CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
1520 West Adams St.
Phoenix, AZ 85007
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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Arizona Department of Mines and Mineral Resources Mining Collection

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PRINTED: 11/09/2001

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: KELVIN SULTANA COPPER CO. PROP

ALTERNATE NAMES:
BRYAN GROUP
SHOEMAKER
SULTANA-ARIZONA CU CO. PROP.
RAY ARIZONA COPPER PROPERTIES
PATENTED CLAIMS MS 2723
RAY BOSTON

PINAL COUNTY MILS NUMBER: 349

LOCATION: TOWNSHIP 4 S RANGE 14 E SECTION 7 QUARTER W2
LATITUDE: N 33DEG 06MIN 00SEC LONGITUDE: W 110DEG 57MIN 30SEC
TOPO MAP NAME: KEARNY - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
COPPER SULFIDE
SILVER
GOLD
IRON

BIBLIOGRAPHY:
ADMMR KELVIN-SULTANA COPPER CO. FILE
BLM MINING DISTRICT SHEETS 638 & 657
RANSOME, F.L., RAY FOLIO 1923, P. 23
ADMMR U FILE PINAL CU19
KELVIN-SULTANA COPPER CO. MINE PLAN AND ASSAY
SHEETS, FOUND WITH A.L. FLAGG VANADIUM REPTS
PAT. CLAIMS EXT. INTO SEC. 12-T4S-R13E
USGS MAP GQ 1188
AGS 1994 SPRING FIELD TRIP GUIDE

KELVIN SULTANA COPPER CO.

A. E. Flagg as receiver sold off all equipt. Co. bonds held in East. Mr. Flagg says claims were all patented, except for one small triangular piece. He thinks the ranch land was sold. He says the Company is defunct and that the property lies there with about $18000. tax lien against it.

8-23-57

At	Rear	Dist	Lat	Dep
				0.00
2 B.S.MS	North	3025.10	+ 3025.10	
¼ Cor.	S 6°56' W	2618.10	− 2598.90	− 316.60
1 M.C.MS	S 80°53' W	591.40	− 584.50	− 91.70
B.S.MS	N 68°48' W	437.30	+ 158.10	+ 407.70

log 2618.10 = 3.417987
sin 6°56 = 9.081759

316.04 = 2.499746

log = 3.417987
cos = 9.996812

2598.954 = 3.414799

log 591.47 = 2.771933 — 2.771933
sin 80°53 = 9.990325 — 9.994719

91.68 = 1.962258 — 2.766652

584.32

log 437.25 = 2.640730 — 2.640730
sin 68°48 = 9.969567 — 9.558258

407.66 = 2.610297 — 2.198988

158.12

Showing no conflict with mineral Creek Mill S M°2573 B

KELVIN-SULTANA COPPER COMPANY

1 MAP MAY BE FOUND IN BROWN CABINET

ON TOP OF MINE FILES - SOUTH WALL.

SECTION # 4

MAPS IN FILE -

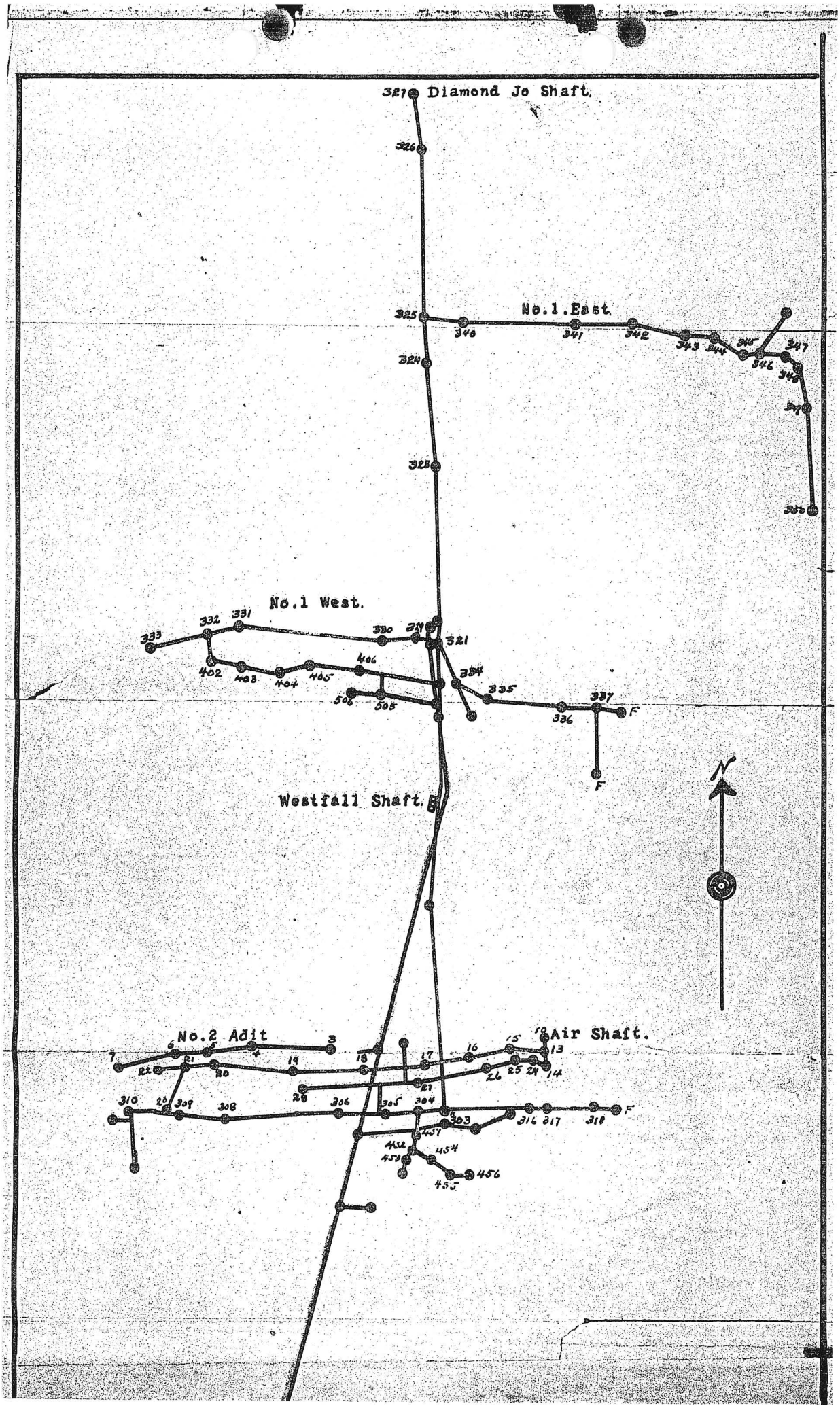
2 sets of 6 - sheets - KELVIN SULTANA COPPER CO. ASSAYS (blue print)

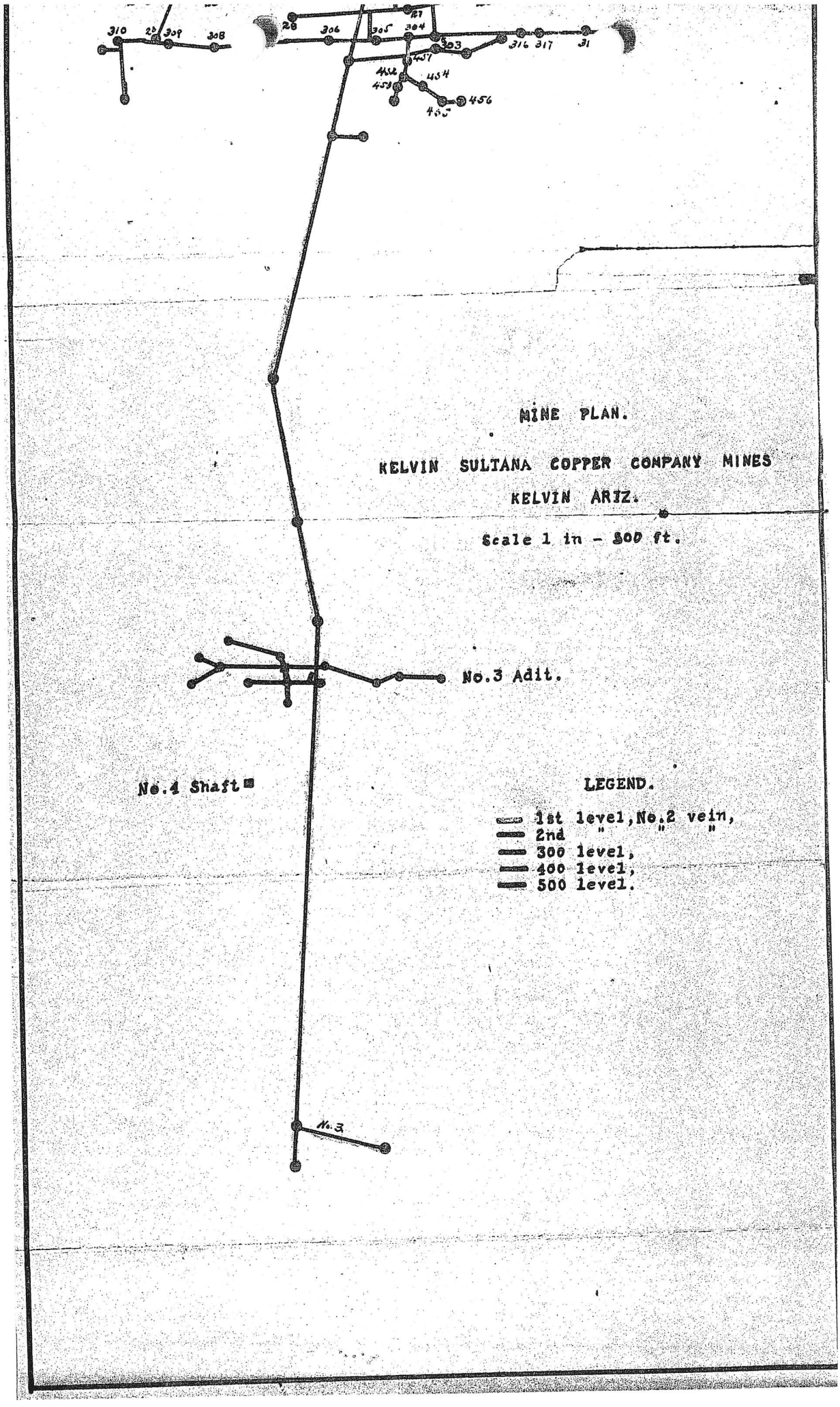
3 ~~8~~ - maps - KELVIN SULTANA COPPER CO. MINES (claims)

2 ~~3~~ - sheets - VEIN PLANS

1 - map - KELVON SULTANA MINE (blue print)

2 - maps - MINE PLAN (blue print)


Diamond Jo Shaft.
No.1 East.
No.1 West.
Westfall Shaft.
No.2 Adit
Air Shaft.
N



MINE PLAN.

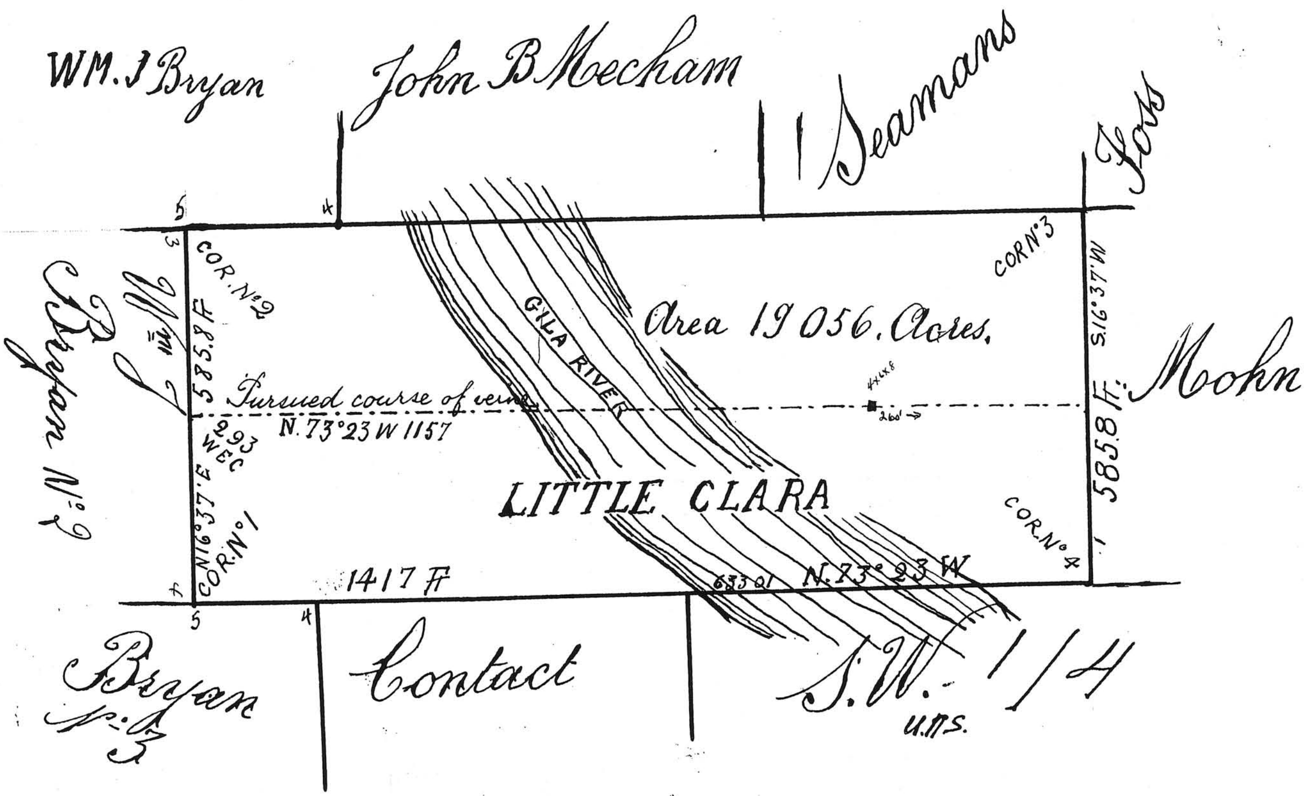
KELVIN SULTANA COPPER COMPANY MINES

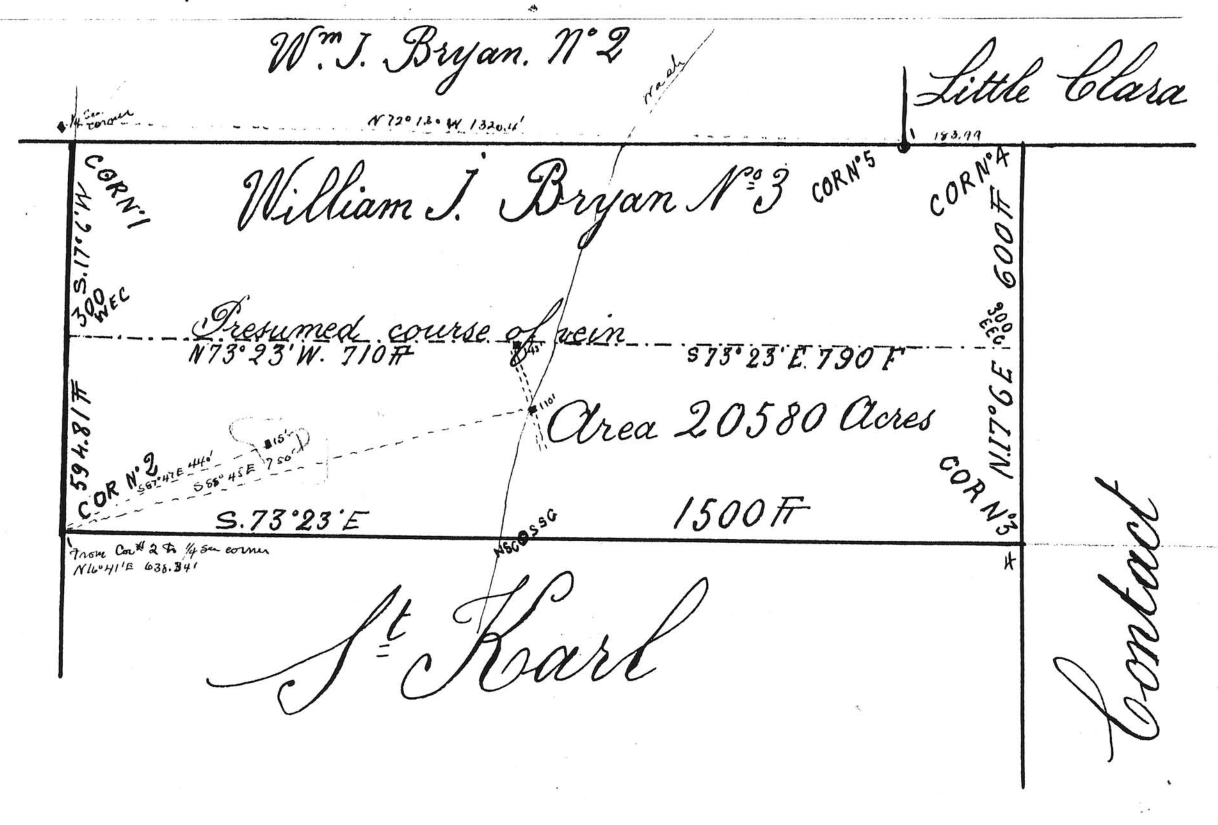
KELVIN ARIZ.

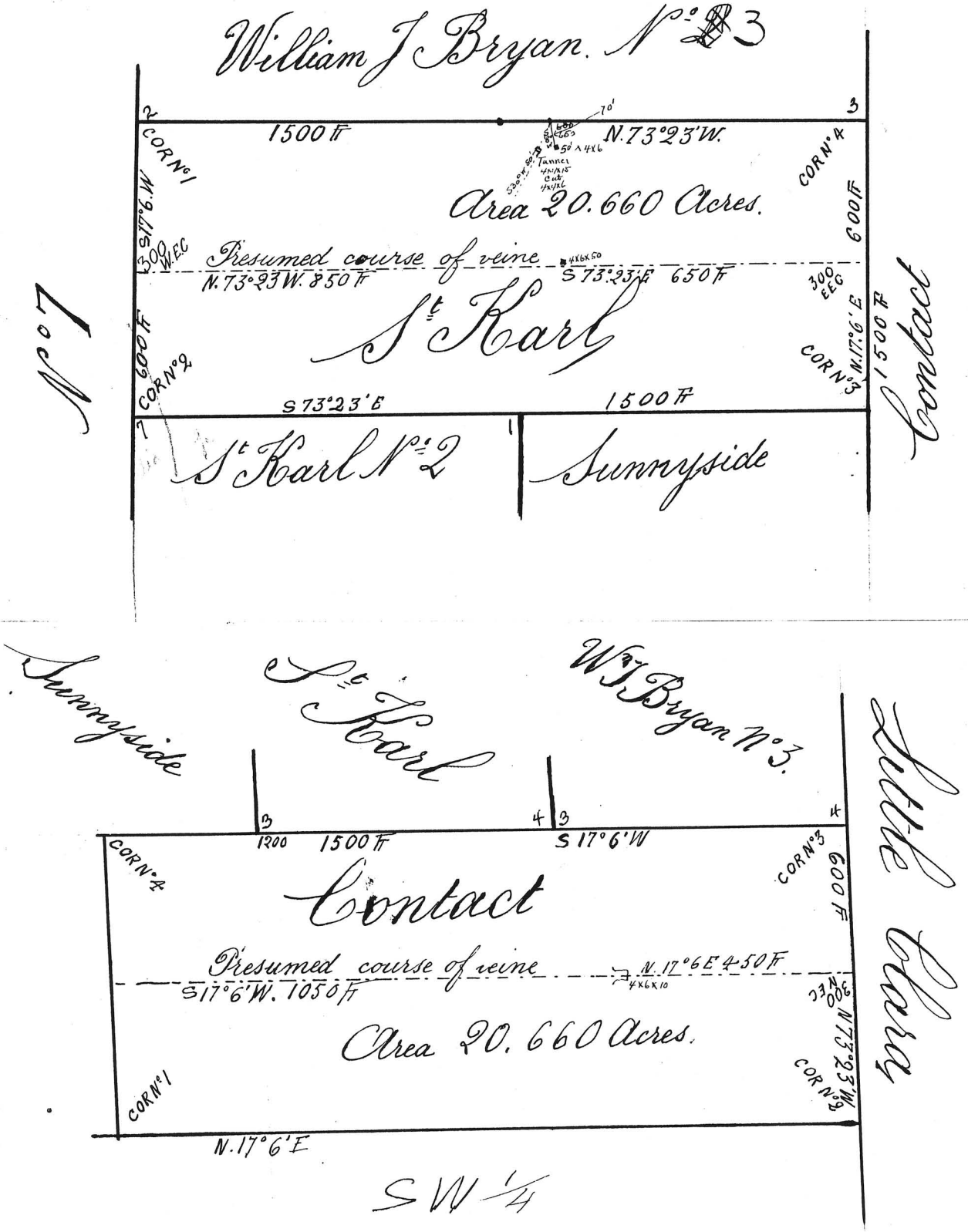
Scale 1 in - 500 ft.

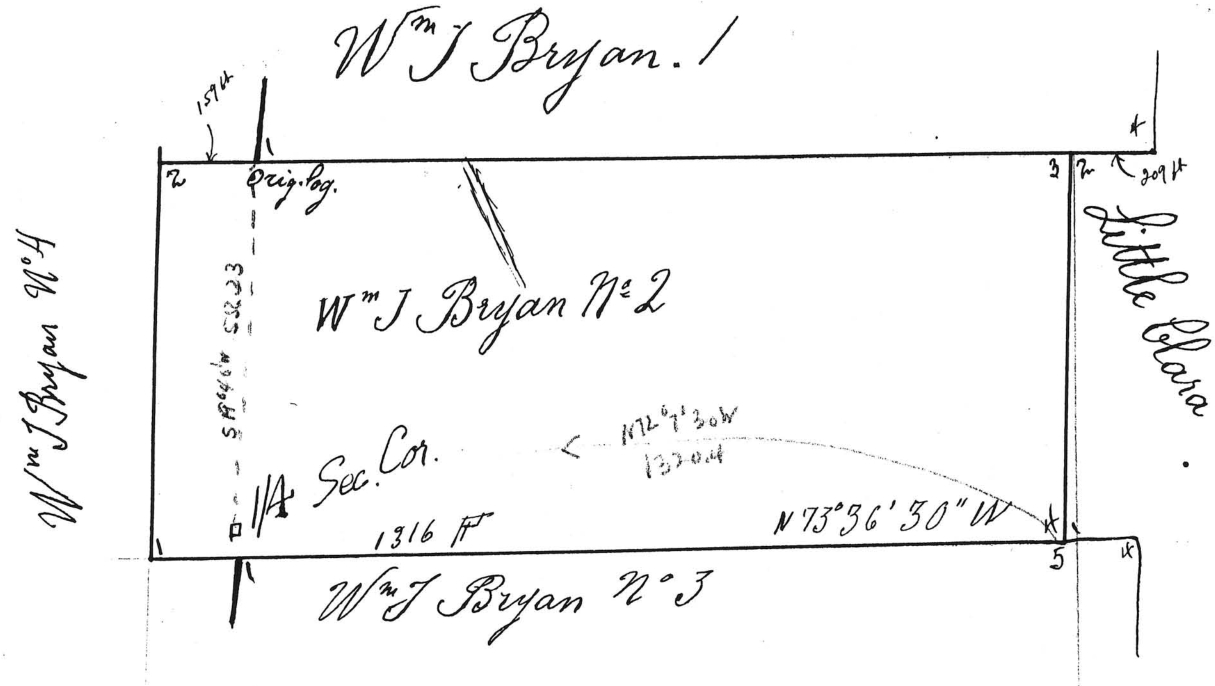
LEGEND.

1st level, No.2 vein,
2nd " " "
300 level,
400 level,
500 level.

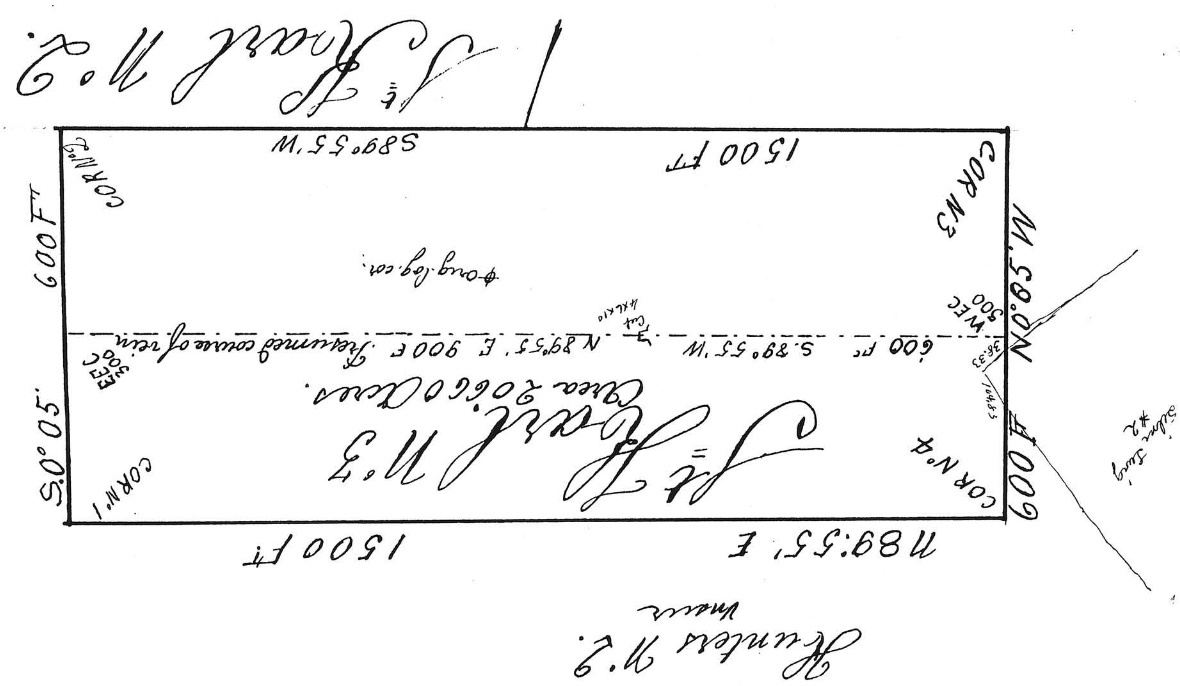

WM. J Bryan
John B Mecham
Seamans
Foss
Wm J Bryan No 2
COR. No 2
585.8 FT
Pursued course of vein
N.73°23 W 1157
293 WEC
N16°37' E
COR. No 1
GILA RIVER
Area 19.056. Acres.
CORN°3
S.16°37' W
Mohn
5858 FT
LITTLE CLARA
CORN°4
1417 FT
N.73°23 W
Bryan No 3
Contact
S.W. 1/4
U.M.S.


Wm. J. Bryan. No 2
Little Clara
N 72°13' W 1320.4'
William J. Bryan No 3
CORN°1
S.17°0' W
300 WEC
CORN°5
CORN°4
600 FT
Presumed course of vein
N73°23' W. 710 FT
S73°23' E. 790 F
300 EC
Area 20580 Acres
594.81 FT
COR N°2
S.73°23' E
1500 FT
N17°0 E
CORN°3
St Karl
Contact


William J Bryan. No 3
1500 ft
N. 73° 23' W.
CORN° 1
CORN° 4
Area 20.660 Acres.
600 ft
300 W.E.C.
Presumed course of veine
N. 73° 23' W. 850 ft
S 73° 23' E 650 ft
300 E.E.C.
St Karl
CORN° 2
CORN° 3
N. 17° 6' E
1500 ft
S 73° 23' E
1500 ft
St Karl No 2
Sunnyside
Contact
Loc N
Sunnyside
St Karl
W J Bryan No 3.
1200
1500 ft
S 17° 6' W
CORN° 4
CORN° 3
Contact
600 ft
Presumed course of veine
N. 17° 6' E 450 ft
S 17° 6' W. 1050 ft
Area 20.660 Acres.
CORN° 1
CORN° 2
N. 17° 6' E
Loc N
S W 1/4

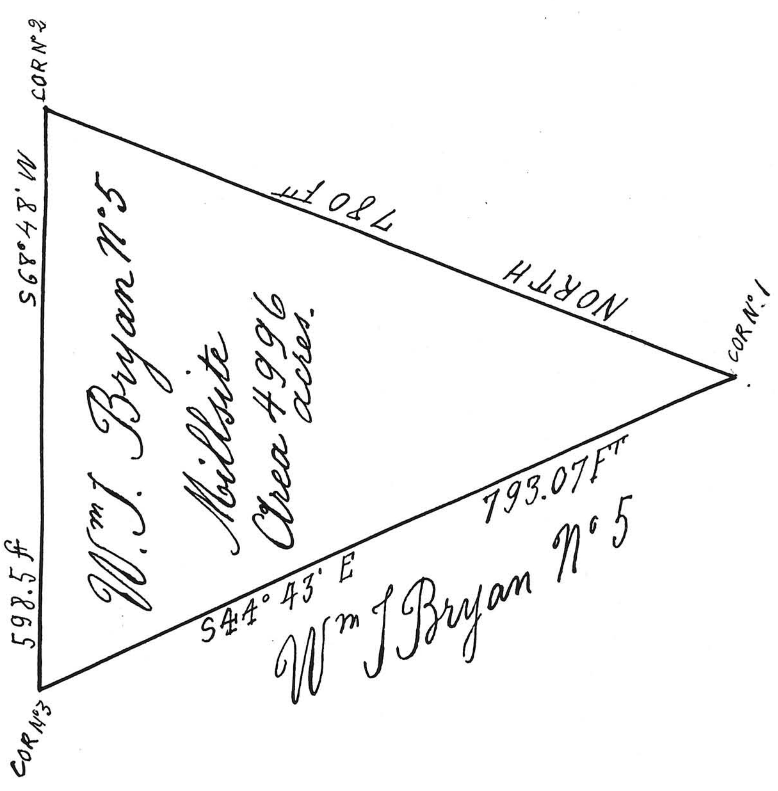


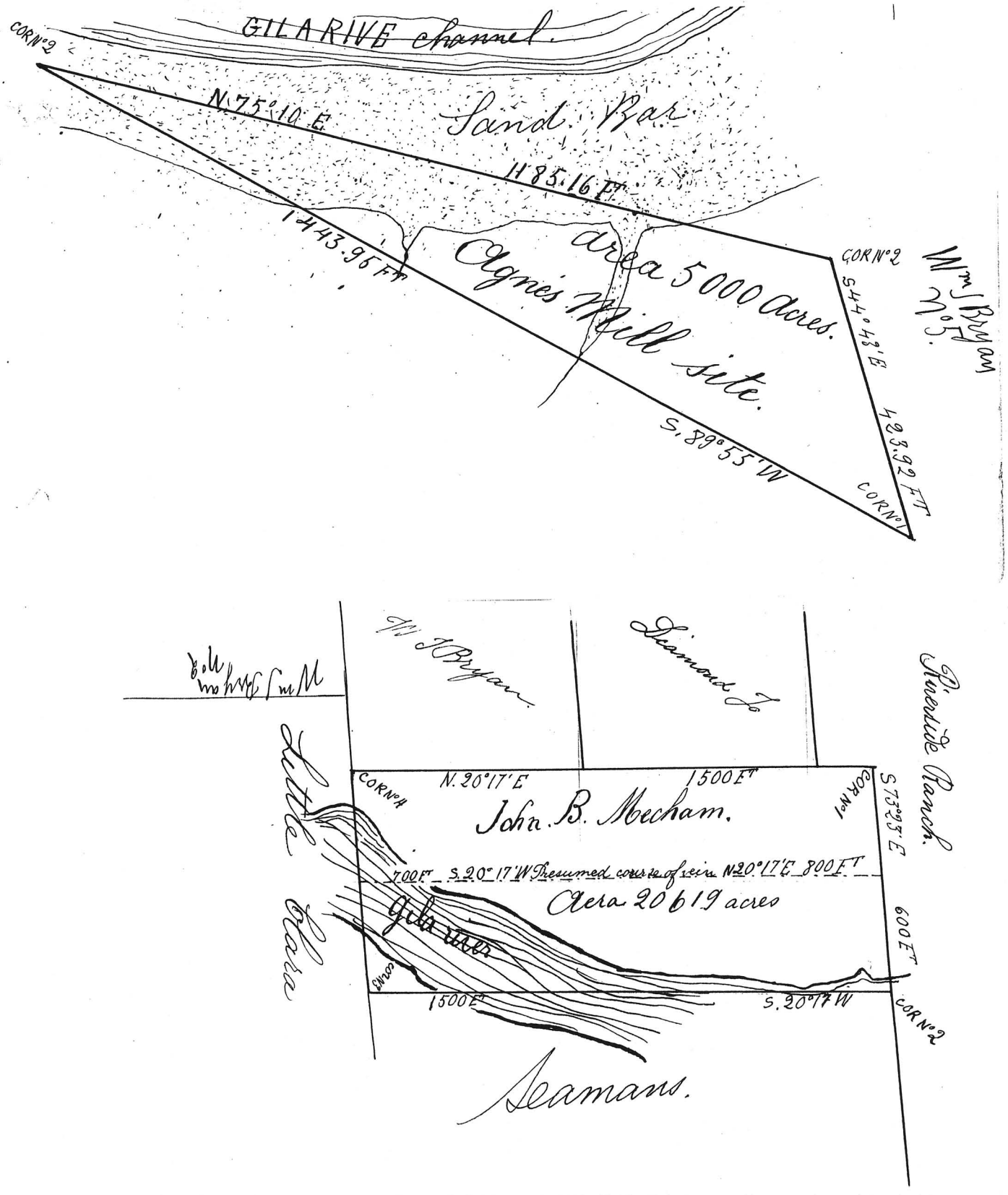
Wm J Bryan. 1
159 ft
Orig. loc.
209 ft
Wm J Bryan No 2
Wm J Bryan No 4
Little Clara
1/4 Sec. Cor.
1316 Ft
N 73°36'30" W
Wm J Bryan No 3

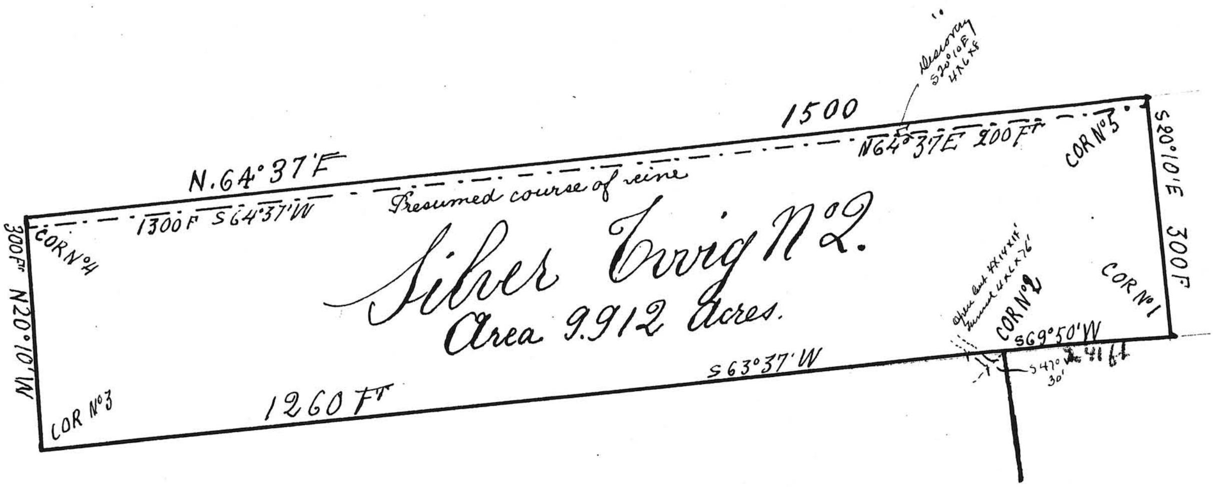


J. E. Hall No 2
S 89°55' W
1500 Ft
COR No 2
COR No 3
600 Ft
N 0°05' W
J. E. Hall No 3
Area 20.660 Acs.
S 0°05'
COR No 1
COR No 4
600 Ft
N 89°55' E
1500 Ft
Hunter No 2

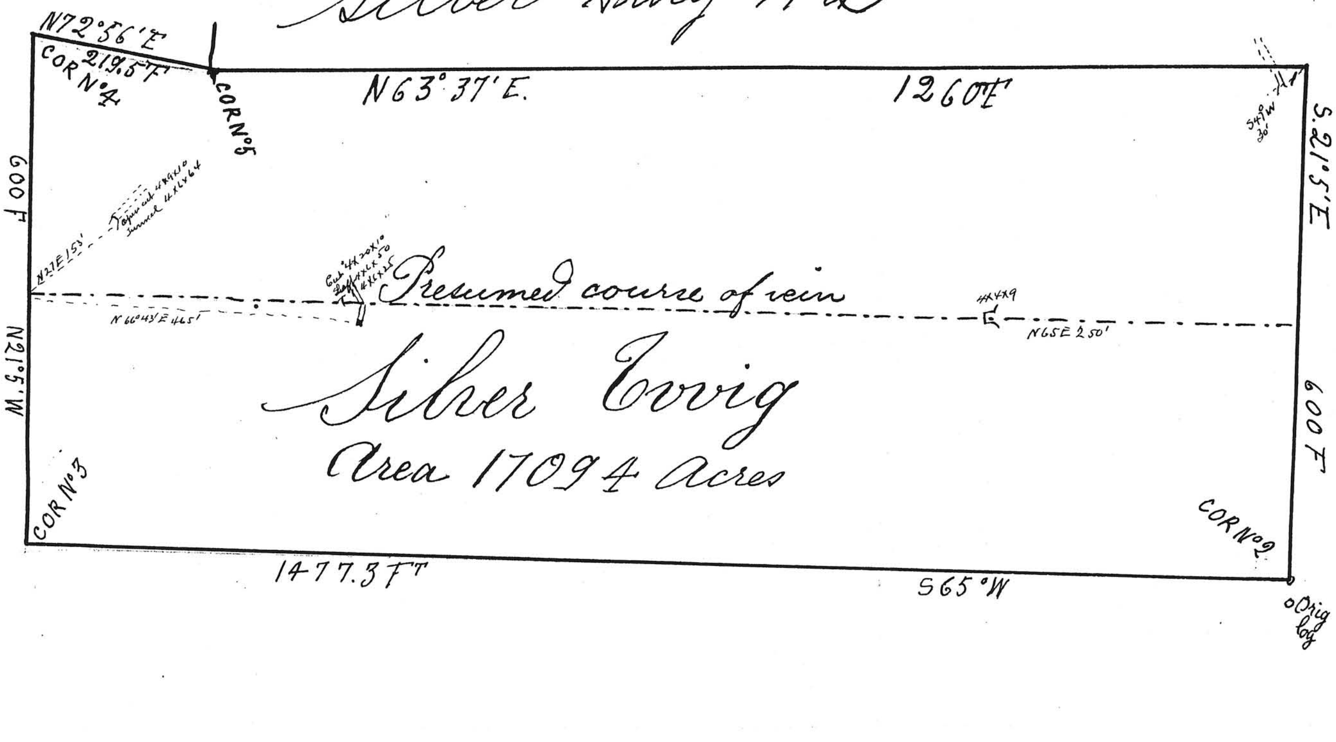

St Karl No 3
No 7
St Karl
S 73°23' E
750 FT
CORN No 1
S17°06'W
600 FT
CORN No 2
N.73°23'W
1500 FT
3
334.10 FT
N17°06'E
CORN No 4
N°89°55 E 747.20 FT
S63°W 990 FT
CORN No 5
CORN No 7
N17°06 E 70.85 F
S44°43' E 41 FT
CORN No 6
Presumed course of vein 750 N73°23'W S 73°23' E
St Karl No 2
Area 18.011 Acres.

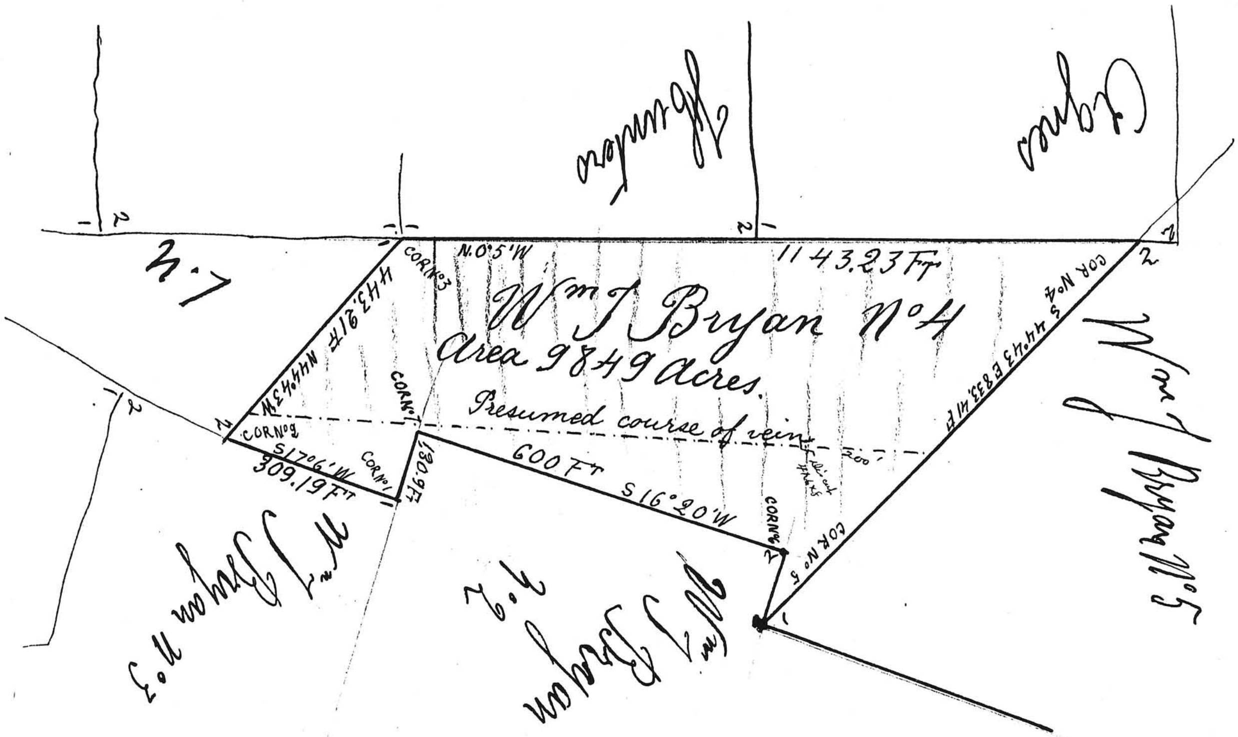
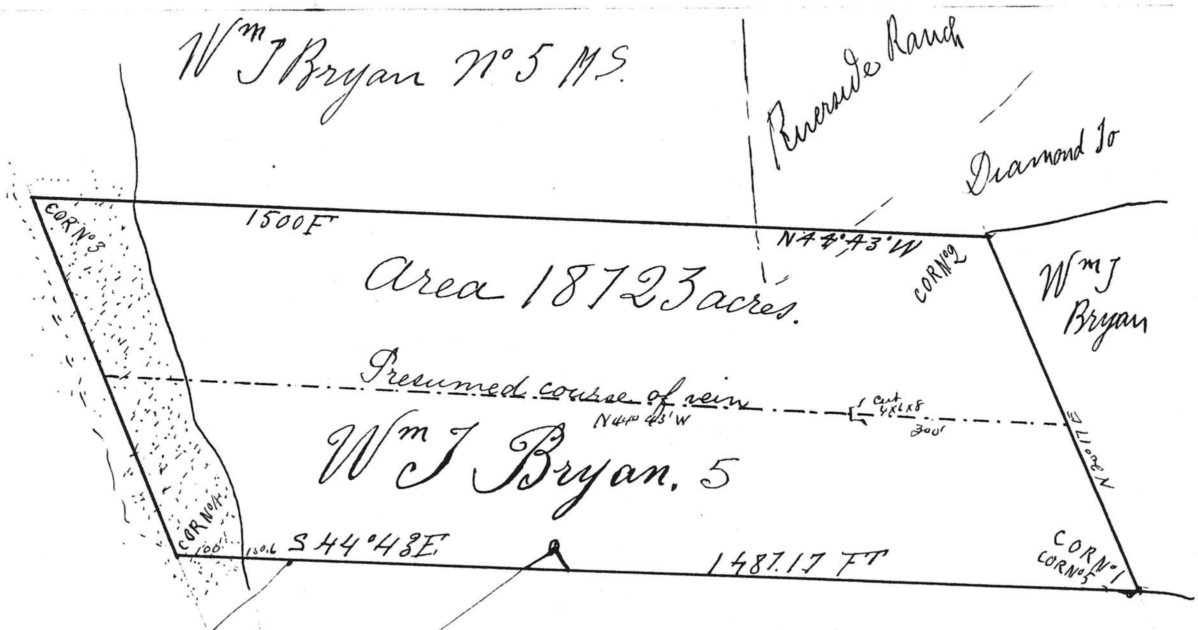

CORN No 2
S59°48'W
780 FT
NORTH
CORN No 1
793.07 FT
S44°43' E
598.5 ft
CORN No 3
Wm J. Bryan No 5
Millsite
Area 4.996 Acres.
Wm J Bryan No 5

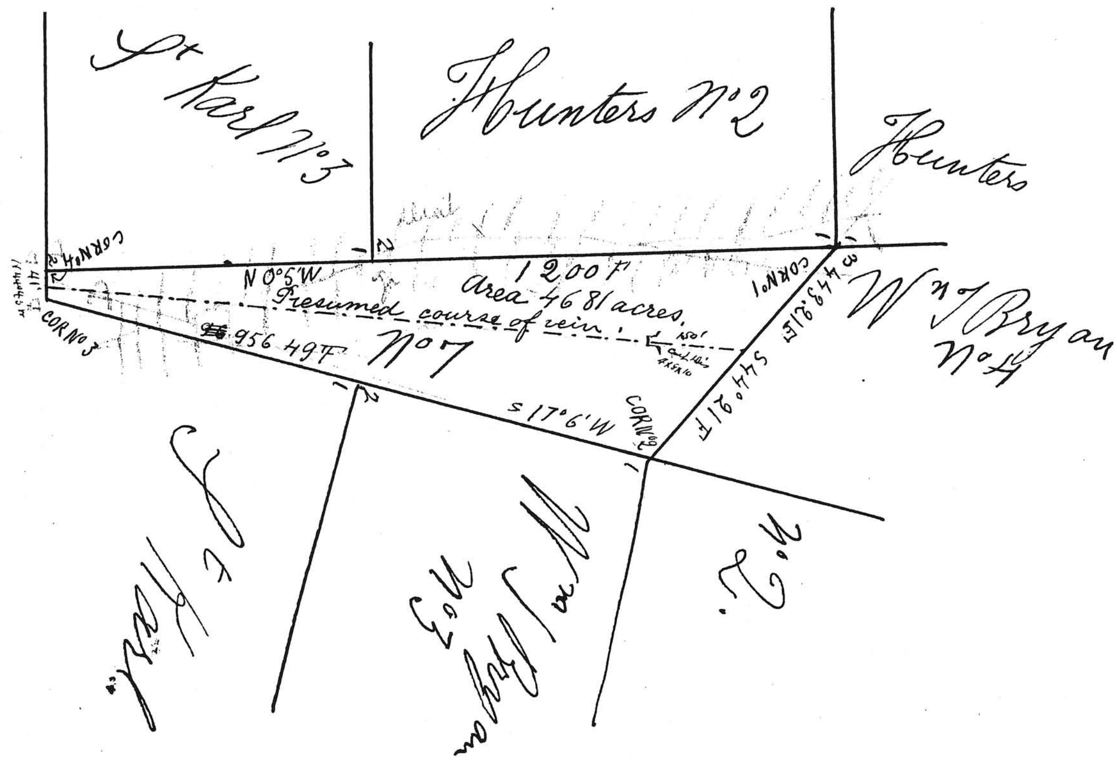

GILA RIVE Channel.
CORN°2
N. 75° 10 E.
Sand. Bar
1185.16 FT.
1443.96 Ft
area 5000 Acres.
Agnes Mill site.
CORN°2
S44° 43' E
483.92 FT
S. 89° 55' W
CORN°1
Wm J Bryan No 5.
Wm J Bryan No 4
W J Bryan.
Diamond Jo
Riverside Ranch.
CORN°4
N. 20° 17' E
1500 FT
CORN°1
S 73° 23' E
John B. Mecham.
700 FT
S. 20° 17' W Presumed course of vein N 20° 17' E 800 FT
Area 20619 acres
Gila River
600 FT
CORN°3
1500 FT
S. 20° 17' W
CORN°2
Seamans.

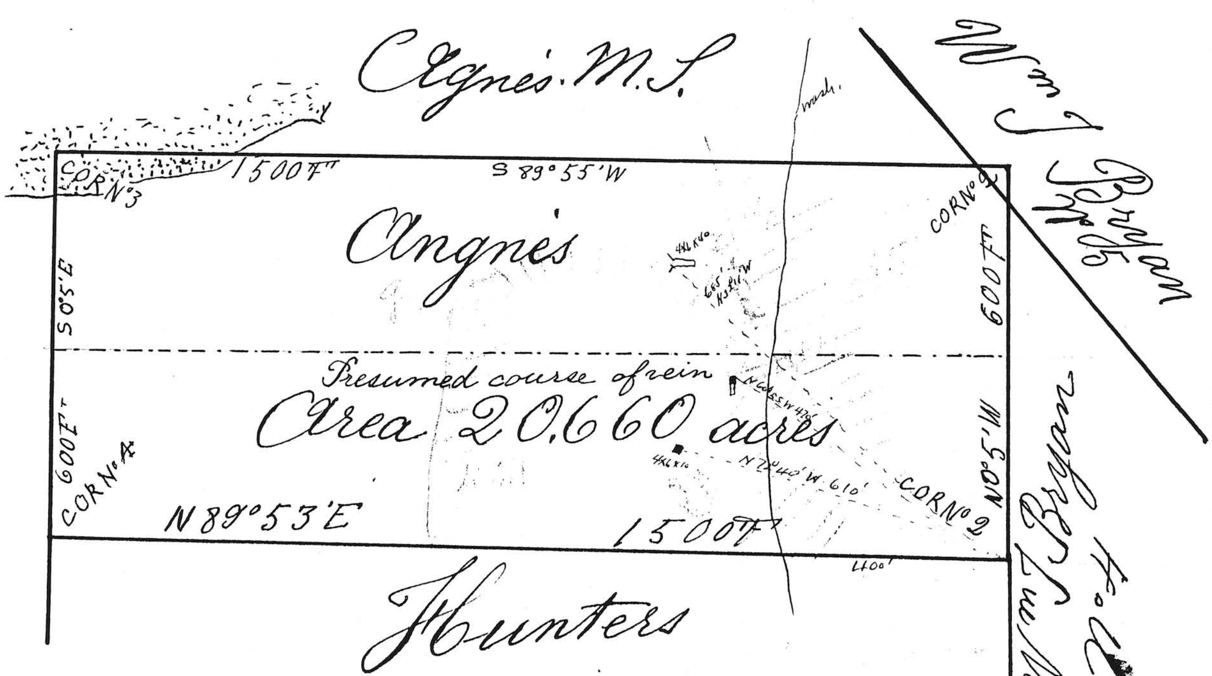


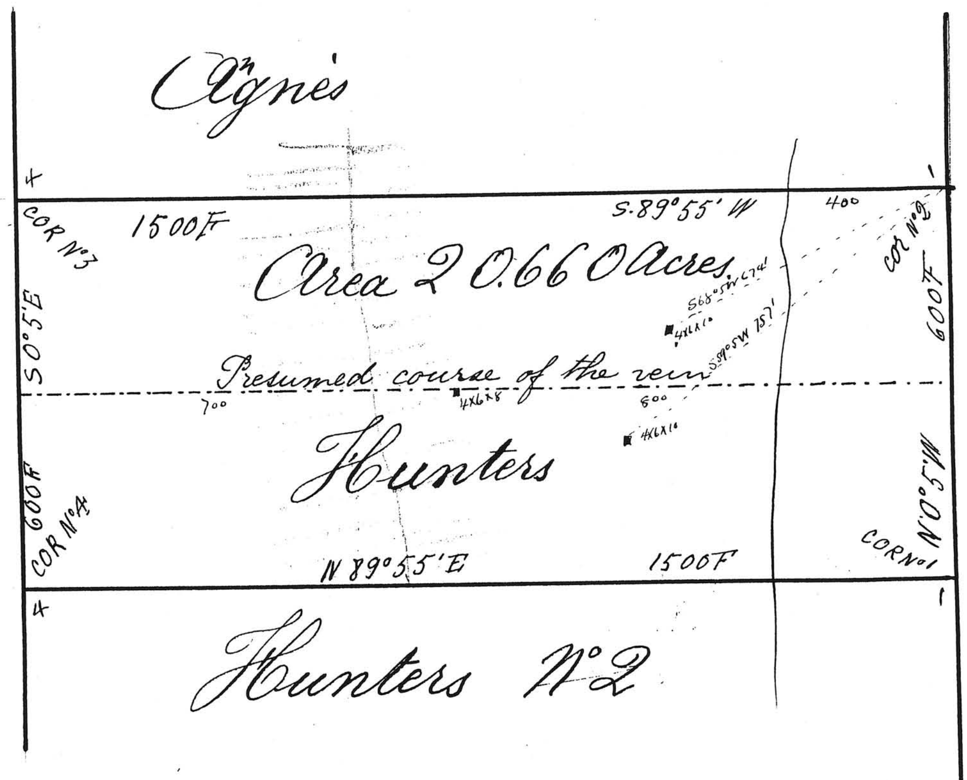
Silver Twig No 2

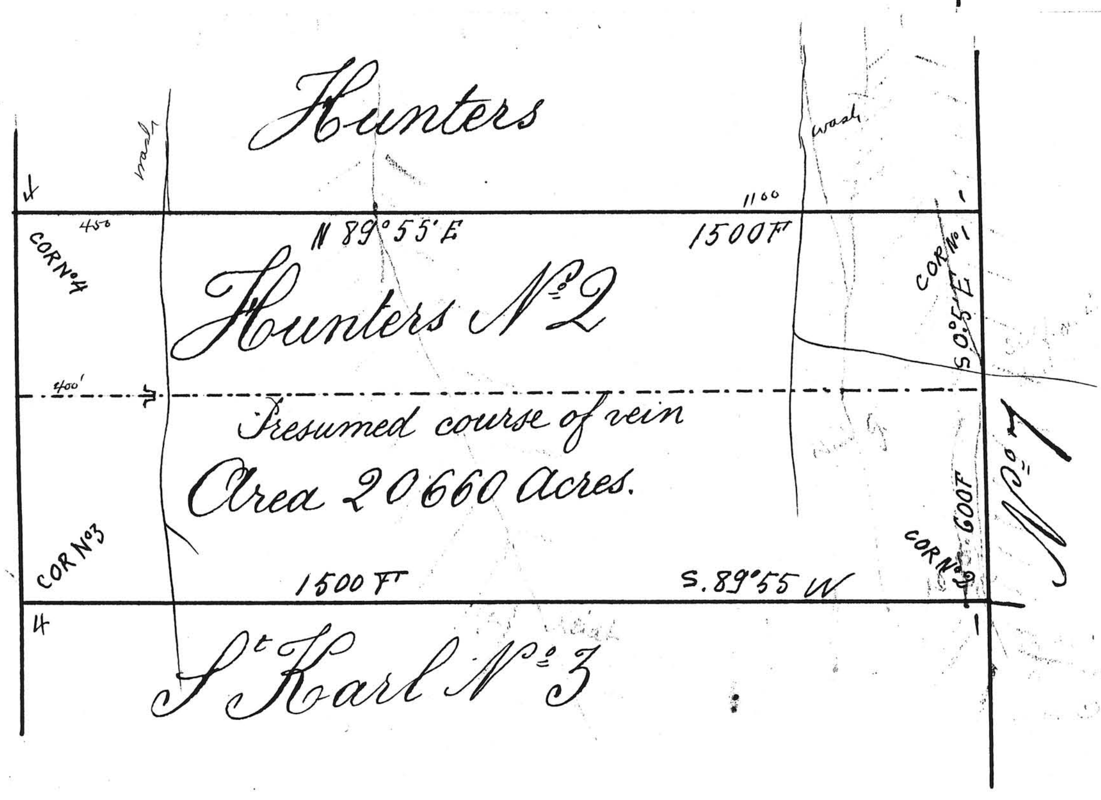


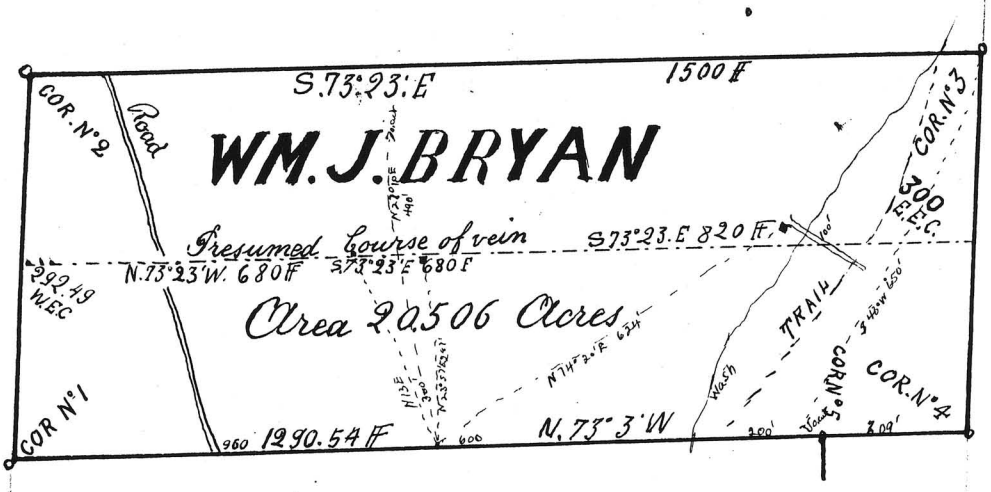

Wm J Bryan No 4
Area 98.49 acres.
Presumed course of vein
N 0°5' W
1143.23 Ft
Cor No 4
S 44°43' E 833.41 F
Corn No 3
443.21 F N 44°43' W
Corn No 2
S 17°6' W
309.19 Ft
Corn No 1
180.9 F
600 Ft S 16°20' W
Corn No 2
Cor No 5
Wm J Bryan No 5
Wm J Bryan No 3
Wm J Bryan No 2
Agnes
Bourbon
L. 7

Wm J Bryan No 5 MS.
Riverside Ranch
Diamond Jo
Wm J Bryan
1500 F
N 44°43' W
Corn No 2
Corn No 3
Area 18.723 acres.
Presumed course of vein
N 44°43' W
300'
Wm J Bryan. 5
Corn No 4
S 44°43' E
1487.17 Ft
Corn No 1
Agnes M.S.

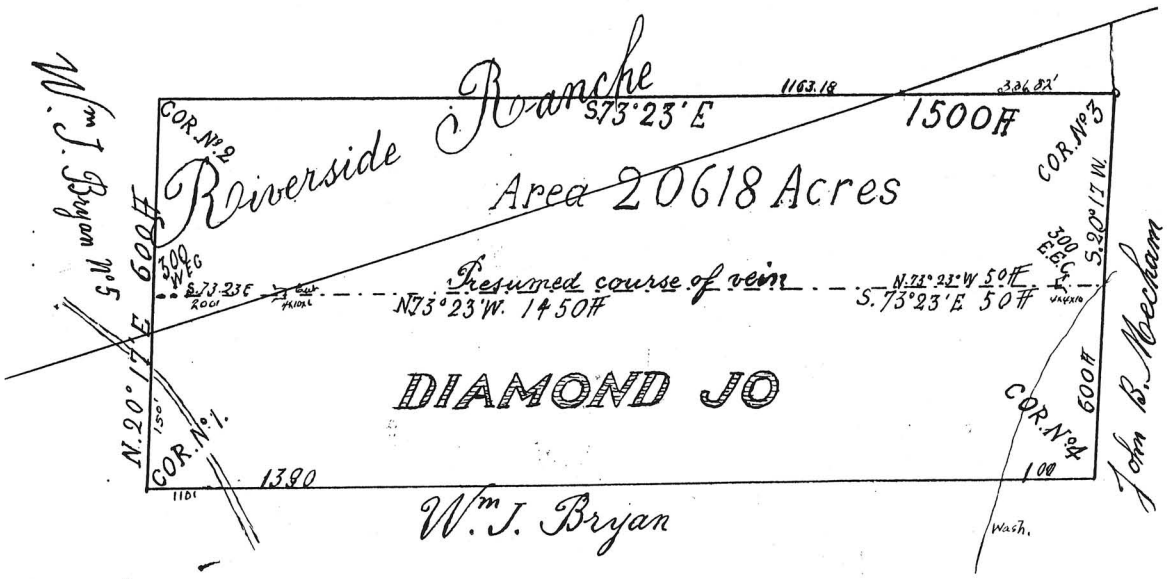

St Karl No 3
Hunters No 2
Hunters
Wm J Bryan No 4
No 7
Area 46.81 acres.
Presumed course of vein
1200 Ft
N 0°5' W
956.49 Ft
S 17°6' W
544.21 Ft
S 44°3' E
Corn No 1
Corn No 2
Corn No 3
Corn No 4
St Karl
Wm J Bryan No 3
No 2


Agnes. M.S.
Wm J Bryan No 5
Agnes
Presumed course of vein
Area 20.660 acres
1500 Ft
S 89°55' W
Corn No 3
Corn No 2
600 Ft
S 0°5' E
600 Ft
Corn No 4
N 89°53' E
1500 Ft
N 0°5' W
Corn No 2
Hunters
Wm J Bryan No 4


Agnes
4
1
COR Nº3
1500F
S.89°55' W
400
COR Nº2
Area 20.660 Acres
S0°5'E
600F
Presumed course of the vein
700
4X6X8
800
4X6X10
Hunters
600F
COR NºA
N0°5'W
CORNº1
N 89°55'E
1500F'
4
1
Hunters Nº2


Hunters
wash
wash
4
1100
1
450
N 89°55'E
1500Ft
CORNº4
CORNº1
Hunters Nº2
S0°5'E
400'
Presumed course of vein
Area 20660 Acres.
Nº1
COR Nº3
CORNº2
600F
1500 Ft
S.89°55 W
4
1
St Karl Nº3


S.73°23'E
1500 F
COR. N°2
Road
WM. J. BRYAN
COR. N°3
300 E.E.C.
Presumed Course of vein
S73°23'E 820 F.
N.73°23'W. 680 F
S73°23'E 680 F
292.49 W.E.C.
Area 20.506 Acres
TRAIL
COR. N°1
1290.54 F
N. 73° 3' W
COR. N°4


Wm. J. Bryan N°5
Riverside Ranche
S73°23'E
1163.18
1500 F
COR. N°2
COR. N°3
Area 20.618 Acres
300 W.E.C.
Presumed course of vein
N73°23'W. 1450 F
N.73°23'W 50 F
S.73°23'E 50 F
300 E.E.C.
S.20°17'W.
N.20°17'E 600 F
DIAMOND JO
COR. N°1.
COR. N°4
600 F
John B. Meeham
1390
W.m J. Bryan
Wash.

STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

February 26, 1968

MEMORANDUM

To: Frank P. Knight, Director

From: C. L. Hoyt, Field Engineer

Subject: KELVIN SULTANA COPPER COMPANY PROPERTIES. RIVERSIDE MINING DISTRICT.

The purpose of this memorandum is to bring up to date the file on this property, as it has been many years with out entry.

The Riverside Ranch which was part of the property was acquired by Mr. Quain Kinsey and subsequently sold to a Mr. Mack Dean and to a Mr. Browning. Both of these parcels were subdivided into residential lots.

The patented mining claims were purchased at Sheriff's Auction by Morris K. and Lucy Q. Wilkins.

In the period 1948-50 the Consolidated Copper Mines whose main properties were in Nevada did extensive drilling on the property. After again lying idle for a few years, a syndicate composed of some former Consolidated Copper Mines men did some further drilling.

E. J. Longyear Company is now drilling the area for Occidental Minerals Corp.

*GENERAL REFERENCES Kelvin-Sultana Mine

REFERENCE 1 F1 <ABGMT C[illegible]S FILES

REFERENCE 2 F2 <ABGMT - USBM FILE DATA

REFERENCE 3 F3 <AZ DEPT MIN RESOURCES FILE DATA

REFERENCE 4 F4 <RANSOME, RAY FOLIO 1923 p 23

M 220 CONT.< MOST OF THE DEVELOPMENT IS ON THE WM. J. BRYAN, AND WM. J BRYAN NO 2 AND NO 3 CLAIMS AND DIAMOND JO CLAIM>

L 110 CONT.< INCLUDE THE DIAMOND JO, WM. J. BRYAN, WM. J. BRYAN NO 2-5, ST. KARL, ST. KARL NO 2-3, CONTACT, LITTLE CLARA, JOHN A. MECHAM, SILVER TWIG AND POSSIBLY OTHERS; MAY INCLUDE OLD RAY ARIZONA COPPER PROPERTY>

F5< USGS GEOLOGICAL QUADRANGLE MAP, GQ 1188, 1975>

vmls 349

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 <USBM 004 021 0568>

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

*REPORTER AFFILIATION G5 <ABGMT> *SITE NAME A10 <KELVIN-SULTANA MINE>

SYNONYMS A11 <SULTANA ARIZONA, RAY BOSTON MINE, RIVERSIDE GROUP>

LOCATION

MINING DISTRICT/AREA A30 <RIVERSIDE DISTRICT>

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

PHYSIOGRAPHIC PROV A63 <1,2,[ ]>

DRAINAGE AREA A62 <1,5,0,5,0,1,0,0,[ ]> *LAND STATUS A64 <0,1,[ ],[ ],(1,9,7,9,1)>

QUADRANGLE NAME A90 <KEARNY (1,9,6,4,)> *QUADRANGLE SCALE A100 <2,4,0,0,0,>

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

ELEVATION A107 <[ ],2,0,0,0,[ ],FT>

UTM

NORTHING A120 <3,6,6,2,0,0,0>

EASTING A130 <5,0,3,6,3,0,>

ZONE NUMBER A110 <+,1,2>

*ACCURACY

ACCURATE (ACC) (circle)

ESTIMATED EST <[ ]>

GEODETIC

*LATITUDE A70 <[ ]-[ ]-[ ] N,>

*LONGITUDE A80 <[ ]-[ ]-[ ] W,>

CADASTRAL

TOWNSHIP(S) A77 <0,0,4,S,[ ],[ ],[ ],[ ]> *RANGE(S) A78 <0,1,4,E,[ ],0,1,3,E,[ ],[ ],[ ]>

SECTION(S) A79 <7,[ ],[ ],12,[ ],[ ]>

SECTION FRACTION(S) A76 <W2 OF W2 ; E2>

MERIDIAN(S) A81 <GILA AND SALT RIVER>

POSITION FROM NEAREST PROMINENT LOCALITY A82 <ABOUT 0.8 MILES SOUTH EAST OF POINT WHERE MINERAL CREEK ENTERS GILA>

LOCATION COMMENTS A83 <LOCATED AT THE HORSESHOE BEND IN THE GILA RIVER AT RIVERSIDE UTM IS AT CENTER OF LARGE GROUP OF ADITS, SHAFTS, AND PROSPECTS>

ESSENTIAL INFORMATION
ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

COMMODITY INFORMATION

*COMMODITIES PRESENT C10 < C,U, | A,G, | A,U, >
*ORE MINERALS C30 < CHRYSOCOLLA, MALACHITE, CHALCOPYRITE >
COMMODITY SUBTYPES C41 <
GEN. ANALYTICAL DATA C43 <
COM. INFO. COMMENTS C50 <

* SIGNIFICANCE

	PRODUCER	NON-PRODUCER
MAJOR PRODUCTS	MAJOR < C,U, >	MAIN COMMODITIES PRESENT C11 <
MINOR PRODUCTS	MINOR < A,G, | P,B, | A,U, >	MINOR COMMODITIES PRESENT C12 <
POTENTIAL PRODUCTS	POTEN <	
OCCURRENCES	OCCUR <	OCCURRENCES OCCUR <

*PRODUCTION

PRODUCER	NON-PRODUCER
PRODUCTION (YES) (circle) PRODUCTION SIZE (SML) 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 < JAS. K. McCARTHY AND C. KINNEY >
*YEAR OF DISCOVERY L10 < PRE-1903 > *NATURE OF DISCOVERY L30 < B > *YEAR OF FIRST PRODUCTION L40 < 1903 > *YEAR OF LAST PRODUCTION L45 < 1918 >
*PRESENT/LAST OWNER A12 < MORRIS AND LUCY Q WILKINS (1968) >
*PRESENT/LAST OPERATOR A13 <
EXPL./DEV. COMMENTS L110 < PREVIOUS OWNERS OR OPERATORS INCLUDE SULTANA-ARIZONA COPPER CO. (1908), KELVIN SULTANA COPPER CO. (1916), J. ERMAN (1906), RAY BOSTON COPPER CO. (1919); CLAIMS

DESCRIPTION OF DEPOSIT

*DEPOSIT TYPE(S) C40 < VEIN / DISSEMINATED >
DEPOSIT FORM/SHAPE M10 < ~~STRATIFORM~~ DISSEMINATED >
*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) M15 (MEDIUM) M15 (LARGE) (circle one) *MAXIMUM THICKNESS M60 < 8 > *UNITS M61 < FT >
*STRIKE M70 < E-W > *DIP M80 < 40 to 70 S >
*DIRECTION OF PLUNGE M100 < > *PLUNGE M90 <
*DEP. DESC. COMMENTS M110 < NUMEROUS SMALL E-W STRIKING VEINS FOLLOWING FAULT FISSURES IN THE DIABASE INTRUSION AND GRANITE >

DESCRIPTION OF WORKINGS

*Workings are: SURFACE M120 UNDERGROUND (M130) BOTH M140 (circle one)
*DEPTH BELOW SURFACE M160 < 530 > *UNITS M161 < FT >
*LENGTH OF WORKINGS M170 < 10,000 > *UNITS M171 < FT >
*OVERALL LENGTH M190 < 2000 > *UNITS M191 < FT >
*OVERALL WIDTH M200 < > *UNITS M201 <
*OVERALL AREA M210 < > *UNITS M211 <
DESC. OF WORK. COM. M220 < WORKINGS INCLUDE DIAMOND JOE SHAFT (175 FT DEEP), WESTFALL (530 FT), NO. 2 SHAFT (180 FT), NO. 3 SHAFT (57 FT), NO 4 SHAFT (100 FT), ALL OF WHICH ARE CONNECTED BY A DRIFT RUNNING NORTH-SOUTH; OTHER WORKINGS ARE NO. 1 SHAFT (100 FT), TWIG SHAFT (from

GEOLOGY

*AGE OF HOST ROCK(S) K1 < P.R.E.C. >
*HOST ROCK TYPE(S) K1A < DIABASE, GRANITE >
*AGE OF IGNEOUS ROCK(S) K2 < P.R.E.C. >
*IGNEOUS ROCK TYPE(S) K2A < DIABASE, GRANITE >
*AGE OF MINERALIZATION K3 < T.E.R.T. > PROBABLY PALEOCENE
*PERT. MINERALS (NOT ORE) K4 < QUARTZ, LIMONITE, CHLORITE, KAOLIN >
*ORE CONTROL/LOCUS K5 < STEEPLY DIPPING FISSURE ZONES >
*MAJ. REG. TRENDS/STRUCT. N5 < EW TO ENE TRENDING VEINS AND TEAPOT MOUNTAIN PORPHYRY DIKES >
*TECTONIC SETTING N15 <
*SIGNIFICANT LOCAL STRUCT. N70 < MINE DIRECTLY EAST OF RIVERSIDE BRECCIA PIPE, SOME PROSPECTS IN BRECCIA PIPE >
*SIGNIFICANT ALTERATION N75 <
*PROCESS OF CONC./ENRICH. N80 <
*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 < RUIN GRANITE >
SECOND IG. UNIT AGE N55 < P.A.L.E.O. >
SECOND IG. UNIT NAME N55A < TEAPOT MOUNTAIN PORPHYRY >
GEOLOGY COMMENTS N85 <

GENERAL COMMENTS

GENERAL COMMENTS GEN <

as seams and veins from a few inches to a foot or so in thickness. At places there are two or three such seams parallel to each other separated by the softened or decayed rock, all highly colored by oxide of iron.

The general mineralization of the region is shown by the prevalence of the red oxide of iron by which the rocks are stained and impregnated on eahc side of the veins of copper ore; and there are heavy croppings of iron oxide in the form of hematite associated with quartz in crystals indicative of a regularly formed lode or vein of large size.

The outcropping of ore is so frequent and widespread that it is difficult to describe. It shows a general mineralization, but there are two or three main lines of cropping upon which work of a comparatively limited and superficial character has been done.

The outcropping ores as usual are the results of the oxidation and change of the normal sulphide ores in depth. The oxidized ores are the carbonates and oxides of copper with some silicate, all intermingled with oxide of iron and the silicious portions of the rock.

As a rule these surface ores are basic rather than acid; that is, the iron oxide prevails as the gangue rather than silica. And where the gangue is silicious it is much impregnated with iron. As a rule also these surface ores are high-grade and give good returns by assay.

The ores in depth (as shown by two shafts) are sulphide of the ordinary yellow (Chalcopyrite) copper, mingled with ordinary iron pyrites, and in a gangue consisting largely of calcite, some iron carbon, and of quartz.

The presence of some high-grade vitreous copper or copper glance has been noted in or near some of the outcrops of the veins in association with the oxidized ores. This I regard as on of the results of oxidation and concentration;

as a secondary product rather than a normal one, such as will be found in depth.

The presence of both gold and silver in notable quantities is claimed for these ores, but the assays as far as made fail to support this claim; gold being present only in very small quantities in the pyritic ore and silver to the extent of from 1 to 3 ounces per ton. There are, however, portions of the heavy cropping charged with iron which look like gold-bearing rock. These require exhaustive and careful testing to determine whether they are sufficiently charged with the precious metal to pay to work. Chimneys or chutes of pay ore may possible be found upon these lodes.

The principal development is upon the cloaims Bryan No. 1, Bryan No. 2, and Bryan No. 3. Special descriptions of each claim follows:

BRYAN NO. 1.

This is the most northerly of the series of four claims covering the chief outcrop of ore. Upon this claim there is a well-defined outcrop of copper ore following the south side contact of the greenstone with the granite. This outcrop assumes the form of a regular vein, standing in a vertical plane in full view at the top of the deepest shaft on the group at the side of the gulch. The croppings consist of oxide of iron and iron stained rock. The copper-bearing part at the surface is from 12 inches to 24 inches wide or thick, but it widens below, and is claimed to be 5 feet wide or more. This is an old shaft sunk by the old Ray Company years ago, and was well timbered, but the planking at the sides has decayed and it is not safe to go down into it, hence it could not be examined in depth. It is vertical, 300 feet deep with two drifts, one to the eastward 100 feet, some say 140 feet, and one to the west A specimen hand sample of the average ore

at the cropping is ferruginous and silicious streaks with layers of silicate and carbonate of copper, and yielded 12.6 per cent of copper by assay. The ore below the 60 or 100 feet level is believed to be in the condition of sulphide, the form of ore which could not be easily worked at the time the shaft was sunk. The continuity of this lode for a considerable distance westward across the gulch and up the hill is shown by several outcrops in line on which there are two or more open cuts. One shows a silicate ore over a breadth of about 24 inches including the green staining with red oxide of iron, of which there is considerable breadth. The best ore measured about 12 inches. A second open cut shows iron croppings and copper stains pitching southwardly. Most of the copper seams dip to the south.

BRYAN NO. 2.

This claim parallel to and adjoining No. 1, on the south side is perhaps the most important of the group. It has numerous openings proving the continuity of the veins of copper from nearly one end to the other.

At one of the central openings a cross-cut on the surface some 30 feet or more in length shows three distinct seams or layers of good copper ore each from 6 inches to 18 and 24 inches in breadth, including the copper stained rock, but ferruginous soft rock lies between and on each side of these seams over a breadth of 12 feet or more, leading to the conclusion that the mineralized ground below has at least that breadth and probably a greater breadth. These copper ore veins or strata are parallel and dip to the north. Samples F, I, K, and L came from these veins, showing, respectively, 21.6 per cent, 16 per cent, 20.2 per cent, and 15.9 per cent, giving an average of 18.40 per cent. These are the upper, carbonated oxidized ores. The nature of the ores below is shown by a

shaft sunk 100 feet deep upon the same line of strata or veins a short distance up the hill. At the bottom of this shaft the ore is mostly in the condition of sulphides. It is a mixture of copper pyrites with iron pyrites, the iron being more abundant than the copper. A general average sample taken across the work of this shaft 4 feet at the bottom yielded by assay at the rate of: Copper 11 per cent; Silver 1.23 ounces; gold 0.04 ounce per ton. The average of the other side of the shaft, also about 4 feet wide, showed in the aggregate about two feet of sulphide ore, a layer next to the hanging wall being mostly iron pyrites. This yielded by assay; Copper 8.1 per cent, Silver 2.61 ounces, and gold a trace. These results from the 100 foot shaft are the best index and evidence we have of the nature and average assay value of the normal sulphide ores on these claims. They average for this shaft 9.6 per cent.

BRYAN NO. 3. ✓

Upon this claim there are open cuts and two shafts, but not safe to descend. At one of these shafts a pit of sulphide ore, of which the best quality has been shipped to the smelter, shows mixture of yellow copper ore, iron pyrites, and calcareous spar and quartz. An average sample of this ore, excluding the surfaces, gave the result of 10.5 per cent by assay. At the extreme eastern end of No.3 upon the hillside facing the Gila River, there is a large outcrop of brown silicious ore filled with streaks and films of copper silicate. There is a large cropping extending some 50 feet, from which from 10 to 15 tons have been thrown down from a face of ore 4 feet wide or thick. An average sample of this ore yielded by assay 6.4 per cent. There is an excess of silica, though considerable oxide of iron is present. This brown ore is somewhat like that called Mahogany ore at Clifton, and, like that ore, is accompanied by small beautifully formed crystals of Dioptase or "Emerald Copper."

KELVIN SULTANA COPPER COMPANY ASSAYS.

No.3 Vein System.	% Copper
2001 Coarse ore on dump,	11.2
2002 West fine dump,	6.2
2003 Ore on loading platform,	11.6
2004 Second class;fine dump on road,	3.2
2005 Coarse waste dump,	0.9
2006 Fines under coarse ore dump,	2.2
2007 No.1 stope,over main level 20' long x 10" wide	6.2
2008 No.1 stope,west face,10"	15.8
2009 Same loc.2008 bottom of face,	8.2
2010 20' shoot on N vein east of N shaft,12"	12.8
2011 Lower level,E side of winze 4-ft	6.5
2012 Lower level,W side of winze 6-10 ins,	11.8
2013 Lower level,over N crosscut 16 ins,	15.2
2014 Uppler level along 20-ft x 24 in shoot,	6.2
2015 Lower level,midway W drift 16-ins,	7.8
2016 Lower level,N side of drift 6-ft	7.4
2017 Lower level,face 14-ins	10.8
2018 Main level,6-ft at bulkhead,	2.5
2019 Main level,midway 2 to 4-ft,	3.5
2020 Main level,midway,8-in streak,	3.4
2021 Main level,stope #1 east face,	3.8
2022 Main level,beyond stope,6 ins,	0.9
2023 Lower level,midway,west end,12 ins,	1.9
2024 Croppings from small vein up wash from #3,	2.5
2025 Lower level,14 ins east face,	22.4
2026 Main level,bent vein cut by left swing,14-ins	10.7
2027 North vein,west of shaft 30-ft by 12 ins	8.4
2028 Lower level,east side incline,18-ins	11.6
2029 Main level stope #2,	2.1
2030 Upper level bottom north shaft both sides,	0.9
2031 Ten tons inside rock wall,	4.2
2032 Incline,south side,lowre level,6 ins,	2.5
2033 Vein west of #3 10-ins,	1.1
2034 500-lbs ore on dump,	34.2
2035 River tunnel,	17.0
2036 Diamond Jo shaft,2-ins streak,	5.0
2037 Ten ton fines,from No1.east,	1.4
2038 One ton coarse,	4.5
2039 One ton coarse sorted,	14.2
2040 Eight tons sorted on platform,	17.7
2041 Fine dump 10-tons on road,	4.6
2042 Gypsum streak in incline,	10.3
2043 Clean malachite in N.vein,	20.1
2044 N.W.Fine dump of 15 tons,	4.7
2045 Same as 2044	4.9
2046 Pyrite dump,collar 40-ft shaft,	9.7
2047 Siliceous portion above,	7.7
2048 Covellite croppings,3A,	24.1
2049 Clean ore Malachite Shaft,	44.8
2050 Second class ore Malachite Shaft,	26.2
2051 Two tons second class ore Malachite Shaft,	10.1
2052 Rough sorted dump,Malachite Shaft,	10.9
2053 First class ore Shaft #4	19.5
2054 Second class ore Shaft #4	7.9
2055 Sorted ore from above,	15.7
2060 Hillside sorted ore,	25.5
2072 Hillside shoot,S end 20-ins,	6.9
2073 Hillside shoot,N end 10-ins,	16.9
2074 Hillside shoot east of swell,16-18 ins,	17.7
2075 Hillside shoot,beyond cut west 16-ins,	6.3
2076 Hillside incline,27-ins face,	19.9
2077 Hillside shoot,top 8 to 20 ins,	3.9
2078 Mammoth vein,streak on S wall,	9.4
2079 Mammoth vein lump ore,	6.8
2080 Mammoth vein centre streak,6 ins,	2.9
2081 Mammoth vein,across 60-ft	0.2

KELVIN SULTANA COPPER COMPANY ASSAYS.

Miscellaneous samples.	% Copper
2061 Hillside cut 2-ft wide,	25.5
2062 Twins,lower dump	6.9
2063 River tunnel sack of fines,	2.3
2064 Diamond Jo right side west drift 5-ft	1.0
2083 Contact shoot,24 ins,	2.1
2084 Contact shoot,12 ins,	4.0
2085 Contact shoot,upper cut,all,	Nil
2086 Contact shoot,upper cut 12 ins ore,	8.6
2087 South vein of Twins,4-ft	6.6
2088 North vein of Twins,6-ft	8.6
2089 Twins dump,one ton,	17.5
2090 Spur vein at N S cut east of wash,	9.9
2091 Hillside shoot west end 14 ins,	10.2
2092 Main No.3 croppings	5.2
2093 No.3 waste dump,collar of incline,	3.3
2094 Extreme W cut No.3 4-ins malachite,	12.4
2104 Main stope No.3 tunnel 8-ins,	6.4
2105 Main stope No.3 tunnel top west end 10-ins,	5.7
2106 Main stope No.3 tunnel W centre roof,8-ins,	4.8
2107 Main stope No.3 tunnel west end,8-ins,	4.7
2108 Main stope No.3 tunnel etreme roof centre 7-ins,	11.2
2109 Average No.3 croppings,	2.5
2110 Select No.3 croppings,	10.0
2111 Cut 100-ft above No.3 whim,	8.8
2112 Five inch slabs 200-ft SW Malachite Shaft,	19.9
2113 Cropping 12-ins wide 50-fe E leasers shaft,	9.5
2114 Sulphide ore leasers shaft,	9.6
2115 Spathic iron ore leasers shaft,	1.5
2116 Cropping 100-ft E leasers shaft,	4.7
2117 Iron dike 30-ft shaft most southerly,	0.3
2118 Iron dike in contact above leasers shaft,	12.0
2119 Twins,remains of dump ore shipped,	30.7
2120 Face middle cut S Twins 6 ins,	7.3
2121 North Twins 10 to 16 ins,	7.5
2122 Eight inch cropping above N Twins,	17.1
2123 North dump at Twins,	9.9
2124 Dump at lower cut South Twins,	4.1
2125 Four unches on wall S Twins,	19.5
2126 Iron dump lower vert shaft Twins,	1.9
2127 West cut S Twins 2 to 4 ins,	6.2
2128 Selected ore N Twins,	26.4
2146 No.1 shaft,50-ft level east side	15.6
2147 " " " " " " fines,	6.3
2148 " " " " " west "	8.6
2150 " " 85-ft level E side 18-ins,	12.0
2151 " " " " " W " 10-ins	5.6
2152 " " 50-ft level E side red ore,	20.9
2153 " " " " " " " black ore,	19.2
2154 " " " " " " " selected ore,	18.7
2155 " " dump from 50-ft level all,	9.1
2160 Hillside geheral 2-ft	16.0
2164 Hillside 2-ft clean ore	17.3
2165 No.3 workings 90-ft level 14 inches,	15.2
2171 No.3 workings upper level N vein top raise 15 ins,	6.0
2209 Surface ore Agnes,	4.4
2210 No.2 east,300-ft level,61-ins,	3.1
2211 No.2 winze from 300-level start,	5.8
2214 Face No.2 east 300-level 3-ft,	8.1
2221 Fines No.2 east 300 level,	3.8
2222 Fines No.2 west 300 level,	6.2
2225 No.2 winze 14-ft below collar 42 ins,	0.8
2228 Face Agnes tunnel 89-ft from portal,	1.7
2233 No.2 west 300 level in granite,	3.0
2235 Carbonates in face Agnes tunnel 8-ins,	9.8
2237 No.2 winze 4th set 4 ft wide,	8.5

KELVIN SULTANA COPPER COMPANY ASSAYS.

Results of systematic sampling in all the workings, both old and new on the No.1 and No.2 veins. Samples taken with mails and hammer by experienced sampler. Widths of samples given in feet. The location of samples indicated by reference to survey stations.

No.		Width	% Copper
2246	Sta.24 and 5-ft 8-ins,	2'6"	1.00
2247	Sta.24 and 0-ft	1'6"	2.50
2248	Sta.24 and 485"	14"	1.70
2249	Sta.24 and 9-ft	2'0"	.70
2250	Sta.24 and 14-ft	3'6"	4.20
2251	Sta.25	3'0"	2.70
2252	Sta.25 and 5-ft	4'0"	2.70
2253	and 10-ft	4'0"	1.90
2254	and 15-ft	4'0"	2.00
2255	and 20-ft	1'0""	3.70
2256	and 25-ft	1'6"	.70
2257	Sta.26 and 12-ft	6"	.20
2258	and 18-ft	10"	.50
2259	and 23-ft	4"	.20
2260	and 28-ft	4"	.10
2261	and 33-ft	6"	.70
2262	and 38-ft	1'0"	.20
2263	and 43-ft	3"	.10
2264	and 48-ft	2"	.10
2265	and 53-ft	16"	.10
2266	and 58-ft	7"	.10
2267	and 63-ft	7"	.10
2268	Sta.27	4"	.10
2269	and 5-ft	1'0"	.10
2270	and 10-ft	8"	.10
2271	and 15-ft	7"	.10
2272	and 23-ft	4"	.10
2273	and 28-ft	4"	.10
2274	and 33-ft	6"	.10
2275	and 38-ft	4"	.30
2276	and 43-ft	6"	2.10
2277	and 48-ft	10"	.10
2278	and 53-ft	6"	.10
2279	and 58-ft	7"	.10
2280	and 63-ft	1'0"	.50
2281	and 68-ft	1'2"	.10
2282	and 73-ft	1'0"	1.20
2283	and 78-ft	1'2"	.10
2284	and 83-ft	1'2"	.60
2285	and 88-ft	1'2"	1.40
2286	and 93-ft	1'0"	.10
2287	and 98-ft	1'0"	2.30
2288	and 103-ft	10"	.10
2289	and 108-ft	8"	.10
2290	Sta.28	6"	.10
2291	and 3-ft;face,	4"	.10
2292	Sta.13 and 18-ft in stope	1'2"	8.60
2293	" " "	1'2"	1.50
2294	" " "	2'6"	1.20
2295	" " "	1'4"	7.20
2296	" " "	1'0"	.80
2297	" " "	1'2"	5.70
2298	" " "	8"	1.60
2299	" " " filling		2.10
2300	" " " "		3.00
2301	Sta.18 and 3-ft		3.80
2302	and 6-ft 3-ins,		.60
2303	and 12-ft		.70

2304	Sta.18 and 17-ft 4-ins,			3.80
2305	and 22-ft			.60
2306	and 26-ft 7-ins,			.20
2307	and 45-ft 7-ins,			.60
2308	and 50-ft 7-ins,			.90
2309	and 56-ft 5-ins,			.60
2310	Sta.19 and 54-ft			1.20
2311	and 58-ft 4-ins.			.90
2312	and 64-ft 4-ins,			1.10
2313	and 72-ft			2.20
2314	Sta.20			8.50
2315	and 5-ft			1.60
2316	and 10-ft			.50
2317	and 14-ft			.20
2318	and 20-ft 8-ins			1.10
2319				2.80
2320	Samples 2320 to 2332 inclusive loose material			2.80
2321	left in stope above Stas. 17 - 18 - 19			2.10
2322				5.50
2323				5.90
2324				4.20
2325				2.50
2326				3.10
2327				4.30
2328				20.50
2329				2.20
2330				11.10
2331				7.20
2332				.02
2340	Sta.303 and 5-ft east (No.2 east drift,300)			.20
2341	and 10-ft		12"	1.30
2342	and 15-ft		14"	.20
2343	and 20-ft		15"	1.50
2344	and 25-ft		12"	2.20
2345	and 30-ft		12"	1.40
2346	and 35-ft		20"	.80
2347	and 40-ft		24"	.20
2348	and 45-ft		14"	.20
2349	and 50-ft		24"	2.40
2350	and 55-ft		10"	1.30
2351	and 60-ft		4"	.20
2352	and 65-ft		17"	.60
2353	and 70-ft		3800"	4.60
2354	Sta.316		44"	3.90
2355	and 5-ft		48"	5.50
2356	and 10-ft		6' 4"	1.80
2357	and 15-ft		5' 4"	1.00
2358	and 20-ft		5' 8"	1.10
2359	Sta.317		3' 7"	.80
2360	and 5-ft		3' 5"	1.70
2361	and 10-ft		4' 1"	4.90
2362	and 15-ft		4' 7"	1.90
2363	and 20-ft		4'10"	3.90
2364	and 25-ft		7' 6"	.50
2365	Sta.318 and 5-ft		5'	.90
2366	and 10-ft		5' 6"	.50
2367	and 15-ft		5'	1.70
2368	and 20-ft		5'	.80
2369	and 25-ft		5'	.70
2370	Sta.305 and 5-ft west (No.2 west 300)		6"	.60
2371	and 10-ft		6"	.60
2372	and 15-ft		8"	2.40

2373	Sta.303 and 20-ft	15"	3.20
2374	Sta.304	12"	2.00
2375	and 5-ft	24"	3.80
2376	Sta.305 and 10-ft	20"	9.40
2377	and 5-ft	28"	3.90
2378	and 10-ft	31"	9.20
2379	and 25-ft	36"	5.60
2380	and 30-ft	28"	6.20
2381	and 35-ft	29"	.70
2382	and 40-ft	32"	1.70
2383	and 45-ft	30"	5.00
2384	and 50-ft	28"	2.00
2385	and 55-ft	29"	2.20
2386	and 60-ft	34"	3.70
2387	Sta.306 and 10-ft	20"	.20
2388	and 15-ft	28"	.20
2389	and 20-ft	12"	.40
2390	and 25-ft	9"	.20
2391	Sta 307 and 5-ft	10"	.20
2392	and 10-ft	6"	.20
2393	and 15-ft	11"	.30
2394	and 20-ft	12"	.30
2395	and 25-ft	19"	.20
2396	and 30-ft	26"	.20
2397	and 35-ft	12"	.10
2398	and 40-ft	14"	1.70
2399	and 45-ft	14"	.60
2400	and 50-ft	19"	2.30
2401	Raise 305 track plus 15-ft	12"	1.90
2402	20-ft	12"	3.90
2403	25-ft	18"	2.00
2404	30-ft	17"	.20
2405	35-ft	12"	.90
2406	40-ft	20"	1.00
2407	45-ft	11"	2.60
2408	50-ft	18"	1.30
2409	55-ft	18"	1.30
2410	60-ft	10"	1.70
2411	Raise 306 track plus 15-ft	24"	8.40
2412	20ft	28"	1.30
2413	25-ft	33"	1.00
2414	30-ft	50"	1.40
2415	35-ft	48"	.30
2516	40-ft	38"	.30
2517	45-ft	22"	3.50
2518	50-ft	24"	1.10
2519	55-ft	26"	3.70
2520	60-ft	18"	2.30
2321	Sta.307 and 55-ft west	14"	5.00
2322	and 60-ft	10"	1.30
2323	and 65-ft	24"	8.00
2324	and 70-ft	23"	2.90
2325	and 75-ft	14"	1.80
2326	and 80-ft	19"	1.70
2327	and 90-ft	18"	2.70
2328	Sta.308 and 5-ft	24"	2.30
2329	and 10-ft	34"	1.70
2330	and 15-ft	17"	5.60
2331	and 20-ft	8"	9.40
2332	and 25-ft	26"	5.70
2333	and 30-ft	34"	2.20
2334	and 35-ft	42"	5.60
2335	and 40-ft	44"	1.60
2336	Sta.309	24"	5.90
2337	Raise 316 track plus 15-ft	36"	2.90
2438	20-ft	36"	2.20
2439	25-ft	36"	.90
2440	30-ft	24"	1.90
2441	35-ft	36"	1.00
2442	40-ft	32"	1.30

2443	Raise 316 track plus 45-ft		36"	1.60
2444		50-ft	36"	1.80
2445		55-ft	36"	.90
2446	Sta.401 East drift,400 level Nol.		24"	2.40
2447	and 5-ft		16"	5.40
2448	and 10-ft		18-	5.20
2449	and 15-ft		16"	2.80
2450	and 20-ft		14"	.80
2451	and 25-ft		25"	2.60
2452	Sta.402		30-	1.80
2453	and 25-ft		6-ft	3.50
2454	and 30-ft		6-ft	3.80
2455	and 35-ft		4-ft	4.90
2456	and 40-ft		2-ft	3.70
2457	Sta.403		2-ft	2.80
2458	and 5-ft		26"	2.00
2459	and 10-ft		30"	4.30
2460	and 15-ft		30"	4.30
2461	and 20-ft		30"	4.20
2462	and 25-ft		42"	4.20
2463	and 30-ft		32"	1.60
2464	and 35-ft		32"	.30
2465	and 40-ft		36"	.80
2466	and 45-ft		36"	1.60
2467	and 50-ft		36"	1.20
2468	Sta.405.		18"	1.50
2469	and 5-ft		30"	1.10
2470	and 10-ft		24"	1.20
2471	and 15-ft		24"	1.80
2472	and 20-ft		24"	1.80
2473	and 25-ft		18"	.50
2474	and 30-ft		14"	1.40
2475	and 35-ft		10"	.60
2491	Raise 306 track plus 70-ft		12"	1.60
2492	top of manway,		19"	2.60
2493	5-ft west manway,		34"	2.90
2494	10-f " "		38"	2.50
2495	15-ft " "		5-ft	4.60
3056	No.2 vein 500-level,		1-ft	1.85
3057	No 2 vein 500-level,		19"	2.30
3058	No.2 vein 500-level (low grade part)		13"	.20
3059	No.2 vein 500-level face		18"	2.30

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SUPPLEMENTARY REPORT ON THE

KELVIN SULTAN COPPER COMPANY PROPERTIES.

KELVIN, ARIZONA.

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Since the excellent report by George C. Clark, E.M., was made in 1908 a considerable amount of work has been done on the property then known as the Sultana-Arizona. Incidentally the property has changed hands and is now the property of the Kelvin Sultana Copper Company.

The principal development work has been done on the W. J. Bryan and W. J. Bryan No. 2 claims, with a lesser amount on the W. J. Bryan No. 3 claim. While a moderate amount of work has been done on other parts of the property in mining carbonate ores or in spasmodic attempts at development work, all such work has been so shallow and so scattered as to be of no value in connection with the future operations of the property. The accompanying plan shows the new work, that is considered of importance. The work will be described as nearly as possible in the order in which it was done. Everything done since August 1st, 1913 has been under the direction of the writer.

About 150-ft north of the south side-line of the Diamond Jo claim and near the west end-line a two compartment shaft was sunk to a depth of 175-ft in 1911 and 1912. Then a crosscut was started southward from the bottom of this shaft which cut the frist vein some 175-ft from the shaft. No work was done on this, presumably because the vein showed only copper carbonates. The vein as intersected at this point has a width of one foot with a slight dip to the south and appears worthy of further exploration.

At a point 230-ft south of the Diamond Jo shaft a less pretentious stringer of unaltered copper sulphide ore was encountered, in a zone of intensely crushed diabase. A drift was started east of this. (No1. East on the plan.) When the granite was encountered the vein was lost. The drift was then turned southward to cut a vein outcropping on the ridge across from the mill. Water was met in excess of the capacity of the pumps so the drift was bulkheaded. No drifting was done west of the main crosscut on this stringer. In the east drift no ore of consequence was developed, the stringer maintaining a width of less than a foot throughout.

The crosscut was then carried south for an additional 314-ft, where it intercepted a fault having a strike of S 26 E and a dip to the south. Later after the Westfall shaft had been raised through, a drift was run west for about 80-ft on the vein cut by the fault near the crosscut at Sta. 321. This vein was known thereafter as No. 1 vein. Subsequent development will be described later.

After the Westfall shaft of two hoisting compartments and a pump and ladder way had been raised through to the surface from a point still further south in the crosscut, the crosscut was continued southward and was then known as the 300-ft level. The actual distance from the station to the surface through the shaft is only 247 feet. When the crosscut reached the No. 2 vein drifts were run east and west to the granite. These drifts were in about twenty feet each when the writer first came to the property.

West of the main crosscut at Sta. 305 a raise of 174-ft was made to connect with the old workings tributary to the incline shaft No. 2 in the Clark report. Later considerable stoping was done above these drifts on this vein. The ore above the east drift was the better grade and in larger amount that that above the west.

A 100-ft winze was sunk from the west drift on the No. 2 vein. Only a small amount of work was done on the vein at the 400-foot level, not enough to determine anything as to the nature or extent of the vein at this level.

While drifting was in progress on the No. 2 vein both east and west from the main crosscut on the 300-ft level the drift was pushed west on the No. 1 vein to the granite. Except for a short distance either side of Sta. 332 the drift opened no ore on this level that was of commercial importance.A Winze was sunk from the 332 station on the centre of that good shoot. The winze was 100-ft deep. From the bottom a drift was opened up along the vein to the east which contained some very good ore as indicated by the samples Nos. 2446 et seq. None of this ore was ever stoped but what was taken out in drifting was run through the mill.

Before the No. 1 winze, mentioned above, was sunk, a drift was run east on the continuation of this same vein beyond the fault. While the hangingwall was very clear cut for the entire length of the drift there was never any indication of mineralization east of the fault, on this level. The amount of displacement by the fault is 48-ft measured horizontally in the plane of fault.

Early in 1914 the Westfall shaft was sunk an additional 283 feet giving a total depth of 530-ft. At a point 500-ft from the collar a new level was started. The crosscut north encountered the No. 1 vein 137-ft from the station. The vein was too narrow to be of commercial importance where encountered. A drift was driven 168 feet west on the vein. At a point 130 feet from the crosscut a raise was made to the 400 level but no other work has been done on this vein or north of the shaft on the 500 level.

The main crosscut on the 500 level was run south to a point approximately 1400-ft from the station. Before the No. 2 vein was cut two stringers were cut. The first was some 70-ft south of the station. It shows a foot of width but has never been prospected. On the surface this vein has yielded highgrade ore. The second, 300-ft from the station dipped very flat to the south and carried clear chalcopyrite with no iron pyrite. It was about 6-inches wide. A drift was driven about 21-ft south and stopped.

The No. 2 vein was cut about 485 feet from the station. This showed a foot of ore assaying 2.3% copper. About 150-ft of drifting was done to the east. None was done to the west.

A short distance beyond the No. 2 vein a very flat vein was encountered. The mineralization was mainly iron pyrite yet it assayed 2% copper. A short drift of about 30-ft was driven east but nothing of importance was developed.

At at point 1386-ft from the station the No. 3 vein was cut. This showed about two feet of ore low in copper. In the bottom of the No. 3 incline shaft the ore was only six inches wide, so not much was expected at this depth. However, the vein is wider by a good margin though lower grade.

The crosscut was not carried south to the St. Karl vein as was originally planned. Though not able to boast of any great surface showing the St. Karl vein can be traced for a greater distance than any other on the property, and it shows a greater regularity throughout its entire course. Other veins further south on the adjoining property are strong too.

The development work on other parts of the property amounts to nothing worth mentioning. The western part of the land was entirely neglected except where the Mexican leasers gophered out large pockets of very rich carbonate ores, amounting to several carloads. No serious work was ever done by the present company on the western part of the property. In the opinion of the writer this is very attractive ground especially the Silver Twig claims where there is a wide, strong quartz outcrop with an eight inch streak of lead-silver ore at a depth of 40-ft assaying 20 oz silver and 26% lead. This is very attractive ground.

It should also be noted that no work has been done on any vein in the granite-porphyry core of Sultana Mountain or in other areas of granite. The granite may not look attractive on the surface but it has some good characteristics underground.

Besides doing the development mentioned the company has spant a large amount of money in surface equipment. Some it has been spent wisely, and unfortunately some of it very unwisely. On the Railway side of the Gila River is a complete steam-electric power plant having a 3 phase 60 cycle, 2200 volt generator of 312 KVA capacity. All the mine and mill equipment is electrically operated. Within a short time this plant can be made a money-making proposition by selling power to neighboring mining companies who will soon be in the market for power.

An aerial tramway, electrically operated, spans the river and loads ore or concentrates at the rate of 8 tons an hour.

At the Westfall shaft is a complete blacksmith shop, assay outfit etc properly housed. There is also a Supt's., office. The shaft is equipped with a double drum electric hoist driven by a 75 HP motor at a rope speed of 360-ft per minute. The drums are 48-in in diameter with a 30-inch face. The hoist is designed for a maximum rope pull of 6900-lbs and a duty of 1000 tons in 20 hours with skips.

The air compressor, also driven by a 75 HP motor is Ingersoll Rand, Imperial Type 10 delivering 327 feet of air at 125-lbs pressure at 2000-ft elevation.

The rest of the mine equipment consists of cages, mine cards, auxiliary hoists both steam and electric, trucks, piston drills with full mountings, stoping drills, plugger drills etc. The property is unusually well equipped and all the equipment is in excellent shape.

In 1914 the company built a concentrating plant of 250 tons daily capacity. The plant was well built and all the equipment has had excellent care. Everything is modern and new.

The attached blueprints show the property, the principal workings and the assays on record. Samples were taken with great care by an experienced sampler, with moils and hammers. Assays were made in duplicate to check within .20%.

The following is the production for the last 6 months of the year 1915.

	Concentrates	Crude Ore
Wet weight,	610960 lbs	382660 lbs
Moisture av,	8.66%	3.52%
Av. Copper	8.15%	13.29%
Av. Silver	2.02 oz	1.65 oz
Total copper	43790.26 lbs	40650.84 lbs
Tot. Silver	538.77 oz	296.49 oz

In 1916 work has been spasmodic and there has been almost no production.

/s/ A.L. Flagg

Kelvin, Arizona.
October 25, 1916.

KELVIN SULTANA COPPER COMPANY ASSAYS

No. 3 Vein System.	% Copper
2001 Coarse ore on dump,	11.2
2002 West fine dump,	6.2
2003 Ore on loading platform,	11.6
2004 Second class; fine dump on road,	3.2
2005 Coarse waste dump,	0.9
2006 Fines under coarse ore dump,	2.2
2007 No. 1 stope, over main level 20' long x 10" wide	6.2
2008 No. 1 stope, west face, 10"	15.8
2009 Same loc. 2008 bottom of face,	8.2
2010 20' shoot on N vein east of N shaft, 12"	12.8
2011 Lower level, E side of winze 4-ft	6.5
2012 Lower level, W side of winze 6-10 ins,	11.8
2013 Lower level, over N crosscut 16 ins,	15.2
2014 Upper level along 20-ft x 24 in shoot,	6.2
2015 Lower level, midway W drift 16-ins,	7.2
2016 Lower level, N side of drift 6-ft	7.4
2017 Lower level, face 14-ins	10.8
2018 Main level, 6-ft at bulkhead,	2.5
2019 Main level, midway 2 to 4-ft,	3.5
2020 Main level, midway, 8-in streak,	3.4
2021 Main level, stope #1 east face,	3.8
2022 Main level, beyond stope, 6 ins,	0.9
2023 Lower level, midway, west end, 12 ins,	1.9
2024 Croppings from small vein up wash from #3,	2.5
2025 Lower level, 14 ins east face,	22.4
2026 Main level, bent vein cut by left swing, 14-ins	10.7
2027 North vein, west of shaft 30-ft by 12 ins	8.4
2028 Lower level, east side incline, 18-ins	11.6
2029 Main level stope #2,	2.1
2030 Upper level bottom north shaft both sides	0.9
2031 Ten tons inside rock wall,	4.2
2032 Incline, south side, lower level, 6 ins,	2.5
2033 Vein west of #3 10-ins,	1.1
2034 500-lbs ore on dump,	34.2
2035 River tunnel,	17.0
2036 Diamond Jo shaft, 2-ins streak,	5.0
2037 Ten ton fines, from No1. east,	1.4
2038 One ton coarse,	4.5
2039 One ton coarse sorted,	14.2

2040	Eight tons sorted on platform,	17.7
2041	Fine dump 10-tons on road,	4.6
2042	Gypsum streak in incline,	10.3
2043	Clean malachite in N. vein,	20.1
2044	N.W. Fine dump of 15 tons,	4.7
2045	Same as 2044	4.9
2046	Pyrite dump, collar 40-ft shaft,	9.7
2047	Siliceous portion above,	7.7
2048	Covellite croppings, 3A,	24.1
2049	Clean ore Malachite Shaft,	44.8
2050	Second class ore Malachite Shaft,	26.2
2051	Two tons second class ore Malachite Shaft,	10.1
2052	Rough sorted dump, Malachite Shaft,	10.9
2053	First class ore Shaft #4	19.5
2054	Second class ore Shaft #4	7.9
2055	Sorted ore from above,	15.7
2060	Hillside sorted ore,	25.5
2072	Hillside shoot, S end 20-ins,	6.9
2073	Hillside shoot, N end 10-ins,	16.9
2074	Hillside shoot east of swell, 16-18 ins,	17.7
2075	Hillside shoot, beyond cut west 16-ins,	6.3
2076	Hillside incline, 27-ins face,	19.9
2077	Hillside shoot, top 8 to 20 ins,	3.9
2078	Mammoth vein, streak on S wall,	9.4
2079	Mammoth vein lump ore,	6.8
2080	Mammoth vein centre streak, 6 ins,	2.9
2081	Mammoth vein, across 60-ft	0.2

KELVIN SULTANA COPPER COMPANY ASSAYS

Miscellaneous samples.	% Copper
2061 Hillside cut 2-ft wide,	25.5
2062 Twins, lower dump	6.9
2063 River tunnel sack of fines,	2.6
2064 Diamond Jo right side west drift 5-ft	1.0
2083 Contact shoot, 24 ins,	2.1
2084 Contact shoot, 12 ins,	4.0
2085 Contact shoot, upper cut, all,	Nil
2086 Contact shoot, upper cut 12 ins ore,	8.6
2087 South vein of Twins, 4-ft	6.6
2088 North vein of Twins, 6-ft	8.6
2089 Twins dump, one ton,	17.5
2090 Spur vein at N S cut east of wash,	9.9
2091 Hillside shoot west end 14 ins,	10.2
2092 Main No. 3 croppings	5.2
2093 No. 3 waste dump, collar of incline,	3.3
2094 Extreme W cut No. 3 4-ins malachite,	12.4
2104 Main stope No. 3 tunnel 8-ins,	6.4
2105 Main stope No. 3 tunnel top west end 10-ins,	5.7
2106 Main stope No. 3 tunnel W centre roof, 8-ins,	4.8
2107 Main stope No. 3 tunnel west end, 8-ins,	4.7
2108 Main stope No. 3 tunnel extreme roof centre 7-ins,	11.2
2109 Average No. 3 croppings,	2.5
2110 Select No. 3 croppings,	10.0
2111 Cut 100-ft above No. 3 whim,	8.8
2112 Five inch slabs 200-ft SW Malachite Shaft,	19.9
2113 Cropping 12-ins wide 50-fe E leasers shaft,	9.5
2114 Sulphide ore leasers shaft,	9.6
2115 Spathic iron ore leasers shaft,	1.5
2116 Cropping 100-ft E leasers shaft,	4.7
2117 Iron dike 30-ft shaft most southerly,	0.3
2118 Iron dike in contact above leasers shaft,	12.0
2119 Twins, remains of dump ore shipped,	30.7
2120 Face middle cut S Twins 6 ins,	7.3
2121 North Twins 10 to 16 ins,	7.5
2122 Eight inch cropping above N Twins,	17.1
2123 North dump at Twins,	9.9
2124 Dump at lower cut South Twins,	4.1
2125 Four inches on wall S. Twins,	19.5
2126 Iron dump lower vert shaft Twins,	1.9
2127 West cut S Twins 2 to 4 ins,	6.2
2128 Selected ore N Twins,	26.4

2146	No. 1 shaft, 50-ft level east side	15.6
2147	" " " " " " " fines,	6.3
2148	" " " " " west "	8.6
2150	" " 85-ft level E side 18-ins,	12.0
2151	" " " " " W " 10-ins	5.6
2152	" " 50-ft level E side red ore,	20.9
2153	" " " " " " " black ore,	19.2
2154	" " " " " " " selected ore,	18.7
2155	" " Dump from 50-ft level all,	9.1
2160	Hillside general 2-ft	16.0
2164	Hillside 2-ft clean ore	17.3
2165	No. 3 workings 90-ft level 14 inches,	15.2
2171	No. 3 workings upper level N vein top raise 15 ins,	6.0
2209	Surface ore Agnes,	4.4
2210	No. 2 east, 300-ft level, 61-ins,	3.1
2211	No. 2 winze from 300-level start,	5.8
2214	Face No. 2 east 300-level 3-ft,	8.1
2221	Fines No. 2 east 300 level,	3.8
2222	Fines No. 2 west 300 level,	6.2
2225	No. 2 winze 14-ft below collar 42 ins,	0.8
2228	Face Agnes tunnel 89-ft from portal,	1.7
2233	No. 2 west 300 level in granite,	3.0
2235	Carbonates in face Agnes tunnel 8-ins,	9.8
2237	No. 2 winze 4th set 4 ft wide,	8.5

KELVIN SULTANA COPPER COMPANY ASSAYS

Results of systematic sampling in all the workings, both old and new on the No. 1 and No. 2 veins. Samples taken with moils and hammer by experienced sampler. Widths of samples given in feet. The location of samples indicated by reference to survey stations.

No.		Width	% Copper
2246	Sta.24 and 5-ft 8-ins,	2'6"	1.00
2247	Sta.24 and 0-ft	1'6"	2.50
2248	Sta.24 and 485"	14"	1.70
2249	Sta.24 and 9-ft	2'0"	.70
2250	Sta.24 and 14-ft	3'6"	4.20
2251	Sta.25	3'0"	2.70
2252	Sta.25 and 5 ft	4'0"	2.70
2253	and 10-ft	4'0"	1.90
2254	and 15-ft	4'0"	2.00
2255	and 20-ft	1'0"	3.70
2256	and 25-ft	1'6"	.70
2257	Sta. 26 and 12-ft	6"	.20
2258	and 18-ft	10"	.50
2259	and 23-ft	4"	.20
2260	and 28-ft	4"	.10
2261	and 33-ft	6"	.70
2262	and 38-ft	1'0"	.20
2263	and 43-ft	3"	.10
2264	and 48-ft	2"	.10
2265	and 53-ft	16"	.10
2266	and 58-ft	7"	.10
2267	and 63-ft	7"	.10
2268	Sta.27	4"	.10
2269	and 5-ft	1'0"	.10
2270	and 10-ft	8"	.10
2271	and 15-ft	7"	.10
2272	and 23-ft	4"	.10
2273	and 28-ft	4"	.10
2274	and 33-ft	6"	.10
2275	and 38-ft	4"	.30
2276	and 43-ft	6"	2.10
2277	and 48-ft	10"	.10
2278	and 53-ft	6"	.10
2279	and 58-ft	7"	.10

No.			Width	% Copper
2280		and 63-ft	1'0"	.50
2281		and 68-ft	1'2"	.10
2282		and 73-ft	1'0"	1.20
2283		and 78-ft	1'2"	.10
2284		and 83-ft	1'2"	.60
2285		and 88-ft	1'2"	1.40
2286		and 93-ft	1'0"	.10
2287		and 98-ft	1'0"	2.30
2288		and 103-ft	10"	.10
2289		and 108-ft	8"	.10
2290	Sta.28		6"	.10
2291		and 3-ft; face,	4"	.10
2292	Sta.13	and 18-ft in stope	1'2"	8.60
2293	"	" "	1.2"	1.50
2294	"	" "	2'6"	1.20
2295	"	" "	1'4"	7.20
2296	"	" "	1'0"	.80
2297	"	" "	1'2"	5.70
2298	"	" "	8"	1.60
2299	"	" " filling		2.10
2300	"	" " "		3.00
2301	Sta.18	and 3-ft	.6	3.80
2302		and 6-ft 3-ins,	.6	.60
2303		and 12-ft		.70
2304	Sta.18	and 17-ft 4-ins,		3.80
2305		and 22-ft		.60
2306		and 26-ft 7-ins,		.20
2307		and 45-ft 7-ins,		.60
2308		and 50-ft 7-ins,		.90
2309		and 56-ft 5-ins,		.60
2310	Sta.19	and 54-ft		1.20
2311		and 58-ft 4-ins.		.90
2312		and 64-ft 4-ins,		1.10
2313		and 72-ft		2.20
2314	Sta.20			8.50
2315		and 5-ft		1.60
2316		and 10-ft		.50
2317		and 14-ft		.20
2318		and 20-ft 8-ins		1.10
2319				2.80

No.		Width	% Copper
2320	Samples 2320 to 2332 inclusive loose material		2.80
2321	left in stope above Stas. 17 - 18 - 19		2.10
2322			5.50
2323			5.90
2324			4.20
2325			2.50
2326			3.10
2327			4.30
2328			20.50
2329			2.20
2330			11.10
2331			7.20
2332			.02
2340	Sta.303 and 5-ft east (No. 2 east drift300)		.20
2341	and 10-ft	12"	1.30
2342	and 15-ft	14"	.20
2343	and 20-ft	15"	1.50
2344	and 25-ft	12"	2.20
2345	and 30-ft	12"	1.40
2346	and 35-ft	20"	.80
2347	and 40-ft	24"	.20
2348	and 45-ft	14"	.20
2349	and 50-ft	24"	2.40
2350	and 55-ft	10"	1.30
2351	and 60-ft	4"	.20
2352	and 65-ft	17"	.60
2353	and 70-ft	3'00"	4.60
2354	Sta.316	44"	3.90
2355	and 5-ft	48"	5.50
2356	and 10-ft	6'4"	1.80
2357	and 15-ft	5'4"	1.00
2358	and 20-ft	5'8"	1.10
2359	Sta.317	3'7"	.80
2360	and 5-ft	3'5"	1.70
2361	and 10-ft	4'1"	4.90
2362	and 15-ft	4'7"	1.90
2363	and 20-ft	4'10"	3.90
2364	and 25-ft	7'6"	.50
2365	Sta.318 and 5-ft	5'	.90
2366	and 10-ft	5'6"	.50
2367	and 15-ft	5'	1.70
2368	and 20-ft	5'	.80
2369	and 25-ft	5'	.70

No.		Width	% Copper
2370	Sta.305 and 5-ft west (No. 2 west 300)	6"	.60
2371	and 10-ft	6"	.80
2372	and 15-ft	8"	2.40
2373	Sta.303 and 20-ft	15"	3.20
2374	Sta 304	12"	2.00
2375	and 5-ft	24"	3.80
2376	Sta.305 and 10-ft	20"	9.40
2377	and-5-ft	28"	3.90
2378	and 10-ft	31"	9.20
2379	and 25-ft	36"	5.60
2380	and 30-ft	28"	6.20
2381	and 35-ft	29"	.70
2382	and 40-ft	32"	1.70
2383	and 45-ft	30"	5.00
2384	and 50-ft	28"	2.00
2385	and 55-ft	29"	2.20
2386	and 60-ft	34"	3.70
2387	Sta.306 and 10-ft	20"	.20
2388	and 15-ft	28"	.20
2389	and 20-ft	12"	.40
2390	and 25-ft	9"	.20
2391	Sta.307 and 5-ft	10"	.20
2392	and 10-ft	6"	.20
2393	and 15-ft	11"	.30
2394	and 20-ft	12"	.30
2395	and 25-ft	19"	.20
2396	and 30-ft	26"	.20
2397	and 35-ft	12"	.10
2398	and 40-ft	14"	1.70
2399	and 45-ft	14"	.60
2400	and 50-ft	19"	2.30
2401	Raise 305 track plus 15-ft	12"	1.90
2402	20-ft	12"	3.90
2403	25-ft	18"	2.00
2404	30-ft	17"	.20
2405	35-ft	12"	.90
2406	40-ft	20"	1.00
2407	45-ft	11"	2.00
2408	50-ft	18"	1.30
2409	55-ft	18"	1.30
2410	60-ft	10"	1.70

No.		Width	% Copper
2411	Raise 306 truck plus 15-ft	24"	8.40
2412	20-ft	28"	1.30
2413	25-ft	33"	1.00
2414	30-ft	50"	1.40
2415	35-ft	48"	.30
2516	40-ft	38"	.30
2517	45-ft	22"	3.50
2518	50-ft	24"	1.10
2519	55-ft	26"	3.70
2520	60-ft	18"	2.30
2321	Sta.307 and 55-ft west	14"	5.00
2322	and 60-ft	10"	1.30
2323	and 65-ft	24"	8.00
2324	and 70-ft	23"	2.90
2325	and 75-ft	14"	1.80
2326	and 80-ft	19"	1.70
2327	and 90-ft	18"	2.70
2328	Sta. 308 and 5-ft	24"	2.30
2329	and 10-ft	34"	1.70
2330	and 15-ft	17"	5.60
2331	and 20-ft	8"	9.40
2332	and 25-ft	26"	5.70
2333	and 30-ft	34"	2.20
2334	and 35-ft	42"	5.60
2335	and 40-ft	44	1.60
2336	Sta.309	24"	5.90
2337	Raise 316 track plus 15-ft	36"	2.90
2438	20-ft	36"	2.20
2439	25-ft	36"	.90
2440	30-ft	24"	1.90
2441	35-ft	36"	1.00
2442	40-ft	32"	1.30
2443	Raise 316 track plus 45-ft	36"	1.60
2444	50-ft	36"	1.80
2445	55-ft	36"	.90
2446	Sta. 401 East drift, 400 level Nol.	24"	2.40
2447	and 5-ft	16"	5.40
2448	and 10-ft	18-	5.20
2449	and 15-ft	16"	2.80
2450	and 20-ft	14"	.80
2451	and 25-ft	25"	2.60
2452	Sta.402	30-	1.80
2453	and 25-ft	6-ft	3.50
2454	and 30-ft	6-ft	3.80
2455	and 35-ft	4-ft	4.90
2456	and 40-ft	2-ft	3.70
2457	Sta. 403	2-ft	2.80

No.		Width	% Copper
2458	Sta.403 and 5-ft	26"	2.00
2459	and 10-ft	30"	4.30
2460	and 15-ft	30"	4.30
2461	and 20-ft	30"	4.20
2462	and 25-ft	42"	4.20
2463	and 30-ft	32"	1.80
2464	and 35-ft	32"	.30
2465	and 40-ft	36"	.80
2466	and 45-ft	36"	1.60
2467	and 50-ft	36"	1.20
2468	Sta.405.	18"	1.50
2469	and 5-ft	30"	1.10
2470	and 10-ft	24"	1.20
2471	and 15-ft	24"	1.80
2472	and 20-ft	24"	1.80
2473	and 25-ft	18"	.50
2474	and 30-ft	14"	1.40
2475	and 35-ft	10"	.60
2491	Raise 306 track plus 70-ft	12"	1.60
2492	top of manway,	19"	2.60
2493	5-ft west manway,	34"	2.90
2494	10-f " "	38"	2.50
2495	15-ft " "	5-ft	4.60
3056	No. 2 vein 500-level,	1-ft	1.85
3057	No. 2 vein 500-level,	19"	2.30
3058	No. 2 vein 500-level (lowgrade pert)	13"	.20
3059	No. 2 vein 500-level face	18"	2.30

L. A. DUNHAM, AGENT

ASSAY RECORD

Ray Ciiz Mine. Kelvin Ariz 1913

LABORATORY NO.	DATE OF ASSAY	HOLE NO.	SAMPLE NO.	SAMPLE DEPTH	PER CENT COPPER	REMARKS
	11/14-13	2	1	120'	No	
		2	2	130'	0 06	
		2	3	140'	0 06	
		2	4	150'	T	
		2	5	160'	T	
		2	6	170'	0 18	
		2	7	180'	0 12	
		2	8	190'	0 24	
		2	9	200'	0 18	
		2	10	210'	0 12	Reduced Hole to 6"
	11/15/13	2	11	220'	0 35	
	"	2	12	230'	0 30	Chalcocite first shown
	"	2	13	240'	0 20	from 130' to 330'. Very
	"	2	14	250'	0 30	little Pyrite in any of th
	"	2	15	260'	0 25	samples.
	"	2	16	270'	0 20	A little Native and
	"	2	17	280'	0 15	specks of Bornite seen.
	"	2		290'	0 10	When the primary was
	"	2		5'	0 15	reached at 405' it was
	"	2	20	300'	0 05	plainly shown from
	11/18/13	2	21	305'	0 20	the fine cuttings and
		2	22	310'	0 10	change in color of sludg
		2	23	315'		All concentrates
		2	24	320'	0 —	from the various sample
		2	25	325'	T	that was panned
		2	26	330'	No	showed Chalcocite
		2	27	335'	T	with the naked eye.
		2	28	340'	No	
		2	29	345'	0 05	

L. A. DUNHAM, AGENT

ASSAY RECORD

1910

LABORATORY NO.	DATE OF ASSAY	HOLE NO.	SAMPLE NO.	SAMPLE DEPTH	PER CENT COPPER	REMARKS
	11/18/13	2	30	350'	No	
	"	2	31	355'	T	
	11/19/13	2	32	360'	No	
	"	2	33	365'	0 05	
	"	2	34	370'	T	
	"	2	35	375'	No	
	"	2	36	380'	No	
	"	2	37	385'	0 05	
		2	38	390'		
		2	39	395'		
		2	40	400'		
		2	41	405'		
		2	42	410'		
		2	43	415'		
		2	44	420'		
		2	45	425'		

L. A. DUNHAM, AGENT

ASSAY RECORD

Ray-Arizona Copper Co. Kelvin, Ariz. 1913

LABORATORY NO.	DATE OF ASSAY	HOLE NO.	SAMPLE NO.	SAMPLE DEPTH	PER CENT COPPER	REMARKS
		1	1	75'		
		1	2	80'		
		1	3	85'		
		1	4	90'		
		1	5	95'		
		1	6	100'		
		1	7	105'		
		1	8	110'		
		1	9	115'		
		1	10	120'		
		1	11	125'		
		1	12	130'		
		1	13	135'		
		1	14	140'		
		1	15	145'		
		1	16	150'		
		1	17	155'		
		1	18	160'		
		1	19	165'		
		1	20	170'		
		1	21	175'		
		1	22	180'		
		1	23	185'		
		1	24	190'		
		1	25	195'		
	9/3/13	1	26	200'	No	Pyrite
	"	1	27	205'	No	"
	"	1	28	210'	trace	"
			29	215'	No	"

L. A. DUNHAM, AGENT

ASSAY RECORD

1910

LABORATORY NO.	DATE OF ASSAY	HOLE NO.	SAMPLE NO.	SAMPLE DEPTH	PER CENT COPPER	REMARKS
	9/3/13	1	30	220'	No	Chalcocite & Chalcopyrite
	"	1	31	225'	trace	"
	"	1	32	230'	No	"
	"	1	33	235'	trace	"
	"	1	34	240'	No	"
		1	35	245'		"
	9/9/13	1	36	250'	trace	Water raise
		1	37	255'		
	"	1	38	260'	trace	Trunk Water
		1	39	265'		
	"	1	40	270'	0 10	
		1	41	275'		Very heavy in Pyrite
	"	1	42	280'	trace	Cut into Fault
		1	43	285'		through Fault
	"	1	44	290'	0 35	
		1	45	295'		
	9/13/13	1	46	300'	0 15	
	9/13/13	1	47	305'		
		1	48	310'	0 10	
		1	49	315'		
	9/13/13	1	50	320'	No	
		1	51	325'		
	9/13/13	1	52	330'	Trace	
		1	53	335'		
	9/13/13	1	54	340'	No	Carbonates
		1	55	345'		
	9/13/13	1	56	350'	0 10	
		1	57	355'		
	9/14/13	1	58	360'	0 12	

L. A. DUNHAM, AGENT

ASSAY RECORD

_____ 1910

LABORATORY NO.	DATE OF ASSAY	HOLE NO.	SAMPLE NO.	SAMPLE DEPTH	PER CENT COPPER	REMARKS
		1	59	365'		
	9/14/13	1	60	370'	trace	
		1	61	375'		
	9/14/13	1	62	380'	0 06	
		1	63	385'		
	9/14/13	1	64	390'	trace	
		1	65	395'		
	9/16/13	1	66	400'	0 10	
	9/16/13	1	67	405'	0 06	
		1	68	410'		
	9/17/13	1	69	415'	trace	
		1	70	420'		
	9/17/13	1	71	425'	No	
	9/18/13	1	72	430'	Trace	Reduced Hole to 6 1/2"
		1	73	435'		
	9/21/13	1	74	440'	Trace	
		1	75	445'		
	9/21/13	1	76	450'	Trace	
		1	77	455'		
	9/24/13	1	78	460'	Trace	
		1	79	465'		Trace of Carbonates
	9/27/13	1	80	470'	No	
		1	81	475'		
	9/27/13	1	82	480'	Trace	
		1	83	485'		
	9/28/13	1	84	490'	0 06	
		1	85	495'		
	9/30/13	1	86	500'	Trace	
		1	87	505'		

L. A. DUNHAM, AGENT

ASSAY RECORD

1910

LABORATORY NO.	DATE OF ASSAY	HOLE NO.	SAMPLE NO.	SAMPLE DEPTH	PER CENT COPPER	REMARKS
	9/30/13	1	88	510'	0 12	
		1	89	515'		
	10/3/13	1	90	520'	No	
		1	91	525'		
	10/3/13	1	92	530'	Trace	
		1	93	535'		Not reliable. Caved considerable
	10/4/13	1	94	540'	No	
		1	95	545'		
	10/8/13	1	96	550'	No	
		1	97	555'		
	" "	1	98	560'	No	
		1	99	565'		
		1	100	570'	No	
		1	101	575'		
		1	102	580'	No	
		1	103	585'		
	10/13/13	1	104	590'	No	
	10/13/13	1	105	595'	No	
				600'	No	No assay made. No change in rock. Sample unreliable

The Western Engineering Company,

Herman W. Hellman Building,

Los Angeles, California.

Gentlemen:-

In accordance with instructions, I have examined the Ray Arizona Copper Company's Mining property, and following this you will find my report.

The veins, dykes, and the country rocks immediately surrounding them are universally brecciated and crushed, thus permitting the passage of surface water into and through them, which leaches out all copper wherever not protected by clay or other material through which the water cannot pass. Therefore, no great bodies of ore can reasonably be expected until developments have gone below permanent water level, which can be expected at depths of from 200 to 300 feet on the north line of your property, and from 300 to 500 feet on the south line.

The assay samples were taken to establish the facts that barren or leached gangue originally contained copper ore. This was effectively proven, as will be seen by an examination of the assay returns. The selected samples were taken to show that the veins carried high-grade ore, and taking the two classes together, whether it was reasonable to expect good commercial ore below water level. The results of the assays justify the opinion that it is reasonable to expect large bodies of commercial ore below water level.

Yours Resp'ly,

(Signed) Wm. A. Farish.

Phoenix, Arizona.

November 1st, 1910.

The Ray Arizona Copper Company's properties are situated in the Riverside Mining District, Pinal County, Arizona, on the south side of the Gila River, opposite the town of Kelvin, and south of Mineral Creek. They are reached by way of the Southern Pacific Railroad from Phoenix. They consist of 42 claims, or mining locations, containing approximately 800 acres of mineral land. They are located in the southerly extension of a great copper mineral belt, which commences at Globe, Gila County, and terminates south of the properties now under consideration. This mineral belt has been traced continuously through the distance given through all formations by the discovery of copper-bearing dykes and deposits of more or less pronounced prospective values. While the existance of copper-bearing prospects on this belt has been known and appreciated by pioneer miners and prospectors for the last thirty odd years, yet there was but one property up to within four or five years ago, that attracted attention and proved to be a valuable asset in the hands of its owners, namely, the Old Dominion mine, at Globe. Frequent attempts were made by capital to make the deposits and veins in the Miami and Ray districts profitable and valuable, yet they all, without a single exception, were failures up to the time they were acquired by their present owners, whose engineers, having kept up to the constantly and rapidly increasing knowledge of the occurances of copper mineral deposits during the last five or six years, from the practical developments of copper mines in the United States, together with the great improvement in the economical handling of the ores and their reduction, realized the importance of the two districts of Miami

and Ray, bought and developed them, and are now equipping them with such skill, with a view of economy, that they are destined to be the center of great copper production districts for a great many years to come.

The ore deposits on this belt occur in fissure veins, porphyry dykes, in limestone deposits, and in disseminated country rock. The greatest attention, within the last few years, has been given to the latter class of deposits as are found in the Miami and Ray districts. However valuable these deposits are, they should not and in fact do not in any degree detract from the great prospective values of many of the other classes of deposits mentioned, which for the time have been overlooked by the investing public.

In concluding this subject, I do not wish to be understood as saying or intimating that large and valuable mines will be found continuously through the length and breadth of this copper mineral belt, but I do mean to say that, in my opinion, there will be several districts developed at intervals on this belt into great copper producers.

The topography in which your property occurs is low rolling hills, rising gradually from the river going south and embracing two mountains, having an elevation of over 700 feet above the river. It is cut by three large ravines or gulches and their tributaries, as shown on the sketch ground plan map, accompanying and forming a part of this report.

#3. W. A. F.

GEOLOGY.

Commencing at the river and running south for a distance of over a thousand feet, the formation is a coarse-grained granitic rock, following which, going south, several porphyry belts (or it may prove to be one continuous porphyry belt of about 2000 feet in width) are found. The entire area contained within your properties, as well as those adjoining, east and west, is cut by series of mineral-bearing dykes and fissures; pronounced faults are also observed at different points within the area mentioned. The course of these different series of dykes or veins varies from North 30° East to North 80° East (Magnetic) to which more particular reference will be made hereinafter. These veins or series of veins, after passing east and west of the properties mentioned, seem to diverge, or in other words, the veins and dykes appear to converge and come close together upon the area mentioned, and particularly upon many parts of your own properties.

DEVELOPMENTS.

Notwithstanding the large amount of work done in the way of sinking prospect shafts of superficial depth, and open cuts upon all of the properties contained in your group, all of which show more or less copper mineral of values ranging from a trace up to 30 to 40 percent in copper, yet they are all absolutely undeveloped and will remain so until the veins and deposits have been prospected below the permanent water level, which in no instance, so far as I observed, has yet been done. For the results found in the various open cuts, shafts, etc., I beg to refer you to the report of

as nearly as I could determine from surfact indications from 10 feet to 50 feet in width, and wherever the croppings have been blasted off or an opening made, they show copper ores of more or less value. Samples 1 and 2, taken from small openings on these veins, at points approximately as marked on the map, gave No. 1, gold tract; Silver 10¢; and Copper .80 of 1%. This represented the leached gangue. No. 2 was from selected copper ore streaks, which have been protected from percolating waters by surrounding material, gave $1.65 in Gold; Silver 96¢; Copper 15%. These series of veins are so close together that the country formation, if any there is, between them, must necessarily be broken and crushed to such a degree as to permit the percolating waters carrying copper in solution to penetrate them and precipitate the value throughout the entire width of the series of veins.

Continuing south for a distance of 600 or more feet, there are three separate veins and one very bold porphyry dyke. This latter is the vein upon which the Kelvin-Sultana Company extracted $16,000 to $20,000 worth of ore from surface workings, which was shipped to the smelters. There are several openings on the line of these veins, all of which show more or less copper ore. Samples Nos. 3 and 4 were from these croppings. No. 3 represented selected ores, occurring as stated above, and gave results: Gold $1.24; Silver $3.97; Copper 33.10%. Sample No. 4, the leached material showing only stains of copper to the eye, the remnants of the effects of leaching, gave 41¢ in gold; 9¢ in silver; and .75 of 1% in copper.

Continuing south for a distance of several hundred feet to a point about 50 feet north of the north line of the "Sorrel Pup" claim, a zone of crushed porphyry and country rock is entered, which continues up to the dyke or vein on which the two shafts for a distance of 50 or 60 feet, at which point, going south, the formation is covered by granitic float and boulders. There are no shafts sunk upon this broken material, but the surface of the ground is covered with ore, some of which is very high-grade. I selected a sample which represent neither the high nor the low grade from these croppings, the value of which is represented by Sample No. 7, which gave Gold trace; Silver 10¢; Copper 2.30%. This will probably prove to be a large belt of disseminated copper-bearing ore, which extends, as far as I was able to judge, for a long distance east and west on this property, if not through its entire length. At the above southerly point, going south, I was unable to trace this belt further in that direction as the mountain rises very abruptly and its surface is covered by debris. Going to the west side of the mountain and up Eagle Canyon, there are numerous dykes, running in an easterly and westerly direction, all of which carry more or less copper mineral, until we reach what is called the Maquan's property, at which place there appears to be a disseminated ore belt of upwards of 200 feet in width, thoroughly leached of its copper contents on the surface, upon which two shafts have been sunk, the easterly shaft to a depth of 100 feet, the westerly shaft to a depth of about 60 feet. In the bottom of the 100 foot shaft, a drift was run north 40 feet. There are about 30 tons of ore left on the dumps.

#7. W. A. F.

This ore was extracted from little veins, which occur at intervals in the width given, the ore being protected from percolating waters by clay or some other material impervious to water. This vein formation appears to traverse the "Eagle Eye" claim its full length; thence on the south side of "Copper King" mine, but south of the center line; thence through the "Iron King."

I consider this a very important belt and well worthy of developing upon your property. Sample No. 5 came from the east shaft dump of ore and gave a result of Gold 40¢; Silver $1.69¢ Copper 11.55%. No. 6 from the west shaft dump of ore gave Gold $1.24; Silver 7¢ and Copper 9.10%. This series of veins dips to the north, whereas the north series of veins dips to the south. Neither of these shafts have yet reached permanent water level; consequently the brecciated country rock is thoroughly leached of its copper contents. The shafts are 400 feet above the river.

Returning to the east side of the mountain and on Copper Cayon, there appears to be a north and south porphyry dyke or vein, about 300 feet wide, that can be traced for upwards of 2000 feet in length. It is on the side of the canyon directly below this dyke where there is a great deal of cemented conglomerated rock, which is thoroughly impregnated with copper sulphates or carbonates, some of which, I am told, were shipped with a profit to the smelters. The evidence contained in this conglomerate is that the copper was undoubtedly leached from the great north and south vein and from the east and west veins which that vein cuts upon its strike. There are one or two tunnels running in the

banks on either side of the gulch, in which some iron sulphurates containing a small amount of copper, was found but the material generally has been thoroughly leached of its copper contents. At a point shown on "Eagle No. 5" claim, there is a shaft sunk to the depth of 28 feet, the portal of the shafts is 10 feet above the bed of the creek, the formation is porphyry and the surface gives no indication whatever of any underlying mineral. At the depth of 10 feet iron sulphides were struck, containing a trace of copper. The copper contents increased perceptibly as depth was attained. Samples Nos. 11 and 12 came from the last material taken from the bottom of the shaft. No. 11 sample was selected from pieces of solid mineral and gave Gold $1.65; Silver a trace; and Copper 1.8%. No. 12 was a grab sample of the very fine material, which gave Gold 20¢; Silver a trace; and Copper a trace. This shaft has not yet reached the permanent water level and is about 300 feet above the bed of the river.

As shown by the assays, the hard ox solid iron sulphide ore carries commercial values, whereas, Sample No. 12, which came from the fine material at same depth represents the fine material lying between the harder material, from which the copper contents which it must have originally contained has been leached out. I consider this a most excellent prospect and that this section of the property through which this north and south vein cuts deserves and fully justifies systematic and full development.

The next point of interest to which I would invite your attention, is upon the "Iron King" property, on which claim there appears to be crossings and junctions of a great many veins and spurs, one running north and south, another northeast, east and west, northeast and southwest, has caused

enormous mineralization as shown by the surface which is iron-stained in almost a circular manner, being about 600 feet in diameter, from which different veins and spurs seem to radiate like the spokes of a wheel from the hub. On both sides of the gulch little openings are made and also openings made on several of the veins radiating from the "hub." Samples Nos. 8 and 9 were taken from a little opening in the gulch. No. 8 which is pure, heavy iron, gave Gold 41¢; Silver 29¢; and Copper.50 of 1%. No. 9 gave Gold 41¢; Silver $1.19 and Copper 20.10%. This sample was carbonates partially leached and found directly under the iron ore. No. 10 was taken at a cut on the south side of the gulch, right in the gulch where they had blasted off the capping (showing no mineralization whatever), exposing mineralized material under it, gave Gold a trace; Silver 70¢; Copper 1.85%. On the east and west vein, Sample No. 13 was from a four-inch streak of red oxide of copper. It gave, Gold $2.48; Silver $1.54; and Copper 40.65%. In several of these spurs which put out from the "hub" there are several openings all of which show copper ores. I consider this claim most valuable and it should make a very valuable mine. It is about 400 feet above the bed of the river. This section of your property, including the adjoining claims is cut by a very great number of dykes and several north and south veins and fissures, all of which are more or less mineralized. They go through the great mountains to the west but I do not look for any ores of any great commercial value until several hundred feet has been sunk below the beds of the present creeks.

#10. W. A. F.

As has been already stated, or intimated, the entire territory covered by your property is very thoroughly mineralized and is consequently very interesting to any mining man. Just how to proceed in the full development of the property, the best miners and mining engineers would probably disagree as to location of the works and the character of the prospecting to be carried on. There is some portion of this ground, notably that below the "Sorrel Pup" and the extension of the Maquan property that can probably be done to good advantage by drilling. There are other points where the values will be confined to the veins which should be developed by shafts, penetrating the earth's crust far below permanent water level, at which point tunnels, north and south, should be run to cut the different veins as on Eagle claims Nos. 2, 3, 4, 9, and 6. On the "Sorrel Pup" claim drilling can be used in what appears to be from surface indications, disseminated ore. The same could be done upon "Eagle Eye No. 5" and so on. On the "Iron King" mine, I would recommend the sinking of a vertical shaft and cross-cutting the entire "hub" of mineral and following different veins on their strike as they leave the "hub." The north and south porphyry vein which traverses the east side of Copper Gulch, is also a very inviting point for exploring. The continuation in depth of the prospect shaft already mentioned (on "Eagle No. 5" claim) in the body of this report, would probably prove to be good. There may be other points, however, upon this great vein that would be more desirable than the one mentioned.

Already the Southern Pacific has its road running to this property and another railroad is said to have surveyed

a line over this property which will be constructed in the near future. How true this will prove to be, I do not pretend to know, but having a great road already in existance and running, puts this property on an equal footing with other mines in the district. Should large amounts of concentrating ore be found, there is ample room upon the property for the storage of tailings from all the ores that can be extracted for a great many years.

CONCLUSIONS.

From a careful reading of the above report, in which I have endeavored to present the facts in plain English, it will readily be seen that this is a wonderfully mineralized property, having, in my opinion, the essential requisites necessary for making a great coppermining property, and as such, is a mining venture of unusual promise, worthy of thorough and systematic development.

(Signed) Wm. A. Farish.

Phoenix, Arizona.
November 1st, 1910.

COPY

REPORT ON THE SULTANA ARIZONA COPPER COMPANY AT KELVIN, PINAL CO. ARIZONA.

****

George C. Clark, E.M.
Tucson, Ariz.
1908.

LOCATION AND EXTENT.

The property under consideration is situated in the Horse Shoe Bend on the Gila River, directly opposite the mining town of Kelvin, on the Phoenix and Eastern R.R., Pinal County, Arizona.

EXTENT. It embraces eighteen locations, consisting of 15 full claims and three fractions, the latter containing an acreage of something more than one and one half claims (30 acres.) All are surveyed and one the Wm. J. Bryan #2, is patented, this having been completed some years ago. The others are held by right of purchase from the original locators, who had owned and worked them intermittently for a number of years. The ground is fully paid for and the present owners, the Sultana-Arizona Copper Company, a corporation, organized under the laws of the Territory of Arizona, need only to complete the patent, to secure a Government title. For further details regarding location, see accompanying map of Arizona.

TOPOGRAPHY.

With the exception of the Silver Twig claims at the S.W. extremity of the group, the property is easily accessible with wagon roads as shown by the accompanying claim map. These are in excellent condition and fit for transportation for ore or machinery to or from the railroad, the cost of their maintainance is practically nothing. The Silver Twig Claims traverse a high granite mountain, ascending steeply from Shoemaker Canyon with a somewhat less descent to Adobe, Wash, a high hill or rather ridge, lies on the E side of the latter, the "flag" on the Wm. J. Bryan #2, approximately marking its apex. The #2 works are on the slope of this hill and hogback which trends M, ending in a gentle slope becoming a flat before reaching the river and would afford an ideal site for a town, smelter, etc. The ridge on the E side of the Camp Wash, with a steep descent to river, gradually slopes

upward from the camp into high hills and mountains toward the South. See accompanying panoramic views.

HISTORY.

The ground was located and held for many years by Jas. K. McCarthy and C. Kinney and was known as the Bryan group.

The following is from the "Arizona Blade" in 1903, being a paper published at Florence, some twenty miles distant, "--- a few hundred yards east of these properties lies the Bryan group of gold, silver and copper claims. This group belongs to Jas. K. McCarthy and C. Kinney --------considerable ore has been shipped from these claims at a profit, notwithstanding the fact that it had to be hauled sixty-five miles by team and shipped two hundred and eighty miles by railroad to El Paso. ---"

The fact of the matter is that when the ground was first located, some dozen years ago, the owners were looking for silver, at that time copper was not much prospected for, silver was "the whole thing" and when they found it was a copper prospect, they simply gouged out the richest ore for shipment. There are no records of how much of this was obtained.

GENERAL GEOLOGY.

The geology of the ground under immediate consideration is comparatively simple, but since there is no stratified formation and we can only arrive at its proper geological time by correlation, it is necessary to embrace a somewhat wider field.

In a trip taken some years ago up Mineral Creek (see map) although at some distance, a good exposure of the Pinal Range was visible. From observations made along this route the following sketch is made, giving the geological sequence

of the formations as they appeared to me at the time from the topography and general outline of the country, taken in conjunction with a somewhat extensive knowledge of the geology of the other side of the range. Since this property includes only the formations below the dotted lines in this section, it will be seen that there are only volcanics to deal with (excepting a little quartzite) all else being long removed by erosion and only given for the purpose of correlation.

From this section it will be seen that the basal rock is a probably pre-cambrian granite, a batholithic mass, evidently cooling at a great depth as indicated by its crystallization, some of the feldspars being more than two inches in diameter. This is particularly noticeable in Shoemaker Canyon, at other points the crystallization is not so coarse. Overlying the granite is a diabasic intrusion, which is of a much later date and will be again referred to. This is succeeded by granite, the quartzite forming the tops of the series and is almost entirely removed by erosion. Again from correlation with the Pinal Range of which this district is the southern extremity, at the close of the Carboniferous the intrusion of diabase occurred, probably accompanied by faulting of the older rock, thus placing the diabase in the early Mesozoic. After this intrusion and still in Mesozoic time, further faulting took place, producing the fissures, from the subsequent mineralization of which the present ores owe their origin. These fissures have a general easterly and westerly strike in approximately parallel lines.

While their course cannot be traced continuously without a break, which is hardly to be expected in a country more or less covered with surface wash, both the granite and diabase disintegrating readily, still the intermissions are not long in extent and where the various works have been done, determine with reasonable certainty, the direction and contin-

uity of their strike.

All the fissures show more or less mineralization, not simply a copper stain but good solid mineral and in at least one instance in particular on the Hunters, the cropping while not arominent, showed a good copper mineralization. Cross faulting is plainly evident in places but not of sufficient displacement to seriously interfere with the working of the veins.

VEINS.

The veins varying in width throughout their strike from one to eight feet as shown in the cross sectional drawings of the work, are mineralized fillings of the post diabase fault fissures just described.

Fresh specimens of the diabase obtained from the bottom of #4 shaft, show it to be composed of the feldspars, plagioclase and labradorite with olivine, augite, somewhat uralitic, iron oxide and pyrite and some magnetite. The vein filling consists of quartz and thealteration products of these minerals, limonite, kaolin, chlorite, amphibole, some serpentine, and a little calcite derived from the feldspar, brecciated fragments of the walls, more or less mineralized and the copper minerals which are to be further discussed. The veins do not always have well-defined walls, the mineralization having penetrated the altered diabase by metasomatic replacement, grading in a short distance into the unaltered rock. Subsequent to the deposition of the ore, faulting within the veins themselves is evidenced by the clay seams showing slickensides and from the character of the striations, was probably normal. The pitch is to the South and varies from 75% to 45%. There can be no reasonable doubt concerning their continuity with depth, from what has preceded and from the fact that the fissures can be traced into the underlying formation where the latter has been exposed by erosion to the South and West

and it is further entirely improbable that such extensive fissuring has been confined to a shallow depth.

GENESIS OF THE ORES.

Since the diabase is the only factor with which we have to deal, it may be regarded as the original carrier or mineralising agent, although other deep-seated sources also undoubtedly played an important part. That the diabase must be so considered is proven by an analysis made of a fresh and unaltered specimen, taken several hundred feet distant from any known ore, twenty grammes were used and found to contain a trace of copper, not an astonishing amount it is true, but corresponds with similar analyses I have made of the intrusive porphyries around Bisbee and from which have originated the immense ore bodies of that camp. That the mineralization is due to hot ascending vapors and waters is believed from the following well known facts. Where crystals are formed from a saturated solution, it is not uncommon to find that they enclose a small portion of the mother liquor. When the temperature at which the crystallization takes place is high, the enclosed fluid will shrink in volume upon cooling, resulting in the formation of a bubble, these are usually microscopic in size and by the application of heat or an electric current can be made to move and their certain identity established under the microscope. Petrographic slides were made and this experiment tried with some of the quartz crystals from the various veins, obtaining the above results in some, but as was to be expected, not in all cases. We are therefore reasonably certain that the original deposition took place from hot ascending solutions. Further, the deposit was without doubt augmented by the circulating meteoric waters, their dissolving power increasing by contact with the cooling diabase. Heat however is not necessary, their chemical action is still at work, although not with its former energy. With the

present amount of development, it is but idle speculation to attempt to predict where future stoping ground will be struck. That such will be found follows however from what has already been said and from the fact that at least one large stope has been opened up and explored, as shown in the cross-section. When sufficient work has been done, it is often although not always found that the ore bodies and chutes follow certain lines or dips along the course of the vein. This characteristic will be readily understood from the accompanying sketch.

Since in this formation there is no limestone or other rock to act particularly as a concentrating agent, the surface waters must be looked to in forming conclusions regarding prospective secondary erichments.

MINES IN DIABASE.

There are numerous localities where great copper mines are in the same or similar formations, among which may be mentioned some of Michigan's great producers, some at Clifton and Morenci and some at Globe, Arizona.

The locations and character of this work may be ascertained by reference to the maps and cross sections.

#1--	Inaccessible	100.00 ft	(may be more)	Vertical Depth
#2--	75 Incline	185.00 "		180.00 ft.
	Winze	20.00 "		20.00 "
	Air Shaft	104.00 "		101.00 "
#3	45	80.00 "	Incline	57.00 "
	Vertical	30.00 "		30.00 "
	Upraise	50.00 "		35.00 "
#4	Vertical	100.00 "		100.00 "
Twig Shaft	"	20.00 "		20.00 "
Between 2 & 3	Shaft	30.00 "		30.00 "
	Total	719.00 Ft.		

DRIFTS AND TUNNELS.

#1	Tunnel----------	50.00 ft.
#2	" ----------	246.00 "
#2	Drifts and Cross Cuts ----------	651.00 "
#3	" " " " ----------	600.00 "
#4	" ----------	148.00 "
Twigs	Tunnels	100.00 "
Between 1 & 2	"	60.00 "
		1855.00 Drifts and Tunnels.
		719.00 Shafts
		2574.00 For all work
#2	Total sinking and drifting	960.00 ft.
#3	" " " "	750.00 "

The above does not include the stoping which is best understood from the sectional drawings. The various open cuts 10 ft. discovery shafts and places were the original locators have gouged out the surface ores, are also not included in the above.

SOME DETAILS OF WORK.

#4 Shaft.-- Is two compartment, well timbered with square sets and is vertically sunk in the diabase, 100 ft. South of No. 3 incline. It is intended to be a main working shaft from which to cross-cut and connect with #3. The present cross-cut is however a little off in its bearings, since the collar is also about ten feet lower than that of #3, the bottom of the shaft is 110 ft. below the surface of #3 incline, which itself is only 87 feet deep vertically, thus they are apart about 20 ft. vertically. A survey should be obtained and this connection by all means made.

#1 Shaft. I should judge to be about 100 ft deep with considerable water at the bottom. There was no means of descending, so am only guessing at this depth from dropping a stone. It also appears to be inclined near the bottom. The dump would

indicate a greater depth but do not know how much comes from the tunnel nor what amount may have been shipped as ore by the former owners, by whom it was evidently put down. The rock on the dump is generally of a very dark color from maganese and some pieces are well seamed with copper minerals.

#1 Tunnel -- Is of little importance. It is only a few feet below the surface and if carried a little further would come out on the other side of the ridge. The vein shows here to have penetrated the overlying granite. It shows limonite and some copper stain but any previous existing values have been leached out, it is not to be inferred that the vein below in the diabase is unimportant. From the looks of the dump it should be investigated.

#2 Tunnel - follows the vein into the hill, is generally leached from its proximity to the surface, shows good iron and some copper, becomes firmer as it gains depth and is beginning to made ore as is shown by the small stope started at 16 ft. from the breast. This stope as well as several others at different places should be further investigated. Even a small seam running from them may lead to good ground.

#2 Shaft and its drifts constitute the most important work so far accomplished. The works all follow the vein which shows throughout with the pinches and swells characteristic of all veins, the particular details have been already described under "Veins" and need not be again repeated here. The fact should be noted that the first level of this shaft is the longest opening along the course of the vein and that of 380 ft. of drifting, practically 300 ft. was good stoping ground, a remarkably good showing and especially so when the quality of the ore extracted is taken into consideration. (See Smelter Returns.)

The bottom of the shaft and the lower level show the contimuity of the vein and the mineralization of the same.

Practically all this work should be pushed, particularly the west drift on the first level, the east drift and upraise on the second, the shaft another fifty feet with drifts E. & W. at the bottom, note that a few hundred feet of drifting West from here will be 600 ft. below the surface. For the characteristics of stoping ground that may be expected in this vein, reference is made to the sketch on page six of this report.

Tunnels and cuts between #2 and #3 have been gouged but reveal another fissue here which shows good copper ore in the cut, this proves mineralization but the tunnel and shaft do not show so well, spots of improverishment are to be expected. The explanation is given in the "Summary" at the top of page 12.

Twig #2 Tunnel, is in granite and is wholly leached, showing copper stain however but consisting principally of kaolinized matter from the feldspars.

Other Twig Work is also in the granite and on lead silver ores showing a little copper, the ore is first class but the vein is too small to work profitably at present unless a further development should open them up or a thorough prospecting of the ground might reveal points of greater dimensions. I think that part of the country would bear a closer search.

#3 Workings show good mineralization in vein similar to #2, the inclination is 45, so that comparatively little depth has been gained, the lowest level being less than 80 ft. from the surface.

About 50 ft. of stoping ground has been opened on the tunnel level and more can be developed when desired. Some very peculiar work has been done here by the original owners as is seen by a glance at the section along vein. This vein should be developed from #4 Shaft.

OTHER WORK.

Good copper and iron are shown in various other places on the property, among which may be mentioned the Agnes, Hunters, Little Clara, and Contact, from a couple of open cuts on the two latter, over a carload of ore was shipped. By a showing isnt meant an ounce of copper staining up an acre of ground but mineral in place and in sufficient quantities to justify further exploration.

FUTURE DEVELOPMENT.

Upon the amount and rate of available funds depends the amount of development to be undertaken and the manner in which it is to be executed. In general when a certain amount has been determined upon for this purpose, the maximum of economy is obtained with the quickest legitimate expenditure. Thus the highest skilled men in each department can be kept busy all the time, the slightly higher wages demanded being more than compensated for by the results obtained. With a fixed monthly expenditure it may be desirable to proceed more slowly, retaining the best men (who cannot always be picked up) by giving them continuous employment.

For the present, considering the development already done it would be advisable to concentrate work at #2. Here the best results have been obtained and the prospect of opening up new ore bodies is most favorable. Another point in its favor is its rather central location and favorable situation from which to transport ore. A reference to the panoramic picture shows that within a radius of 2000 ft. a gravity tram will place the ore in concentrator or smelter at any one of a dozen points, extending N. & W. from the E. end of Little Clara.

The picture shows the sloping ground so much to be desired in the choice of a millsite, other things being equal.

The W side of the property should also receive attention. Near the west end of the Hunters Claim there is a good copper showing upon which as yet no work has been done. A shaft on this side of the ground, connecting with #2 workings will be an ultimate necessity both for exploration and ventilating purposes.

Succeeding alittle preliminary opening up a vertical shaft with cross cuts to the vein would best answer for all purposes.

If the vein here has the same pitch, 75° it gains only 25 ft. horizontally per 100 ft. in depth. In addition should further development show it advisable, its topographical situation offers a most favorable millsite, the ore being trammed directly to concentrator bins, the concentrates only by gravity tram about 2000 ft. to railroad. The development of #2 and 3 has already been referred to. There are other points that could be advantageously explored, the manner of this however would depend upon the preceding, which for the present is sufficient.

TIMBERING.

No timbering is necessary except for shaft work, in the drifts and stopes a stull now and then is sufficient.

WATER LEVEL.

The water so far encountered appears to be surface seepage and its amount is immaterial. The permanent water level has not been reached in any mine sufficiently near to make a comparison, calculations however could be made, giving an approximation, if sufficient time were taken to become further acquainted with the general conditions of the mines of the district.

It is not probable that any pumping will become necessary in the near future.

PRODUCTION.

Summing up the smelter returns and on a basis of 95% of the assay value, 16 shipments of 394 tons net, the mine up to date has produced:

Production cont.

Copper, lbs	94047.00
Value at the mine	$18209.00
Silver	923.00
Iron	368.00
Total	$19500.00

This does not include what may have been taken out and shipped by the previous owners.

The smelter facilities may be improved before a great while. From a glance at the map of Arizona it will be seen that the Southern Pacific, which owns all these branch lines, has only a few miles to build to connect with the Globe road, which will place the Old Dominion smelter within fifty miles of the ground.

It is persistently rumored that the Phoenix and Eastern will be thus connected and become the main line of the S.T., the object being to avoid the heavy grades on the old line, especially in the Dragoon Mountains. This would also cut off 200 miles of the present distance to the El Paso smelter.

SMELTERS RETURNS.

Following is a condensed copy of the originals.

HUMBOLDT SMELTER.

Gold---0.02 oz.--$- - -		Smltng.	Frt.	Costs	Value.
Silver - - -2.00 oz	1.24	$5.28	$3.80		
Copper - - -8.74%	23.20				
Iron - - - 15.70%	0.78				
Silica - - 36.60		3.66		$12.74	$25.22
Tons shipped 10.657		Net value per ton			12.48
Copper @ 18.25 per lb.	Total " "				132.95

Gold - - - tr		3.67	5.65		
Silver - - - 4.6 oz.	2.36				
Copper - - -14.11%	36.83				
Iron - - - 15.40%	.77				
Silica		4.80	14.12		40.46
Tons shipped 21.134		Net value per ton			26.34
Copper @ 18.00 per lb.	Total " " " "				566.08

Gold - - - 0.01 oz.		3.98	5.25		
Silver - - 5.20 oz.	3.21				
Copper - - 13.08%	34.63				
Iron - - - 14.50%	.72				
Silica - - 50.00%		5.00		14.25	38.56
Tons shipped 22.172		Net value per ton			$24.31
Copper @ 18.21c per lb.	Total " " " "				539.00

Gold - - - tr.		4.87	4.35		
Silver - - 3.30 oz.	2.09				
Copper - -10.10%	26.92				
Iron - - -14.70%	.73				
Silica - -54.10		5.41		14.63	29.74
Tons shipped 18.031		Net value per ton			15.11
Copper @ 18.31c per lb	Total net value of shipment				262.88

Smelter Returns cont.

Humboldt Smelter.

			Smltng	Frt.	Costs	Value
Gold - - -	tr	$				
Silver - - -	3.99 oz.	2.52	$4.57	$5.10		
Copper - -	11.09%	30.20				
Iron - - -	17.90%	89				
Silica - -	48.00%		4.80		$14.47	$33.61
Tons shipped	15.706		Net value per ton			19.14
Copper @ 18.63c per lb.	Total		" " " "			300.66

Gold - - -	tr.		$2.03	$6.23		
Silver - -	4.60 oz.	2.98				
Copper - -	19.58%	56.71				
Iron - - -	22.40%	1.12				
Silica - -	31.80%		3.18		11.44	60.81
Tons shipped	22.691		Net value per ton			49.37
Copper @ 19.59 per lb.	Total		" " " "			1120.12

Gold - - -	0.01 oz.		2.32	1.80		
Silver - -	5.20 oz.	3.40				
Copper - -	18.60%	70.91				
Iron - -	19.50	.97				
Silica -	33.40%		3.34		12.46	75.28
Tons shipped	20.286		Net value per ton			62.82
		Total	" " " "			1274.31

Gold - - -	-					
Silver - -	5.50 oz.	3.60	1.72	6.35		
Copper - -	20.60%	83.27				
Iron - - -	22.60	1.13	2.72		10.79	78.83
Silica - -	27.20					
Tons shipped	33.513		Net value per ton			72.48
Copper @ 24.68 c per lb.	Total		" " " "			2428.38

HUMBOLDT SMELTER CONT.

		Smtng	Frt.	Costs	Value
Gold - - -	tr				
Silver ---	4.20 oz.	$2.68	$3.39	$10.73	
Copper ---	13.70%	45.62			
Iron ----	19.40%	.97			
Silica --	39.80%		3.98	$18.10	49.30
Tons shipped	33.245		Net value per ton		$31.20
Copper @ 22.00 c per lb.			Total " "		1037.20

Gold ---	tr				
Silver --	4.0 "	2.55			
Copper --	16.50%	54.97			
Iron ---	18.60%	.93			
Silica -	39.10		3.91	18.21	58.45
Tons shipped	27.871		Net value per ton		40.24
Copper @ 22.00 c per lb.					1122.47

COPPER QUEEN SMELTER
Douglas.

Silver -----	2.10	1.37	2.50	4.12	
Copper -----	8.60%	23.19			
Iron ------	16.10%	.80			
CaP -------	1.30	.08			
Silica ----	81.00		4.08	10.70	26.00
Tons shipped	29.430		Net value per ton		15.30
Copper @ 17.98			Total " " " "		450.17

Silver	---3.30 oz.	2.14	2.50	4.60	
	--12.05%	31.60			
Copper	---18.10%	.90			
Iron	--- 1.10%	.07			
Lime	---43.10%		3.44	10.54	35.61
Silica					
Tons shipped	25.784		Net value per ton		$25.07
Copper @ 17.57c per lb.			Total " " " "		639.62

EL PASO SMELTER.

		Smtlng	Frt	Costs	Value
Silver--- 3.40 oz.	$1.80				
Copper --11.60%	22.32	$2.14	$4.75		
Iron ----21.80"	1.09				
Silica --38.60"		3.86		$10.75	$25.21
Tons shipped 43.942		Net value per ton			14.46
Copper @ 13-11/16 c per lb	Total	" " " "			631.88

		Smtlng	Frt	Costs	Value
Silver 4.80 oz.	2.46	1.75	4.50		
Copper 15.60%	26.33				
Iron 19.60"	.98				
Silica 35.60"		3.56		9.80	29.77
Tons shipped 31.541		Net value per ton			19.95
Copper @ 13-3/8 c per lb.	Total	" " " "			625.44

		Smtlng	Frt	Costs	Value
Silver 5.60 oz.	2.80	1.52	4.00		
Copper 10.80%	30.24				
Iron 22.00"	1.10				
CaO 1.70					
Silica 32.00		3.20		8.72	34.14
Tons shipped 13.810		Net value per ton			25.42
Copper @ 12. 7/16	Total	" " " "			349.13

		Smtlng	Frt	Costs	Value
Silver 4.00 oz.	(2.12)	2.42	4.00		
Copper 8.80%	14.95				
Iron 20.00"	1.00				
Silica 44.00"		4.40		10.82	15.95
Tons shipped 24.298		Net value per ton			5.13
Copper @ 12-7/16 c per lb.		Total " "			119.00

ALL OF THESE ORES RAN FROM 10% to 20% SULPHUR.

From an average of all the ore shipped, the following data results.

SULPHUR AS STATED IS 10% to 20%.

Total Gross Wt. Lbs.	813500.00
" Net " "	788227.00
Moisture	3.30%
Tons shipped	394.11
Silver ozs. Per Ton	4.10
" Val. " "	2.50
Copper	14.00%
" " " " less 3 to 4 c pr. lb. for marketing	42.00
" " " " " freight charges	35.00
" " " " net value in market	29.50
Iron	19.00%
Silica	40.00%
Treatment charges	3.00
Silica Deductions	4.00
Freight charges	6.00

Average Copper Val., 18.5c per lb.

There is no doubt about this freight rate being high. It is due to the high rate on the shipments to the Humboldt Smelter which some times was nearly $12.00 per ton, something pecular about it as the ore was not of the highest grade, which regulates the rates. Too much was paid by shipping to this smelter, considerable could have been saved by dealing with others.

ANALYSIS AND ASSAYS.

A number of these were made but as they did not differ materially from the smelter returns, which naturally gives the best averages, it was not thought necessary to give them here.

It is worthy of note that the largest shipment also the highest grade, 33.513 tons assayed 20.6% copper and yielding on 90% assay value. 12428 lbs. of metal and having a net value of $2428.00

SUPPLIES.

Lumber per M. Oregon Pine		$35.00
Coal, good	$9.00	10.00
Coal, Slack in car load lots		6.00
Coal, good " " " "		7.50
Lumber " " " "		25.00
Oil In Tanks from Los Angeles, per gal.		.04
Coke	9.00	12.00

The last two articles are in the event of a smelter being erected in which case either may be used, the oil would be the cheapest not only for smelting but for fuel also instead of coal.

If enough men are employed and have accommidations for stopping on this side of the river, a store would pay well, the trade is practically all cash, since a man is not credited with more than he earns.

LABOR.

Top	$2.50-$3.00
Miners, white	3.50
Miners, Mexican	3.00
Machine Men	4.00
" Helpers	3.75
Timbermen	4.00
Blacksmiths	4.00
Engineers	3-4.00
Millmen	3.50-4.00
Unskilled labor	2.50

There is no doubt that the best results can be had obtained by contracting by the foot in all sinking, drifting and cross cutting and by the ton for stoping, when once the work to be done has been laid out.

Kelvin, Ariz., July 19,1906.

Mr. C. H. Seamans,

Chicago, Ill.

Dear Sir:-

In compliance with your request I have made a careful examination of the Bryan Group of claims at this point and beg herewith to hand you a statement of the facts as I found them.

The Bryan Group of mining claims consists of fifteen claims and three mill sites, to-wit: The W. J. Bryan, The W. J. Bryan No. 2, The W. J. Bryan No. 3, The W. J. Bryan No. 4, The W. J. Bryan No. 5, The St. Karl No. 1, The St. Karl No.2, The St. Karl No. 3, The Hunters, The Hunters No. 2, The Agnes, The Little Clara, The Contact No. 1, The Silver Twig No. 1, The Silver Twig No. 2, The W. J. Bryan mill site No. 1, The Hunters Mill site and The Agnes mill site.

This group of claims is located in the Riverside Mining District, in the County of Pinal and Territory of Arizona, directly across the Gila River from the town of Kelvin, a station on the Phoenix and Eastern Railway, a branch of the Santa Fe road, to which town there is one of the best wagon roads in the territory. The elevation of the mine is about three hundred feet above the town of Kelvin, and Two thousand two hundred feet above the sea level. The mountains in and around this group are one of the western spurs of the Pinal Range.

Of these claims and mill sites of the W. J. Bryan No. 2 is vested in the owners by United States patent, while title to the remaining claims and mill sites is held by location, possession and compliance with the laws of the United States and the territory of Arizona.

The Riverside Mining District is a comparatively old one, but up to January 1905 was very inaccessable, the nearest railroad station having been nearly one hundred miles distant. About that time, however, the Santa Fe built what is now known as the Phoenix and Eastern, east from Phoenix, Arizona, up the Gila River, and through Kelvin. As in all old districts, during its early days, it had its period of so-called "Raw hiding", considerable money was spent foolishly, squandered as it were, but with the exception of the Old Dominion mine at Globe, thirty miles north of Kelvin, nothing was accomplished until about two years ago. Since that time, and since mining has been carried on along business lines, a number of good producers have been opened up, until this district is now fifth in point of production in the United States.

The veins on the Bryan group are several, all having a uniform strike from east to west with a dip to the south. The principal three are the so-called numbers one, two and three veins. All three of these veins are tracable over the surface for long distances, and all along them more or less work has been done including most of the deep workings on the property. The gangue in all of these veins is rather siliceous, but contains a good percentage of iron, and iron predominates on the surface, the capping of the veins in many places being a pure gossan. Near the surface the ores are oxidized, but before any great depth is reached their character is changed to that of sulphides in the form of chalcocite, bornite, and chalcopyrite. This change takes place partially above the fifty foot level in all of the workings, while at the one hundred foot level the ore is in the form of an unaltered sulphide.

The principal work is a shaft 320 feet deep on the number one vein, a shaft 120 feet deep with about 100 feet of lateral workings on the number two and a shaft 130 feet deep with about 200 feet of lateral workings.

On the number one vein the shaft is all in ore, it showing about twelve inches wide and widening out to some two feet at the 120 foot level, the deepest the shaft can be penetrated at the present time. At this point the shaft is bulkheaded on account of being in bad condition and full of water below.

The most interesting piece of work on the property for the reason that it shows more and better ore than any other place is the number two shaft with its lateral workings. The shaft was sunk all in ore in the first place and the developments in the levels below show that it was well located. The ore now showing in the eastern level is remarkable, there being three feet of semi-sulphide ore exposed that runs a little better than thirty percent. This ore has been opened up very lately, development has been diligently prosecuted and it has been demonstrated that the body is continuous both laterally and vertically. I sampled this body of ore very carefully, and believe the figures both as to the size and value of this ore to be conservative. The west rrift from this shaft also shows some ore but it is smaller and lower grade. The bottom of the shaft, which was being sunk deeper at the time of this examination, is all in ore running about ten percent in copper, the same in iron and the same in sulphur, being a straight chalcopyrite, in a siliceous gangue.

The number three shaft is thirty feet deep vertically, and then is inclined at an angle of about forty-five degrees.

No ore was encountered in this shaft for about 120 feet, but at this point a good body of ore was encountered with the copper in the form of bornite. Some lateral workings were driven from the bottom of the vertical portion of this shaft, but no ore was encountered. From the bottom of the shaft levels were run, but when I was down in it they were about half filled with water and consequently inaccessable, but it looked as though the ore was continuous in them.

In several other places on the property shafts have been sunk short distances and open cuts made, in every one of which ore was exposed. Particularly was this the case in the so-called Rattle Snake Shaft. Here there is a very good showing of oxidized ore as there is also in the Green Shaft. While these workings do not amount to much, nevertheless they show the general mineralization of the entire group.

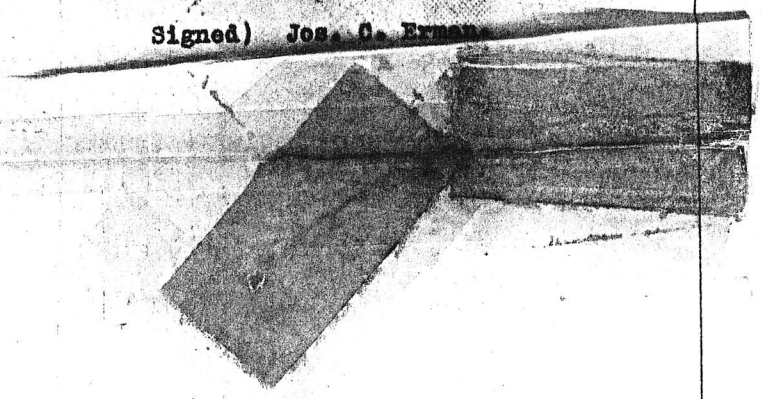
The formations observable on the surface consist of granite, lime-stone, quartzite and diabase, in and alongside of which most of the ore on the property has been found. The fact that the ore is found alongside of this diabase is one of the most encouraging things about this property for the reason that most of the big bodies of ore uncovered in this district are in more or less close connection with this formation, and notably is this the case in the Old Dominion at Globe. Another thing that seems to be indicative of the existence of extensive copper deposits on the property is the fact that in numerous places on the surface heavy bodies of iron gossan are to be seen on the contact between this [illegible] and the other formations. In several places the copper is found in direct association with this gossan, which apparently goes to prove the theory of the existance of copper deposits below.

In gold and silver values the sulphides seem to run much better than the oxidized ores. At least my samples would lead me to think so.

Taken as a whole this group of claims makes the best copper prospect I have seen for a long time. It has all of the surface indications one could ask for, good ore in underground, and is located convenient to the railroad. Crude oil for fuel purposes is delivered in Kelvin for $1.25 per barrel of forty-two gallons. which is about equal in price to the average bituminous coal at $3.50 per ton. Mining timbers, Oregon pine, cost $34.00 per thousand feet in Kelvin. Labor costs are about the same as in all of the copper camps in the territory ranging from two to three dollars on the surface and from three and one-half to four and one-half dollars underground, depending on the character and location of the work. Water in ample quantities for all reduction purposes, no matter how large the plant might be, is to be had from the Gila River all year around. Hence taking all the advantages of water, transportation, good surface indications and a good supply of good ore considering the amount of development work done, I will say that I consider this a very meritorious property, and well worthy of your consideration.

Respectfully submitted.

Signed) Jos. O. Ermen.



RIVERSIDE GROUP

TO SUPERIOR COURT OF COOK COUNTY AND
CHARLES T. MASON, SOLICITOR FOR COMPLAINANT.

REPORT OF

B. F. SKIDMORE, RECEIVER.

IN ACCOUNT WITH HOUSE AT #1197 93rd STREET.

DEBIT.

Allowed E. F. Cooper, tenant, the following bills which he had receipts for on November 3rd, 1906, at the time of settlement with him;

Painting and papering,	$4.25
Water Bill Nov. 1/05 to May 1/06	3.00
New Trap Sink,	.90
Water Bill May 1/06 to Nov. 1/06	3.05
New screen wire,	2.54
Papering and varnishing,	26.75
	$40.49

-1906- October 26th, To B. F. Skidmore, Receiver, for services serving notice on E. F. Cooper 1197-93rd Street and getting the address of Mary Murphy, etc., one-half days time, $2.50, carfare, 30 cents, 2.80

November 3rd. To B.F.Skidmore, Receiver, for services as Receiver and collecting rents, etc., 1197-93rd Street, seven months, including October rent, at $2.00 per month, 14.00

November 26th. Water Bill, November 1, 1906 to May 1, 1907, 2.98

December 11th. To cash Ayers & Petrie for bond in Receivership foreclosure proceedings, 5.00

-1907- January 25th. To B. F. Skidmore, for services as Receiver and collecting rents for November, December1906 and January, 1907 $2.00 per month, 6.00

January 25th. To Charles E. Murphy to pay on Water Pipe Bill due at South Chicago on House at 1197-93rd Street, (being for part of said bill.) Order of Charles T. Mason, Solicitor for Complainant and by Defendant. 10.00

Carried Forward, $81.27

REPORT ON THE PROPERTY

of the

SULTANA-ARIZONA COPPER CO.

Superior, Ariz. Feb, 29, 1908.

To John R. Ryan, William Fischer and James Krupp, the committee of the Houghton County Stockholders, Sultana-Arizona Copper Co.

Gentlemen:-

In response to your request, made to me through Mr. P. H. Finnegan, I spent three days examining the property of the Sultana-Arizona Copper Co. near Kelvin, Arizona, and respectfully report upon the same as follows:

The property of the Sultana-Arizona Copper Co. consists of seventeen full claims, three fractional claims, and two mill sites, totaling in all about 380 acres. It is situated on the south side of the Gila River nearly opposite and distant one-half mile from the town of Kelvin, a station on the Phoenix & Eastern R. R. eighty miles southeast of Phoenix. The elevation is about 1900 feet above sea level.

The topography of the country is one of steep, sharp hills, with deeply eroded gulches. A portion of the property lying on the edge of the river is a gentle slope and will make an ideal location for a reduction plant. Plenty of water can be obtained from wells near the river.

There are a number of parallel fissure veins on the property, having an east and west strike, with a varying dip to the south. All of the veins occur in a diabase intrusion, which underlies a barren formation of feldspathic granite. Most all of the veins have been prospected to some extent, but the one known as "No. 2" and located on Bryan No. 2 claim is the only one upon which any considerable work has

been done. This has been by means of two inclined shafts 160 feet apart, one known as "No. 2" and the other "the air shaft." No. 2 shaft, is 185 feet deep, and the air shaft about 100 feet, both being sunk on the vein. There are three levels, one 50-ft., one 85-ft., and one 130-ft. The 50-ft. level has been driven about 75 feet west of No. 2 and the ore stoped out for practically the whole length and to within a few feet of the surface. Ore which has been broken is still being hoisted from this level. The stope shows a vein width of about four feet. Two samples from 3 1/2 feet and two feet of the vein in this stope returned 4.1% and 2.1% copper respectively.

The 85 ft. level has been driven about 250 feet west of the No. 2, and for a distance of 75 or 80 feet from the shaft the vein contains ore of the same grade as that on the 50 ft. level above and can be expected to continue so between these levels. A small stope has just been started about 40 feet from the shaft and is up about ten feet. A sample of 3 1/4 feet of vein in this stope returned 2.8% copper. A little further west is a larger stope, partly filled with broken ore. Beyond this, the vein narrows, and at the extreme west end it pinches out entirely. This, I believe, is on account of its proximity to the overlying barren granite, which, in only one or two instances, did I find carrying the extension of the underlying veins to surface. At a point 185 feet west of the shaft, a sample of 16 inches of vein returned 4% copper. East of the shaft on this level, a drift extends to the air shaft, and about half of that distance has been stoped to the 50-ft. level, most of the ore remaining in the stope. The remaining portion has been prepared for stoping and should open up some good ore. A sample of three feet of vein at this point returned 6.1% copper.

The 130 foot level has been driven west about 155 feet and east as far as the air shaft. There are no stopes on this level and the vein, for the most part, is very narrow and low in copper. About forty feet of the vein between the two shafts shows good ore, and a stope is soon to be started there. A sample of four feet of vein 120 feet from No. 2 shaft returned 8% copper. A sample taken in the air shaft of five feet of vein, 30 feet below the 85-ft. level, returned 1.1% copper. The ore body opened in these workings is the characteristic lenticular form of Arizona copper ore bodies occurring in veins, and while, at the present depth,(130 feet) it has narrowed considerably, with further depth it may be expected to widen out or to give place to an entirely new body.

About 600 feet south of No. 2 shaft, a vertical double-compartment working shaft has been sunk to a depth of 113 feet and is well timbered for its entire depth. A station is now being cut at the 100-ft. level, from which cross-cuts will be driven north and south. This shaft is located on the Bryan No. 3 claim and is known as No. 3. Between No. 2 and No. 3 shafts, there are several veins, all dipping towards No. 3 and the north cross-cut should cut them all in a distance of 300 feet; in fact, the shaft is at present bottomed in what appears to be the wall rock of the first of these veins. The south cross-cut will also cut several veins in a short distance. A vein which does not outcrop on a line between the two shafts has been tunneled on near the bottom of the gulch. A carload of ore was shipped from this tunnel, which returned 8.6% copper. Both shafts are equipped with horse whims and No. 3 has been arranged for the installation of a hoist.

On the little Clara Claim, forming the eastern extension of the Bryan No. 2, some promising surface copper indications have been found and which are probably on one of the veins already opened. On the Bryan No. 4 and 5, near the center of the property, are also good copper showings.

Several shipments have been made by the present and former management, and all returned a good profit. The ore was sorted and about 2,000 tons of the discard remains on the dumps. a general sample from which returned 3.3% copper. This is all milling ore. The ores contain small values in gold and silver, which will be raised to commercial values by concentration.

Except for a few feet below the surface, the ores of this property are the primary sulphides of iron and copper, which, in other Arizona districts, have been found to form ore bodies of both smelting and concentrating grades, and I believe that, with deeper developments more ore bodies of this character will be found. It is a possibility also that this vein system has sprung from a parent source which may be located by deeper workings. With proper development, this property should produce a large tonnage of concentrating ore from which a high grade product can be obtained for shipment to the smelters. The principal future developments should be looked for in No. 3 shaft as it is centrally located and in a position from which the entire vein system can be conveniently explored. In my opinion, I consider this property a very promising one.

Respectfully submitted,

(Signed) R. R. Richardson, M. E.

Report by H. C. Erman on the

BRYAN GROUP OF COPPER CLAIMS.

The Bryan Group of Claims consists of fifteen (15) mining claims and three (3) millsites, located at Kelvin, Pinal County, Arizona, on the South bank of the Gila River and directly opposite a branch of the Santa Fe Railroad, one-half mile away. The formation is Granite Quartzite and Lime Stone through which large dykes of diorite intrudes. On the other contact between the diorite and granite is where the copper ore is found in the largest bodies. The country as a whole is highly mineralized, there being a large amount of Iron Hematite. The croppings of copper are frequent and widespread, there being four principal and distinct croppings that can be traced the entire distance across the Group of Claims. These vein croppings have been prospected by a great many different prospect workings. All the prospect workings show copper ore in good strong veins from 4 to 20 feet wide. The ores on the surface are principally carbonates and oxides. But in the undergraund workings chalcopyrites with an excess of Iron pryrites constitute the copper bearing ore. On the surface, combined with the carbonate and oxide is found secondary sulphides. Chalcocite, both primary and secondary ores carry gold and silver values. The principal workings consist of a shaft 4 x 6 on the Bryan Claim Number One, which I was unable to get into on account of it being partially fil with water. But I was informed by men who last worked i shaft that the shaft was 310 feet deep, from which t of 100 & 140 feet respectively have been run at diff levels. I have learned that quite a lot of ore ed from thks shaft. Sufficient ore can be see show what is below. On the Bryan Cl[illegible]n Number

an open cut and part way tunnel some 40 feet long, which connects with a shaft some 20 feet from the surface. This shaft is 60 feet deep sunk on a vein of copper ore. 10 feet from the bottom of the shaft there is a tunnel run east 60 feet long on the vein which is 4 to 6 feet wide, which show good copper ore, assaying from 15 to 20% copper. The open cut which intersects this shaft at 20 feet from the surface show three distinct seams of good copper ore varying from 6 inches to 2 feet in thickness; at the present depth of this shaft a tunnel can be run westward on the ore vein which would gain a depth of some 400 feet below the apex of the top of the mountain. This vein can be traced by the croppings on the surface over the entire group of claims. Ore is now being mined and shipped out of this workings. There has been no ore shipped out of the workings except the ore taken out in development, which has been shipped to a good profit. This claim is patented title. On Bryan Claim Number Three two open cuts have been made and two shallow shafts sunk, from one of which shafts a shipment of chalcopyrite of high grade was made. On the St. Karl a shaft 50 feet perpendicular with a 50 foot of a 35 degree incline from bottom of shaft which shows a vein of copper ore from 3 to 5 feet wide throughout the workings. This is a good grade of ore for shipping. On Silver Twig No. 1 is a shaft 50 feet deep with a tunnel 40 feet long to intersect the ore showing above but which has not as yet been driven far enough. On Silver Twig No. 2 there is 50 feet of work in one place and 40 feet on a contact in another place, all showing good ore. A great many open cuts and shallow shaft have been made over the entire group of Claims, all of which shows more or less copper ore, and which are too numerous to mention in this report.

Altogether, on the entire Group, there has been about three thousand feet of development work done, in most all of which ore has been opened up. The ores from this Group of Claims is a very desirable ore for smelting, as the ore carries a sufficient amount of Iron and Lime to be self-fluxing in smelting.

The present development work on this Group of Claims and the ore that has been uncovered demonstrates that the ore is classed as a Sulphide ore and the smelting charges at smelters are very low on this character of ore. In my opinion the ore body will greatly increase and get much larger and the ore get much richer as depth is gained. It will not require very much more development work to make this property class with the great copper-producing mines of Arizona.

From the present state of development, the property with fair management can be made to be self-sustaining and a source of revenue to its owners and in the near future pay good dividends.

Not only is the railroad in close proximity, but good wagon roads have been built over the property to all of the principal workings. The cost of hauling ore from the mine and to load on the cars is 50¢ per ton and the railroad freight rate is $3.00 per ton to the smelter.

This property has undoubtedly an exceptional advantage over most of the mines in shipping ore and getting mining sulphides, being so very close to the railroad and to the town of Kelvin.

The Bryan Claim No. 2 is a patented claim from the U. S. Land Office and the other 14 claims' title is held by doing the annual assessment work on the claims. The Group of Claims being adjoinin and contiguous to each other, the total amount of assessment work for the entire Group of Claims can all be done on one claim which will apply to all the claims.

The shaft on Bryan Claim No. 2 is equipped with a Davis Horse Whim , Mining Car and Black Smith Shop and mining tools, etc.

This group of mining claims is a very attractive group of copper mining claims and should attract the attention of capital as an investment for large return for money invested.

The Three mill-sites are located on the river front opposite the town of Kelvin and consist of five (5) acres each.

Respectfully submitted,

(Signed) H. C. Erman.

June 12th, 1906.

SHOEMAKER.

This property consists of twenty-two Copper bearing claims, situated one-fourth of a mile from a R. R. and town. It has nearly a mile of river frontage, carrying good values in gold, silver and lead. Lime and porphyry constitutes the country rock. A large Iron dyke or vein, from 4 to 30 feet intrudes from north to south, showing it to be a true fissure, passing from north-west to south-east.

No less than 600 feet of working can be seen on the different claims, On Eagle Ey's, large veins of lead show up with good values in silver. Iron King's, is principally copper with the prospects of opening up a large body of copper.

Copper King has good sulphides on surface, something not often seen in this District. Nob Hill is on the South East vein with 6% values at the grass roots. The deepest work is 65 feet, showing good vein in the bottom. This property shows no dead work, as ore still continues as far as work has been done.

With very little work this property can be put on a paying basis, as it is virtually on the same ore bodies as the Sultana-Arizona Co's property.

All claims in this group have more or less work done on them, and every claim has a vein of ore from two to thirty feet wide upon it. This is not a wildcat proposition, nor is it over-loaded in price. The property speaks for itself. It is in between two of the deepest workings on the south side of the river. The property can be opened either by shaft or tunnel. Thousands of tons of [illegible] conglomerate lays on the surface in Copper Canyon ready for shipment. Values of from 5% to 30% copper can be found on this property.

Respectfully submitted,

H. C. Erman

Mining Engineer.

REPORT OF WM. P. BLAKE ON THE BRYAN GROUP OF MINING CLAIMS, KELVIN, ARIZONA.

This group consists of nine full mining claims and three mill sites so located at Riverside, Pinal County, upon the left or south bank of the Gila River as to cover numerous outcrops and indications of copper-brewing deposits. The property was visited and examined by me in February, 1899. The names of these claims are, Hunters No. 1, Hunters No.2, Bryan No. 1, Bryan No. 2, Bryan No.3, Bryan No. 4, Bryan No. 5, Agnes and St. Karl. These are each 1500 by 600 feet. The mill-sites are known as W. J. Bryan No. 1, Mill site, the Hunters mill-site, and the Agnes mill-site. They are so located as to give good places on the bank of the river for furnace or other work. All these claims have been surveyed by A. J. Colton, United States deputy mineral surveyor, Florence, and their relative positions are shown upon a map made by him. This group is at Riverside, 32 miles east of Florence, and about 41 miles from Picacho, the nearest station on the Southern Pacific Railroad. It is believed that the parties now reopening the Ray mine, which is near this group, will soon open up a good roadway ffom Riverside to Picacho.

ROCK FORMATION.

The foundation rock of the group are granite with a few croppings of quartzite and of limestone, the whole being cut out or traversed by thick depths of plutonic rock, which may be called green-stone or diorite. There are two chief intrusions of this nature trending in an approximately east and west direction.

Copper ores are developed at and near to the contact of their greenstone dykes with the granite. These ores show

SUPPLEMENTARY REPORT ON THE

KELVIN SULTAN COPPER COMPANY PROPERTIES.

KELVIN, ARIZONA.

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Since the excellent report by George C.Clark,E.M., was made in 1908 a considerable amount of work has been done on the property then known as the Sultana-Arizona. Incidentally the property has changed hands and is now the property of the Kelvin Sultana Copper Company.

The principal development work has been done on the W.J.Bryan and W.J.Bryan No.2 claims, with a lesser amount on the W.J.Bryan No.3 claim. While a moderate amount of work has been done on other parts of the property in mining carbonate ores or in spasmodic attempts at development work, all such work has been so shallow and so scattered as to be of no value in connection with the future operations of the property. The accompanying plan shows the new work, that is considered of importance. The work will be described as nearly as possible in the order in which it was done. Everything done since August 1st, 1913 has been under the direction of the writer.

About 150-ft north of the south side-line of the Diamond Jo claim and near the west end-line a two compartment shaft was sunk to a depth of 175-ft in 1911 and 1912. Then a crosscut was started southward from the bottom of this shaft which cut the first vein some 175-ft from the shaft. No work was done on this, presumably because the vein showed only copper carbonates. The vein as intersected at this point has a width of one foot with a slight dip to the south and appears worthy of further exploration.

At a point 230-ft south of the Diamond Jo shaft a less pretentious stringer of unaltered copper sulphide ore was encountered, in a zone of intensely crushed diabase. A drift was started east on this. (No1. East on the plan.) When the granite was encountered the vein was lost. The drift was then turned southward to cut a vein outcropping on the ridge across from the mill. Water was met in excess of the capacity of the pumps so the drift was bulkheaded No drifting was done west of the main crosscut on this stringer. In the east drift no ore of consequence was developed, the stringer maintaining a width of less than a foot throughout.

The crosscut was then carried south for an additional 314-ft, where it intercepted a fault having a strike of S 26 E and a dip to the south. Later after the Westfall shaft had been raised through, a drift was run west for about 80-ft on the vein cut by the fault near the crosscut at Sta.321. This vein was known thereafter as No.1 vein. Subsequent development will be described later.

After the Westfall shaft of two hoisting compartments and a pump and ladder way had been raised through to the surface from a point still further south in the crosscut, the crosscut was continued southward and was then known as the 300-ft level. The actual distance from the station to the surface through the shaft is only 247 feet. When the crosscut reached the No.2 vein drifts were run east and west to the granite. These drifts were in about twenty feet each when the writer first came to the property.

West of the main crosscut at Sta.305 a raise of 174-ft was made to connect with the old workings tributary to the incline shaft No.2 in the Clark report. Later considerable stoping was done above these drifts on this vein. The ore above the east drift was the better grade and in larger amount that that above the west.

A 100-ft winze was sunk from the west drift on the No.2 vein.Only a small amount of work was done on the vein at the 400-ft level,not enough to determine anything as to the nature or extent of the vein at this level.

While drifting was in progress on the No.2 vein both east and west from the main crosscut on the 300-ft level the drift was pushed weston the No.1 vein to the granite.Except for a short distance either side of Sta.332 the drift opened no ore on this level that was of commercial importance.A winze was sunk from the 332 station on the centre of that good shoot.The winze was 100-ft deep.From the bottom a drift was opened up along the vein to the east which contained some very good ore as indicated by the samples Nos.2446 et seq.None of this ore was ever stoped but what was taken out in drifting was run through the mill.

Before the No.1 winze,mentioned above,was sunk,a drift was run east on the continuation of this same vein beyond the fault.While the hangingwall was very clear cut for the entire length of the drift there was never any indication of mineralization east of the fault,on this level.The amount of displacement by the fault is 48-ft measured horizontally in the plane of fault.

Early in 1914 the Westfall shaft was sunk an additional 283 feet giving a total depth of 530-ft.At a point 500-ft from the collar a new level was started.The crosscut north encountered the No.1 vein 137-ft from the station.The vein was too narrow to be of commercial importance where encountered.A drift was driven 168 feet west on the vein.At a point 130 feet from the crosscut a raise was made to the 400 level but no other work has been done on this vein or north of the shaft on the 500 level.

The main crosscut on the 500 level was run south to a point approximately 1400-ft from the station.Before the No.2 vein was cut two stringers were cut.The first was some 70-ft south of the station.It shows a foot of width but has never been prospected. On the surface this vein has yielded highgrade ore.The second,300-ft from the station dipped very flat to the south and carried clear chalcopyrite with no iron pyrite.It was about 6-inches wide.A drift was driven about 21-ft south and stopped.

The No.2 vein was cut about 485 feet from the station. this showed a foot of ore assaying 2.3% copper.About 150-ft of drifting was done to the east.None was done to the west.

A short distance beyond the No.2 vein a very flat vein was encountered.The mineralization was mainly iron pyrite yet it assayed 2% copper.A short drift of about 30-ft was driven east but nothing of importance was developed.

At a point 1386-ft from the station the No.3 vein was cut.This showed about two feet of ore low in copper.In the bottom of the No.3 incline shaft the ore was only six inches wide,so not much was expected at this depth.However,the vein is wider by a good margin though lower grade.

The crosscut was not carried south to the St.Karl vein as was originally planned. Though not able to boast of any great surface showing the St.Karl vein can be traced for a greater distance than any other on the property,and it shows a greater regularity throughout its entire course.Other veins further south on the adjoining property are strong too.

The development work on other parts of the property amounts to nothing worth mentioning.The western part of the land was entirely neglected except where the Mexican leasers gophered out large pockets of very rich carbonate ores,amounting to several carloads. No serious work was ever done by the present company on

the western part of the property.In the opinion of the writer this is very attractive ground especially the Silver Twig claims where there is a wide,strong quartz outcrop with an eight inch streak of lead-silver ore at a depth of 40-ft assaying 20 oz silver and 26% lead.This is very attractive ground.

It should also be noted that no work has been done on any vein in the granite-porphyry core of Sultana Mountain or in other areas of granite.The granite may not look attractive on the surface but it has some good characteristics underground.

Besides doing the development mentioned the company has spant a large amount of money in surface equipment. Some of it has been spent wisely,and unfortunately some of it very unwisely. On the Railway side of the Gila River is a complete steam-electric power plant having a 3 phase 60 cycle,2200 volt generator of 312 KVA capacity.All the mine and mill equipment is electrically operated. Within a short time this plant can be made a money-making proposition by selling power to neighboring mining companies who will soon be in the market for power.

An aerial tramway,electrically operated,spans the river and loads ore or concentrates at the rate of 8 tons an hour.

At the Westfall shaft is a complete blacksmith shop,assay outfit etc properly housed. There is also a Supt's.,office.The haft is equipped with a double drum electric hoist driven by a 75HP motor at a rope speed of 360-ft per minute.The drums are 48-in in diameter with a 30-in face.The hoist is designed for a maximum rope pull of 6900-lbs and a duty of 1000 tons in 20 hours with skips.

The air compressor,also driven by a 75HP motor is Ingersoll Rand,Imperial Type 10 delivering 327 feet of air at 125-lbs pressure at 2000-ft elevation.

The rest of the mine equipment consists of cages,mine cars, auxiliary hoists both steam and electric,trucks,piston drills with full mountings,stoping drills,plugger drills etc.The property is unusually well equipped and all the equipment is in excellent shape.

In 1914 the company built a concentrating plant of 250 tons daily capacity.The plant has been run only about six months so everything is in good condition.The plant was well built and all the equipment has had excellent care.Everything is modern and new.

The attached blueprints show the property,the principal workings and the assays on record. Samples were taken with great care by an experienced sampler,with moils and hammers.Assays were made in duplicate to check within .20%.

The following is the production for the last 6 months of the year 1915.

	Concentrates.	Crude Ore.
Wet weight,	610960 lbs	382660 lbs
Moisture av,	8.66%	3.52%
Av.Copper	8.15%	13.29%
Av.Silver	2.02 oz	1.65 Oz
Toal copper	43790.26 lbs	40650.84 lbs
Tot.Silver	538.77 oz	296.49 Oz

In 1916 work has been spasmodic and there has been almost no production.

Kelvin,Arizona.
October 25,1916.

A.L. Flagg