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PRINTED: 03/22/2002

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: MONTOSA

ALTERNATE NAMES:
AMADO
BLACK DIAMOND
ISABELLA

SANTA CRUZ COUNTY MILS NUMBER: 11A

LOCATION: TOWNSHIP 20 S RANGE 14 E SECTION 29 QUARTER NE
LATITUDE: N 31DEG 40MIN 08SEC LONGITUDE: W 110DEG 55MIN 46SEC
TOPO MAP NAME: MOUNT WRIGHTSON - 15 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
LEAD
COPPER
SILVER
ZINC
GOLD

BIBLIOGRAPHY:
KEITH, S.B., 1975, AZBM INDEX OF MINING PROP.
IN SANTA CRUZ CO., BULL. 191, P. 86
AZBM CARD FILE SANTA CRUZ CO.
SCHRADER, F.C., 1915, USGS BULL. 582,
P. 186-187
ADMMR MONTOSA MINE FILE
ANTHONY, J. 1951 GEOL. OF MONTOSA-COTTONWOOD
CYNS. AREA S. CRUZ CO. U OF A THESIS

01/18/88

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CYNS. AREA S. CRUZ CO. U OF A THESIS

MONTOSA MINE

REFERENCES

SANTA CRUZ COUNTY
TYNDALL DISTRICT
T20S R14E Sec. 29

ABM Bull. 194, p. 86

ABM Card File - Santa Cruz County

USGS Bull. 582, p. 186-187

Anthony, John 1951 Geology of Montosa-Cottonwood Canyons Area, U of A Thesis

MILS Sheet sequence number 0040230292

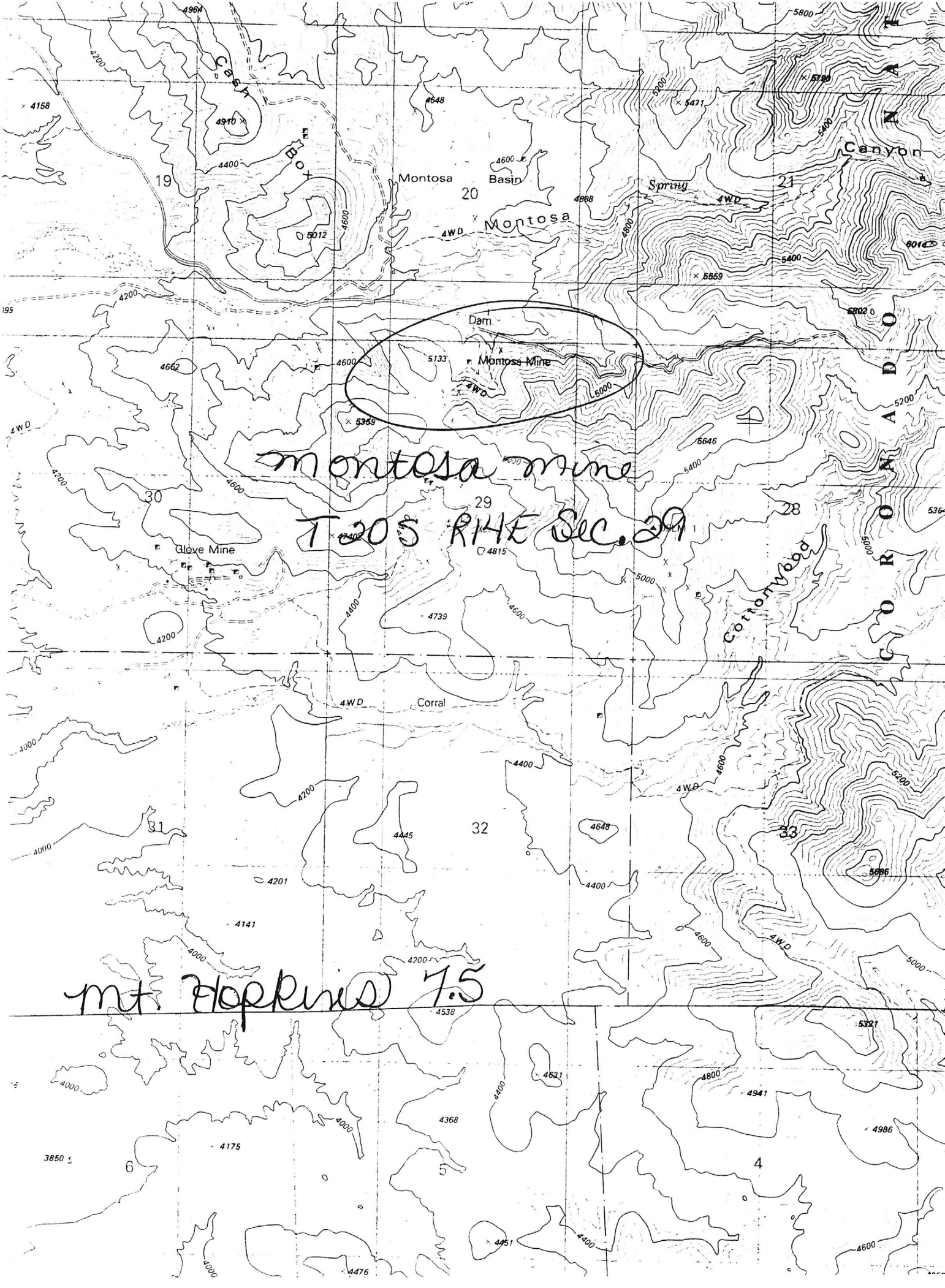
MILS Santa Cruz Index #11A

USGS PP 748, p. 11-14

Geo file--Tenney, James R., 1927-29, p. 320-321

Geo file--Anthony, John W., 1951, p. 71-82

Mt. Hopkins 7.5 (included in file)


Montosa Mine
Dam
Montosa
Basin
Montosa
Spring
Canyon
Box
Glove Mine
Corral
Cottonwood
4WD
19
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32
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5
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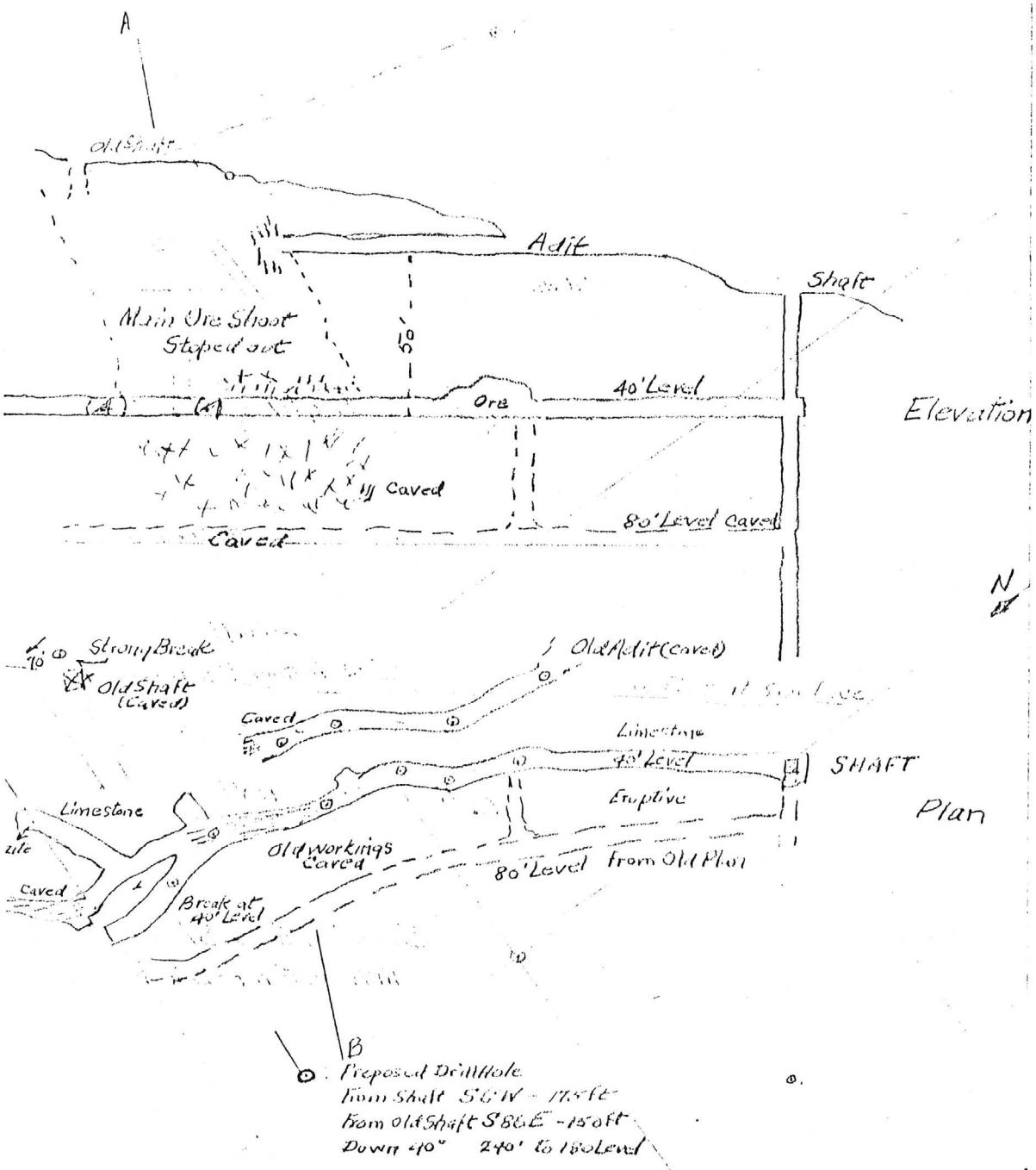
montosa mine
T20S R14E Sec. 29
mt. Hopkins 7.5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Stoped out
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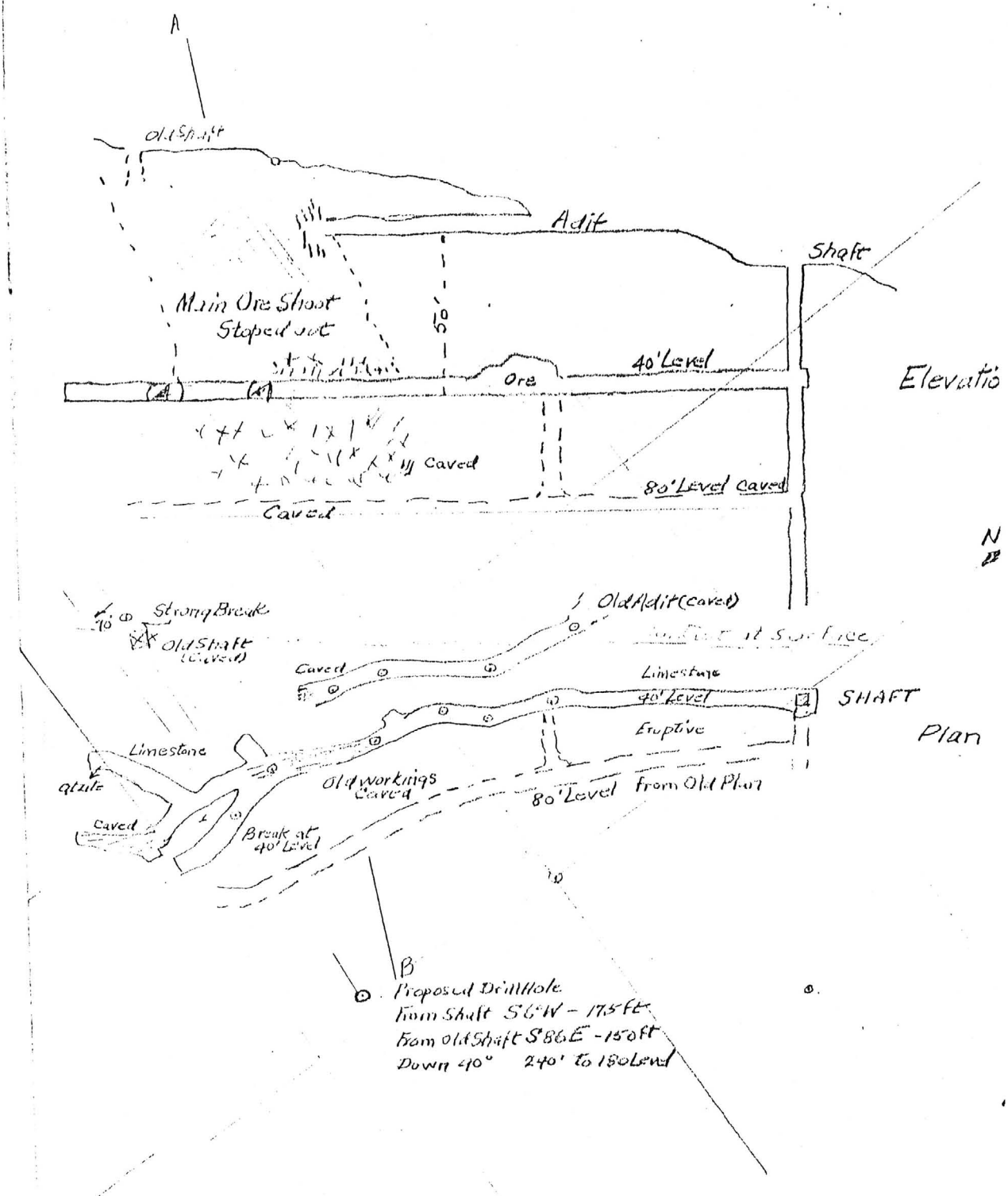
Ore
40' Level
Elevation
Caved
80' Level caved
N
Strong Break
Old Shaft
(Caved)
Old Adit (caved)
Caved
Limestone
40' Level
SHAFT
Eruptive
Plan
Limestone
Old workings
Caved
80' Level from Old Plan
Caved
Break at
40' Level
B
Proposed Drill Hole
From Shaft S6°W - 175 ft
From Old Shaft S86°E - 150 ft
Down 40° 240' to 160 Level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80' Level From Old Plan
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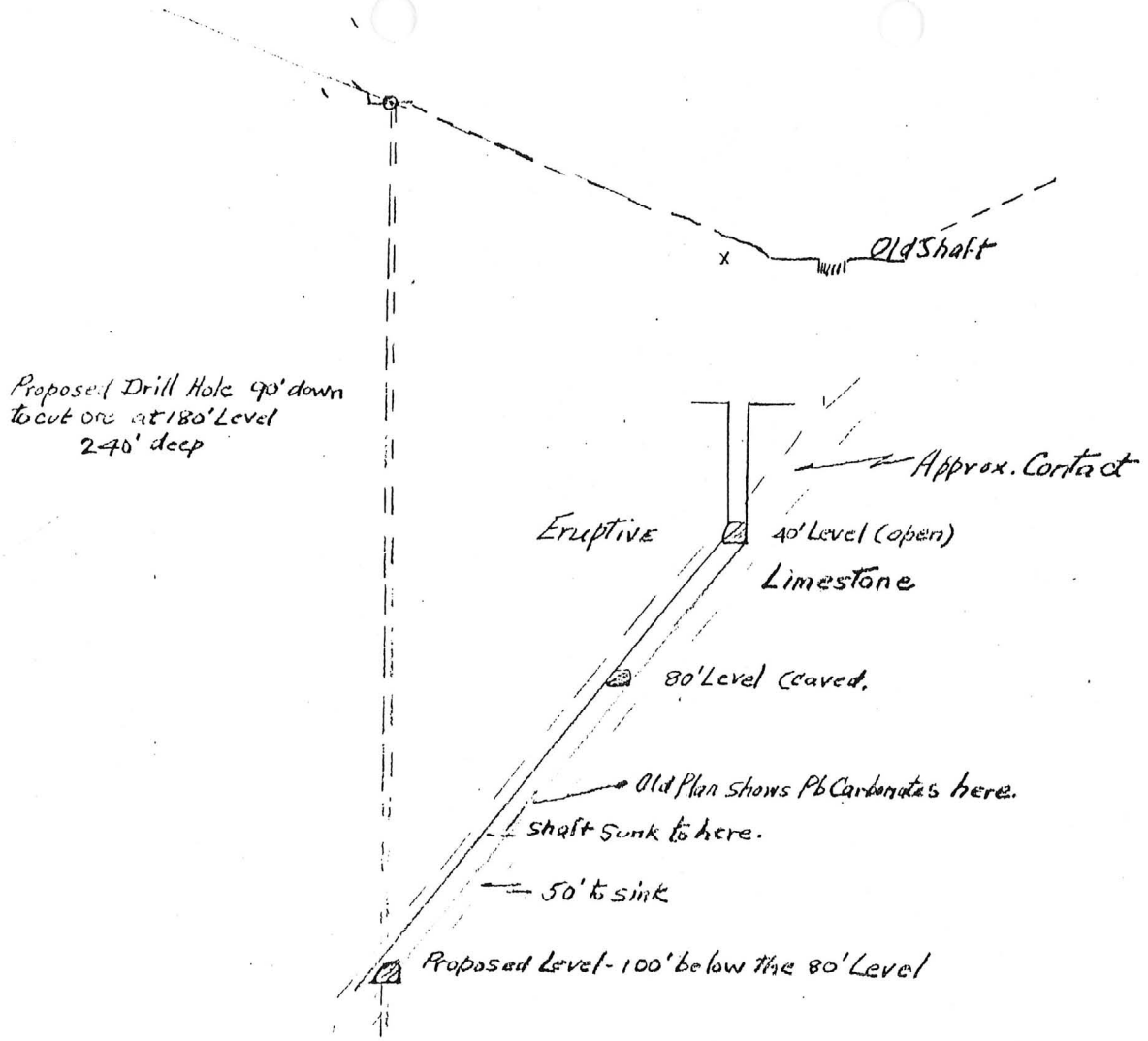
Break at 40' Level
B
Proposed Drill Hole
From Shaft S 6° W - 175 ft
From Old Shaft S 86 E - 150 ft
Down 40° 240' to 150 Level

Good

Arnold



Section thru Shaft looking SW
with Section A-B in background

IES

2.

).

MONTOSA SANTA CRUZ COUNTY

MG WR 8/9/85: Visited the Montosa mine. There is no activity at this property.

MG WR 12/25/87: With Dave Rabb and Mr. Nico Willis (U of A Property Management), I visited the Montosa mine, Santa Cruz Co. There is no activity at this mine. The University of Arizona owns an interest in the two patented claims, however, and would like to see that interest.

MG WR 1/1/88: Visited Mr. Nico Willis of the Assets and Property Management Office of the University of Arizona and received additional information on the Montosa Mine (file) Santa Cruz County. Sent a copy of the data to the Phoenix office.

---

*GENERAL REFERENCES

*REFERENCE 1 F1 < ABGMT-USBM DATA

*REFERENCE 2 F2 < USBM FILES, MONTOSA MINE

*REFERENCE 3 F3 < SCHRADER, F.C., 1915, USGS BULL. 582, p. 186-187

*REFERENCE 4 F4 < JENNEY, JAMES R., 1927-29, HISTORY OF MINING IN ARIZONA; ARIZONA BUREAU OF MINES, p. 320-321

F10 < ADMR FILE DATA, AMADO MINE >

C30 < BROCHANTITE, WILLEMITE, PLUMBOJAROSITE, ANGLESITE, COVELLITE, CHALCOCITE, ARGENTITE >

L110 < PATENTED CLAIMS OF BLACK DIAMOND AND ISABEL OR ISABELLA; MOST WORK DONE ON CLAIMS WAS CONFINED TO ISABELLA MINE (ALSO KNOWN AS AMADO MINE), ON THE ISABEL OR ISABELLA CLAIM; SINCE 1930, THE BOARD OF REGENTS OF THE UNIVERSITY OF ARIZONA HAS HAD PART OWNERSHIP OF THE ISABELLA AND BLACK DIAMOND CLAIMS >

M220 < LOW-GRADE ORE OR BEDDED MINERALIZED MATERIAL >

K2A < METAMORPHIC ROCKS >

K4 < LARGE MASSES MIXED WITH MALACHITE >

K5 < AND LENSES ARE CONCENTRATED; LEAD MINERALS FORM STRINGERS AND VEINLETS, AND FILL VUGGY CAVITIES IN LOOSE POWDERY MASSES >

N15 < THRUST FAULT >

N70 < SHALE >

N75 < SERICITIZATION AND CHLORITIZATION >

N80 < MAY BE CONNECTED WITH ORIGIN OF ORE DEPOSITS; OXIDATION AND SUPERGENE ENRICHMENT; SECONDARY AND HYPOGENE ENRICHMENT OF LEAD MINERALS (PLUMBOJAROSITE) >

N85 < SEEMS TO HAVE BEEN CHIEF SOURCE OF ORE PRODUCED; LATITE PORPHYRY HAS BEEN FAULTED AGAINST LIMESTONE BY A HIGH-ANGLE FAULT DIPPING ABOUT 60E AND TRENDING N35E (ISABELLA FAULT); SLICKENSIDES IN GOUGE SHOW MOVEMENT IN NUMEROUS DIRECTIONS IN PLANE OF FAULT >

F5 < DREWES H., 1971 USGS MAP I-1014 (1:48000) >

F6 < DREWES, H., 1972, USGS PROFESSIONAL PAPER 748, p. 11-14 >

F7 < ANTHONY, JOHN W., 1951, GEOLOGY OF THE MONTOSA-COTTONWOOD CANYONS AREA, SANTA CRUZ COUNTY, ARIZONA: M.S. THESIS, UNIVERSITY OF ARIZONA, p. 71-82 >

F8 < KEITH, STANTON B., 1975, ABM BULL. 191, p. 86 >

F9 < ABGMT FILES, STANTON B. KEITH >

MILS# 11A

U.S. CRIB-SITE FORM

RECORD IDENTIFICATION

RECORD NUMBER B10 < >

*RECORD TYPE B20 < X, 1 M >

DEPOSIT NUMBER B40 < >

REPORT DATE G1 < 82, W, 04 > (YR., MO.)

*INFORMATION SOURCE B30 < 1, 2, , >

*FILE LINK IDENT. B50 < USBM-0040230292

REPORTER (SUPERVISOR) G2 < LARABA, PETER (last, first, middle initial) (CALDER, SUSAN R. (last, first, middle initial) >

REPORTER AFFILIATION G5 < ABGMT >

*SITE NAME A10 < MONTOSA MINE GROUP

SYNONYMS A11 < AMADO, BLACK DIAMOND, ISABELLA MINE, DOUBLE O MINE

LOCATION

MINING DISTRICT/AREA A30 < TYNDALL DISTRICT >

*COUNTY A60 < SANTA CRUZ >

*STATE A50 < A, Z >

*COUNTRY A40 < U, S >

*PHYSIOGRAPHIC PROV A63 < 1, 2, W, >

DRAINAGE AREA A62 < 1, 5, 0, 5, 0, 3, 0, 1, W, LOWER COLORADO >

*LAND STATUS A64 < 4, 1, W, , W, (1, 9, 7, 9,) >

*QUADRANGLE NAME A90 < MT. WRIGHTSON (1, 9, 5, 8,) >

*QUADRANGLE SCALE A100 < 6, 2, 5, 0, 0, >

SECOND QUAD NAME A92 < MT. HOPKINS (1, 9, 8, 1,) >

SECOND QUAD SCALE A91 < 2, 4, 0, 0, 0, >

ELEVATION A107 < 4, 6, 6, 0, W, F, T >

UTM

*NORTHING A120 < 3, 5, 0, 3, 6, 0, 0 >

*EASTING A130 < 5, 0, 6, 4, 4, 0 >

*ZONE NUMBER A110 < +, 1, 2 >

*ACCURACY

ACCURATE (ACC) (circle)

ESTIMATED EST < >

GEODETIC

*LATITUDE A70 < 3, 1, - 4, 0 - 0, 8, N >

*LONGITUDE A80 < 1, 1, 0, - 5, 5 - 4, 5, W >

CADASTRAL

*TOWNSHIP(S) A77 < 0, 2, 0, S, , W, , , W, , , W, , >

*RANGE(S) A78 < 0, 1, 4, E, , W, , , W, , , W, , >

*SECTION(S) A79 < 29 , , W, , , W, , >

*SECTION FRACTION(S) A76 < CENTER OF N2 OF N2 >

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

*POSITION FROM NEAREST PROMINENT LOCALITY A82 < 3.2 MILES SW OF MT. HOPKINS >

*LOCATION COMMENTS A83 < ON SOUTH SIDE OF MONTOSA CANYON, 1.0 MILE NE OF GLOVE MINE >

* ESSENTIAL INFORMATION
+ ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

COMMODITY INFORMATION

*COMMODITIES PRESENT C10 < Pb, Ag, Zn, Au, Cu, Mn

*ORE MINERALS C30 < MALACHITE, CHALCOPYRITE, BORNITE, CERUSSITE, GALENA, CHRYSOCOLLA, AZURITE,

COMMODITY SUBTYPES C41 <

*GEN. ANALYTICAL DATA C43 < 1946 ORE VALUES AVERAGED 40% Pb, 2% Cu, MINOR Zn AND AU, 3 OZ./TON Ag

COM. INFO. COMMENTS C50 < SULFIDES SEEM TO BE ABSENT FROM DEPOSITS

* SIGNIFICANCE

PRODUCER		NON-PRODUCER	
MAJOR PRODUCTS MAJOR	Pb	MAIN COMMODITIES PRESENT C11	
MINOR PRODUCTS MINOR	Ag, Zn, Cu	MINOR COMMODITIES PRESENT C12	
POTENTIAL PRODUCTS POTEN			
OCCURRENCES OCCUR	Au, Mn	OCCURRENCES OCCUR	

*PRODUCTION

PRODUCER

PRODUCTION (YES circled) (circle) — PRODUCTION SIZE (SML circled) MED LGE (circle one)

NON-PRODUCER

PRODUCTION UND NO (circle one)

EXPLORATION OR DEVELOPMENT

*STATUS

PRODUCER — STATUS AND ACTIVITY A20 < 4 >

NON-PRODUCER — STATUS AND ACTIVITY A20 < >

*DISCOVERER L20 < SPANIARDS (PRE-1850's). RELOCATED BY CLARKE AND PETERSON

*YEAR OF DISCOVERY L10 < 1873 > *NATURE OF DISCOVERY L30 < B > *YEAR OF FIRST PRODUCTION L40 < 1901 > *YEAR OF LAST PRODUCTION L45 < 1949

*PRESENT/LAST OWNER A12 <

*PRESENT/LAST OPERATOR A13 < C.H. AND S.A. McINTOSH (1947-1948)

EXPL./DEV. COMMENTS L110 < OWNERS AND OPERATORS INCLUDED FREEMAN AND SMITH (1901), CALABASAS COPPER CO. (1902), R.O. BOYKIN (1912), AMADO MINES INC.; PROPERTY COMPRISES 14 CLAIMS, INCLUDING

DESCRIPTION OF DEPOSIT

*DEPOSIT TYPE(S) C40 < REPLACEMENT

*DEPOSIT FORM/SHAPE M10 < SMALL POCKETS AND LENSES

*DEPTH TO TOP M20 < > *UNITS M21 < > MAXIMUM LENGTH M40 < > *UNITS M41 <

*DEPTH TO BOTTOM M30 < > *UNITS M31 < > MAXIMUM WIDTH M50 < > *UNITS M51 <

*DEPOSIT SIZE M15 (SMALL circled) M15 < MEDIUM > M15 < LARGE > (circle one) MAXIMUM THICKNESS M60 < > *UNITS M61 <

*STRIKE M70 < N70W > *DIP M80 < SW

*DIRECTION OF PLUNGE M100 < > *PLUNGE M90 <

*DEP. DESC. COMMENTS M110 < DEPOSIT LIES IN MINERALIZED ZONE WHICH EXTENDS AT LEAST 1/8 MILE TO SE, BEYOND WHICH LIMESTONE COVERED BY OVERLYING ANDESITE THAT CAPS MOUNTAINS >

DESCRIPTION OF WORKINGS

*Workings are: SURFACE M120 UNDERGROUND M130 BOTH (M140 circled) (circle one) — OVERALL LENGTH M190 < > *UNITS M191 <

*DEPTH BELOW SURFACE M160 < 250 > *UNITS M161 < FT > OVERALL WIDTH M200 < > *UNITS M201 <

*LENGTH OF WORKINGS M170 < 2000 > *UNITS M171 < FT > OVERALL AREA M210 < > *UNITS M211 <

*DESC. OF WORK. COM. M220 < ABOUT 2000 FT OF UNDERGROUND WORK DONE ON THE ISABELLA CLAIM. WORKINGS INCLUDED 250-FT DEEP ISABELLA SHAFT, 211-FT DRIFT SW FROM THE 80-FT. LEVEL, DRIFTING AND CROSSCUTTING ABOUT 380 FT TO SOUTH, 30 BY 40 FT OPEN CUT SHOWING

GEOLOGY

*AGE OF HOST ROCK(S) K1 < PERM.

*HOST ROCK TYPE(S) K1A < LARGE EXOTIC LIMESTONE BLOCK

*AGE OF IGNEOUS ROCK(S) K2 < L.CRET.

*IGNEOUS ROCK TYPE(S) K2A < DACITIC VOLCANIC BRECCIA CONTAINING EXOTIC BLOCKS OF IGNEOUS AND

*AGE OF MINERALIZATION K3 < L.CRET.-TERT.

*PERT. MINERALS (NOT ORE) K4 < SILICIFIED GREEN EPIDOTE, MAGNETITE, SPECULAR HEMATITE, IRON OXIDES IN

*ORE CONTROL/LOCUS K5 < NW AND NE TRENDING FAULT FISSURES ALONG WHICH SMALL REPLACEMENT POCKETS

*MAJ. REG. TRENDS/STRUCT. N15 < NE-TRENDING QUARTZ VEINS AND DIKES IN MADERA-AGUA CALIENTE CANYONS

*TECTONIC SETTING N15 < MONTOSA CANYON FAULT BLOCK; N-S MONTOSA TEAR FAULT; NW-TRENDING MONTOSA

*SIGNIFICANT LOCAL STRUCT. N70 < DEPOSITS LIE IN LOWER PART OF LIMESTONE NEAR ITS CONTACT WITH UNDERLYING

*SIGNIFICANT ALTERATION N75 < LIMESTONE IS SILICIFIED OR DOLOMITIZED AND MANGANESE-STAINED; INTENSE

*PROCESS OF CONC./ENRICH. N80 < REPLACEMENT MINERALIZATION; INTRUSION OF NEARBY ANDESITE (CRETACEOUS)

*FORMATION AGE N30 <

*FORMATION NAME N30A <

SECOND FM AGE N35 <

SECOND FM NAME N35A <

*IGNEOUS UNIT AGE N50 < L.CRET.

*IGNEOUS UNIT NAME N50A < SALERO FORMATION, EXOTIC BLOCK MEMBER

SECOND IG. UNIT AGE N55 <

SECOND IG. UNIT NAME N55A <

GEOLOGY COMMENTS N85 < SPECULAR HEMATITE IS PRINCIPAL GANGUE MINERAL; BEST PART OF EXPOSURE IS A 6-FT. FERRUGINOUS BED THAT FOLLOWS A SLICKENSIDED FOOTWALL, DIPS 75 S, AND

GENERAL COMMENTS

GENERAL COMMENTS GEN <

University of Arizona
TUCSON

COLLEGE OF MINES
DEPARTMENT OF MINING ENGINEERING
AND METALLURGY

December 18, 1946

CONDITION OF MINE

MEMO TO: Dean T. G. Chapman

CONCERNING THE WORKINGS on the Isabel and Black Diamond patented mining claims located on Section 29, Township 20 S, Range 14 E in Santa Cruz County, Arizona, according to the U. S. General Land Office Survey of 1923. (It is to be noted that the original patent survey describes the Isabel claim as being on Sections 17 and 20 and the Black Diamond claim as being on Section 20. This is apparently a patent survey error).

The older workings from an adit on the Isabel claim are completely caved and no examination of them could be made.

About 100 feet north of the older workings is a combination vertical and inclined shaft. The vertical part of this shaft, 35 feet deep, is in fairly good condition and the shaft timbers well preserved but some lagging must be replaced to make it safe. The inclined part of this shaft, starting from the bottom of the vertical part, follows a fault which contains about 3 feet of gouge and dips S 63° E at an angle of about 45°. The timbering of the inclined part, although in poor condition, is still in place for the first 40 feet. Beyond this 40 foot point the shaft has been partly caved by mining. This lower part was considered unsafe to enter and the depth of the shaft and extent of workings below this point is unknown.

At the bottom of the vertical part of this timbered shaft a drift extends S 30° W a distance of 32 feet with no ore in sight and another drift extends N 20 E of the shaft a distance of 10 feet where a small stringer of ore, 2 to 3 inches thick, was partly mined.

In addition to the shaft described above there are three other shafts on the properties. About 300 feet northeast of the timbered shaft there is a vertical, untimbered shaft of unknown depth. This shaft is partly caved at the collar and was considered unsafe to enter. Two other vertical shafts or prospect holes are located on the ridge to the southeast of the old workings. Both of these shafts, one about 25 feet deep and the other about 6 feet deep, are in solid rock and are in good condition.

The latter three shafts are open and unprotected and should be fenced to comply with the State laws. It would require 12 pieces of pipe about 6 feet long, 350 feet of barbed wire and the efforts of two or three men for about two days to fence the shafts. All material must be carried from the end of the road to the mine, a distance of about one mile. It is estimated that the cost of fencing these shafts, to include transportation, will be at least fifty dollars.

H E Krumlauf

H. E. Krumlauf

ARIZONA DEPT. OF MINES & MINERAL RESOURCES
STATE OFFICE BUILDING
416 W. CONGRESS, ROOM 161
TUCSON, ARIZONA 85701

ISABEL (ISABELLA) AND BLACK DIAMOND CLAIMS

Situation and accessibility: The Isabel and Black Diamond claims are in northern Santa Cruz County, in the southwestern part of the Santa Rita Mountains. This area is part of the Tyndall mining district.

The claims are reached by about one mile of trail that leads southeastward from a ranch at Montosa Spring, 10 miles by road east from Amado.

History of operations: The Isabel claim was located in 1896, and the Black Diamond in 1904. Both were surveyed for patent in 1912 (see attached plats).

According to Schrader,[1] the Montosa mine on the Isabel claim

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[1] F. C. Schrader, Mineral deposits of the Santa Rita and Patagonia Mountains, Arizona: U. S. Geol. Survey Bull. 582, p. 186 (1915).

"was worked principally about 1901 and soon thereafter by Capt. John D. Burgess, of Tucson, for the Calabasas Copper Company (Ltd.), with headquarters in New York City. The company did about 2,000 feet of underground work, mostly on the Isabella ground. It sunk to a depth of 250 feet and installed a 36-inch 30-ton water-jacket testing smelter. The smelter, however, was operated only 4½ days, but during that time $9,600 worth of bullion was extracted. The company gave up the mine to the owners when its bond expired in February, 1902.... "

As the mine dumps are insufficient to account for more than a fraction of 2,000 feet of workings, some of Schrader's information may not have been well founded. The patent survey plats showed a total of

only 275 feet of workings on both claims in 1912.

Mr. F. G. Hawley, who worked as assayer at the Montosa mine during 1901-2, states [2] that the small tonnage of copper-lead ore

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[2] Oral communication.

---

which was put through the local smelter yielded a few bars each of copper-lead and lead-copper bullion.

Mr. Robert O. Boykin writes [3] that in 1912 he discovered a deposit

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[3] Letter to President, Univ. of Ariz., Dec. 6, 1946.

---

of ore on this property and shipped to the El Paso smelter some hundreds of tons of ore containing about 40 per cent lead and 2 per cent copper, with very low gold and silver values. He continues: "I used native Tubac miners and selectively mined and hand sorted to produce that grade of ore. At that time lead was about 5¢ per lb. and copper was about 14¢ per lb. Labor was about $2.00 per day. I had a short term lease and after my discovery and production of this high grade ore, Mr. Freeman thought the mine could be sold immediately for cash after I had placed it on production, and refused to grant an extension of my lease. The lease was to O'Hara and Boykin and we called it the Double O Mine at that time. Having a short term lease, I could not put equipment on the mine and was unable to go deeper than 125 feet. The production was all from the "Isabella' and occurred as small pockets and lenses of lead and copper carbonate ores. The location of these lenses was unpredictable and when my lease expired there was no profitable ore in sight."

Harvey Saxby is reported to have sunk a shaft 65 feet deep on the Isabel claim in 1917 and to have shipped a car of sand carbonate lead ore from a pocket that was found at a depth of 30 feet.

During 1927-28, H. S. Hillman and associates deepened Saxby's shaft to 125 feet and at a depth of 80 feet drove a drift southwestward for approximately 211 feet. This drift was for the purpose of testing the area down the dip beneath Boykin's stope, but it encountered very little ore.

Workings: The Isabel workings are now inaccessible, but all the available data regarding them are given in the Tenney and Wilson Report dated June 13, 1928. A copy of the sketch map accompanying that report is attached hereto.

Workings on the Black Diamond claim consist of a few shallow shafts and pits.

Geology and ore occurrence: The Isabel and Black Diamond claims are in the southern portion of Montosa Basin, and the principal Isabel workings are at an altitude of 4,900 feet.

The ridges forming the west side of Montosa Basin consist of faulted and folded beds of limestone and underlying marl, of Permian age. The basin is floored principally with shale, sandstone, thin limestone, and volcanic rocks of Cretaceous age, faulted against the Permian. Dikes of diorite intruded both the Permian and Cretaceous rocks.

On the Isabel and Black Diamond claims the Permian limestone dips steeply southwestward and is separated from the Cretaceous on the east by a fault striking north 10 degrees to 20 degrees east and dipping

steeply eastward, as indicated on the accompanying map. This fault contact is intersected by fissures of easterly trend. In the adjacent limestone west of the contact, the outcrops of some of these fissures are mineralized with oxides of iron and copper. The largest ore body mined apparently was associated with one of the most strongly mineralized fissures. It replaced limestone near the fault contact but reportedly lensed out above the depth of the 80 level.

This same contact between Permian and Cretaceous extends across the Black Diamond claim but, where exposed, is less strongly mineralized southward. Elsewhere on the Black Diamond the principal apparent mineralization consists of specular hematite veins up to 2 feet wide, associated with small lenses of limestone along faults in the Cretaceous series.

Conclusions: In general geologic relations, the Isabel depcsit resembles the San Xavier deposit, south of Tucson. The evidence of mineralization, however, is much weaker on the Isabel than at the San Xavier.

Further exploration of the Isabel and Black Diamond probably would find additional bodies of lead ore, but there seems to be no basis for predicting any large commercial deposit of lead or other ores on these claims.

D S Butler

Dec. 18, 1946

Montosa File
Santa Cruz Co.

University of Arizona

TUCSON

COLLEGE OF MINES
ARIZONA BUREAU OF MINES

December 18, 1946

Dean T. G. Chapman
College of Mines, University of Arizona
Tucson, Arizona

Dear Dr. Chapman:

Last week you requested a re-examination of the Isabel and Black Diamond claims, in the Tyndall district, for the purpose of appraising their potential mineral resources. Our report, together with a statement by Prof. H. E. Krumlauf regarding condition of the mine workings, is enclosed herewith.

We believe that these claims offer possibilities for some small commercial production by a competent operator. As there seems to be no basis for predicting any large deposits of lead or other ores in this ground, Mr. Boykin's offer of purchase for $20,000, deserves consideration if that is the best that can be obtained from him or from others.

Sincerely yours,

B. S. Butler

E. D. Wilson

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TUCSON

COLLEGE OF MINES
ARIZONA BUREAU OF MINES

December 19, 1946

President Alfred Atkinson
Campus

Dear President Atkinson:

Attached hereto is a report by Dr. B. S. Butler, Dr. E. D. Wilsor, and Professor H. E. Krumlauf relating to the potential possibilities of the Isabella and Black Diamond mining claims partially owned by the University of Arizona. A brief summary of the present condition of these properties from the standpoint of safety by Professor H. E. Krumlauf is also attached.

Briefly the situation appears to be as follows:

1. There are possibilities for a small commercial production by a competent operator.

2. The examination did not indicate large deposits of lead or other ores on this ground.

3. A purchase price of $20,000 mentioned in Mr. Boykin's letter appears favorable from the standpoint of the University.

4. If we do not lease the properties to Mr. Boykin the property should be put in satisfactory shape from the standpoint of safety. The cost to do this is estimated by Mr. Krumlauf at approximately $50.00.

Yours sincerely,

T. G. Chapman
Director, Arizona Bureau of Mines

Montosa File
Santa Cruz Co.

From U of A Anthony Thesis 1951

Isabella Mine

Location

The Isabella mine is in the Tyndall mining district on the south side of Montosa Canyon. The mine is at an elevation of about 4900 feet on the southern edge of Montosa Basin, also called "The Devil's Cash Box." The shaft of the Isabella mine is located in the northwest quarter of section 29, T 20 S, R.14 E on the Isabel claim. A discrepancy exists between the General Land Office survey plats of the Isabel and Black Diamond claims and the location observed by the writer. The plats show the Isabella claim in section 17 and 20, T 20 S, R 14 E. A quarter corner on the property shows it to be located as stated above. As the section corners were located several years (1923) subsequent to this claim survey, the error may lie with the latter. Bearings and distances given on the survey plats do not agree with the U.S. Geological Survey Patagonia quadrangle as to the correct location.

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History and Production

The Isabella claim, one of a group of fourteen known as the Montosa group, was located in 1896 and patented in 1912 together with the adjacent Black Diamond claim, located in 1904. Schrader states that the mine, then known as the Amado mine, was worked principally about 1901. [1]

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[1] Schrader, op. cit., p. 186.

Shortly thereafter Capt. John D. Burgess of Tucson, employed by the Calabasas Mining Co., Ltd., of New York City, leasing from Smith and Freeman of Tucson, owners of the mine, conducted operations at the property. Reportedly 2000 feet of underground drifting was done, largely on the Isabella claim, and the shaft was deepened to a 250-foot depth. [1] It is questionable that this much work was accomplished as there are no dumps in evidence to account for such extensive mining. Some dump material is reported to have been shipped during the late 1940's, however, and this may have been the fate of some earlier extracted material. At the time the present writer examined the Isabella mine the inclined shaft was open a short distance below the 38-foot level and shortly thereafter was lagged off at the 38-foot level so that the lower workings are no longer accessible. Wilson and Butler further state that the patent survey plats show a total of only 275 feet of underground workings on both the Isabel and Black Diamond claims. [2]

[1] idem, p. 186.

[2] Wilson, E.D., and Butler, B.S., report of condition of Isabel and Black Diamond claims to the President of the University of Arizona, 1946.

In 1901 Burgess erected a 36-inch 30-ton water-jacketed smelter a few hundred feet west of the mouth of

the draw in which the Isabella mine is located and, although it was operated for a total of only four and one half days, $9600 worth of bullion was shipped to Ledoux and Co., New York. [1] ~2 Tons

[1] Schrader, op. cit., p. 186.

Mr. Fred G. Hawley of Tucson, who was employed at the mine as an assayer during 1901-2, reports that a few bars each of copper-lead and lead-copper bullion were extracted from the small tonnage of copper-lead ore treated by the Burgess smelter. [2]

[2] Hawley, F.G., personal communication.

Schrader was informed that minerals mined at this time included malachite, chalcopyrite, bornite, cerussite, galena, magnetite, specular hematite, and epidote. [3]

[3] Schrader, op. cit., p. 186.

When its bond expired in February, 1902, the Calabasas company gave up the property.

In 1912 ore was mined from the Isabella by Robert O. Boykin, who is quoted below from a letter to the President of the University of Arizona, Dec. 6, 1946. Boykin wrote that he shipped ore containing about 40% lead, 2% copper, and low gold-silver values produced from the property to the El Paso smelter.

> I used native Tubac miners and selectively mined and hand sorted to produce that grade of ore. At that time lead was about 5¢ per pound and copper was about 14¢. Labor was about $2.00 per day. I had a short-term lease and after my discovery and production of this high-grade ore Mr. Freeman thought the mine could be sold immediately for cash after I placed it in production and refused to grant an extension of my lease. The lease was the O'Hara and Boykin and we called it the Double O mine at that time. Having a short-term lease, I could not put equipment in the mine and was unable to go deeper than 125 feet. The production was all from the 'Isabella' and occurred as small pockets and lenses of lead and copper carbonate ore. The location of these lenses was unpredictable and when my lease expired there was no profitable ore in sight.

Wilson and Butler state:

> Harvey Saxby is reported to have sunk a shaft 65 feet deep on the Isabel claim in 1917 and to have shipped a car of sand carbonate lead ore from a pocket that was found at a depth of 30 feet.

They continue:

> During 1927-28, H.S. Hillman and associates deepened Saxby's shaft to 125 feet and at a depth of 80 feet drove a drift southwestward for approximately 211 feet. This drift was for the purpose of testing the area down the dip beneath Boykin's stope, but it encountered very little ore. [1]

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[1] Wilson and Butler, op. cit.

Since 1930 the Board of Regents of the University of Arizona has had part ownership of the Isabel and Black Diamond claims through the bequest of Merril P. Freeman of Tucson.

In 1947 and 1948 C.H. and S.A. McIntosh of Lordsburg,

New Mexico, to whom a lease was transferred from C.W. Walker of Patagonia, drifted south from the bottom of the vertical shaft on the 38-foot level and encountered small pockets of ore averaging about 17% lead, 2% copper, and four ounces of silver, with very low values in gold. About 102 tons of this ore were shipped to the El Paso smelter. No work has been done on the property since the McIntoshes ceased operations in 1948 after drifting and cross-cutting about 380 feet southward in limestone.

During the last operation (1947-48) a new road was constructed from the base of the mine canyon to the Isabella mine and the mine was re-equipped throughout. At the present time some repair work would be required on the road to make it serviceable.

Geology

The Isabella mine is located entirely in limestone of Permian age at a fault contact between intrusive latite porphyry and the limestone.

Permian limestone and marls form the west side of the small north-south trending canyon in which the mine is located. The limestone and marls strike generally east-west to northwest-southeast and dip to the south. Locally the limestone is silicified or dolomitized and manganese-stained. Red shales of Cretaceous age occur at the base

of the draw at the junction of the mine canyon and Montosa Canyon beneath the limestone which has been thrust over them from the south. The latite porphyry has been faulted against the limestone by a high-angle fault dipping on the average 60° to the east and striking N 35° E. Just north of the Isabella shaft this fault splits, one segment striking about N 12° E and the other N 50° E. The block of limestone and marls between these fault segments may have been moved up with respect to the Permian limestone to the west. No evidence of the dominant direction of movement on the Isabella fault was obtained underground. Slickensides in gouge show movement in numerous directions in the plane of the fault. The latite porphyry, however, was most likely moved up to the limestone. This relative movement, reflected in the position of the marls in the lower part of the canyon to the north, would make the Amado fault a high-angle reverse fault.

A break 500 feet to the east of and approximately parallel to the Isabella fault has displaced the limestone at least 100 feet horizontally. Local topography is controlled by weaknesses resulting from these breaks.

About 300 feet south of the Isabella shaft a segment of the Isabella fault swings sharply westward. At least one other east-west cross fault intersects this segment.

Strong iron mineralization is found along this intersection and the limestone to the west has been dolomitized and stained by manganese dioxide along east-west fissures.

Underground, the ~~Amado~~ Isabella fault is exposed in drifts on both the 38- and 80-foot levels. It dips 62° east on the 38-foot level near the shaft and 50° east on the 80-foot level, forming a surface concave upward. To the south the curve is reversed, the steeper portions being generally deeper. The altitude of the fault varies considerably, however, along its strike where exposed underground. To the south, underground, several branching segments are present, showing the fault to be a fault zone locally. White clay gouge up to four feet thick is present on the hanging wall, which is limestone, in all accessible parts of the workings. Slickensides are abundant but give no indication of the directions of major displacement.

Mineralization

Heavy specular hematite masses occurring mainly in the footwall are prominent on the 38-foot level. Some of these masses have malachite, azurite, lead carbonate, and sulfate and plumbojarosite associated with them.

The ore shipped during McIntosh's operation yielded lead, copper, and silver, with low gold (values quantitatively similar to those shipped during the early days of

the mine). Burgess' ore was supposed to be sulfides, however. Lead occurred as cerussite--the typical "sand carbonate" of the miner, being extremely friable and sandy. Plumbojarosite has contributed to the lead content. Very few residual masses of galena were observed in the workings, surrounded by anglesite and cerussite, indicating that the oxidized lead minerals were formed, at least in part, from galena. Malachite, azurite, and rare brochantite, associated with lead minerals and specular hematite, have probably accounted for the lion's share of the ore's copper content. Some zinc occurs in the oxidized ore and in specular hematite. Ultra-violet light reveals a very small quantity of willemite, but not enough to account for the zinc present in assays. The mineral nature of the preponderance of the zinc present is not known.

While no sulfides, aside from galena mentioned above and a little covellite, are found in the accessible portions of the mine, a reconstruction of the original minerals from the oxidized end products would suggest that the stoped ores were originally sulfides (galena, sphalerite, perhaps chalcocite and chalcopyrite, and some silver sulfide such as argentite). A relatively small amount of iron oxide staining is present. Iron is present in vivid yellow plumbojarosite. The abundant primary specular

and micaceous hematite in the mine has not resulted from contact-metamorphism. Lime silicates, garnet, and the remainder of the contact mineral assemblage are missing.

Small massive pieces of a chlorite group mineral are found irregularly in the clay gouge filling the fault zone. Powdery plumbojarosite coats some of these, and small plates of specularite are scattered through the chlorite.

Polished sections of ore minerals and gauge were prepared to obtain genetic relationships between ore minerals and ore minerals and gangue minerals. A few sections showed that specular hematite replaced quartz, suggesting that there was an early stage of silicification. What little silica was observed in the workings seems to be confined to the areas containing massive hematite.

A thin section of one of a few fragments of latite porphyry found in the gouge formed in the fault shows it to have been intensely altered with the formation of secondary quartz veinlets, which are quite probably of the same generation as the quartz replaced by specular hematite. Intense sericitization and chloritization have taken place.

Azurite and malachite are intimately mixed with specular hematite. Quite possibly they have been derived in place from sulfides which replaced hematite. These

copper carbonates fill triangular interstices between intersecting tabular crystals of hematite and cut across hematite in veinlets. Not uncommon is the replacement of copper carbonate veinlets by parallel veinlets of plumbojarosite.

The sequence of oxidation of lead minerals is clearer than that of the copper minerals. Galena is clearly the first lead mineral deposited. It was later than specular hematite and possibly later than copper sulfides. In polished section reaction rims of anglesite are seen surrounding residual islands of galena. Smooth, wavy boundaries between anglesite and galena are remarkably sharp. Anglesite replaces galena both along cleavage traces and in irregular patterns. Under high magnification residual galena blebs can be seen disseminated throughout anglesite and later cerussite. Anglesite has been replaced by cerussite, which is considerably more abundant. After the development of anglesite and cerussite, but prior to the formation of plumbojarosite, covellite replaced galena, anglesite, and cerussite. A reversal from an oxidizing to a reducing environment is patently necessary here for the formation of the sulfide, covellite. It is postulated that, subsequent to the oxidation of lead sulfide, the water table rose, meeting solutions bearing copper sulfate. These precipitated on encountering the reducing

environment provided by the water table with the formation of covellite. Copper sulfate may have been derived from residual copper sulfides which had not been entirely oxidized at that time and which were destroyed by oxidation following a later lowering of the water table.

Plumbojarosite [1] is abundant in the mine and probably was important as a source of lead in the ore shipped.

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1 Identification of this mineral is certain, perhaps, only so far as placing it in the jarosite group is concerned. A lead test was obtained from clean, carefully selected material which showed no contamination by the lead minerals with which it is so intimately associated. The microscopic crystals were too small to yield diagnostic optical data, but the index range appears rather too high for jarosite.

It is intimately associated with other lead minerals, especially cerussite, crystals of which it coats. Polished sections show individual euhedral, six-sided crystals of plumbojarosite in galena, anglesite, cerussite, and covellite. The mineral replaces cerussite in stringers and veinlets. In loose, powdery masses, it fills vuggy cavities in essentially all the ore.

The nature of the origin of plumbojarosite here is not definitely established but its occurrence suggests a secondary origin. The mineral, as pointed out above, replaces and coats all earlier ore minerals, and occurs most commonly as loose, powdery crusts and minute euhedral crystals in early ore minerals. The mineral is hydrous

and is generally thought to be formed at moderate to low temperatures under conditions where ferric sulfate will form.[1]

[1] Butler, B.S., personal communication.

The mineral is closely related to alunite,[2] however, which is known to form under both hypogene and supergene conditions, the former being probably the more common.

[2] Hendricks, S.B., The crystal structure of alunite and the jarosites, Am. Min., vol. 22, no. 6, pp. 773-784.

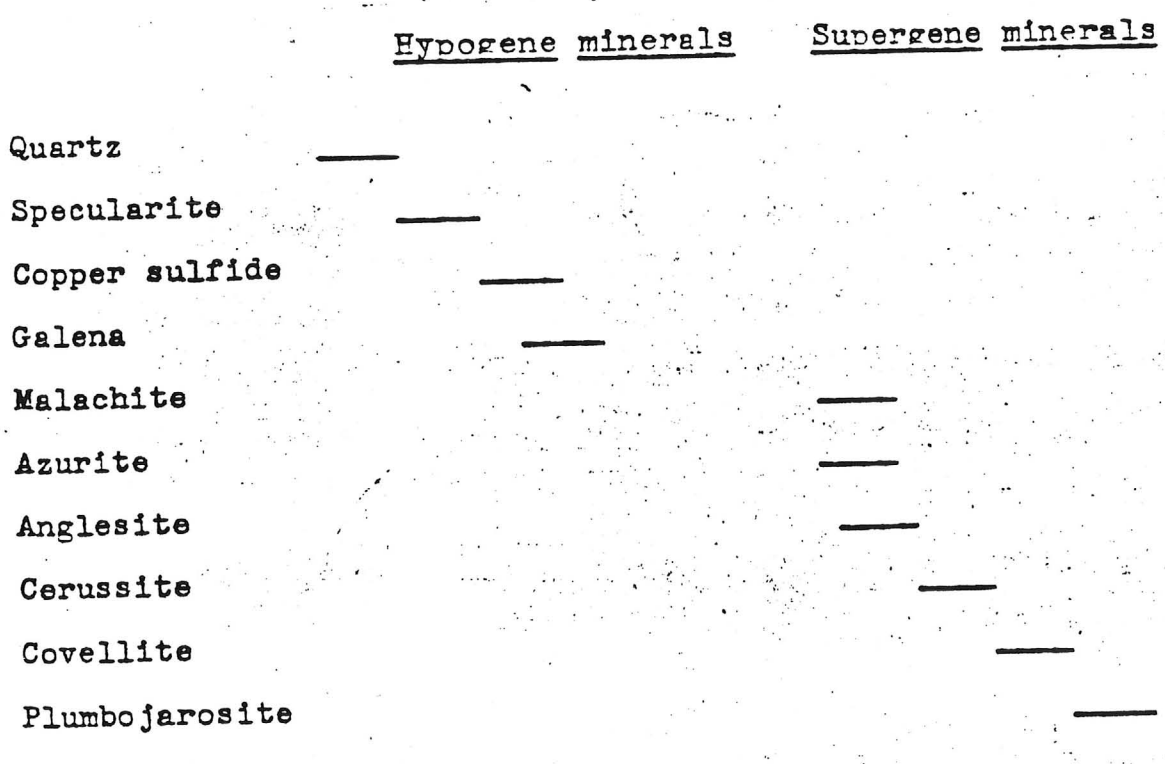

Diagram showing the sequence of mineralization, Isabella mine

M Rosa File
Sa. Cruz Co.

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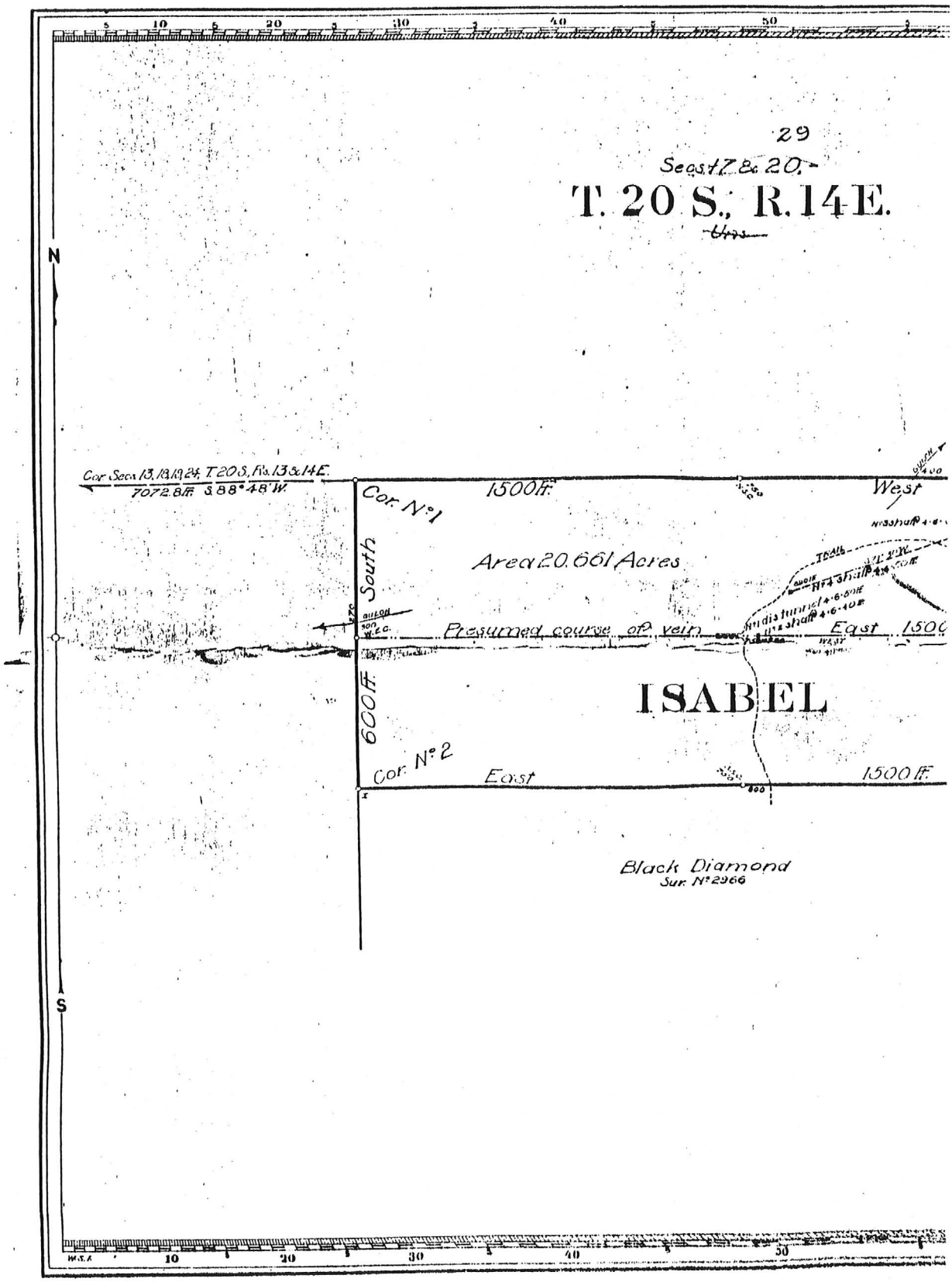

ARIZONA DEPT. OF MINES & MINERAL RESOURCES
STATE OFFICE BUILDING
416 W. CONGRESS, ROOM 161
TUCSON, ARIZONA 85701

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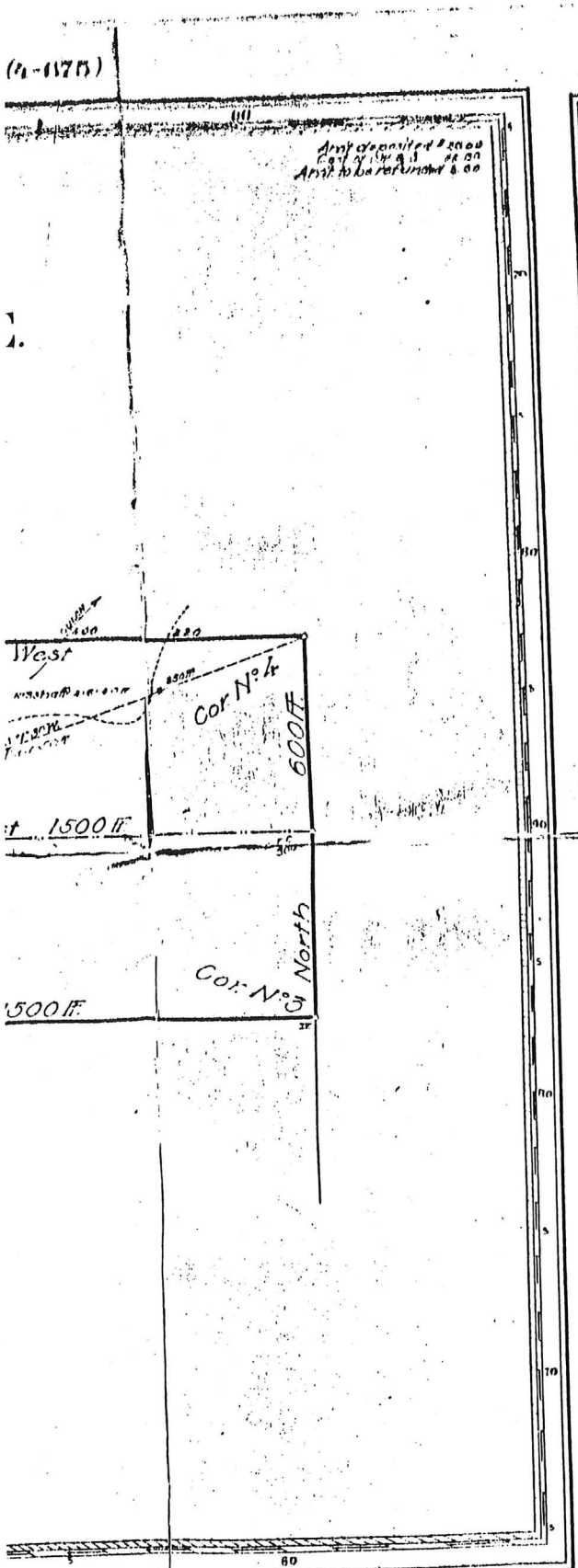


Claim Located August 24, 1896

Mineral Survey No. 2967

Lot No.

ARIZONA Land District.

PLAT

OF THE CLAIM OF

M. P. Freeman, Frances E. Smith & E. J. Hughes

KNOWN AS THE

Isabel

IN Salero MINING DISTRICT,
Santa Cruz COUNTY, Arizona
Containing an Area of 20.661 Acres.
Scale of 200 Feet to the inch.
Variation 13° E.

SURVEYED January 31 1912 BY
Edgar C. Dietrich
U.S. Mineral Surveyor.

The Original Field Notes of the Survey of the Mining Claim of M. P. Freeman, Frances E. Smith & E. J. Hughes known as the Isabel

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 claimants or their grantors, and that said improvements consist of tunnel and 3 shafts

total value $1300

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, Phoenix, Arizona
April 12, 1912

Frank A. Ingalls
U.S. Surveyor-General for
ARIZONA.

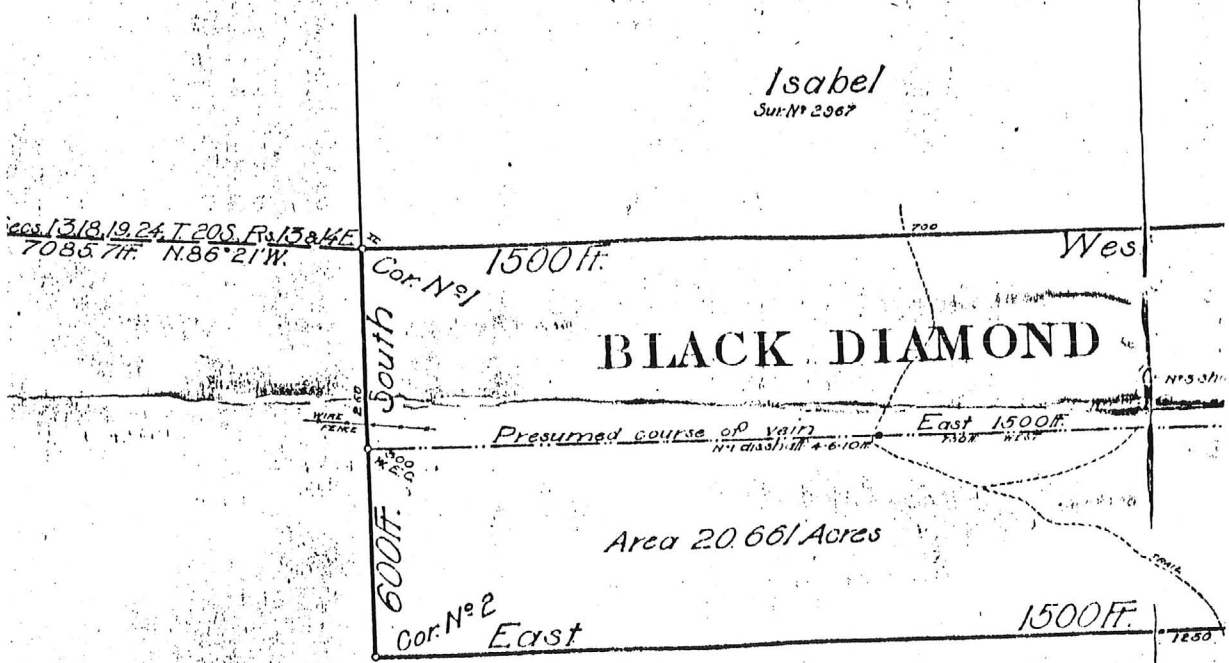
(4-675)

29

Sec. 20,

T. 20 S., R. 14 E.

Uns



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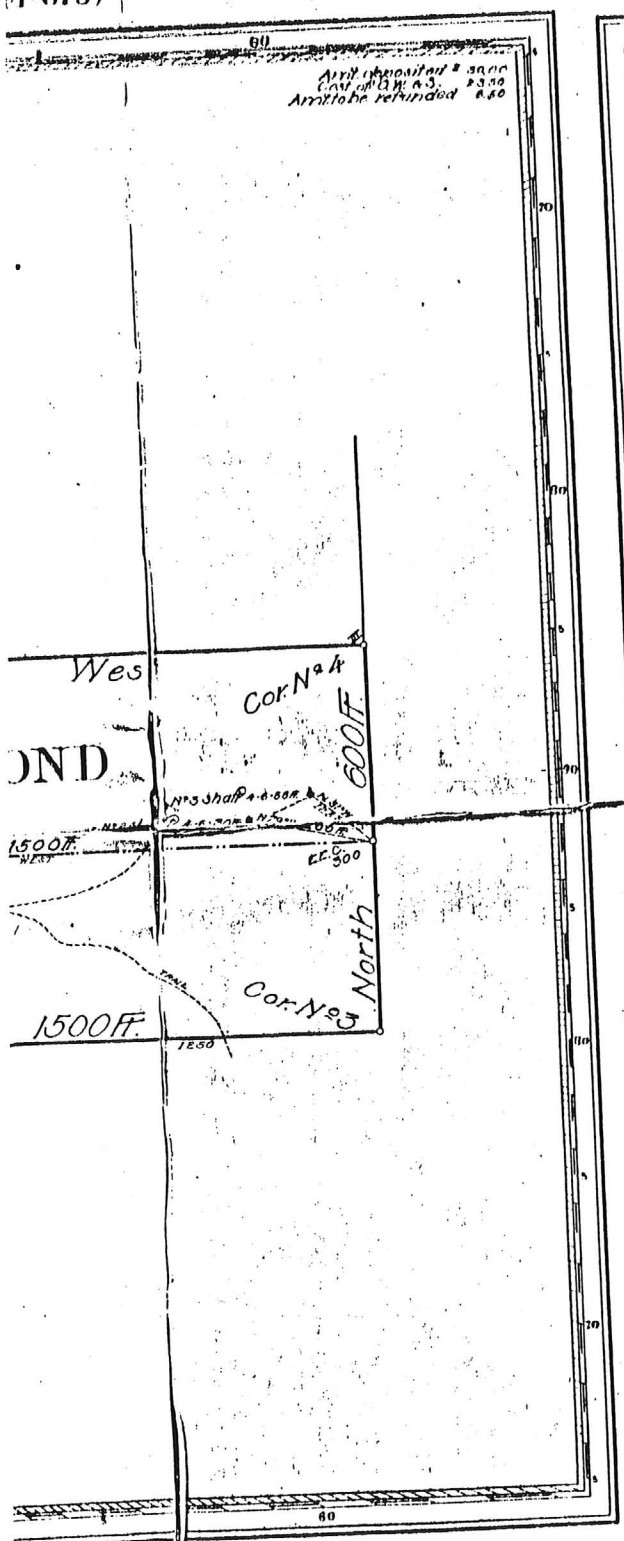


Claim Located July 1, 1901

Mineral Survey No. 2966

Lot No.

ARIZONA Land District.

PLAT

OF THE CLAIM OF

M.P. FREEMAN & FRANCES E. SMITH

KNOWN AS THE

Black Diamond

IN Salero MINING DISTRICT,
Santa Cruz COUNTY, Arizona
Containing an Area of 20.661 Acres.
Scale of 200 Feet to the inch.
Variation 13° E.

SURVEYED January 30, 1912 BY
Edgar C. Dietrich,
U.S. Mineral Surveyor,

The Original Field Notes of the Survey of the Mining Claim of M. P. Freeman & Frances E. Smith known as the Black Diamond

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.

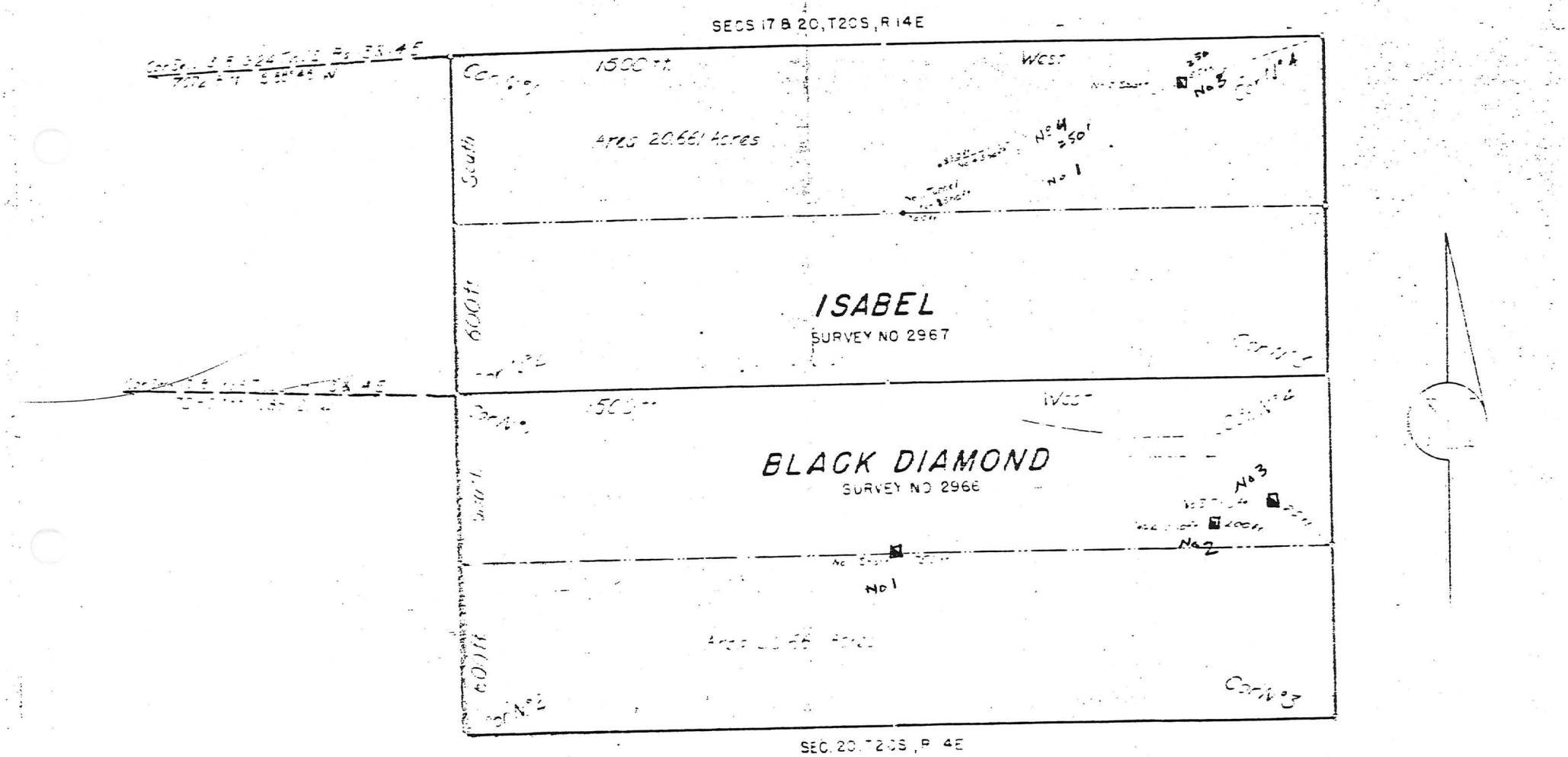
I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimants or their grantors, and that said improvements consist of 3 shafts, total value $950.

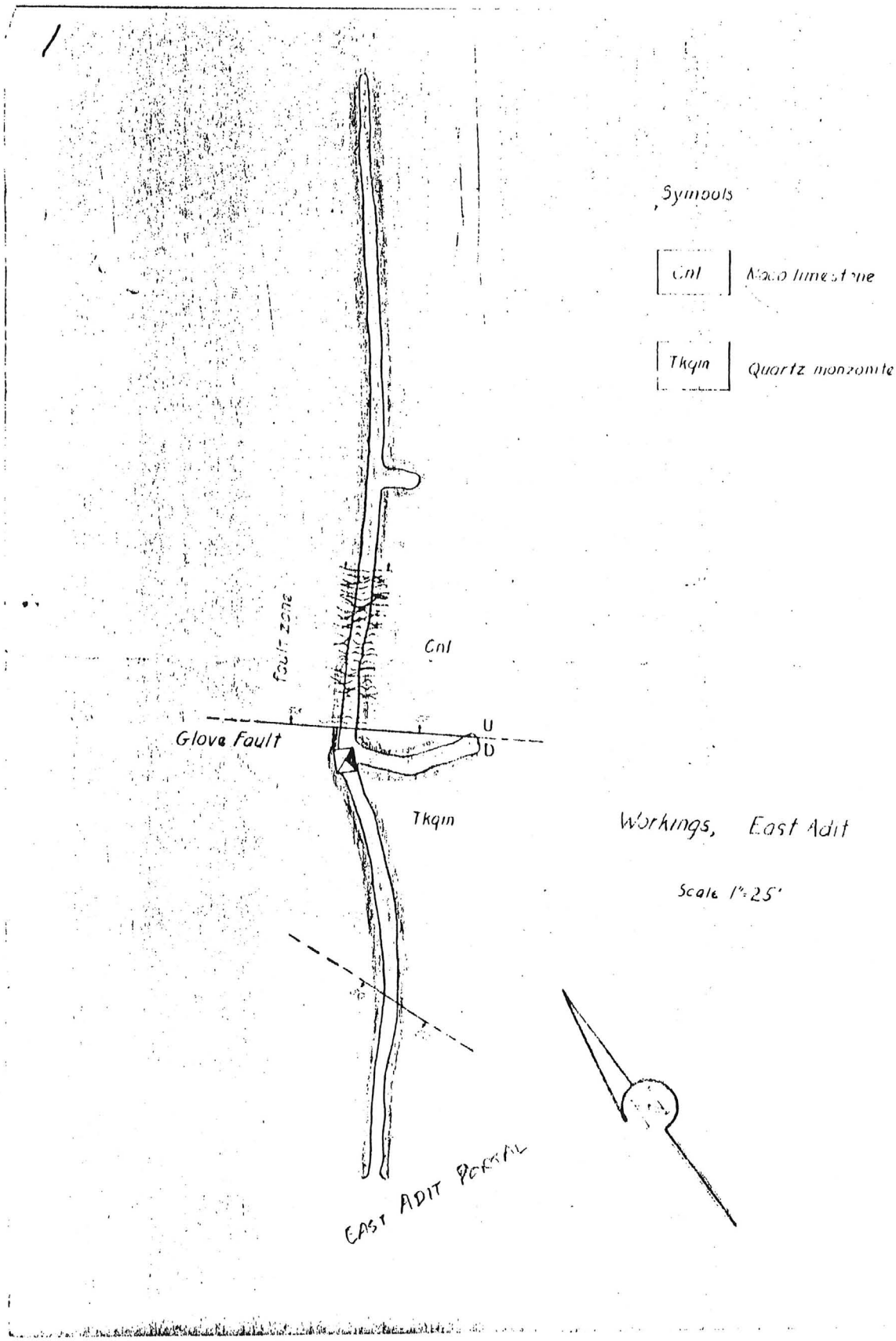
that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

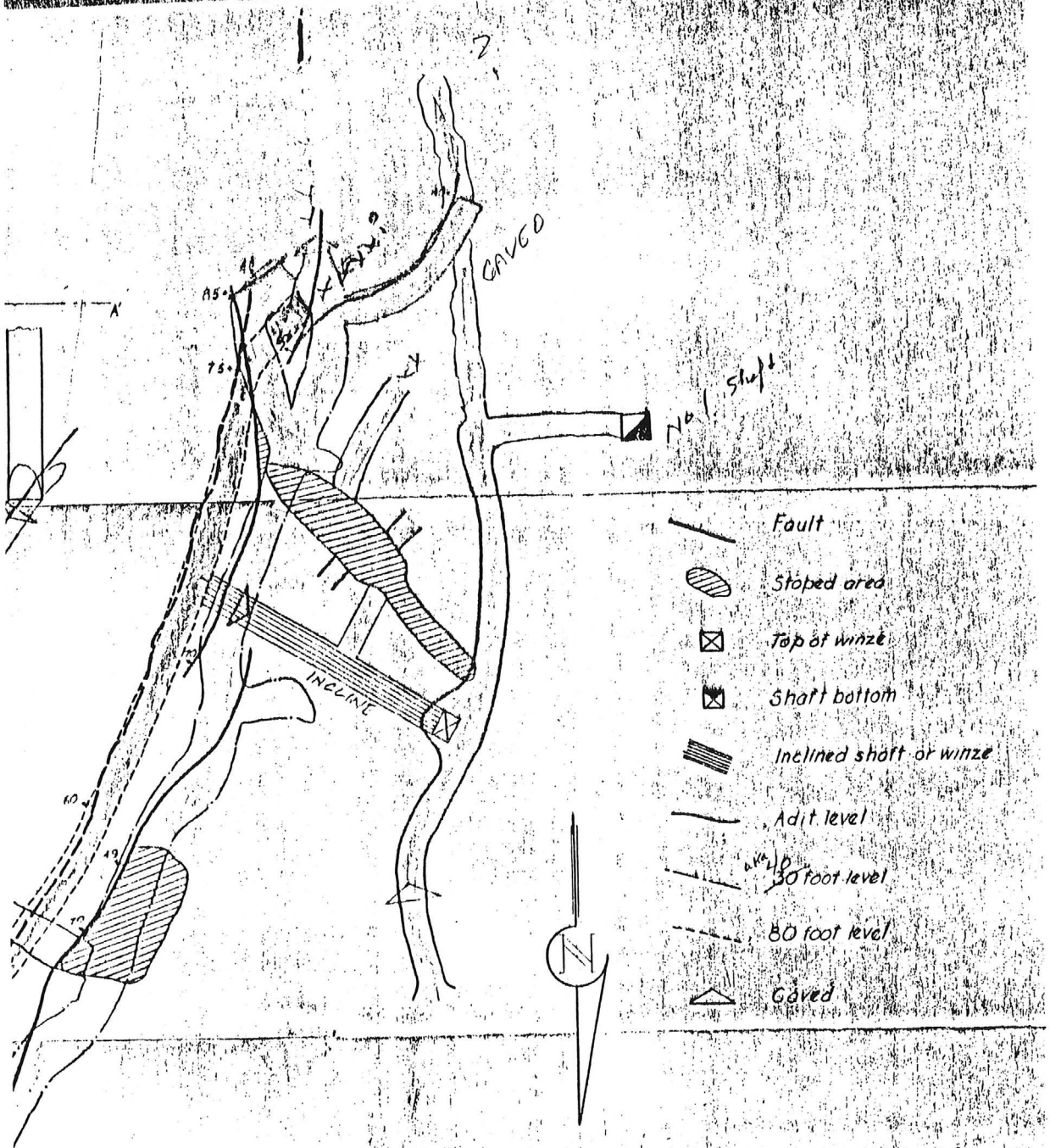
And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office.
Phoenix, Arizona
April 12, 1912.

Frank Edgerton
U.S. Surveyor General for
ARIZONA.


SECS 17 & 20, T20S, R 14E
1500 ft.
West
No 5
No 4
No 1
ISABEL
SURVEY NO 2967
BLACK DIAMOND
SURVEY NO 2966
No 3
No 2
No 1
SEC. 20, T20S, R 14E


Symbols
Cnl
Mass limestone
Tkqm
Quartz monzonite
Fault zone
Cnl
Glove Fault
U
D
Tkqm
Workings, East Adit
Scale 1"=25'
EAST ADIT PORTAL

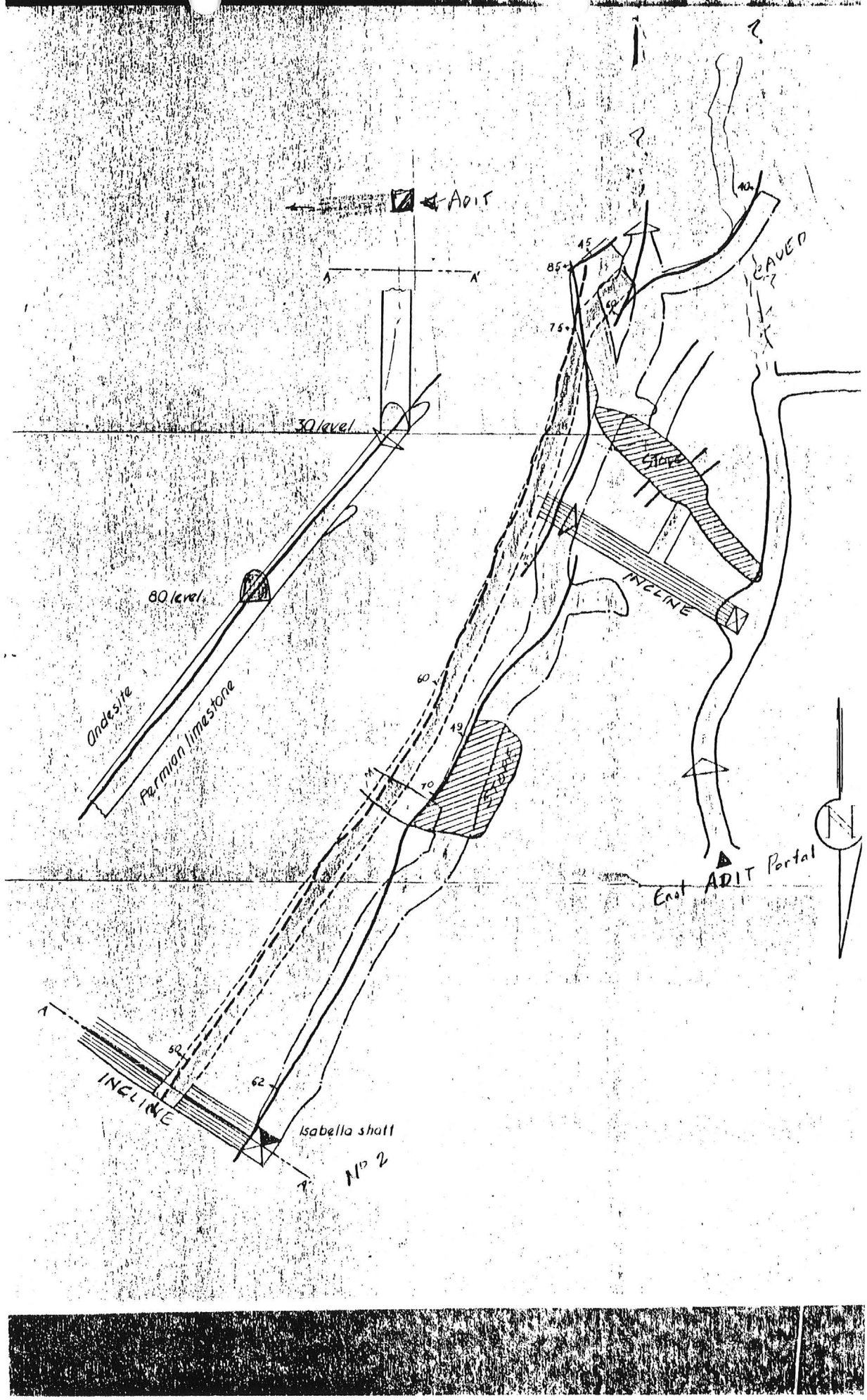


Sketch Map of Workings, Isabella Mine

(Data from Wilson & Tenney, 1928; Hart, 1912; modified by Anthony & Mosier, 1948)

Scale: 1" = 20'

aft


ADIT
A
A'
30 level
80 level
Andesite
Permian limestone
CAVED
Stope
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East ADIT Portal
N
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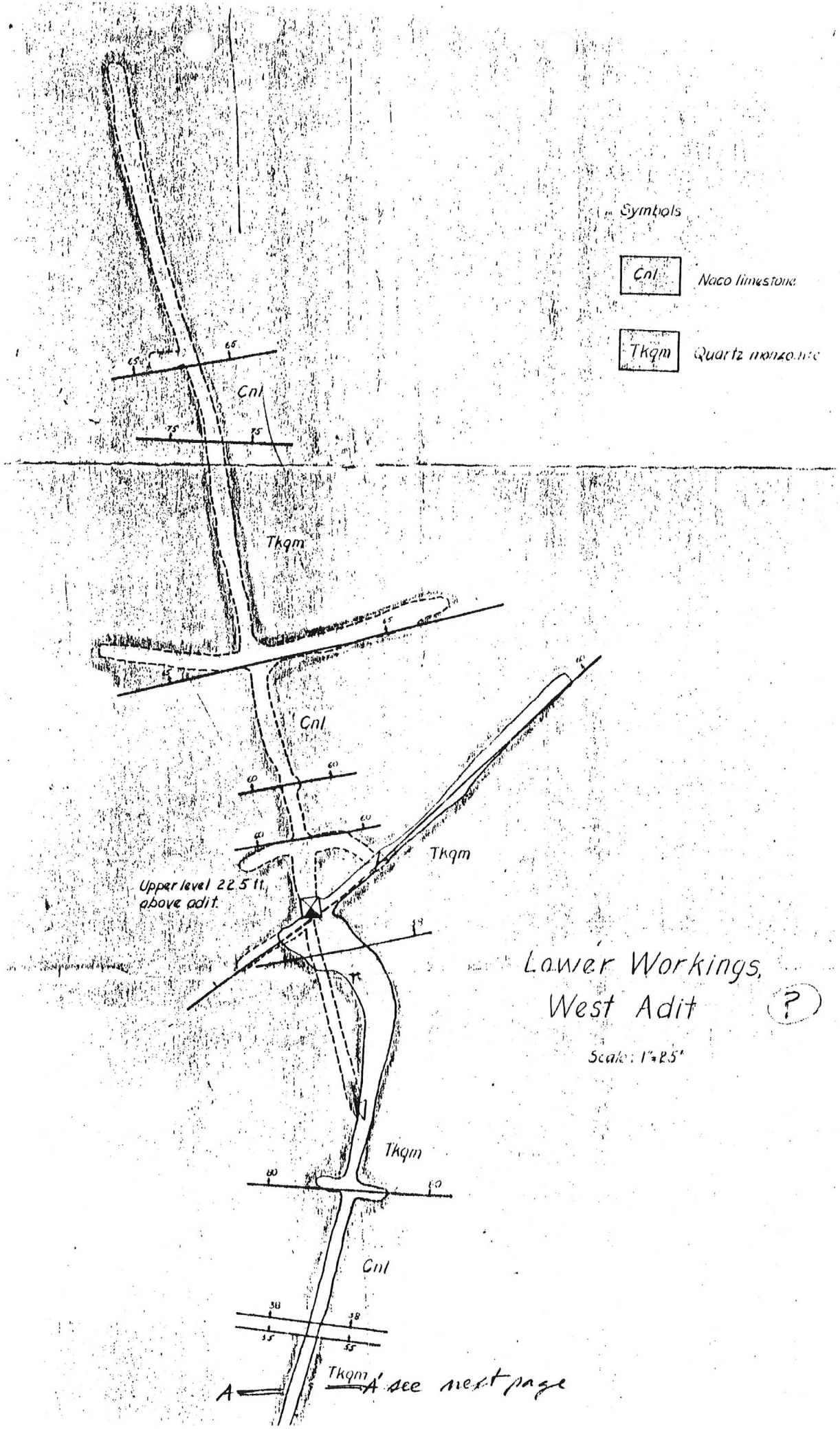
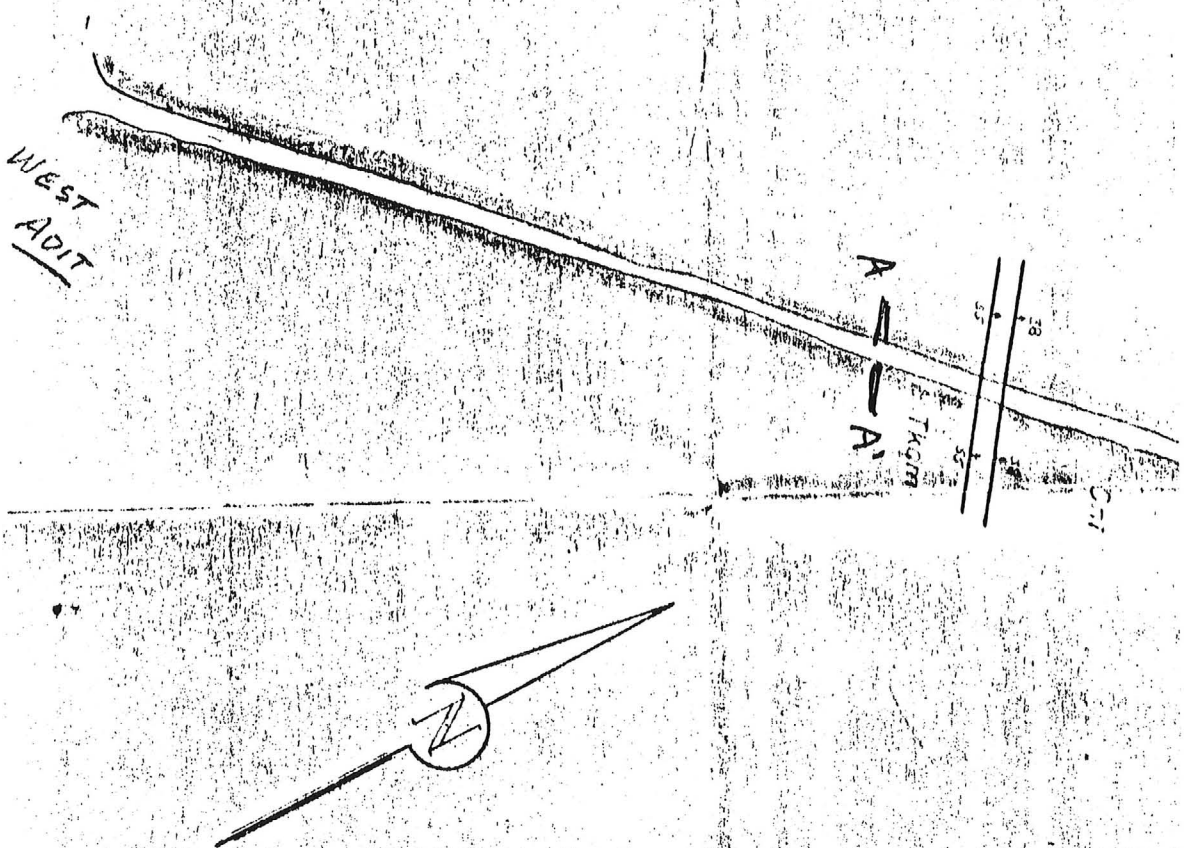
Isabella shaft
N° 2
85
75
60
70
62



Lower Workings, West Adit (?)

Scale: 1"=25'



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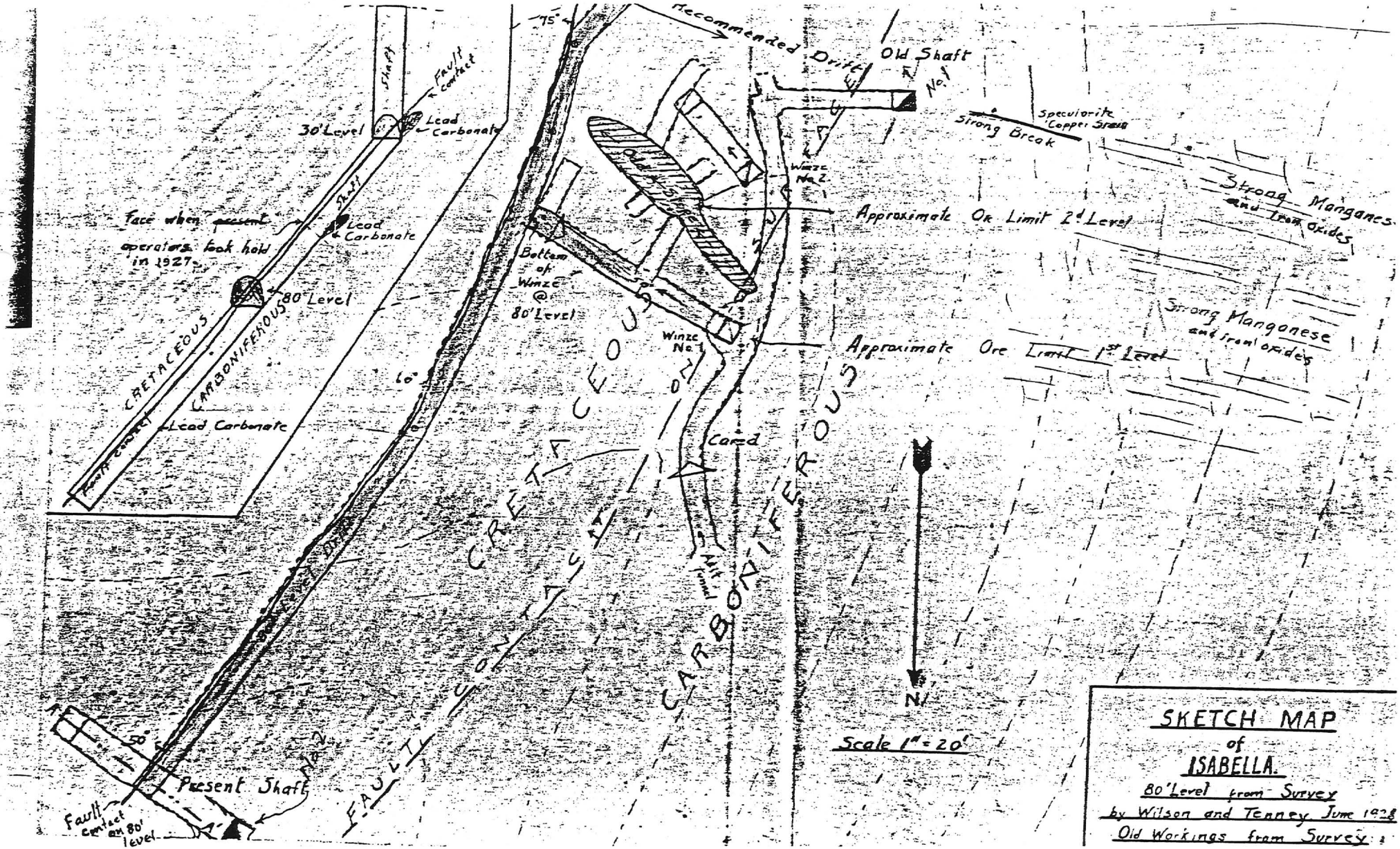
Shaft
Fault contact
30' Level
Lead Carbonate
Face when present operators took hold in 1927
80' Level
CRETACEOUS
CARBONIFEROUS
Lead Carbonate
Fault contact
Present Shaft
Fault contact on 80' level
75°
60°
50°
Recommended Drive
Old Shaft No. 1
Winze No. 2
Old Stope
Bottom of Winze @ 80' Level
Winze No. 1
Approximate Ore Limit 2nd Level
Approximate Ore Limit 1st Level
Speculorite Copper Stain
Strong Break
Strong Manganese and iron oxides
Strong Manganese and iron oxides
Cond
Mill Tunnel
CRETACEOUS
CARBONIFEROUS
FAULT
N
Scale 1" = 20'
SKETCH MAP
of
ISABELLA.
80' Level from Survey
by Wilson and Tenney June 1928
Old Workings from Survey.

The Amado Mine (Isabella and Black Diamond)

Tyndall Mining District

Santa Cruz County, Arizona

Location: The Amado Mine is located about nine miles east of Amado, on the southwestern slope of the Santa Rita Mountains.

Ownership: The two patented claims, Isabella and Black Diamond, are jointly owned by the University of Arizona, C. W. Walker, and another unknown (to me) individual. The University of Arizona has the controlling interest.

Geology: The ore bodies are small replacement pods within the Permian limestone along a strong northeast fault. This fault can be traced on the surface for several hundred feet. It dips steeply southeastward, and may be a tear fault related to the thrust action which shoved the Permian limestone-quartzite series over the Cretaceous sediments and volcanics. The rock on the hanging wall is either the Cretaceous sedimentary or volcanics series or an igneous intrusive. Both may be present.

There is a vertical shaft open down to the single working level (about the 40 level). Walker followed southwestward along the contact beyond where early workers had mined two short, narrow stopes of oxidized lead ore. This development work has not revealed any large new ore zones along the contact. Near the end of the drift, a cross fault was encountered which dipped steeply southward. A small shoot of ore was seen to lie beneath this fault and the main fault contact. Beyond the cross-fault three drifts branch out in search of the contact and more ore. Very little mineralization had been encountered at the time of this visit.

The ore consists of argentiferous cerrusite and copper oxides. At one time 32 cars of ore reported to have averaged 9 ounces of silver, 32 per cent lead, and 3.5 per cent copper. Pods of specularite are common along the contact.

Conclusion: There appears to be a reasonable chance for the known ore bodies to continue at depth down on the under side of the faulted contact. There is even a good chance that new ore bodies may be found by drifting the contact in both directions. Because of the smallness of the individual shoots, exploration drill holes from the surface would necessarily be closely spaced, if the results were to be significant. The prize, if any, which might be uncovered by considerable costly development and exploration, is very apt to be unworthy of the risk. The fault contact has a very irregular outcrop, and it may be that the present mine is located in a section of the fault where the ore solutions were localized in their upward course. If this is true, and unless other sections of the fault having a similar attitude can be found, the chances of new ore bodies along the contact are materially reduced. Only above the known ore shoots are there any signs of ore mineralization at the surface.

Review this mine when John Anthony's thesis map is made available.

W. R. Jones, Geologist
The Eagle-Picher Mining & Smelting Co.

Examined Dec. 27, 1948
in company with C. W. Walker

C
O
P
Y

Lordsburg, New Mexico, Aug. 27, 1947.

PRELIMINARY REPORT on the two patented mining claims, ISABELLA and BLACK DIAMOND, situated in the Tyndall Mining District, Santa Cruz County, Arizona.

The primary object of this examination is to find out whether the information presented to us by C. W. Walker in his letter dated August 15, (excerpts from which accompany this report) can be verified and what the possibility is of making the property a producer of direct shipping ore.

Though some of this information is based on hearsay, the most important fact, that of the production of 32 cars of ore shipped to the Douglas Smelter in 1912-1913, has been substantiated by the smelter records and the average assay of this ore is reported to be:

Silver	Lead	Copper
9.0 ozs.	32%	3.5%

There seems no reason to doubt this and it became necessary to find out definitely where this ore came from.

On the Isabella claim, there is a very definite NE and SW contact between quartz monzonite on the one side and limestone on the other and this contact can be traced for distance of approximately 1,000 feet. The contact in places shows good mineralization on the surface of lead and copper carbonates accompanied by specularite iron.

A tunnel has been driven into the hill on the contact for a distance of about 100 feet. The mouth is caved. At about 50 feet from the entrance a winze has been sunk on the contact to a depth of 65 feet on a 50 degree incline and the mouth of this winze is said to be bulkheaded. Beyond this winze ore has apparently been stoped up to the surface about 40 feet and some caving has occurred here.

It is evident that the ore that was shipped to the Douglas smelter came from the tunnel level to the surface and possibly some was stoped from the winze below the tunnel level. There seems to be no other place it could have come from. I was informed by Mr. Yost, a rancher who lives nearby and who helped the leasers at times in their work, that the ore was stoped from this area and that the orebody continues below the tunnel and can be seen from the winze referred to above. A sample gathered up from the dump where the leasers loaded the ore into wagons gave 28% lead.

My opinion is that the proposition is well worth looking into further for the following reasons:

FIRST. One orebody was evidently found in the tunnel and there is a good chance that this continues downwards as Mr. Yost affirms.

SECOND. The ore produced is high grade. At present day prices it would bring, net to shipper, $60 per ton after paying cost of trucking to shipping point, freight and smelting charges, so that all that has to be deducted from the $60 is the cost of mining. Therefore such ore is well worth going after.

THIRD. At the point where the orebody comes to the surface there are some interesting geological features, the significance of which may not have been appreciated. At this point, and on the left hand side of the fracture looking up the hill, there is an intrusion of a different type of eruptive, forming a dike in the monzonite. Where it strikes the fracture there is a very strong break going on into the limestone and on the line of this break, manganese gossans can be seen on the surface for a distance of 200 feet into the limestone. Samples from these gossans gave from 2% to 4% lead. Also there is strong cross fracturing in the limestone and some appearance of subsidence all of which point to a good chance of an orebody out in the limestone along this line of fracture. This possibility should certainly be investigated.

I therefore recommend that the mouth of the tunnel be cleaned out and the winze uncovered so that the area below the tunnel can be examined. If the extension of the orebody can be seen, a further decision as to the next step can then be made.

This work should not cost more than $200 or $300.

(Signed) W. S. Harrison.

SUPPLEMENTARY

If it is decided to go on with the proposition, the following additional data becomes relevant.

The claims lie at the base of the mountain range east of the railroad and highway running from Tucson to Nogales and about nine miles east of the station of Amado on the railroad, 27 miles north of Nogales and 41 miles south of Tucson.

From Amado station there is a desert road to a point about 1,000 feet from the mine workings. From this point an old road exists but it is too steep for use and a new road would have to be graded up to the tunnel about 1,200 feet on the contour. C. W. Walker informs me that a man from Tucson who has the equipment and does this kind of work, looked over the ground with him and said that he could put the road up to the tunnel in four days at a cost of $50 a day for the job. The desert road from Amado could be much improved with a couple of days' work with a blade.

There is a good two roomed house with large porch about 15 minutes walk from the mine. Water from a spring is laid into the house. Mr. Yost, the rancher, is the owner and he is agreeable to renting it.

Excerpts from C. W. Walker's letter dated Aug. 15, 1947.

"The history of the property as I have been able to determine, is that about 50 years ago it was operated as a stock Company and they did some work and built a smelter and operated the smelter about a week and closed down.

"Then in 1912 two cowmen took a lease and option on it and shipped 32 cars of ore from near the surface which ran better than 32 percent lead and 4 ounces of silver and about 3 percent copper. (This assay later verified by the Douglas Smelter as 32 percent lead, 9 ounces silver and 3.4 percent copper). Then in 1928 a couple of railroad engineers took an option on the property and sank a shaft about 200 feet deep and ran quite a long drift but found nothing to speak of. Nothing further has been done with the property.

"I located the cowmen who shipped the ore above mentioned and had quite a talk with them. Their story is that they made quite a little money from the ore shipped but drank it up as fast as they made it and used no timber whatever and as they were just a few feet under the ground it caved and they had no money to meet the payment which was about due, they abandoned the property. I had them go with me and show me where they took out the ore and tell me what they knew of the place. They told me that there is a winze 64 feet deep below where they were working and all in the same grade of ore as they were shipping when it caved. This was verified by another cowman who has a ranch near the mine and at the time the ore was being shipped he said that he used to go up in the evenings and help take out the ore and that he was down the winze and said the ore was still going down. Then I found a Mexican who used to work in the mine for the old company and he told me about the winze and the ore the same as the others had said was there. I think that it was upon this information that the railroad engineers started work.

"The cowmen showed me where they used to load the ore on wagons and I gathered up a sample and had it run for lead. It ran 28 percent."