is now in progress. The scale of the published maps is $\frac{1}{30,000}$.

The features shown on topographic maps may be arranged in three groups—(1) water, including seas, lakes, rivers, canals, swamps, and other bodies of water; (2) relief, including mountains, hills, valleys, and other features of the land surface; (3) culture (works of man), such as towns, cities, roads, railroads, and boundaries. The symbols used to represent these features are shown and explained below. Variations appear on some earlier maps, and additional features are represented on some special maps.

All the water features are represented in blue, the smaller streams and canals by single blue lines and the larger streams by double lines. The larger streams, lakes, and the sea are accentuated by blue water lining or blue tint. Intermittent streams—those whose beds are dry for a large part of the year—are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, which on a few maps are supplemented by shading showing the effect of light thrown from the northwest across the area represented, for the purpose of giving the appearance of relief and thus aiding in the interpretation of the contour lines. A contour line represents an imaginary line on the ground (a contour) every part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in practice only the contours at certain regular intervals of altitude are shown. The datum or zero of altitude of the Geological Survey maps is mean sea level. The 20-foot contour would be the shore line if the sea should rise 20 feet above mean sea level. Contour lines show the shape of the hills, mountains, and valleys, as well as their altitude. Successive contour lines that are far apart on the map indicate a gentle slope, lines that are close together indicate a steep slope, and lines that run together indicate a cliff.

The manner in which contour lines express altitude, form, and grade is shown in the figure below.



The sketch represents a river valley that lies between two hills. In the foreground is the sea, with a bay that is partly enclosed by a hooked sand bar. On each side of the valley is a terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently sloping spurs separated by ravines. The spurs are truncated at their lower ends by a sea cliff. The hill at the left terminates abruptly at the valley in a steep scarp, from which it slopes gradually away and forms an inclined tableland that is traversed by a few shallow gullies. On the map each of these features is represented, directly beneath its position in the sketch, by contour lines.

The contour interval, or the vertical distance in feet between one contour and the next, is stated at the bottom of each map. This interval differs according to the topography of the area mapped: in a flat country it may be as small as 1 foot; in a mountainous region it may be as great as 250 feet. In order that the contours may be read more easily certain contour lines, every fourth or fifth, are made heavier than the others and are accompanied by figures showing altitude. The heights of many points—such as road intersections, summits, surfaces of lakes, and benchmarks—are also given on the map in figures, which show altitudes to the nearest foot only. More precise figures for the altitudes of benchmarks are given in the Geological Survey's bulletins on spirit leveling. The geodetic coordinates of triangulation and transit-traverse stations are also published in bulletins.

Lettering and the works of man are shown in black. Boundaries, such as those of a State, county, city, land grant, township, or reservation, are shown by continuous or broken lines of different kinds and weights. Public roads suitable for motor travel the greater part of the year are shown by solid double lines; poor public roads and private roads by dashed double lines; trails by dashed single lines. Additional public road classification if available is shown by red overprint.

Each quadrangle is designated by the name of a city, town, or prominent natural feature within it, and on the margins of the map are printed the names of adjoining quadrangles of which maps have been published. More than 4,100 quadrangles in the United States have been surveyed, and maps of them similar to the one on the other side of this sheet have been published.

Geologic maps of some of the areas shown on the topographic maps have been published in the form of folios. Each folio includes maps showing the topography, geology, underground structure, and mineral deposits of the area mapped, and several pages of descriptive text. The text explains the maps and describes the topographic and geologic features of the country and its mineral products. Two hundred twenty-five folios have been published.

Index maps of each State and of Alaska and Hawaii showing the areas covered by topographic maps and geologic folios published by the United States Geological Survey may be obtained free. Copies of the standard topographic maps may be obtained for 10 cents each; some special maps are sold at different prices. A discount of 40 percent is allowed on an order amounting to $5 or more at the retail price. The discount is allowed on an order for maps alone, either of one kind or in any assortment, or for maps together with geologic folios. The geologic folios are sold for 25 cents or more each, the price depending on the size of the folio. A circular describing the folios will be sent on request.

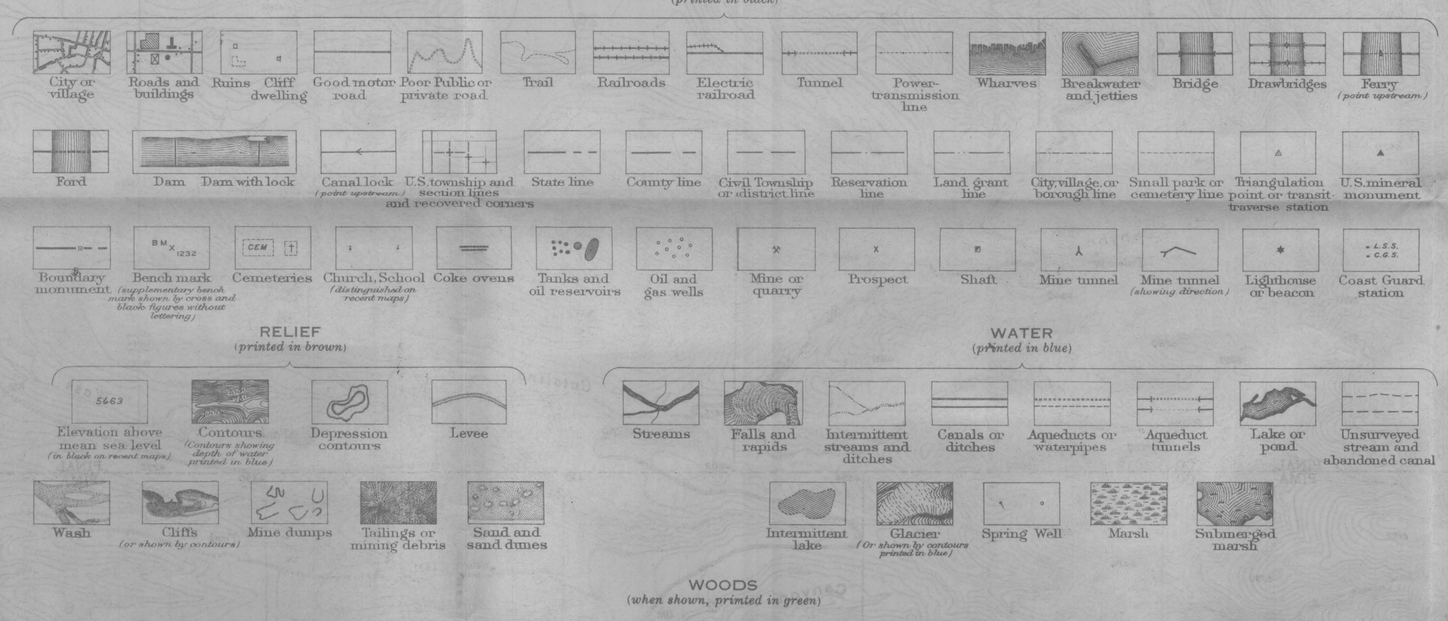
Applications for maps or folios should be accompanied by cash, draft, or money order (not postage stamps) and should be addressed to

THE DIRECTOR,
United States Geological Survey,
Washington, D. C.

November 1937.

NOTE:—Effective on and after October 1, 1946, the price of standard topographic quadrangle maps will be 20 cents each, with a discount of 20 percent on orders amounting to $10 or more at the retail rate.

STANDARD SYMBOLS



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R E P O R T

on the

MAUDINA TUNGSTEN MINE

Oracle, Pinal County, Arizona

by

J. M. Hill, Geologist

Dec. 15, 1946

MAUDINA TUNGSTEN MINE
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LA JOLLA, CALIFORNIA

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MAP #1 Maudina Group Claim Map showing generalized Geology

MAP #2 Detailed Geological Map of Mississippian Limestone block containing Pure Gold-Morning Star ore bodies, with 2 Cover-Sheets

MAP #3 Molson's Plan of Pure Gold Workings, showing extralateral boundary, expected ore extension and proposed development

MAP #4 Molson's Cross Section, Pure Gold Workings, showing estimated ore

MAP #5 Maudina Mine Longitudinal Section, showing workings

REPORT
on the

MAUDINA TUNGSTEN MINE
Oracle, Pinal County, Arizona

by
J. M. Hill, Geologist
Dec. 15, 1946

INTRODUCTION

The twenty nine patented claims of the Maudina Tungsten Mine at Campo Bonito are 7 1/2 miles by road, 3 1/2 miles air line S S E of Oracle, Pinal County, Arizona. The Group covers the old Maudina Mine, examined by Cortelyou in 1937, and the Pure Gold deposit, which was discovered and worked during World War II by Edward H. Molson and E. J. Ewing. Patent to the group, Survey #4250, was issued February 26, 1945, under Number 1,119,503. The claims are located in sections 17 and 20, T10S R16E, Salt River Prime Meridian in the Old Hat Mining District (see Map #1).

The Maudina Mine has not been worked since the first World War. Operations on the Pure Gold Deposit in 1943 and 1944, resulted in the production of ~~7,500~~ 8,100 Tons tons of ore carrying 1.51% WO_3, which was delivered to the Metal Reserve Stock pile at Tucson, Arizona. In June 1944, work was stopped by a lawsuit as Pure Gold workings were encroaching on the Morning Star Claim, which

belongs to the Southern Bell Mining Company. Final decision in this case was given by the Superior Court of Pima County, June 19, 1946, in favor of Maudina. This decision makes possible mining the downward continuation of the ore body outcroping on the Pure Gold Claim under Southern Bell's property with certain limitations (see Map #3).

Mr. Ewing died in 1946, and Mr. Molson is disposed to sell this property as it seems to him advisable to build a mill at the mine to get away from haulage costs of $10. per ton to the custom mill located at Tucson. He made application for an R.F.C. mining loan of $29,700., to put this plan in effect, on June 30, 1945, but has not pressed for decision since he now wishes to withdraw from management of the enterprise.

First installment of this loan granted but not used. RDM

GEOLOGY

The general geology of the area covered by the claims is shown on Map #1. The northern 2/3's of the area is underlain by coarsely porphyritic Pre Cambrian granite, with some dikes and one large mass of diorite. Crossing near the southern 1/3 of the group is a very strong thrust fault, "The Mogul Fault", which strikes W N W and dips at 20° to 50° to the S.

The overriding block consists almost entirely of Cambrian sediments, including buff or cream colored sandstone and shales, white quartzite and a distinctive quartzite conglomerate bed. At the extreme eastern end of the group, there are some Devonian sandy porous limestones overlying the sandstones.

At the Pure Gold-Morning Star workings, there is a small mass of Mississippian blue-gray fossiliferous limestone entirely surrounded by faults. There are no other occurrences of this relatively young limestone elsewhere for miles in any direction.

The Mogul Fault is extremely well marked all along its course by a thick clay gouge of ~~dull~~ color and a zone of crushed granite below and sediments above the gouge that varies from 25' to 75' wide. There are numberless tear faults in the sedimentary rock, striking in general to the N W and dipping S W at various angles, only a few of which are noted on the General Map #1.

In the small limestone block at the Pure Gold-Morning Star workings (see Map #2) the east and west bounding faults are shown by deep steep sided canyons. The fault at the south side of the block is covered on surface by gravel and wash but is approximately placed by a shallow swale in which a 3' deep open cut shows crushed limestone and sandstone. Its exact direction is inferred but is believed reasonably accurate as a south

dipping fault is shown in the south cross-cut from the lower Morning Star Tunnel separating limestone and sandstone (see Oversheet #1 for Map #2).

ORE DEPOSITS

Pure Gold-Morning Star

The highly siliceous scheelite bearing ore bodies developed along tear faults in the Mississippian block is shown on Map #2. There is practically no ore where these limestone beds are not intensely fractured. The siliceous bodies are not all scheelite bearing. The tungsten mineralization seems to have favored the immediate vicinity of strong fractures called the "Foot and Hanging Wall" by the geologist employed by Molson in his legal battle. There is also tungsten mineralization of the limestone along nearly verticle tear faults which are tight. Open fractures with evidence of passage of cool water (by deposition of calcite) as a rule are barren of scheelite. One of these is clearly shown by the Intermediate and Sub-level from the south face of the Pure Gold open cut (see Map #3) and in the large open cut and stope in the Upper Tunnel of the Morning Star.

The tungsten ore is an intimate intergrowth of quartz, white calcite, a flesh colored carbonate (probably magnesian) and scheelite. In some places a minor amount of fine needle crystals of black tourmaline was noted, but it is nowhere in conspicuous quantities. The ore gives the impression of being practically all silica and under the Mineralight it is seen that the more siliceous the ore the more WO_3 is contained. Many irregular areas of redish tinged rock in the midst of ore, which carries more ~~junk~~ carbonate mineral than ordinary, carry very little scheelite or are practically barren. The Mineralight shows that the richer ore is found on the two fractures, below the Hanging Wall and above the Footwall breaks. The ore is highly fractured, breaks rather fine, but is said to be hard on steel, and drilling is difficult because of the broken condition of the ground. pink

The ground is dangerous because of the many intricate fractures, along which there is no cementing material. The Pure Gold open cut is partly filled with huge blocks which have fallen from the south face. As a matter of fact I am informed that the State Mine Inspector was about to close the mine down as unsafe just before the lawsuit filed stopped operations.

Under the Mineralight, the scheelite looks to be of fair size. I am told by Molson that the ore had to be ground very fine in order to make a 75-80% recovery and that without flotation it

was impossible to make better than a 70% recovery of the WO_3.

Maudina Mine

The Maudina Mine at the southeast end of the group has not been worked since the last war. A cloudburst, a few years ago, took out all the shaft timbers and filled the 175' shaft to the 150' level. Access to the workings can still be had through the open stopes (see Map #5).

The Maudina deposit is located on a nearly vertical east trending fracture that varies from 4' to 15' in width. It cuts Cambrian sandstones in the western part of the workings and sandy porous Devonian limestones at the extreme east workings on the lower levels. This east-west break shows considerable horizontal as well as vertical displacement as indicated by the outcrop of a massive white quartzite bed to the west of and above the workings (see Map #1). As shown on Map #5 (a vertical longitudinal projection of the Maudina workings) the ore raked at a low angle to the east. My impression is that this rake was caused by a N W trending flat N E dipping fracture to the north of the Maudina break. The fault gouge of this N W fracture is clearly seen at the west end of several of the open stopes. It is said that the best ore was found in a sandy layer of the steeply east dipping sediments. In places, scheelite mineralization extend out north of the Maudina fracture for as much as 15 feet. In general, however, the ore was from 2' to 4' wide close to the main break. Apparently the scheelite was coarsely crystalline and occurred in bunches through the brecciated lode rather than as a continuous vein-like body.

The large unfilled stopes have stood open for many years, but in my judgment, it would be impossible to mine the few remaining tons left in pillars at a profit. It is possible that scheelite mineralization will persist down the rake of the ore body as far as the Mogul Fault, possibly 1,000 feet. It is very questionable, however, that a profit could be made from developing this deep ore since new openings from the surface would be necessary to react the ore.

R. J. Ewing reported scheelite in place on floor of lowest level. [illegible]

I did not consider the Maudina deposit of sufficient interest to warrant the risk and expense of sampling.

DEVELOPMENT

As will be seen, by an inspection of Maps #2, #3 and #4, the Pure Gold deposit is developed by an open cut, two short cross-cut tunnels and a lower haulage tunnel. The entire outcrop part of the body has been removed and large blocks of ore and waste have fallen into the open cut from the vertical south and west walls

of the pit. The haulage tunnel was run just north of and parallel to the Pure Gold side line. Three raises were used as draw points from the open cut. The lower part of all of these raises are below the so-called Foot Wall or the ore body.

The Morning Star is developed by three open cuts and two tunnels. The upper tunnel is in bad shape and most of the high grade ore above it has been stoped. The lower tunnel passes through the bottom of the lower open cut and continues southwest a few feet to the north of the fault separating Pre Cambrian sandstones from the block of Mississippian limestone. This fault is shown to dip to the north at 70° in the cross-cut to the S W. The northwest drift has a chute and ore pass from the stope at the end of the upper tunnel.

The Cody Tunnel (across the gulch northeast from the Pure Gold ore bin) (see Map #2) is a 560' cross-cut through granite that cuts the Mogul Fault in two short west cross-cuts near the back end. The Mogul Fault dips 52° to the S W. The quartz vein, exposed by the Mogul Tunnel, is a 2' to 4' milk white quartz that dips 35° to the south and strikes about 5.80° E. It was drifted on for a short distance east and west and a winze sunk on it to connect with Cody workings. There is a 2' to 6' basic dike along this vein. This was developed for supposed gold values carried in pyrite. All the ore removed, possibly 500 tons, is still on the dump so was apparently not worth taking to Campo Bonito Mill. I did not take a sample, but am informed by Molson that it carries $15. per ton in gold, silver, copper with about 0.2% WO_3.

ECONOMIC FEATURES

The mine and camp are situated at the N E base of the Santa Catalina Mountains. Campo Bonito is in the bottom of a broad wash and can house 25 to 30 miners. There are also 2 good living houses and cook house. It is about 1/2 mile north of the Pure Gold workings, and 1 1/2 miles N W of the Maudina shaft. An 18" narrow gauge railroad connects the Maudina with the mill (now ruined) which is located at the camp.

The county gravel road from Oracle to Mount Lemmon is well maintained. From Campo Bonito it is 2 1/2 miles east over a good desert road to that highway 5 miles from the turn to Oracle. Highways #80 and #77, between Oracle and Tucson, is a 34 mile paved road over good terrain.

Water for the camp is obtained from a well in Bonita Canyon. In times of drought, water is not abundant even for camp use. I am informed that Maudina Tungsten has some sort of claim on the water in Peppersauce Canyon, which is about 3 miles air line S E of Campo Bonito. There is a permanent stream in this

canyon. During the first World War there was a pipeline to bring Peppersauce water to Campo Bonito. I am not informed as to the present condition of this line.

There is no timber suitable for mine use on the claims - none closer than the summit of Mount Lemmon in the Forest Reserve. Mine timber will have to be bought.

A three-phase 440 volt line ends at the Morning Star Mill, about 1200' north of Campo Bonito.

At present mine labor is very hard to get because of the call for laborers in connection with prospecting of the San Manuel Copper project a few miles N E of Oracle. If this property develops as expected Oracle should have an adequate supply of mine labor. The present wage scale is $9.14 per 8 hour shift for surface work of all sorts.

ORE ESTIMATES

Molson, in his application dated June 30, 1945, for an R.F.C. loan, included as estimate of 10,935 tons of 1.32% WO_3 in three blocks of ore indicated by the present workings and the results of diamond drilling. The basis for his estimate is graphically shown on Maps #3 and #4 with this report. I believe these figures can be accepted with little question for the depth of 75' on dip postulated by Molson. This estimate takes into consideration only the ore which underlies the Morning Star Claim that is within the boundaries of the extralateral right area granted by the Pima County Superior Court decision.

Judging from my examination, I question whether the ore on the so-called Pure Gold vein will continue more than 75' to 80' beyond the depth expected by Molson. This belief is based on study of the dips and strike of the faults which limit the ore both on the Hanging and Foot Walls as indicated on Oversheets to Map #2. I am also inclined to the opinion that the ore body will become shorter on strike N E by S W with depth. I would estimate the total possible mineralized body remaining within the extralateral boundaries as between 95,000 and 100,000 tons. It is clearly to be seen that the central portion of the mineralized body is very low grade (between 0.10% to 0.30% WO_3), and possibly could not be mixed with material from the high grade (1.3% to 4.1% WO3) wall ore bodies without too great dilution. It will depend on decision, as to the cut-off point for ore that can be profitably milled, how much of the mineralized rock can be considered ore. I would judge that the best that could be expected would be between 45,000 and 50,000 tons of better than 1% WO_3 grade.

@ $30. = $1,500,000.

Assuming that the whole body of 100,000 tons, mineralized material, carries an average of 0.50% WO_3, as maybe possible, with an 80% mill recovery there is apparently 4,000 units of WO_3 presumably belonging to Maudina Tungsten Mines that could be recovered by milling all the mineralized rock. If it is possible to mine only the higher grade 1.25% or better ore on the Foot and Hanging Wall sections - there probably will be 50,000 tons of ore from which something over 5,000 units of WO_3 could be recovered.

For the southern ore body on the Morning Star, it is much more difficult to arrive at a reasonable guess as to tonnage available since the mineralization is quite spotty and appears to be limited to the immediate vicinity of the fractures. It is my feeling that the main channels through which mineralizing solutions reached this whole area are now marked by the fractures followed by the open water courses: 1) in the N E trending break opened by the Sub and Intermediate levels of the Pure Gold; 2) by the two fractures seen in the workings of the Morning Star at the west face of the upper open cut, and at the west side of the stope at the end of the Upper Tunnel.

Inspection of the Morning Star outcrops and walls of the present workings with the Mineralight shows very little high grade ore remaining, and the lower tunnel is decidedly uninteresting so far as ore is concerned. I would hazzard the opinion that only a few thousand tons, possibly 5,000, of profitable ore could be expected from presently developed showings. However, I do feel that the limestone block between the Pure Gold and Morning Star workings is worthy of diamond drill prospecting.

That part of the ore body developed by the Pure Gold, which extends into Morning Star ground has been worked in the open cut just N W of the ore bin near the N E corner of the Morning Star Claim. It is relative short 160' on strike and has been shown to be about 10' thick. This is possibly the Hanging Wall streak of the Pure Gold though I believe it will prove to be the whole ore zone. It might contain as much as 24,000 tons of better than 1% WO_3 ore if it continues down the dip for 150' which is not an unreasonable assumption in my opinion. With an 80% mill recovery, this should yield at least 2,400 units of WO_3.

1.51%

from.

The ore mined by Maudina Tungsten on the Pure Gold Claim averaged 1.32% WO_3, and the results of sampling by the company in connection with the law suit has been summerized by Molson in his application for an R.F.C. loan as follows:

> "There is probably no section of ore or sludge that did not fluoresce, but it became evident that commercial values (plus 1%) were probably confined to a section along the Hanging Wall and another section along the Foot Wall . . . . . ."

"To summarize the blocks outlined (see Maps #3 and #4 with this report for location):

Block A	2,810 tons	1.30% WO_3
Block B	3,750 tons	1.70% WO_3
Block C	4,375 tons	1.00% WO_3
	10,935 tons	1.32% WO_3"

To makea preliminary check on the above figures, I took four samples as follows:

	Location	Width	Assay by Jacobs
1.	Haulage tunnel, 1st cross-cut to south; chip sample roof and sides; this is Foot Wall section	10'	0.26 WO_3
2.	Haulage tunnel at end; chip sample roof and both sides	8'	0.11 WO_3
4.	Intermediate level; west drift on pillar north wall; cut sample	4' 10"	1.02 WO_3
5.	Intermediate level; east drift, just east of cross-cut on south wall; cut sample	9' 10"	2.40 WO_3"

My samples check reasonably with Molson's, except for the bottom part of the Foot Wall Section.

CONCLUSIONS AND RECOMMENDATIONS

The facts presented in this report indicate that it can be assumed that in the ore bodies developed in the small block of limestone shown in Maps #2, there exists at least 79,000 tons of better than 1% WO_3 ore. Practically all of this ore is located beneath the Morning Star Claim belonging to the Southern Bell Mining Company. However, owing to the legal decision as to the extralateral right of Maudine Tungsten to permit mining under the Morning Star Claim that company appears to be in a position to mine at least 3/4's of the possible ore.

The court decision was based on the theory that the ore body is a vein. It is my belief that it is a typical replacement deposit in limestone localized near fractures and makes ore in only certain favorable beds in the limestone series.