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PRINTED: 08/16/2002

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: SILVER REEF

ALTERNATE NAMES:
HORNSILVER CLAIMS, MS 3369
SANTIAGO MS 3369 UNPAT.
CHOLLA MS 3369 UNPATENTED
LEAD BOULDER MS 3369 UNPAT.
UNPATENED CLAIMS MS 3369
NUGGET
AZ MERCANTILE TRANSP. AND SMTG
GREENHORN MINING CO. PROPERTY

PINAL COUNTY MILS NUMBER: 655

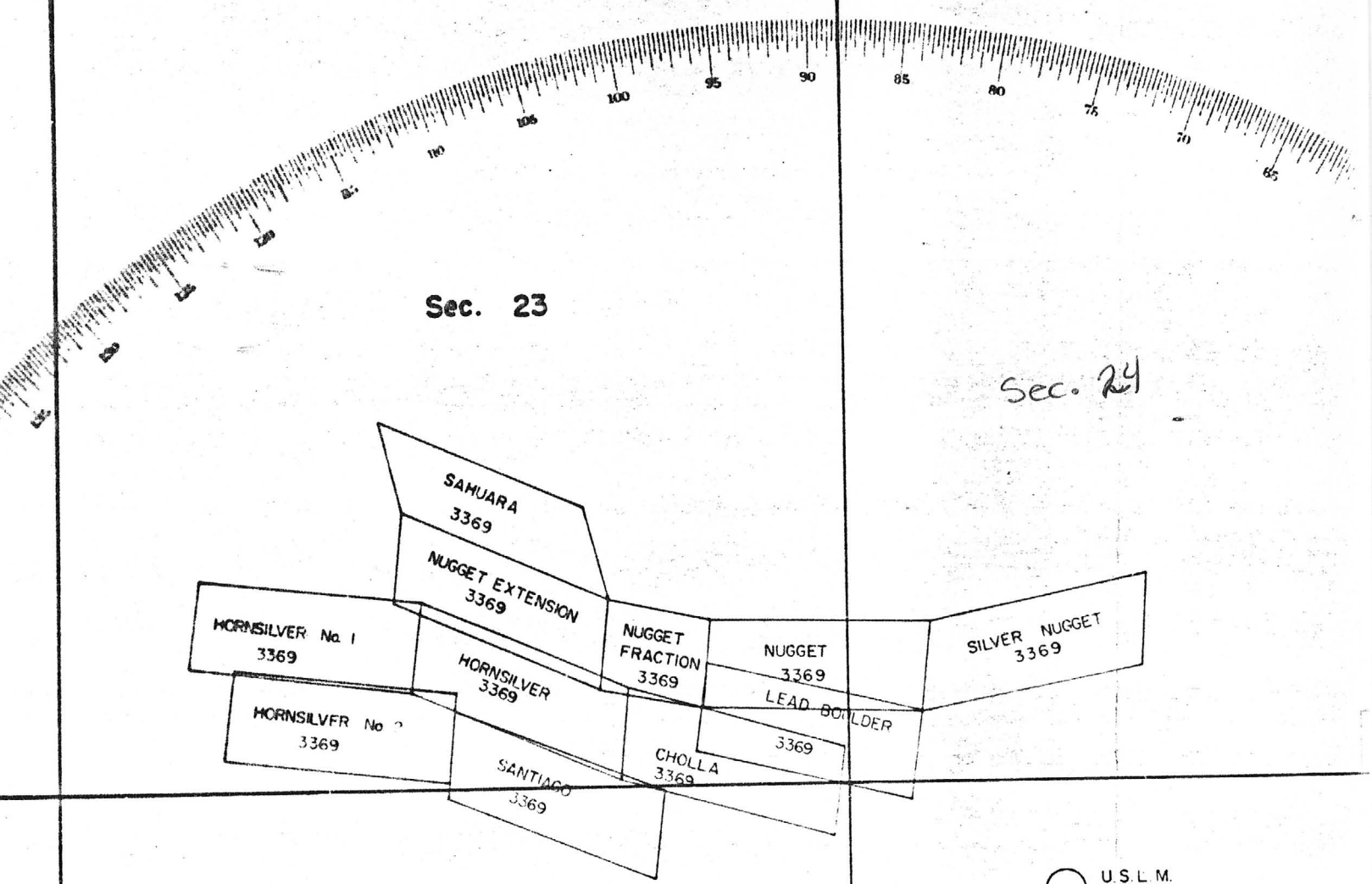
LOCATION: TOWNSHIP 8 S RANGE 5 E SECTION 23 QUARTER S2
LATITUDE: N 32DEG 42MIN 42SEC LONGITUDE: W 111DEG 48MIN 50SEC
TOPO MAP NAME: SILVER REEF MTS - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

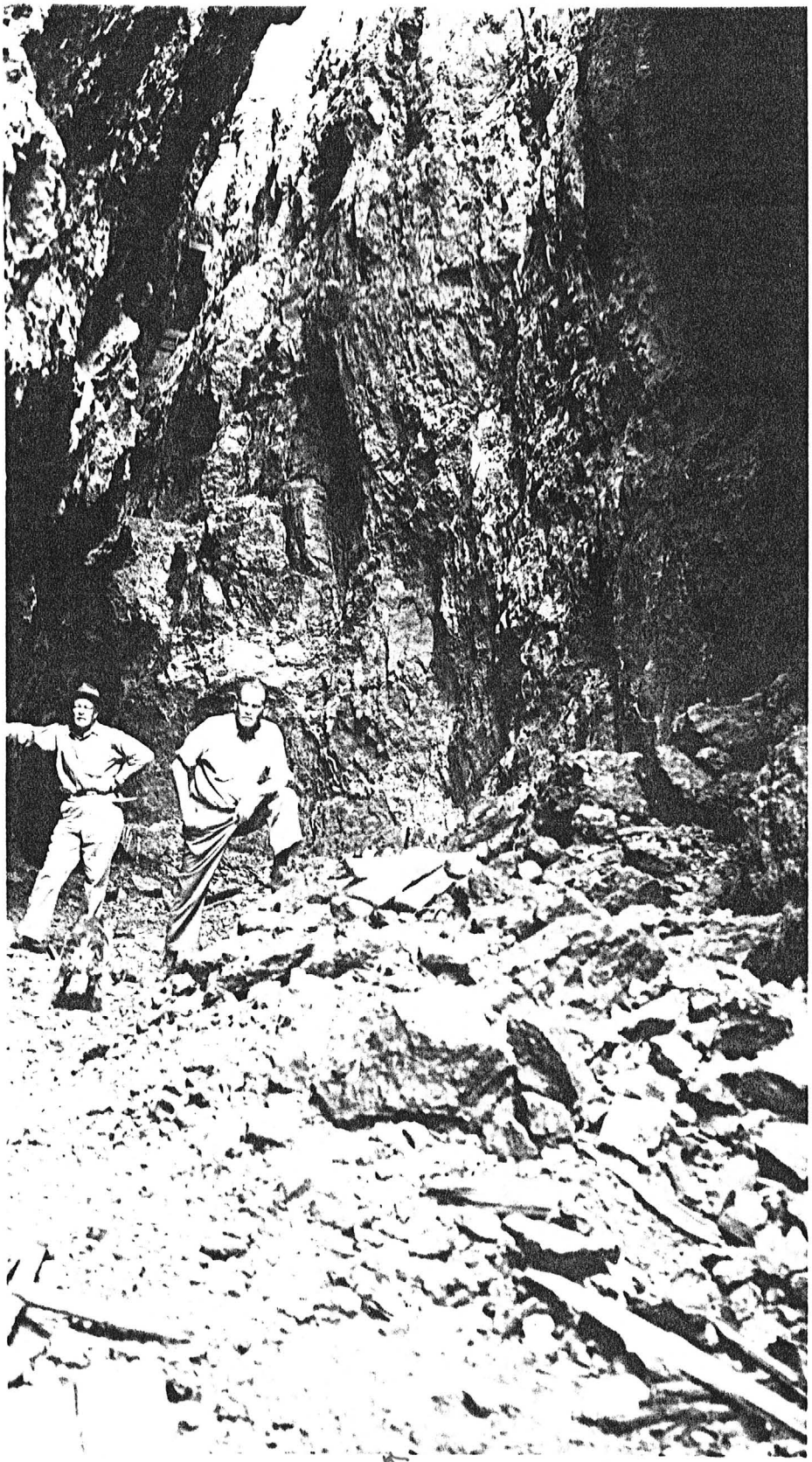
COMMODITY:
SILVER
SILICON
LEAD
GOLD
COPPER

BIBLIOGRAPHY:
BLM MINING DISTRICT SHEET 561
TENNEY, J. "HIST OF MNG IN AZ 1927-29" P 340
TENNEY, J.B. "ECON GEOL RECONN OF CASA GRANDE MNG DIST." P 23-24; 1934
ADMMR SILVER REEF MINE FILE
ADMMR EL PASO NATURAL GAS FILE
ADMMR U FILE, PINAL AG13
AEC PRELIM RECONN RPT 172-488, P 12; 1953
DUNNING, CHARLES H., SILVER 1966, P 121-122

T85 R5E Sec. 23
Silver Reef Mine
BM 1457
1444
BM 1439
BM 1420
16
15
14
1420
1440
1480
BM 1499
22
23
Ruins
4WD
1600
Old Jonah Mine
Nugget Mine
Borrow Pit
Silver Reef Mine
1873
2200
USLM 3369
2476
BM 1494
1771
2000
27
26
1725
Silver
Reef
Quarry
PAPAGO
SILVER
REEF
1767
1838
1968
1925
1520
1527
1694
BM 1473
34
35
Borrow Pit
Silver
Wash
IAN
RESERVATION



BLM Mining Dist Sheet 561

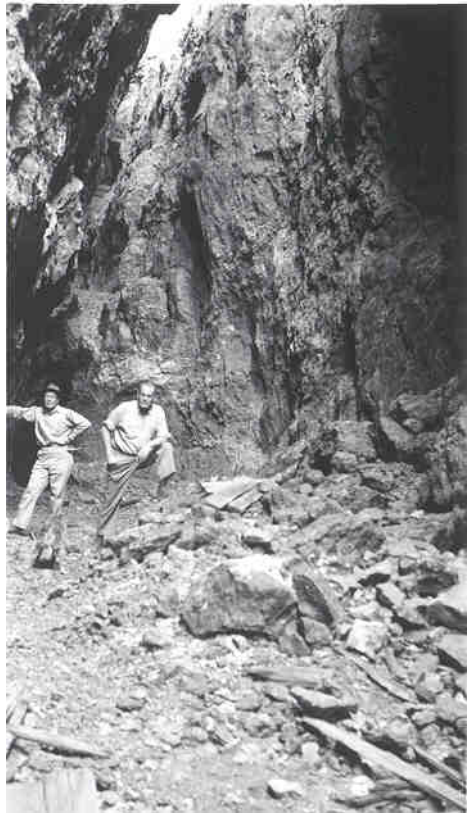


A-181-36

SILVER REEF

(C.H. DUNNING)

C-1950

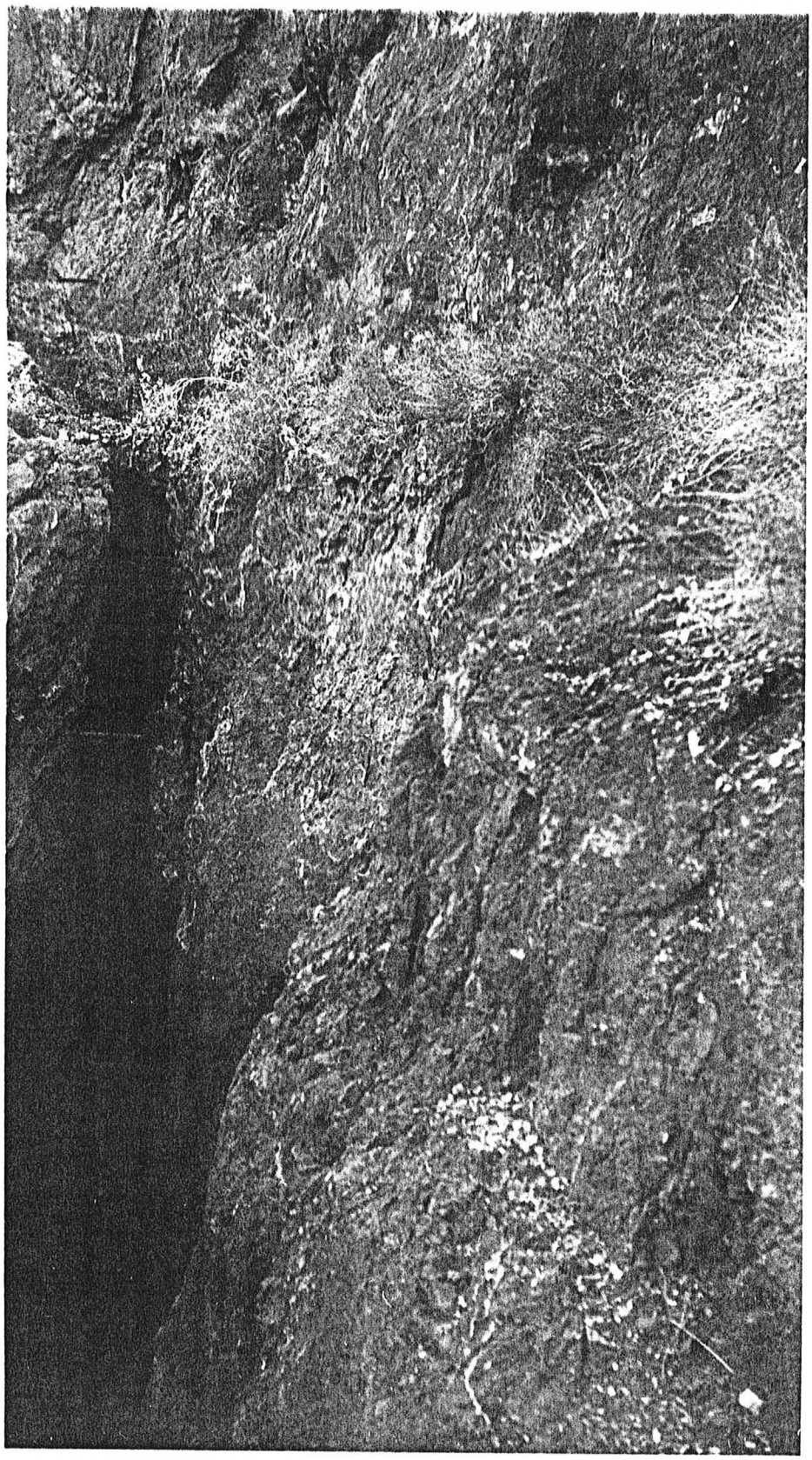


A-1811-35

C-1950

A-181-37

C-1950



C-181-38

C-1950

Arizona Department of Mines and Mineral Resources

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA Pinal
~~MARICOPA~~ CO.

Silver Reef Mine

MILS #655
8 AKA's
Silver Reef Mine (Gila)

MM 420 Silver Lead Ore

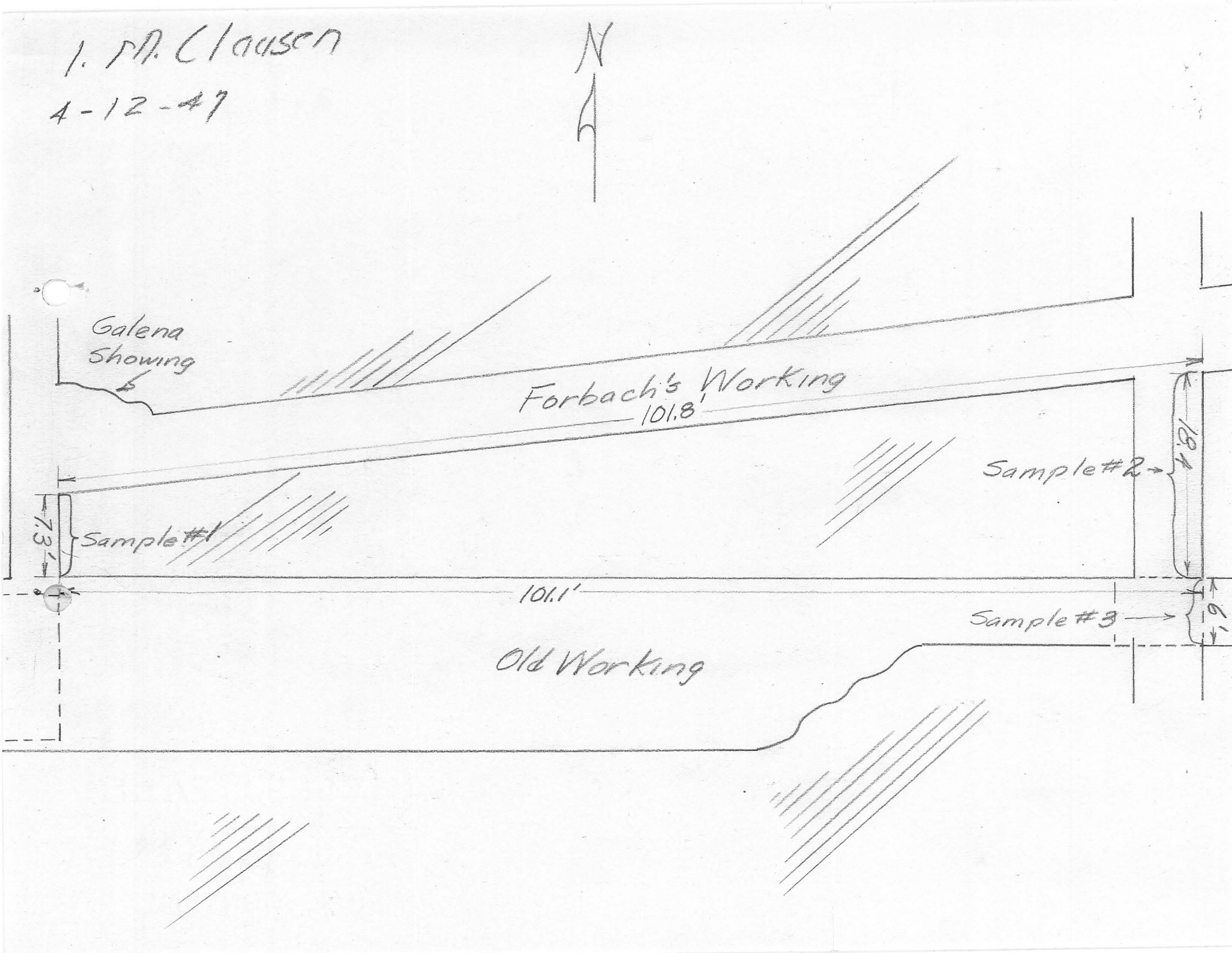
ARIZONA

PINAL COUNTY

SILVER REEF MINE

MILS #655
8 AKA's
Silver Reef Mine (Gila)

MM 1149 Galena & Secondary Lead Minerals


1. M. Clausen
4-12-47
N
Galena Showing
Forbach's Working
101.8'
Sample #2
Sample #1
7.3'
101.1'
Sample #3
Old Working

GREENHORN MINING COMPANY PINAL COUNTY

I. M. Clausen - deceased
Bob Clausen - 491 N. Vine
P.O. Box 881
Chandler, Arizona

Bob Clausen says Tate Mining looking at the property with a view toward leasing and operating. LP 12-1964

Visited the Silver Reef - saw no signs of work. GWI WR 1-20-68

Property checked with ore-finding device. GW WR 7-12-71

NJN WR 3/19/82: Alan Rabinoff of the BLM Geologist's Training Center in Phoenix confirmed that they use the Silver Reef Mine, Pinal County, in their training program. They get permission yearly to use the mine from the Papago Tribe. Although some cerrusite and wulfenite crystals are seen in the mine, he discouraged collecting even with Indian approval due to the dangers present from open shafts and stopes and that such activity would remove mineralization they (BLM students) need to see.

NJN WR 3/26/82: A brief visit at the Silver Reef mine, Pinal County showed evidence of use by the BLM Training Center. The limited inspection did not uncover any wulfenite or cerrusite mineralization. Some magnetite was collected from the dumps for use in the Department's "teachers kits".

MG WR 12/17/82: Mr. Sherwood B. Owens reports that he mined a dump as well as fresh material from the Silver Reef Mine (SE¼, Section 23, T8S R5E, Pinal County) during the late 1940's and early 1950's. He leased the property from someone in Phoenix and shipped the ore as silver-bearing siliceous flux to copper smelters owned by ASARCO and Phelps Dodge.

---

*

* GENERAL REFERENCES

REFERENCE 1 F1 < ABGMT ASBM FILE DATA

REFERENCE 2 F2 < ADMR FILE DATA

REFERENCE 3 F3 < BLM DISTRICT SHEET561

REFERENCE 4 F4 < USGS. MF-934

L110 CONT. < CLAIMS INCLUDE HORN SILVER, HORN SILVER NO. 1 AND NO. 2, SANTIAGO, NUGGET, NUGGET FRACTION, NUGGET EXTENSION, SAHUARA, CHOLLA, LEAD BOULDER, SILVER NUGGET; THESE SAME CLAIMS ARE ALSO CALLED 'SILVER REEF NO. 1 TO NO. 9,' (Dupp. 3369); MAY ALSO HAVE BEEN OPERATED IN 1905 BY AZ. MERCANTILE TRANSPORTATION AND SMELTING CO. >

N70 < MINERALIZED ZONE, MAINLY IN ORACLE GRANITE, WITH SOME ADJACENT TERTIARY ANDESITE >

U.S. CRIB-SITE FORM

RECORD IDENTIFICATION

*RECORD NUMBER B10 < > *RECORD TYPE B20 <X,1,M> DEPOSIT NUMBER B40 <

*REPORT DATE G1 <8,2,/,0,3> (YR. MO.) *INFORMATION SOURCE B30 <1,2> *FILE LINK IDENT. B50 < USGM-004021 0765

*REPORTER(SUPERVISOR) G2 < ROTH, FRANCES A. (last, first, middle initial) (GEST, DON (last, first, middle initial)

*REPORTER AFFILIATION G5 < ABGMT *SITE NAME A10 < SILVER REEF MINE

*SYNONYMS A11 < HORN SILVER MINE, SILVER NUGGET MINE, NUGGET MINE, LEAD BOULDER MINE, GREENHORN MIN

LOCATION

*MINING DISTRICT/AREA A30 < SILVER REEF DISTRICT

*COUNTY A60 < PINAL *STATE A50 <AZ> *COUNTRY A40 <U,S>

*PHYSIOGRAPHIC PROV A63 <1,2,/,

*DRAINAGE AREA A62 <1,5,0,5,0,3,0,3,/, *LAND STATUS A64 <7,7,/, /,(,1,9,7,9,)

*QUADRANGLE NAME A90 < SILVER REEF MOUNTAINS (1,9,4,2)> *QUADRANGLE SCALE A100 <6,2,5,0,0>

SECOND QUAD NAME A92 < ( )> SECOND QUAD SCALE A91 <

*ELEVATION A107 <1,7,0,0,/,F,T>

UTM

*NORTHING A120 <3,6,1,4,6,0,0>

*EASTING A130 <4,2,3,3,5,0,>

*ZONE NUMBER A110 <+,1,2>

*ACCURACY

ACCURATE (ACC) (circle)

ESTIMATED EST <

GEODETIC

*LATITUDE A70 < _ _ N>

*LONGITUDE A80 < _ _ W>

CADASTRAL

*TOWNSHIP(S) A77 <0,0,8,S,:,/, :,/, :,/, > *RANGE(S) A78 <0,0,5,E,:,/, :,/, :,/, >

*SECTION(S) A79 < 23 :,/, :,/, >

*SECTION FRACTION(S) A76 < S2 OF S2 >

*MERIDIAN(S) A81 < GILA AND SALT RIVER >

*POSITION FROM NEAREST PROMINENT LOCALITY A82 < ABOUT 2.5 MILES SOUTH WEST OF WHITE HORSE PASS >

LOCATION COMMENTS A83 < LOCATED ON THE NORTH SLOPE OF THE SILVER REEF MOUNTAINS; CLAIMS EXTEND SLIGHTLY INTO SECTIONS 26 AND 24; UTM GIVEN IS FOR THE ⊕ HORN SILVER SHAFT >

* ESSENTIAL INFORMATION
- ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

COMMODITY INFORMATIC

*COMMODITIES PRESENT C10 A,G, P,B, C,U, A,U, S,I,L, M,O,
*ORE MINERALS C30 NATIVE SILVER, GALENA, ARGENTITE, HORNSILVER, WULFENITE, VANADANITE, CHRYSOCOLLA
COMMODITY SUBTYPES C41
*GEN. ANALYTICAL DATA C43
COM. INFO. COMMENTS C50

* SIGNIFICANCE

	PRODUCER	NON-PRODUCER
MAJOR PRODUCTS	MAJOR A,G,	MAIN COMMODITIES PRESENT C11
MINOR PRODUCTS	MINOR P,B, C,U, A,U, S,I,L,	MINOR COMMODITIES PRESENT C12
POTENTIAL PRODUCTS	POTEN M,O,	
OCCURRENCES	OCCUR	OCCURRENCES OCCUR

*PRODUCTION

PRODUCER	NON-PRODUCER
PRODUCTION (YES) (circle) PRODUCTION SIZE (SMI) MED LGE (circle one)	PRODUCTION UND NO (circle one)

EXPLORATION OR DEVELOPMENT

*STATUS

PRODUCER	NON-PRODUCER
STATUS AND ACTIVITY A20 4	STATUS AND ACTIVITY A20

*DISCOVERER L20
*YEAR OF DISCOVERY L10 1880'S *NATURE OF DISCOVERY L30 *YEAR OF FIRST PRODUCTION L40 1905 *YEAR OF LAST PRODUCTION L45 1955
*PRESENT/LAST OWNER A12 T. M. CLAUSEN AND B. CLAUSEN (GREEN HORN MINING) (1970)
*PRESENT/LAST OPERATOR A13 M.H.M. MINING CO. (1955)
EXPL./DEV.COMMENTS L110 PREVIOUS OWNERS AND OPERATORS INCLUDE WM. FORBACH (1917); SILVER REEF MIN M (1926, 1930); AZ. LEASING AND DEVELOPMENT (1927-1928); ALBERT C. FORBACH (1942); S.B. OWENS (1951)

DESCRIPTION OF DEPOSIT

*DEPOSIT TYPE(S) C40 VEIN & SHEAR ZONE
DEPOSIT FORM/SHAPE M10 LENSES
*DEPTH TO TOP M20 *UNITS M21 *MAXIMUM LENGTH M40 6000 *UNITS M41 FT
*DEPTH TO BOTTOM M30 *UNITS M31 *MAXIMUM WIDTH M50 *UNITS M51
*DEPOSIT SIZE M15 (SMALL) M15 (MEDIUM) M15 (LARGE) (circle one) *MAXIMUM THICKNESS M60 50-25 *UNITS M61 100 FT
*STRIKE M70 N 79 E *DIP M80 *PLUNGE M90
*DIRECTION OF PLUNGE M100
*DEP. DESC. COMMENTS M110 3 TO 4 VEINS IN FAULT ZONES; MAJOR VEIN STRIKES N 79 E AND IS TRACE ABLE FOR 6000 FT VEIN WIDTH VARIABLE FROM A FEW FEET IN WEST TO 25-50 FT IN EAST

DESCRIPTION OF WORKINGS

*Workings are: SURFACE M120 UNDERGROUND (M130) BOTH M140 (circle one)
*DEPTH BELOW SURFACE M160 240 *UNITS M161 FT *OVERALL LENGTH M190 *UNITS M191
*LENGTH OF WORKINGS M170 *UNITS M171 *OVERALL WIDTH M200 *UNITS M201
*OVERALL AREA M210 *UNITS M211
DESC. OF WORK. COM. M220 LARGEST AND EARLIEST WORKINGS ARE THE HORN SILVER SHAFT WITH LEVELS AT 96, 200, AND 240 FT, OPENED BY AN INCLINED SHAFT AND ADIT; OTHER WORKINGS INCLUDE THE SILVER NUGGET AND LEAD BOLDER AS WELL AS OTHER SMALLER WORKINGS

GEOLOGY

*AGE OF HOST ROCK(S) K1 P,R,E,C,
*HOST ROCK TYPE(S) K1A GRANITE
*AGE OF IGNEOUS ROCK(S) K2 TERT.
*IGNEOUS ROCK TYPE(S) K2A ANDESITE, VESICULAR
*AGE OF MINERALIZATION K3 T,E,R,T,
*PERT. MINERALS (NOT ORE) K4 QUARTZ, LIMONITE
*ORE CONTROL/LOCUS K5 E-W FRACTURES, MINOR NW STRIKING FAULTS, MAIN EW VEIN DIPS 75-77 S
*MAJ. REG. TRENDS/STRUCT. N5 E-W STRIKING FAULT WITH MINOR NW STRIKING FAULTS
*TECTONIC SETTING N15
*SIGNIFICANT LOCAL STRUCT. N70 E-W FRACTURE ZONE WITH MINOR NW STRIKING FAULTS, MF-934 MAPS E-W
*SIGNIFICANT ALTERATION N75
*PROCESS OF CONC./ENRICH. N80 SECONDARY ENRICHMENT BY GROUND WATER PERCOLATING DOWN FAULT ZONE
*FORMATION AGE N30
*FORMATION NAME N30A
SECOND FM AGE N35
SECOND FM NAME N35A
*IGNEOUS UNIT AGE N50 P,R,E,C,
*IGNEOUS UNIT NAME N50A ORACLE GRANITE OF PETERSON
SECOND IG. UNIT AGE N55 TERT.
SECOND IG. UNIT NAME N55A VESICULAR ANDESITE
GEOLOGY COMMENTS N85

GENERAL COMMENTS

GENERAL COMMENTS GEN

WESTERN UNION TELEGRAM: Denver, Colorado.

R.I.C.M.:-

Re your telegram Clayton application vindicates he expects to receive money in advance. Funds are provided only on a reimbursable basis otherwise a direct loan should be requested. Clayton can write us stating that he wishes to alter his original application as indicated above and we can process the form now on file here. Rental of equipment by contractor is not allowable. The equipment is depreciated at one sixtieth of a fair value per month.

J.H.East Jr.

A.L.F. 1:20 P.M.

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

W. P. MARSHALL, PRESIDENT

(15)

SYMBOLS

DL=Day Letter

NL=Night Letter

LT=Int'l Letter Telegram

VLT=Int'l Victory Ltr.

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LC293

1952 MAR 10 PM 12 55

08

L.DVA201 LONG GOVT PD=DENVER COLO 10 1206P=

R I C MANNING, DIRECTOR=ARIZONA DEPARTMENT MINERAL RESOURCES STATE FAIR GROUNDS PHOENIX ARIZ=

REURTEL. CLAYTON'S APPLICATION INIDCATES HE EXPECTS TO RECEIVE MONEY IN ADVANCE. FUNDS ARE PROVIDED ONLY ON A REIMBURSEABLE BASIS OTHERWISE A DIRECT LOAN SHOULD BE REQUESTED. CLAYTON CAN WRITE US STATING THAT HE WISHES TO ALTER HIS ORIGINAL APPLICATION AS INDICATED ABOVE AND WE CAN PROCESS THE FORMS NOW ON FILE HERE. RENTAL OF EQUIPMENT BY CONTRACTOR IS NOT ALLOWABLE. THE EQUPPMENT IS DEPRECIATED AT ONE-SIXTIETH OF FAIR VALUE PER MONTH=

J H EAST JR=

NO 86989 TO Flagg

BY [illegible] AT 1230P TO BE [illegible]

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

Excerpt from Economic Geological Reconnaissance
of Casa Grande Mining District
By J. B. Tenney

SILVER REEF MINE

History and Production

This old silver mine was probably discovered in the early eighties, although it was not mentioned in the early U. S. mint reports.

The first extensive work was done about 1905 when a deep shaft was sunk on the vein and a 20-stamp mill and 50-ton cyanide plant were erected. The company operating the mine was the Arizona Mercantile Transportation and Smelting company. After a short mill run, the mine was closed. It remained idle until 1914 when it was relocated by B. S. Wilson and about 1000 tons of silver ore were mined from a vein about 2000 feet east of the old workings, after which the mine was again closed. In 1919 it was purchased by Frank M. Leonard and associates. A two-compartment shaft was sunk 125 feet on the vein mined by Wilson after which the mine was again closed.

In 1925 Frank M. Leonard, Jr. obtained a lease on that part of the ground worked by Wilson and shipped 1000 tons of 22 ounce silliceous ore left by Wilson in the footwall of the vein. This ore was shipped to the Hayden Smelter as flux. Shipments continued through 1928 at about the same rate and in 1929 the mine was bonded to the Silver Reef Mining and Milling Company promoted by Percy Williams. The company drove a deep extraction tunnel, and shipped 250 tons of 15 ounce siliceous silver ore, after which the option was surrendered.

The present owners are: Frank M. Leonard, Charles R. Leonard, Frank Royer, James W. Gerard, and John Hays Hammond. Twelve claims surveyed for patent are held in the group. The total recorded production has been about $60,000 almost entirely in silver.

Geology and Ore Occurrence.

The claims of the mine are located on the northern piedmont slopes of the Silver Reef Hills, about 13 miles south of Casa Grande. The Casa Grande-Covered Wells partly graded highway passes within a quarter of a mile of the workings and is connected with them by a fair road.

The northern piedmont slopes of the mountains consist of coarse grained granite. A few hundred feet south of the mine workings a partly planed surface of this older granite is capped by essentially flat-lying amygdaloidal flows of lava, the exact composition of which was not determined. The granite has been much broken by steeply inclined faults and sheer zones striking east and west, and some of these faults have involved the lava as well as the underlying granite. The faults have been strongly mineralized by siliceous solutions carrying iron, a little copper, lead, and a small amount of erratically distributed silver salts. Subsequent oxidation has left them as closely spaced limonite and copper-stained quartz veins, varying in thickness from a few inches up to five feet. Many of the veins show crustification and sharp walls, but in most of them the quartz grades through partly silicified granite into fresh granite with no distinct walls. The higher silver values occur as shoots in the vein in association with lead carbonate and copper carbonate and silicate stain.

*

The exact form of the silver was not determined but is probably chloride. A little free silver and black sulphide (argentite?) have been reported. Most of the work on the property has been done at the western end, where several thousand feet of shafts and drifts were driven on a single vein varying from a foot to five feet in thickness. The total depth prospected was about 350 feet, but the workings are in bad condition and were not visited. The production from this end of the property was small and the values are said to be low. The principal production has come from a parallel vein about 2000 feet east of the main workings where a shoot of better grade ore was mined. The vein in the shoot is ten feet thick and the shoot is several hundred feet long. In this vein the fault in which it occurs cut the lava which at the outcrop formed the hanging wall. The mineralization is confined however to the granite. It is probable that the movement on the fault was revived after the deposition of the lava and that the mineralization took place before the volcanic activity.

GENERAL SUMMARY

From the foregoing descriptions of the principal ore deposits of the Casa Grande District, it is seen that possibilities for the future development of profitable mines are far from exhausted. Some of the silver deposits were sufficiently rich to have been profitable worked even during low silver market years. The possibilities at these properties for the development of new ore bodies are good.

*

IN REPLY REFER TO

United States Department of the Interior

OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS
4015 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22203

See Gower Federal Service - Mining for entire decision

I.M. and ROBERT L. CLAUSEN

IBLA 72-51 Decided September 22, 1972

Appeal from a decision (A 6330) by Arizona state office, Bureau of Land Management, declaring mining claims null and void.

Affirmed.

Mining Claims: INDIAN LANDS; LOCATABLE PUBLIC LANDS - Indian Lands - advance rentals; DETERMINATION OF VALIDITY

The failure of a mining claimant to make the required annual rental payments in advance for claims located under the Act of June 18, 1934, 48 Stat. 984, as amended, August 28, 1937, 50 Stat. 862, 863, within the Papago Indian Reservation is a sufficient basis for invalidating the claims where the annual rental payments were not remitted until almost three months after the due date and no explanation is offered for the delay.

APPEARANCES: W. T. Elsing, Esq., for the appellants

OPINION BY MR. FISHMAN

I. M. Clausen and Robert L. Clausen have appealed to the Secretary of the Interior from a decision by the Arizona state office, Bureau of Land Management, dated June 21, 1971. The decision declared seven unpatented mining claims 1/ held by the appellants to be null and void for the reason that the appellants failed to make rental payments on or prior to the anniversary date of the location of the claims in compliance with 43 CFR 3825.1(b).

1/ The mining claims, all of which were situated within the boundaries of the Papago Indian Reservation, were the Silver Reef Fraction, and the Silver Reef Nos. 3, 4, 6, 7, 8, and 9. The mining claims were located on March 16, 1936.

Index Code:
43 CFR 3825.0-3(6)(1972)
43 CFR 3825.1(6)(1972)

GFS(CON) 174(1972)
GFS(MIN) 55(1972)

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine	Silver Reef Mine	Date	June 2, 1964
District	Silver Reef District - Pinal County	Engineer	Lewis A. Smith
Subject:	Interview with W. H. Coplen - Quijotoa		

Mr. Coplen stated that his father was the discoverer of the Silver Reef Mine, before 1900.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Silver Reef Claim (Silver Reef Mine) Date March 3, 1960

District Silver Reef Mtns. (Casa Grande Dist.) Engineer Lewis A. Smith
Pinal Co.

Subject: Mine Visit by Lewis A. Smith and interview with Bob Clausen, part owner.

Owners: I. M. Clausen, Bob Clausen, et al (Greenhorn Mining Co.)

Geology: General Geology is in files along with other mine data.

The Silver Reef Claim forms the northwest unit of the property and adjoins the west end line of the Silver Reef No. 3 claim and the north side line of the Horn Silver No. 2 claim overlaps it on the south. The principal workings lie in the west 2/5 of the Silver Reef No. 3. These underground workings consist of a 325 foot inclined (70°) shaft with three levels largely as drift on the vein. The breast of the western most drift is about 150 feet from the east end line of the Silver Reef. East of these workings, at a distance of 200 feet, is a 350 foot adit from the end of which is a 300 foot drift on the vein. The vein, in the area of these workings, strikes E-W and dips about 75° south. The quartz vein appears to range in width from 4 to 7 feet, but the zone of mineralization is much wider, possibly 20-25 feet. The vein and accompaning brecciated zone are much more resistant than the granite country rock and therefore stands as a bold rib or "reef" to as much as 10 feet high. This vein structure continues across the south 1/2 of the Silver Reef for at least 800 feet and then crosses the NW corner of the Horn Silver No. 2 for another 500 feet where it is submerged by valley fill. That portion of the vein lying west of the Silver Reef No. 3, has been prospected by several 10-12 foot shafts and a 15 foot adit. As the vein structure goes toward the west it narrows somewhat, becomes lighter, and curves toward the southwest, striking S 85° W where it disappears under the aluvium. The quartz portion of the vein in this portion, contains veinlets and blebs of chrysocolla, lead carbonate, vanadinite, wulfenite, silver minerals (principally silver halogens) and considerable manganese dioxide (principally psilomelane). Silver greatly predominates in value, according to assays taken by the owners. A 6-foot wide sample, across the vein, in the first pit west of the Silver Reef No. 3, assayed $5.00 per ton in lead, silver, and gold with minor copper. This value , as in other samples, was mostly silver. A sample, from the second pit to the west, ran $6.00 over a vein width of 7 feet. More samples along the outcrop and in the adit and third pit are being processed. The vein material in these was lithologically similar to that in the two pits already sampled. (These averaged $1.50 up to $2.00 per ton)

Minor transverse faults appeared fairly frequently, but since these have only minor throws, they had no appreciable effect upon the vein trend or dip. A dike (reported by some observers to be similar to syenite)appears to cross the vein west of the shaft workings. Since the vein mass uninterruptedly crosses this dike, and may even disjoint it, the dike is considered to have been injected prior to most of the vein formation. It, more than likely, does act, in part, as a curtailant to the flow of the mineralizing solutions, but did **not** cut them off entirely since values continued on westward but to a less degree of intensity.

The country rock in the Silver Reef and Horn Silver No. 2 claims is mainly graphic, or semi-pegmatitic granite which had been intensely shattered prior to vein formation. The shatter planes are filled with dense white quartz and manganese and iron oxides.

*

The vein quartz and breccia quartz, both parts of the vein formation, distinctly cut the silicated granite. The quartz vein has strong walls whose continuity has been irregularly echeloned by post-quartz shearing. Metallization followed the silicification and locally extends out into the granite.

The main vein structure is traceable for some 6000 feet to the east. The mineralization is stronger and the vein structure is wider in the east half of the claims. This may be due to the fact that the upper portions of the vein were in andesitic agglomerate (called, by some, rhyolite) which is more susceptible to shattering and replacement.

The most important identifying characteristics of this vein are the presence of a typical banding and vanadinite and wulfenite. Galena and argentite (?) are also reported in the deeper parts. The gangue is generally neutral for silver, but contains sufficient calcite and siderite to hold up gold, lead and copper. Argentite generally is regarded as the secondary enrichment sulphide of silver. The richer silver in the upper parts of the east workings may indicate an old water table stop point which may be associated with the late Pliocene and early Pleistocene lake epoch. During this period the climate was more humid than now and water tables higher. However, this does not preclude other deeper enrichment zones which might have formed at other stop points in the water table as the water table rose. Several other mines in the Cordilleran Region have shown this. The intervening zones are relatively low grade. This suggests that it may be advisable to drill to intercept the veins in depth. Thus far no workings have penetrated to the true primary mineralization even though the relicit sulphides thus far encountered do give a hint of the character of the primary minerals other than silver. The silver primary more than likely consists of sulpharsenides and sulphantimonides of silver, such as pyrargyrite proustite and stephanite. The presence of some copper oxides may indicate tetrahedrite or stromyerite. The silver in most of the area probably is in the form of cerargyrite (AgCl) or embolite (Ag (Br.-Cl) although none was seen because of masking by manganese dioxides or iron oxides.

Therefore, that prospecting, which has been done in the Silver Reef claim is entirely too shallow to be of much use in determining the real worth of the claim. The area near the surface could conceivably lie between two enrichment zones. Leaching of the vein mass has been intensive as evidenced by silica boxworks and limonite boxworks which have been "whipped" clean, or nearly so, by weathering. The leached out silver sulphide values may thus have moved downward.

This inference is supported by two such typical cases at Morenci and the Commonwealth Mine at Pearce. At Morenci 50 to 500 feet of leached capping overlies the enriched chalcocitic zone. The leached capping averaged between 0.04 and 0.21% copper, whereas the underlying enriched zone has to date, averaged about 0.94% copper. At the Commonwealth 5 to 150 feet of leached silver capping averaged about 1 oz. of silver while the upper enriched zone, immediately below the capping, averaged from 15 to 200 ounces of silver. There were two deeper enriched zones within a vertical distance of 200 feet. In between these enriched zones the tenor averaged from 3 to 15 oz. silver. Such leached capping zones are prevalent over many disseminated porphyries, and in some cases the Morenci situation is duplicated. In other cases where the gangue rocks are more chemically reactive the degree of enrichment may

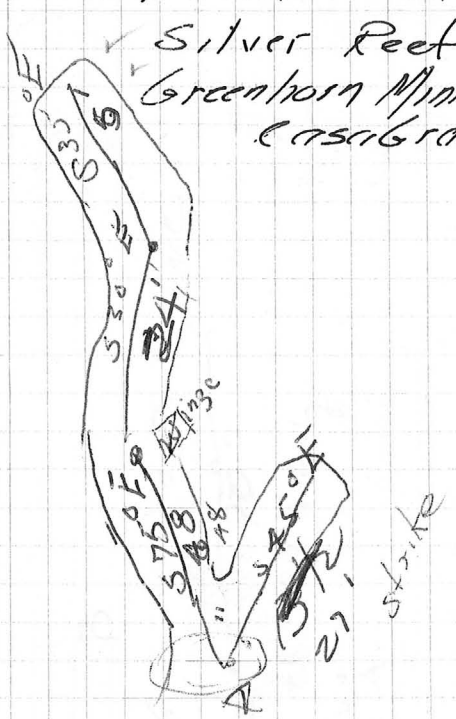
vary in proportion to the hold-up copper as oxidized minerals. Similarly silver may be held up where chlorine and bromine are prevalent to variable degrees. At Ajo the gangue is so intensely reactive that nearly all of the copper remained in sites as oxides converging rapidly into primary sulphides with minor enrichment. At Bullfrog, in Nevada, the same was true as regards silver. The oxide silver mineral (cerargyrite) persisted down to the old water table where a rapid transition to primary silver minerals occurred.

The zoning of enriched ores or transitions from oxidized ores to primary ores is controlled to a marked extent by fluctuations in the geological water table. In this region and most of the entire Cordilleran Region, the water table started rising shortly after the Miocene Revolution, and continued to rise in spurts until late Pleistocene. The even rise of the water table was apparently interrupted at least three times during this period of rising himidity. At Pearce three enrichment zones in the mine were closely tied to three stop points in the history of Old Lake Cochise, west of Willcox. The stop points were evidenced by three old shore lines each of which contained fossil mammalia by which they could be dated. Since remnants of old lake beds of unknown depth have been reported in the Silver Reef area,[50] it is possible that at least one and maybe more stop points may have existed here also. Similar lake deposits are prevalent all over the Cordilleron region, some of which, such as "Lake Mahontan" and others in Nevada, had a vertical range of up to 500 feet during the period of rising himidity. The Benson and San Pedro Lake beds have considerable depth range. The apparent light upper enrichment in the east half of the Silver Reef claims, probably represents the top of the water table fluctuation. The deepest penetration in the claims is 325 feet in the Silver Reef No. 3 claim. Oxidation and strong leaching is present throughout most of this depth as evidenced by silica boxworks and lead oxides. Where did the silver, which once occupied these cavities, go? Obviously since the prevailing fractures are nearly vertical, the silver in solution must have descended. Three competent observers reported that argentite, or what they believed to be this mineral, was present in the lower level of the Silver Reef No. 3 workings. Argentite is generally believed to be the prevailing silver enrichment sulphide. The reported argentite was found as a sooty coating in galena fractures. The galena had partly been converted to vanadinite and wulfenite in most cases.

Therefore, in lieu of the climatic history of the region, and the presence of argentite and lake deposition, it would seem out of line to condemn a claim, or a group of claims, in a known mineral district, on no more than surface assay conditions, especially since these outcrops show strong evidence of leaching of sulphides. This is particularly pertinent when one looks at the evidence from such deposits as Morenci and Pearce in particular, and others of less positive appearance without the opportunity to find out.

*

Lead Boulder 3 Claim
Silver Reef Mine
Greenhorn Mining Co.
Casa Grande



Vein outcrop 570 ft.

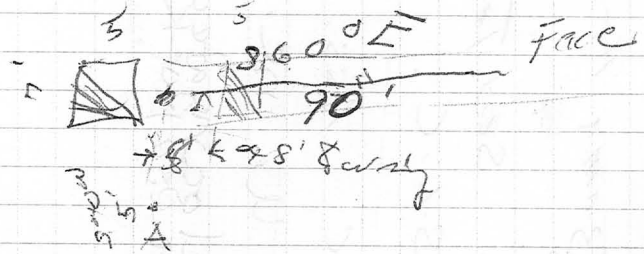
P = 8'

*

*

A is under B

B



A

Steinberger Drilling Contractors
Cameron, Ariz.

Rate Metals of Amer.

Montezuma Uranium Mining
incorp

276 SW Temple
SL.C.

B C Ass.

Zion U. Inc.
amalgamated U.
Mouse Rock Valley

*

Mr. Manning

P. O. Box 6156

March 31, 1952

Mr. Charles F. Willis
Arizona Small Mine Operators Association
508 Title and Trust Building
Phoenix, Arizona

Dear Mr. Willis:

I greatly appreciate the copies of Mr. East's letter of recent date which I received from you. I had every intention in the world of being up there last Monday to pick them up but I wasn't released from the house until Wednesday and after that I had to get busy and try to gather a few of the beans that I have to get into the pot every now and then.

The matter of getting something started on this loan application is now a dead issue. I would like however to make two comments on, what looks like to me, a rather laborious attempt to produce an alibi.

1. With his loan application Mr. Clayton sent Mr. East a letter of transmittal. In this letter he stated that he had had the advice and guidance of Mr. Roger I. C. Manning, Director of Mineral Resources of the State of Arizona, in the preparation of his application. Evidently Mr. East has a rather low opinion of Mr. Manning's ability to interpret the rules and regulations laid down by the D. M. A.

2. It seems to me that Mr. East is quibbling when he states that the equipment which Mr. Clayton proposed to use in transporting labor could not be rented but that if used on exploration work this equipment could be depreciated and operation and maintenance costs allowed. I would like to bet Mr. East a cookie that depreciation, operation and maintenance cost on the two vehicles would be in excess of the rental suggested by Clayton.

Please accept my sincere expression of appreciation for your help in getting behind this application. I believe that without your help we would be just a couple of other Arizona knotheads struggling against the unbeatable Bureaucracy.

Sincerely yours,

Signed - R. M. Manning

IMC-fc

March 14, 1952

J. H. East, Jr., Regional Director
U. S. Bureau of Mines, Region IV,
224 New Customhouse,
Denver 2, Colorado.

Dear Jack:

I was discussing a situation this morning with a very prominent and influential mining man. I thought that before I started tearing things to pieces I should write you for an explanation of events.

There was an application made for a small exploration loan for the Greenhorn Mine by a man named Clayton. This application was made in January. It was most intelligently presented, and complete, actually being made out by a very competent engineer.

The first thing that came back from your office was a long letter signed by you (but probably not written by you), asking if the applicant was sure he knew what he was doing and, if so, was he sure he had studied the application. That he was sure was obvious from the application itself.

Your office was promptly advised that the applicant did know what he was doing and what he was getting into. Then, a few days later, along came a telegram indicating that your office was still not convinced that the applicant knew what he was doing. It was about as ridiculous an interchange of correspondence as I have ever seen. It looked to us as though it was nothing but a deliberate attempt to stall and stall before an examination of the property would even be authorized.

It is rather hard to understand such tactics. I feel sure that there must be an explanation because I cannot feel that your associates are quite as dumb as would be indicated by such procrastinating procedure.

To date no authorization has been made. The applicant is working along, spending what limited money he has but by the time action is taken, if ever, he will have used up the money he had expected to use as matching funds.

I will appreciate knowing the answer to this particular problem. With kindest personal regards, I am

Very sincerely,

Charles F. Willis

CFW:VSW
cc: I. M. Clausen
1724 W. Adams St.

- Greenhorn Mining

UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Mines

Region IV

224 New Customhouse
Denver 2, Colorado

(Dictated by J.H. East, Jr.
signed in his absence)

3/52

Mr. Charles F. Willis,
Arizona Small Mine Operators Assn.
508 Title & Trust Building,
Phoenix, Arizona.

Dear Charlie:

This will acknowledge your letter dated March 14, regarding application for the Greenhorn mine by W.L. Clayton. The discussion seems to be getting out of hand, and I have made an investigation of the whole affair.

In the fourth paragraph of your letter, you have indicated that it looked to you as a deliberate attempt to stall to avoid an examination of the property. I can assure you that such is not the case, as all applications are examined in the order of receipt, except under the circumstances where one mineral is more strategic than another mineral.

We have received numerous applications from small operators who misunderstood the basis on which Government assistance is given for exploration work. It has been publicized that the Government assistance is a loan, which of course, it is not, being merely reimbursement, and we advise such applicants that it takes six to eight weeks from the time work is started before they will receive a reimbursement check. In many instances, the applicant then withdraws his application, stating that he cannot finance his share.

Mr. Clayton's application raised a doubt in our mind because on page 4, the answer to question No. 21 stated:

> "When I obtain the loan I intend to exchange the equipment which I now have under rental for larger equipment and increase the size of my working force. It is difficult for me to estimate the length of time it will take to complete the work after receiving the loan because I am going to continue working with the facilities I now have and the depth which I will have obtained by the time I receive the loan money is of course speculative."

It appeared to us from this statement that Mr. Clayton, when the application was made out, expected to receive a sum of money as the loan. Also, no estimate was given as to the cost of the larger equipment referred to, this information being asked under question 23e of Form MF-103, and important to proper consideration of the application.

Another phase of Mr. Clayton's application was statement that he proposed to haul labor from Casa Grande each day and statement that a fair daily rental for his own jeep and truck for hauling men and material was $22.50 per day. These statements implied to us that Mr. Clayton might not

understand that equipment owned by himself could not be rented to the exploration project but that if used on exploration work, could be depreciated and operation and maintenance costs allowed. Mr. Clayton was so advised in my letter of February 8.

Under date of March 15, Mr. Clayton wrote us in reply to our letter of February 8 that he understood that he did not receive money as a loan but would be reimbursed and on this basis, we will proceed to process his application. A field examination of the mining property will follow at which time further details needed but lacking in the application will be secured.

I hope I have made myself clear in regard to the desirability of obtaining needed information in writing before spending money to go out and examine properties where it is not clear that the applicant understands what is required of him.

We are having our own difficulties with auditors and are being severely criticised in certain instances, but the old adage applies to DMEA, that is, "it is easy if you do it the Government way." Certainly I am not responsible for some of the regulations and if you could spend two or three days in this office, you would see why some things are done.

Please remember me to your wife, and I will appreciate your comments regarding this controversy.

Sincerely yours,

/signed/

J.H. East, Jr.
Regional Director

COPY

DOMESTIC SERVICE

Check the class of service desired; otherwise this message will be sent as a full rate telegram

FULL RATE TELEGRAM		SERIAL	
DAY LETTER		NIGHT LETTER	X

WESTERN UNION

1206

W. P. MARSHALL, PRESIDENT

INTERNATIONAL SERVICE

Check the class of service desired; otherwise this message will be sent at the full rate

FULL RATE		LETTER TELEGRAM	
VICTORY LETTER		SHIP RADIOGRAM	

NO. WDS.-CL. OF SVC.	PD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED

Send the following message, subject to the terms on back hereof, which are hereby agreed to

PHOENIX, ARIZONA, MARCH 8, 1952

J. H. EAST, JR.,
REGIONAL DIRECTOR, REGION 4
BUREAU OF MINES
224 NEW CUSTOM HOUSE
DENVER 2, COLORADO

REQUEST CLARIFICATION OF LAST PARAGRAPH IN YOUR LETTER OF MARCH3, 1952. IS THIS PARAGRAPH TO BE INTERPRETED TO MEAN THAT YOU ARE REQUESTING MR. CLAYTON TO AGAIN FILE IN QUADRUPLICATE AN APPLICATION FOR EXPLORATION LOAN ON FORM MF-103?

REQUEST REPLY BY WIRE AS WE ARE HAVING HARD TIME EXPLAINING NEED FOR AGAIN FILING.

ROGER I. C. MANNING, DIRECTOR
DEPARTMENT OF MINERAL RESOURCE
STATE OF ARIZONA
MINERAL BUILDING
FAIR GROUNDS
PHOENIX, ARIZONA

DOMESTIC SERVICE

Check the class of service desired; otherwise this message will be sent as a full rate telegram

FULL RATE TELEGRAM		SERIAL	
DAY LETTER		NIGHT LETTER	X

WESTERN UNION

1206

W. P. MARSHALL, PRESIDENT

INTERNATIONAL SERVICE

Check the class of service desired; otherwise this message will be sent at the full rate

FULL RATE		LETTER TELEGRAM	
VICTORY LETTER		SHIP RADIOGRAM	

NO. WDS.-CL. OF SVC.	PD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED

Send the following message, subject to the terms on back hereof, which are hereby agreed to

PHOENIX, ARIZONA, MARCH 8, 1952

2-3411

A-2595

J. H. EAST, JR.,
REGIONAL DIRECTOR, REGION 4
BUREAU OF MINES
224 NEW CUSTOM HOUSE
DENVER 2, COLORADO

REQUEST CLARIFICATION OF LAST PARAGRAPH IN YOUR LETTER OF MARCH3, 1952. IS THIS PARAGRAPH TO BE INTERPRETED TO MEAN THAT YOU ARE REQUESTING MR. CLAYTON TO AGAIN FILE IN QUADRUPLICATE AN APPLICATION FOR EXPLORATION LOAN ON FORM MF-103?

REQUEST REPLY BY WIRE AS WE ARE HAVING HARD TIME EXPLAINING NEED FOR AGAIN FILING.

ROGER I. C. MANNING, DIRECTOR
DEPARTMENT OF MINERAL RESOURCE
STATE OF ARIZONA
MINERAL BUILDING
FAIR GROUNDS
PHOENIX, ARIZONA

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

REGION IV

OFFICE OF
REGIONAL DIRECTOR

224 NEW CUSTOMHOUSE
DENVER 2, COLORADO

RECEIVED
MAR - 6 1952
DEPT. MINERAL RESOURCES
PHOENIX, ARIZONA

March 3, 1952

Mr. R. I. C. Manning
Director, Arizona Department
of Mineral Resources
Minerals Building
State Fairgrounds
Phoenix, Arizona

Dear Mr. Manning:

Referring to our telephone conversation today regarding the property of W. L. Clayton and our letter dated February 8: I have discussed with the engineers our letter of February 8, and find that the intent of the letter was to explain to the applicant the Government assistance under the Defense Minerals Exploration Administration program, which consists of reimbursement and not an actual loan and that the reimbursement requires 60 to 80 days. This time is required because Form MF-104 for the preceding month is suppose to be in the office by the 15th of the following month. By the time the project is visited by an engineer and his report submitted, about 60 days time minimum has elapsed. Many applicants do not realize this and we have adopted a policy of explaining to the applicant prior to the start of actual work, so there will be no embarrassment.

Regarding the equipment, the answer given to question 23g stated that the operator proposed to rent his truck and jeep to the project. The regulations do not permit rental but permits the depreciation allowance and operating costs are allowable costs of the project.

If the applicant understands the conditions as stated above, we will be glad to have him forward his application to us for referral to the proper office. I greatly appreciate your calling this to our attention, as our letter of February 8 was not clearly stated.

Very truly yours,

J. H. East, Jr.
Regional Director

University of Arizona

TUCSON

Silver Reef

COLLEGE OF MINES
ARIZONA BUREAU OF MINES

April 23, 1947

Pinal

DEPT. MINERAL RESOURCES
RECEIVED
APR 24 1947
PHOENIX, ARIZONA

Mr. Charles Dunning
Director, Dept. of Mineral Resources
304 Home Builders Bldg.
Phoenix, Arizona

Dear Mr. Dunning:

The samples which Mr. I. M. Clausen sent to the Arizona Bureau of Mines assayed as follows:

	Oz. per ton	
	Silver	Gold
No. 1	9.15	0.002
2	9.55	0.002
3	17.50	0.003
Composite	10.45*	0.002*

*Calculated compositing 25 percent No. 1, 55 per cent No. 2 and 20 percent No. 3.

The minimum charges will be $17.50 and the maximum $30.00. Suggest you send a check for the minimum amount and bill you for any balance which might be due.

Yours very truly,

Geo. Roseveare

Geo. Roseveare
Metallurgist

*

STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA

Re: CLAYTON'S APPLICATION FOR LOAN.

Telephoned Mr. East on March 3rd in answer to a letter written to Mr. Clayton on February 8th, requesting clarification of his letter and stating that it was most certainly not Mr. Clayton's intention to apply for a direct loan. Was informed by Mr. East that he did not dictate the letter, nor had he read the application, he merely signed a letter written by someone in his office who presumably had read the application; promised to write immediately clarifying the matter.

R. I. C. Manning,
Director

RICM:lp

CLAUDE E. McLEAN
P. O. BOX 1888

ARIZONA TESTING LABORATORIES

ANALYTICAL AND CONSULTING CHEMISTS
ASSAYERS, MINING ENGINEERS
823 EAST VAN BUREN STREET

TELEPHONE 3-6272

ASSAY CERTIFICATE

PHOENIX, ARIZONA, February 27, 1947

Mr. I. M. Clausen ✓

Phoenix, Arizona

WE HAVE ASSAYED THE SAMPLES RECEIVED FROM YOU AND FIND THE RESULTS AS FOLLOWS:

GOLD FIGURED AT $35.00 PER OUNCE.

LAB. FORM 2

SILVER FIGURED AT $.90 PER OUNCE.

LAB. NO.	SAMPLE	GOLD		SILVER		PERCENTAGES			
		OZ. PER TON	VALUE	OZ. PER TON	VALUE	COPPER	LEAD	Vanadium	Molybdenum
63636	# 1 Adit Level	0.02	$0.70	4.20	$3.78				
63637	# 2 Cut-up	0.01	0.35	1.60	1.44				
63638	# 3 Adit Face			5.80	5.22 ✓			None	None

REGISTERED ASSAYER
CERTIFICATE EXPIRES
CLAUDE E. McLEAN
DEC. 31, 1947
ARIZONA, U.S.A.

RESPECTFULLY SUBMITTED,
ARIZONA TESTING LABORATORIES
BY _____ ASSAYER
Claude E. McLean

CHARGES $ 9.00

SILVER REEF MINE
SMELTER RETURNS 1948-51

YEAR	SMELTER	WEIGHTED AVERAGE Ag oz	WEIGHTED AVERAGE SiO_2 %	TONNAGE SHIPPED	LIME RANGE %
1948	HAYDEN (JUNE-DEC)	774	6445	755296	1.8 - 17.6
1949	HAYDEN (JAN - SEPT)	934	6345	776990	2.5 - 14.2
1949	EL PASO (JUNE - DEC)	915	6245	546090	NO ANALYSIS
1950	EL PASO (JAN - FEB)	875	NO ANALYSIS	117597	NO ANALYSIS
1950	HAYDEN	876	7019	1141534	6.7 - 16.2
1951	HAYDEN	693	7062	180832	8.1 - 16.8
	OVERALL AVERAGES	864	6616	(3518839 TOTAL)	

*

D. M. Clausen

#1 Waste, ~~Below~~ level, Adit

#2 East end old stope 40' above Adit level.

#3, Adit level - Face East drift - Old workings.

*

DEPARTMENT OF MINERAL RESOURCES

News Items

Date Dec 2, 1940

Mine Silver Reef

Location Casa Grande Dist., Pinal Co.

Owner Greenhorn Mining Co.

Address 1724 W. Adams, Phoenix.

Operating Co. Albert Forback

Address Casa Grande

Pres. I. N. Clausen

Genl. Mgr.

Mine Supt.

Mill Supt.

Principal Metals Silver

Men Employed 4

Production Rate Not estab. Expect 200 tons.

Mill, Type & Capacity

C. P. 9 x 8 Comp. C. P. Jackhammer

Power, Amt. & Type Buda 50 HP 4 cyl.

Signed M. M. C.

(Over)

[redacted]

MIN 100 R 6/15/44

*

Present Operations Setting machinery

Developing on vein. Opened- 20 ft

5-7 ft. wide.

Outcrop hundreds of ft.

New Work Planned

Miscl. Notes 450' Tunnel to vein. Drop

ore thru 135' Raise from level and

tram th mouth

Shipped 5 cars to date.

If any considerable amount of calcite is present in the gangue of a sulphide ore body through which surface water is descending, any metal excepting silver that may be dissolved will be deposited. There can, under such conditions, be no considerable downward migration of the metal. In fact, if calcite is plentiful in the gangue, a metal other than silver cannot be transported to any appreciable extent. It will oxidize and remain at or very close to the point where it was deposited as primary ore. Silver may be transported in spite of the presence of carbonates if no chlorine or other halogen element is present.

Ariz Bureau of Mines, Geo. Series #8
Bulletin #139

Univ. of Ariz. Bulletin
Ariz. Bureau of Mines
Vol III #6 Aug 15, 1935

*

ASAR HAYDEN SMELTER RETURNS Feb. 11, 1950 - Aug 7, 1951

No.	Dry Tons	Silver oz.	Silica %	Alumina %	Iron %	Lime %
1	156.06	8.22	63.0	5.6	5.6	10.6
2	251.29	7.80	65.0	4.6	4.4	11.8
3	144.06	9.50	63.3	3.6	4.4	14.3
4	206.54	8.42	66.5	3.8	4.1	13.1
5	197.14	7.40	64.0	4.1	4.1	14.1
6	251.14	8.00	66.4	4.1	4.3	11.6
7	146.56	7.93	65.0	3.8	4.3	13.8
8	206.71	9.07	65.7	2.3	3.2	15.2
9	206.56	9.55	65.3	2.8	3.6	14.0
10	373.49	9.91	68.0	2.4	3.3	13.6
11	269.52	9.43	69.0	2.1	3.2	13.7
12	327.89	9.36	67.1	2.2	3.2	14.4
13	220.97	9.76	70.0	2.8	3.2	13.2
14	285.79	8.91	69.2	1.8	2.8	11.9
15	229.22	7.78	69.1	1.8	3.0	12.4
16	176.39	7.86	68.5	2.1	2.9	13.8
17	226.88	8.44	69.1	1.4	2.4	12.8
18	227.08	7.62	68.9	2.2	2.5	11.9
19	285.18	9.55	68.7	2.0	2.5	11.6
20	156.29	8.66	66.6	3.3	4.1	12.2
21	107.02	8.66	67.1	1.9	3.2	14.9
22	169.32	11.37	73.2	1.8	2.6	11.9
23	159.29	9.08	67.0	2.1	3.2	11.7
24	211.56	8.67	69.1	2.3	3.4	14.6
25	209.58	8.89	71.6	1.8	3.0	11.7
26	212.70	9.75	72.5	1.8	2.2	11.8
27	55.02	8.05	69.3	1.8	3.4	13.0
28	209.96	8.37	67.4	2.2	3.5	14.2
29	222.32	12.06	76.2	2.1	4.5	7.7
30	266.35	8.55	71.2	1.3	2.8	14.6
31	268.87	10.86	76.2	1.9	2.4	8.3
32	206.68	9.39	73.8	2.1	2.5	9.5
33	200.72	9.63	72.5	2.0	2.3	10.9
34	212.67	8.67	71.5	1.4	2.7	11.0
35	456.29	10.18	77.0	1.4	2.6	8.8
36	257.06	8.45	71.5	1.5	2.6	11.0
37	52.78	9.09	78.2	1.4	1.9	7.1
38	158.80	9.29	74.3	2.3	2.7	8.6
39	226.04	8.96	77.5	2.3	2.2	7.7
40	206.52	9.05	73.9	2.1	2.7	9.0
41	199.25	9.43	77.7	1.8	2.1	6.7
42	216.80	8.33	75.9	2.1	2.1	8.5
43	119.96	7.72	72.0	2.1	2.3	9.3
44	228.79	7.99	73.5	1.8	2.0	9.5
45	145.86	8.08	72.8	2.0	2.3	9.4
46	21.633	8.29	71.0	2.4	2.2	11.1
47	106.86	7.29	70.5	3.0	2.3	11.4
48	166.27	7.44	73.6	2.2	2.2	8.9
49	159.60	9.07	71.1	1.8	2.1	10.8
50	146.30	9.00	70.8	1.3	2.0	12.7
51	240.98	7.61	64.5	1.8	2.1	16.2
52	165.78	7.30	71.0	1.6	2.1	11.4
53	259.13	7.30	70.7	1.7	2.7	11.8
54	106.25	6.90	67.0	3.1	2.3	14.2

*

No.	Dry Tons	Silver oz.	Silica %	Alumina %	Iron %	Lime %
~~55~~	157.94	5.71	65.0	4.8	2.7	13.6
56	155.99	5.53	66.8	3.7	2.6	12.2
1	155.51	5.80	66.4	3.3	2.9	12.6
2	158.67	5.94	68.2	4.2	3.0	9.8
3	103.63	8.75	67.5	4.8	3.4	9.5
4	44.40	6.11	64.6	7.7	4.3	8.2
5	44.98	5.50	60.0	8.3	4.7	10.2
6	47.93	6.31	63.8	2.9	2.9	11.1
7	41.68	5.94	61.1	2.9	2.4	16.8
8	46.42	6.96	68.4	2.1	2.3	12.3
9	49.51	5.53	69.4	2.7	2.3	12.4
10	49.36	6.30	71.5	2.4	2.5	9.2
11	46.54	7.97	69.6	3.9	2.9	8.5
12	46.33	8.27	75.4	1.7	2.4	8.0
13	100.57	6.83	76.2	1.2	2.3	8.5
14	95.49	7.70	77.6	100	1.7	8.8
15	46.65	8.34	76.9	1.3	2.1	8.1
16	89.04	8.11	75.6	1.5	1.6	9.9
17	50.93	8.87	74.5	1.4	1.5	8.7
18	149.11	7.17	70.4	1.9	1.6	12.4
19	50.88	7.11	70.4	1.3	1.6	12.1
20	149.18	7.31	73.6	1.2	1.7	11.3
21	98.64	7.31	72.6	1.4	1.4	13.4
22	95.35	6.98	69.9	1.5	1.7	13.8
23	47.58	6.59	70.9	1.2	1.8	12.4

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ASA[illegible] PASO SMELTER RETURNS Jun[illegible], 1949 - Rec. Mar. 8, 1950

Lot No.	Dry Tons	Silver oz.	Silica %	Alumina %	Iron %	Lime %
1885	52.84	9.30				
1898	56.79	11.20				
1922	157.77	11.20	62.1	5.0	4.2	9.0
1999	162.52	12.60				
2052	102.94	10.40				
2392	157.69	10.00	63.2			
2441	154.01	8.60				
2577	141.99	8.50	60.4			
2597	151.69	10.05				
2630	151.77	10.00			3.7	
2667	157.56	9.65				
2725	152.31	11.30	63.4			
2797	152.76	10.10	63.2			
2859	153.31	9.10	64.4			
2904	149.99	8.45	62.6			
2985	154.48	8.50				
3020	153.44	8.30	61.2			
3050	153.70	10.50				
3067	155.23	10.10				
3126	155.55	8.99	64.0			
3167	155.75	7.80	63.8			
3202	159.78	8.10				
3290	155.21	9.60	62.6			
3335	150.04	9.50	61.2			
3346	159.48	9.00				
3389	158.83	8.20				
3428	159.30	7.95	61.0			
3455	154.69	8.10	59.8			
3520	153.08	8.00				
3574	160.32	9.50				
3652	166.59	8.85	62.8			
3660	148.72	8.10	63.2			
3705	156.00	8.00				
3762	153.52	7.25				
3802	150.63	8.30				
3856	146.63	8.80				
3891	140.88	8.80				
29	166.37	7.90				
145	149.54	9.10				
192	149.39	9.60				
214	153.39	8.60				
246	158.83	9.20				
310	156.10	7.20				
368	101.47	8.75				

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MAR 29 - SEPT 16, 1949

No.	Dry Tons	Silver oz.	Silica %	Alumina %	Iron %	Lime %
[illegible]	105.05	10.52	64.6	5.4	6.0	8.3
34	52.29	11.47	66.4	4.4	5.7	7.8
35	52.19	11.65	66.1	4.6	5.9	8.5
36	53.16	10.13	64.4	5.8	5.0	9.0
37	52.18	9.42	63.4	5.1	6.0	8.9
38	51.78	7.61	66.7	5.5	5.4	8.1
39	103.79	8.37	65.1	5.6	5.7	8.3
40	110.13	8.32	62.8	6.4	6.1	8.0
41	93.05	9.05	65.0	5.2	4.3	11.3
42	52.87	10.00	64.7	4.8	4.4	11.0
43	105.02	11.69	62.6	7.5	4.4	9.4
44	53.21	10.74	62.5	7.6	4.3	8.8
45	109.91	13.03	64.4	6.8	4.0	10.6
46	157.59	9.99	62.5	5.9	4.9	13.7
47	51.82	8.58	63.0	6.2	4.5	10.2
48	49.97	8.21	62.3	6.8	5.4	8.9
49	154.06	9.59	62.4	6.1	4.5	10.1
50	109.73	10.57	64.1	4.8	4.2	10.4
51	45.64	9.89	64.8	4.2	3.6	10.0
52	55.35	10.53	64.9	6.3	4.2	11.1
53	63.41	10.87	64.1	6.2	5.0	11.3
54	52.74	10.83	67.5	4.0	5.2	9.5
55	116.86	9.55	67.1	4.8	4.8	10.4
56	100.60	9.88	62.8	5.5	6.1	9.8
57	56.92	9.88	63.1	5.6	5.3	11.7
58	111.50	11.06	63.6	6.8	4.2	9.7
59	49.31	9.49	65.1	4.7	5.2	11.0
60	50.58	10.75	63.3	4.9	5.2	11.2
61	51.39	9.92	61.5	5.8	5.7	11.4
62	105.68	10.93	62.1	4.6	4.9	10.7
63	153.01	10.60	63.5	4.9	4.3	10.3
64	50.34	11.43	64.1	4.9	3.7	11.0
65	103.63	11.11	63.0	5.4	4.3	12.3
66	51.21	10.95	63.5	5.6	4.2	10.1
67	103.65	12.15	63.5	5.2	4.4	11.9
68	157.66	10.15	65.0	4.0	4.3	10.9
69	49.98	10.71	65.0	2.6	3.4	12.3
70	52.28	10.20	63.9	2.5	4.4	14.2
71	53.74	11.07	64.7	4.0	4.1	10.6
72	104.61	8.78	64.8	5.2	4.2	11.8
73	54.12	9.72	63.9	4.4	4.1	10.7
74	157.38	9.70	61.2	5.4	4.5	10.9
75	101.34	10.74	63.7	2.3	3.7	12.8
76	98.69	10.20	64.4	4.0	4.8	11.7
77	50.05	8.82	61.7	4.9	5.2	11.9
78	52.61	9.59	62.7	4.0	4.7	11.3

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NOV 15, 1948 - JAN 4, 1949

No.	Dry Tons	Silver-oz.	Silica %	Alumina %	Iron %	Lime %
59	181.27	7.96	64.5	7.1	5.2	6.4
60	140.87	7.93	61.8	7.1	5.8	7.1
61	94.45	7.33	64.0	6.8	6.4	6.7
62	46.38	5.64	64.1	8.6	5.9	4.9
63	141.55	5.20	62.5	8.4	6.6	4.6
64	91.00	6.54	62.3	8.3	7.1	4.0
65	143.23	5.25	63.2	8.6	6.7	4.8
66	101.03	6.30	64.0	7.7	5.9	5.8
67	47.18	7.28	64.3	6.9	5.1	7.4
68	90.60	8.31	63.5	7.4	5.8	7.7
69	140.47	6.23	63.3	7.3	6.8	4.2
70	99.52	5.99	62.1	7.9	6.5	6.1
71	95.61	7.62	62.7	7.1	5.8	7.4
72	139.54	10.00	63.6	7.2	5.4	7.5
73	92.98	8.61	63.4	7.2	5.7	6.9
74	94.74	6.79	62.0	8.6	7.3	4.5
75	133.35	5.52	62.7	9.0	7.1	4.5
76	94.81	5.67	61.7	9.8	7.6	3.2
77	147.25	7.29	62.9	7.7	6.2	5.8
78	51.00	6.62	62.5	8.5	6.9	4.8
79	49.35	5.81	61.6	8.9	7.9	3.3
80	99.53	5.25	60.8	9.8	8.4	2.5

JAN 7, 1949 - MAR 24, 1949

1	135.82	6.50	60.6	9.0	7.7	3.2
2	48.78	7.30	61.2	7.6	5.1	5.4
3	252.57	8.30	64.0	6.3	6.3	6.5
4	162.42	7.86	63.1	6.1	6.6	6.3
5	110.27	7.97	62.6	7.4	5.9	6.5
6	150.75	7.05	64.8	7.1	6.5	6.0
7	96.78	6.15	61.5	9.1	76	4.3
8	203.02	7.55	61.5	7.9	7.5	5.3
9	151.21	8.91	62.5	6.5	5.7	7.6
10	99.82	7.47	60.5	8.6	8.4	4.7
11	51.15	8.93	62.0	7.0	7.2	7.3
12	54.94	8.99	59.3	7.7	8.4	6.2
13	153.86	8.97	64.2	5.4	5.3	9.6
14	98.45	9.07	64.0	5.4	4.4	10.3
15	147.51	8.98	63.4	5.9	5.1	10.3
16	100.64	8.77	62.5	7.1	5.6	9.0
17	102.30	10.48	62.5	5.6	4.9	10.7
18	51.14	9.85	63.4	5.8	5.1	10.0
19	203.88	8.54	64.1	6.4	6.4	6.5
20	105.06	8.95	62.1	7.1	6.9	8.0
21	158.91	8.01	64.1	6.5	5.7	8.4
22	107.91	8.41	63.9	8.2	7.1	4.5
23	108.28	8.99	63.1	7.8	6.9	6.3
24	107.02	10.60	63.0	6.1	5.7	8.3
25	106.09	10.22	64.2	5.6	5.0	9.7
26	104.33	9.74	64.9	5.5	4.6	9.8
27	51.74	8.91	65.0	5.0	3.8	10.1
28	158.26	9.08	63.4	4.9	4.6	9.9
29	151.25	9.33	65.0	6.1	4.5	9.8
30	50.86	10.19	66.2	5.2	4.4	9.1
31	52.47	9.82	65.8	4.6	4.3	10.3
32	158.47	10.50	64.9	5.4	5.4	9.6

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R HAYDEN SMELTER June 1, 48 - ~~June 4, 1948~~ Nov 15, 1948

No.	Dry Tons	Silver-oz.	Silica %	Alumina %	Iron %	Lime %
1	231.08	11.01	65.0	5.0	3.6	9.6
2	93.32	10.35	64.1	7.1	5.0	7.4
3	146.72	10.50	63.5	6.4	4.8	17.6
4	96.60	10.27	64.1	6.7	4.4	6.9
5	46.00	13.10	63.9	9.5	5.8	5.9
6	134.68	8.93	64.3	6.2	4.5	7.7
7	102.62	10.29	62.5	7.4	5.3	8.3
8	51.16	10.83	70.5	3.9	2.3	7.0
9	54. 72	7.75	71.8	3.7	2.5	7.7
10	102.26	5.89	69.3	6.4	4.5	5.6
11	90.31	6.40	68.7	5.6	4.9	6.4
12	94.05	5.56	68.8	5.6	5.7	5.4
13	184.23	6.80	balance incomplete			
14, 15 & 17 missing						
16	85.30	7.80	72.0	5.0	5.8	5.5
18	90.51	7.37	65.3	3.1	4.8	9.2
19	42.84	8.18	66.2	3.9	3.9	9.8
20	84.21	8.47	64.3	4.4	4.4	9.9
21	48.09	7.10	66.3	5.1	5.5	7.1
22	94.77	8. 27	65.7	5.2	4.9	9.5
23	140.01	5.97	62.0	9.2	7.4	4.1
24	45.52	4.05	63.1	9.7	7.5	2.3
25	179.56	6.50	63.5	8.2	7.5	3.5
26	90.72	9.50	61.9	7.7	8.2	4.1
27	91.82	8.92	61.5	9.0	9.3	2.3
28	137.38	8.77	64.5	9.8	8.4	2.6
29	139.58	9.17	65.9	8.3	7.9	2.9
30	94.34	9.00	67.0	7.7	7.5	3.1
31	132.72	8.53	67.3	10.0	6.9	1.9
32	89.86	7.55	64.6	11.6	6.7	1.6
33	94.60	7.17	66.5	10.3	3.8	2.0
34	45.21	8.47	66.0	11.0	5.6	2.0
35	192.69	7.95	66.7	12.0	6.0	1.8
36 & 37 missing						
38	143.51	8.86	65.0	10.8	7.3	2.2
39	95.08	8.90	64.0	12.2	7.6	2.5
40	145.31	9.32	66.6	8.6	6.3	3.9
41	51.57	9.19	65.5	7.7	5.2	7.0
42	145.40	8.90	65.5	6.4	5.7	5.1
43	98.14	9.64	65.2	5.8	5.2	8.0
44	97.29	9.73	66.2	5.3	4.3	7.3
45	145.75	8.10	61.5	7.7	7.5	6.1
46	97.26	8.47	63.8	6.1	6.1	8.9
47	99.35	7.03	64.5	6.4	6.0	7.5
48	134.31	4.51	61.2	10.2	7.8	3.5
49	92.72	4.24	62.7	9.2	8.8	2.9
50	183.64	5.98	65.0	8.4	6.8	3.3
51	45.63	6.59	65.3	10.0	6.2	3.5
52	135.47	7.29	66.6	6.9	6.3	3.7
53	91.77	5.56	65.1	9.2	6.3	3.7
54	91.13	3.64	63.2	10.4	6.5	3.4
55	47.90	3.83	63.4	9.6	6.3	3.6
56	96.86	9.25	63.2	5.6	5.1	8.0
57	45.42	9.54	64.0	6.1	4.5	8.8
58	45.14	9.17	66.6	5.6	4.2	8.0

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SILVER REEF MINE
Smelter Returns 1948 thru 1951

Year	Smelter	Weighted Average Ag - Oz.	Weighted Average SiO_2 - %	Tonnage Shipped
1948	Hayden (June-Dec)	7.74	64.45	7552.96
1949	Hayden (Jan-Sept)	9.34	63.45	7769.90
1949	El Paso (June-Dec)	9.15	62.45	5460.90
1950	El Paso (Jan-Feb)	8.75	---	1175.97
1950	Hayden	8.76	70.19	11415.34
1951	Hayden	6.93	70.62	1808.32
	Overall Average	8.64	66.16	35183.39 Total

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C O P Y

SILVER REEF MINING COMPANY'S PROPERTY

LOCATION AND TITLE.

The nearest railroad point is Casa Grande, Arizona, 13 miles to the north, on the main line of the Southern Pacific Railroad. The property comprises eleven adjoining and partly overlapping mining claims. Patent had been applied for in the name of Frank M. Leonard, and so far as is known, there are no adverse suits. The Pinal County Records show that Frank M. Leonard purchased the Nugget Claim for $2000.00; the Silver Nugget Claim for $2500.00; the Lead Boulder and Horn Silver Claims, with the mill and other improvements, at Sheriff's Sale for $3127.88; and paid various small sums at tax sales.

The property is now vested in the Silver Reef Mining Company, incorporated under the laws of Arizona, with a capitalization of 1,000,000 shares, par value $1.00 eadh. All the shares have been provisionally allotted as follows:

John Hays Hammond	150,000	shares
H. H. Burger	50,000	"
Chas. H. Leonard	100,000	"
Frank M. Leonard	100,000	"
" " "	500,000	"
Frank W. Rayoyer	100,000	"
	1,000,000	"

The half million block of shares allotted to Frank M. Leonard is intended for sale for development etc. The legal business of incorporation has been attended to by Mr. Chas. H. Leonard, an eminent corporation lawyer, and it may be safely assumed that everything in this connection is in order.

TOPOGRAPHY.

The ore deposits occur in rugged hills of mederate elevation above desert plains usual in Arizona. Aneroid readings at the camp varied from 1575 to 1675 ft. during my visit. (The elevation of Casa Grande thirteen miles to the north, is given by the railroad as 1395 ft.) The mount of the main crosscut tunnel on the Nugget Claim showed 1850 ft.; the outcrop of the Nugget vein above the crosscut, 1900 ft; and the collar of the main shaft on the Horn Silver vein 1675 ft. Water for milling and domestic purposes is obtained from the mine. There is no local timber. Mining operations can be conducted all the year round, though the summer is rather hot for surface work.

GEOLOGY.

The basal formation is coarse granite or pegmatite, containing lenses and veinlets of quartz in all directions, as is common with permatite. Overlying the pegmatite are the remains of deposits of andesitic breccia and tufa, which no doubt once covered much larger areas, but have been eroded so that the underlying pegmatite is exposed in the gulches and lower hillsides. The rather basic andesitic breccia immediately above the main corsscut on the Nugget Claim bears much resemblance to the Marshall Basin formation with shich you are so well acquainted, but no resemblance to the more acidic rhyolite. I am therefore adopting Boyer's nomenclature.

COPY
GEOLOGY Cont'

The veins, of which there are three or four, appear to me to be in shattered fault zones. There is some cross-faulting, but the throw is generally only a foot or two, so that the vein can be easily followed up in drifting. The shattered fault zones are silicified so that the quartz filling has a banded structure, both in the andisitic breccia and in the underlying pegmatite. The original constituent quartz veinlets and lenses of the pegmatite do not have this banded structure, nor apparently any considerable values in silver outside of what I am calling the shattered fault zones. The pegmatite does, however, show interesting bunches of sulfenite (molybdate of lead) and vanadinite (CHloro-vanadate of lead) which I will refer to lated when describing the old Horn Silver workings. The portal of the main Nugget crosscut is in pegmatite, but the open workings on the vein a short distance up hill have both walls in the andesitic breccia, though the contact of the andesitic breccia and pegmatite is nearby. A short distance to the west a clean and polished contact shows no ore on the contact. Farther west, towards the middle of the property, both walls of the vein here exposed are in pegmatite, as are both walls of the Horn Silver vein still further west. I must conclude, therefore, that Royer's description of the veins as contact deposits is not justified by the evidence, though where the shattered fault zones happen to coincide with the contact, ore may be found on the contact of the formations. This is no disadvantage to the prospect of finding pay ore in depth in the pegmatite by means of the prospect development work, but rather an advantage. It appears to be a fact, however, that the best silver values have hitherto been found in or near the overlying andesitic breccia; and that the formation is comparatively shallow.

WORKINGS

The notice of application for patent, now posted on the ground, mentions 36 shafts, 8 tunnels, 7 cuts, 7 drifts; 1 winze, 3 crosscuts; and 2 stopes. The total cost is estimated at $22,350.00.

THE NUGGET WORKINGS

These, the only ones considered in Royer's report, are located at the joint end of the Nugget and Silver Nugget claims. The vein has a strike of about N 79 E (true) and only a slight dip. A short crosscut tunnel, commencing in pegmatite and soon reaching the andesitic breccia, cuts the vein at a vertical depth of about 50 feet below the outcrop. For a length of about 120 feet stoping has been carried to the surface, and pillars of ore left; presumably less valuable than the ground stoped. About halfway to the surface I took a sample across 8 feet of banded quartz and andesitic breccia which assayed (A) 18.10 oz. silver. Near this point Royer's assay map indicates that a sample across 6 feet assayed 15.5 oz. silver. Here and elsewhere the ore showed no visible silver except possibly a very little argentite, too fine for identification without a microscope. Down below at the fork, in the level, near where Royer indicates a value of 25.8 oz. for 6 feet, my sample across 4 feet assayed (B) 18.30 oz. Next to this I sampled 8 feet which assayed (a) 11.90 oz. My two samples therefore indicate a value of 14 oz. for the total width of 12 feet, which happens to be very close to Royer's figure of 14.2 oz. for 12 feet, based on a large number of samples. My six check samples taken at arbitrary points, averaged 13.5 oz. for 6 feet. Omitting the one sample (N) taken 25 feet above the level, my five samples averaged 12.2 oz. for 5.9 feet. Along the drift at a point where Royer's map indicates 14.6 oz. for 4 feet, my sample across

4 feet assayed (C) 9 oz. May sample across ten feet along both walls of the crosscut immediately north of the drift assayed (L) 11.80 oz. Royer here shows two samples, each 5 ft. assaying 14 oz. and 8 oz. respectively, or 11 oz. for the 10 feet I sampled, a remarkably close check. At apoint above 20 feet east of the fork in the drift where Royer indicates 11.6 oz. for a width of 3½ feet, my sample across the same width assayed (M) 11 oz. another remarkably close check. My grab samples from the small dump outside assayed (F) 10.10 oz. From these few check samples I cannot but conclude that the values are about as represented on Royer's assay map, and that they are a reasonable basis for estimating possible ore to be developed by the work now proposed.

With regard to the total width of the pay ore, the crosscut at the end of the drift was so nearly full of broken dirt, that it could only be fairly sampled after doing more work that would seem warranted at this time. Grabs along 35 feet of broken country rock and quarts which had been thrown back assayed (E) only 2 oz. silver. At the northeast end of the crosscut, extended, I am informed since Royer's sampling, and which might in a few feet be extended through to the surface, is an interesting exposure of the contact of the andesitic breccia where it fills the troughs in the former surface of the pegmatite. At the contact can be seen specularite, iron oxide, a little manganese and slight copper stains. A sample across three feet assayed (K) 2.30 oz. of silber and a trace of copper. A four inch streak of feldspar, with iron and manganese, assayed (D) 3.50 oz. silver. These are apparently beyond the limits of the pay ore. To arrive at the estimated width of the pay ore expected to be developed below the present crosscut level, Royer has added 3' to the 12' of his average samplings, making 15'. This appears to me to be reasonable. a 40 foot winze, which is proposed to extend to 100 feet, shows ore near the bottom. Water now in the winze prevented my sampling the ore without the erection of a stage etc. which did not appear to be warranted at this time. The 25,000 tons of possible ore estimated by Royer as below the crosscut level have, of course, yet to be developed by the extension of the winze another 60 feet and the driving of 250 feet of level and a 100 foot raise from the bottom. Some development work will also have to be done above the crosscut tunnel level to make the ore there available. The estimated cost of $25,000 should be plenty for the proposed development work on the Nugget vein.

THE HORN SILVER WORKINGS

The shaft, called 325' deep, on the considerably flatter slope of the vein than the Nugget Vein, is shown by the aneroid to have a vertical depth of 235 feet. A 50 foot winze, now full of water, has been sunk from the bottom level. Considerablestoping has been done, but I am informed that the silver ore in sight is mostly of too low grade to be commercial. Both vein walls are pegmatite and I judge the average width of the vein to have been about four feet. In places the vein matter is brecciated. The silver values were probably bunchy. On the bottom level near the mouth of the winze, are small bunches of wulfenite and vanadanite. One sample (H) across one foot assayed 4.40 oz. silver; .42% molybdic acid; and .16% vanadic acid. Another sample nearby, same width, assayed (I) 4.50 oz. solver; .66% Molybdic acid; .65% vanadic acid. On the second level above is a considerable showing of disseminated wulfenite and vanadanite. On the chance of finding a definite pay streak of molybdenum or vanadium ore, some prospecting would seem to be adviseable here. Fifteen to twenty percent molybdic acid concentrates are now worth two dollars or more a pound at Arizona points, for the contained molybdenum, which is six-tenths of the molybdic acid. The wulfenite is not difficult to concentrate. the vanadium is generally

COPY
THE HORN SIL[illegible]WORKINGS CONT'D.

considered objectionable with the molybdenum, but can easily be separated chemically and then has a good market value. Some grab samples I took from the Horn Silver dump, more particularly for the molybdenum and vanadium, assayed (J) 18.0 oz. silver; 10% Molybdic acid; and .50% Vanadic acid. The small tailing pile at the mill grap sampled by scraping some of the surface assayed (G) silver 9.20 oz. Molybdic acid .64%.

METALLURGY

Reports on Cyanide test made on the ore by Sill and Sill, Los Angeles, for the owners, indicates an extraction of 80 to 89.3% of the silver values. (The gold content is generally negligible.) The consumption of cyanide varied from 1 lb. to 4.2 lbs. per ton of ore treated, and of lime, from 2.4 to 5.2 lbs. A combined flotation and cyanide process has also been experimented with. In any event, Royer's estimate of $3.00 per ton for milling should cover the cost.

EQUIPMENT

The mill contains a Dodge crusher; 2o Fraser and Chalmers gravity stamps; old vanners (dismantled); tube mill; cone classified; and a Fairbanks and Morse 40 HP enigne. The building itself is in bad repair. Outside are two old type copper smelters, one never erected; and 2 Baker blowers. The complete set of tools for a small crew on the ground. The camp buildings, other than the mill, are in fair condition.

CONCLUSION

The property appears to be worthy of further development, with a good chance of success. As suggested in my telegraphic message, I think you are entitled to more favarable terms, inasmuch as without the expenditure of such funds as you are asked to supply, the present promoters can reap little, if any, profit from their investment.

Respectfully submitted,

(Signed) L. F. S. Holland

Mining Engineer

*

June, 1957

GREENHORN MINING COMPANY
(Silver Reef Mine)

Pinal County
Casa Grande Dist.

T8S,R5E, Sec's 23-24. - Silver Reef Mountains
Papago Reservation, SW of Casa Grande

Ore shipped from 1948 to 1951 inclusive - averaged 8.64 oz. Ag 66.16% SiO_2 (Some Cu & Some Lead) Lime varied from 1.8 - 17½%.

Shipped to Hayden and El Paso.

Faulted vein extending 1½ Mi. along side of Silver Reef Mtns.

Principal Minerals: - Silver, Lead, Zinc. Galena, sphalerite, Argentite (Sooty)) Cerargyrite, Vanadinite, Cerussite, Wulfenite.

Probably - Calamine and Anglesite, Chrysocolla & Shattuckite - little Malachite - Psilomalone Flooding along main fault.

LEWIS A. SMITH

*

NOTES ON SILVER NUGGET and SILVER REEF MINE.

Location. 12 miles south of Casa Grande, Arizona; by very good road; approximately 19 miles south of the Lake Shore Mine.

Date Visited. April 28th, 1920, with F. W. Leonard and F. B. Church.

The property consists of 10 claims and one fraction; owned by the Silver Reef Mining and Milling Co; see blue print of claims and assay maps attached.

Outcrop and workings lie on the slope of steep hill facing to the north and on tilted contact between granite foot wall and rhyolite hanging wall. I am not certain whether there is a true contact fissure at this point or not; strike of veins East and West.

Silver Ledge workings about 425 feet deep and considerable drifting; also some stoping. Equipped with an old Mill and Lead Jacket for smelting ore. Treatment was concentration and cyanidation of tailings. An attempt was made to smelt the concentrates but appears to have been unsuccessful. The first work done here was in the 70's and 80's; mill and smelter constructed in the 90's. Was apparently largely a stock selling project. Ore carries lead and low values in silver. Workings were not visited and were stated by Leonard to show very little ore.

The Silver Nugget Mine lies 3500' east of the Silver Ledge. It is developed by an adit with old stopes and raises to the surface, about 60 feet above a winze about 60' deep. Equipment consists of a gasoline engine; small compressor and some rails and mine cars.

Vein is developed for length of about 120 feet in an adit level and apparently no working was done at the bottom of the winze, although it is said that good ore was found continuously in the winze. Assay maps show ore to continue both ends of drift and apparently ore body is somewhat wider than development would indicate. The width appears to be about 50 feet and the average grade of ore according to Royer's sampling which was checked by Johns is 14 oz. silver. There is no gold and very little lead in this ore. The values are mainly in the form of silver-chloride, also some argentite. The ground is quartz; crushed wall rock and considerable lime. The high grade ore has been stoped out in stringers and small lenses.

Royer estimated as positive 30,000 tons of 14 oz. ore above the adit. This estimate appears reasonable from measurements and assay map. The principal value of the property lies in the probability of developing a much larger tonnage below the adit and at the other end of the drift. If the vein is actually 50 feet wide it will run into tonnage fast, and the prospect seems well worth additional development which could be accomplished at comparatively small expense.

There is a good site for a mill or treatment plant * on the hillside below the mouth of the adit and the ore should be susceptible to treatment by cyanidation or Volatilization.

NOTE: SEE Volatilization test on sample taken from dump.

There is said to be plenty of water at the bottom of the Silver Ledge shaft and the quality is reported good. The property has all been surveyed and passed for patent and

c-o-p-y

701 Hollingsworth Bldg.,
Los Angeles, California.

August 14th, 1917.

Mr. John Hays Hammond,
120 Broadway,
New York City.

Dear Sir:-

I beg to submit for your consideration and approval a plan to finance the treasury of the proposed Silver Reef Mining Company.

This company is in process of formation. The holdings consist of eleven mining claims upon which survey for U.S.patents have been made and it is expected that the patents will be granted some time this fall.

The company being formed will have a capital of 1,000,000 shares par value $1.00 per share.

It is proposed to issue 500,000 of the shares of this corporation to the present owners of this property, as follows:

John Hays Hammond - 40%	.....	200,000 shares
Chas. M. Leonard - 20%	.....	100,000 "
Frank M. Leonard - 20%	.....	100,000 "
Frank W. Royer - 20%	.....	100,000 "
Total shares issued	.....	500,000 "

This will leave 500,000 shares unissued, which can be issued and sold as funds are required for developing and equipping this property.

ASSETS:

The assets of this company will consist of 11 patented mining claims upon which are located a number of living houses, boarding houses, stables, a twenty-stamp mill containing a 15" x 24" Blake crusher, 5" x 10" tube mill, a number of steel tanks, a 40 H.P. gas engine, etc.

The mill building and much of this machinery is in a fair state of repair and will be used when a new milling plant is built.

Located near the upper end of this mill a shaft 250 feet in depth has developed enough water to supply a camp and mill of at least 100 tons daily capacity.

patent will be issued on payment of the necessary fee, according to Leonard.

The company owning this property is known as the Silver Ledge Mining & Milling Co., an Arizona corporation; capital 1,000,000 shares of Common Stock at $1.00 par value per share. The stock is now held as follows:-

F. W. Leonard	100,000 shares
Chas. Leonard	100,000 "
F. W. Royer	100,000 "
John Hays Hammond	150,000 "
James Gerard	100,000 "
Total Issued	550,000 "
Stock in Treasury	450,000 "
	1,000,000 "

There is apparently no cash in the Treasury and no market for the Treasury stock. The owners of the issued stock put up part cash and altogether some $50,000 appears to have been spent by the present company, this including the cost of purchasing the claims and a very small amount of development work.

My suggestion to Leonard was that all owners of stock should put back into the treasury one-half of their holdings which would then provide the Treasury with a total of 725,000 shares leaving 275,000 shares of stock with the present stock-holders pro rata. A syndicate then to be formed by parties to whom 25,000 shares of stock should be given for promotion and on the basis of a new sampling to be conducted at the expense of these parties. The syndicate should guarantee, provided such sampling checked Royer's results--to purchase at once 100,000 shares of Treasury stock at 25 cents per share, thus providing the company with $25,000. --necessary for additional development. If the expenditure of this money resulted in developing an additional 70,000 tons of ore, or thereabouts, the Syndicate should further guarantee to purchase the remaining 600,000 shares at 25 cents a share thus providing the company with an additional $150,000 of which sum approximately $25,000 would be required for additional Mine equipment and approximately $100,000 for the construction of a treatment plant, leaving $25,000 working capital which, under the conditions, should be sufficient. The present stock holders should have the right to participate in the syndicate in such share as to leave to them 49% of the total authorized stock of the company; leaving to the new investors and promoters 51%, i. e., the controlling interest.

I would estimate working costs roughly as follows:

MINING	$2.00	
Treatment	4.00	
Overhead & selling expense	1.00	
Total		$7.00 per ton.

Assume recovery of 80% of the values and average grade of ore 14 oz. per ton with silver at $1.00 per ounce and a recovery of $11.20 per ton should be effected, leaving a net profit of $4.20 per ton of ore mined or $420,000 on the 100,000 tons which should be developed before the Syndicate was obliged to purchase the principal quantity of stock. In this way the Syndicate would be assured of getting their money back even if no more ore were developed and would have a most excellent chance to make a large profit in the probable event of additional ore reserves being proven and subsequently mined and treated.

It would appear from the above that the mine might be worked profitably with silver down to 70 cents per ounce and the cost figures are believed to be liberal estimates which might be materially improved with practice.

Humboldt, Arizona
May 5th, 1920

(NOTE: Statement not signed but prepared by (some member of the Engineering Staff of (Western Metallurgical Co.)

This shaft is equipped with a Cornish type pump, operated by a gas engine, all of which is in good working order.

VEINS AND ORE BODIES:

The country rock is granite and rhyolite. The veins are lead, copper, silver bearing veins at the contract of the granite with the rhyolite, and in some instances entirely in the granite.

The gangue rock of the veins is quarts and brecciated country rock.

Four large veins are within the boundaries of these claims. At one time the veins included within the limits of these claims were owned by a number of different companies or individuals, and considerable work was done and ore shipped from every vein.

The workings having the best showing of ore at present are located in the Nugget claims. A map of these workings accompanies this report.

ORE BODIES IN THE NUGGET WORKINGS:

The workings shown on the accompanying map consist of a short cross-cut tunnel which cuts the vein at a depth of 60 feet below the outcrop; a drift along the vein for a distance of 150 feet, and a winze 40 feet deep below this adit level.

These workings have been thoroughly sampled by me.

The adit level for a length of 120 feet and for a width of ore exposed of 15 feet gives an average of 14.2 ozs. silver per ton. This average does not include high grade ore which has been gouged out and shipped.

Above the adit level there is exposed in the accessible portion of the vein, ore which, over an average width of 4.7 feet assays 36.7 ounces silver.

The vein on the surface and the adit level is from 24 to 35 feet wide,

ORE BODIES:

Before a tonnage of ore can be estimated some development work must be done.

It is estimated that there remains in the old workings above the adit level to the surface and to a distance of 50 feet

beyond the present breasts, 7000 tons of ore having an average value of 25.0 ounces of silver per ton. This is obtained by assuming the vein to be but 15 feet in width while the outcrop and two crosscuts on the adit level show the width of ore to be 33 feet.

Below the adit level, to a depth of 100 feet and assuming the ore to continue to a distance of 50 feet beyond the extremity of the ore opened on the adit level, or a total length of ore shute 250 feet, and assuming the width of workable ore to be but 15 feet, there will be in this block 26,000 tons, value 14.2 oz. silver.

On the dump at the mouth of this adit is 200 tons of ore assaying 15.9 oz. silver.

SUMMARY

	Tons	Ounces Silver	Total Ounces
Above adit level	7,000	25	175,000
To depth 100 feet below	26,000	14.2	369,200
In dump	200	15.9	3,180
	33,200		547,380 oz.

Average per ton 16.5 oz. Silver.

The cost of doing the work necessary to open up this ground sufficient to put the above tonnage figures in sight will be

	feet
Drifts and raises on and above adit level	290
Winze to depth of 100 feet	60
Drifts on 100 foot level	250
Raise	100
TOTAL	600

Practically no timbers or equipment would have to be purchased for this work.

The total cost of doing this work including general expenses, etc. will not exceed $25,000.

Tests have been made upon samples of this ore by several metallurgical firms and they report that by combined flotation and cyanide, a recovery of 90 to 93% of the silver value, with a loss of cyanide of from 1 to 3 lbs. per ton of ore treated.

Assuming a recovery of 80% of the silver and giving no consideration to the lead or small amount of gold in the ore which would be saved by flotation and cyanide, we have:

Total tonnage - - 33,200.

Basis 100 tons daily-Average value per ton 16.5 oz. Silver Silver at 85 cts.

80% of 16.5 oz. - 13.20 oz. at 85 cts. ---------$11.22

Costs.

Mining	$2.00	
To Mill	.25	
Milling	3.00	
Metal realization	.25	5.50

Estimated profit per ton .....l.....$ 5.72

To put the present mill in shape to mill economically 75 to 100 tons per day using a combined flotation and cyanide treatment should not exceed a total of $40,000.

SUMMARY AND CONCLUSION

The development of the Nugget mine should bestarted at once. The bottom of the winze and both breasts of the adit level, where work will be started, are in low grade ore, and judging from the meager data obtained from sampling the outcrop, ore may be expected to extend for much longer distances than I have estimate . The money necessary to do the work required is $25,000. which should be raised immediately. Considerable high grade silver ore has been encountered and shipped while running the adit level and it is probable that in doing the work contemplated some revenue can be obtained from shipments.

The chances for opening up a big low grade silver mine are extremely good and the figures given above are simply meant to illustrate what I consider to be the poorest possible outcome of this development work provided the values to not leave entirely as we go down.

Sincerely,

(signed) F. ..oyar

MEMO

ALL OF THE INFORMATION AND OPINIONS EXPRESSED IN THIS MEMO, WITH THE EXCEPTION OF THE COPIES BY MR. BUTLER WERE OBTAINED FROM HEARSAY

In 1936 I acquired title to a group of claims known as the Silver Reef. Naturally I became interested in its history and previous operation. In the course of my studies I came across one fact which, I think, has particular significance. The following is an explanation of what happened.

1. In 1928 a Mr. Percy Williams (a mining Engineer of wide experience and the man who wrote the report just preceding this memo) interested Mr. Charles A. Belin (whom I understand was a member of the Dupont family) in this property.

Under Mr. Williams direction some fifty or sixty thousand dollars was spent in sinking a shaft and driving an adequate extraction tunnel and doing considerable drifting. It is my understanding that, when this work was completed, they were going to sink on the vein until they encountered a secondary enrichment which Mr. Williams was sure existed.

In the latter part of 1929 Mr. Belin (whom I understand was tubercular at the time of the beginning of the operation) became very ill and was not expected to live. Mr. Belin then retained Mr. G. Montague Butler, of the University of Arizona, to make an examination of the property and advise if in his opinion the mine has possibilities of developing into a large property or if it looked like a small deal.

On December 4, 1929 Mr. Butler wrote a letter to Mr. Belin a copy of which immediately follows this memo.

Acting on the conclusions drawn by Mr. Butler, Mr. Belin withdrew from the project and the work was shut down. Nothing further was done on the property other than a small amount of leasing until 1936 when I acquired ownership of the property.

*

2. The reason Mr. Belin abandoned the project was based on the statement made by Mr. Butler on Page 1, Par. 4, of his letter of December 4, 1929. The significant statement made by Mr. Butler that there could be no secondary enrichment are contained in that part of the Par. which I have underscored with red lines. You will note that he states that silver could not be transported because of the presence of calcite (calcium carbonate) in the vein.

3. In 1936 I acquired title to this property and in the course of my search into its past history I secured a copy of this letter written by Mr. Butler. In the latter part of 1936 I called upon Mr. Butler at the U. of A. And asked him if he had any information which would be of value to me concerning this property. From his I ovtained some of the information which I have related in the foregoing.

4. In 1937 I came across a publication written by Mr. Butler. This was Geological Series No. 8, Bulletin No. 139, Arizona Bureau of Mines and was published August 15, 1935. In this bulletin in the last Par. on Page 35 and completed on Page 36 Mr. Butler directly contradicts the statements made in his letter to Mr. Belin on December 4, 1929.

5. I then wrote Mr. Butler concerning this particular item and you will note that in his letter dated March 26, 1937 he again states that the presence of calcite does not cause a precipitation of silver that is held in solution in natural solution.

I. M. Clausen

*

DESCRIPTION OF SILVER REEF MINES

Near.

CASA GRANDE, ARIZONA.

OWNERS:

Silver Reef Mining Company, $1,000,000 capital stock divided into $1.00 par value shares.

LOCATION:

In Casa Grande Mining District ten miles from Casa Grande on the Southern Pacific R. R. in Pinal County, Arizona.

MINING CLAIMS AND ACREAGE:

Eleven claims comprising approximately 300 acres, extending 6000 feet along the strike of the main Silver Reef fissure vein and covering several minor fissures and spurs; also taking in sufficient area of land for camp site, mill site, stores and townsite.

Property all surveyed for patent by Paul E. Fernald, U. S. Deputy Mineral Surveyor.

HISTORY:

The Silver Reef was the scene, some seventy years ago, of extensive production of high grade chloride silver ores from pockets and streaks occuring in the big quartz fissure near the surface. When these superficial bonanzas were exhausted, the hardness and low grade character of the vein quartz discouraged early miners from anything more than half-hearted attempts at deep mining.

*

After lying idle for many years, the property was purchased some fifteen years ago by present owners (a group of experienced mining men) who recognized not only its possibilities of future, deep-seated bodies of high grade silver-lead ores, but also were aware of the great value of its low grade 15 and 20 ounce silver ores, when blocked out in quantity sufficient to justify large operations by the cyanide process.

The Silver Reef was incorporated and a control of its stock apportioned amongst this group of skilled mine operators who were actively engaged in various mining and engineering operations elsewhere. They always intended to do something with the Silver Reef, but on account of their preoccupation with other interest, never got around to doing any active work beyond giving temporary, superficial leases on the Reef to contractors who shipped large tonnages of 15 and 20 ounce silver quartz to smelters requiring millis flux.

No systematic, deep exploration on this great vein has been done. The present owners are now unable to get together upon plans for re-opening and developing the silver-lead ores of this property, and have optioned the treasury stock to a group of younger mining engineers and business men who will undertake to place the property on a profitable basis within a year after equipping with machinery and doing some preliminary shaft-sinking and deep mining.

GEOLOGY:

The Silver Reef is a great fissure in granite from two to thirty feet thick, averaging 10.2 ounces of silver at

its widest point with high grade hanging wall and footwall streaks (now largely mined out from the surface down to the 100 foot level.)

The vein dips easterly at varying degrees, and at the surface is traceable on the Company's property for approximately 6000 feet, being covered for much of this distance by uneroded rhyolite capping rocks. Several intrusions of basic dykes, aspecially Syenitic rock, is noticeable and wuch undoubtedly have much importance in the geological history of this vein system.

The Silver Reef has numerous unexplored, smaller and seemingly parallel hanging wall veins. The deepest workings show lead sulphides beginning to appear in quantity sufficient to encourage expectations of profitable lead ores to result from deep exploration of the main reef, in addition to the silver values.

DEVELOPMENT:

It is proposed to drive a 300 foot crosscut tunnel from the surface to cut the vein at a lower horizon, and then sink 200 feet on the vein from this intersection, and drive exploration drifts and crosscuts from the bottom of this new shaft. It is expected that this work (requiring about a year) will result in an increase of present reserve of 15 to 20 ounce silver ore, extensive enough to justify installation of a 300 ton cyanide plant. Also it is believed this development program will render available important tonnage of 25 to 50 ounce silver smelting ores and lead smelting ores carrying some silver and 25 to 40 percent lead.

*

(a)

After equipping the property and placing compressed air drills at work, it is certain that the upper portion of the great vein, already partially opened up, can be made to yield at least 50 tons daily of 25 oz. silver ore that can be shipped direct to the smelters at a profit. This means it would not be necessary to await the completion of the deep development program before some profits were coming in. With R. R. freight to smelter from Casa Grande at $1.00 per ton, trucking from mine to railroad at $1.50 per ton and smelter treatment charge of $2.00 per ton, the profits on 50 tons daily of 25 oz silver ore would be $5.50 per ton after deducting a $3.00 per ton mining cost. This is a probable profit of $8,000.00 per month obtainable before the deep mining exploration and development is complete.

If the grade can be raised to 50 ounces per ton and 50 tons daily this profit would amount to nearly $20,000.00 per month. Such a return in the early stages of the venture is only possible if the grade of the smelting ore encountered in the unexplored upper portions of the vein should unexpectedly prove to be twice the grade conservative sampling indicates.

The substantial and lasting profit resulting from the deeper exploration of this vein system (aside from contingent discoveries of high grade silver and lead ores) lies in the practically assured development of large reserves of 15 to 20 ounce silver ore susceptible to cyanide process recovery with flotation auxiliary on a scale of at least 300 tons daily.

Tests have shown that the average 15 oz silver quartz which constitutes the mass of the vein will show a recovery of 88% of its silver contents.

Based on a recovery of 88%, a 15 oz. silver ore, on a scale of 300 tons daily, will show a profit of approximately $3.00 per ton, or $900.00 per day, or over $300,000.00 net per year. This profit is based on a mining cost of $1.65 per ton, a milling cost of $2.00 per ton and freight and refining cost of $0.53 per ton.

The assay maps accompanying this description show, at the Eastern and widest part of the Silver Reef (where exposed by erosion of overlying rhyolite) for a length of 180 feet and a depth of 100 feet, 7000 tons of 25 oz. silver ore and 26,000 tons of 14 oz. silver ore. 200 feet deeper development at this point, together with 1500 feet of deep levels driven, will certainly vastly increase this tonnage of low grade ore at the same time yielding a notable tonnage of higher grade smelting ore.

When it is considered that several thousand feet of this vein remains to be explored for further shoots of high grade silver and lead (whose probable outcrops are concealed at the surface by rhyolite capping) the possibilities of the enterprise become strikingly apparent. Less than one-third of the vein extent laterally has been even superficially explored.

It is believed that with machine drills and a properly equipped assay office, it is possible to recover, from ore blocks

already available near the surface, enough 25 oz. smelting ore to return the entire additional investment of $52,500.00 now to be made. This would protect the investment in the remote possibility that the deeper exploration as planned proved disappointing.

This $52,500.00 will be expended as follows:

1 air compressor and receiver erected	$ 5000.00
Water tanks, pipe, pump, tools, drills, mountings and repair parts	4000.00
1 one-ton truck	1200.00
1 automobile	800.00
1 warehouse and shop	500.00
Overhauling dwellings	1000.00
Assay outfit	500.00
Mexican houses	1000.00
Pumpt for shaft (water and drills)	1500.00
25 H. P. gas hoist	3500.00
2000 ft 12 lb rails and four mine cars	1500.00
300 feet of ait tunnel	3000.00
200 ft of shaft	7000.00
2000 ft drifts and cross-cuts	8000.00
1 pilot mill	10000.00
Mangement one year	5000.00
	$ 52,000.00

Estimated earnings:

Second six months of first year 50 tons daily 25 oz. ore shipped to smelters net	42,700.00
Second year - 100 tons daily of 25 oz silver shipped direct to smelter	200,000.00
Third year and thereafter for [illegible]	350,000.00

Or approximetly $0.25 per share earned annually after one year of development work.

When equipped as above recommended and when financed to accomplish the development work recommended, all properly managed with expert and frequent assay guidance, I can see no reason for any but extremly profitable results from this enterprise.

(Signed) PERCY WILLIAMS

*

Silver Reef
Coso Grande, Ariz.

CONSOLIDATED ARIZONA SMELTING COMPANY

MINE DEPARTMENT

ALL COMMUNICATIONS SHOULD BE ADDRESSED TO THE COMPANY

Original Letter Report

Blue Bell Mine,
Mayer, Arizona,
December 4, 1920.

Mr. G. M. Colvocoresses, General Manager,
Consolidated Arizona Smelting Company,
Humboldt, Arizona.

Dear Sir:-

Pursuant to your request, I have carefully examined the Silver Reef Mine, also, I have gone over the Horn Silver workings, as carefully as possible under the conditions. On the Horn Silver property, only those samples were taken, that, in my judgment, seemed necessary. I spent seven days, from October 21st to October 28th, on the ground and herewith submit my report:

The Silver Reef property is worthy of further development. On it, there is probable ore exposed, of such value, that with a mill on the ground, it may be worked profitably; also the quantity is such that it would pay, for the necessary development and putting the mill in order.

The Silver Reef workings lie at the junction of the Silver Nugget and the Nugget claims -- the two having coincident end lines. The vein is well defined and may be traced the full length of the Silver Nugget claim to the East and also about two hundred feet Westward into the Nugget claim. It is a quartz vein associated with the contact of rhyolite and earlier granite and made up of small quartz stringers. In some places the vein lies

wholly in the granite and in others in the rhyolite; but the best ore seems to be found where it is at the contact, or, in the rhyolite. There are small amounts of wulfenite and vanadinite throughout the workings; also some galena, argentite and native silver. However, the valuable minerals in the upper workings are the hronsilvers. These minerals indicate a lead silver vein in the depth and this is born out by the appearance of galena in the bottom of the winze. At points along the outcrop, the vein is as wide as thirty feet. In the bottom of the winze which is one hundred and twenty five feet below the adit level, or, about two hundred feet below the surface, the vein is fully fifteen feet wide. I believe the longitudinal extension of the ore will be at least fifty feet beyond the present faces. I do not believe ore will be found at any greater depth than the bottom of the winze.

My sampling of the outcrop did not indicate the presence of other ore shoots. There is another vein about seven feet wide seen in the adit at the west end of the Nugget claim. It's strike is about perpendicular to that of the Silver Reef vein. It is highly mineralized. Where I sampled it, it contained 2.20 ounces of silver and some copper. This vein, the Horn Silver and Silver Reef veins constitute the only three veins of any importance on the property.

The property is situated in Pinal County, Arizona, twelve miles from the Southern Pacific railroad, at Casa Grande, and is in the low rugged hills at the edge of the desert. The climate, although very hot in the summer, is such that work may be conducted all the year round. The road across the desert from the Mine is almost level and always passable.

From the assay map, it will be seen that for one hundred and twenty-eight feet along the adit level, the ore averaged 17.36 ounces of silver per ton, over an average width of 7.4 feet. For one hundred and twenty-three feet down the winze, the ore averaged 8.38 ounces of silver per ton over an average width of 5.8 feet. In the raise above the adit level for seventy-two feet, the ore averaged 17.38 ounces of silver per ton over an average width of 3.55 feet. From these figures, there are 1,540 tons of probable ore above the adit level, averaging 15.06 ounces of silver per ton. There are also 7,760 tons of probable ore below the adit level averaging 13.50 ounces of silver per ton.

Assuming a fifteen foot vein and extension of the ore body to fifty feet beyond the present faces, there are 7000 tons above the adit level and 34000 tons below the adit level. The development work necessary to prove or disprove the probable ore and also to develope the ore to the extent of 34000 tons below the adit level and 7000 tons above, could be done by four hundred feet of drifting and one hundred and twenty-five feet of raising. This development work could be done for fifteen thousand dollars. No timbering would be necessary.

There is no appreciable amount of ore above the adit level that will average twenty-five or more ounces of silver to the ton.

The equipment of the old cyanide mill on the Horn Silver property is as follows:

1 - 12" x 14" jaw crusher
1 - Stampmill consisting of 4 batteries of 5 stamps each
1 - 5' x 12' tube mill
1 - 40 H.P. Fairbanks-Morse gas engine
3 - 5' x 16' steel leaching tanks
2 - 8' x 12' steel tanks
5 - 8' x 8' steel tanks
16 - zinc boxes

All this equipment is in a good state of repair and could be made use of in reconstructing the mill. There are several other pieces of equipment such as vanners, boilers and an old type blast furnace. These are all practically worthless. The mill could be made modern and put in order to handle one hundred tons for forty thousand dollars. There is also a Cornish pump and a six horse power gasoline engine on the Horn Silver used to pump water from the Mine. These are in good condition. At the Silver Reef, there is a six horsepower gasoline hoist and forge in good condition.

There is plenty of water in the Horn Silver shaft to run a mill of one hundred ton capacity. A cyanide mill or combined cyanide and flotation mill will be best suited to treat the ore. The cost of mining and milling should not exceed seven dollars per ton. Transportation to Casa Grande costs thirty-five cents per ton mile or four dollars and twenty cents per ton. This price could probably be reduced to three dollars on a contract for a large amount of haulage.

The accessible workings of the Horn Silver showed no material that could be handled profitably. The water level was three hundred and twenty-seven feet below the collar of the shaft measured along the dip. This made some of the lower workings inaccessible. All the available ore has been taken and was mined from the narrow stope shown on the map to the left of the shaft. There is much more wulfenite and vanadinite shown in these workings than in the Silver Reef.

Very truly yours,

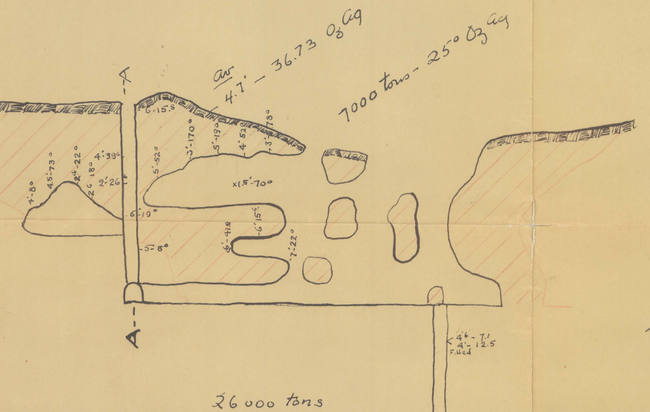
Wayne A. Harrod

Wayne A. Harrod

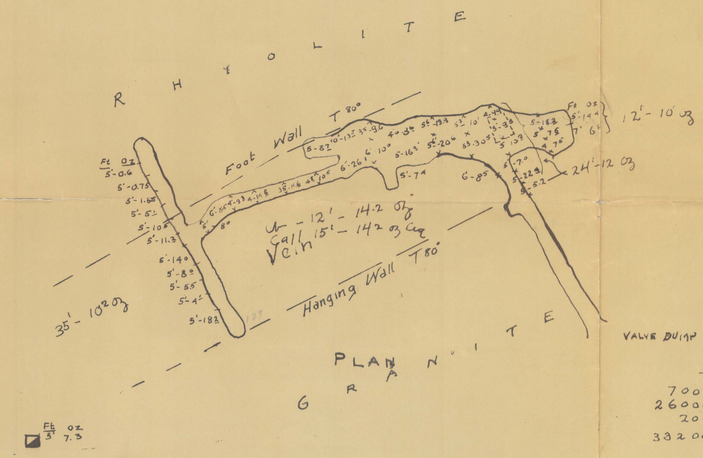
WAH/H

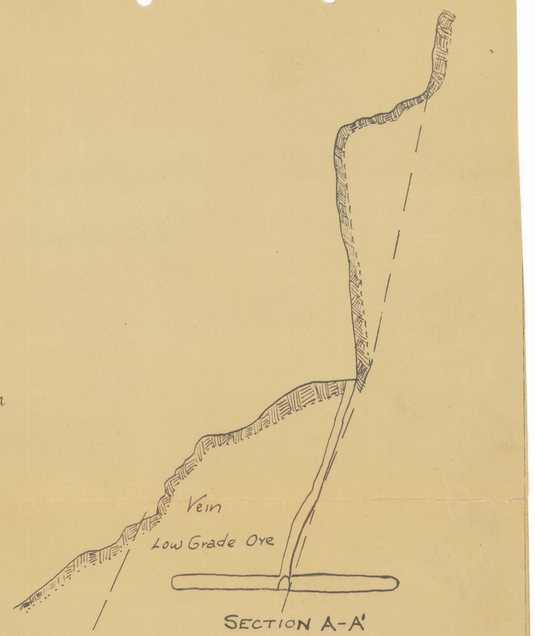
*

35
5
280
4
24



LONGITUDINAL VERTICAL PROJECTION-Looking South





VALVE DUMP 15.9 OZ.-200 TON

Summary

			Oz Silver
7000	Tons -	25 oz -	175000
26000	Tons	14.2 Oz -	367 200
200	Tons	15.9 oz -	3 180
33200			5H7380

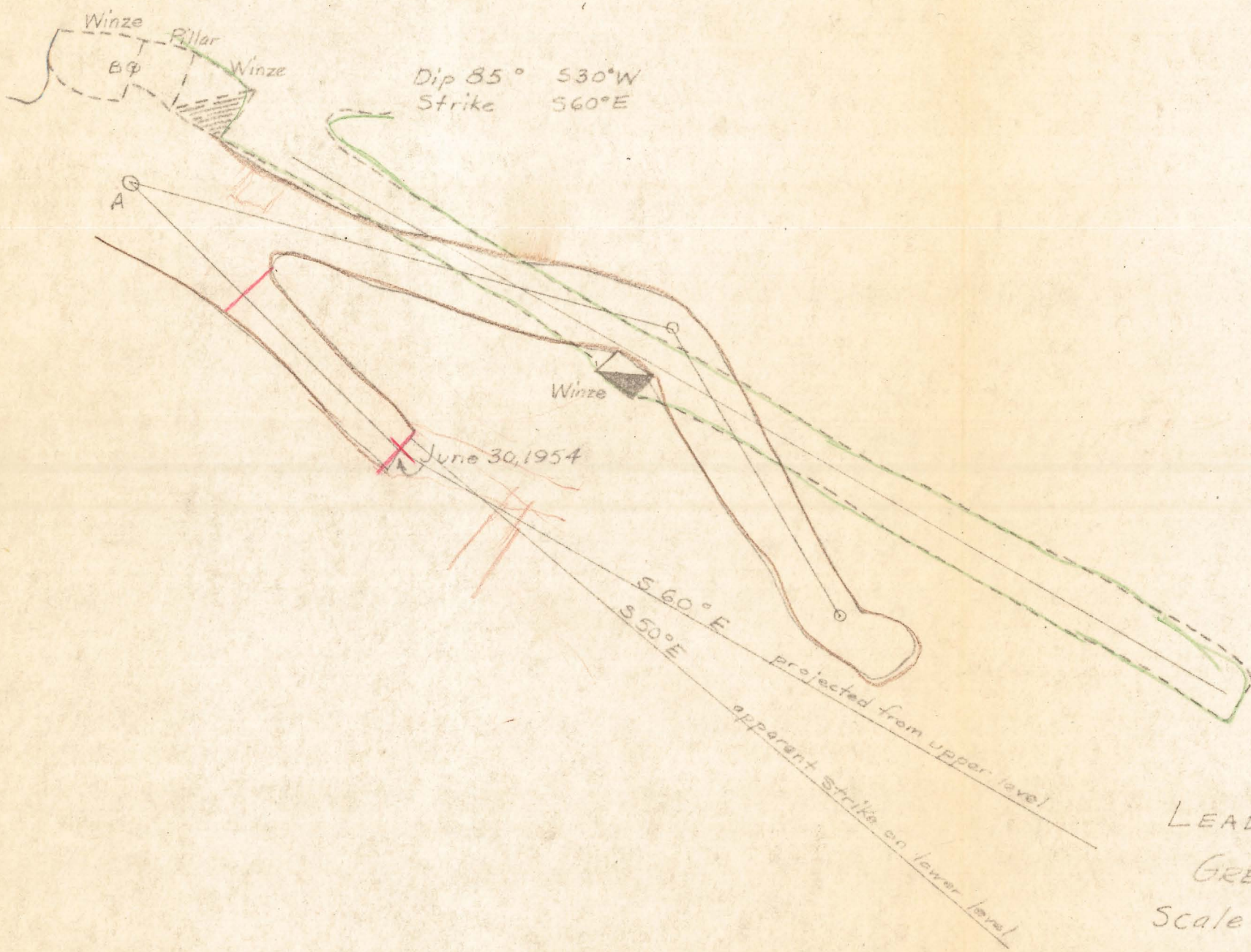
Ave per ton 16.5 oz.

Assay Map of Silver Nugget Mine

Pinal Co Arizona

Scale 1" = 20'

Assays in ounces of Silver



LEAD BOULDER (S.R. No. 7)

GREENHORN MINING CO.

Scale 1" = 10' 11-4-54

upper level

lower level

7 - 31

Sheet No1

NOTE: The purpose of filing and recording this annotated copy of the Plat and Mineral Survey #3369 is to define clearly the precise location, boundary lines, angles, and corners of the herein designated Silver Reef group of lode mining claims located by I. M. Clausen on March 16, 1936, and recorded in the office of the County Recorder of Pinal County, at Florence, Arizona, on June 5, 1936, in book 49 of Mines at pages 297-304 incl. Such Silver Reef Mining claims were, and are, exactly superimposed upon the earlier and corresponding Sahuara thru Nugget lode claim areas, as shown in this Mineral Survey # 3369, and the said I. M. Clausen, in locating said Silver Reef group of claims, then and there adopted, and used as his own, said Survey #3369, together with the identical discovery monuments, corner and center and monuments, boundaries and angles of said Sahuara thru Nugget lode mining claim areas, as indicated on this Survey Plat.

Sec. 23

Sec. 24

STATE OF ARIZONA } ss.
County of Pinal

I hereby certify that the within instrument was filed and recorded at request of Robert Clausen
5-2-55 2:00 P m.
In Book Map Book 1, page 31; Map #21, Pocket #5, Folder #1
on page
Witness my hand and official seal the day and year aforesaid. 122258
SOPHIE M. SMITH, County Recorder.
By Sophie M. Smith Deputy Recorder

Am't deposited $175.
Cost of U.M.S. 102.
Unearned am't. 73.

Nugget Fraction SUR. No 3369

NUGGET SILVER REEF NO.8

SILVER NUGGET SILVER REEF NO. 9

LEAD BOULDER REEF NO. 7

CHOLLA SILVER REEF NO. 6

Horn Silver SUR. No 3369

Santiago SUR. No 3369

Claims Located

Cholla, Nugget Fraction, Horn Silver No 1 and Horn Silver No 2,	Oct. 26, 1915.
Horn Silver and Lead Boulder	June 6, 1911.
Sahuara,	Nov. 1, 1915.
Nugget Extension	Oct. 28, 1915.
Silver Nugget	Feb. 4, 1890.
Nugget	Mar. 9, 1897.
Santiago	" 6, 1917.

Sec. 26 Sec. 25 U.S.L.M. ▲ 3369

Secs. 23-24-25&26

T. 8 S., R. 5 E.

Unapp'd.

Claim Located (See table) 19

Mineral Survey No. 3369

Lot No.

Arizona Land District.

PLAT

OF THE CLAIM OF

Frank M. Leonard

KNOWN AS THE

Sahuara, Nugget Extension, Cholla, Nugget Fraction, Horn Silver, Horn Silver No 1, Horn Silver No 2, Santiago, Silver Nugget, Lead Boulder & Nugget lodes.

IN Casa Grande MINING DISTRICT,

Pinal COUNTY, Arizona

Containing an Area of Acres.

Scale of 300 Feet to the inch.

Variation 14° 05' E

SURVEYED Mar. 26 - Apr. 16 1917 BY

Paul F. Fernald U.S. Deputy Mineral Surveyor,

The Original Field Notes of the Survey of the Mining Claim of Frank M. Leonard known as the Sahuara, Nugget Extension, Cholla, Nugget Fraction, Horn Silver, Horn Silver No 1, Horn Silver No 2, Santiago, Silver Nugget, Lead Boulder and Nugget lodes

from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon, or for each of, said Mining Claims by claimant or his grantors and that said improvements consist of 36 Shafts, 8 tunnels, 1 cuts, 8 drifts, 1 winze, 3 crosscuts and 2 stopes, total value $22,350.

that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office. Frank O. Smith
Phoenix, Arizona. U.S. Surveyor General for
September 22, 1917. Arizona

(4-675)

7 - 32

Sheet No2

NOTE: The purpose of filing and recording this annotated copy of the Plat and Mineral Survey #3369 is to define clearly the precise location, boundary lines, angles, and corners of the herein designated Silver Reef group of lode mining claims located by I.M.Clausen on March 16, 1936, and recorded in the office of the County Recorder of Pinal County, at Florence, Arizona, on June 5, 1936, in Book 49 of Mines at pages 297-304 incl. Such Silver Reef Mining Claims were, and are, exactly super-imposed upon the earlier and corresponding Sahuara thru Nugget lode claim areas, as shown in this Mineral Survey #3369, and the said I.M.Clausen, in locating said Silver Reef group of claims, then and there adopted, and used as his own, said Survey #3369, together with the identical discovery monuments, corner and center end monuments, boundaries and angles of said Sahuara thru Nugget lode mining claim areas, as indicated on this Survey Plat.

N

SAHUARA
1400
N.66°32'W.
1500 Ft.
Cor.No3
Cor.No4
Cor.No2
Cor.No1
600 Ft.
W.E.C. 315
S.66°32'E.
N.24°0'W.
No1 Dis. 100
House
Stable
EEC 315

NUGGET EXTENSION
SILVER REEF NO.4
N.66°32'W.
S.66°32'E.
1500 Ft.
600 Ft.
W.E.C. 300
EEC 300
No1 Dis. 100
House
Cor.No3
Cor.No4
Cor.No2
Cor.No1

SILVER REEF
HORN SILVER No1
N.83°52'30"W.
1499.09 Ft.
600 Ft.
W.E.C. 300
EEC 300
No1 Dis. 135
Cor.No3
Cor.No4
Cor.No2
S.6°20'W.
S.6°20'E.
1320 Ft.

SILVER NUGGET
REEF FRACTION
N.77°47'W.
S.77°47'E.
689.79 Ft.
68972 Ft.
600 Ft.
W.E.C. 300
EEC 300
No1 Dis. 200
Cor.No3
Cor.No4
Cor.No2
Cor.No1
N.5°13'E.
S.5°13'W.
3625.85
3396.54
3. Boulder
4. Lead
U.S.L.M. No3369 Nugget Sur.No3369

HORN SILVER No2
N.83°52'30"W.
1049.09
1499.09 Ft.
S.83°52'30"E.
1207.75
1207.85
600 Ft.
W.E.C. 300
EEC 300
No1 Dis. 430
Cor.No5
Cor.No4
Cor.No1
S.6°31'W.
S.6°31'E.
1320 Ft.

HORN SILVER
SILVER REEF NO.3
S.66°32'E.
1500 Ft.
N.68°0'W.
S.68°0'E.
1194.33
1500 Ft.
600 Ft.
W.E.C. 300
EEC 300
No1 Dis. 398
Cor.No3
Cor.No4
Cor.No2
Cor.No1
N.6°20'E.
N.6°31'E.
S.6°31'W.

SANTIAGO
1500 Ft.
1450
600 Ft.
EEC 300
Cor.No2
Cor.No1
S.79°12'30"E. 4199.78
S.68°0'E.
S.87°49'50"E. 2750.44
N.6°31'E.

Cholla
S.72°21'30"E. 4565.10
SUR. No3369
S.75°11'30"E. 3076.66
S.73°43'30"E.

Secs. 23&26
T. 8 S., R. 5 E.
Unapp'd.

STATE OF ARIZONA }
County of Pinal } ss.

I hereby certify that the within instrument was filed and recorded at request of Robert Clausen
5-2-55 2:00 P.M.
In ~~Docket~~ Map Book 9, Page 32; Map #22 Pocket #5, Folder #7
on page
Witness my hand and official seal the day and year aforesaid.
SOPHIE M. SMITH,
County Recorder
By Sophie M. Smith
~~Deputy~~ Recorder

122259

Claim Located 19

Mineral Survey No. 3369

Lot No.

Land District

PLAT

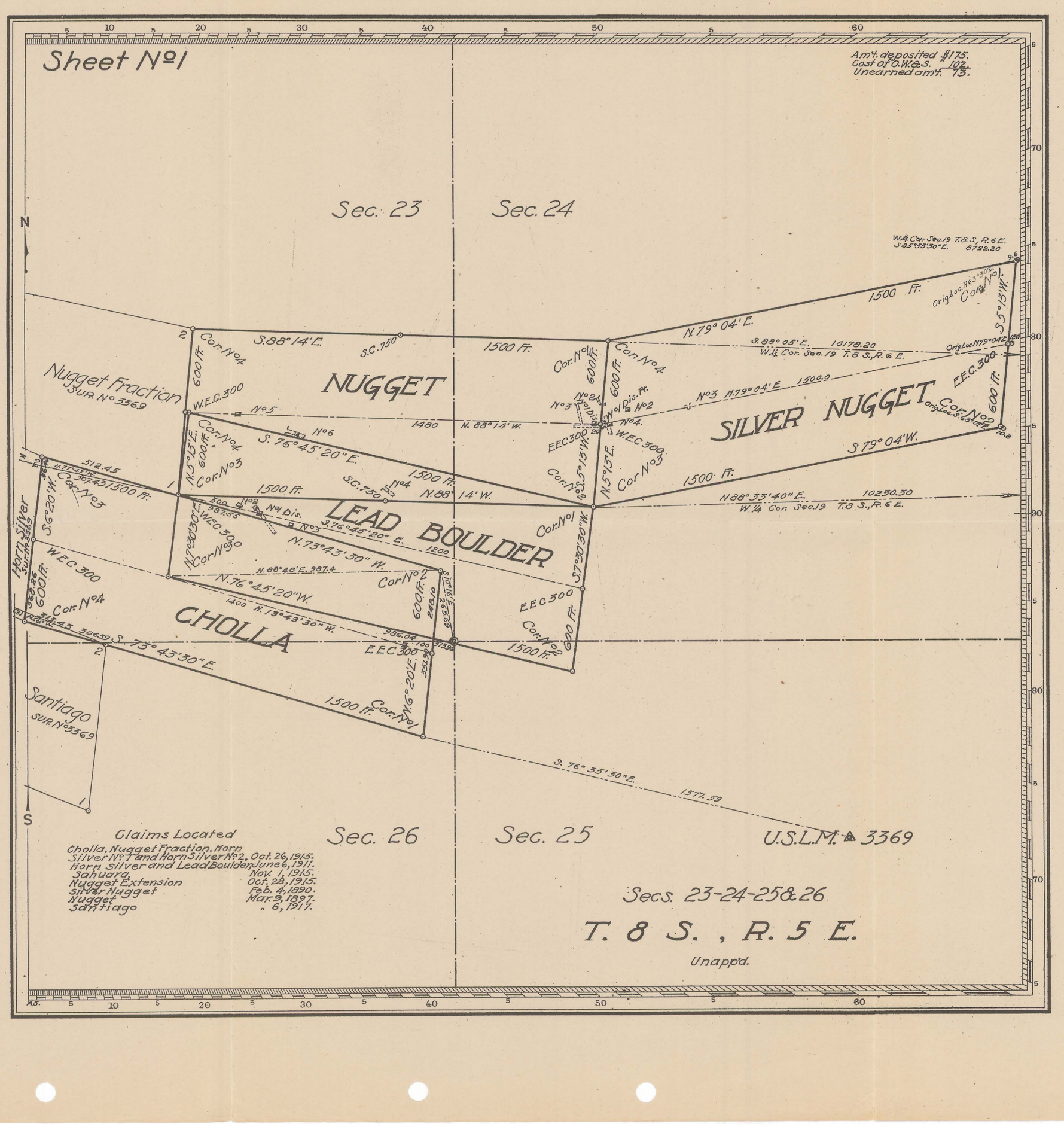
OF THE CLAIM OF

KNOWN AS THE

IN MINING DISTRICT,
COUNTY,
Containing an Area of Acres.
Scale of 300 Feet to the inch.
Variation
SURVEYED 19 BY
U.S. Deputy Mineral Surveyor,

The Original Field Notes of the Survey of the Mining Claim of
known as the
from which this plat has been made under my direction, have been examined and approved, and are on file in this Office; and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.
I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant or grantors and that said improvements consist of
that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.
And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office.
, 19
U.S. Surveyor General for



Claims Located (See table) 19

Mineral Survey No. 3369

Lot No.

Arizona Land District.

PLAT

OF THE CLAIM OF

Frank M. Leonard

KNOWN AS THE

SAHUARA, NUGGET EXTENSION, CHOLLA, NUGGET FRACTION, HORN SILVER, HORN SILVER No 1, HORN SILVER No 2, SANTIAGO, SILVER NUGGET, LEAD BOULDER & NUGGET lodes.

IN Casa Grande MINING DISTRICT, Pinal COUNTY, Arizona

Containing an Area of _____ Acres.

Scale of 300 Feet to the inch.

Variation 14° 05' E

SURVEYED Mar 26 - Apr 16 1917 BY

Paul F. Fernald U.S. Deputy Mineral Surveyor,

The Original Field Notes of the Survey of the Mining Claim of Frank M. Leonard known as the Sahuara, Nugget Extension, Cholla, Nugget Fraction, Horn Silver, Horn Silver No 1, Horn Silver No 2, Santiago, Silver Nugget, Lead Boulder and Nugget lodes

from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

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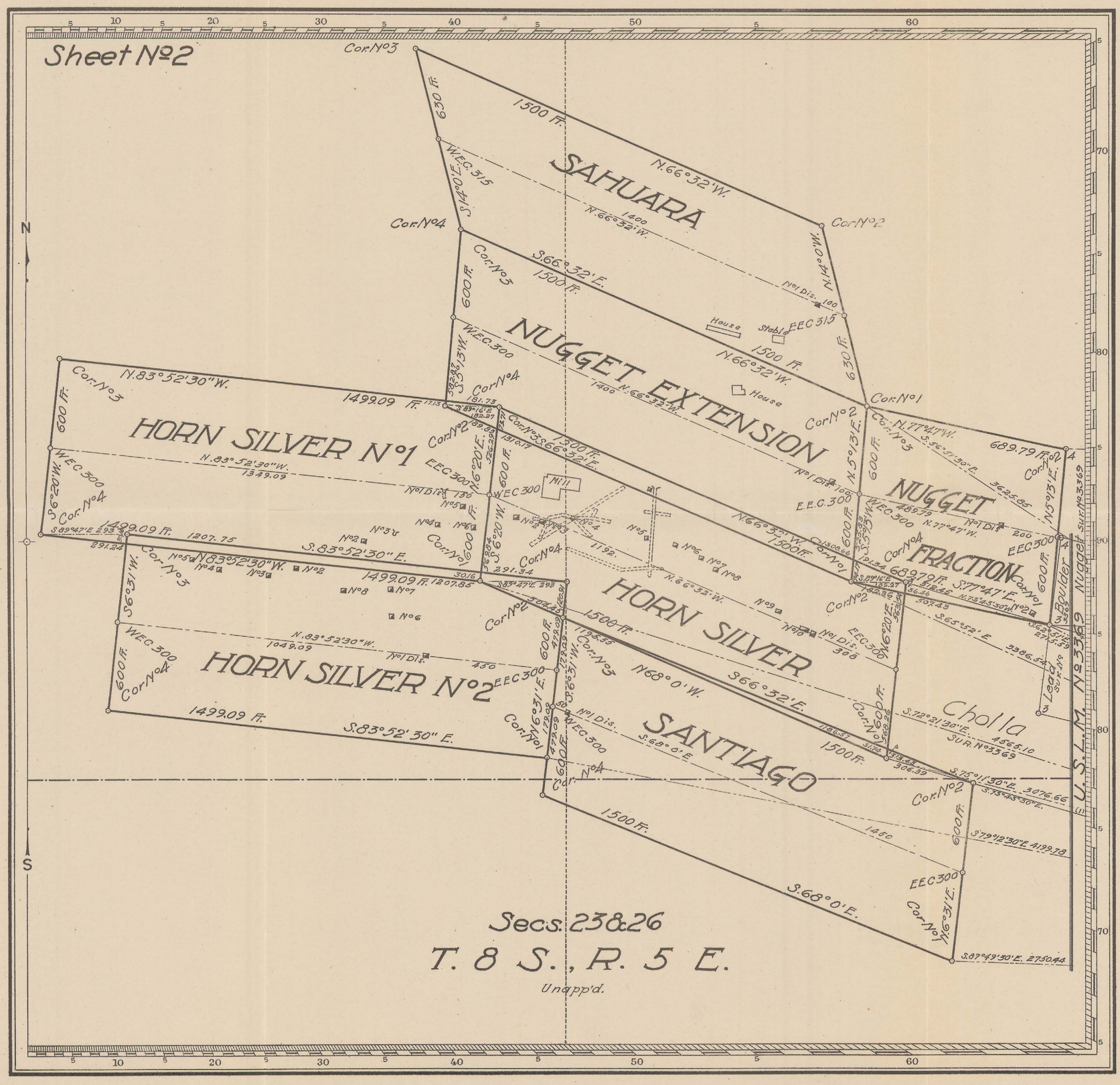
And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office. Frank O. Smith

Phoenix, Arizona

September 22, 1917

U.S. Surveyor General for Arizona



Claim Located _____ 19

Mineral Survey No. 3369

Lot No. _____

_____ Land District.

PLAT

OF THE CLAIM OF

_____

KNOWN AS THE

_____

IN _____ MINING DISTRICT,

_____ COUNTY,

Containing an Area of _____ Acres.

Scale of 300 Feet to the inch.

Variation _____

SURVEYED _____ 19 ____ BY

_____,

U.S. Deputy Mineral Surveyor,

The Original Field Notes of the Survey of the Mining Claim of

_____

known as the _____

_____

_____

_____

from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant _____ or _____ grantors and that said improvements consist of _____

_____

_____

_____

that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office.

_____

_____, 19

U.S. Surveyor General for _____

_____

Plotted 8/18/30

T7S R4E

EAST 38.22 | 82.64 | 1379

N0°9'W 40.14

1st G. Mer. East.

31 | 32 | 33 | Retraced | 34 | 35 | 36

N89° 13'W 79.68 | S89° 24'W - 80.15 | N89° 43'W 40.26 | S89°44'W 279.90

VEKOL

79.10

T8S R4E

PAPAGO INDIAN RESERVATION

CASA GRANDE

EAST 79.98 | EAST 79.97 | EAST 80.16 | N89°59'E 79.77 | S89°51'W 80.07 | EAST 162.74

N0°1'E | N0°1'E | N0°2'E | N0°2'E

EAST 79.98 | EAST 79.92 | S89°55'E 80.17 | N89°59'E 79.71 | S89°52'W 80.22 | EAST 162.27

SILVER REEF MINE BUILDINGS

EAST 79.92 | EAST 80.00 | S89°59'E 80.99 | N89°54'E 79.80 | S89°51'W 80.30 | EAST 162.91

37 | 38 | 39 | 40 | 41 | 42 | 43

WEST 80.00 | N89°59'E 79.99 | N89°56'E 80.07 | WEST 80.04 | EAST 162.73

DAM

162.47

1.13 | 1.13 | WEST 1.13 | 1.13 | JACKRABBIT 80.00 | 3.60

LAT. 32°40'49"N
LONG. 111°53'44"W
DECL. 13°45'E
MAR. 19, 1917.

FIRST GUIDE MERIDIAN EAST

RESURVEYED

N0°4'E 40.20 | N0°4'E 40.20 | N0°4'E 40.26 | N0°4'E 40.26 | N0°4'E 40.26 | N0°12'E 40.19 | N0°12'E 40.19 | N0°12E 40.19 | N0°

Resurveyed