



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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05/20/91

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: PHOENIX

ALTERNATE NAMES:

WESTSIDE PAT. CLAIM
CAVE CREEK GOLD MINE

MARICOPA COUNTY MILS NUMBER: 550

LOCATION: TOWNSHIP 6 N RANGE 4 E SECTION 9 QUARTER NW
LATITUDE: N 33DEG 53MIN 02SEC LONGITUDE: W 111DEG 57MIN 06SEC
TOPO MAP NAME: NEW RIVER MESA - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

GOLD LODE
SILVER
LEAD SULFIDE
VANADIUM
IRON SULFIDE

BIBLIOGRAPHY:

FLAGG A VANADIUM REPORT BOOK V
ALLEN M & BUTLER G AZBM BULL 115 P 13
ADMMR PHOENIX FILE
ELSING M & HEINEMAN R AZBM BULL 140 P 94
ADMMR "U" FILE



Looking west toward the Phoenix dumps and surrounding area. April 1982

A-152-1

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



July 30, 1970

Please make one copy each of the report & newspaper clipping on
the Cave Creek mine for Warren Holst, 1826 N. 12th Street, Phoenix.
He will pay for them C.O.D. if you will send them out when finished.
Please return the originals to this office.

Adm. Assistant
258-6681

*This man says
he owned the mine
now.*

C
O
P
Y

CURRENT MINERAL PROPERTIES (con't)

On June 14, 1988 Lectus announced the signing of an agreement with Ryan Exploration Co. Ltd. ("Ryan") a 100% owned subsidiary of U.S. Borax & Chemical Co. Ltd. which is itself a wholly owned subsidiary of Rio Tinto Zinc Corp PLC ("RTZ") of Great Britain. Ryan holds options on claims adjacent to the Lectus property in the Nelson area (Star Property). The agreement is on the Star Property and Lectus' Gold Eagle #3 claim, on which no work has been done to date, over 2 kilometres west of the Great Western Property on which Lectus has been working for 2 years with the results reported on above. Ryan has worked on their Star Property for the past 5 years and has had the following drill hole assay results. The potential of this property is a large tonnage low grade deposit in the order of 5,000,000+ tons grading 0.10 OPT Au. Trenching and drilling are in progress at this time.

The Company has acquired an option to earn a 50% interest in a 55 claim property in Dieppe Township, Quebec, in the Casa Berardi Gold camp. It is positioned strategically adjacent to the massive Inco Golden Knight deposit where reserves in excess of 11 million tons have been proven grading .22 OPT Au. and \$75.9 million is being spent to put the property into production. A drilling program was completed last fall and results just evaluated by Nelson Baker, P. Eng. who recommends further exploration work to explore the polymetallic potential.

The Company has an option on a small but potentially profitable gold property near Phoenix, Arizona. In the last century, the property was a high-grade gold mine and then was explored in 1980 by American Selco, who reported the ore body has 400,000 tons of 0.06 oz/ton heap leachable ore. A recent drilling program now indicates that there are at least 700,000 tons of 0.05 OPT Au leachable ore probable plus possible additional tonnage of 500,000 grading 0.05 OPT Au. This can be set into production within 120 days at a cost of \$600,000 US, with cash flow commencing 90 days thereafter.

Lectus has a 2% interest in a natural gas well to be drilled in the Arkoma Basin of Oklahoma known as the Goforth #1. The Company also has acquired approximately 462.5 acres of proven gas leases in the Arkoma Basin. This acreage is committed to a Joint Venture, with industry partners providing drilling funds for a tax write-off and a share of production income. The first well of the Joint Venture is scheduled to be drilled in August 1988. The expected revenue from the Goforth #1 and the joint venture gas wells is a minimum of \$115,000 per annum based on \$1.50 MCF natural gas.

FINANCING

The Company has "Flow Through" financing agreements in place for 1988 with the First Exploration Fund for \$1 million, at a price to be set by a 30 day average, and a further \$250,000 with the CMP Funds Management Ltd. at a share price of \$0.68 per share.

GENERAL

The Company has received its 12(g) exemption for the Securities Exchange Commission, Washington, DC - File #82-1364, is listed in the Moody's Investor service and Standard and Poor's. The Company has blue sky clearance in California, File #OP-5979 and is Pink Sheeted. The Company will apply for NASDAQ after the July 31, 1988 annual statement is completed.

For additional information call:

LECTUS DEVELOPMENTS LTD.

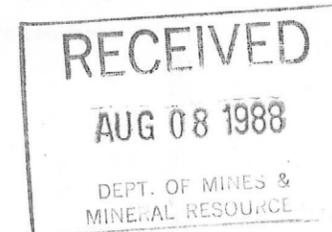
530 - 355 Burrard Street
Vancouver, B.C. Canada V6C 2G8
(604) 687-5257

Attn: Mr. Joe Clarland
Vice President, Public Relations



CORPORATE UPDATE LECTUS DEVELOPMENTS LTD.

SYMBOL LDV



JUNE 22, 1988

CAPSULE

Lectus is a Vancouver Based natural resource company with mineral properties in British Columbia, the Casa Berardi area of Quebec, and Cave Creek, Arizona as well as natural gas interests in the Arkoma Basin of Oklahoma which will produce significant cash flow within one year. The Company has agreements for \$1.25 million dollars in "Flow-Through Share" financings for 1988; \$250,000 at a share price of \$0.68 per share with CMP Funds Management Ltd. and a further \$1 million dollars with the First Exploration Fund at a share price to be set by a 30 day average.

INDUSTRY

Natural gas and mineral properties.

MARKET SPONSORS

Canarim Securities Ltd., Vancouver; Yorkton Securities Inc., Vancouver; McDermid St. Lawrence, Vancouver; Georgia Pacific, Vancouver, U.S. and Foreign Communication Inc., New York

SHARES ISSUED

6,160,988 of which 1.5 million are subjected to various controls

INSIDERS (and Control persons)

3.07 million.

FISCAL YEAR END

July 31.

TRADING

Came to trade April 1986 at \$0.50; High \$1.60, Low \$0.39. In 1987, average daily trading was 38,400 shares with a high of 101,300 per day in August and a low of 9,900 per day in July. Recent trading level \$0.39/\$0.50.

CASH

ON DEPOSIT: \$25,000

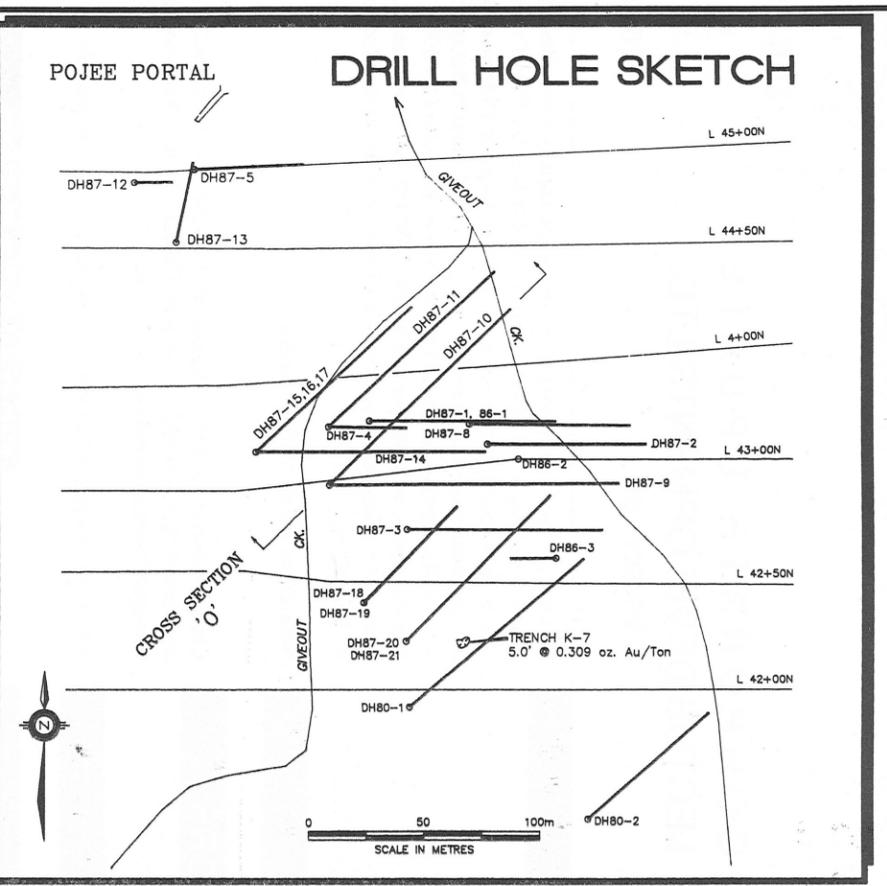
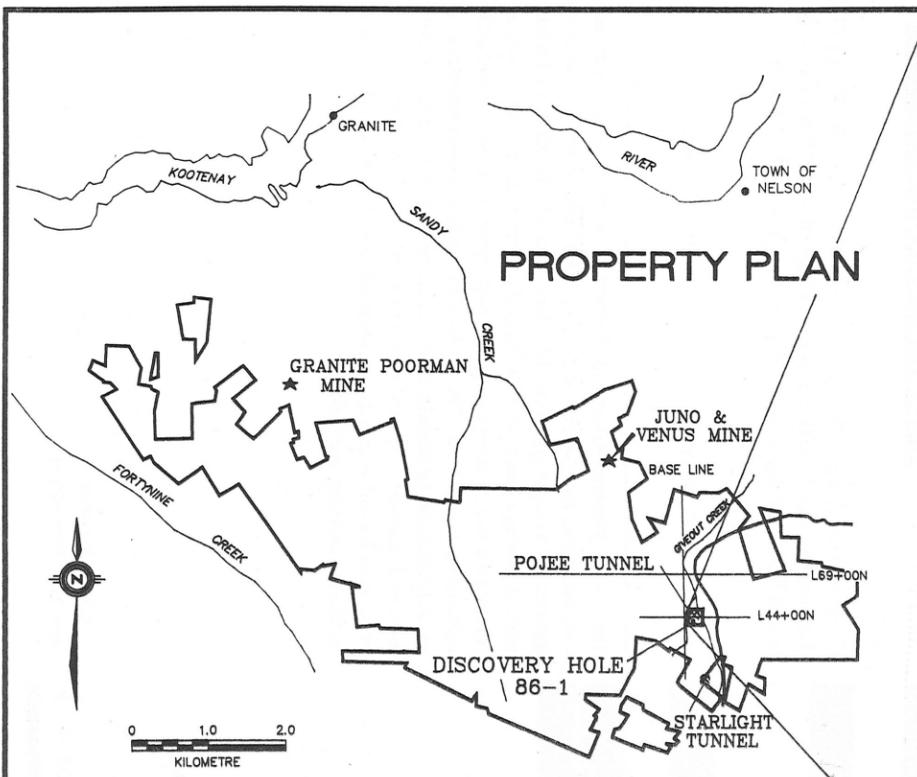
DEBT: None

CURRENT MINERAL PROPERTIES



The Great Western Group of Properties is located in southeastern British Columbia and has the potential to prove up ore in 1988. The discovery hole intersected a major gold vein 14.3 feet deep which extends a further 16.21 feet with an average grade of 0.182 oz/ton and includes a 0.86 oz/ton over 2.3 feet. A later hole has an intersection of 0.148 oz/ton gold over 38 feet including 1.715 oz/ton gold over 2.8 feet. The exploration work presently underway will improve the definition of the boundaries of the ore body with the intent of computing drill indicated reserves. Several high grade intersections of mineable widths have been encountered. A trenching program has just been completed, further drilling and bulk sampling are planned.

Great Western
and Star Properties



HIGH GRADE ASSAY RESULTS

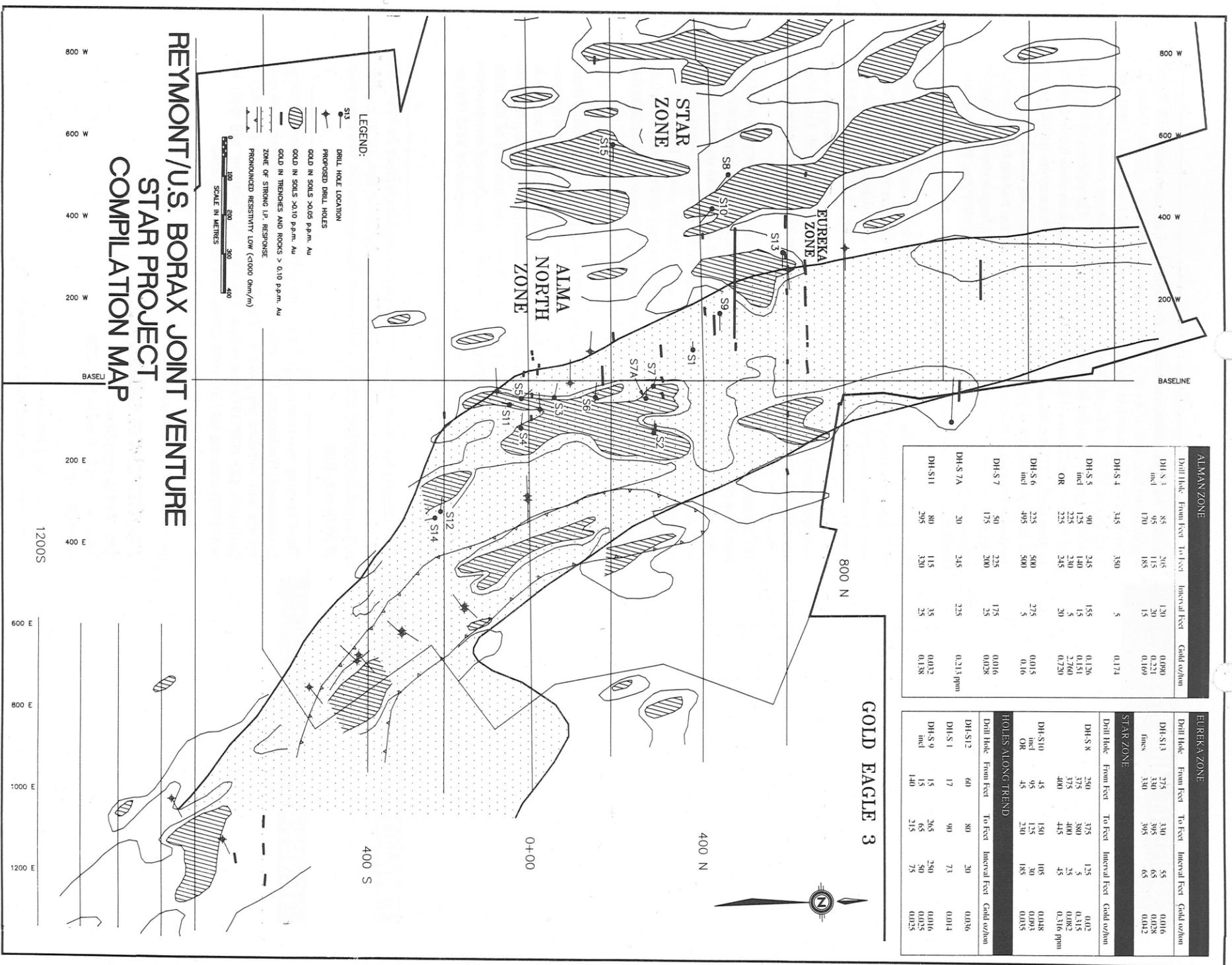
WITHIN THE TYPE A HIGHER GRADE ZONES, MINEABLE WIDTHS OF HIGH GRADE HAVE BEEN ENCOUNTERED:

DH. No.	WIDTH IN FEET	oz/ton GOLD	DH. No.	WIDTH IN FEET	oz/ton GOLD
DH86-1	5.6	0.469	DH87-4	0.3	0.650
	1.7	0.248	DH87-6	0.2	0.594
DH87-1	0.6	0.364	DH87-9	1.9	1.154
	6.7	0.300	DH87-10	6.2	0.730
DH87-3	1.3	0.224			
	3.5	0.142			
	2.0	0.577			
	2.8	1.715			
	1.0	0.523			
	0.7	0.238			
	0.5	0.214			
	1.2	0.426			
	1.0	0.206			

THESE GOLD GRADES CONFIRM THE POTENTIAL OF A HIGH GRADE DEPOSIT.

LECTUS DEVELOPMENTS LTD. GREAT WESTERN PROJECT DRILLING RESULTS

FEBRUARY, 1988
Prepared By RWR MINERAL GRAPHICS LTD.



ALMAMAZON

Drill Hole	From Feet	To Feet	Interval Feet	Gold oz/ton
DH-S-1	85	205	120	0.090
incl	95	115	20	0.221
	170	185	15	0.169
DH-S-4	345	380	5	0.174
DH-S-5	90	245	155	0.136
incl	125	140	15	0.151
OR	225	230	5	2.760
	225	245	20	0.720
DH-S-6	225	500	275	0.015
incl	485	500	15	0.16
DH-S-7	175	225	175	0.016
	175	200	25	0.028
DH-S-7A	20	245	225	0.213 ppm
DH-S-11	80	115	35	0.032
	295	320	25	0.138

EUREKA ZONE

Drill Hole	From Feet	To Feet	Interval Feet	Gold oz/ton
DH-S-13	275	320	45	0.016
incl	330	395	65	0.028
	330	395	65	0.042

STAR ZONE

Drill Hole	From Feet	To Feet	Interval Feet	Gold oz/ton
DH-S-8	380	375	125	0.03
incl	375	400	25	0.15
	400	445	45	0.082
DH-S-10	45	150	105	0.316 ppm
incl	95	125	30	0.048
OR	45	200	155	0.093
	45	200	155	0.055

HILES ALONG TRENCH

Drill Hole	From Feet	To Feet	Interval Feet	Gold oz/ton
DH-S-12	60	80	20	0.036
DH-S-1	17	90	73	0.014
DH-S-9	15	265	250	0.016
incl	15	65	50	0.025
	140	215	75	0.025

CAVE CREEK GOLD MINE

MARICOPA COUNTY

RRB WR 2/27/87: Sally Dix of the Bureau of Land Management called for information on the Maricopa and Phoenix Mines. She is working on a land exchange in the area. I gave her the information that she asked for over the phone and invited her to come examine the files herself.

NJN WR 1/16/87: The watchman at the Cave Creek Mine (file) Maricopa County did not let us into the property but reported that there is no current leaching activity there. From the watchman's quarters and the road the leach facilities including heaps, carbon columns, etc could be seen in place.

MG WR 7/31/87: Provided file information on the Phoenix Mine (Maricopa County) to Mr. Wilson McCurry (c). He reports that Roddy Resources (c) is planning to drill there soon.

NJN WR 10/30/87: Ernie Black reported that Norm Foster representing a group of owners of the Cave Creek Gold Mine (file) Maricopa County has leased the property to Keld 'Or Resources Inc (card). They have just finished a 15 hole drill program on the property. Exploration activity at the property had been held up by negotiations between the mine owners and the Spur Cross Ranch which wanted to buy the property to develop.

RRB WR 12/18/87: James T. Keller II, 1409 Allison #27, Lakewood, CO 80215 (303) 233-7969 (President of Clear Creek County Metal Mining Association, P O Box 403, Idaho Springs, CO 80452) reports that he has a contract from Lectus Development Ltd. of Vancouver, BC to do the mining at the Cave creek Gold Mine (file) Maricopa county. I gave him a copy of Pertinent Facts and discussed problems of mining near metropolitan Phoenix.

CAVE CREEK GOLD MINE

MARICOPA COUNTY

KAP WR 12/21/84: Momentarily stopped by the Add West operation at the Phoenix Mine (Cave Creek Gold Mine - file), Maricopa County. The operation is idle. The camp is apparently being used as there were four travel trailers and associated camp equipment being used, but no one was around. There has been no change in the mine site since my previous visit.

KAP WR 4/5/85: Chris Lieurance reported he and Jerry Dillard are reopening the Phoenix Mine (Cave Creek Gold Mine - file) Cave Creek District, Maricopa County. This is the same property which was operated by Add West as a cyanide heap leaching project. The new operating company will be Carefree Mining Corporation. Jerry Dillard was the engineer for Add West at the operation.

KAP WR 11/8/85: Jerry Dillard dropped in briefly to look for more information on the Phoenix Mine (Cave Creek Gold Mine -file) Maricopa County. He stated they are still running the cyanide leaching operation.

KAP WR 1/3/86: Provided information on the Phoenix Mine (Cave Creek Gold Mine-file) in the Cave Creek District, Maricopa County to Bill Fuchs of Whitney and Whitney Consulting Engineers in Reno. He has been retained by an investor in the current operation to evaluate his investment.

NJN WR 6/20/86: Ernie Black (c) visited from Colorado and reported that he is still trying to get a group interested in the Cave Creek Gold Mine (f) Maricopa County.

NJN WR 10/24/86: A caller reported that there is surface mining activity at the Cave creek Gold mIne (file) Maricopa County.

CAVE CREEK GOLD MINE

MARI COPA

Nov. 18, 1968 6631 E. Horseshoe Dr.

B. C. Lumbert, 55 E. Monterey, Phoenix, Arizona, visited office said he was with International Robot Co. and that King Midas was one of their companies, was interested in Cave Creek Gold mine, Maricopa Co.

Friday, June 1 - Accompanied Mr. Lumbert to his Maricopa and Phoenix Au properties north of Cave Creek. Here the schist is intruded by rhyolite and andesite dikes that strike about $N40^{\circ}-50^{\circ}E$ in places they are sheared by $N75^{\circ}W$ faults of no great displacement. It is at the shears where the ore occurs in highly silicified zones. On the north side of the ridge and about 25 feet above Cave Creek and adit trends $S30^{\circ}E$ for a reported 600 feet. At about 200 feet from the portal, a cross-cut to the east intersects a stope 8-20 feet wide by 60 feet long by 50-60 feet high and probably 60 feet deep (below the adit level). About 30 feet NE of this stope is another of comparable size but only about 20 feet below the level. Part of this stope connects with one of 4 shallow shafts. On the surface none of the shafts appear to be more than 50 feet deep. However, they are all clustered within about 40 feet horizontally and are near the top of the ridge.

The Phoenix mine is about $3/4$ mile NE of the Maricopa and consists of 2 patented claims. Here two parallel open stopes about 150 feet long and from 10-30 feet deep by 8-25 feet wide, are sloughed or otherwise inaccessible. These trend about $N30^{\circ}E$ and dip W at 75° ; they are 50-75 feet apart and are in a rock too altered for positive identification. However, slightly north of the west one, tuff crops out which Mr. Lumbert stated ran \$14.00 per ton at \$35.00 Au. This tuff has been tunneled in various northerly directions for several hundred feet. GW WR 6/1/73

Bernie Lumbert called to say he wants to sell both the Maricopa and the Phoenix gold properties north of Cave Creek. GW WR 1/22/75

PAY DIRT for February 24, 1975

American Selco Inc. geologist John Procheu called regarding the whereabouts of Bernie Lumbert saying his company is interested in the Maricopa and Phoenix mines NW of Cave Creek. Mr. Lumbert was contacted at his office and told of the company's interest. GW WR 5/6/75

July 23, 1975

Do Not Reproduce

To: John H. Jett, Director
From: Ken A. Phillips
Subject: Weekly report for week ending July 18, 1975

Monday, July 14 - Office details

Tuesday, July 15 - Completed Tap 'Er Light. Dave Muller, 279-3787, with the local Phoenix group of the Gold Prospectors Association of America requested a program for their August 15, 1975, meeting on gold mining history and gold deposits which was scheduled. Received a call requesting ownership status of the Phoenix and Maricopa mines in the Cave Creek District. Data on the Phoenix mine is contained in the Cave Creek Gold Mine file. The properties generally referred to as the Phoenix and Maricopa mines are two separate properties. The Phoenix mine is located in the NE $\frac{1}{4}$, NW $\frac{1}{4}$ and NW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 9, T6N, R4E, and consists of two patented claims, the Phoenix and the Westside and two patented mill sites owned by Betty Pickering, 6631 E. Horse Shoe Lane, Scottsdale, 85253, 948-6994 or 949-9413 (office) and Warren Holst per a conversation with Mrs. Pickering. They had at one time leased with an option to purchase the property to Bernie Lumbert. About 18 months ago a group allegedly associated with the Maricopa County Sheriff's Dept. on permission from Lumbert as supposed legal owner filled in a shaft on the Phoenix-Westside property with old tires and other rubble prior to blasting the opening shut as a safety measure. Lumbert referred to the location of the shaft as his Katherine Claim. American Selco (often referred to as just Selco) has expressed some interest in the Phoenix and Westside property, but the owners are presently allowing anyone interested to study the property and have not yet signed any agreements. The Maricopa mine property is located in the (SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 8, T6N, R4E.) The property is private ground, according to the BLM, owned by Rubenstein Construction et al, as per Maricopa County Assessor's office and was acquired by them through a land exchange. Prior to the exchange there was a Mineral Survey #4504 on the property according to the BLM, however, Betty Pickering understands that Bernie Lumbert has staked many claims on the property.

KP/WR 4/4/79 - Visited the location of the Phoenix Mine, Cave Creek Dist., Maricopa Co. The property remains idle with shafts and adits continuing to cave. 5/22/79 a.p.

GM WR 6/20/79 - Ms. Pickering, owner of the Phoenix Gold Mine (Cave Creek Gold Mine file) called. She wanted info on a lease agreement. I suggested she contact a lawyer. She told me that American Selco Inc. conducted an extensive exploration project on her patented property. According to her, they blocked out 500,000 to 700,000 tons of .006 Au ore. However, Selco did not exercise their option to purchase the property because they felt the deposit was too small. Ms. Pickering said she would bring Selco info. down and place the data in our file. Ms. Pickering is now negotiating with a company named Min. Ex. Services. 7/10/79 a.p.

Do Not Reproduce

KP/WR 11/5/79 - A report was received that considerable sampling has taken place on surface exposures at the Phoenix Mine, Cave Creek District, Mar. Co.

KAP WR 12/26/80: A visit was made to the Phoenix Mine in Cave Creek District, Maricopa County. From indications on the ground, it appears that American Selco have completed their first state of exploration drilling on the property. A firm, British Petroleum, is reported to have purchased a portion of the land position.

KAP WR 3/23/84: Met with Jerry Dillard, metallurgist and plant manager for Add West Limited. Add West is under the direction of Tim Atkinson which is operating a cyanide heap leach operation at the Phoenix Mine - Cave Creek Gold Mine, Maricopa County. At the Phoenix mine they are mining a 150,000 ton reserve which was partially proven by Amselco. The operation consists of open cut mining, screening, agglomerating the fines and heap leaching. Recovery is by carbon absorption. The operation is described in more detail in the file.

KAP WR 8/24/84: A Mr. Baker, an attorney for a client, reported his client had supplied the \$600,000 to Tim Atkinson for the Add West cyanide heap leach operation at the Phoenix Mine - Cave Creek Gold Mine (file) Maricopa County. Mr. Baker explained that his client has not received any return on his money and that he is being asked to invest more money to construct another pad and heap at the property. Mr. Baker, his client and their accountant plan to visit the property within the week. They want to hire a consulting engineer and an assayer to evaluate the past and proposed additional operation.

KAP WR 9/21/84: A visit was made to the Add West cyanide heap leach operation at the Phoenix Mine, Cave Creek District, Maricopa County (Cave Creek Gold Mine - file). Current operating status was discussed with an investor-employee who was monitoring the carbon adsorption plant. Leach solution is sprayed on the heap at night only to reduce losses to evaporation. Mining ceased after the first ore heap was constructed. The primary investor won't supply money for the second heap and reportedly fails to understand that the proceeds from his investment and all the gold from the first heap went to pay start up costs. The whole operation is currently on a wind down basis. The mining equipment has all been moved off as has the crusher, screens and conveyors. There are still 3-5 employees at the property. It was reported that dozer cuts made in constructing a new pad base cut some 0.25 tr. oz Au/ton ore. A recent State Mine Inspector's repair order was to patch holes in the plastic liner under the carbon adsorption plant.

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DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA
FIELD ENGINEERS REPORT

Cave Creek Gold Mine

Mine ~~Phoenix Mine~~

Date April 25, 1962

District Cave Creek District, Maricopa Co.

Engineer Lewis A. Smith

Subject: Conference with Howard Gentry, Box 12, Black Canyon Rt. (Rockhound Center) and summary of previous file information.

Location: NW $\frac{1}{4}$ S 9, T. 6 N., R. 4 E.

Property: 2 patented lode claims
2 " millsite claims

Owner: Howard Gentry

Minerals: Gold and minor silver and lead.

Work: (1) 308 foot shaft with 3 levels (main levels 100, 200 and 300 feet).

(2) Several short shafts (Channel 60 feet deep (1910) Stokes, 115 feet (1901) and lesser ones).

(3) 100 foot well with 1800 feet of tunnel in volcanic tuff at 60 feet below collar. This developed 300 to 500 gallons of water per minute, the major flow being near the well. The tunnel is now partly blocked by detritus near the well. The well was cleaned out a few years ago.

(4) On the 300 foot level there are two main crosscuts to the northwest and northeast, the former being 330 feet long and the later being 793 feet long.

(5) The main tunnel is 1125 feet long and was begun in the 1870's. (1995 feet of drifts) Meshackerty tunnel (length not shown).

Thomas tunnel (190 feet long, 59 ft. above main tunnel).

South tunnel, 97 feet long (1890's)

Alley tunnel, about 100 feet long (1894).

(6) Stopes: 1. East side south tunnel: -

N to S: Bishop, Cassin, Kinread, Channel and Back.

2. West side south tunnel:

N to S: Fleming, Frank, Deboe, Adobe Hole, Catacombs.

Of these the Deboe stope yielded 2000 (up to 1912); the Adobe Hole, 10,000 tons, and the Frank, 3000 tons. The ore ranged from a few dollars up to \$40.00 per ton in gold (according to Gentry).

The production 1882 to 1912 was estimated at \$300,000, obtained from about 60,000 tons of ore, indicating an average grade of about \$5.00 per ton. Gentry stated that the early day ore ran much higher and pockets yielded high grade ore up to \$2000 per ton, but these occurrences were of minor consequence.

Previously there was an 100 ton stamp mill (3000 pound stamps) which burned about 1913. This mill used a combination of pan-amalgamation and cyanidation.

Geology: The ore zone lies in a brecciated zone 1500 feet long and up to 500 feet wide but most of the pay dirt was within a width of 100 feet. The brecciated material consists of quartz, diorite, and quartz porphyry. The fragments are cemented by a siliceous matrix and they are severely altered both by hypogene and supergene solutions. According to various observers the brecciated area is associated with a flat fault. This brecciated zone lies in a basin which is composed of diorite intruded by the quartz porphyry and invaded by siliceous solutions which produced considerable quartz as veins and impregnations. The principal values are in gold, apparently associated with iron minerals. Less important lead mineralization, according to Gentry, occurs in kidneys and bunches of galena, anglesite, cerussite and vanadinite. Gentry thinks

Phoenix Mine (continued)

the lead is somewhat later than the pyrite-gold and didn't consider it of much economic importance. The gold values are associated with quartz and silicified quartz porphyry.

Kirby Thomas, consulting engineer (1912) estimated the reserves to a depth of 50-100 feet as follows:

		<u>Gold @ \$ 20.00</u>	<u>Gold @ \$35.00</u> ^{1/}
Block A (Phoenix Cl.)	280,000 tons	\$ 3.00	\$ 5.25
" B "	130,000 "	2.65	4.65
" C "	200,000 "	2.75	4.81
" D (Westside Cl.)	700,000 "	3.00	5.25
	1,310,000 "	2.93	5.14

^{1/} Calculated by Lewis Smith.

Thomas estimated the cost of mining and milling at \$1.732 per ton and miscellaneous costs at \$0.24 to \$0.35 per ton. This would, according to his figures, yield a profit of \$0.93 per ton of \$3.00 ore and \$0.53 per ton of \$2.50 ore. Milling cost was figured at \$1.175 and mining costs at \$0.56 per ton. Labor cost ranged from \$2.50 to \$3.50 per 8 hour day.

The future of the property appears to depend upon a notable rise in the gold price.

Simplified map of Canadian Pawnee's Lexington property.

Catch zone were:

88-8	9.84	0.042	0.304
	3.28	0.176	0.446

Main Zone alone. These reserves are within a 394-foot area known to have a minimum of 1,476 feet in strike length. Canadian

British Columbia properties. *World Investment News* will have a report in the next issue.

Lectus Developments / U.S. Borax plan program

Lectus Developments Ltd. (VSE-LDV) is gearing up for a summer exploration program on its Great Western gold project near Nelson in southeast British Columbia. Depending on weather, work is expected to begin the first week of June.

This summer's work is following up on last year's encouraging geochemical, geophysical, and drilling programs that included identifying an extensive gold anomaly associated in places with silver and copper. Twelve of 15 reverse circulation holes on the Star property encountered mineralized sections of sufficient grade and width to be of economic interest.

Part of the Great Western project includes an agreement with Ryan Exploration Co. Ltd., a 100%-owned subsidiary of U.S. Borax & Chemical Corp. The companies will each spend C\$400,000 on each other's adjacent ground over a three year period to earn a 50% interest. The work on Ryan claims, known as the Star property, will be funded through a private company, Reymont Resources Ltd., as will Lectus' Gold Eagle #3 claims. Reymont has agreed to fund the project to the feasibility stage, and upon completion, Lectus has 60 days in which to back into the joint venture. This method of funding was necessary as the large IP anomaly, some 6,000 feet by 600 feet, straddles the border between the Star and Gold Eagle No. 3 ground. Other portions of the Great Western project are optioned to various interests.

In total, three northerly-trending structures have been recognized; the Alma N, the Star, and the Eureka. This season's

program includes reconnaissance drilling on the Eureka with detailed diamond and reverse drilling on the Alma N. Zone. If results are encouraging, the companies would consider an underground development program for the Alma N.

The Alma N. has the potential for an open-pit, bulk tonnage operation. In addition, this area will see more IP geophysical survey work plus trenching and sampling. Earlier drilling on the Alma N. Zone intersected 20.0 feet grading 0.219 ounces of gold per ton including a 5.0-foot section

grading 0.517 ounce of gold per ton in Hole #3. One hundred and fifty feet south of Hole #3, Hole #5 intersected 155.0 feet averaging 0.126 ounces of gold per ton (uncut). There were numerous other encouraging holes in this area.

The far western portion of Ryan's Star ground will see a work program that will include IP and geochemical surveys, trenching and sampling.

The Eureka Zone is known to have produced 10,000 tons of copper/gold/silver ore in the early 1900s. Hole #13 of the

recent drilling, located 150 feet from the old workings, averaged 0.0278 ounces of gold per ton, 0.15 ounces of silver per ton, and 0.165% copper over 65.0 feet.

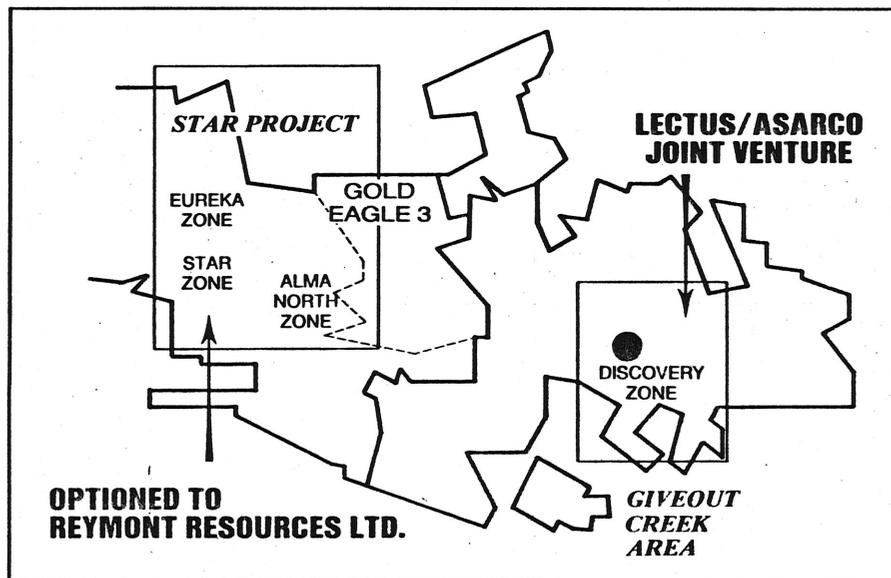
On the Star Zone, where two holes, #8 and #10, cross-sectioned a fairly large geochemical anomaly, an intersection of 105.0 feet grading 0.048 ounces of gold per ton was returned.

To the east of the Star property, Lectus is involved with Asarco Exploration in a joint venture on the Giveout Creek area. Specifically, the Discovery Zone on this claim group will be the focus of a program to include trenching, sampling, and detailed mapping to be followed by IP and geochemical surveys and drilling.

Lectus has recently added adjacent ground north and south of its claim group where preliminary exploration work will be conducted.

The company also has a 24.5% interest in the Cave Creek gold property at Carefree, Arizona. Lectus and its joint venture operators, Baden Exploration Ltd. and Keld'or Resources Inc., have completed a Phase I exploration program. The joint venture partners have begun Phase II that includes a pre-feasibility study with the intent to place the property into production this summer as an open-pit, heap leach operation at a production rate of 1,000 ounces of gold per month.

Reserves stand at 400,000 tons grading 0.060 ounces of gold per ton. Currently, negotiations are in progress with groups to supply a gold loan that will fund the development and working capital requirements.



Map depicts areas under investigation as part of Lectus Developments' Great Western Project near Nelson in southeast British Columbia.

Cave Creek ~~gold~~ (f) 17
mine

ORDER REFORM - SEE BACK COVER

CAVE CREEK CO (P)

11/15/88

LD LECTUS DEVELOPMENTS LTD.

530 - 355 Burrard Street
Vancouver, B.C. V6C 2G8
Tel. (604) 687-5257
Fax. (604) 687-0913

August 5, 1988

Dear Sirs:

Pursuant to your inquiry for information following our advertisement in the World Investment News publication please find enclosed the Executive Summaries written on our properties of merit and Lectus' Corporate Update.

I trust that you will find the enclosed information to be of great interest and will inspire the investor confidence that enables you to purchase shares in our company.

Should you have any questions or require any additional information, please do not hesitate to contact our offices.

Thank you for your interest in Lectus.

Yours truly,

LECTUS DEVELOPMENTS LTD.



per:
Joe A. Charland
Vice President, Public Relations

0772pr02.jac

Enclosures

RECEIVED
AUG 08 1988
DEPT. OF MINES &
MINERAL RESOURCES

ARIZONA DEPARTMENT OF MINERAL RESOURCES

GOLD AND SILVER
CYANIDE LEACHING CHECKLIST
(With Example)

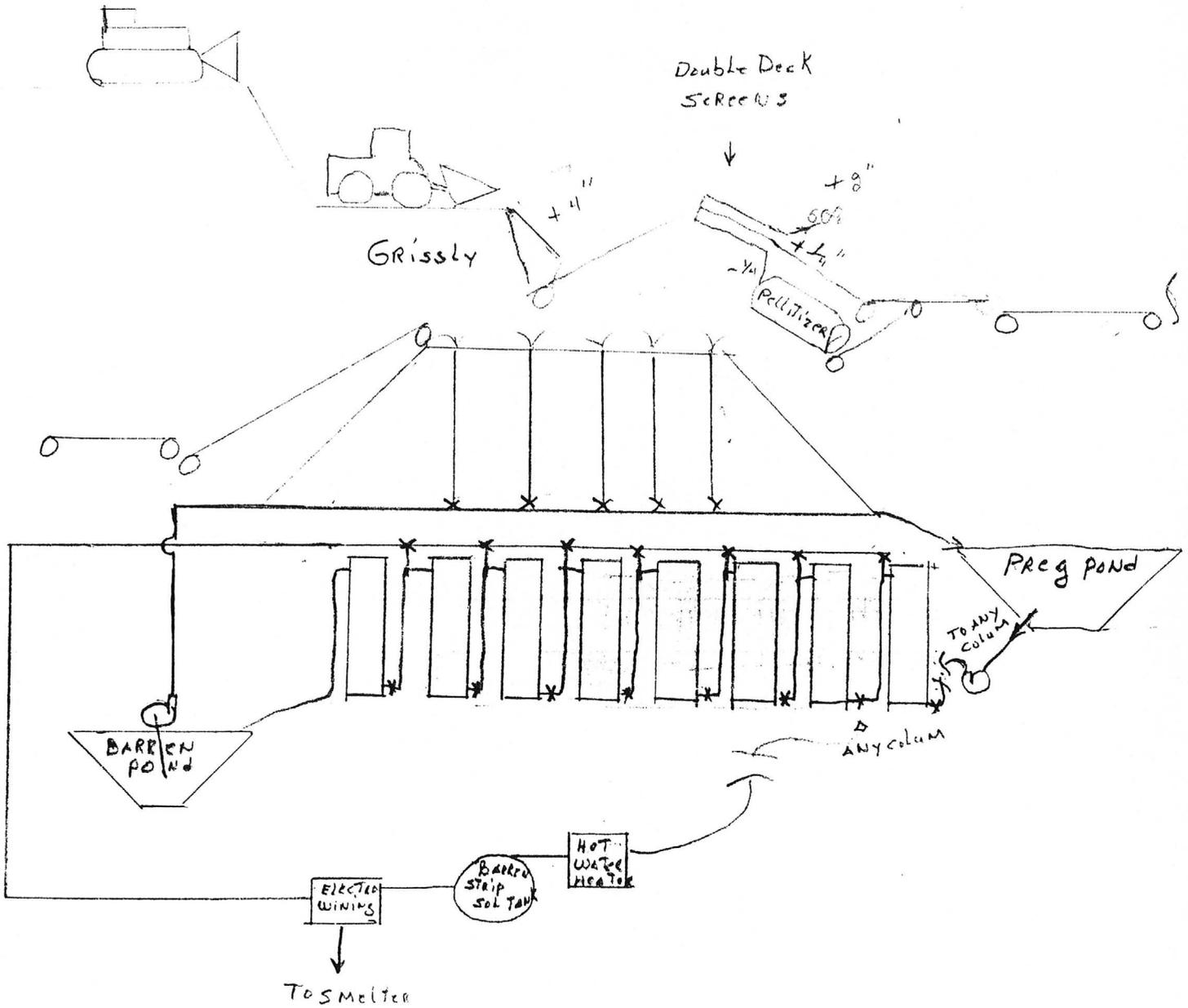
MARICOPA Co.

<u>PARAMETER</u>	<u>EXAMPLE</u>	<u>YOUR MINE</u>
<u>TYPE & LOCATION</u>		
Mining District	Gold Mountain	Cave Creek
Company	Apex Auro Inc.	Add West Inc.
Mine Name	Apex	Phoenix
Projected Startup Date	November 1981	March 16, 1984
Type of Operation	Open Pit	Open pit
Size of Operation	200 tpd	800 - 1000 fpd
Extraction Method	Heap Leach	Heap Leach
<u>ORE CHARACTERISTICS</u>		
Host Rock	Quartz in Rhyolite	Ancient Hot spring-Qtz. iron
Mineralization	Gold - Silver	Gold-Silver
Grade	0.07 Au, 1.7 Ag	.05 Au+ .025 Ag
Associated Minerals		
<u>HEAP CHARACTERISTICS</u>		
Size	10,000 Tons	30,000 tons
Area	100' X 40'	150' x 300'
Height	6'	30'
Ore Preparation	Crushing	Crushing & agglomeration
Material Size	Minus 2"	Minus 2"
<u>INFLUENT SOLUTION</u>		
Water Source	Drilled Well	Cistern above Cave Creek
Cyanide Concentration	1#/ton	2# NaCN/ton
ph	10-11	10.5 - 11.8
Alkaline Control	CaO	CaO + NaOH
Alkalinity Strength	1#/ton	
Application Method	"Bagdad" wiglers	Wobblers
Flow Rate	40 gal/min	5.5 gal/sq. ft/ 24 hours

CAVE CREEK GOLD MINE (file) MARICOPA Co.

Gold and Silver
Cyanide Leaching Checklist (With Example)

<u>PARAMETER</u>	<u>EXAMPLE</u>	<u>YOUR MINE</u>
<u>INFLUENT SOLUTION (Cont'd)</u>		
Application Rate		5.5 gal/sq.ft/24 hrs.
Application Interval	Continuous	Continuous
Leach Cycle	35 Days	
Wash Cycle	7 Days	
<u>EFFLUENT SOLUTION</u>		
Pregnant Solution Grade	0.07 - 0.43 oz/ton	
Solution Loss	Approx. 15%	
Cyanide Consumption		
Alkalinity Consumption (NaOH and/or CaO)		
<u>RECOVERY</u>		
Recovery Technique	Carbon Adsorption	Carbon adsorption
Zinc Activity Booster		
Smelter		
Charcoal Loading	350 oz/ton	
Charcoal Stripping	Ethanol-Caustic	Ethanol-Caustic
Electrowinning Configuration	Steel Wool	Steel wool
Voltage	3.1 Volts	4 volts
Current	30 Amps	As necessary for 4 volts
Gold-Silver Separation	Nitric Acid	Nitric acid
Recovery	45%	Proposed 90%



FLOW SHEET
 ADD WEST INC.
 PHOENIX MINE
 CAVE CREEK GOLD MINE (file) MARICOPA Co.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Phoenix Date March 19 and 21, 1984
File: Cave Creek Gold Mine
District Cave Creek Engineer Ken A. Phillips
Maricopa County
Subject: Mine visit to Add-West Limited's cyanide heap leach operation
at the Phoenix Mine

Add West Limited, P.O. Box 1598, Cave Creek Arizona, telephone 252-9120 is operating a cyanide heap leach operation at the Phoenix Mine. Tim Atkinson is in charge, Jerry Dillard is the general manager. A total of 12 workers are involved; 4 office and managerial; 8 production workers.

New ore is mined from a drilled and sampled site by ripping and pushing broken ore into a stockpile uphill above a grizzly. Daily production rate is 800 - 1000 tons.

Stockpile ore is dumped across a 4" grizzly with a front end loader. The over-size is stockpiled for future crushing. The grizzly undersize is screened to remove the minus $\frac{1}{4}$ " material which is pelletized with cement in a rotating dump with lifters. Barren leach solution is used as the wetting agent for the agglomeration. The pelletized fraction is added to the -4" + $\frac{1}{4}$ " portion on a conveyor belt which transports the ore to a belt stacker which is used to build the heap.

The heaps are built on a 150' x 300' pad constructed of fine-sized sand and gravel which has been compacted and rolled and covered with 40 mil vinyl. The ore is heaped 20' high and the heap is projected to contain 35,000 tons when completed. Two additional heaps of the same size are planned, then later plans call for each of the three heaps to have a second lift of 20' of ore added. The pads are sloped such that the pregnant solution drains to a 500,000 gallon pregnant solution pond. A separate 500,000 gallon barren solution pond is adjacent to the pregnant pond. The ponds are lined with 40 mil vinyl. Solution flow is handled so that both ponds are never more than half full. The extra capacity then serves as surge and runoff protection.

Barren leach solution containing 2 pounds of NaCN per ton at a pH of 10.5 - 11.8 is distributed over the heap by PVC pipes and plastic "wobbler" type sprinkler heads. The solution percolates through the heap in 40-60 hours and is collected in the pregnant solution pond where suspended particles (if any) are allowed to settle out. Relatively clear pregnant solution is then pumped through a sand filter and then 7 series carbon columns. The carbon removes dissolved gold and silver from the solution and the now barren solution goes to the barren leach solution pond. Cyanide concentration and pH of the barren solution are monitored and cyanide and lime or caustic soda are added as needed. The ore is somewhat "limey" and thus little extra lime or NaOH is needed for makeup.

The deposit is reported to contain 150,000 tons of ore averaging 0.05 tr oz Au/ton and 0.025 tr oz Ag/ton as determined by Amselco when they held the property. Add West is reasonably confident that they can extend the reserve to 300,000 tons total.

The land position consists of a group of patented mining claims. After completion of the mining operation plans are to develop the land for resort-residential use.

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY

1. Mine file: CAVE CREEK
2. Mine name if different from above:
3. County: Maricopa
4. Information from: Charlie Dalrymple

Company: Western States Minerals

Address: 4975 Van Gordon

Wheatridge, CO 80033

Phone: 303-425-7042

5. Summary of information received, comments, etc.:

Mr. Dalrymple reports Western States Minerals have become involved in the Cave Creek Mine with Lectus and Keld'or.

Date: November 7, 1988

Nyal J. Niemuth, Mining Engineer

MEMORANDUM

Files

Date: January 31, 1980

FROM: Paul S. Strobel

SUBJECT: Preliminary Economics for Phoenix Mine

The following figures represent preliminary costs and potential return for an operating cyanide leaching venture at the Phoenix Mine (Au).

The values represented are taken from sampling results and calculations made in 1976 (report by Bradshaw...tonnage, grade, etc.) and projected costs of our recent Vantage deposit utilizing a similar method of extraction.

Indicated Reserves

<u>Tonnage</u>	<u>Grade</u>	<u>Recoverable Grade (@70%)</u>
400,000	.06 oz/t Au	.04 oz/t Au

Estimated Value (@ \$500.00/oz Au)

400,000 T @ .04 oz/t = 16,000 oz Au = \$8,000,000.00

Estimated Total Production Costs

Exploration & pre-production costs (@\$5.00/T)	\$2,000,000.00
Direct mining & production costs (@\$10.00/T)	4,000,000.00
Reclamation costs (tentative)	1,000,000.00
Property purchase cost	700,000.00
Reserved Royalty cost (@3% GSR)	<u>240,000.00</u>
Total Estimated Costs	\$7,940,000.00

As these figures indicate, this property is marginal at present tonnage and grade. However, there is the possibility of increasing the tonnage and/or the value of gold maintaining a higher level. Therefore, it is felt that negotiations for the property should continue, followed by extensive exploration drilling in an effort to determine an increased tonnage factor at the Phoenix Mine.

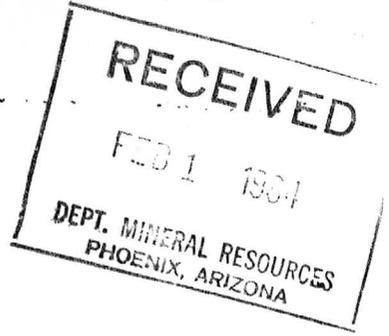


DEC 30 1983

Matt

Office of State Mine Inspector

705 West Wing, Capitol Building
Phoenix, Arizona 85007
602-255-5971



NOTICE TO ARIZONA STATE MINE INSPECTOR

In compliance with Arizona Revised Statute Section 27-303* we are submitting this written notice to the Arizona State Mine Inspector (705 West Wing, Capitol Building, Phoenix, Arizona 85007) of our intent to start stop (please circle one) a mining operation.

COMPANY NAME Add-West, Ltd.

CHIEF OFFICER Timothy W. Atkinson

COMPANY ADDRESS P.O. Box 1598, Cave Creek, AZ 85331

COMPANY TELEPHONE NUMBER 252-9120

MINE OR PLANT NAME Phoenix Mine

MINE OR PLANT LOCATION (including county and nearest town, as well as directions for locating by vehicle)

8 miles NW of Cave Creek, AZ off Spur Cross Road

TYPE OF OPERATION Leach PRINCIPAL PRODUCT Gold

STARTING DATE 1/1/84 CLOSING DATE 6/30/85

DURATION OF OPERATION 18 months

PERSON SENDING THIS NOTICE Timothy W. Atkinson

TITLE OF PERSON SENDING THIS NOTICE Director

DATE NOTICE SENT TO STATE MINE INSPECTOR 12/20/83

*A.R.S. Section 27-303 NOTIFICATION TO INSPECTOR OF BEGINNING OR SUSPENDING OPERATIONS: When mining operations are commenced in any mine or when operations therein are permanently suspended, the operator shall give written notice to the inspector at his office prior to commencement or suspension of operations.

PHOENIX GOLD MINE (formerly known as Cave Creek Gold Mine and Bully Cave Gold Mine)

REPORT ON CAVE CREEK GOLD MINE, MARICOPA COUNTY, ARIZONA, WITH SAMPLING

DATA AND CALCULATIONS OF OPERATING COSTS AND EXPECTED EARNINGS.

EXAMINATIONS AND SAMPLING, MARCH 1914, AND PRELIMINARY GEOLOGICAL

INVESTIGATIONS IN 1911 AND 1912.

The Cave Creek Mine has produced more than \$300,000 of gold during about 30 years since the property was discovered. The first production was from rich gold quartz outcrops on the south end of the Phoenix claim. Subsequently a small mill was operated, and later a large stock company undertook the exploitation of the property. An extensive mine development plan was partly carried out and the erection of a 100 stamp mill begun. The company found itself in financial difficulties before regular operations had been inaugurated. Later attempts to operate with insufficient equipment and limited capital or by leasing led to loss and failure. The result was the financial involvement of the company and the passing of the control of the property finally to the present owners.

The Cave Creek Property includes two full patented claims, the Phoenix and the West Side, four claims held by location, and two patented mill site claims, together with water-right locations. It is located 35 miles north of Phoenix, Maricopa County, Arizona, in the Cave Creek Mining District.

The principal operations on the property have been confined to the Phoenix Claim and from numerous tunnels, shafts, drifts and stopes, mostly on the south end of this claim, there has been extracted upwards of 60,000 tons of ore. The main tunnel and the lateral drifts extend under the ore body mostly. The extensive development of the property which was done by the former owners is of great value now in connection with the proposed operations, as it not only makes the ore accessible for examination, but it provides already installed adequate and effective conditions for the very cheap mining of the ore and for its transport through the tunnel to the mill bins. The relation of the old workings and the tunnel and drifts is best understood by reference to the mining maps herewith.

The records of the former operations are incomplete and conflicting. These were all based on high mining and milling costs which precluded the mining and treatment of the lower grade ore, most of which was left in the workings. The actual mining was chiefly devoted to a search for the rich blocks and pockets of ore, which fact accounts for the irregular underground workings and the consequent high cost of producing the ore under the earlier managements. Under the conditions, it was considered advisable to sample the developed ore on the property with a view to ascertain its extent and grade. A preliminary sampling of the property was planned by me and this was carried out under my specific instructions by Mr. W. H. Channell, a practical, experienced mining man. In March of 1914 I spent ten days at the property doing further sampling to check up the sampling done by Mr. Channell and to supplement it. In order to properly interpret the results of the sampling, it is necessary to have clearly in mind the nature of the ore body and the condition under which the sampline was done.

NATURE OF THE DEPOSIT: The Cave Creek ore-body or more properly speaking, ore mass, is a lens-shaped body or broken material lying on the south-western slope of Marion Peak. It is approximately 1500 ft. long and from 300 to 500 ft. wide and has a determined thickness up to more than 100 ft. at its central portion. It is principally within the Phoenix claim.

The ore-mass lies on a basin shaped floor of diorite and porphyry representing the plane of the fault. The material consists of small pieces of quartz, quartz-porphyry and diorite and larger blocks of porphyry and of vein quartz. These are all cemented by a silicious material and the porphyry and rock has been ~~so~~ more or less altered, conditions clearly due to thermal spring action. The vein blocks or portions of the vein in places are continuous for two or three hundred feet longitudinally in the ore-mass as at the "Black Ledge" and a strong vein can be seen extending nearly the full length of the ore-mass in broken blocks, indicated by the outcrops and disclosed in the underground workings.

The ore-mass is evidently due to horizontal faulting which has resulted in the broken and mixed condition of the material, and account for it lying on the top of the rock floor, as described. The general condition relating to the ore deposit indicate that the fault movement was from the northeast. The principal valuable mineral in the ore is gold, which is found in practically every part of the ore-mass. The principal source of the gold is presumably from rich quartz veins which accompanied the porphyry dikes before faulting took place. Several tests assays indicate that the porphyry itself is gold-bearing to an interesting extent. There are indications that more than one vein accompanied these dikes. The thermal solutions have introduced into the mass lead carbonates and vanadium minerals and probably some gold.

DEVELOPMENT AND EXPLORATION: The main tunnel was driven at the level of the upper floor of the mill, 1100 ft. in the ore-body, crossing it at a depth of about 125 ft. From this, drifts were driven north and south, as shown on the maps and photographs, and raises made to connect with the ore above. These tunnels and drifts and the upper stopes and workings make the south end of the property completely accessible for sampling and measurement. Owing to the irregular distribution of the gold in the mass, as would be expected under the conditions of the formation of the deposit it is necessary to sample extensively to arrive at any fair and dependable average. The mine developments were not such that the ore could be sampled on two or three sides with any regularity, as is conventionally required in the valuation of an ore-body. Instead, the sampling had to be done on the irregular sides of the excavations extending the full length of the ore-body south of the main tunnel and extending 50 to 100 ft. in depth from the surface, so that the samples taken must be considered as representing the average of the exposed surface of a series of interior excavations in and through the ore-mass. The calculated tonnage represents the unmined portions of the blocks sampled and the dimensions of the blocks are determined and defined by the actual exposures of the ore at numerous places in the extensive workings.

The excavations in the ore-mass south of the Main tunnel are exceedingly irregular. At the south end of the ore-mass they are mostly above the Thomas tunnel levels, which is 59 ft. above the Main tunnel. This tunnel is above the floor of the ore and passes through the ore-block designated as "A". At this tunnel level are numerous branching drifts and above the tunnel and drifts are a series of irregular stopes and chambers with radial drifts driven to locate the "bunches" of high-grade ore, under the plan of the former mining operations.

A series of drifts and stopes extend the full length of the ore-mass south of the tunnel, as shown on the sketch maps, herewith. These maps represent roughly the horizontal extension of the stopes. In fact the stopes are from 3 to 12 ft. high only and represent the attempts to follow the vein blocks and richer portions of the ore-mass. The tonnage actually extracted is much less than indicated by the maps and the accessible openings in the ore-mass practically enable one to sample it in three dimensions by means of these interior excavations. Other excavations, as noted, defined the limits of the accepted ore-blocks.

TONNAGE CALCULATIONS: On the Phoenix claim south of the Main tunnel there is a measurable tonnage exceeding 640,000 tons. This can be conveniently divided into three blocks, as follows:

Block 'A'- A triangular block bounded by the Debo stope workings, the South tunnel, Channell shaft, Drift No. 1 South and the stopes along the course of the "Black Ledge". This block has an average thickness of 50'. It is exposed in the Channell shaft, the South tunnel, in No. 1 and No. 2 South drifts and in the Thomas tunnel. The block by computation contains a tonnage of 280,000 tons.

Block 'B'- A rectangular block beginning at chute F and including the "Black Ledge" and part of the Frank stope and extending in depth to the Thomas tunnel level - 70 ft. The tonnage contained is 130,000 tons.

Block 'C'- This block is an extension of Block 'B' to the Main tunnel and includes the Bishop stope and chute G and has a depth in excess of 60 ft. as indicated in the raises. The total tonnage of this block is 200,000 tons.

The ore already mined from the respective blocks by estimate is as follows: From Block 'A'- 10,000 tons; Block 'B' - 30,000 tons; Block 'C'- 20,000 tons. Some additional tonnage can be estimated below the Thomas tunnel level for Blocks 'B' and 'C'. Blocks 'A', 'B', and 'C' constitute positively developed ore and they are all tributary to the South drifts from the Main tunnel and are connected with them by more than 20 raises.

Block 'D'- Includes the ore-mass north of the Main tunnel extending to the end of the Phoenix claim. This is partly developed by No. 1 North and No. 2. North drifts and by several short tunnels and numerous open cuts and pits. The Main tunnel passes through one end of it at a depth exceeding 100 ft. This block is not accessible for complete sampling but the openings on it are sufficient to determine that the character of the ore is similar to that south of the Main tunnel and to satisfactorily define its extent. The ore here extends in depth below the Main tunnel and for that reason, in calculating the tonnage for this part of the ore-mass, I have assumed a depth of 100 ft. This block by calculation has approximately 700,000 tons. Part of this block is covered with a thin lava flow from Marion Peak.

METHODS OF SAMPLING: Nearly 500 samples were taken to determine the average grade of the ore on the Phoenix claim.

Certain limitations and conditions involving the application of the results of the sampling should be clearly in mind in the consideration of the conclusions hereafter noted. It was impossible to determine the grade of the ore of the Cave Creek deposit by visual examination. The samples were taken continuously or at regular intervals as far as possible.

In the old workings, necessarily, a large number of samples were taken from the low grade or barren places, which, by reason of their low grade were left untouched at the time of the former operations. It has been deemed, therefore, justifiable to cast out certain continuous blocks of the low assays as a factor to allow for the above conditions and on the assumption that in mining, these low grade blocks could be left standing in the mine or disposed of as "fill." There is a reasonable expectation that some detached portions of the veins with the rich gold content will be found in the parts of the ore-body which have not been opened up and these will prove a factor in tending to maintain or raise the grade as calculated. It is my belief that the continuation of the "Black Ledge" vein will be found in Block "D".

RESULTS OF SAMPLING: An analysis of the samples justify placing for Block 'A' an average value of \$3.00 a ton. For Block 'B', \$2.65 a ton; and for Block 'C', \$2.75 a ton. The probable ore in Block 'D' can be fairly assumed to be as high as that in Block 'A', namely, \$3.00 a ton. All these values represent the gold content only. There is a small amount of silver in some parts of the ore-mass and incidental to the operation, some lead and vanadium might be saved from some of the ore.

DETAILED SUMMARY OF SAMPLING RESULTS: Affecting Ore Reserves Block 'A'.

Average Channell samples Debo stopes, 450 ft. total sampling	\$3.65
Average Thomas samples, same, 150 ft. total	2.51
Average 20 tons Channell shaft No. 23C	5.15
South tunnel raise, No. 21C@22C	3.70
No. 1. South drift, 40 ft. No. 193 - 188	3.65
No. 2 South drift, No. 9C	2.40
Accepted grade, \$3.00 and better.	
Affecting Ore Reserves Block 'B'	
Average Channell samples, 640 ft. sampling,	\$2.72
Average Thomas samples, 344 ft. sampling,	2.46
Accepted grade, \$2.65	
Affecting Ore Reserves Block 'C'	
Average Channell samples, 290 ft. sampling	\$2.44
Average Thomas samples, 266 ft. sampling	2.90
Accepted grade, \$2.67	
Affecting Ore Reserves Block 'D'	
Average High tunnel, 75 ft. No. 198 - 191	\$2.30
Average 5 samples on outcrop 300 ft. Nos. 192 - 196	3.24
Main or Shipman tunnel samples, Nos. 1-16, avg. of 30 ft.	2.70
Dump Shipman tunnel, Nos. 197-198.	2.30
Line tunnels, Nos. 137-151	1.36
Nos. 26C to 33C, chutes Shipman tunnel	2.70
From Mashackety claim to north, average claimed	4.00
No ore has been mined from Block 'D' and it was not possible to sample it more conclusively under the conditions.	
Accepted probable grade, Block 'D', \$3.00 or better.	

COST OF MINING: The ore south of the Main tunnel on the Phoenix claim is ready to be mined. The new cars, track and drills required will cost about \$3,000. Cleaning out the chutes and putting in new ore-gates, reopening the tunnels and other necessary work will cost about \$2,000. The proposed operation contemplates taking practically all of the ore in Blocks 'A', 'B', and 'C' to the mill and it is planned to mine by a method known in

the Lake Superior country as "milling", that is, breaking the ore down in conical openings to the raises which connect with the ore bins below from which will be loaded by gravity into the tram cars. It is estimated that by this method the ore can be delivered at the mill to cost not to exceed 30 cents per ton. The ore is easily broken. No timbering is required, and of course no pumping or hoisting. The average distance to the mill is about 1000 ft. It is proposed to use mule haulage. There is no overburden to be removed. The mine can be put in shape immediately to produce 300 tons a day.

OUTLAY REQUIRED FOR MILL EQUIPMENT: There is now on the Cave Creek property, a mill equipped with 60- 950 lb. stamps, a Corliss engine of 250 HP. capacity, cyanide tanks and equipment and other mill equipment. The mill will require additional equipment provisioned for the use of oil for power and a general reconstruction of the use of the machinery. There is also on the property an office building which can be utilized. The buildings and equipment represent about two-thirds of the cost that will be required to provide a suitable mill of similar type and of a capacity as proposed of 500 tons daily. The treatment scheme provides for recovery of the ore by cyanidation and probably without concentrating and probably without the use of amalgamation plates. The estimated cost of completing the mill equipment and providing the required changes in power equipment and the restoring the buildings is about \$100,000 on the basis of a mill capacity of 500 tons daily. (See estimate attached)

COST OF ORE TREATMENT: A calculation of the cost of ore treatment made by Mr. Cooper Shapley, of Guanajuato and Philadelphia, is attached. Mr. Shapley who investigated the conditions at the property at the time of my examination figures the milling cost including cyaniding at \$1.175 per ton with certain undetermined factors which may vary this slightly. The important item in the milling is the cost of power. It is proposed at present to use oil which can be delivered at the mine at \$2.95 a barrel. It is possible that electric power can be advantageously brought from the Roosevelt Dam installation 20 miles away, and there is a likelihood that the Clark railroad would come within 12 miles of the property soon.

MILL CAPACITY AND PERCENTAGE OF SAVING: Owing to the broken condition and soft nature of the ore, it is estimated that the stamps would have a duty of about 5 tons in 24 hours, which would give the mill capacity for the 60 stamps as proposed for the initial installation of 300 tons daily or approximately 100,000 tons yearly.

The ore is free from any minerals that are objectionable to cyanidation and it is believed that a saving of 90% of the gold content can be affected. This would depend somewhat on the methods used. At any rate the recovery will be high.

EXPECTED EARNINGS: On the basis of a recovery in the mill of 90% of the gold in the ore, the expected earnings would be as follows:

Ore assaying \$3.00:

Saving.....	\$2.70
Cost of mining and milling	1.475
Operating profit per ton	1.22

Ore assaying \$2.50:

Saving.....	\$2.25
Cost of mining and milling	1.475
Operating profit per ton	0.78

On an 80% basis:

\$3.00 ore gives operating profit	\$0.93
2.50 ore gives operating profit	0.53

Expected yearly operating profits on 500 tons daily, approximately 150,000 tons yearly is \$183,000 to \$79,500.

The profit of the first year of operation should return practically the total cash outlay required for the mine and mill equipment.

LIFE OF THE MINE: On the basis of 500 tons daily, or 150,000 tons a year, the proven tonnage estimated would give 5 years of operation and including the probable tonnage of Block 'D' about 9 years.

It will probably be advisable to increase the mill capacity after operations have been established, particularly if the explorations proposed proves additional ore in depth.

Several other properties in the immediate neighborhood of the Cave Creek mine have been more or less developed and these will provide additional tonnage for the mill with the results of justifying still larger mill capacity or of prolonging the expected period of operation for many years. These properties can be secured cheaply now and negotiations for them are recommended.

GENERAL CONDITIONS: The Cave Creek district presents generally favorable conditions for mining. It has an elevation of about 2000 ft. above sea level and is about 500 ft. above Salt River Valley, at Phoenix.

The locality is healthful and the climate will permit of all the year operations. The district is well watered by Cave Creek, a perennial stream of good water which furnishes ample supply for milling and domestic purpose. This stream flows by the mill and the company which owns the Cave Creek mine controls by water-right locations the use of the water for all purposes for considerable distance above and below the mill site. The camp is connected with Phoenix, at present the nearest railroad point, by a good auto road which can be covered by auto in about two hours. Freighting services with Phoenix for fuel oil and supplies would have to be established. The delivery of the product, bullion, is of course easy. Auto truck haulage will lessen the freight cost to the mine and probably will be advisable. The labor conditions are practically the same as elsewhere in Arizona, being \$2.50 to \$3.50 per day for eight hours. It will be necessary to provide accommodations for labor at the mine. In deep operations it is expected that water will be found about 40. ft. below the Main tunnel level but not in large amount. Very little power and practically no timber is required for the mining operations proposed above the Main tunnel level.

EXPLORATION FOR ORE IN DEPTH: The former company sunk a shaft 300 ft. deep southeast of the main ore-body and did a limited amount of exploration from this shaft with a view of locating the downward extension of the veins and dikes. The results of this exploration are not conclusive and indicate that the dikes from which the Phoenix ore-mass was derived has been horizontally displaced or faulted from the northeast. The same conclusion is indicated from the shallower exploration made by the extension of the Main tunnel. The study of the condition of the Phoenix ore-mass leads to the conclusion that the orebearing veins and dikes will be found in place and extend in depth at some place, not far distant from the present ore-body and to the north and east of it. It is reasonable to expect that these veins when found will be gold-bearing and judging from the richness of the vein-blocks found in the brecciated mass, there is good reason to expect some rich ore in depth.

It is reported that some of the ore from the Phoenix ore-mass assayed \$50 and \$60 to the ton. One sample I took, No. 91, a portion of the vein in place, 2 ft. wide, assayed \$24 per ton.

Exploration for these veins in depth should be carried on simultaneously with operation and under that condition, the cost will not be very great. The probability of the extension of these rich veins in depth is largely a favorable factor affecting the value of the property.

OTHER PROPERTIES: Adjoining the Phoenix claim on the south but separated from it by a fault, is the Maricopa mine in which is found the same dikes that are found in the Cave Creek mine but here not so extensively broken, and altered. This property has produced some high-grade gold ore and some vanadium ore.

On the north adjoining the Phoenix claims is the Mashackety property which contains the extension of the Phoenix claim ore-body. Northeast 1500 ft. from the Phoenix claim is the Woodrow claim and adjoining this on the northeast is the Wilson claim; both controlled by the same interests which own the Cave Creek mine. Both of these claims show quartz and vein outcrops but have not been explored.

Between the Maricopa and Phoenix claims is the King Leopold claim which shows porphyry outcropping. An assay of the porphyry gave \$2.00 per ton.

CONCLUSION: The investigations of the Cave Creek mine for the purposes of this report have determined that there is at this property a large tonnage of low grade gold-bearing ore which under the conditions can be mined and treated with a resulting attractive operating profit, providing proper equipment is installed and under good business and technical management. The proven tonnage is ample to justify the necessary investment for equipment.

There is a strong probability that the downward extension of the vein can be found by well directed exploration and this and the other conditions justify the expectation that the Cave Creek mine has an ultimate value greatly in excess of that which can be calculated from the indicated net returns from the proven and probable ore as presented in detail in the preceding paragraphs.

It should be borne in mind that the mining and milling costs as here accepted are relatively low for a mining operation of this kind and magnitude, but the conditions justify the expectation that they can be attained under the favorable and exceptional conditions.

Respectfully submitted,

New York.
43 Exchange Place,
April 20th, 1914.

Kirby Thomas, Mining Engineer.

Attached to the original report of Mr. Thomas are:

- 1- Samples taken by Mr. Thomas.
- 2- Samples taken by Mr. Channell.
- 3- copy of record of "Heads"
- 4- Copy of record of "Car Samples"
- 5- Assays made from Cave Creek while the mine was in operation.
- 6- Assays thereof made by Mr. Neall of Phoenix, Arizona.
- 7- Estimate of mill cost by Mr. Cooper Shapley.

The above records and assays together with the original report are in possession of the owners and may be inspected by persons interested.

The cost per ton as shown below is calculated on a freight rate from Phoenix to the Cave Creek mine of \$7.00 per ton and labor working eight hour shifts.

The cost for cyanide and the percentage of extraction cannot be definitely stated until tests are run on the ore. Neither can the tonnage per stamp be stated nor the percentage of slime which will be made, crushing through a 26 mesh screen. The figures as shown are approximate for these terms. It will be noted that no tube mills are used, which will be a saving in fuel. I believe that the high cost of fuel will prohibit the use of a tube mill for regrinding of any kind and that the addition of a large number of sand treatment tanks in order to give the sand product sufficient time for a treatment will save a considerable amount per ton.

	Per ton
COARSE CRUSHING:	
By gyratory or jaw crushing before ore reaches stamps.....	\$0.020
STAMP CRUSHING:	
Power: \$8.00 per H.P. per month. 30HP for each 10 stamps	
100 stamps for crushing 500 tons daily.....	0.160
Pumping solutions, slime and filters, 50 HP engine	0.026
Agitation of slime, Trent or similar system	0.015
Supplies; Estimating a set of shoes and dies to last 105 days at a cost of \$125,000 per set	0.020
Stems, liners, bossheads, screens, tappets, wedges, etc.....	0.015
SAND TREATMENT:	
Filling and discharging and turning sand tanks for aeration...	0.100
Repairing false bottoms, cocoa matting, etc.,.....	0.010
SLIME TREATMENT:	
Filtering slime on basis of 50% slime to 50% sand	0.040
Discharging slime tails from filters.....	0.010
CHEMICALS:	
Cyanide at .8 lb. per ton of dry ore	0.220
Lime for settlement, etc.....	0.040
Zinc room attendance, cut zinc, fluxes, melting.....	0.030
LABOR:	
1 mill supt.....	\$150.00
6 battery men, 2 on each shift at \$4.00.....	720.00
6 battery men helpers at \$3.00.....	520.00
3 filter men at \$4.00.....	360.00
3 solution men at \$4.00.....	360.00
3 slime treatment men at \$4.00.....	360.00
3 engine men at \$4.00.....	360.00
3 roustabouts at \$2.50.....	225.00
	\$3,055.00- 0.200
GENERAL EXPENSE:	
General manager	\$150.00
Assayer.....	125.00
Supplies for assay office	50.00
Bookkeeper.....	125.00
Master mechanic.....	200.00
Mechanics (2)	300.00
Lubricants.....	150.00
Belting.....	150.00
Other supplies.....	200.00
	\$1,450.00- 0.096
Marketing bullion, insurance on same, etc., figured on	
2% of gross product.....	0.055
Metallurgical loss of 10% on ore worth \$2.75 per ton.....	0.275

TOTAL COST PER TON FOR MILLING AND CYANIDING.....	\$1.332
Estimated cost per ton for mining	<u>0.400</u>
TOTAL COST PER TON FOR MINING AND MILLING.....	\$1.732

By crushing through a 26 mesh screen, there are two points to be considered in the above calculations. The first is that the tonnage per stamp may not reach 5 tons per stamp and the second is that the percentage of extraction may be cut down below 90% because of the coarseness of the sand. These facts can only be determined by a thorough test. These tests will also show the percentage of slime to sand made in the batteries. A high percentage of slime is given because the ore is an easy sliming one and it is probable that this will not be far off. Even if this slime is off as much as 15% it will not affect the cost per ton to any great extent.

The cost of mining has not been detailed. The large cost of this will be in tramming and in keeping the chutes clear of large boulders of ore.

By the double treatment of sand and slime, the first cost of the mill will be increased because of the number of tanks required for the sand treatment and the increased number of stamps.

A mill of less than 500 tons daily capacity should not be considered as the cost per ton would be too great for this grade of ore.

LECTUS DEVELOPMENTS LTD.

EXECUTIVE SUMMARY

PROJECT: Carefree Project
Phoenix Mine; Maricopa County, Arizona

OBJECTIVE: To establish a 1,000 (+/-) tons per day leaching operation in 1988.

PROPERTY: The property consists of four patented claims containing the Phoenix Mine.

EXISTING RESOURCE: Work by Amselco (BP) has indicated three blocks of ore between the surface and 100 feet.

- I. 110,000 tons of 0.048 oz/ton gold
- II. 192,000 tons of 0.075 oz/ton gold
- III. 120,000 tons of 0.041 oz/ton gold.

A further 200,000 tons is possible to the North. Grades have been calculated using a 0.02 cut off. Reserves total 17,220 oz of gold based on a 70% recovery rate.

RECOMMENDATIONS: Work to date consists of mapping, surface and underground sampling, percussion drilling, air track drilling, reverse circulation drilling and leaching of 40,000 tons. An area of gold bearing chert breccia 250 feet by 800 feet contains the known reserve. The 40,000 ton pile that has been leached produced 830 ounces and still runs 0.026 gold (12 samples - Blan), suggesting a total grade of 0.05 gold.

The next program should consist of metallurgical testing followed by a large leach 5,000 tons test using the current facilities upgraded. The existing pile should be tested and sampled for further recovery.

Should gold recoveries be satisfactory a commercial scale test leach (50,000 tons) is the next step. A recovery rate of 70% would return approximately 2,000 ounces and would constitute commercial production. Investment in exploration and equipment should be kept to a minimum and contractors should be used wherever possible. Supervision should be in the hands of an in-house crew (Keld'Or/CCJV) guided by a recognized strong operator/engineering firm. Total investment less than \$500,000.

CAVE CREEK GOLD MINE

MARICOPA COUNTY

AKA: Phoenix Mine

ABM Bull. 115 p. 13

ABM Bull. 137 p. 164

ABM Bull. 140 p. 94

A. L. Flagg vanadium reports - Book V

Geology File - Lewis, Alfred Strong, 1920 Ore Deposits of Cave Creek, AZ

Eand MJ October 9, 1920, p. 714

Areal Geology in file cabinet

CURRENT MINERAL PROPERTIES (con't)

On June 14, 1988 Lectus announced the signing of an agreement with Ryan Exploration Co. Ltd. ("Ryan") a 100% owned subsidiary of U.S. Borax & Chemical Co. Ltd. which is itself a wholly owned subsidiary of Rio Tinto Zinc Corp PLC ("RTZ") of Great Britain. Ryan holds options on claims adjacent to the Lectus property in the Nelson area (Star Property). The agreement is on the Star Property and Lectus' Gold Eagle #3 claim, on which no work has been done to date, over 2 kilometres west of the Great Western Property on which Lectus has been working for 2 years with the results reported on above. Ryan has worked on their Star Property for the past 5 years and has had the following drill hole assay results. The potential of this property is a large tonnage low grade deposit in the order of 5,000,000+ tons grading 0.10 OPT Au. Trenching and drilling are in progress at this time.

The Company has acquired an option to earn a 50% interest in a 55 claim property in Dieppe Township, Quebec, in the Casa Berardi Gold camp. It is positioned strategically adjacent to the massive Inco Golden Knight deposit where reserves in excess of 11 million tons have been proven grading .22 OPT Au. and \$75.9 million is being spent to put the property into production. A drilling program was completed last fall and results just evaluated by Nelson Baker, P. Eng. who recommends further exploration work to explore the polymetallic potential.

The Company has an option on a small but potentially profitable gold property near Phoenix, Arizona. In the last century, the property was a high-grade gold mine and then was explored in 1980 by American Selco, who reported the ore body has 400,000 tons of 0.06 oz/ton heap leachable ore. A recent drilling program now indicates that there are at least 700,000 tons of 0.05 OPT Au leachable ore probable plus possible additional tonnage of 500,000 grading 0.05 OPT Au. This can be set into production within 120 days at a cost of \$600,000 US, with cash flow commencing 90 days thereafter.

Lectus has a 2% interest in a natural gas well to be drilled in the Arkoma Basin of Oklahoma known as the Goforth #1. The Company also has acquired approximately 462.5 acres of proven gas leases in the Arkoma Basin. This acreage is committed to a Joint Venture, with industry partners providing drilling funds for a tax write-off and a share of production income. The first well of the Joint Venture is scheduled to be drilled in August 1988. The expected revenue from the Goforth #1 and the joint venture gas wells is a minimum of \$115,000 per annum based on \$1.50 MCF natural gas.

FINANCING

The Company has "Flow Through" financing agreements in place for 1988 with the First Exploration Fund for \$1 million, at a price to be set by a 30 day average, and a further \$250,000 with the CMP Funds Management Ltd. at a share price of \$0.68 per share.

GENERAL

The Company has received its 12(g) exemption for the Securities Exchange Commission, Washington, DC - File #82-1364, is listed in the Moody's Investor service and Standard and Poor's. The Company has blue sky clearance in California, File #OP-5979 and is Pink Sheeted. The Company will apply for NASDAQ after the July 31, 1988 annual statement is completed.

For additional information call:

LECTUS DEVELOPMENTS LTD.

530 - 355 Burrard Street
Vancouver, B.C. Canada V6C 2G8
(604) 687-5257

Attn: Mr. Joe Clarland
Vice President, Public Relations

CURRENT MINERAL PROPERTIES (cont')

The Stump Lake Group of Properties, located in lower central British Columbia, is well positioned in a region of world class mines. The property has excellent geochemical, geophysical and drilling results which indicate the presence of mineralization. This summer's geological and geophysical exploration program has produced interesting gold values in one area where further work will be done to test the Target.

The Company has acquired an option to earn a 50% interest in a 55 claim property in Dieppe Township, Quebec, in the Casa Berarde Gold camp. It is positioned strategically adjacent to the massive Inco-Golden Knight deposit including a diagonal offshoot. A drilling program was completed last fall and results just evaluated by Nelson Baker, P.Eng who recommends further exploration work to explore the polymetallic potential.

The Company has acquired an option on a small but potentially profitable gold property near Phoenix, Arizona. In the last century, the property was a high-grade gold mine and then was explored in 1980 by American Selco. The ore body has 400,000 tons of 0.06 oz/ton heap leachable ore. A recent drilling program is now being evaluated and preliminary indicators suggest that there are at least 1,000,000 tons of leachable ore.

Lectus has a 2% interest in a natural gas well to be drilled in the Arkoma Basin of Oklahoma known as the Goforth #1. The Company also has acquired approximately 462.5 acres of proven gas leases in the Arkoma Basin. This acreage is committed to a Joint Venture, with industry partners providing drilling funds for a tax write-off and share of production income. The first well of the Joint Venture is scheduled to be drilled in March 1988. The expected revenue from the Goforth #1 and the joint venture gas wells is a minimum of \$115,000 per annum based on \$1.50 MCF natural gas.

Cave Creek
Gold Mine (P)



FINANCING

The Company has "Flow Through" financing agreements in place for 1988 with the First Exploration Fund for \$1 million, at a price to set by a 30 day average, and a further \$250,00 with the CMP Funds Management Ltd. at a share price of \$0.68 per share.

GENERAL

The Company has received its 12(g) exemption for the Securities Exchange Commission, Washington, DC - File #82-1364, is listed in the Moody's Investor service and the Standard and Poor's. The Company has blue sky clearance in California, file number #OP 5979 and is Pink Sheeted. The Company will apply for NASDAQ after the January 31, 1988 semi-annual statement is complete.

For additional information call:

LECTUS DEVELOPMENTS LTD.
530 - 355 Burrard Street
Vancouver, B.C. Canada V6C 2G8
(604) 687-5257

Attention: Mr. Joe Charland
Vice President, Public Relations

Memorandum
on
Cave Creek
mine.

New York City, July 23rd, 1917.

David B. Gemmill, Esquire,
care Bradshaw Reduction Co.,
C r o w n K i n g,
Arizona.

Dear Sir:-

Following your request made to Mr. Edward Sargent Hatch during his recent visit at Phoenix that he obtain for you such information from our files and records as he believed would be of assistance to you in your examination and consideration of the property of the Bully Cave Company at Cave Creek, Arizona, we are attempting to comply with your request in the following memorandum accompanying it with such extracts from papers in our possession as we think may assist you, but we have not included the Report of Mr. Kirby Thomas made in 1914, of which we understand you have a copy.

A good history of the property briefly digested is to be found in the Report of Mr. Samuel Huntington, Superintendent of the property in 1899, which we have attached to this memorandum, and marked "Exhibit A".

No attention was paid either in the Huntington Report or in the latter Report of Kirby Thomas to the Wilson and Woodrow Claims, formerly known as the Kansas Claims, the location of which can be ascertained from an examination of a sketch map which shows all of the Cave Creek property, and which is attached hereto as "Exhibit B".

With reference to these two Claims there exists a difference of opinion as to their value, but Mr. Hatch is at least a believer in their possibilities, independent of the conceded fact that the consensus of opinion is against their value, but in this memorandum we will make no effort to discuss those problems.

Confirming Mr. Hatch's opinion, explained to Mr. Gemmill in June last at Phoenix we refer to a sketch map which indicates the greatest number of located Claims or developments of alleged gold values within the gold belt of twenty to twenty-two miles in the low grade gold ore zone under consideration. The map is marked "Exhibit C".

We are prepared with the assistance of Mr. Channel, the present Superintendent at the mine, to collect facts, figures and information in respect to these various properties as soon as you are ready to consider them.

We understand that you particularly desire information as to who advised the owners of the property to locate or work the various shafts, tunnels, cross-cuts and upraises, and, while our records are not complete in many respects, we will try by referring to the various shafts, tunnels and other workings by name to give you in detail such information as we have.

SMITH SHAFT:

The Smith Shaft was commenced under the superintendency of L. J. Horton who carried it down about 75 feet, and it was completed by Superintendent James F. Smith under direct orders from the Company. Mr. Smith has written us a full report, dated October 10, 1902, addressed to Mr. Reiff, who was at that time President of the Company.

This report showed that during the previous year he had sunk the Smith Shaft 93 feet deeper having had considerable water to contend with; that he finally reached a depth of 308 feet. He then began to crosscut two ways, southeast and northwest. In the southeast crosscut the ground was wet and the character of the rock slow to work until he had progressed about 40 feet, when it changed to something of a diorite looking rock working fairly well. That rock continued for about 35 feet, and then changed to a harder character of porphyry, hard to drill, but which worked fairly well. That continued for about 4 feet. Then he found a block porphyry carrying small seams of decomposed iron and a small space of sulphide giving a trace of gold, which in turn changed to a softer rock of diorite character. This continued for 35 feet where he found a strata of soft rock or properly a kind of volcanic formation. Then he found a seamy porphyry, seams running in all directions which looked

to be pitching toward the mud seam, which he had just crossed. This was about 30 feet, at which point he reached the slate contact. He then decided to drive to the south side of the slate, and the ground being soft he advanced as much as 28 feet in a week. The slate at that point was about 100 feet wide. He found the porphyry on the south side of it and advanced 25 feet into it, finding no change, and it being of the same character as on the surface. He then decided to stop work in that direction, being about 330 feet from the shaft. In the Northwest crosscut he first cut out a small station of about 8 feet. Then he came in contact with a rock full of decomposed streaks of iron carrying considerable sulphide, giving traces of gold. It was about 2 feet in width and was of the same character that he found in the south-east crosscut at about 115 feet from the shaft. It did not cross the drift, but was on the north side. After passing through this streak he had a hard blue porphyry or diorite. He continued for something like 50 feet when he came to a very nice streak of talc standing nearly vertical and looking very encouraging so that he began to drift on it. He followed it toward the west about 25 feet, where it broke up into small seams. He decided to follow it to the east, which he did for about 40 feet, where it cut off and left no trace. This was at a point about 60 feet from the shaft. He then continued crosscutting for about 20 feet when the Officers of the Company suggested concentrating all the work

on the southeast drift, which was done until Smith was again ordered to resume work in the Northwest drift. In a few days he came across some very nice native copper in the porphyry at a point of about 110 feet from the shaft. He then decided to do a little drifting, and ran in on the Westside of the Crosscut about 16 feet where he had a small seam of very nice quartz. He still continued the crosscut now in very fair ground, being a blocky porphyry, which continued for something around 45 feet. Then it came into a mixture of porphyry and jasper, the seams being filled with a decomposed iron and clay. This continued about 20 feet, when he came to some very favorable looking ground, but after a few feet it changed to a hard dry black porphyry, which continued with a little variation to the end of the drift 214 feet from the shaft. Near the shaft, where Smith found the sulphide, he cut into it for a short distance and then stopped work.

Northeast cross-cut: On his return from New York Smith drifted on a seam in a northeasterly direction for about 60 feet, where he came in contact with a cross seam of mineralized mixture of porphyry and quartz, with a clayish formation, making a favorable formation for mineral. He changed his course, and went directly east for about 12 feet, where he cut the rock carrying \$3.80 per ton in gold. During the period referred to he sunk a shaft 193 feet in depth; two winzes, 21 feet; and cross-cutted and

drifted 793 feet, making a total of 907 feet of work done.

The ore referred to in Smith's Report was not taken out for the reason that at that time the cost of milling was so high that the ore was not of sufficiently high grade to induce the investment necessary for mining and treating it.

Taking Smith's Report as a basis, we prepared in our office a rough drawing which indicated the different kinds of rock, etc., which were encountered by Smith during the operations which he referred to, and we mark it "Exhibit "D".

Mr. C. L. Constant, in Oct. of 1901, reported upon the work that Superintendent Smith was doing at that time, stating that "he is now sinking a vertical shaft near the contact. He is not responsible for the location of the shaft, as it had been sunk to the tunnel level before he was placed in charge. The exact line of contact at the surface is somewhat obscured by float rock and other loose matter, and is not readily determined, but I think it would have been more economical to have put it 'the shaft' a hundred feet further south. The shaft is now 75 feet below the tunnel level and is in good hard porphyry. The only thing to be done is to continue sinking to about 400 feet total depth and then crosscut south to the schist. This will surely find the vein if there be any. Should the vein not be found where expected, I would continue the cross-

cut into the schist for a sufficient distance, to be thoroughly satisfied that the contact had been cut through, and then abandon the work. Should the vein be encountered, drift on it both ways, to determine the size and length of the ore chute, and then you will be ready to start your mill."

"Mr. Smith intends to start a crosscut at the present level, and figures that 80 to 100 feet would bring him to the contact. This will not cost a great deal and will not greatly impede the shaft sinking. It will hasten the final determination of affairs, should he find the vein."

ALLEY TUNNEL:

This tunnel was driven in 1894 when Mr. Alley was at the mine. The reason for driving it was that the Phoenix Co. then had a bond and lease on the Meshackerty Claim and ran the tunnel to get at the rich ore which they had heard was found in the Meshackerty Tunnel. The tunnel proved to be in solid diorite all the way, and did not cross any ore.

CHANNEL SHAFT:

The Channel Shaft was started about Oct. 1910 by William Channel, and Mr. Constant in a letter to us from Phoenix in Dec.

of 1910 stated that he was of the opinion that Channel should be allowed to drive his shaft on down from 60 to 100 feet, employing himself and two others. He believed that it would take forty days to complete the work; he recommended that if the shaft did not then reach the contact that he would abandon it. He stated that Smith and McCabe and Parker, an experienced engineer, all agreed as to this. When Channel reached the forty foot level he wished to crosscut on that ore to the north and south, but Mr. Kirby Thomas advised against it, recommending on the other hand to go down to a depth of 100 feet, and then crosscut, which advice was followed with the result that the shaft and crosscut passed out of the ore and into the wall rock. Mr. Kirby Thomas afterwards said that the shaft had demonstrated that there was considerable rich surface ore in that locality, and that it might pay well if Channel's advice was followed to crosscut at a depth of 30 or 40 feet. The idea of Mr. Kirby Thomas in advising us to go lower was to explore below the broken zone of small fragments with the idea of finding the vein in place, but no such vein was found.

MEXICAN SHAFT:

This shaft was started during the time of the early prospectors, but by whom is not known. It is called the Mexican

Shaft, because of the fact that a Mexican fell down the shaft and was killed, after which occurrence the miners refused to go on with it. It is wholly in hard rock, except at the top where there is some ore on the surface, and it is too far west to be of any use as it is in the wall rock.

STOKES SHAFT:

This was driven under Mr. G. W. Stokes' direction on the porphyry dyke, which abuts up against the slate at G shaft, which is somewhere between the Channel Stope, the Cassin Stope and the Kinread Hole. This was in 1901. He went down 115 feet, and found nothing whatever but hard rock, as he was in the foot wall.

MESHACKERTY TUNNEL:

This tunnel, while not on our property, is mentioned for the reason that it might possibly become part of our property, and because it contained very rich ore at one point. We are satisfied that it can be secured or controlled, but that the man in control is so peculiar that the matter will have to be handled with discretion, and probably will have to be handled through Mr. Hatch, who is in contact with the owner and also with his attor-

ney. The tunnel was started by Thomas Lawrence, who took the name of Channel, and never belonged to the Phoenix Co. except as stated under a bond and lease at one time. It starts in porphyry, goes through a narrow zone of ore, and then goes into the lava flow. The narrow zone of ore assayed about \$45. a ton, and various efforts were made to reach it by the Alley Tunnel, the Line Tunnels and the High Tunnel.

MAIN TUNNEL:

This tunnel was probably commenced sometime in the '70's, and prior to any time that records were filed with us. The Mill with which it connects was erected in 1892. In 1899 the President's Report showed the existence at that time of the following Tunnels:-

Main, or Shipman's, Tunnel;
Drift Nos. 1 and 2 North;
Drift Nos. 1 and 2 South;
Drift No.3 South.

The Tunnel which entered the ridge on a level with the top of the mill 52 feet above the bed of Cave Creek was connected by a tramway over a trestle and embankment from its mouth. The tunnel extends 1125 feet into the hill on a line crossing at nearly right angles the West Side and Phoenix Claims about one-

third the distance from their northern boundary. From it five drifts 1,995 feet in length run north and south under the ore belt, Nos. 1 and 2 North towards the northern limit of the property, and Nos. 1, 2 and 3 South towards and into the workings described as the stopes and holes originally excavated by the first prospectors. From these drifts numerous chutes for receiving and conducting the ore to the cars extend to the upper workings where it is mined. These chutes are seventeen in number, four on No.1 North, 3 on No.1 South, four on No.2 South, and six on No.3 South, over which most of the mining has been conducted.

Apparently the engineer driving the Main Tunnel at or about that period was in search of the very rich seam of ore that had been elsewhere located, and was working entirely independent of any low grade proposition.

The Main Tunnel forms to the present day an outlet for ore from all the several levels which had been worked, as chutes descend from all the workings to the drifts which run into the Main Tunnel. It is therefore a valuable asset.

THOMAS TUNNEL:

The Thomas Tunnel at an elevation of 59 feet above the Main Tunnel is 190 feet long and connects with Drifts Nos. 1 and

3 South from the Main Tunnel. It runs under the Frank Hole and Stope in a southeasterly direction and chutes lead from the stope and holes to it.

The Thomas Tunnel is part of the general plan of development in the early days of the Phoenix Consolidated Gold Mining Co. formed in 1892, as also the south Tunnel, and they were both driven for the purpose of reaching the known ore.

SOUTH TUNNEL:

The South Tunnel is 380 feet long and parallels the Thomas Tunnel, and is still further South, not far from the same elevation, which is 97 feet, and cuts under the Adobe Hole, giving a second outlet for material from this location. It has been stated that the South Tunnel is one of the original tunnels on the hill made by prospectors, and that the Adobe Hole is that from which the early prospectors obtained nearly all their supply of rich ore. This statement was made by Mr. Stokes at one time. Mr. Kirby Thomas considers the Thomas and South Tunnels the best located tunnels on the hill, and suggestions have frequently been made that the mill be moved to a new site higher up on the hill away from floods and nearer the Thomas and South Tunnels.

STOPES:

These consist in regular order from the Main Tunnel south.

1. The Bishop stope, which is connected with the Main Tunnel by a raise;
2. The Cassin stope, connected with No. 3 south drift;
3. The Kinread stope, connected with No. 3 south;
4. The Channel stope;
5. The Back stope.

These are on the right or east of the No. 3 drift south. On the west of that drift are the Fleming stope, Deboe stope, Adobe hole and the Catacombs.

The first explorers took from the Adobe hole, as shown by measurements, about 10,000 tons, the hole being about 6,000 square feet and the depth 40.

From the Frank hole, 30 ft. deep, they took 3,500 tons,

From the Kinread hole, 3,000 tons,

From the Deboe hole about 2,000 tons,

showing that these were the first workings on the Hill.

Encouraged by the stories which miners told of the richness of the ore in these stopes, each successor owner of the mine endeavored to obtain more ore from them. New upraises were made in the time of Mr. Stokes (August 1901) in the Frank stope and Deboe stope.

One of the drifts from the Smith shaft was run under the Back stope without result. Mr. Stokes explored under the Kinread

stops, also without effect.

Mr. Channel, while working for them, excavated the Stope which bears his name and found some excellent ore.

The following page contains a list of the various tunnels and tunnel stops and drifts, showing who the sampling was done by and the average values of the ores taken from the various places.

These values are taken from actual assays made at various times by employes of the Company, or parties in New York, and there is little or no reason to doubt them. Mr. Thomas accepts them as authentic after examining our Assay Book, and they correspond very well with other information which we have received.

<u>LOCALITY</u>	<u>SAMPLING BY</u>	<u>AVE. VALUE</u>
South Tunnel,	Armstrong,	5.22
South Tunnel,	Waters,	7.67
South Tunnel,	Jardon,	5.35
Channel Shaft,	C. S. C.,	11.55
Thomas Tunnel,	K. T. -- Jardon,	8.99
Adobe Hole,	Channel mostly,	2.96
Stoller Hole,	do	2.20
Between Adobe and Deboe,	Channel,	9.40
Black Ledge,	Phoenix,	2.68
Channel Stope,	Phoenix,	3.71
Frank Stope,	Phoenix,	10.32
Kinread Stope,	Phoenix-Channel-Jardon,	3.28
Fleming Stope,	Phoenix-Channel,	2.74
Deboe Stope,	Phoenix-Chammel,	3.73
Gossan Stope,	Phoenix,	2.30
Bishop Stope,	phoenix,	2.38
Sraft A No.1 South Drift,	Armstrong,	4.79
Shaft B No. 2 South Drift,	Chamel,	3.80
Shaft C No. 2 South Drift,	Channel,	3.50
Shaft A 2 No. 3 South Drift,	Channel,	2.85
Shaft A No.3 South Drift,		2.70

We are attaching to this memorandum a record of samples taken from the Phoenix and West Side Mines by Channel, and although it does not convey much to one who relies on the face of the paper it will convey a good deal to you, because we understand you have found the samples themselves and from this record you will be able to find the particular places from which the samples were taken.

In 1914, at the time when Mr. Kirby Thomas prepared his Report on the value and quantity of the ore at the mine, a cost estimate was prepared by Mr. Cooper Shapley, of Los Angeles, California, and this Report is attached to Mr. Thomas' Report and may be of assistance to you in arriving at a determination as to the value of the Cave Creek property, although it should be borne in mind that the present methods will probably reduce the cost."

The three Tunnels on the north end of the Phoenix Claim, called the lower line, upper line and high tunnels, were efforts to reach the large pieces of broken vein matter which at this point show on the surface. As far as our information goes the lower line tunnel was advised by Mr. Maynard, and the upper line tunnel by Mr. Watson.

The reason given for the failure to produce practical results was that the tunnels were much too high and the ore body at that point was very narrow. The height of the tunnels also

made it extremely difficult to transport the ore to the mill, as there was no rail connection with these tunnels. We are advised that mining men classed the Alley Tunnel, the line tunnels and the high tunnel as impractical for the reason that any ore that was at that point could readily have been reached from North Drift No.1, or North Drift No.2 of the Main Tunnel, at a much lower level. Mr. Kirby Thomas in his Report estimates a large body of possible ore in this locality. We have discovered in our papers a map made by Superintendent Smith in 1901 showing the workings at that date. It is attached to this memorandum and marked "Exhibit E".

The general theory of the causes which led to the exploration work at Cave Creek and the reasons why such work was not a success, except in rare instances, as gathered from the reports of those who were at the mine, including Huntington, Stokes, Constant, Thomas, Smith, Channel and many others may be summarized as follows:

First: The original locators of the Phoenix Claim found rich surface ores consisting of broken pieces of the vein matter on the south end of Phoenix near the dike, which, at that point, as shown by Mr. Thomas, bends to the west and runs down to the Creek Valley. As they were obliged to send ores by pack mule five miles to a mill, at a cost of \$10. per ton, they could not afford

to take out any ores but those of the highest grade. The fact that they did make an average of \$5. a ton, according to common report, shows that the average grade of ore in that locality must have been over \$15., and Messrs. Channel and Philes said that some of it ran as high as \$40. a ton.

They sought these ores only, and in so doing adopted the easiest method of getting at them, i.e., of starting on the surface and digging down, making stopes and holes, and connecting one with the other, and finally driving small tunnels like the Thomas Tunnel, South Tunnel and Southwest Tunnel connecting with the stopes to bring out the ore to the small mill which they then had on Phoenix Claim. This accounts for the southerly stopes and tunnels on the Phoenix Claim.

Second: The second stage consisted of the developments made by crossing the ore body on east and west lines and beginning the small tunnels, i.e., the main or Shipman tunnel, the two line tunnels, then called by other names, and the high tunnels.

The main tunnel was at first a success. It struck three pieces of the broken dike, containing vein matter, a short distance in and took out therefrom valuable ore which probably led to the blowing reports of that period. This induced them to believe that the same conditions would prevail throughout the ore

body, i.e., that from time to time they would chance upon large pieces of the broken vein matter containing high grade ore. Acting on this belief they continued the tunnel 1125 feet reaching the wall rock.

They then determined to go south under the stopes where they knew rich ore had been found by the original prospectors. The belief was quite justifiable that if they under-ran the stopes they would find just as rich ore as the prospectors had.

The first drift south was apparently the drift we now call No.3. Having driven that drift they worked the stopes over again and sent down the ore in chutes to No.3, and thence to the mill through the main tunnel. They pursued the same policy as the original prospectors, looking for high grade ore, and disregarding the lower grade ore, for the reason that up to that time no one had been able to extract more than seventy per cent of the gold from such ores.

The next developments were of the drifts north and south from the main tunnel, which yielded very little good ore, for the reason that they were too high, and as far as the most westerly were concerned were partly in the wall rock.

Mr. Huntington in his report, when he came on the scene, in 1899, at last showed the fallacy of the development work high up on the mountain. The work admittedly was done at high levels for three reasons:

a: To do the work at a higher level than the mill, so that all ore could be sent down by gravity, as they used only hand power to move the cars;

b: To avoid water, the miner's chief obstacle; they believed that if they went below the creek level they would strike water, and not only would they have to timber the shafts and tunnels at great expense, but they would have to pump the water out. Maricopa and Phoenix were located at about the same time, and in the Maricopa Mine the creek had flooded the mine, and caused them to abandon it, and they believed that the same thing would happen at the Phoenix mine;

c: The third reason was of the least importance to them, i.e., to find ore. As Mr. Smith expressed it, if a miner had steady work and beefsteak and hot rolls for supper, he did not care whether he ever found ore or not.

Mr. Huntington in his report, page 19 of the pamphlet, described the character of the ore body. (See Exhibit "A".)

It will be noted that Mr. Kirby Thomas without ever having seen Mr. Huntington's report concided with his views in many particulars.

Third: This report evidently made an impression on the Company, for Horton was ordered to sink a deep shaft. He went to

the level of the main tunnel. Then Smith took hold and drove the shaft to an ultimate depth of about 300 feet, which, however, did not bring it very low as it was started from an elevation on the hill of nearly 300 feet above the creek. Their theory was that they were working along the dike and expected to find ore in place, but as Mr. Thomas' cross sections have shown us, and Mr. Smith's own map of that period shows us, they were entirely mistaken as to the location of the dike, and were far east of it. The shaft did not uncover any ore whatever. Finding this to be so, and reaching water which to their mind precluded going any deeper, they began to drive drifts in three directions. Only one of these, the northeast, was toward the actual ore body, and that apparently ran under one of the stopes from which the ore had been all extracted. This shaft and the drifts therefrom were tremendously expensive, \$15. a foot being charged; whereas Channel states that even now, when labor is much higher and materials more expensive, \$9. a foot would be ample. The Company naturally got into financial difficulties and suspended operations.

Fourth: The next development work was attempted by Goerner & Lockhardt, lessees of the property. They appear to have been simply mining pirates, who took hold of the property and gutted all the high grade ores in sight, took all the money they could get their hands on conveniently, and threw up the develop-

ment work that was expected.

Fifth: Channel opened his shaft, to get at the surface ore he had seen others take out. He reached it between 30 and 40 feet down. He then wished to crosscut at that level and stay in the ore. Mr. Thomas was consulted and advised sinking to a depth of 100 feet. This was done, and Channel passed out of the ore into hard rock. The Channel shaft may be said to be the most notable case of "hard luck" at Cave Creek. If he had started to sink it 100 feet further east he would have been in the ore body all the way as he was on the edge of the wall in the shaft which he did sink. (See diagram of Channel Shaft annexed, "Exhibit F".)

Sixth: Mr. Thomas has now given us a definite and positive idea where the ore body is, and estimated its contents, and there will be no excuse in the future for sinking shafts or driving tunnels in the wall rock.

The following maps, with their description, may be of assistance, and are bound in the back of this memorandum:

1: The Dyer Map, which is the earliest one that we know of. There is one cross-section and one plat. Cross section shows the Shipman tunnel at a very early date, and three chutes of ore, which encouraged them to continue the Shipman tunnel.

The plat shows what work had been done at that time. The only tunnels were the Shipman with one crosscut south, line tunnels called "Watson" tunnel and "Maynard" tunnel, and the "Bancroft" tunnel, which we call the high tunnel, the Thomas tunnel, the South tunnel, the Mexican shaft (there called the Jones shaft), and a little tunnel marked "Prospect" alongside the main tunnel.

2: The Horton Map, dated 1901. Horton took charge in 1899, and stayed until 1904, and this map probably represents the condition when the Phoenix G. M. Co. took hold. This map shows all the workings on the present map, except the Alley tunnel and Smith shaft, and shows a number of stopes leading from the main tunnel and South tunnel, which apparently do not exist to-day. This map is not drawn to scale, and it makes the short tunnels as long as the long tunnels. It is therefore very deceptive. Upon the map is a statement which is interesting because it shows how many tons of ore are left in the stopes named on the map. There is no indication that anybody tried to get this ore out at any time since. It may be there yet. Channel says it is.

3: A set of sketches made by Smith in his time, which were attached to letters received from him, and the maps have figures on them in some cases which seem to show the

time when they were received. The first one is dated 9/16/1905.

4: A rough sketch, which shows in the upper right-hand corner the place where Stokes got ore assaying \$10., which must have been in one of the stopes, as it is far east of No. 3 drift south from the main tunnel.

5: A map not dated shows on the north end of Phoenix how they propose to get at Meshackerty ore by an upraise from No. 1 North Drift Main Tunnel.

6: A map, not dated, shows where the old work mentioned above was in the Phoenix Claim. It also shows a continuation of the porphyry dike to and beyond Cottonwood Creek. This map is instructive as showing how little Smith knew where the walls were and the limits of the ore body. We have marked in blue what the east limits of the ore is, as compared with his east limits, which he calls "slate contact", and it shows how Horton and Smith came to put down the Smith shaft in solid rock.

The records show that about all the work done in the last twenty years has been as follows:

Horton took charge in 1899, and spent 1900 in dead work, as the mine was all choked up in a very bad condition.

In 1901 Huntington said the work was all in No. 3 South Drift from the main tunnel in the Deboe stope between that and the Fleming stope, and in Cossin (or Gossin) and Bishop stopes, and in "A" Chute Drift.

There was a great deal of dissatisfaction with Horton and Smith came to the mine while Huntington was there. Constant also visited the mine at this period, and reported upon it. Horton started the shaft described above as Smith shaft, and went on with it until 1904, when Horton was put out, and Smith put in, as Supt. Smith, without any responsibility for the location of the shaft, went on with it, and sank it during 1901 and 1902.

The Company then suspended, and the next work was in 1907 and 1908, when Goerner & Lockhardt took a lease, and put in about three months at the mine. They opened up the Alley Tunnel, repaired the machinery, and did a little work, which amounted to nothing. Lockhardt disappeared, leaving the miners unpaid, and Goerner sold all the personal property he could dispose of.

No other work was done until Channel began to sink his shaft, as above described, and no work has since been done.

CHRONOLOGY:

1878,

Phoenix Claim, located;

1889, 10 Stamp Mill erected on Phoenix Claim;
1890-)
1891,) Marshall mill tried;
1892, Phoenix G. M. Co. formed; mill erected;
1893, Ppty. sold to Alley, Silkman and others;
1894,)
1895,) Much sampling done by Armstrong and other assayers;
1897, Ppty. sold under foreclosure to Christy, Trustee,
who deeded to Phoenix G. M. Co.;
1899, Horton put in charge;
1900, Spent in dead work, cleaning up tunnels, repairing
machinery;
1901, Westside Claim located; Smith came to the mine;
1901, Smith shaft commenced;
1902, Smith shaft continued;
1904, Smith took charge as Supt.;
1908, Lease to Goerner & Lockhardt.
Channel in charge for Bully Cave Co.

We have in the office a file of assay certificates covering a period from 1898 to 1912, which we would rather not allow to go out of our possession for any period of time, for fear of accident, and which would take weeks to copy, but if the necessity arises we can loan it for a limited number of days at a time by express.

In April of 1915 we directed Mr. Channel, the Superinten-

dent of the mine, to send to the Colorado Iron Works Co., of Denver, Colorado, about two hundred pounds of ore taken from various parts of the property for the purpose of making cyanide tests, with the view of obtaining the highest possible extraction in the most economical manner. The Colorado Iron Works Co. made its test and furnished us with its report of the results, and we are attaching to this memorandum a copy of that report.

In February of 1915 the Minerals Separation American Syndicate, whose address is the Merchants Exchange Building, San Francisco, California, made a test of a sample of ore from the mine, and they advised us after making such a test as follows:

"The results indicate that the ore, as represented by this sample, is amenable to treatment by our flotation process.

"The sample assayed \$2.82 in gold, and from this we made in one experiment an indicated recovery of 70.8% of the gold in the form of a concentrate assaying \$148.83 in gold and a tailing which carried 82 ¢ in gold.

"In another test on the same sample, we made a \$257.40 concentrate with a tailing which carried 43 ¢ in gold, giving an indicated recovery by assays of 84.8% of the gold. Treatment in all cases was comparatively cheap and simple."

We have a survey showing the properties of the Phoenix Consolidated Mining Co. made by F. S. Shewell, Mining Engineer of Phoenix, Arizona, in 1908, and if it would be necessary for you to have this before you we will send it to you.

We believe that valuable water rights can be developed at Cave Creek, and that the water of the Creek can be impounded for use during the dry season. The Company caused a preliminary application to be filed about three years ago, but did not complete its final application, but we understand that under the Statute we are permitted at this time to re-apply for water rights.

The foregoing memorandum has been prepared by us with as much care as possible from the mass of records in our office, some of which may be entirely reliable and others less so, and we do not undertake to guarantee any of the statements, although we believe that they are reasonably accurate.

ALB.

Very truly yours,

Walter B. Cate

COLORADO IRON WORKS COMPANY

DENVER, COLO., U.S.A.

April 7, 1915.

Messrs. Hatch & Clute,
100 Broadway,
New York City.

Gentlemen:

Referring to previous correspondence and to sample of ore sent us by Mr. W. H. Channellof Cave Creek, Arizona.

We have completed the cyanide tests on this ore, the same having been conducted with a view to obtaining the highest possible extraction in the most economical manner, with a view to the installation of a plant to treat about 500 tons per day. The results of these tests and the method of making them are given below.

The 200 pounds of ore sent us was carefully crushed to 20 mesh, screened and sampled through a Jones "Split" Sampler, the final sample being 30 pounds, which was put through a sample grinder and ground to practically all minus 40 mesh, then run through a Jones sampler and divided into two equal parts for original and duplicate assays.

Assay results.

Crude Ore or head sample; Gold 0.12, oz. Silver 0.18, oz.
Copper trace. Gold value in dollars and cents, at \$20.00 per ounce, \$2.40. Silver value at 60 cents per ounce, 10 cents or a negligible amount.

Test No. 1.

Fifteen pounds of the ore was tube milled in 15 pounds of water containing at the rate of 2# cyanide per ton, together with 5#

of lime per ton of ore and 1 lb. of lead acetate, ground to 90% minus 100 mesh. Loss of cyanide in tube milling necessitated bringing up the solution to the standard 2lb. strength. The ratio of dilution was increased to 1-1/2 parts solution to 1 part solids, and agitated for 22 hours in porcelain Pachuca air agitation tanks. Results, Gold trace, Silver 0.10. Agitation continued for 47 hours. Results Gold trace, Silver 0.04. Total cyanide consumption at the end of 47 hours was .7 lb., Lime 5lbs. per ton of ore.

This test showed exceedingly good results, but we considered cyanide consumption a little high.

Test No. 2.

Twenty pounds of ore tube-milled in 20 lbs. of cyanide solution for 3-1/2 hours to 90% minus 100 mesh. 1 lb. cyanide per ton of solution, 1 lb. of lead acetate per ton of ore, and 8 lbs. of lime per ton of ore was used, carrying the alkalinity a little higher than in test No. 1. Cyanide titration after tube milling, .7 lb. Consumption .3 lb. cyanide at this point. Product taken from tube mill and put into porcelain Pachuca air agitators. Ratio made up to 2lbs. solution to one of solids and solution re-standardized to 1 lb. cyanide per ton of solution. Lime titration .11 lbs. lime. After 19 hours agitation, .9 lb. cyanide per ton, lime titration .9 lime, and loss .2 lb. in alkalinity.

Final sample after 23 hours agitation, cyanide titration .9 lb. per ton of solution, lime .9 lb.

Total consumption of cyanide in this test, 1/2 lb. per ton of ore.

Lime consumption, normal.

Assay Results.

Head sample, gold 0.12 oz. Silver 0.18 oz.

After 24 hours agitation, gold 0.01 oz., silver 0.05 oz.

After 30 hours agitation, gold 0.01 oz. silver 0.05 oz.

Test No. 3.

Taking a quantity of ore after being crushed to 20 mesh, we made screen test through 100 mesh laboratory screen, giving 30% of the total product minus 100 mesh or slimes, and 70% plus 100 mesh to 20 mesh, or sands.

The slimes subject to continuous air agitation in a two to one pulp with a 1-3/10 lb. cyanide solution and 8 lbs. of lime per ton of ore and 1 lb. lead acetate per ton of ore.

After 20 hrs. agitation, titration 1 lb. cyanide, lime .4 lb. After 26 hrs. agitation, results on slime tails, 0.04 oz. gold, silver 0.08 oz. and .6 lb. cyanide this period.

Solution brought up to 1-1/2 lbs. cyanide per ton, and agitation carried on for a period of 44 hrs. Assay results, 0.01 oz. gold, silver 0.13 oz.

Note: Silver values being negligible showed a difference in assay in these two results, being hardly worth while repeating.

Sands, or plus 100 mesh, were subjected to a 2 hr. contact, with 2 lbs. solution to one of solids, cyanide solution strength of 1 lb., lime 8 lbs. per ton. Cyanide titration after 2 hrs., 1 lb., showing no consumption.

Assay results after 2 hrs. contact, 0.07 oz. gold, silver 0.13 oz.

Value of sands, or 70% of the total, 0.10 oz. gold and 0.13 oz. silver, showing an actual recovery of \$.60 per ton for this period of time.

Another screen analysis of this product of the same proportion gave the following assay results: The minus 100 mesh, amount to 30% of the whole gave gold 0.225 oz. value \$4.50 per ton, silver, 0.225 oz.

Value 13 1/2 cents. The plus 100 mesh amounting to 70% of the whole, gave gold 0.08 oz., silver 0.16 oz. Value \$1.60 per ton.

This shows, we believe, that it is possible to crush to 30 mesh, classify out the minus 100 mesh as a slime, treat by continuous air agitation, and then filter by continuous revolving filter. Then subjecting the coarser sands to a separate treatment for a period of one to 20 hours. This treatment to be made by mechanical means.

By this method we believe that it is possible to handle this ore at a very low cost, possibly \$1.00 per ton, on a basis of 300 to 500 tons per day. The cyanide consumption is about 1/2 lb. per ton of ore, lime consumption 5 lbs. per ton, and 1 lb. (or none) of lead acetate per ton of ore, this depending on keeping the solutions neutral.

Test #4.

A further test was made on the plus 100 mesh sands, extending the time of leaching contact to a period of 22 hours in a 1 lb. strength of cyanide solution, 5 lbs. of lime, but no lead acetate used. Total consumption of cyanide after 22 hours contact .2 lb.

Assay results after 22 hours contact, 0.03 gold, silver 0.12 This shows good extraction of the gold by mere contact for this length of time, as it will reduce the value from \$2.00 per ton of sands to \$.60 The sands amount to .7% of the total. The slimes amount to 30%. X

Test #5.

Fifteen pounds of ore tube milled in 15 lbs. of .9 lb. cyanide solution, ratio one ton ore to one ton of solution, to 90% minus 100 mesh, with 7 lbs. of lime per ton of ore and 1 lb. of lead acetate per ton of ore. Consumption of cyanide in tube mill .4 lb.

Pulp taken from tube mill, solution re-standardized, ratio

changed to one of pulp to 2-1/4 parts solution. Solution titrated. 1 lb. cyanide per ton of solution, lime 1.25 lb. after 17 hours agitation in porcelain Pachuca air Agitators.

Assay value after 17 hours continuous agitation gave results as follows, gold 0.02, silver 0.18, showing no silver extraction at this period.

Agitation continued for 23 hours. Results 0.005 gold, silver 0.14.

Agitation continued to 40 hour period, not knowing results of former assay value, and gave the following 0.005 gold, silver 0.14.

The method of determining the low value in these two samples was by taking a number of assay tons and dividing the number for result, thus determining the 0.005 value, which is equal to about \$.10 gold. Silver negligible.

Total cyanide consumption on test 5, 1/2# per ton. We believe in actual practice that the cyanide consumption and lime consumption can be held down to that which is shown in the various tests.

Test 5 was made for the purpose of checking results of former tests.

We do not believe there is a question of a doubt that this ore can be treated by cyanidation in an up-to-date plant, which must be constructed on economical lines. The power, labor and chemical cost should be kept at a minimum. Below we give a list of the cost of different items, taken from actual practice from one of the large mills which the Colorado Iron Works designed and built and is running today on a basis of 600 tons per day.

	<u>Per ton.</u>
Electric power cost	.26
Chemicals	.1106
Zinc for precipitation	.033
Lime	.037
Water, bought at \$.22 per thousand gallons	
tailings discharged at water moisture of 25%	.0143

Coarse Crushing	.07
Fine crushing	.21
Classification	.02
Sand treatment by continuous washing system	.03
Agitation	.10
Thickening	.02
Filtration	.05
Melting Bullion	.03
Pumping solution	.01
Overhead expense	.10
	<u>\$1.09</u>

These figures are based on handling a \$2.40 ore and making a 92% extraction of the value and milling costs at \$1.10 per ton, and would leave \$1.11 for profit and mining costs. Extraction of 95% to 97% could be obtained by all sliming, but we believe the cost of all sliming tube milling would be greater than the difference in value recovered.

We would figure on using modern oil engine for power installation or it may be possible from the location of your mine to get electric power at an economical rate of 3/4 of a cent per H.P. hour. However, this is a matter than can be worked out by the engineers on the ground.

We believe that it is possible to duplicate the above figures in a modern and well designed plant such as we would propose for the treatment of the ore as shown by the above tests. We have prepared 80 to 100 ton unit plant flow sheet, such as we feel would be most suitable for the treatment of your ores; a plant that would give the highest efficiency and low cost for operation and maintainance.

We hope that we have made this matter clear to you, and await your early reply.

Respectfully submitted,

COLORADO IRON WORKS COMPANY.
R.P. AKINS
Salos Manager.

RPA Z
Encls.

COLORADO IRON WORKS COMPANY

DENVER, COLO.

April 8, 1915.

Messrs. Hatch & Clute,
100 Broadway,
New York City.

Gentlemen:

Enclosed please find specifications and preliminary drawing showing machinery equipment and general flow sheet for an 80 to 100 ton per 24 hours wet crushing, Cyanide Plant, which we think is most suitable for the successful treatment of the low grade ores such as your Mr. Channell shipped us for cyanide tests.

We have carefully completed the tests, and have prepared the enclosed specifications for the first unit of a 500 ton treatment plant. The machinery and equipment for the first unit, not including power plant and making use of the present sand leaching tanks at the mill and the refinery now there, would cost approximately \$76,000.00 erected and running. We have figured on a \$15.00 per ton wagon haul from railroad to mill site.

We would suggest that the plant be constructed in five units of 100 tons capacity each, and would advise the preparation of complete specifications and drawings of a 500 ton plant, but install the mill unit by unit. In this way by completing the No. 1 unit and having it running to complete any further experimental work, further refinements in the process may be included in the other units. This would ensure a plant in the end that would have the very highest efficiency and most economical maintainance, in view of obtaining the highest extraction at the lowest cost per ton of ore mined and treated.

We do not see any reason at this time why the proposition as you have stated it, and with a low cost for mining and putting the ore into the mill, would not yield a profit from 60 to 90 cents per ton of ore per day, with an average tonnage of 500 tons per day. Cost based on mining at \$.50 per ton, milling at \$1.10 per ton, leaving \$.60 per ton for profit, basing total extraction at 92% or \$2.21 recovery, and crushing to 30 mesh with Chili mill making 70% slimes and 30% sand. This will make 70% of the total to be handled by slime treatment and 30% that would be plus 100 mesh sands and through 30 mesh. The slimes show high extraction, the sands being handled mechanically at low cost.

As the proposition when summed up in practically a manufacturing one, it necessarily means close management to keep the high costs from creeping in and destroying profits, which should be made if properly managed.

We, as engineers and manufacturers of ore treatment plants, have made a specialty of designing machinery and equipment for the special treatment of low grade ores. We will be pleased to have our Mr. Akins come to New York to confer with you when you are ready to go ahead with the proposition.

If there are any points both in our report of tests and the above proposition that are not entirely clear to you, please let us know in what respect.

Yours very truly,

COLORADO IRON WORKS COMPANY

R. P. AKINS
Sales Manager.

RPA Z

APPROX
T. 4 N., R. 4 E.
6
UNS

Am't deposited \$ 90.00
Cost of O.W.A.S. 30.00
Am't to be refunded \$ 00.00

Claims Located (Am'd) Phoenix West Side Aug. 26, 1909
Phoenix and West Side Mill Sites Aug. 26, 1909
Mineral Survey No. 2727 A & B

Lot No. _____
Arizona Land District

PLAT

OF THE CLAIM OF
Phoenix Gold Mining Co.
KNOWN AS THE

Phoenix, West Side,
Phoenix Mill Site, West Side Mill Site

IN Cave Creek MINING DISTRICT,
Maricopa COUNTY, Arizona
Containing an Area of 47.227 Acres.
Scale of 200 Feet to the inch.
Variation 14° 20' E.
SURVEYED October 23-24, 1909 BY
E. R. Rice, U.S. Mineral Surveyor.

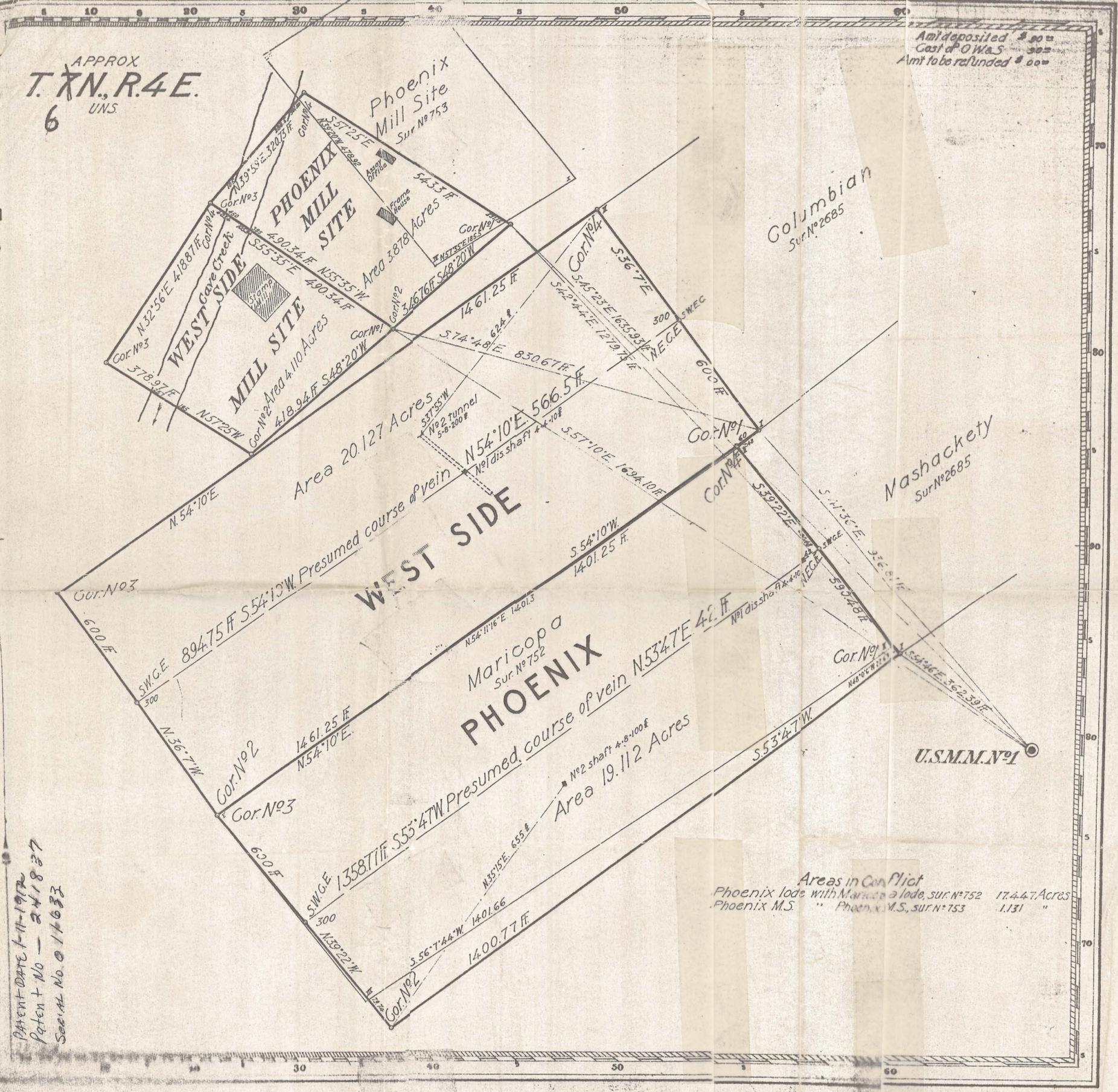
The Original Field Notes of the Survey of the Mining Claim of
Phoenix Gold Mining Co.
known as the
Phoenix, West Side,
Phoenix Mill Site, West Side Mill Site

from which this plat has been made under my direction, have been examined and approved, and are on file in this office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.
I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claims by claimant or its grantors, and that said improvements consist of 3 shafts and 1 tunnel, total value \$5050.00

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

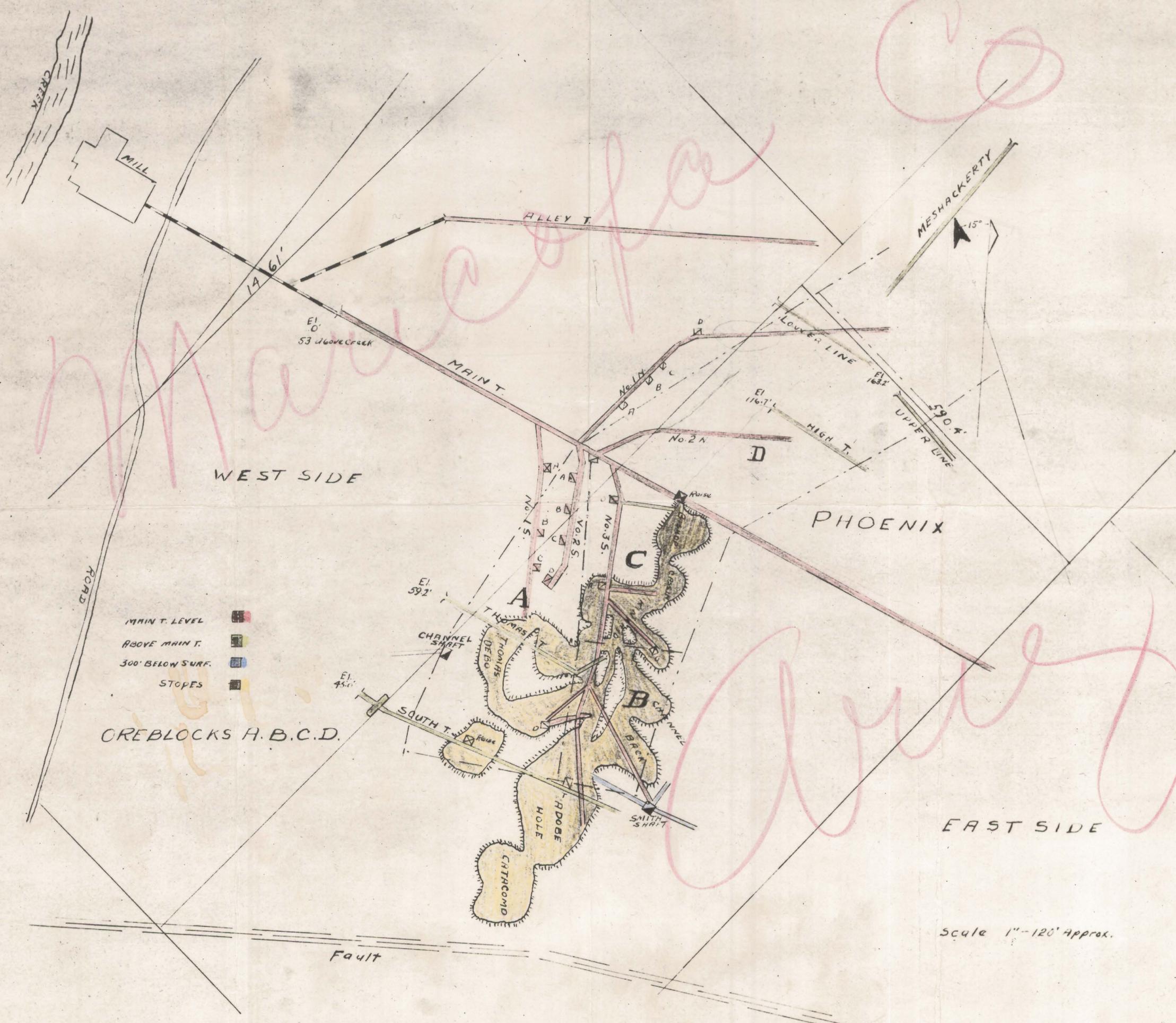
And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office. *Frank J. Dugan*
Phoenix, Ariz. } U.S. Surveyor General for
April 21, 1910 } Arizona



PATENT DATE 1-11-1910
Patent No. 241837
Serial No. 11633

Areas in Conflict
Phoenix lode with Maricopa lode, SUR. No. 752 17.447 Acres
Phoenix M.S. " Phoenix M.S., SUR. No. 753 1.131 "



Maricopa

Phoenix

- MAIN T. LEVEL
- ABOVE MAIN T.
- 300' BELOW SURF.
- STOPE

OREBLOCKS A.B.C.D.

Scale 1" = 120' Approx.