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

The following file is part of the

Arizona Department of Mines and Mineral Resources Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

PLEASE See ESPECIALLY P.8 — JUST for the BLACK QUEEN ALONE for "ORE RESERVES" @ 221,000 ton.+ EST. VALUATION = $93,000,000+ (JUST in the 1ST 100'-150')

Bests, Marshall
(602) 982-0361

PROPOSED EXPLORATION PROGRAM

FOR THE

MAMMOTH PROPERTY, GOLDFIELD-MAMMOTH MINING DISTRICT

PINAL AND MARICOPA COUNTIES, ARIZONA

A CERTIFIED REPORT

by

Brian W. Hester, Associate
P. Eng. (Ontario) #19438019
FGAC #1177

March 1, 1990
Golden, Colorado

TABLE OF CONTENTS

	Page
SUMMARY	i
INTRODUCTION	1
Background and Commission	1
Location, Access, and Topography	3
Figure 1 ..... follows page	3
Property	4
Figure 2 ..... follows page	5
HISTORY AND PREVIOUS WORK	5
Figures 3 and 4 ..... follow page	6
Figure 5 ..... follows page	7
Table 1 ..... follows page	7
GEOLOGY	10
Mineralization	11
Figure 6 ..... follows page	14
Figures 7, 8, and 9 ..... follow page	15
RECOMMENDED PROGRAM	17
Phase I	17
Phase II	19
Phase III	20
Budget	21
CERTIFICATE OF QUALIFICATIONS ..... follows page	25
LETTER OF AUTHORIZATION ..... follows page	25

SUMMARY

M & M Enterprises, a general partner of Western Labs and Engineering, holds title to the Mammoth property in south central Arizona. Underground mining in the past has shown gold to occur in coarse metallic form within well defined fractures. Old sample records and more recent drill results and resampling indicate that, in addition to the high grade fracture controlled mineralization, there is a large surrounding lower grade halo of gold mineralization. This widespread mineralization is possibly amenable to low cost, open pit, or bulk underground mining and heap leaching.

A three phase program of exploration and development work is recommended to bring the property to the stage at which a production decision can be made. Advance to the second and third phases would be justified in each case by positive results from each completed phase. Recommended expenditures in each phase are:

Phase One	$ 228,000
Phase Two	242,000
Phase Three	1,220,000
	$1,690,000

The recommended program is designed to identify ore as quickly as possible and especially any which might be amenable to the cost effective combination of open pit mining and heap leach extraction of gold. This method of mining and extraction is judged to give the quickest cash flow to the project.

INTRODUCTION

The Goldfield-Mammoth Mining District lies in the south-central part of the state of Arizona, about 35 miles east from the center of the city of Phoenix. Production of gold from the district has been principally from the Mammoth Mine during the period 1890 to 1893 with lesser amounts from 1910 to 1930. This mine and the presently less important open cut workings of the Black Queen Mine lie within the property covered by this report.

Additional gold mineralization was substantiated by two more recent programs of drilling on the property, one in 1984 and the other in 1987. Records of both programs are incomplete.

Background and commission

Mr. Marshall A. Ott of Western Labs and Engineering (WLE) contracted Darry, Michener, Booth & Wahl, Inc. (DMBW) on October 19, 1989 with the request that a review be made of the Mammoth property with the object of recommending a program of work to define and develop the gold potential of the property. Mr. Brian W. Hester of DMBW subsequently visited the Mammoth property from October 29-31, 1989 and November 11-14, 1989.

Following discussions between DMBW and Mr. Ott, WLE, commissioned Sierra Engineering and Mining Corporation of

Scottsdale, Arizona to perform a program of surface sampling over and around known mine workings. This work was conducted under the direction of Mr. Harvey W. Smith, Registered Professional Engineer (Mining) Number 2878 in the state of Arizona. Mr. Smith did the patent work on the Mammoth claim from 1961-64. Certificates of assays made on these samples by Michael G. Jacobs (Registered Assayer Number 11650 in the state of Arizona) are included with this report as Appendix A.

Other reports referred to are:

1. A geological report on the Mammoth property of Brace Resources situated 30 miles east of Phoenix, Arizona, U.S.A., by D. R. Morgan, P. Eng. (registered in the Province of British Columbia) and dated February 9, 1984.

2. Report on the Goldfield Mines, Apache Junction, Arizona for Hewlett Management April 1, 1987, by Frank H. Buchella, Jr., P.E. (Registered in the state of Arizona under certificate number 13158).

3. Geology and structure of the Goldfield Mining District, Maricopa and Pinal Counties, Arizona. A Master of Science thesis by Thomas Ryan Kilbey, Arizona State University, August, 1986.

Location, Access, and Topography

The property lies 35 miles east of the center of the city of Phoenix, Arizona and about 4 1/2 miles northwest of the suburb of Apache Junction. It is close (1-2 miles) to the base of the western slope of the Superstition Mountains (Figure 1). The property is located in Section 36, T2N, R8E and Section 1 T1N, R8E, straddling the boundary between Maricopa and Pinal Counties. The latitude and longitude are roughly 33°28'N and 11°29'W. The property is covered by the Mesa 2 degree topographical sheet of the U.S.G.S. (Number N1 12-8).

From Phoenix, the property is reached by State Highways 60 and 89 to Apache Junction and then by State Highway 88 otherwise known as the "Old Apache Trail". A gravel access road on the property meets Highway 88 at a point about four miles north of Apache Junction. The journey from the international airport at Phoenix takes about 45 minutes by car. The property itself is well served by dirt tracks suitable for motor vehicles.

The property lies on the western outwash plain of the Superstition Mountains at an elevation of about 2,000 feet ASL. An ephemeral stream, known as Weekes Wash, flows across the southern end of the property. There are no other water courses of note on or close to the property, but it

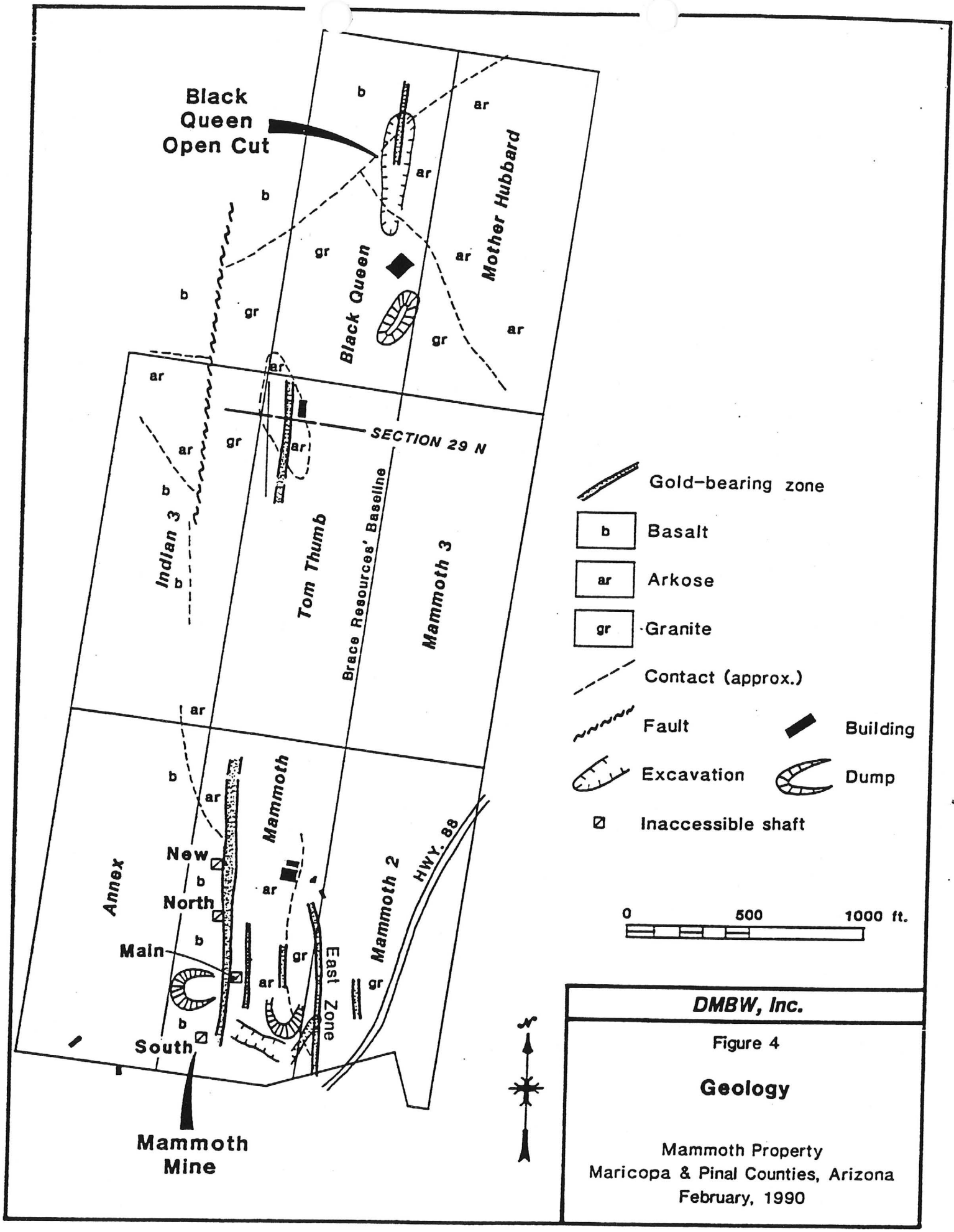
Between 1951 and 1953, about 3,205 ounces of gold were recovered by small scale operators under terms of a lease. The site of these activities is not recorded.

In 1979, Goldfield Mines, Inc. leased the property to a Mr. Harlow Sanstead who conducted small scale, high grade mining operations. Details of this work are not available other than a 9 page affidavit written by Sanstead regarding the occurrence of gold in panned samples. There is no record of production, although numerous shallow excavations attributed to this period of work are credited with hosting spectacular specimens of gold.

In 1984, Goldfields Mines, Inc. and Triple S Mining Company granted an option to buy the property to a joint venture managed by Brace Resources Limited, a public company incorporated in British Columbia, traded on the Vancouver Stock Exchange, and now succeeded by Brace International Limited. The joint venture consisted of Brace with a 60% interest and Ansco Resources (B.C.) Ltd. with 40%. These companies shared common management.

Brace commissioned the report by D. R. Morgan, P.Eng., referred to above and which resulted in 1984 in a program of drilling using diamond and reverse circulation equipment (Figure 5). The greater part of the results of this work have been recovered by WLE and are incorporated herein where appropriate. Values of interest cut in holes drilled during the Brace program are presented in Table 1.

An amended version dated March 16, 1984 of the plan dated February 9, 1984 which forms part of Morgan's report, shows the

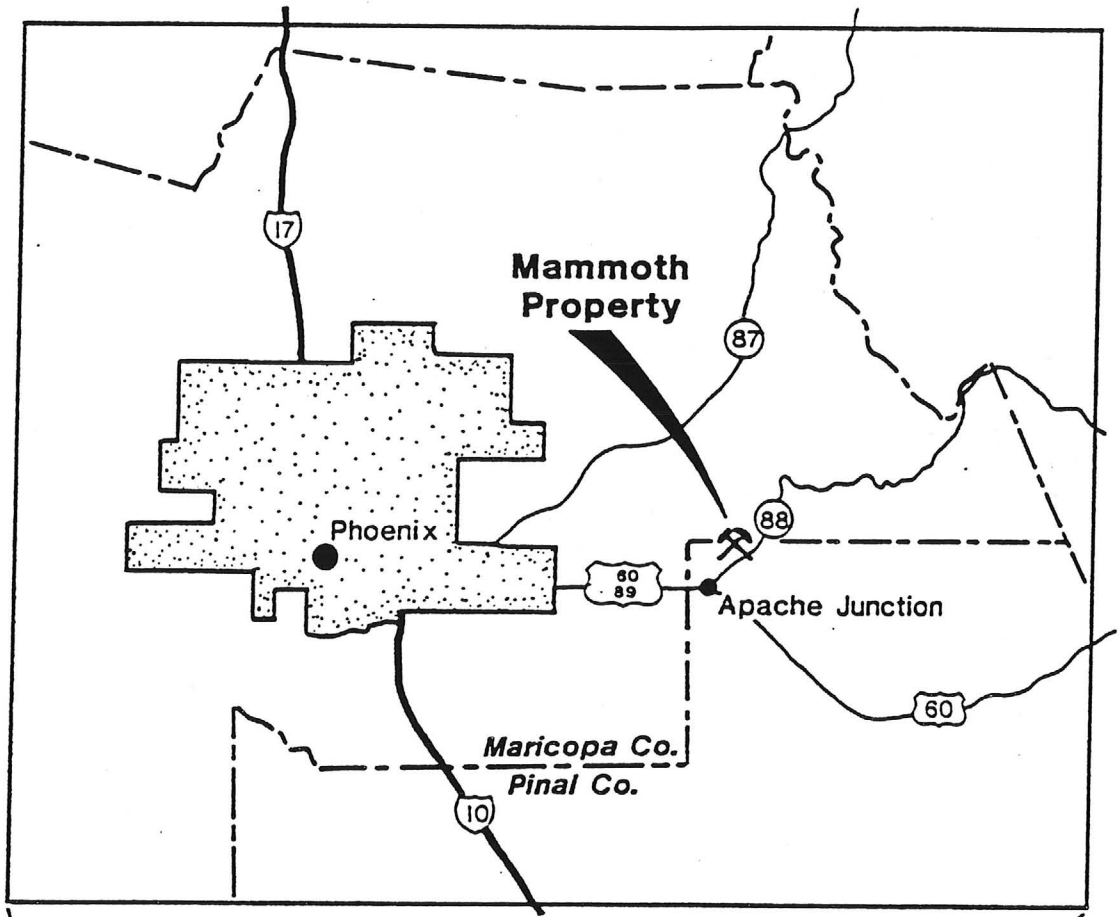


DMBW, Inc.

Figure 4

Geology

Mammoth Property
Maricopa & Pinal Counties, Arizona
February, 1990



DMBW, Inc.

Figure 1

Location

Mammoth Property
Maricopa & Pinal Counties, Arizona
February, 1990

should be noted that there is at least one spring fed pond on the property.

The property enjoys a semi-desert climate with mean daily temperatures falling in the range of 50° in January to 90° in July. Annual rainfall averages about 7.1 inches.

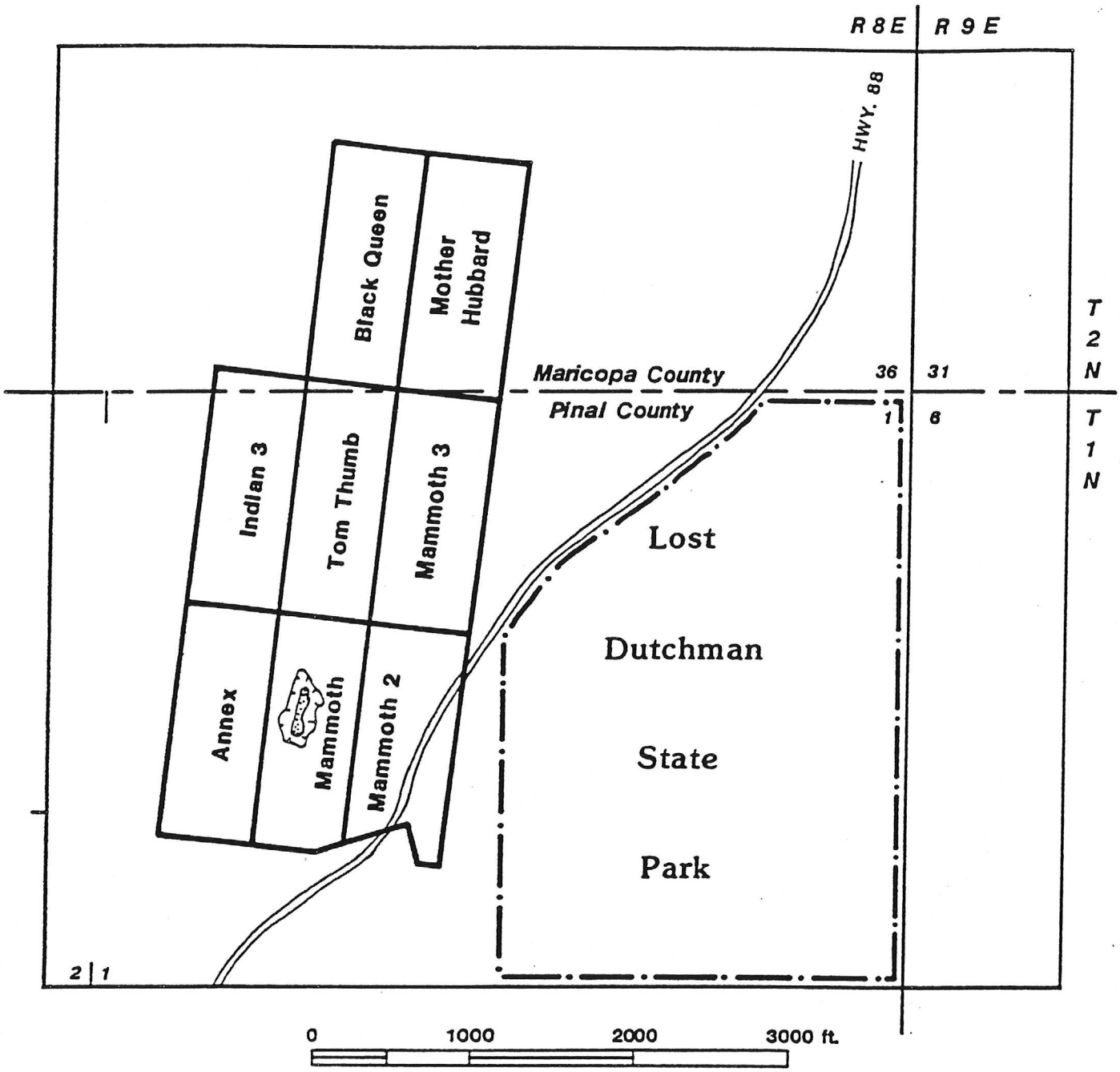
Observations of the water level in old workings show that the natural water table is at depths of less than fifty feet below the mean surface of the ground.

Vegetation is sparse and includes varieties of cactus and shrubs typical of the desert environment. There is no timber of value for mining on the property.

Property

This report covers the following properties and claims:

Name of Claim	County	Book	Page	BLM No.
Annex	Pinal	36	295	137400
Black Queen	Pinal	38	288	137393
	Maricopa	27	256	
Indian #3	Pinal	36	261	137403
	Maricopa	27	1	
Mammoth #2	Maricopa	38	448	137396
	Pinal	38	296	
Mammoth #3	Pinal	27	263	
	Maricopa	38	299	50452
Mother Hubbard	Maricopa	27	256	
Tom Thumb	Pinal	38	287	137398
	Maricopa	27	257	
Mammoth Lode patented claim	Pinal	Patent No. 02-65-0071 granted Dec. 23, 1964, County Recorder Docket 768, page 551.		



DMBW, Inc.

Figure 2

Claims

Mammoth Property
Maricopa & Pinal Counties, Arizona
February, 1990

The general arrangement of these claims is shown in Figure 2.

A formal title search was beyond the scope of the DMBW commission. The above data was provided by Mr. Ott of WLE, who also advised that title was held by M & M Enterprises, a general partner of WLE. Title was awarded to M & M Enterprises by the Superior Court of Arizona on August 17, 1989.

HISTORY AND PREVIOUS WORK

Early prospecting in the area led to staking of the Mammoth claim in the late eighteen eighties, although there is some evidence to indicate these may have some Spanish and Mexican mining going on as early as 1536. High grade gold mineralization was revealed following a flash flood in 1890. A mine was quickly developed and a reported $1,000,000 (about 50,000 ounces) worth of gold removed before a second flood invaded the mine filling much of the workings with debris. Contemporary sections of the mine show seven levels to have been developed between surface and a depth of 420 feet. High grade gold mineralization was found in tabular bodies 5-20 feet wide, dipping at about 82° to the west on the contacts of a sheared zone about thirty feet thick, composed of what has been variously termed "pegmatite" and "granite". Ore was stoped from two short shoots. Longitudinal

have been consumed in subsequent test work and small scale activity. In appended notes, Buchella describes how he estimated the stated reserve of proven ore at the Black Queen deposit by sampling the floor of the cut and assuming values extend for fifty feet both along strike and down dip. Any plan or section showing the location and value of the samples used in this estimate are missing from the copy of the report provided DMBW. DMBW presumes the values cut in diamond hole 7 of the Brace program were utilized.

The assay certificates supplied by Jacobs, marked "Argo" and purported to relate to drilling on the Black Diamond property under Buchella's direction, are dated July, 1987. None of these results are incorporated into any contemporary report in the possession of WLE and the locations of the drill holes remain unknown. DMBW recommends that efforts continue to be made to locate these records, as the assay certificates indicate several samples contain values of interest.

A plan showing the contours of gold values used by Buchella in estimating probable reserves is included in his report. These contours were generated by a computer program using assays from 206 chip samples.

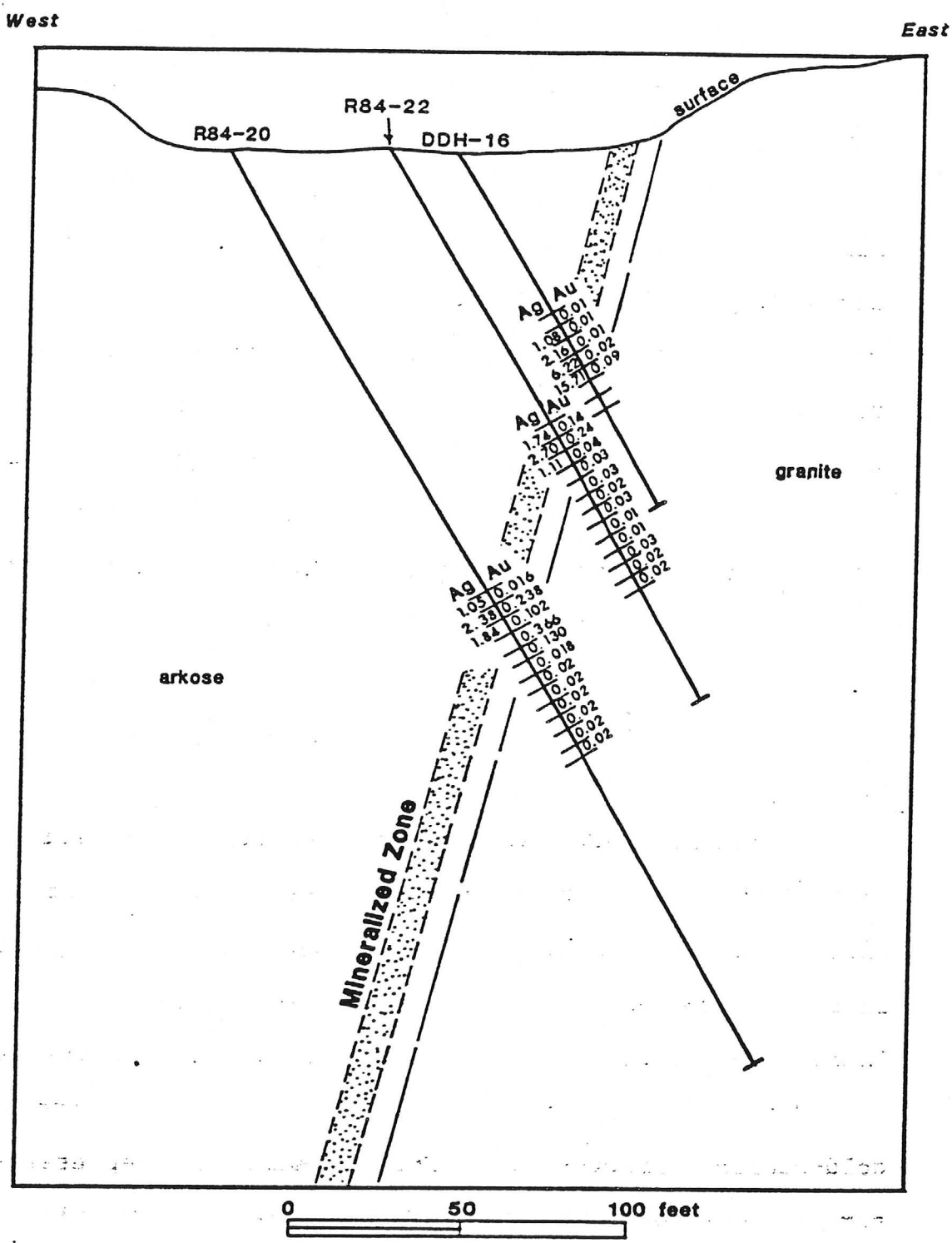
DMBW cautions that the procedure described may not conform to the definition of probable ore according to accepted standards generally used in the industry, but draws attention to the values as evidence of extensive mineralization which requires additional testing and evaluation.

location of the collar of Diamond Drill Hole 7 close to the Black Diamond Pit on the Black Diamond claim. This is the only evidence of any drilling on that claim during Brace's program. Presumably the hole was directed beneath the mineralization exposed in the pit.

From the report by Frank H. Buchella, Jr., P.E., dated April 1, 1987 and referred to above, it would appear that at some time before this date control of the property had been acquired by Hewlett Mineral Management, or a related group and that a second drilling program had been completed. Maps showing the location of holes completed during this program are not available, but assay certificates provided by Mr. Michael Jacobs, the assayer referred to earlier, suggest the drilling program was extensive. DMBW is advised that this drilling was confined to the Black Queen claim (Figures 2 and 4). Buchella presents the following tabulation of ore reserves:

Class	Description	Tonnage	Grade oz. Au/t	Recoverable oz. Au/t
Proven	Crushed stockpile	15,000	0.15	2,025
	Mine stockpile	10,000	0.15	1,350
	Black Queen Pit:			
	Depth 100 feet	85,000	0.25	19,125
		110,000 tons	0.23	22,500
Probable	Gold Contours: (minus proven ore) Depth = 150 feet	429,000	0.25	96,525
Possible	Mammoth-Black Queen	600,000 tons	0.19	102,600

Neither of the two stockpiles included in the above table was evident at the time of DMBW's visits. Both are assumed to



Assay values for gold and silver are in ounces per ton.

Brace Resources drilling as reported by D. R. Morgan, P. Eng., 1984.

DMBW, Inc.

Figure 7

Drilling Results
Cross Section 29 N

Mammoth Property
Maricopa & Pinal Counties, Arizona
February, 1990

0.16 oz. Au/t, but these are not contiguous. The surface position of this zone is roughly along the line separating the Mammoth No. 2 and Mammoth claims (Figure 4).

There is no evidence for the continuation of this "East" zone in underground workings, but further evidence comes from a series of pits marked on old plans. These coincide with the projected position of the zone found by drilling and two have dollar values marked against them. These are presumably derived from assays. All evidence of these pits has been destroyed by subsequent surface work.

Further east again there is yet another shear zone in a trench and pit excavated by Sanstead. Several assays of interest were obtained from samples cut here under the direction of Mr. H. E. Smith and shown in Figure 6.

It is not possible to project these secondary zones northwards with any confidence across the 2,000 feet of ground which has not yet been prospected, although WLE reports the "high quartz spider stringers" pan well in this area. It seems possible that either of the two most westerly zones near the Mammoth could be represented by the Black Queen zone. It is unlikely that any high grade gold at surface would have been missed by the early prospectors so drilling for deeper targets seems the sensible approach to pursue in testing this area. This is especially so given the results of the Brace drilling on Section 29N shown in Figure 7. Testing for bodies of gold mineralization of

commercial value on these fractures should receive priority second to that on the Main Zone.

RECOMMENDED PROGRAM

Widespread occurrence of gold in surface samples (Figure 6), the intersections of interesting values recovered from the Brace drilling (Table 1 and Figures 3, 7, and 9), and the history of past successful mining activities, all point to the existence of further potential for the Mammoth property. These possibilities justify a phased program of exploration.

Phase I

The first phase of such a program should consist of trenching to expose and allow sampling of the zones known to contain gold. This should be supplemented by a program of drilling using reverse circulation equipment. First priority should be given to the investigation of possible wide zones of mineralization in the walls of the Mammoth Mine structure as suggested by old plans and results of the Brace drilling, as well as WLE's pilot ore runs.

Continuity of the values encountered by the Brace drilling on cross section 29N (Figures 4 and 7) should be investigated by drilling both to the south, towards the Mammoth Mine, and to the north towards the Black Queen Mine.

Depth and lateral extensions of the Black Queen vein should also be tested.

Much of the gold occurring in the veins is known to be coarse and distributed erratically within the zones. To lessen the effects of these conditions, all the cuttings recovered from each drill hole intercept of the veins should be treated in the plant at Apache Junction, or in the 1 tph pilot plant at the mine site, to recover all the contained "free" gold. Splitting of the cuttings seriously impairs the representivity of the resulting sub-sample. Coarse gold should be recovered in either of the plants and weighed to allow calculation of the true grade of the intercept.

All fractures exposed by the trenching should be sampled. Sampling should be extended well into the wallrocks to test for any wide zones of low grade mineralization. If continuous mineralization of either high grade in fractures or disseminated low grade can be identified, a bulk sample of five to ten tons should be mined and the contained gold separated by gravity means. It should be practical to do this in either of the plants owned by WLE in Apache Junction, or at the mine site. Results of this work will provide a better estimation of gold content than the smaller channel samples and will also give an indication of the range and distribution of the sizes of gold particles present. Tailings produced by the gravity

process should be treated with cyanide, or equivalent, or ion exchange resin process to recover any fine-grained gold.

The mineralogical character of the ore should be studied as a guide to the ultimate selection of methods of concentrating the gold.

Remaining drill core from the Brace program should be examined for evidence of the depth of oxidation.

In the execution of any further work on the property, including that of Phase I, it is essential that a system of survey control be established so that the position of samples, drill holes, and excavations are plotted routinely and accurately on proper base maps using a system of coordinates.

Phase II

Initiation of the second phase of the program will depend upon encouraging results from the first phase. Should a second phase be justified, it should consist of drilling on fifty foot centers to a depth of not more than 500 feet below surface. The object of Phase II would be to define individual ore bodies.

Also, an environmental study should be made on initiation of the second phase. This should be done by a competent group of consultants. The property lies within what could prove to be an environmentally sensitive area

adjoining the Lost Dutchman State Park and not far from residential areas. Any potential "fatal flaws" should be recognized and addressed as early as possible.

As part of this phase of the investigation, a topographic map should be made of the active part of the property. Contours at intervals of no more than five feet should be plotted. Areas for the disposal of waste rock and tailings should be selected and a mill site identified possibly on the Tom Thumb, which connects the Mammoth and Black Queen claims. Methods of disposal or storing water pumped from the old workings should be studied.

Sampling of the wall rocks of the fractures should be extended so as to establish the limits of blocks amenable to surface mining. It is desirable to establish these at an early date, as they would represent a ready source of cheap ore which might be amenable to heap leaching with cyanide or alternate solution and so produce an early cash flow for an operation.

Phase III

Successful completion of the program thus far would justify a third phase which would lead to a production decision. To start with, plans would have to be made to establish openings underground in which the nature and extent of mineralization outlined by drilling from surface

could be examined. Condition of the old shafts is uncertain. The more practical approach, at least initially, would be to enter the old mine by way of an inclined ramp driven at about 15 degrees below horizontal and located entirely in the west wall of the old workings. The same opening would be suitable for taking out ore from depths of up to 400 or 500 feet. Initially, the ramp should be designed to reach only to a depth of about 200-300 feet below the surface and connections made to the several drifts at and above this level.

As soon as practical, a 10-30 ton bulk sample of typical mineralization should be mined and sent for metallurgical appraisal by a reputable laboratory.

At the conclusion of this stage there should be enough information for a feasibility report and plant design which would serve as the basis for raising funds needed to implement production.

Budget

Details of the proposed three phase program are as follows:

Phase I

Claim & Work	Linear Feet	Time (Days)	Cost ($)
Trenching with backhoe			
Mammoth & Mammoth 2 7 cross lines 400' long (100' spacing) on Main and subsidiary zones)	2,800	6.0	3,000
Tom Thumb 14 cross lines 150' long (100' spacing) (on Main zone)	2,100	4.0	2,000
Black Queen 4 cross lines 150' long (100' spacing) (on BQ zone)	600	1.5	750
	5,500	11.5	5,750
Sampling & Surveying			
Geologist/Engineer @ $600/day		5.0	3,000
Assistant Geologist @ $400/day		14.0	5,600
Helper @ $100/day		14.0	1,400
		33.0	10,000
Room & Board, @ $60/da.		19.0	1,140
Travel			1,000
		19.0	2,140
Assaying			
500 samples, AA analysis @ $5/each			2,500
100 samples, Fire analysis @ $8/each			800
			3,300
Reclamation and Permitting			2,000
Total			23,190
Total for Trenching Program			23,190
SAY			24,000

Claim & Work	Feet	Time (Days)	Cost ($)
Drilling			
37 holes drilled with Reverse Circulation equipment, 4 holes on each of 9 sections spaced 100' apart, to meet structure at 100'intervals from surface. One hole on additional section to cut structure at 400'. All holes to be collared at 55 degrees.	12,020		
Cost of $12/ft. including mob and demob			144,240
Lapsed time at 200 ft/day		60.0	
	12,020	60.0	144,240
Supervision			
Asst. Geologist @ $400/day		60.0	2,400
Helper @ $100/day		60.0	6,000
		120.0	8,400
Room & Board @ $60/day		60.0	3,600
Travel			1,400
		60.0	5,000
Assaying			
1,200 AA assays @ $5/each			6,000
200 Fire Assays @ $8/each			1,600
			7,600
Operation of Gravity Plant @ Apache Junction			
Say, 15 days @ $500/day			7,500
Total			172,740
Contingencies			
Total for Drilling Program			172,740
SAY			173,000

TOTALS FOR PHASE I		
Trenching	24,000	
Drilling	173,000	
Reporting and Compilation	10,000	
TOTAL TOTAL FOR PHASE I	207,000	
CONTINGENCIES @ 10%	20,700	
TOTAL	227,700	
SAY	228,000	

Phase II

Claim & Work	Feet	Time (Days)	Cost ($)
Drilling			
30 holes with Reverse Circulation equipment to block out ore zone on 50 foot centers	9,750		
Cost of $12/foot, including mob and demob			117,000
Lapsed time @ 200 feet/day		49.0	
	9,750	49.0	117,000
Supervision			
Asst. Geologist @ $400/day		50.0	20,000
Helper @ $100/day		50.0	5,000
Travel, Room & Board (geologist) @ $60/day		50.0	3,000
			28,000
Assaying			
120 Fire Assays @ $8/each			9,600
Operation of Gravity Plant @ Apache Junction			
Say, 10 days @ $500/day			5,000
Total Drilling			159,600
Environmental Study			25,000
Topographic Map			15,000
Site study, dump site selection, etc.			5,000
Compilation, Ore Reserve Estimates, Report			15,000
Total			219,600
TOTAL PHASE II			219,600
CONTINGENCIES @ 10%			21,960
TOTAL			241,560
SAY			242,000

Phase III

Claim & Work	Feet	Time (Days)	Cost ($)
Drive decline ramp at 15 degrees to meet existing level 200 feet below surface at Mammoth Mine and drive through ore at five sites, 1,000 feet lateral work @ $1,000/ft.			1,000,000
Metallurgical test work on 30 ton bulk sample			25,000
Engineering work and plant design			50,000
Feasibilty Report			30,000
TOTAL COST, PHASE III			1,105,000
CONTINGENCIES @ 10%			110,500
TOTAL			1,215,500
SAY			1,220,000

RECAPITULATION

PHASE I	228,000
PHASE II	242,000
PHASE III	1,220,000
TOTAL	1,690,000

DERRY, MICHENER, BOOTH & WAHL
(DMBW, INC.)

MINING AND GEOLOGICAL CONSULTANTS

- *13949 W. Colfax Ave., Suite 110*
- *Golden, Colorado 80401*
- *Telephone: (303) 233-8786*
- *Telex: 296466*
- *Telecopier: (303) 232-2586*

March 1, 1990

LETTER OF AUTHORIZATION

Subject: PROPOSED EXPLORATION PROGRAM
FOR THE
MAMMOTH PROPERTY, GOLDFIELD-MAMMOTH MINING
PINAL AND MARICOPA COUNTIES, ARIZONA
Dated March 1, 1990

To Whom It May Concern:

We hereby authorize the use of the above described report in a Statement of Material Facts, or in a Prospectus.

Signed,

Brian W. Hester, Associate
P. Eng. (Ontario) #19438019
FGAC #1177

CERTIFICATE OF QUALIFICATIONS

I, Brian Hester, residing at 14690 West 58th Place, Arvada, Colorado, do hereby certify that:

1. I am a consulting geologist employed by Derry, Michener, Booth & Wahl, Inc.

2. I am a graduate of the Royal School of Mines, London with the degree of B. Sc. in Mining Geology in 1950 and of the University of Toronto, Toronto, Ontario with the degree of M.A. Sc. in 1954.

3. I have been practicing my profession for 40 years.

4. I am a Certified Professional Engineer of the Province of Ontario and a Fellow of the Geological Association of Canada

5. I have not received, nor do I expect to receive, any interests, directly or indirectly, in the stock of Western Labs & Engineering, or any associated or related corporation.

6. I have no past or present, direct, indirect, or contingent interest in the property which is the subject of this report, or in any property within a radius of 10 kilometers of the subject property.

7. The statements contained in this report and the conclusions reached are based upon my review of published data and of unpublished data made available to me by Western Labs and Engineering and my own personal examination of the property made on October 29-31 and Nov. 11-14, 1989.

Brian W. Hester

Brian W. Hester, Associate
P. Eng. (Ontario)#19438019

KIMBALL LABORATORIES
AND CONSULTING

[illegible] EAST 11800 SOUTH
DRAPER UTAH 84020
Telephone 571-3695

October 1, 1981

Valorex Corporation
2351 South 2300 West
Salt Lake City, Utah 84119

Dear Sirs:

On September 29, 1981, I observed a test run on a disintegrator and concentrator at Valorex. Prior to the test run the equipment had been cleaned, checked, and sealed by Valorex personnel. I verified that the equipment was clean.

A 55-lb sample of ore, approximately ¼-inch or less, was weighed in my presence from which I split out about 2 lbs for a head sample for test purposes. This was sealed inside a container. The remainder of the ore was later used as the feed ore for the disintegrator.

Circulating water was turned on and allowed to flow over the concentrator tables for a few minutes. Some residue material was passing over the tables with the water. I took a sample of this material and analyzed it in the laboratory. No gold was present. The disintegrator was turned on at 3:11 p.m., ore was fed into the disintegrator, and the disintegration was complete by 3:23 p.m. The unit was allowed to run approximately 10 minutes more in order for the material to pass over the tables completely. The unit was then turned off.

The concentrate was washed from the tables into a clean container and the container was sealed.

Water from the tailings container was decanted from the tailings and approximately 5 lbs of tailings were removed for test purposes, placed into a container, and sealed. The bulk of this sample was taken from across the bottom and corners of the container holding the tailings.

The three samples (heads, concentrate, and tailings) remained in my possession at Valorex and were brought by me to my laboratory where the concentrate and tailings were dried and the concentrate weighed. Duplicate fire assays for gold and silver were performed on the three samples.

One sample each of the heads, concentrate, and tailings are to be delivered to Union Assay Office and Rocky Mountain Geochemical by tomorrow at the latest.

A certificate of analysis showing the results of the tests performed at this laboratory accompanies this letter.

The per cent recovery of gold and silver is based on a calculated head assay using the results from the analysis of concentrate and tailings as a basis for the calculation. The calculated head assay is higher for gold and no easy explanation for this difference is available. Samples were carefully prepared and assayed.

The recovery of this disintegrator and concentrator is very favorable compared with other types of concentrator systems. The operation of the equipment is reasonably simple. It may be possible to increase the recovery percentage by cleaning the tables more frequently or using a small concentrator table similar to the ones being used and placing it just before the tailings container. No attempt is made here to evaluate the use of the equipment from an economical point of view, but from an operational perspective should compete extremely well with other pulverizing-concentrating approaches that are presently used.

I certify that the foreoing is a true and accurate statement of the events related to the test observations, sampling, and assaying. I also certify that the results shown on the certificate of analysis are those obtained here at this laboratory using standard fire assay techniques.

Sincerely,

G. Lyn Kimball

G. Lyn Kimball
Manager

GRADUATE SCHOOL
OF BUSINESS

October 5, 1981

Valorex Corporation
2351 South 2300 West
West Valley City, Utah

Dear Sirs:

The attached exhibits provide computational verification of the Kimball Laboratories Certificate of Analysis for tests conducted on the 15th and 29th of September, 1981 for Valorex Corporation. The computations and methods appear valid for both tests.

I personally observed the test on the 29th of September, and concur with Mr. G. Lyn Kimball's description of this test contained in his letter dated October 1, 1981. Careful mixing and a splitter were used to obtain a valid head sample. In my opinion the results of this test are statistically valid. This opinion is based on my observations of the sampling method, test procedures, security measures, and my computational verifications.

Sincerely

LeRoy G. Faerber

Dr. LeRoy G. Faerber
Professor

Attachments: Exhibits A and B

EXHIBIT A

Computational verification of Kimball Laboratories Certificate of Analysis for Valorex Corporation. Sample number 6819 - 6821 (Gold). Samples taken on 15 September 1981.

Sample No.	Sample Weight (in tons)	X	Average Assay (oz./ton)	(=)	Gold in Sample (in oz.)
6819 - Head ($\frac{47 \text{ lbs.}}{2000 \text{ lbs.}}$) =	.0235		0.227		.0053345
6820 - Concen. ($\frac{.407 \text{ lbs.}}{2000 \text{ lbs.}}$) =	.0002035		15.80		.0032153
6821 - Tails ($\frac{46.593 \text{ lbs.}}{2000 \text{ lbs.}}$) =	.0232965		0.027		.000629
	Total gold in concentrate and tails				.0038443

Calculated % Gold Recovery:

Gold in concentrate/Gold in concentrate and tails -

$$\frac{.0032153}{.0038443} = 83.6\%$$

Calculated Head Assay:

Gold in concentrate and tails/Sample weight of head -

$$\frac{.0038443}{.0235} = 0.164 \text{ oz./ton}$$

Relationship of Calculated Head Assay to Average Sample Head Assay:

Calculated head assay/Sample head assay -

$$\frac{.164}{.227} = 72.2\ \%$$

Conversion Factors:

1-troy oz. = 31.1035 grams, 453.5 grams = 1 lb.
14.58 troy oz.= 1 lb, 2000 lbs. = 1 ton

EXHIBIT B

Computational verification of Kimball Laboratories Certificate of Analysis for Valorex Corporation. Sample numbers 7080 - 7082 (Gold) Sample taken on 29 September 1981

Sample No.	Sample Weight (In tons)	X	Average Assay (Oz./ton)	(=)	Gold in Sample (In oz.)
7080 - Head	$\frac{53 \text{ lbs.}}{2000 \text{ lbs.}} = .0265$		3.103		.0822295
7081 - Concen.	$\frac{1.012 \text{ lbs}}{2000 \text{ lbs.}} = .000506$		335.17		.169596
7082 - Tails	$\frac{51.988 \text{ lbs.}}{2000 \text{ lbs.}} = .025994$		0.154		.004003
	Total Gold in Concentrate and Tails				.173599

Calculated % Gold Recovery:

Gold in concentrate/ Gold in concentrate and tails -

$$\frac{.169596}{.173599} = 97.7\ \%$$

Calculated Head Assay:

Gold in concentrate and tails/ sample weight of head -

$$\frac{.173599}{.0265} = 6.55 \text{ oz./ton}$$

Relationship of Calculated Head Assay to Average Sample Head Assay:

Calculated Head Assay/Sample Head Assay -

$$\frac{6.55}{3.103} = 211\ \%$$

Conversion Factors:

1-troy oz. = 31.1035 grams, 453.5 grams = 1 lb.
14.58 troy oz. - 1 lb. , 2000 lbs = 1 ton

ROCKY MOUNTAIN GEOCHEMICAL CORP.
1323 W 7900 SOUTH • WEST JORDAN, UTAH 84084 • PHONE (801) 255-3558
WEST JORDAN OFFICE

Certificate of Analysis

Date: October 15, 1981

Client: Valorex Corp.

RMGC Numbers:
Local Job No.: 81-32-38
Foreign Job No.:
Invoice No.: M104329

Client Order No.: None

Report On: 3 pulp samples

Submitted by: Valorex Corp.

Date Received: October 2, 1981

Analysis: Gold and Silver

Analytical Methods: Fire Assay

Remarks:

cc: enc.
File (2)
GJC/cl

Sample No.	oz/ton Gold	oz/ton Silver
7080 B Heads	6.117	46.83
7081 B Conc.	342.280	882.02
7082 B Tails	.353	7.89

Computational review of Rocky Mountain Mountain Geographical Corporation Certificate of Analysis for Valorex Corporation. Sample numbers 7080 B - 7082 B (Fire Assay - Gold).
Sample taken September 29, 1981

Sample No.	Sample Weight (in tons)	X	Average Assay (Oz./ton)	=	Gold in Sample (in oz.)
7080 B - Head ($\frac{53 \text{ lb.}}{2000 \text{ lbs.}}$)	= .0265		6.117		0.1621005
7081 B - Concen. ($\frac{1.012 \text{ lb.}}{2000 \text{ lbs.}}$)	= .000506		342.280		0.1731936
7082 B - Tails ($\frac{51.988 \text{ lbs.}}{2000 \text{ lbs.}}$)	= .025994		0.353		0.0091758
			Total Gold in Concentrate and Tails		0.1823694

Caluclated % Gold Recovery:
Gold in Concentrate/Gold in Concentrate and Tails -

$$\frac{.1731936}{.1823694} = 95.0\%$$

Calculated Head Assay:
Gold in Concentrate and Tails/Sample Weight of Head -

$$\frac{0.1823694}{.0265} = 6.882 \text{ oz./ton}$$

Relationship of calculated Head Assay to Average Sample:
Calculated Head Assay/Sample Head Assay -

$$\frac{6.882}{6.117} = 113\%$$

Conversion Factors:

1-troy oz. = 31.1035 grams, 453.5 grams = 1 lb.
14.58 troy oz. = 1 lb., 2000 lbs. = 1 ton

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

BRYANT L. LARSEN, President
G. P. WILLIAMS, Vice President
JAMES G. STRATTON, Secretary
A. S. JOLLIFFE, Treasurer
P. O. Box 1528
Salt Lake City, Utah 84110
(801) 363-3302

Telephone 363-3302

Hand Sample Serial 50390-95

Mine Valorex Corp

Oct 19, 1981

RESULTS PER TON OF 2000 POUNDS

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. Per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
6819-A Heads	0.100	1.5									
6820-a Cons	12.400	14.8									
6821-A Tails	0.030	1.6									
7080-A Heads	6.240	36.2									
7081-A Cons	258.590	1093.4									
7082-A Tails	0.345	9.3									

Remarks

Charges $ 60.00

Computational review of the Assay Report from Union Assay Office, Inc. for Valorex Corporation. Sample numbers 7080 A - 7082 A (Fire Assay - Gold). Sample taken September 29, 1981

Sample No.	Sample Weight (in tons)	X	Average Assay (Oz./ton)	=	Gold in Sample (in oz.)
7080 A - Head ($\frac{53 \text{ lb.}}{2000 \text{ lbs.}}$) =	.0265		6.240		0.1653600
7081 A - Concen. ($\frac{1.012 \text{ lb.}}{2000 \text{ lbs.}}$) =	.000506		258.59		.1308465
7082 A - Tails ($\frac{51.988 \text{ lbs.}}{2000 \text{ lbs.}}$ =	.025994		0.345		.0089679
			Total Gold in Concentrate and Tails		.1398144

Calculated % Gold Recovery
Gold in Concentrate and Tails/Sample Weight of Head - $\frac{.1308465}{.1398144}$ = 93.6%

Calculated Head Assay:
Gold in Concentrate and Tails/Sample Weight of Head - $\frac{.1398144}{.0265}$ = 5.276 oz/ton

Relationship of calculated Head Assay to Average Sample:
Calculated Head Assay/Sample Head Assay - $\frac{5.276}{6.240}$ = 84.6%

CONVERSION FACTORS:

1-troy oz. = 31.1035 grams, 453.5 grams - 1 lb.
14.58 troy oz. = 1 lb., 2000 lbs. - 1 ton

KIMBALL LABORATORIES
AND CONSULTING

600 EAST 11800 SOUTH
DRAPER UTAH 84020
Telephone 571-3695

Certificate of Analysis

Date: October 1, 1981

Client: Valorex Corporation
2351 South 2300 West
Salt Lake City, Utah 84119

Sample Number: 7080 - 7082

Date received: September 29, 1981

Submitted by: Samples taken by G. Lyn Kimball for and in behalf of Valorex Corporation

Samples analyzed for: Gold, Silver

Results:

Sample No.	Your Sample No.	Gold (oz/ton)	Silver (oz/ton)
7080	Head Sample 1	3.424	36.263
	Head Sample 2	2.784	36.488
	Average:	3.103	36.376
7081	Concentrate Sample 1	336.25	829.66
	Concentrate Sample 2	334.09	843.26
	Average:	335.17	836.46
7082	Tails Sample 1	0.116	7.83
	Tails Sample 2	0.191	7.40
	Average:	0.154	7.62

Remarks:

Weight of Heads into disintegrator: 53 lbs
Weight of Tails (Head wt - Con wt): 52 lbs
Weight of Concentrates: 459 grams
Concentration ratio (wt heads/wt cons) 52.4
Calculated Head Assay: (Gold) 6.544 (Silver) 23.43
Calculated % Precious Metal Recovered in Concentrates: 97.7 % (Gold)
82.4 % (Silver)

By G. Lyn Kimball
G. Lyn Kimball, Manager

ALL VALUES REPORTED AS [illegible]

WILKINSON ASSAYS

ASSAY REPORT

8849 SIERRA AVE. FONTANA, CA. 92335 SINCE 1967 PHONE; (714)823-4607

ASSAYER•CHEMIST•METALLURGIST•REFINER•GEOLOGIST•MINE CONSULTANT

CHEM. TEST	CHARGE	WEIGHT USED	DATE	PRICE PER OZ.	OZS. PER TON	GRAMS PER TON	VALUE PER TON
GOLD	5.00	1 OZ.	12/31/87	$456.	1	9.0	$ 588.39
SILVER	5.00	"	"	$ 10.70	0	5.3	$ 1.80
~~COPPER~~							
LEAD							
ZINC							
PLATINUM	10.00	"	"	$344.	0	3.4	$ 37.74
PALLADIUM							

PAID IN FULL	X	FREE MILL ORE		TELLURIDE ORE		CHLORIDE ORE	
MICRON SIZE ORE		SULPHIDE ORE	X ✓	SELENIDE ORE		SULPHATE ORE	

MELVIN SPRAGUE — SUBMITTED BY

O VEIN — SAMPLE #

Duane Williamson — ASSAYED BY

ASSAY BASED ON SPECIMENS LEFT AT LAB. ONLY BASED ON ASSAY TON OF 2000 LBS.

1

STATEMENT OF CHAS. H. DUNNING, DIRECTOR OF THE ARIZONA DEPARTMENT OF MINERAL RESOURCES, REGARDING THE DISCOVERY OF AN OLD MINE WORKING AT GOLDFIELD

I have inspected the workings on two occasions at the request of Mr. Alfred Lewis and Mr. Tom Russell, and it appears to be a true "antigua", or mine opening that antedates recorded history. The discovery was made within a stone's throw of the old Goldfield Mine workings which are reported to have produced over a million dollars in gold, but it apparently is not connected with those workings and seemingly was entirely unknown to the operators of the Goldfield.

One must visualize a vein formation or mineralized zone somewhat over 100 feet in width running parallel to a prominent wash and extending partly into or under the wash and partly along its bank. At one point a small promontory of the rather hard quartzose vein material juts out into the wash and forms a steep bank. In the wash, close to this cliff, Lewis discovered an ancient cribbed shaft dipping out under the wash at an angle of about 70 degrees.

The working was discovered accidentally but not without sensible reason. The little promontory of vein matter carried quartz stringers showing only low values on the surface. Lewis felt that these stringers might become higher grade with a little depth, so he planned to sink down in the wash a short distance and then crosscut back into the hard wall. About two feet below the wash level he began to encounter old ironwood logs, and a little deeper these took shape as a cribbed (like a log cabin) chute or shaft, completely filled with wash material.

The size of the opening inside of the timbering was only about 18 x 36 inches - too small to work in - so Lewis had to tear out the cribbing on the lower side to make room to excavate further. The fill on the underside of the cribbing extended a short distance to a wall which approximately followed the dip of the shaft. By excavating out to the wall Lewis gave himself enough room to work while still leaving three sides of the cribbing intact.

It soon became evident that the wall had been the limit of an old mining excavation, and the area in the vicinity of the shaft was a mined out and filled area. Tool marks on the wall show that it had been scaled off, and remnants of quartz sampled by Tom Russell assayed $40.00 per ton in gold.

The fill on the outside of the cribbing had been carefully placed by hand even to rocks being chinked in between the logs. This fill material is such as might have come from a mine working waste dump after the high grade had been extracted, and was not wash material. Inside the cribbing the fill is entirely wash material such as would fill any opening if a cover over the opening had given way and a flood had taken place.

All crib timbering was done with heavy ironwood logs - some of them 10" in diameter. Occasional pieces of completely rotted mesquite are encountered in the inside fill, indicating that a cover or bulkhead of this material had been used, and later had rotted away permitting a flood to fill the shaft.

At the present writing Lewis has excavated about 25 feet and the timbering and fill is continuing.

It is impossible to accurately estimate the age of the timbering but it is no doubt very old. All bark and an outer layer of the iron-

wood has disintegrated, and even mesquite will last a long time in a mine. A section of one of the ironwood logs was taken to the tree ring laboratory at the University of Arizona but they advised that it was impossible to determine its age.

If the work was done with the idea of concealment one could scarcely imagine a more thorough job. The timbering was done for permanency and at great expenditure of labor. And it must have been done from the bottom up, precluding any idea of a "prospect" shaft. It then stopped abruptly a couple of feet below the wash level where a log cover could be overlain with wash gravel, some brush dragged over it; and the first rain would obliterate all traces. Its relation to the promontory is such that floods down the creek would tend to pile more gravel on top of it instead of expose it. If one planned to come back in a reasonable time there would be no use making the cover of ironwood, but if one planned to have the shaft itself intact <u>indefinitely</u> the ironwood cribbing would be ideal.

The formation is one in which it is reasonable to expect high grade gold pockets and if the Spaniards, or the Dutchman, or whoever it was, found such an outcrop, mined it down from the surface, and then wished to leave it for a while but conceal it, there could be no more perfect way than to put in such a cribbed opening for access, fill in around it and cover it over.

The answer to most high grade gold pockets and lost mines is that they were small and worked out, and that may be the answer in this case. But the nature of the work indicates that it is a true "antigua" and that it was cleverly arranged for concealment.

February 4, 1949

Chas. S. Denning

MINERAL REPORT ON GOLDFIELD PROPERTIES

Located in

MARACOPA and PINAL COUNTIES,

STATE OF ARIZONA

owned by

GOLDFIELD, INC.

SANSTEAD MINING CO.

PAN-MINING CO.

Prepared by:
Edgar M. Chambers

Confidential Report
Prepared for
Sierra Resources, Inc.
April, 1981

CHARACTER OF THE ORE BODY

The ore body is apparently that of a shattered vein type with gold appearing free in stringers and rocks, which is enclosed in a mineralized zone of rholite combined with ferromanganese. From previous reports written over the last hundred years, an ore body has been established that runs from north to south for a distance of approximately 7,000 feet with a width at least 1,000 feet. From the exploration down on the Mammoth properties, the depth of the ore body is known to be at least 1,000 feet, and there is no reason to doubt that the depth may extend at least another 500 feet.

This does not include numberoud outcrops and mineralized showings outside the area that have been previously worked.

CONCLUSIONS AND RECOMMENDATIONS

After having spent approximately 45 days on the property and reading volumes of reports and data written as far back as 1898, it is my professional opinion that a vast ore body exists to unknown depths. As the deposit is of a porphyry origin, there is a possibility that at great depth, the gold and silver values may be replaced by a vast copper ore body. These conclusions are drawn from the presente to the north of the mammoth of an iron pyrite mine, and of drill reports from claims on the eastern boundary that have encountere-cholcapyrite to a depth of 110 feet. Also, native copper is visible in the concentrates when viewed with a 60 power microscope.

A vast drilling and sampling process is recommended to establish reserves on the limits of the ore body.

It is my recommendation that a small pilot mill, approximately 5 tons per day, be established on the Black Queen property. As the values are extremely high in gold, expansion of the present operation should commence immediately. With ore in sight, it is my feeling that a constant mill head of approximately 200 ounces of gold per ton could be fed through the pilot mill for at least the next five years. Thiswill generate approximately $500,000.00 per day, a large portion of the proceeds could be used for a large drilling and [illegible] operation to establish the extents and the values of the ore body.

INTRODUCTION

This report is prepared at the request of Sierra Resources, Inc. by its officers, and will cover the Goldfield Mines, Inc. claims which consist of one patented claim and 51 unpatented claims. The claims cover an area of ~~140,000 acres.~~ 1046 acres

The claims are as follows: Mammoth (patented), Mammoth #2, #3, Annex, Laurence, Tom Thumb, Indian #1, #2, #3, #4, #5, Black Queen, Black King, Mother Hubbard, Mother Hubbard #2, Clark Oliver, #5, #7, #9, #10, #11, #12, #13, #14, #15, #16, #17, #18, #19, #20, #21, #22, #23, #24, #25, #26, #27, #28, #29, #30, #31, #32, #33, #34, #35, #36, #37, #38, #39, #40, and #43.

Two claims which have the heaviest concentration of work, and have produced the largest amounts of gold are the Black Queen and the Mammoth. Therefore, more attention will be given to these particular claims in this report.

However, the writer has walked over the entire property and examined the entire area, and feels that with proper development, these claims could become one of the largest gold producing properties in North America.

LOCATION

The Goldfield Mines are located approximately 35 miles east of Phoenix, Arizona, and are accessible through highway 60 and highway 88, which cuts through the properties.

Highway 88 is a very good paved road and many roads criss-cross the 1,040 acres. (See Map)

GEOLOGICAL HISTORY

In Archean time the country rock was primarily an undisturbed granitic batholith, and this formation probably constituted the earth's lithosphere for the early part of the period. Pre Cambrian faulting resulted in a plane of low resistance traversing the batholith. Probably contemporaneous, or as a close sequence thereto, was the injection along this rupture of an intrusive mass crystallizing out as pegmatite. The pegmatite ascended along the fault plane, and nearing the Pre Cambrian surface, the horizontal and lateral resistance of the older wall rocks was less stable as against the super-pressure exerted by the magmatic pegmatite with the consequence that the walls of the primary were forced apart by the intruding mass to an extent consistent with the proportionate degree of resistance exerted by the wall rocks. The resultant mass solidifying between the displaced walls formed a pegmatite chonolith. Radiating along fracture planes in the older wall rocks are many injected veindikes of pegmatite magma.

The pegmatite probably extended to the Pre Cambrian surface but, owing to its structure, pegmatite resists weathering and erosion to a lesser degree than the more compact granite serving as its wall rocks. Early Paleozoic (Cambrian) weathering disintegrated the pegmatite and apparently the chonolith was eroded to a depth of 400 feet, and perhaps deeper to the East, however, movement along the master fault planes resulted in an upthrust of the footwall rocks to the extent that the Cambrian erosion elements became more quescent; probably due to segmental uplifts in the older rocks, forming barriers that precluded the intense erosive action of previous torrents. With more quiescent conditions the process became one of deposition with silicification where favorable. This deposition in the form of a fluviatile piedmont plane was made up of quartz and other fragments, both transported and local, which when consolidated formed quartzite, or graywacke, conglomerate as the bonding constituents permitted. Following this was a period of slow, long-enduring, disintegration of the conglomerate effecting for the most part the conglomerate predominently graywacke, as owing to the silicious bond in the quartzite that rock was more stable.

Toward the end of the Paleozoic era (Permian) this disintegration ceased, and the process of recementation of the residual products took place in a relatively short period of time. This is indicated by the fact that the residual recementation is an arkose-graywacke continental conglomerate. The arkose is

especially predominent along the basal contact of the conglomerate against the Pre Cambrian pegmatite. Few quartzite pebbles are noted in the later conglomerate and on the surface an unconformity is observed between the remnant Cambrian Quartzite and the recemented arkose-graywacke.

Since Permian time no great change is evidenced locally with the exception of a very considerable movement having taken place along the fault planes. The hanging wall fault, owing to its great length and depth, is amenable to the reactions of adjustment in the igneous rocks within an extensive area of the earth's lithosphere. Regionally there have been extrustions of volcanic lavas, probably late Cretaceous, such as basalt, rhyolite, trachyte, and andesite, however none of these have any relation to the problem under consideration. A basaltic flow traverses the property and fragments of the other lavas are to be found in the unconsolidated alluvium overlying the Permian and older conglomerates.

Considerable movement along the master fault planes since their primary shear is evidenced, not only by pegmatite fragments in the breccia, but by vertical displacements of the wall rocks. That these events have been accompanied by ascending vapors is evidenced by the silicification of the Cambrian conglomerate superimposing the Archean fault zones. Along fault planes in the conglomerate silicification was extensive, and enrichments of gold ores deposited forming the surface ores. This condition should obtain equally as rich in the conglomerate superimposing the footwall fault.

SUMMARY OF HISTORIC GEOLOGY

The Historic Geology may be summarized thus:

First:	Undisturbed granite batholith.
Second:	Faulting in a North and South plane in the batholith.
Third:	Injection into this fault rupture of pegmatite magma which forced component parts of wall rocks apart.
Fourth:	Continued movement in planes of faulting built up wide fault zones which in turn were heavily mineralized.
Fifth:	Erosion of less stable pegmatite with later faulting of foot wall with up thrust.

Sixth: Arresting of erosion and the gradual building up in Cambrian time of piedmont plans composed of the detrital material from granite and pegmatite. The latter is predominent. Areas of this material consolidated to a quartzite, or graywacke as conditions favored.

Seventh: A long period of weathering (Cambrian to Permian) disintegrated the conglomerate, particularly the graywacke.

Eighth: During a short period of time (Permian) products of disintegration consolidated into residual arkose conglomerate.

Ninth: Weathering and leaching (Permian to and including Quaternary Recent) has extensively returned solubles to belt of cementation.

In the above outline of the geologic history consideration as to their occurrence is taken of all the three great classes of rocks in the earth's lithosphere. An outline of the physical conditions, and the characteristics of these rocks is as under:

1. Igneous - The granites in mass as a batholith. The pegmatites as an injected choloith along a low resistance plane in the batholith, and also as vein-dikes in fracture planes in the wall rocks contiguous to chonolith. Basalt as an extrusive lava flow. Minerals of the igneous rocks grouped according to their order of crystallization in solidifying as as 1) iron, 2) ferromagnesian silicates (Olivine, Pyroxine, Amphibole, and Mica), 3) Feldspar and Feldspathoids (Plagioclase, Orthoclase, Nephelite, Leucite, and Analcite), 4) quartz (in acidic rocks). Pegmatites being the produce of magmatic interior of semi-solidifying igneous rock are obliviously composed of a preponderence of those minerals which would solidify lastly, such as quartz, feldspar and some of the ferromagnesian silicates. Basalt owing to its more sudden cooling is a fine grained rock. All the constituents cool to a more homogenious mass, i.e., before they have had opportunity to cool selectively as individual aggregates. The granites normally have their characteristic light color, however locally circulating solutions have added a preponderence of ferromagnesian minerals which unoxidized give these rocks a green color. The basalt is dark

gray to black owing to an excess of dark silicates (Pyroxene and Olivine) and magnetite.

2. Metamorphic Rocks - The quartzite and graywacke conglomerates while originally a sedimentary are metamorphic by reason of their being bonded by newly deposited silica, or silicates, and if metamorphism is complete the rock is compact and will not retain cleavage along previous aggregates. The contact metamorphic pegmatites are in various stages of alteration from gneiss at the fault contact to that showing various stages of change affected by gaseous accensions and circulating ground waters. The pegmatite fragments making up, in part, the fault breccia are highly metamorphosed by heat and pressure, along the gasses and solutions traversing the fault planes. Coloring of the quartzites is brown to red owing to oxidation of their component dark silicates. These rocks and those of contact metamorphism have the following mineral constituents of 1) quartz, 2) feldspars, 3) biotite, 4) muscovite, 5) hornblende, 6) epidote, and 7) chlorite. The graywacke has in addition to the above ferromagnesian silicates.

3. Sedimentary - These rocks are the residual products of former disintegrations. The arkose conglomerate makes up the bulk of this formation. The sedimentaries retain the constituents, less oxidation, hydration, etc. of their former aggregates and in addition feldspar and newly deposited ferromagnesian silicates. Where oxidation and weathering has broken down the ferromagnesian constitutents the color is brown to red depending on the degree of oxidation. Where unoxidized the color is green. Phenocrysts of feldspars are predominently white in the arkose ground mass.

GEOLOGY

The character of the ore body is that of a shattered vein type with gold occurring free in streamers and in the rocks. Gold shows in cuts that area in the side of the form in matted like masses and much find gold can be seen in many of the rocks that are found in the area. This appears to be a large deposit which has been altered greatly and the resulted minerals being primarily of gold with some silver. Previous geological reports have shown the gold is associated in most areas and on most claims. There appears to be a deep strip approximately two to three hundred feet wide and more than 7,000 feet long judging from samples that were taken from the properties. This does not include numerous outcrops and mineralized showings outside of the area that had previously been worked in the 1950's. From all appearances the ore body is possibly scattered throughout the entire area perhaps as much as 1,000 feet wide and in places at least a mile long. A great deal of attention has been given to the ore deposits that were in the old Mammoth Mine and the workings thereof. These working and vein material has been described in detail, however, little attention has been paid to the tertiary ore of the existing deposit.

The Cenozoic ore when ore products were established during the tertiary climate and produced the uplift of the Sierra Nevada resulted in the erosion of the Mother Load gold veins and deposition of Californian and Peruvian gold plassers. There are important gold veins of tertiary age at Cripple creek, Colorado, and Gold Field, Nevada. Tertiary igneous intrusions are current for a large portion of mineral wealth of the Rocky Mountains and Latin America. Silver deposits at Park City, Utah, and of the Comstock Load, Virginia City, Nevada, and in Mexico and Bolivia date from the tertiary period. The huge copper mines of Bingham Canyon, Utah, and similar copper mines throughout the Western Hemisphere are also of tertiary deposits. The assemblage of fossils recording major oscilations of land and sea is now the criteria for dating tertiary rocks, except for a short interval during which the oceans reached the interior by the way of the Mississippi Valley and made a brief stand in the Dakotas of North America.

Hence, tracing the changing patterns of land and seas so vital to the study of past eras is not applicable to the study of Cenozoic geology. Instead the

events of the Cenozoic era are best summarized by discussing them from the standpoint of the major physical subdivisions developed during this era. The Gulf Coast Plane from Florida to Yucatan was occupied by the sea in a broad curving band which extended inland at the Mississippi Valley nearly to St. Louis. The river and its tributaries imposed a swampy typography upon much of the Southern coastal region of the United States. As the Mississippi Delta grew seaward to its present position, the body of the Gulf of Mexico subsided rapidly under its heavy load of sediment creating a troft referred to as the Gulf Coast Geosyncline which parallels the shore line of Louisiana and Mississippi. Pugs of rock salt forced upward into the overlying strata and distinctive features of Gulf Coast structure being now known as salt domes. The Colorado plateau region lies in the American Southwest in Arizona, Utah, New Mexico, and Colorado. The repeated uplift during the Cenozoic era arched the mesozoic rocks of this region into a broad dome several thousand feet above sea level. As erosion stripped away a considerable portion of these comparatively horizontal formations, a spectacular series of step like cliffs was formed as a result of the alternation of hard and soft beds that characterizes the sequence. Continued uplift rejuvenated the rivers which proceed to incise canyons of profound depth. One of these is the Grand Canyon, carved by the Colorado River, and over a mile deep. The basin and range province occupies the central part of the Mid Cordilleran region of the United States. Its north trimming mountains are tilted fault blocks of tertiary origin. They are surrounded by wide flat bottom desert valleys filled with sediments, which have piled to such an extent that some of the isolated mountains are fairly well burried in their own debris.

It is at this point that the tertiary area becomes applicable to the ore deposit in question. Considering the valley floor and the location of the property a tertiary river or ancient river has been located running from north to south. This tertiary river carries in a form of free gold content. Free gold being developed from various geological activity in relation to other geological occurences are shown in this report. Due to the physical condition in the various salts and magma intrustions which preceded the tertiary area, a great deal of gold has been assimilated in many, many deposits throughout this property area. The quarts, feldspar, and ferromagnesian

silicates are also contributors to the disposition of the gold and gold on surface including in vein like material. This occurrence as in relation to the intrusive masses crystallizing out of pegmatite and the pegmatite accession and the fault plains. The pegmatites between intrustions is highly crushed in addition to metamorphism. Footwall country rocks are also crushed. Faultings have shown favorable samples and the brecciation along all faults in well developed and the pegmatite between walls is in a high state of metamorphism. The contact metamorphism shows high mineralization and excellent gold distribution. In conclusion, there appears to be major mineralization throughout the deposit in as many as three different geological occurrences, making this deposit a major mineralized deposit and potentially a very major gold producing property.

PROPOSAL - GOLDFI[illegible]INES

16 Feb.46
[illegible]ed Strong Lewis,E.M.
Box 742, Phoenix,Arizona

GOLD PROPERTY This property contains about 200 acres and has produced over one million dollars in gold bullion shipped to the U. S. Mint.

PRESENT ORE RESERVES On the surface -

(a) Broken ore in mine dumps -
1,000 Tons Assay value $10.00/ton in gold
2,500 Tons Assay value $ 5.00/ton in gold

(b) Tailings left from old mill - 10,000 Tons Assay value $2.25 ton in gold

Profit recoverable from (a) & (b) 13,500 Tons estimated $15,000.

Underground workings - partially processed for mining - contain
Block A - 255,000 tons assay average value $6.09 ton in gold
Block B - 500,000 tons assay average value $3.00 ton in gold
Block C - 4,000,000 tons assay average value $1.50 ton in gold

Profit recoverable from Block A with 200 ton plant $800,000.
Profit recoverable from Blocks B & C not expected in initial stage.

OPERATING COSTS Very low costs for mining and milling the ores of this property can be obtained. The ore itself is already shattered and easily crushed to milling size. It is all free milling. The climate is mild all year around. The distance to rail point is 20 miles to city of Mesa and 36 miles from Phoenix. The road from Phoenix and Mesa is paved for 32 miles and excellent gravel surfaced State Highway the remaining four miles to property. Electric power line and telephone lines cross the center of the property. Water for milling and domestic use occurs at shallow depth. The cheapest and most abundant labor market in the Southwest is Phoenix which is also the distributing point for all provisions and mining supplies. Goldfield is an isolated mining camp producing gold only and has never been invaded by labor Unions. All operations at this property are of such a nature that power equipment may be used almost exclusively.

HISTORY Mine discovered in 1890. Within a few years $1,000,000 in gold bullion was produced. In 1895 the inadequate timbering failed and the old mine workings caved in. The owner died. In 1910 the mine was reopened and extensively developed under new management for a period of twenty years. The key man died. The property was sold to present owners, who, just prior to World War II, sold off the equipment. The original operator confined his operation to high grade ore on a small daily tonnage basis and produced one million dollars. The next operator, having found low grade gold values to exist in a very large area, conceived the idea and rigidly adhered to it that the mine should be made ready to produce and process 1,000 tons of this low grade ore per day. He expended one million dollars in this project and reached the stage of mine development where his engineers estimated that he had ore reserves of over $13,000,000 which would be sufficient to justify a 1,000 ton milling plant. At his death he had part of the milling equipment on the property and had completed most of the excavation and foundation work for the plant. There were, however, unpaid accounts and no one left in the organization who could complete the large scale financing necessary to carry out such an ambitious plan of operation. The final consequence was foreclosure and sale to the present owners.

IMPROVEMENTS The value of improvements are appraised much below the original cost. The actual value to a future operation would be greater than this figure.

Underground Mine Workings. There are over two miles of workings between the surface and 1,000 feet in depth - appraised value	$ 130,000
1 galvanized shop building and 1 dwelling	4,000
Water Supply, drilled wells, tanks & pipe lines	1,750
Excavation & concrete work for milling plant	1,300
Concrete structures convertible into use for Cyanide Mill	3,125
Total appraised value of improvements.....	$ 140,175

PLAN FOR OPERATION A plan has been worked out by which a small operation starting with 10 tons per day then increasing to 50 tons per day will make the mine self-supporting. There would be $15,000 profit to be derived from treatment of the 13,500 tons of ore and tailings now on the surface. While this surface ore was being treated by cyanide leaching, a new mine working would be completed, designed for low cost production of ore from underground. This initial stage can be put into operation with the expenditure of around $10,000. The next stage would be to gradually increase the operation to a daily capacity of 200 tons per day in order to reduce production costs to a point where underground Block A would yield a good profit. This second stage may be financed either by plowing back the profits of the first stage or, if more haste is desired, additional financing could be obtained as indicated in next paragraph. The transition from the second stage to the ultimate large scale possibilities of handling the enormous areas of low grade ore in Blocks B & C need not be inquired into for a long time. In this initial operation a very cheap process, demanding only simple concrete leaching tanks will be used, sacrificing a high economy in the percentage of gold extraction to gain a low figure for the amount of money required to start the operation going. The percentage of gold recovered in the initial stage would be about 73% which, with gradual improvements, can be raised to 98%.

PLAN OF OPERATION A one yard gasoline-powered shovel and dragline will be purchased (preferably from Government Surplus). Between 10 and 15 feet of sand, gravel and soil now covering that part of the vein known as the Mormon Stope will be removed. The waste material from this stripping operation will be used for building a diversion dam to prevent flood waters from again breaking into and damaging the mine workings. A period of 60 to 90 days will be required to complete this stripping operation, thus preparing this ground for production. Simultaneously with this operation, the Lewis mill and mining equipment will be delivered to the property and installed.

Immediate treatment of stockpile ore of a $10.00 grade may be commenced at the rate of 10 tons per day by using two 30 ton tanks with a 6 day cycle of leaching. This ore does not require crushing and can be prepared for cyanide treatment as soon as the screening bins are set up. There is a sufficient tonnage of this ore on hand to carry the operation for a period of six months. Within that same period the milling equipment will be installed and production brought up to 50 tons per day with ore from the Mormon Stope.

The grade of ore to be handled has been set at $6.00. This is the average grade arrived at by combining all of the underground assays and other data which is available. This grade can be changed at will. It would be lowered by less careful selection of ore sent to the milling plant. It can be raised to about $9.00 per ton by selecting the best of the caved material. The main back-log of caved material has an average value of $9.17 per ton. This figure, as will be seen in the following analysis, does not include the very rich occurrences of gold which are known to be irregularly distributed in the caved material.

To get a fair picture of the real expectation of the reward to come from opening up this old Mormon Stope it is necessary to go back to 1895. At that time Chas. Hall was systematically developing the mine and shipping 150 lbs. of gold bullion at intervals of three weeks. These shipments contained from $40,000 to $60,000 in gold at the present price, and had been made regularly for a period of several years. Without warning, and within a period of only a few hours, his entire mine workings were wrecked by the inrush of water during a flash flood coming down the hitherto dry wash which had been undermined. He had taken out over one half million dollars of very high grade gold ore from the Mormon Stope and an equal amount of medium grade ore from other points along the vein. He had many thousands of tons of ore developed and held in reserve for future production. His entire mine operation came suddenly to an end. His mine which had been producing from $2,000 to $3,000 per day ceased to exist. It was caved in. That caved part, from the surface down to 300 feet in depth and containing untold riches in fabulously rich stringers of wire and crystalized gold remains today, just as it was at the time of Mr. Hall's death.

Mr. Geo. U. Young during a score of years beginning in 1910 made several heroic efforts to re-open these old caved workings by orthodox underground mining methods. Upon several occasions he was able to partially open this caved ground and hold it for brief periods of time but before he could begin extracting the ore, his timbering would collapse and this method was eventually proved to be a complete failure.

It can be re-opened now by the use of modern power equipment and open pit mining methods. It can be made to produce with the same or greater output than was ever reached by Chas. Hall. Only a small segment of the mineralized zone was mined out. His operation and production was only a sample compared to the latent future possibilities of this mine. Fortunately, during the period when these workings were temporarily accessible, Mr. Young's engineers took some 98 samples of the caved "muck" of the old Mormon Stope from points along the level at a depth of 120 feet below the surface. The average value of these samples is $9.17 in gold per ton. The material sampled was the general run of caved materials which consisted of a mixture of the low grade wall rock and such portions of the vein which Mr. Hall in his mining operations had passed by and left in the mine after removing the high grade portion of the vein. The important thing to be considered in relation to this average value of $9.17 is the fact that all of the fabulously rich ore had been previously mined out from the localities where these 98 samples were obtained. At the time of the cave-in there existed large untouched portions of the high grade ore at a slightly higher level and extending to the surface.

These remaining areas of high grade ore are now mixed in the caved material at many unknown points. They will be found scattered along several hundred feet of the vein and at depths below the present surface as shallow as 15 feet and extending downward to 100 feet or more. It would not be practical to search for these hidden and scattered portions of this jewelry shop ore. The only sure method of finding and mining all of them is by removing the entire mass of caved material. This can be done systematically, thoroughly and economically by the open pit mining method with a power shovel and dump trucks.

The great advantage of this open pit mining is the extremely low cost per ton of removing this caved material. Selective mining can easily be carried on. Waste rock can be discarded, low grade material can be stockpiled for future treatment, and the medium grade ore can be milled at a good profit in the pilot mill which will be constructed and will have a capacity of 50 tons per day.

SIDELIGHTS Th[illegible] ope[illegible]ty has definite evidence of a la[illegible]ge of ore such as Bl[illegible] B & C. Certain rehabilitation of old wo[illegible]ngs and additions of milling equipment will be required to make these low grade ores available. It is my thought that financing for this enlargement of operation may be secured through a public offering of stock. The purpose of the following sidelight is to display the reason for my belief that this stock will practically sell itself. The locality of this property is the most highly publicized point of interest within easy reach of Phoenix. Superstition Mountain rises precipitously a mile high just at the western boundary of this property. The name of Goldfield was used for this mining camp during the days of early activity long before the discovery of gold in the Nevada camp of similar name. The legend of the Lost Dutchman Mine is definitely traced to this immediate section. The Apache Indians had some hair-raising superstitions concerning the whispering gods among the more fantastic pinacles of the mountain from which derived the name Superstition. Paintings of the mountain have commanded prices up to $10,000. The Apache Trail Highway, famed for its mountain scenery, passes through the property a few miles before entering the rugged mountainous region. Winter visitors to Arizona are greatly interested in traveling this road and many stop to look at the Goldfield Mines. Only recently, while some tests were being made by the "panning method" of ore left by former operators in the old mine dumps, a number of these casual visitors were so impressed by the appearance of gold in the panning tests that they voluntarily offered to purchase stock as soon as a company was organized and stock available. This being the case with little or no work going on, it appears certain that this natural advertisement, augmented by actual operation and small scale production of gold bullion, will insure that a stock issue of several hundred thousand dollars can be marketed right here on the property. The necessary organization and qualification to sell stock under the Blue Sky Laws of Arizona could be completed and ready by the opening of the coming winter season.

PRICE The owners have set a price of $300,000 for this property. However, the important thing is that all of this purchase price is to be paid out of actual production of the mine in the form of a sliding scale of royalty payments.

The estimated value of the improvements and the profit recoverable from surface ore and underground Block A is $955,175.

General form of contract to purchase Goldfield Mines - 1. Duration of agreement five years. 2. Purchase price $300,000. 3. Royalty-sliding scale beginning at 6% and rising to 15% to apply on ore up to the value of $30.00 per ton and a flat 30% on ore of a value in excess of $30.00 per ton. All payments of royalty to be credited as payments on purchase price. 4. Customary clauses for continuous operation and development of the property.

OPERATING SYNDICATE For the purpose of getting this proposal under way, it is proposed to divide this project into 100 units; to offer 50 units for subscription at $1,000. per unit; to start operation under a Trusteeship as soon as 15 or more subscriptions are paid in; to close the subscription 30 days thereafter and incorporate a company with capitalization of around $600,000. issuing one per cent of the corporate stock in exchange for each syndicate unit. In addition to the units sold to cash subscribers Lewis is to receive 25 units in exchange for 1. organization and engineering services, 2. certain mining and milling equipment (the first cost of which was $10,000), this equipment to be transported to the property from points elsewhere in Arizona at company expense, and 3. his interest in a one-third ownership in the property of the Goldfield Mines. The operation of the property will be so conducted as to permit continuous small scale operations for an indefinite period but with a view of having sufficient evidence of value exposed by early Fall to justify and support a price of $1.00 per share, which will be the price set in the Permit to sell stock to the public. A gradual increase in the scale of production can be expected as operations are smoothed out and without the sale of additional stock to the public but with sales coming in rapidly next fall a quick step-up may become possible.

Submitted by Alfred Strong Lewis
Alfred Strong Lewis

- - - - - - - - - - - - Tear off along this line and mail at once - - - - - - - - - - -

Date _____

Alfred Strong Lewis
Box 742
Phoenix, Arizona

Reserve and give me the option to purchase _____ units of Goldfield Mines Syndicate at $1,000. per unit. It is understood that when you have received reservations amounting to 15 units on this form you will send me a list of the subscribers and final details of the organization plan. I am then to have ten days to investigate before making final decision to exercise or reject this option.

Address: _____

V

The cost set up for this style of operation is as follows:-

Mining cost per ton of ore with value of $6.00	$1.00
Milling cost per ton of ore	2.00
Total cost per ton for mining and milling	$3.00
Gold recovered per ton with 75% extraction	$4.50
Deducting production costs per ton of	3.00
Net profit per ton	$1.50

Daily production 50 tons. - Net profit per day $75.00

It should be understood that this figure of a profit of $75.00 per day does not take into consideration the uncovering of high grade ore. There will be days when no high grade at all appears. There will be days when the high grade may be expected to contribute thousands of dollars. The whole idea of the plan is designed to make a profit on the general run of caved material and by removing all of it, to ferret out each and every segregation of high grade left in the mine.

Scores of witnesses who had personal knowledge of the old Hall operation of the Mormon Stope agree that untold wealth is covered up in these old workings. In addition to a profit of $75.00 per day to be derived from the removal of the caved material, I expect one half million dollars of hidden high grade to be discovered and added to the profit side of this enterprise within a period of two years.

The Lewis milling plant consists of a jaw crusher and ball mill with rated capacity of 25 tons per day. It is powered by gasoline motor with line drafts and belting. By the addition of screening devices and dry crushing rolls this plant will prepare 50 tons of material per day for coarse leaching by the cyanide process. There are ample concrete structures now on the property which at small expense may be convered into leaching tanks to accommodate this 50 tons of daily intake of ore.

Laboratory tests made by the Southwestern Engineering Co. have proven that 98% of the gold can be recovered from this ore by the cyanide process. However, it is thought better mining practice to sacrifice this high recovery of gold in the interest of holding to a minimum the first cost of the installation of the milling plant. It has been found by small scale tests that 75% of the gold in the ore may be recovered by grinding the ore to a mesh such as ordinary sand and by doing it this way a large amount of expense for fine grinding and handling the finely pulverized material may be avoided. Thus the loss of some 25% of the gold in our initial program will be offset by materially reducing the necessary financial requirements to equip the mine and start production.

Estimate of expenditures to bring the mine to a production of 50 tons per day

Mining equipment, shovel, etc.	$ 7,500.
Stripping Mormon Stope and building Dam	3,000.
Delivery and installation Lewis Equipment	4,000.
Additional milling equipment, rolls, dump truck, etc	2,000.
Cyanide tanks and accessories	2,000.
Organization-Corporate fees, etc.	500.
Camp facilities	1,500.
Laboratory equipment	500.
Reserve for contingencies	4,000.
Total Requirement	$ 25,000.

SUBSCRIPTION PROPOSAL The subscription will be limited to 10 units at a price of $2,500 each. When these units are all subscribed a Company will be organized under Arizona Laws with a capitalization of $500,000 divided into 500,000 shares of common stock of a par value of $1.00 each. The holder of each unit will receive a stock certificate for 10,000 shares. Lewis offers to exchange mining and milling equipment for 3 units; his interest in the property of the Goldfield Mines (being a 1/3 interest) for 5 units; his organization and engineering services already rendered for 2 units - A total of 10 units to Lewis.

S U M M A R Y

Issued to holders of 10 units paying in $25,000	--	100,000 shares
Issued to Lewis for 10 units	--	100,000 shares
Total issued shares	--	200,000 shares
Balance left in Corporation Treasury	--	300,000 shares
Total Capitalization	--	500,000 shares

Submitted by Alfred Strong Lewis
Alfred Strong Lewis

Tear off along this line and mail

Alfred Strong Lewis
Box 742
Phoenix, Arizona

Date_____

I am interested to the extent of_____ units. Send subscription form for my inspection and final approval.

Address:_____

PRELIMINARY
FOR STUDY PURPOSES ONLY
4-25-1999

THE OLD WASP MINE

The preceding report on the Mammoth Mine contains important information that applies directly to the adjacent Old Wasp. To avoid repetition here, the reader will be referred to parts of the Mammoth Mine report that are applicable to the Wasp. The inconvenience to the reader is regrettable, but to anyone reading this entire report, an unnecessary repetition would be equally annoying.

The Old Wasp Mine is offered for sale for U.S.$2,500,000. $2,200,000

The Old Wasp claim adjoins the Mammoth claim on the south, along a continuation of the Mammoth Fault hanging wall contact. While the Mammoth claim has some three miles of underground workings sunk to the 1,030 ft. level by 1925, the Wasp remained essentially a virgin property until 1983.

The Wasp is a 20.64 acre claim, patented fee simple absolute, with a quiet and undisputed title since 1893. The north half, upon which all development exists, is owned by Clay Worst and his wife, who live in the owner's residence at the mine. The south half is undeveloped, and is owned by associates of Worst. The claim is crossed by hard-surfaced State Hwy. 88. A 3-phase electric distribution line and a 6-inch municipal water main are on the property, and a 45 kV substation is a mile distant. has recently been sold

The highest and best use of the Wasp would be if operated in concert with the Mammoth Mine by a major mining company. However, since the Wasp has a perfect title, a known ore body and the only currently operational mill at Goldfield, it is still a viable independent, ~~though smaller~~, operation.

The preceding report on the Mammoth Mine (page 4, paragraph 11) references the work of Kennedy [7] in 1910 and Bedford [12] in 1923. If Kennedy and Bedford were correct, and the ore emplacement on the Mammoth was being fed from the south, then it was being fed from beneath the Wasp. Their counsel was undoubtedly what prompted George U. Young in 1925 to drift south at the 1,000 ft. level from the No. 7 Shaft (The Main Shaft) of the Mammoth Mine along the hanging wall contact of the Mammoth Fault, and intercept the Wasp ore shoot at the 1,000 ft. level.

That this is the same ore shoot exposed in the bottom of the present Wasp open pit is well established, for these reasons:

1) The surface exposure of the Mammoth Fault contact from the Mammoth Mine southward to the Wasp was clearly in evidence when the properties were mapped in 1916 [77].

2) If the fault contact in the bottom of the Wasp open pit is protracted downward on the average westward dip of the Mammoth Fault, the calculated intercept at the 1,000 ft. level is within 5 ft. laterally of the actual location as platted on the Mammoth worksheets [81].

3) As the values in the Wasp pit are followed southward, they increase to a peak, and then decrease beyond that point. The same occurred at the 1,000 ft. level. If the point of highest assay in the Wasp pit is protracted downward on the dip of the vein, 90 degrees to the strike, it intercepts the point of highest assay at the 1,000 ft. level [81].

4) Whenever extremely high grade ore is encountered in the Wasp open pit, it is associated with malachite (copper carbonate) and galena (lead sulphide). The assay records from the Wasp shoot at the 1,000 ft. level indicate up to 3% copper and 18% lead [80].

The south drift at the 1,000 ft. level in the Mammoth Mine is of great value in evaluating the Old Wasp ore shoot. The following data can be verified by the Mammoth plats of the 1,000 ft. level dated 8/20/1925 [80] and 11/5/1925 [81].

At station 1026, the drift entered the Wasp claim. Initial values were low grade, but the continued extension of the drift was probably motivated by assays of 19.3 oz. and 21.1 oz. gold per ton, found in this drift 57 and 69 feet prior to entering the Wasp.

77 feet onto the Wasp, they encountered the beginning of another 75 feet of drift which averaged 0.70 oz. gold per ton. The central 30 feet of this 75 foot section averaged 1.12 oz. gold per ton. The 36 foot remainder of this drift averaged 0.51 oz. gold per ton. There is also a notation of 35 lineal feet of "black ore 12 in. wide" that averaged 2.52 ounces. Individual samples of "black ore" at the 1,000 ft. level assayed up to 4.94 ounces of gold per ton.

This comprises 111 feet of drift averaging 0.634 ounces of gold per ton. These were daily car samples, taken as the drift advanced, perhaps as representative samples as could be obtained.

No such "black ore" has been encountered in the Wasp open pit to date. However, in the entrance ramp to the pit, near the south end of the mined ore shoot, the operators discovered a filled-in shaft. The patent survey plat of the Wasp indicates all the shallow prospect holes, but this shaft is not shown, nor is there any known record of it.

This is a 4 x 6 foot shaft, cribbed solid with modern mill-sawed timbers, but with short lengths of hand chopped ironwood timbers laid just outside the modern timbers. None of the ironwood timbers are much over three feet long. It appears the early Anglos found an old timbered Mexican shaft, which they reopened and retimbered. The shaft is still evident at the 40 foot level on the entrance ramp. It seeps groundwater.

The shaft is filled with black material, which has not been assayed. The shaft is located above the south end of the vein of "black ore" disclosed at the 1,000 ft. level. The purpose or meaning of this shaft is unknown. No attempt to clean it out has been made, as it is in the center of the ramped roadway into the open pit, and opening it would block access to the pit.

Of significance is that a 12-inch width on the face of the completed drift at the 1,000 ft. level still averaged 3.60 ounces of gold per ton [81]. Obviously, the drift was not discontinued due to a lack of values; it was discontinued due to the death of the operator. Accordingly, the actual southerly extent of the Wasp ore shoot at the 1,000 ft. level, and its gold values, are totally unknown.

Gold values in the Wasp open pit are not as clearly defined. No assay records of the upper 45 feet survived the original lessee's office fire.

At the 53 foot level in the open pit, assays exist only for the south end of the ore shoot, where an average width of 5.25 ft. averaged 2.20 oz. gold per ton for 30 lineal feet. At the north end of this 30 feet, an 8.2 ft. width averaged 3.48 oz. gold per ton, of which the 3.9 ft. next to the fault contact averaged 7.68 oz. gold per ton. ~~No meaningful assay records exist north of this point.~~

Usually, the highest values lie in the first two feet of granite next to the hanging wall contact. As an experiment, a 40-ft. hole was drilled in the bottom of the pit, starting one foot out into the hanging wall from the fault contact. The drill rig was "eyeball" inclined to attempt following this two-foot high-grade width downward. Samples were taken at five-foot intervals.

These samples assayed 8.7, 4.2, 3.65, 2.15, 1.90, 1.05, 0.90 and 0.75 ounces of gold per ton. This hole averaged only 2.91 ounces. It proves nothing, as it cannot be known whether the values in this two-foot width actually decreased with depth, or whether the drill hole drifted out of its estimated one-foot width tolerance. There would seem a remote chance of drilling 40-feet with an air-track drill and staying within a one-foot tolerance, with only an estimated drill inclination on an unproven dip. The only assurance was that the upper five feet averaged 8.7 ounces of gold per ton.

To interpolate values between the present 60-ft. level in the open pit and the drift at the 1,000-ft. level involves conjecture and guesswork. The point of highest value in the open pit at the 53 foot level was 3.48 ounces 8.2 ft. wide. Directly down the dip of the vein, 90 degrees to the strike, you intercept the point of highest value at the 1,000 ft. level, 1.60 ounces of gold. Accordingly, the values at this point at the 1,000 ft. level are 54% less than directly above this point in the open pit.

The most complete assay records are those at the 1,000 ft. level, where 111 feet of drift averaged 0.634 ounces. If you split the 54% variation in half for an average, a 17% increase in value in the portion of the vein overlying the 1,000 ft. level would be 0.805 ounces of gold per ton.

An ore shoot 111 feet long by 8 feet wide by 940 feet deep contains about 38,400 tons of material. At an average assay of 0.805 ounces, there would be 30,912 ounces of gold, at $289.50 an ounce, worth $8,949,000.

However, the south terminus of the 1,000 ft. drift still assayed 3.60 ounces 12-inches wide, so the values should not be expected to end at that point. Also, having proved only that values persist to the 1,000 ft. level, there is no reason to assume they end at that depth. With only a probable increase of 10% in length and 10% in depth, both very reasonable presumptions, the shoot would contain about $11 million in gold values.

The foregoing arithmetic is really only conjecture, but there is no better existing data. Only a drilling program will delineate and evaluate the existing ore shoot. The remainder of the unexplored Mammoth Fault contact across the Wasp may reveal additional ore bodies.

The Wasp ore shoot ought to be drilled. Three slant bore-holes, calculated to cut the Wasp shoot at the 250 ft., 500 ft., and 750 ft. levels, would give a general idea of what values lie throughout the shoot. The outcome of that drilling may encourage additional drilling to further delineate the ore body.

The 250 ft. intercept would require 320 ft. of hole; the 500 ft. intercept would require 640 ft. of hole; the 750 ft. intercept would require 865 ft. of hole, a total of 1,825 feet of borehole; see the cross-section plan enclosed [41]. These really should be cored.

These slant holes ought to be drilled from the footwall side rather than the usual hanging wall side for several reasons. The dip of the Mammoth Fault contact throughout the Mammoth Mine is a quite consistent 87 degrees west, but therein a problem arises.

There were two different surveys of the 1,000 ft. level in 1925; one in August [80] and a resurvey in October [81]. Apparently a mistake of exactly ten degrees was made in a deflection at station 1008 on the August map, and a corrected map was drawn in November. This results in an ambiguity between the two maps of 83 ft. laterally in the location of the Wasp ore shoot at the 1,000 ft. level. The October resurvey is presumed correct.

If the drilling is done from the footwall side, and that presumption is wrong, no harm is done; the vein would just be intercepted sooner than expected. However, if it were drilled from the usual hanging wall side, and the presumption proved wrong, the vein would be intercepted much deeper. It might be missed altogether at the 750 ft. level. This is illustrated by the enclosed drilling plan [41].

The footwall of the Mammoth Fault has never been identified on the Wasp claim. In the Wasp open pit, the Mammoth Fault hanging wall contact between the altered latite (dacite?) on the west and the granite on the east is sharply defined. There is a two-inch seam of fault gouge at the contact. The gold values lie eastward in the adjacent brecciated, silicified granite. The highest values lie in the first two to three feet against this contact. Then the values simply grade out eastward into the harder granite dike, without a definite cutoff.

There is a further reason for slant-hole drilling from the footwall side. In 1983, Wayne Blood, while drilling for the then operator, recovered 7-oz. and 10 oz. assays from 25-ft. depth from two vertical boreholes about 25 ft. out in the intruded granite, near the path of the proposed slant holes.

They tried to intercept these values by horizontal drilling from within the pit, but failed. These two drill holes did not define any particular structure as Blood advised there were a couple holes between them that were "down in the tenths of an ounce." However, they might be intercepted by the proposed slant holes if drilled from the footwall side. Also, the topography makes a drill setup far easier on the footwall side. There are no records of the prior operator's drilling. They had an office fire, with a loss of their records, about the time Clay Worst, the owner, called for an accounting and terminated their lease for failure to pay royalties.

There appear to be four development options for the Wasp. The first would be sinking an inclined shaft, following the ore shoot itself down the 87 degree dip. This would have the advantage of sinking on pay ore, but faces problems created by the original lessees in 1983.

The high-grade ore shoot then averaged six to eight feet in width, averaged 13 ounces of gold per ton, and was encountered under only four feet of overburden. It was five miles from town, had paved-road access, water, electricity, and an owner/lessor who was totally occupied elsewhere. It was a poor miner's dream come true. They should have started sinking a shaft on it, but chose to begin a surface mine.

Surely they knew that pursuing an eight-foot vein as a surface mine would quickly result in a stripping ratio that would end their operation, but would be immensely profitable initially. This evidently caused them to "grab the easy pickings" and not pay royalties as promised, knowing their plan would eventually be discovered and their lease terminated.

When Worst, the owner, called for an accounting, the operator reported $200,020. in smelter returns, all from one refiner. Worst determined an actual total of $536,369., which included sales to six other refiners, which the operators finally admitted. It may be presumed there were other sales that were never disclosed. With a shortage of $50,452. in Worst's royalty account, he terminated their lease. None of the royalty shortage was ever paid.

Since a 20% deduction was taken for refining the "black sand" concentrates, the gross production exceeded $670,000., taken from the top 45 feet of the Wasp pit. It may have been twice that amount.

Worst then entered an agreement with a second operator. They removed some 10,000 tons of low grade material to lower the ramp to the pit. During this process they dozed out about 1,560 tons of mixed lower grade ore. Some of this material was processed at a small mill they built on a nearby leased property.

The mill was junk. Due to heavy down time they averaged only about two tons throughput per 8-hour shift. The result was that with this primitive plant they recovered about one ounce of gold per ton, probably not over a 50% recovery, since the head ore averaged close to two ounces. They were losing the fine gold.

The tails were never assayed. The millsite was later leased to another operator who just hauled the tailings away and then abandoned his lease.

Smelter returns from the sale of concentrates and dore' during that operation were $47,832. It was obvious that this mill could not show a profit on two-ounce mill heads. Worst also discovered that two of his then associates were involved in the non-payment of royalties during the previous operation. He terminated the second operation.

Worst was left with $28,528 in unpaid bills, owed $22,342 in wages, and owed for $42,000 worth of ore shipped from the property. None of this was ever recovered. If Worst sounds a bit paranoid, it is based on bitter experience!

The Wasp was inactive from 1985 until 1992 other than sampling and assaying by Worst. The last channel sample taken across the vein at the bottom of the pit then assayed 7.68 oz. Au/ton 3.9 ft. wide, and 3.48 oz. Au/ton 8.2 ft wide.

In May 1992, as an experiment, they set up Rex Thompson's spiral classifier, actually a placer machine, on the Wasp. No head ore was available, as the pit was then filled with water, so they ran samples of stripping waste from eight random locations around the Wasp pit. They recovered gold from every sample. There was nothing quantitative learned, since this was lode material that was never crushed or ground to liberate the gold. It only evidenced that even the stripping waste contained considerable values in the fines. A color photograph [43] of the gold buttons recovered is included with this report.

Regrettably, all this left the Wasp shoot in the bottom of a large open pit into which the surrounding 5 acres of surface drains. Once committed to a surface operation, subsequent operations have compounded the problem by further enlarging and deepening the pit. To continue mining the original Wasp ore shoot as a surface operation is impractical, and would further complicate the problem.

Sinking a shaft in the bottom of the open pit would require some means of excluding surface water runoff. One might extend a watertight collar upward from the bottom of the pit, aligned with the 87 degree dip of the vein to a point safe from surface flooding. To extend this collar to the original surface, some 60 feet, and backfill the pit around it, would be expensive. The advantage would lie in further sinking on pay ore with its attendant cash flow.

The second development option would be to go east into the solid granite that intruded the fault and sink a vertical shaft. Then crosscut about every 100 feet to intercept the Wasp shoot, then stope. Fortunately, the vein dips only three degrees off vertical, so the crosscuts would remain short.

The disadvantage is that you would be sinking and crosscutting in barren rock, creating no cash flow. Also, you would have to leave considerable pay ore between the roof of the uppermost stope and the bottom of the present open pit, enough to support the weight if the pit were partially filled with surface flood water. A diversion dike around the periphery of the pit might help.

A third development option involves an electromagnetic survey Worst conducted with induced currents on the northeast part of the Wasp claim, near the open pit. They discovered four anomalies [42], all within 30 feet of each other.

They had only a percussion air-track drill and 60 feet of steel. They drilled the first anomaly, and only averaged 0.10 ounces for the top 40 feet. Between 40 and 50 feet they averaged 0.70 ounces. It should be noted that a loss of 50% of precious metal values in an uncased percussion drill hole is common, due to the values getting hung up in the cavities and rough walls of the borehole. Even reverse circulation drilling with a rotary Tricone bit has resulted in a 51% loss of metal values remaining in the drill hole (*California Mining Journal,* Jan. 1988).

At 50 feet the drill hammer broke down, and they could neither continue nor withdraw the drill steel. They had the hammer repaired and managed to salvage the drill steel, but the borehole had caved beyond salvage. They do plan to redrill this anomaly, plus the remaining three. They also plan to complete the electromagnetic survey of the area surrounding the pit, as there may be other anomalies.

If drilling these anomalies discloses another ore shoot, the third development alternative might be to sink on this shoot in pay ore, and then crosscut to the original Wasp shoot at depth.

A fourth development alternative would be to set a crane at the surface on the granite footwall side, and attempt to continue mining the Wasp shoot with a clamshell.

The vein is sufficiently brecciated and friable at that point that no blasting has been required. All mining has been done with a trackhoe and skidloader. The State mine inspector advises it is permissible to clamshell to the 125-foot level. Whether this is feasible can probably only be determined by trial. Worst plans to pursue it, but with some misgivings, as deepening the surface working just compounds the mistake made by beginning it as a surface operation. The Wasp should have been an underground operation from the start.

The Wasp pit makes about 1,500 gallons of water per day. A two-inch pump handles the inflow at perhaps a 5% duty cycle. If not pumped, the static water level in the Wasp pit stabilizes at about the 20-foot level. However, it is questionable if this shallow water table existed at Goldfield prior to the construction of Mormon Flat Dam, and the resulting Canyon Lake, to the north. Nevertheless, the high gold values "in the grass roots" may have been the result of a supergene enrichment from surface waters.

However, Bedford [12], in 1923, and others, state that the 1,000 ft. level in the Mammoth Mine still had not reached what they called "the constant water table."

Following his report on the 1,000 ft. level, Bedford states, "Anticipating that the water level will be constant at about the 1,200 level, and that the nature of the mineral deposition will change as outlined under Historical Geology and that ore deposits of economical importance will be proven to be greater in extent, and better in average values than those deposits now developed, I would strongly advise that your main shaft be sunk an additional 450 feet from its present (1,000ft.) bottom."

If Bedford is correct, the true zone of secondary enrichment, with the richest ore, may lie even deeper than the 1,000 ft. level, rather than being only a grass-roots enrichment found at the surface.

A final point on the Wasp ore shoot: There were individual high grade pods encountered in the Wasp pit; these pods ran several hundred ounces of gold to the ton. They carried heavy galena and malachite (lead and copper), while the surrounding gold-bearing vein itself carried little of either. The most recent of these pods weighed about 300 pounds and assayed 244 ounces of gold and 56 ounces of silver to the ton. However, assay records of the 1,000 ft. level indicate the gold-bearing vein itself carried both lead and copper.

We have no geologist's opinion as to how these high-grade pods were created and got where they were. But if the Wasp shoot at some depth were an actual vein of this material, from which these pods were detached and relocated, and that spot could be found, it could be very profitable.

The Wasp has a complete laboratory for both fire assay and wet chemical analysis, and small batch refining. Worst is not a registered assayer, but took a course in fire assaying at the Mackey School of Mines, University of Nevada / Reno, and has college level chemistry.

There is a 3-phase electrical distribution line to the mill, but the Wasp had access to cheap diesel fuel, so we are running a GM 480-volt 60-kW generator with a freshly overhauled GMC 6-71 engine. With the entire mill running, it pulls about 30 kW, so the generator has plenty of reserve capacity for additional equipment. 120-240 volt single phase current is supplied from a public utility, but is also available from the generator. There is bulk storage for 3,000 gallons of fuel. The Wasp mill was built with new and used materials, and excellent used machinery, no junk.

The mill is designed to process about 10 tons of head ore per 8-hour shift. The mill flowsheet is a simple wet gravity process. The head ore is dumped on a 3-in. grizzly; 95% passes. The 3-inch minus is then hauled with a front-end loader up a ramp and dumped into an elevated 5.5 x 7.5 ft. bin.

We have a Syntron apron feeder for this bin, not yet installed. Ore then drops into a 6" x 8" jaw crusher which takes it to about 3/4 minus, then into a 12" x 18" roller mill which takes it to about 3/8 minus.

Then up a 16" x 35' belt conveyor to a 5' x 7.5' bin with vibrator feeder. Then up a 12" x 10' belt conveyor to a 4 ½ foot Hardinge conical ball mill with a four-foot long cylindrical screen on the discharge. We are currently using a 30-mesh screen. Oversize is passed under a magnet to remove tramp iron, then returned to the ball mill intake via a sand screw in closed circuit. The 30-minus discharge goes to a distributor box, where it is split between two Stephens (4' x 8') rougher tables, which have new sand decks. Concentrate from the rougher tables go to a single Stephens (4' x 8') finishing table, with new deck.

There are also two 3-R reverse spiral concentrators in the circuit. Rougher table tailings go to the first 3-R Spiral.
The cons from the first 3-R Spiral and the tailings from the finishing table go to the second 3-R Spiral. Cons from the second 3-R Spiral, and the middlings from the finishing table, go to a sump where they are pumped back to the feed end of the finishing table.

Tails from both 3-R Spirals go to a sluice box, then to a dewatering screw. Sand from this screw is elevated by a 16" x 25' belt conveyor into a dump truck.

Tail water goes through two 1,000 gallon steel settling tanks in series, then to a 25,000 gallon mill pond with plastic liner. From there a 2-inch pump recirculates the clarified water back to the mill. Mine water supplies all needs for the mill.

A 2-inch service line from a 6-inch domestic water main at the Wasp boundary supplies any supplemental water, which is used only for cleanup.

The roller mill and ball mill are in new condition; the jaw crusher, conveyors, tables, and other equipment are in excellent shape. All motors except the tables and 3-R Spirals are 480 volt, 3-phase, powered by the generating plant. The three table motors are 240 volt, single phase, and can be operated on either public utility power or the generator. The 3-R spirals have DC motors with rectifiers and speed controls, which operate off one leg of the 3-phase generator. Each sand screw has its own independent hydraulic motor, pump and controls. Almost all wiring is in conduit, most of it underground.

Concentrates from the finishing table are amalgamated, the amalgam retorted, and a dore' bar poured. The Wasp refinery can produce a 995 fine gold bar, but chooses to market the 750 fine dore'. The smelter charges only 4% for refining the Wasp dore'. Since the Wasp cannot hallmark, even their 995 fine bar would entail this 4% refining charge, so refining to 995 fine would be pointless.

The Wasp mill's capacity is limited by the ball mill, which the manufacturer rates at one ton per hour, grinding ½-inch hard quartz to 100 mesh. However, Wasp ore is very easy milling, the ball mill feed averages finer than ½-inch, and already has a high percentage of fines. The mill is currently fed 1.2 tons per hour, which seems a bit under capacity.

The mill is just being placed in production as of this writing, so no current production figures are yet available.

The Wasp owners have never solicited nor accepted investment money from anyone, which eliminates any possibility of adverse claimants against their clear title.

Regarding an exploration license and purchase option, the owners would require the three drill holes mentioned earlier, aligned to intercept the Wasp ore shoot at it's known point of highest assay. Calculations for this alignment will be agreed upon prior to any license. After these three boreholes, the developer may drill anywhere he wishes.

The owners require the results of the developer's assay reports as they are developed, and the right to sample drill cuttings and split drill cores. The capacity of the Wasp lab will not handle the work of two operators. Unless otherwise agreed, Worst retains sole control of the Wasp laboratory until any sale is funded and closed. Worst also requires evidence of the operator's prior experience and financial capability to develop an underground mine in the event it appears warranted by the drilling program.

The Wasp was bought in 1978 by Worst and an associate, Cliff Sovig. They divided the property. Worst took the north half, upon which all existing development was later done. Sovig took the south half. Sovig died, and the south half is owned by his successors. The south half is undeveloped land, mostly dacite, however the Mammoth Fault as platted [77] does cut across a portion of it. The owners believe the property is worth more if sold as an integral unit, and it is presumed that a developer would want the entire claim.

Residential land in the area, with utilities available, runs from $30,000 to $50,000 per acre, some as high as $100,000 per acre.. This can be verified by contacting any area real estate broker.

The owner's residence was FHA appraised five years ago at $92,000. and is currently rated for insurance purposes at $140,000. With the mill, laboratory and outbuildings included, just the surface estate of the claim ought to be worth $750,000.

If drilling indicates there actually is $11 million in the Wasp ore shoot, the entire property ought to be worth the asking price of $2.5 million. This is attributing only $1.75 million to the mineral estate, as the buyer would still have the remaining value of the surface estate after the mine is depleted, which value should by then be substantially appreciated.

13 of 16

Some speculative value is attributed to the fact that in 1893-1895, within pistol-shot distance, $34 million (at today's gold prices) was taken out of two ore shoots on this same geological structure.

If a drilling program indicates the property is worth less than the sellers now presume, they may consider a downward adjustment in the price. Such adjustment would be solely the sellers' prerogative. The sellers will not index the price to drilling results in advance, as this excessively transfers control of the price to the buyer. If the developer abandons the project after the drilling program, he retains no residual earned equity in the property.

The owners are not soliciting lease offers, having already sustained losses of $143,000 from the infidelity of lessees. In any lease event, the existing Wasp ore shoot may not be additionally mined by surface methods without the owner's consent, the granting of which is questionable. Neither will the owners accept any investment money or sell any fractional interests.

If a buyer/developer has other ideas, the owners will listen, but may not depart far from the outline offered here. Meanwhile, until someone makes a proposal, the owners will continue with exploration and development, during which the price and terms may be adjusted either way depending on the results of the work.

The owners would consider reducing the $2.5 million "asking price" by $140,000., and retain only the surface estate to the 1¼-acres containing the owner's residence, with an easement for ingress and egress. This 1¼-acres is across the highway from, and would not interfere with, the mining operation. The mineral estate underlying this 1¼-acres would be conveyed to the buyer, who must warrant against damage from blasting or subsidence. This offering, however, is not conditioned upon such an arrangement. If the buyer requires the entire property, the sellers will need a 6-month leaseback on the owner's residence to permit their orderly departure from the premises.

Clay Worst

THE OLD WASP MINE

INTRODUCTION

The Old Wasp gold mining claim, at Goldfield, Arizona, although located in 1893, was not appreciably developed during the pioneer era. Modern development was not commenced until the discovery of the Old Wasp ore shoot in 1983.

The adjacent Mammoth claim, however, has an extensive development history beginning in 1891. This includes twelve shafts and over three miles of underground workings, of which detailed records are available.

The gold deposition at the Mammoth Mine occurred along the hanging wall contact of the Mammoth Fault. The developed Wasp ore shoot occurs along a continuation of this same contact as it extends across the Old Wasp claim. The Wasp shoot was in fact intercepted in 1925 at the 1,000 ft. level by a drift from the Mammoth Mine which encroached under the Wasp claim. Complete assay records of this interception are included in this presentation.

That the adjacent Wasp and Mammoth Mines are on the same geological structure makes the abundance of data available on the Mammoth mine invaluable in evaluating the Wasp. The Wasp, in fact, cannot properly be evaluated except in context with the history of the adjacent Mammoth Mine.

The Old Wasp Mine is owned by the writer, Clay Worst, and his wife. Working with Warren Konemann, a mining consultant, we compiled some 600 pages of data on the Mammoth Mine and other mines in the immediate Goldfield area. We are not in the publishing business, and cannot furnish this amount of data to the idle curious at no charge. Accordingly, the first part of this report includes only the synopsis of our report on the Mammoth Mine, included to place the subsequent Wasp report in perspective. Superscript parenthetical numbers [1] throughout the text refer to sources listed in the bibliography of the 600 page report. This bibliography is included herewith, that the reader may verify this material independently. If the reader is seriously interested in pursuing it further, the entire 600 page report can be made available.

C:\wrdprfct\goldfild\modern\package\waspk991.wpd

GOLDFIELD, ARIZONA, USA

THE MAMMOTH MINE

January 1, 1998

INTRODUCTION

The Goldfield mining district is located on the western foothill slope of Superstition Mountain, 5 miles northeast of Apache Junction, Arizona, and 38 miles east of Phoenix. It lies in Pinal and Maricopa Counties, Townships 1 & 2 North, Range 8 East of the G.& S.R. Base & Meridian.

At Goldfield, the Mammoth Mine alone produced over $34 million (at today's prices) between 1891 and 1925. Of the five major groups of claims, E.O. Kennedy [7], E.M. quotes J.R. Hubbard, EM, as estimating the remaining ore reserves on the Mammoth group alone to be equivalent to $111.7 million today. The ore body remains in place.

Goldfield has paved road access via State Highway 88, 6½ miles straight and level, from Superstition Freeway # 60. Public utility 3-phase electric power is available. A 45kV transmission line with an existing substation 1,800 ft. from one of the properties could provide power for a very large operation.

AREA HISTORY

This report has been compiled by Warren Konemann, mining consultant, and Clay Worst, a real estate broker who is the owner of the Old Wasp Mine . The writers would emphasize that most of this history is based on records of the Arizona Department of Mineral Resources, which is the work of others. We cannot be responsible for the accuracy or sufficiency of work done by men who died before we were born, much of which was done in another century.

Further, between 1837 and 1934, the price of gold in the U.S. was fixed at $20.67 per ounce, the price basis of the pioneer reports referenced herein. It now exceeds 14 times that price.

Accordingly, for the sake of clarity, some production figures have been converted from pioneer prices to current prices and dollar values to gold content and vice versa. We are responsible only for faithfully and accurately reproducing the work of others, and for the accuracy of the conversions, which are identified wherever used. Some 80 historical and contemporary sources are listed in the bibliography following, and are referenced by superscript numbers [0] throughout the text. These may annoy the casual reader, but are invaluable to anyone referencing the source of the data.

Inconsistencies throughout the text reflect that we have not adjusted the reports of some 80 sources to create a reconciliation of opinions. Such adjusting is left to the reader.

"Today's price" as referenced herein is New York spot gold, December 20, 1997, viz. $289.50 per ounce.

Historically, the largest producer at Goldfield was the Mammoth Mine. The Mammoth has over three miles of underground workings, almost entirely devoted to exploring a 4,000,000 ton body of low-grade (0.07 oz. gold per ton) ore to the 1,000 ft. level [15] . With the projected higher grade ores added, total projected values have reached $126 million by today's prices [15].

Virtually no stoping has been done; the ore body remains in place. $34 million (at today's prices) was produced from selectively mining the high-grade shoots encountered.

The Old Wasp Mine is a key property at Goldfield. The Wasp claim has patented fee simple title. It lies adjacent to the Mammoth claim on the south, along the strike of the Mammoth Fault. Deep exploration from the adjacent Mammoth claim has established that the Wasp ore shoot, which has been mined only to the 60 ft. level, persists with good values at the 1,000 ft. level. At least $670,000. was recovered from the upper 45 feet of the Wasp shoot. The Wasp has a 6-inch domestic water main, however the Wasp generates enough mine water for milling purposes if recycled.

Of the various claims at Goldfield, all except the Bulldog group lie along the strike of the Mammoth Fault, much of which remains unexplored. The historic production at Goldfield has largely been along the hanging wall contact of this fault.

THE MAMMOTH GROUP

The Mammoth group of claims consists of the 20-acre Mammoth claim, patented fee simple absolute, seven 20-acre unpatented claims and eleven fractional unpatented claims totaling 274 acres, all contiguous. The Mammoth Mine has by far the largest production history and the most extensive exploration at Goldfield. Since the Mammoth is now flooded, the extensive pioneer-era records of these workings give the clearest picture of the geological structure, extent, and estimated value of probable ore deposits along the Mammoth Fault.

Gold was first discovered by Anglos at Goldfield in the 1870's, though the property then showed evidence of prior mining activity during the Mexican period [17]. O.D. Merrill, a Mr. Hakes, a Mr. Cosner and J.R. Morse filed the earliest claims of record [45].

In 1890, Chas. L. Hall, and a backer, Dennis Sullivan, optioned the Black Queen, Tom Thumb and Mammoth claims from O.D. Merrill. Within a year, a flash flood in Goldfield Wash uncovered a rich shoot on the Mammoth claim where the wash crossed the Mammoth Fault.

Merrill discovered the shoot, but had already optioned the properties to Hall. Hall exercised his option at once and erected a 20-stamp mill on the property. While mining this shoot, Hall also sank a series of shallow shafts tracing the north-south trending Mammoth Fault (the main fault plane) for some 4,000 feet. The known ore zone lay adjacently to and eastward of the fault contact.

Hall developed the vein along the Mammoth Fault for about 700 feet, disclosing a second rich ore shoot near the south boundary of the Mammoth claim. The north shoot was called the Mormon Stope; the south shoot was called the Glory Hole.

According to early-day reports [7, 13, 15], these shoots, mined in 1892-1893 to about the 100-150 ft. level, produced $1 million. Gold was priced at $20.67 per ounce, indicating production of some 48,000 ounces of gold in 14 months [13], some $14 million at today's prices. Hall was reportedly regularly shipping 150 pounds of gold every three weeks [15].

E.O. Kennedy [7], Hall's engineer, reported one month, February 1893, when $105,000 was recovered. He states, "...many other months came close to it." This converts to $1.47 million in one month at today's prices. A.S. Lewis [15] states Hall was producing "$3,000 per day" (about $42,000 per day at today's prices).

Kennedy [7] also reports the brush was cleared for 200 feet on each side of the roadway so the guards could not be ambushed by road agents.

Regrettably, in 1894 [15], Goldfield Wash experienced a second flash flood. Hall's workings extended under the wash, his timbering was inadequate, and his workings caved. Hall sank a shallow shaft adjacent and drifted in under the old workings, but was unable to hold the caved material with timbering.

Kennedy [7] advises that $90,000 of the rich ore was lost in the cave-in. Young and Pecord [8] quote $100,000. This converts to $1.3 million at today's prices. It has never been recovered. E.W. Smith [82] plats all of this caved material situated upward of the 100 ft. level.

Hall, then the sole owner, became ill and went to Denver, where he died. His daughters had no interest in mining, and the Mammoth Mine was closed. Hall died one of the richest men in Colorado. At that time, the deepest workings were at 425 ft. Hall's last bar of gold weighed 1,700 ounces

With Hall's death, all original contemporaneous records of the mine were lost. The best evidence of Hall's operation is found in the recollections and records of Hall's engineers.

Kennedy [7] reports that Hall milled a total of 50,000 tons of head ore averaging 1.9 ounces of gold per ton. A.S. Lewis [15] reports Hall's mill heads averaged 2.1 ounces per ton. If even the lesser figure is correct, Hall's total production would have been 105,000 ounces, worth over $27.5 million today. Kennedy [7], Williams [13], Lewis [15] and others concur that Hall' production reached $1 million, with gold priced at $20.67 per ounce..

It should be noted, however, that Young and Pecord[8] state that by 1912 (20 years later), only $400,000 in Hall's bullion receipts were still at hand. However they do add, "No doubt much ore was taken out of which no record is to be had." Even this partial figure converts to $5.6 million today.

In 1909, George U. Young, the Territorial Secretary of the Arizona Territory and also the mayor of Phoenix, secured an option on 10 claims, including those owned by Hall's daughters. He purchased them in 1917.

He rehired E.O. Kennedy, who had been Hall's engineer. He also sank a shaft adjacent, and attempted to drift in under the caved workings. He, too, was unable to hold the caved ground with timbering. A.S. Lewis [15] states that Young's engineers took 96 samples of caved low-grade muck that Hall had left behind. These averaged 0.44 oz. gold per ton.

Young then sank a shaft on the Mammoth Fault near the north end of the Mammoth claim, intending to sink to 800 ft. [13]. Results were disappointing, and it appears to have been abandoned at 320 ft. He then directed his efforts southerly.

By 1911, Young had drifted under the old Mormon Stope [8] and the Glory Hole at the 100 and 200 ft. levels. Later, at the 425 ft. level under the Glory Hole, the south shoot was still 50 ft. long by 12 inches in width. It averaged 1.1 ounces of gold per ton. A winze at this level averaged 42 in. wide at 1.49 ounces per ton. This was leached with cyanide by Kennedy [8] for a 98% recovery.

Young had no intention of only following rich shoots, but proposed to block out an immense body of low grade but profitable ore, to be mined later on a large scale. To this end, he ultimately sank at least 12 shafts on the Mammoth claim alone, with 13,760 ft. (nearly 3 miles) of shafts, drifts, cuts, raises and winzes. Lewis [15] states that Young did "little if any stoping."

Several engineers estimated that Young had blocked out four million tons of low-grade ore averaging 0.07 ounces per ton. Chas. B. Broan [11] quotes J.R. Hubbard as estimating ore reserves at the Mammoth Mine at $7,977,000., converting to $111.7 million today. Broan states that Hubbard deducted 50% "for his protection," and that "Work since has added many times to that value."

While his work was deliberately exploratory, with virtually no stoping, by 1920 Young did produce $63,000 in recovered gold [8], over $882,000 at today's prices. His real accomplishment, however, was in generally proving an immense ore body of low grade ore 4,000 ft. long by 500 ft. wide by 1,000 ft. deep, presumably deeper. Lewis [15] states the entire mine, figuring the vein 500 ft. wide, including dumps and caved ground, had a computed average of 0.13 ounces of gold per ton. Broan [11] provides Young's production records from Oct., 1913, to Oct. 1914, totaling $39,000, equivalent to $546,000 today.

The reports that follow are very important with reference also to the Old Wasp claim, which adjoins the Mammoth claim to the south, along the strike of the same Mammoth Fault contact. Two engineers' reports, Bedford [12] in 1923 and Kennedy [7] in 1925, both concur on a significant point.

Bedford [12], in his report to Young, in discussing the origin of the mineralization at the Mammoth Mine, states, "The resultant mass silicifying between the displaced walls formed a pegmatite chonolith. **The feeder to, and the bulk of the chonolith, is southerly from the area under consideration, hence only the extreme north extremity is encountered in your mine development to date.**" (Emphasis is the writers').

Kennedy [7], working separately, concurs: "PITCH OF ORE; **The ore pitches to the south. The high values in the South Shaft, 430 ft. deep, would confirm the belief of rich ore to great depth. This deduction is undoubtedly true.**" (Emphasis is the writers').

Bedford and Kennedy's counsel that the ore body at depth would lie to the south was undoubtedly what incited Young to drift south at the 1,000 ft. level from Shaft No. 7 (The Main Shaft) along the Mammoth Fault contact, where, as related by J.H. Williams [13], "He encountered a very good grade of ore." The facts are these:

In 1925 [80, 81] Young, at the 1,000 ft. level, drifted southwest from the Main Shaft to intercept the Mammoth Fault contact, then followed the contact south; Williams [13] states "some 1,000 ft.", but Young's plats show that he only drifted south 830 ft.

In May 1925, this drift had exited the south boundary of Young's Mammoth Claim and was under his tiny "Fraction" claim (the present-day Nettie).

At this point he began obtaining assays as high as 21 ounces of gold per ton, but had reached the south boundary of his own property, which was the north boundary of the Old Wasp..

Joseph Riley Morse filed the original claims on the Mammoth group in 1892. When he sold his holdings, he insisted on retaining only the Old Wasp claim, which he patented in 1896. In 1897 he sold a half-interest to a Mr. White.

The Wasp was the only claim at Goldfield that was patented during the pioneer era. Morse's motive in patenting and excluding the Wasp from the sale of the Mammoth group remains unclear. However, it resulted in the Wasp retaining separate, clear, undisputed title during the litigation that later encumbered the remainder of the Mammoth claims.

Young attempted to buy the Wasp, but Morse and White declined to sell. This placed Young in a dilemma. Understandably, perhaps, Young kept on drifting south under the Wasp, property he didn't own.

In a letter to Clay Worst in 1977, after Worst had acquired the Wasp, Mr. White's son, himself then 87 years old, wrote, "My father always thought the Mammoth people were intruding on his property with their deep shafts."

From August 15 through October 21, 1925, Young [80,81] continued his drift at the 1,000 ft. level southward, encroaching 188 feet under the Old Wasp claim. Car samples of mine run material assayed between the above dates over 75 ft. of drift averaged 0.70 ounces of gold per ton. The best of the ore was in the final 75 ft. of Young's drift. Mine run average along 30 lineal ft. of drift assayed 1.12 ounces of gold per ton.

Young ultimately did acquire Morse's half-interest in the Wasp, but then Young died. His bank foreclosed on the property and the mine was closed. The heirs of White and Young sold the Wasp to Roy Rhodes in 1977. Clay Worst and an associate, Cliff Sovig, bought it in 1978.

After Young's death, an extended period of litigation followed on the Mammoth group. However, during this period, the mine was reopened in 1929 and 1930 by the Apache Trail Gold Mining Company, who made a small production. By 1934 the mine was filled with water to the 200 ft. level. It is currently filled nearly to the surface.

The litigation ended with a sheriff's sale to E.H. and L.D. Shumway in 1940. Alfred Strong Lewis was the engineer. In 1946 Lewis compiled reports of the mine's prior history, already related here, and detailed proposals for the mine's reclamation [15]. These are lengthy, and his cost estimates are now 50 years obsolete. In 1950 Lewis died and again the mine was closed.

Ownership of the Mammoth group then passed to Goldfield Mines, Inc., owned largely by Tom Russell, Ted Sliger, C.C. "Doc" Waterbury, and Hugh Nichols. The extreme increase in the price of gold following deregulation caused a resurgence of interest in Goldfield. Regrettably, this led to many title disputes and lawsuits. The major antagonist was convicted of mining fraud and is now serving 46 years in the state penitentiary.

The above material is excerpted from a 489-page presentation we have assembled on the Mammoth Mine from 80 sources. These include worksheets of all underground workings, some 2,500 assays, assay maps, drill logs, and reports of many engineers and geologists, made when the Mammoth was open to inspection to the 1,000 ft. level.

THE OLD WASP MINE

The Old Wasp claim adjoins the Mammoth claim on the south, along a continuation of the Mammoth Fault hanging wall contact. While the Mammoth claim has some three miles of underground workings sunk to the 1,030 ft. level by 1925, the Wasp remained essentially a virgin property until 1983.

The Wasp is a 20.64 acre claim, patented fee simple absolute, with a quiet and undisputed title since 1893. The north 9.51 acres, upon which the Old Wasp ore shoot, the Wasp mill and all other development exists, is owned by the writer, Clay Worst, and his wife. We live in the owner's residence on this 9.51 acres. The south 11.13 acres is presently totally undeveloped, is owned by others and is not included in our offering. An explanation is in order.

The Old Wasp claim, then totally undeveloped, was purchased in 1978 by ourselves and a friend, Cliff Sovig. It was divided under separate ownership into the two parcels just described. Sovig died, and title to his 11.13 acres was transferred to his wife, then to her niece. I am advised that the niece has just now sold her interest to others, whom I have been unable to contact. I have no knowledge of their intended disposition of the property.

The claim is crossed by hard-surfaced State Highway 88. A 3-phase electric distribution line and a 6-inch municipal water main are on the property, and a 45 kV substation is a mile distant.

The highest and best use of the Wasp might be if operated in concert with the Mammoth Mine by a major mining company. However, since the Wasp mine has a perfect title, a proven ore body and the only currently operational mill at Goldfield, it is still a viable independent operation.

The preceding report on the Mammoth Mine (page 4, paragraph 11) references the work of Kennedy [7] in 1910 and Bedford [12] in 1923. If Kennedy and Bedford were correct, and the ore emplacement on the Mammoth was being fed from the south, then it was being fed from beneath the Wasp. Their counsel was undoubtedly what prompted George U. Young in 1925 to drift south at the 1,000 ft. level from the No. 7 Shaft (The Main Shaft) of the Mammoth Mine along the hanging wall contact of the Mammoth Fault, and intercept the Wasp ore shoot at the 1,000 ft. level.

That this is the same ore shoot exposed in the bottom of the present Wasp open pit is well established, for these reasons:

1) The surface exposure of the Mammoth Fault contact from the Mammoth Mine southward to the Wasp was clearly in evidence when the properties were mapped in 1916 [77].

2) If the fault contact in the bottom of the Wasp open pit is protracted downward on the average westward dip of the Mammoth Fault, the calculated intercept at the 1,000 ft. level is within 5 ft. laterally of the actual location as platted on the Mammoth worksheets [81].

3) As the values in the Wasp pit are followed southward, they increase to a peak, and then decrease beyond that point.

The same occurred at the 1,000 ft. level. If the point of highest assay in the Wasp pit is protracted downward on the dip of the vein, 90 degrees to the strike, it intercepts the point of highest assay at the 1,000 ft. level [81].

4) Whenever extremely high grade ore is encountered in the Wasp open pit, it is associated with malachite (copper carbonate) and galena (lead sulphide). The assay records from the Wasp shoot at the 1,000 ft. level indicate up to 3% copper and 18% lead [80].

The south drift at the 1,000 ft. level in the Mammoth Mine is of great value in evaluating the Old Wasp ore shoot. The following data can be verified by the Mammoth plats of the 1,000 ft. level dated 8/20/1925 [80] and 11/5/1925 [81].

At station 1026, the drift entered the Wasp claim. Initial values were low grade, but the continued extension of the drift was probably motivated by assays of 19.3 oz. and 21.1 oz. gold per ton, found in this drift 57 and 69 feet prior to entering the Wasp.

77 feet onto the Wasp, they encountered the beginning of another 75 feet of drift which averaged 0.70 oz. gold per ton. The central 30 feet of this 75 foot section averaged 1.12 oz. gold per ton. The 36 foot remainder of this drift averaged 0.51 oz. gold per ton. There is also a notation of 35 lineal feet of "black ore 12 in. wide" that averaged 2.52 ounces. Individual samples of "black ore" at the 1,000 ft. level assayed up to 4.94 ounces of gold per ton.

This comprises 111 feet of drift averaging 0.634 ounces of gold per ton. These were daily car samples taken as the drift advanced, perhaps as representative samples as could be obtained.

A limited amount of such "black ore" has been encountered in the Wasp open pit to date. However, in the entrance ramp to the pit, near the south end of the mined ore shoot, the operators discovered a filled-in shaft. The patent survey plat of the Wasp indicates all the shallow prospect holes, but this shaft is not shown, nor is there any known record of it. Its purpose is a matter of conjecture.

This is a 4 x 6 foot shaft, cribbed solid with modern mill-sawed timbers, but with short lengths of hand chopped ironwood timbers laid just outside the modern timbers. None of the ironwood timbers are much over three feet long. It appears the early Anglos found an old timbered Mexican shaft, which they reopened and retimbered. The shaft is still evident at the 40 foot level on the entrance ramp. It seeps groundwater.

The shaft is filled with black material, which may be ash. The shaft is located directly above the south end of the vein of "black ore" disclosed at the 1,000 ft. level. No attempt to clean it out has been made, as it is in the center of the ramped roadway into the open pit, and opening it would block access to the pit.

Of significance is that a 12-inch width on the final face of the completed drift at the 1,000 ft. level still averaged 3.60 ounces of gold per ton [81]. Obviously, the drift was not discontinued due to a lack of values; it was discontinued due to the death of the operator. Accordingly, the actual southerly extent of the Wasp ore shoot at the 1,000 ft. level, and its gold values, are totally unknown.

Gold values in the Wasp open pit are not as clearly defined. No assay records of the upper 45 feet survived the original lessee's office fire.

At the 53 foot level in the open pit, assays exist only for the south end of the ore shoot, where an average width of 5.25 ft. averaged 2.20 oz. gold per ton for 30 lineal feet. At the north end of this 30 feet, an 8.2 ft. width averaged 3.48 oz. gold per ton, of which the 3.9 ft. next to the fault contact averaged 7.68 oz. gold per ton.

Usually, the highest values lie in the first two feet of granite next to the hanging wall contact. As an experiment, a 40-ft. hole was drilled in the bottom of the pit, starting one foot out into the hanging wall from the fault contact. The drill rig was "eyeball" inclined to attempt following this two-foot high-grade width downward. Samples were taken at five-foot intervals.

These samples assayed 8.7, 4.2, 3.65, 2.15, 1.90, 1.05, 0.90 and 0.75 ounces of gold per ton. This hole averaged only 2.91 ounces. It proves nothing, as it cannot be known whether the values in this two-foot width actually decreased with depth, or whether the drill hole drifted out of its estimated one-foot width tolerance. There would seem a remote chance of drilling 40-feet with an air-track drill and staying within a one-foot width tolerance, with only an estimated drill inclination on an unproven dip. The only assurance was that the upper five feet averaged 8.7 ounces of gold per ton.

To interpolate values between the present 60-ft. level in the open pit and the drift directly below at the 1,000-ft. level involves some conjecture, but we have to start with the best information available. The point of highest value in the open pit at the 53 foot level was 3.48 ounces 8.2 ft. wide. Directly down the dip of the vein, 90 degrees to the strike, you intercept the point of highest assay at the 1,000 ft. level, 1.60 ounces. Accordingly, the values at this point at the 1,000 ft. level are 54% less than directly above this point in the open pit.

The most complete assay records are those at the 1,000 ft. level, where 111 feet of drift averaged 0.634 ounces. If the values at this level are also 54% less than directly above in the open pit, then the values in the open pit should average 1.38 ounces, which presumption appears validated by prior experience. On this basis, the overall assays between the 60 ft. and 1,000 ft. levels should average 0.976 ounces.

An ore shoot 111 feet long by 8 feet wide by 940 feet deep contains about 38,400 tons of material. At an average assay of 0.976 ounces, there would be 37,478 ounces of gold, at $289.50 an ounce, worth $10,850,000.

However, the south terminus of the 1,000 ft. drift still assayed 3.60 ounces 12-inches wide, so the values should not be presumed to end at that point. Also, having proved only that values persist to the 1,000 ft. level, there is no reason to assume they end at that depth. With only a probable increase of 10% in length and 10% in depth, both extremely conservative presumptions, the shoot would contain about $13.5 million in gold values.

The foregoing arithmetic may be a presumption based on incomplete information, but it is a reasonable presumption based on the best existing data. Only a drilling program will delineate and evaluate the existing ore shoot. Further, there is no reason to believe the known Wasp ore shoot is the only such deposit on the property, while the remainder of the Mammoth Fault Contact remains unexplored.

The Wasp ore shoot ought to be drilled. Three slant bore-holes, calculated to cut the Wasp shoot at the 250 ft., 500 ft., and 750 ft. levels, would give a general idea of what values lie throughout the shoot. The outcome of that drilling may encourage additional drilling to further delineate the ore body.

The 250 ft. intercept would require 320 ft. of hole; the 500 ft. intercept would require 640 ft. of hole; the 750 ft. intercept would require 865 ft. of hole, a total of 1,825 feet of borehole; see the cross-section plan enclosed [41]. These really should be cored.

These slant holes ought to be drilled from the footwall side rather than the usual hanging wall side for several reasons. The dip of the Mammoth Fault contact throughout the Mammoth Mine is a quite consistent 87 degrees west, but therein a problem arises.

There were two different surveys of the 1,000 ft. level in 1925; one in August [80] and a resurvey in October [81]. Apparently a mistake of exactly ten degrees was made in a deflection at station 1008 on the August map, and a corrected map was drawn in November.

This results in an ambiguity between the two maps of 83 ft. laterally in the location of the Wasp ore shoot at the 1,000 ft. level. The October resurvey is presumed correct.

If the drilling is done from the footwall side, and that presumption is wrong, no harm is done; the vein would just be intercepted sooner than expected. However, if it were drilled from the usual hanging wall side, and the presumption proved wrong, the vein would be intercepted much deeper. It might be missed altogether at the 750 ft. level. This is illustrated by the enclosed drilling plan [41].

The footwall of the Mammoth Fault has never been identified on the Wasp claim. In the Wasp open pit, the Mammoth Fault hanging wall contact between the altered latite (dacite?) on the west and the granite on the east is sharply defined. There is a two-inch seam of red fault gouge at the contact. The gold values lie eastward in the adjacent brecciated, silicified granite. The highest values lie in the first two to three feet against this contact. Then the values simply grade out eastward into the harder granite dike, without a definite cutoff.

There is a further reason for slant-hole drilling from the footwall side. In 1983, Wayne Blood, while drilling for the then operator, recovered 7-oz. and 10 oz. assays from 25-ft. depth from two vertical boreholes about 25 ft. out in the intruded granite, near the path of the proposed slant holes.

These two drill holes did not define any particular structure as Blood advised "there were a couple holes between them that were down in the tenths of an ounce." However, they might be intercepted by the proposed slant holes if drilled from the footwall side. Also, the topography makes a drill setup far easier on the footwall side. There are no records of the prior operator's drilling. They had a fire about the time we called for an accounting and terminated their lease for failure to pay royalties.

The Wasp ore shoot as discovered in 1983 averaged six to eight feet in width, averaged 13 ounces of gold per ton, and was encountered under only four feet of overburden. It was five miles from town, had paved-road access, water, electricity, and an owner/lessor who was totally occupied elsewhere. It was a poor miner's dream come true. The lessee should have started sinking a shaft on it, but chose to begin a surface mine.

They must have known that pursuing a 13-ounce eight-foot wide vein on a nearly vertical dip as a surface mine would quickly result in a stripping ratio that would end their operation, but would be immensely profitable initially. This evidently caused them to "grab the easy pickings" and not pay royalties as promised, knowing their plan would eventually be discovered and their lease terminated.

There are local traditions of the Mammoth Mine having struck an "underground river," which filled three miles of workings overnight. Water was said to be running out the portal in the morning, and the water level could not be lowered with pumps.

Not only do the extensive pioneer records reflect no such thing, the story is refuted by Mammoth records stating that by 1934, after lying dormant for four years, the mine had only filled to the 200 ft. level. Further, Brace Resources, in 1984, pumped out the caved-in Mammoth pit with no problem.

These pioneer era records of the Mammoth group, and exploration activity in recent years, indicate that the properties have a very definite potential for profitable development.

Rex Thompson, an experienced miner at Apache Junction, has worked extensively on the Mammoth group, both at the Mammoth and Black Queen mines. Thompson worked in concert with a succession of operators, during which he acquired an intimate working knowledge of both properties. His counsel would be invaluable to a new operator.

When we called for an accounting, the operator reported $200,020. in net smelter returns, all from one refinery. We determined an actual total of $536,369., which included sales to six other refineries, which the operators finally admitted. It may be presumed there were other sales that were never disclosed. With a known shortage of $50,452. in our royalty account, we terminated their lease. None of the royalty shortage was ever paid.

Since a 20% deduction was taken for refining the "black sand" concentrates, the gross production had to have exceeded $670,000., taken from the top 45 feet of the Wasp pit. It may have been twice that amount. Their employees have estimated $1.2 to $1.5 million, and we are advised one of the lessees boasted privately of $1.5 million.

We then entered an agreement with a second operator. They removed some 10,000 tons of lower grade material to lower the ramp to the pit. During this process they dozed out about 1,560 tons of mixed lower grade ore.

Some of this material was processed at a small mill they built on a nearby leased property.
The mill was junk. Due to heavy down time they averaged only about two tons throughput per 8-hour shift. The result was that with this primitive plant they recovered about one ounce of gold per ton, probably not over a 50% recovery, since the head ore averaged close to two ounces. They were losing the fine gold.

Their tails were never assayed. Their millsite was later leased to another operator who just hauled the tailings away and then abandoned his lease.

Smelter returns from the sale of concentrates and dore' during that operation were $47,832. Their mill required water to be hauled out from town at a cost of $50,000 per year. It became obvious that this mill could not show a profit on two-ounce mill heads. We also discovered that two of our then associates were parties to the non-payment of royalties during the previous operation. We terminated the second operation.

We were left with $28,528 in unpaid bills, owed $22,342 in wages, and owed for $42,000 worth of ore shipped from the property. None of this was ever recovered. If we sound a bit paranoid, it is based on bitter experience.

The Wasp was inactive from 1985 until 1992 other than sampling and assaying by ourselves. The last channel sample taken across the vein at the bottom of the pit then assayed 7.68 oz. Au/ton 3.9 ft. wide, and 3.48 oz. Au/ton 8.2 ft wide.

In May 1992, as an experiment, we set up Rex Thompson's spiral classifier, actually a placer machine, on the Wasp. No head ore was available, as the pit was then filled with water, so we ran samples of stripping waste from eight random locations around the Wasp pit. We recovered gold from every sample. There was nothing quantitative learned, since this was hard-rock material that was never crushed or ground to liberate the gold. It only evidenced that even the stripping waste contained considerable values in the fines. A color photograph [43] of the gold buttons recovered is included with this report.

Although there is still good ore exposed in the open pit, continued mining of the Wasp shoot as a surface operation will be limited by increasing stripping ratios. However, there appear to be at least five other development options for the Wasp.

The first option would be sinking an inclined shaft, following the ore shoot itself down its 87 degree dip.

This would have the advantage of sinking in pay ore with its attendant cash flow.

Sinking a shaft in the bottom of the open pit would require some means of excluding surface water runoff. One might extend a watertight collar upward from the bottom of the pit, aligned with the 87 degree dip of the vein to a point safe from surface flooding. It could even be extended to the original surface, as almost the entirety of the material excavated from the pit is stockpiled adjacent and available for use as backfill. Also, the removal of these stockpiles would greatly increase the area available for other surface activity.

The second development option would be to go east into the solid granite that intruded the fault and sink a vertical shaft. Then crosscut about every 100 feet of depth to intercept the Wasp shoot, then stope. Fortunately, the vein dips only three degrees off vertical, so the crosscuts would remain short, even at depth.

A disadvantage is that you would probably be sinking and crosscutting in lower grade material, reducing the cash flow. However, the possibility exists of encountering the 7 and 10 ounce ore disclosed there by Wayne Blood's drilling.

A third development option involves an electromagnetic survey we conducted with induced currents on the northeast part of the Wasp claim, near the open pit. We discovered four anomalies [42], all within 30 feet of each other.

We had only a percussion air-track drill and 60 feet of steel. We drilled the first anomaly, and only averaged 0.10 ounces for the top 40 feet. Between 40 and 50 feet we averaged 0.70 ounces. It should be noted that a loss of 50% of precious metal values in an uncased percussion drill hole is common, due to the values getting hung up in the cavities and rough walls of the borehole. Even reverse circulation drilling with a rotary Tricone bit has resulted in a 51% loss of metal values remaining in the drill hole (*California Mining Journal,* Jan. 1988).

At 50 feet the drill hammer broke down, and we could neither continue nor withdraw the drill steel. We had the hammer repaired and managed to salvage the drill steel, but the borehole had caved beyond salvage. We do plan to redrill this anomaly, plus the remaining three. We also plan to complete the electromagnetic survey of the area surrounding the pit, as there may be other anomalies.

If drilling these anomalies discloses another major ore shoot, the third development option would be to sink on this shoot in pay ore, and then crosscut 190 ft. to intercept the original Wasp shoot at depth.

A fourth development alternative would be to set a crane at the surface on the granite footwall side, and continue mining the Wasp shoot with a clamshell. The vein is sufficiently brecciated and friable at that point that no blasting has been required. All mining there has been done with a trackhoe and skidloader. Only one round of blast holes has been fired in the pit, this on the north wall where harder material is encountered.

A fifth alternative would be to begin a circular decline, using rubber-tired equipment underground.

The Wasp pit makes about 1,500 gallons of water per day. A two-inch pump handles the inflow at less than a 5% duty cycle. If not pumped, the static water level in the Wasp pit stabilizes at about the 20-foot level.

However, it is doubtful if this shallow water table existed at Goldfield prior to the construction in 1929 of Mormon Flat Dam, and the resulting Canyon Lake, to the north. Bedford [12], in 1923, and others, state that the 1,000 ft. level in the Mammoth Mine still had not reached what they called "the constant water table."

Following his report on the 1,000 ft. level, Bedford states, "Anticipating that the water level will be constant at about the 1,200 level, and that the nature of the mineral deposition will change as outlined under Historical Geology and that ore deposits of economical importance will be proven to be greater in extent, and better in average values than those deposits now developed, I would strongly advise that your main shaft be sunk an additional 450 feet from its present (1,000ft.) bottom." If Bedford is correct, the true zone of secondary enrichment, with the richest ore, may lie even deeper than the 1,000 ft. level.

A final point on the Wasp ore shoot: There were individual high grade pods encountered in the Wasp pit; these pods ran several hundred ounces of gold to the ton.

They carried heavy galena and malachite (lead and copper), while the surrounding gold-bearing vein itself carried much less of either. The most recent of these pods weighed about 300 pounds and assayed 244 ounces of gold and 56 ounces of silver to the ton. However, assay records of the 1,000 ft. level indicate the gold-bearing vein itself carried substantial lead and copper.

We have no geologist's opinion as to how these high-grade pods were created and got where they were found. But if the Wasp shoot at some depth becomes an actual vein of this material, from which these pods were detached and relocated, and that spot could be found, it could be very profitable.

We have a complete laboratory for both fire assay and wet chemical analysis, and small batch refining. I am not a registered assayer, but took a course in fire assaying at the Mackey School of Mines, University of Nevada / Reno, and have some college level chemistry. We do our own fire assays, all of which are control assays, as we do not believe the ordinary specimen assays done by commercial labs are sufficiently reliable. All higher-grade results are done in duplicate. We do not use AA equipment.

There is a 3-phase electrical distribution line to the mill, but we had access to cheap diesel fuel, so we are running a GM 480-volt 60-kW generator with a freshly overhauled GMC 6-71 engine. With the entire mill running, it pulls about 30 kW, so the generator has plenty of reserve capacity for additional equipment. 120-240 volt single phase current is supplied from a public utility, but is also available from the generator. There is bulk storage for 3,000 gallons of fuel. The Wasp mill was built with new and used materials, and excellent used machinery, no junk.

The mill is designed to process about 10 tons of head ore per 8-hour shift. The concentration portion of the flowsheet was designed by our consultant Warren Konemann, who has been directly involved with us for over a year. The mill flowsheet is a simple wet gravity process. The head ore is dumped on a 3-in. grizzly; 95% passes. The 3-inch minus is then hauled with a front-end loader up a ramp and dumped into an elevated 5.5 x 7.5 ft. bin.

We have a Syntron apron feeder for this bin, not yet installed. Ore then drops into a 6" x 8" jaw crusher which takes it to about 3/4 minus, then into a 12" x 18" roller mill which takes it to about 3/8 minus.

Then up a 16" x 35' belt conveyor to a 5' x 7.5' bin with vibrator feeder. Then up a 12" x 10' belt conveyor to a 4 ½ foot Hardinge conical ball mill with a four-foot long cylindrical screen on the discharge. We are currently using a 30-mesh screen. Oversize is passed under a magnet to remove tramp iron, then returned to the ball mill intake scoop via a sand screw in closed circuit. The 30-minus discharge goes to a distributor, where it is split between two Stephens (3.3' x 7.3') rougher tables, which have new sand decks. Concentrate from the rougher tables go to a single Stephens finishing table, with a new deck.

There are also two Tri-R reverse spiral concentrators in the circuit. Rougher table tailings go to the first Tri-R Spiral. The cons from the first Tri-R Spiral and the tailings from the finishing table go to the second Tri-R Spiral. Cons from the second Tri-R Spiral, and the middlings from the finishing table, go to a sump where they are pumped back to the feed box of the finishing table.

Tails from both Tri-R Spirals go to a sluice box, then to a dewatering sand screw. Sand from this screw is elevated by a 16" x 25' belt conveyor into a dump truck.

Tail water goes through two 3,000 gallon steel decantation tanks in series, then to a 35,000 gallon mill pond with plastic liner.
From there a 2-inch pump recirculates the clarified water back to the mill. Mine water supplies all needs for the mill. A 2-inch service line from a 6-inch domestic water main at the Wasp boundary supplies any supplemental water, which is used only for cleanup.

Concentrates from the finishing table are amalgamated, the amalgam retorted, and a dore' bar poured. The Wasp refinery can produce a 995 fine gold bar, but chooses to market the 750 fine dore', since the smelter charges only 4% for refining. Since the Wasp cannot hallmark, even their 995 fine bar would entail this 4% refining charge, so refining to 995 fine would be pointless. The remainder of the dore' is almost all silver, possibly a little platinum-group metals.

The roller mill and ball mill are in new condition; the jaw crusher, conveyors, tables, and other equipment are in excellent shape. All motors except the tables and Tri-R Spirals are 480 volt, 3-phase, powered by the generating plant. The three table motors are 240 volt, single phase, and can be operated on either public utility power or the generator. The Tri-R spirals have DC motors with rectifiers and speed controls, which operate off one leg of the 3-phase generator. Each sand screw has its own independent hydraulic motor, pump and controls. Almost all wiring is in conduit, most of it underground.

The Wasp mill's capacity is limited by the ball mill, which the manufacturer rates at one ton per hour, grinding ½-inch hard quartz to 100 mesh. However, Wasp ore is very easy milling, the ball mill feed averages finer than ½-inch, and already has a high percentage of fines. The mill is currently fed 1.3 tons per hour, which is 10.4 tons per 8-hour shift, or 31 tons per 24-hour day.

The mill was just completed when we shut down for several weeks to bring the project into compliance with state and federal safety standards. That work is essentially completed, and we are just now beginning actual production. We have only marketed a couple pounds of gold, which we recovered while fine-tuning the mill, so no current production figures are yet available.

As owners, we have never and will never solicit nor accept investment money from anyone, which eliminates any possibility of adverse claimants against our clear title.

Regarding an exploration license and purchase option, the owners would require the three drill holes mentioned earlier, aligned to intercept the Wasp ore shoot at depth at it's known point of highest assay. These should be cored. Calculations for this alignment will be agreed upon prior to any license. After these three boreholes, the developer may drill anywhere he wishes.

We require the results of the developer's assay reports as they are developed, and the right to sample drill cuttings and split drill cores. The capacity of the Wasp lab will not handle the work of two operators. Unless otherwise agreed, we retain sole control of the Wasp laboratory until any sale is funded and closed. We also require evidence of the operator's prior experience and financial ability to develop an underground mine in the probable event that it appears warranted by the drilling program.

The Old Wasp Mine is offered for sale for U.S.$2,200,000. This consists of the 9.51 acres including the mine, machinery, mill, shop, lab, office, owner's residence with all real property improvements. Alternatively, it is available for U.S.$2,060,000 including the mineral estate to the entire 9.51 acres, but with us retaining the surface rights to only the 1.25 acres which includes our home, shop, lab and office, with the right of ingress and egress. This 1¼-acres is across the highway from, and would not interfere with, the mining or milling operation. The mineral estate underlying this 1¼-acres would be conveyed to the buyer, who must warrant us against damage from blasting or subsidence.

Residential land in the area, with utilities available, runs from $30,000 to $50,000 per acre, some as high as $100,000 per acre.. This can be verified by contacting any area real estate broker.

The owner's residence on 1 1/4 acres was FHA appraised five years ago at $92,000. and is currently rated for insurance purposes at $140,000, which is the price reduction stipulated above in the event we retain surface title to our home. With the mill, residence, laboratory and outbuildings included, just the surface estate of the claim ought to be worth $750,000.At a price of $2.2 million, this is attributing only $1.45 million to the mineral estate, as the buyer would still have the remaining value of the surface estate after the mine is depleted, which value should by then be substantially appreciated. If drilling indicates there actually is at least $13.5 million in that one Wasp ore shoot, then a price of $1.45 million attributed to the entire mineral estate seems reasonable.

Some speculative value must also be attributed to the fact that in 1893-1895, within pistol-shot distance, $34 million (at today's gold prices) was taken out of two ore shoots on the adjacent claim, on a continuation of this same geological structure.

If a drilling program indicates the property is worth less than we now presume, we may consider a downward adjustment in the price, however such adjustment must be solely our prerogative. We will not index the price to drilling results in advance, as this excessively transfers control of the price to the buyer. If the developer abandons the project after the drilling program, he retains no residual earned equity in the property.

We are not soliciting lease offers, having already sustained losses of $143,000 from the infidelity of prior lessees. In any lease event, the existing Wasp ore shoot may not be additionally mined by surface methods without our consent. Due to the history of prior operators taking the "easy pickings" and walking, the granting of such consent is questionable. Neither will we accept any investment money nor sell any fractional interests.

If a buyer/developer has other ideas, we will listen, but may not depart far from the outline offered here. Meanwhile, until someone makes a proposal, we will continue with exploration, mining and milling, during which the price and terms may be adjusted either way depending on the results of our work.

If the buyer requires the entire property, we will need a 6-month leaseback on the owner's residence to permit our orderly departure from the premises.

Clay Worst, owner

THE OLD WASP MINE

INTRODUCTION

The Old Wasp mining claim, at Goldfield, Arizona, although located in 1893, was not appreciably developed during the pioneer era. Modern development was not commenced until the discovery of the Old Wasp ore shoot in 1983.

The adjacent Mammoth claim, however, has an extensive development history beginning in 1891. This includes twelve shafts and over three miles of underground workings, of which detailed records are available.

The gold deposition at the Mammoth Mine occurred along the hanging wall contact of the Mammoth Fault. The developed Wasp ore shoot occurs along a continuation of this same contact as it extends across the Old Wasp claim. The Wasp shoot was in fact intercepted in 1925 at the 1,000 ft. level by a drift from the Mammoth Mine which encroached under the Wasp claim. Complete assay records of this interception are included in this presentation.

That the adjacent Wasp and Mammoth Mines are on the same geological structure makes the abundance of data available on the Mammoth mine invaluable in evaluating the Wasp. The Wasp, in fact, cannot properly be evaluated except in context with the history of the Mammoth Mine.

The Old Wasp Mine is owned by the writer, Clay Worst, and his wife. Working with Warren Konemann, a mining consultant, we compiled some 600 pages of data on the Mammoth Mine and other mines in the immediate Goldfield area. We are not in the publishing business, and cannot furnish this amount of data at no charge to the idle curious. Accordingly, the first part of this report includes only the synopsis of our report on the Mammoth Mine, included to place the subsequent Wasp report in perspective. Superior parenthetical numbers throughout the text refer to sources listed in the bibliography of the 600 page report. This bibliography is included herewith, that the reader may verify this material independently. If the reader is seriously interested in pursuing it further, the entire 600 page report can be made available.

PRELIMINARY
FOR STUDY PURPOSES ONLY
2nd. Draft
5-22-99

THE OLD WASP MINE

The Old Wasp claim adjoins the Mammoth claim on the south, along a continuation of the Mammoth Fault hanging wall contact. While the Mammoth claim has some three miles of underground workings sunk to the 1,030 ft. level by 1925, the Wasp remained essentially a virgin property until 1983.

The Wasp is a 20.64 acre claim, patented fee simple absolute, with a quiet and undisputed title since 1893. The north 9.51 acres, upon which the Old Wasp ore shoot, the Wasp mill and all other development exists, is owned by the writer, Clay Worst, and his wife. We live in the owner's residence on this 9.51 acres. The south 11.13 acres is presently totally undeveloped, is owned by others and is not included in our offering. An explanation is in order.

The Old Wasp claim, then totally undeveloped, was purchased in 1978 by ourselves and a friend, Cliff Sovig. It was divided under separate ownership into the two parcels just described. Sovig died, and title to his 11.13 acres was transferred to his wife, then to her niece. I am advised that the niece has just now sold her interest to others, whom I have been unable to contact. I have no knowledge of their intended disposition of the property.

to be updated

The claim is crossed by hard-surfaced State Highway 88. A 3-phase electric distribution line and a 6-inch municipal water main are on the property, and a 45 kV substation is a mile distant.

The highest and best use of the Wasp might be if operated in concert with the Mammoth Mine by a major mining company. However, since the Wasp mine has a perfect title, a proven ore body and the only currently operational mill at Goldfield, it is still a viable independent operation.

The preceding report on the Mammoth Mine (page 4, paragraph 11) references the work of Kennedy [7] in 1910 and Bedford [12] in 1923. If Kennedy and Bedford were correct, and the ore emplacement on the Mammoth was being fed from the south, then it was being fed from beneath the Wasp. Their counsel was undoubtedly what prompted George U. Young in 1925 to drift south at the 1,000 ft. level from the No. 7 Shaft (The Main Shaft) of the Mammoth Mine along the hanging wall contact of the Mammoth Fault, and intercept the Wasp ore shoot at the 1,000 ft. level.

That this is the same ore shoot exposed in the bottom of the present Wasp open pit is well established, for these reasons:

1) The surface exposure of the Mammoth Fault contact from the Mammoth Mine southward to the Wasp was clearly in evidence when the properties were mapped in 1916 [77].

2) If the fault contact in the bottom of the Wasp open pit is protracted downward on the average westward dip of the Mammoth Fault, the calculated intercept at the 1,000 ft. level is within 5 ft. laterally of the actual location as platted on the Mammoth worksheets [81].

3) As the values in the Wasp pit are followed southward, they increase to a peak, and then decrease beyond that point. The same occurred at the 1,000 ft. level. If the point of highest assay in the Wasp pit is protracted downward on the dip of the vein, 90 degrees to the strike, it intercepts the point of highest assay at the 1,000 ft. level [81].

4) Whenever extremely high grade ore is encountered in the Wasp open pit, it is associated with malachite (copper carbonate) and galena (lead sulphide). The assay records from the Wasp shoot at the 1,000 ft. level indicate up to 3% copper and 18% lead [80].

The south drift at the 1,000 ft. level in the Mammoth Mine is of great value in evaluating the Old Wasp ore shoot. The following data can be verified by the Mammoth plats of the 1,000 ft. level dated 8/20/1925 [80] and 11/5/1925 [81].

At station 1026, the drift entered the Wasp claim. Initial values were low grade, but the continued extension of the drift was probably motivated by assays of 19.3 oz. and 21.1 oz. gold per ton, found in this drift 57 and 69 feet prior to entering the Wasp.

77 feet onto the Wasp, they encountered the beginning of another 75 feet of drift which averaged 0.70 oz. gold per ton. The central 30 feet of this 75 foot section averaged 1.12 oz. gold per ton. The 36 foot remainder of this drift averaged 0.51 oz. gold per ton. There is also a notation of 35 lineal feet of "black ore 12 in. wide" that averaged 2.52 ounces. Individual samples of "black ore" at the 1,000 ft. level assayed up to 4.94 ounces of gold per ton.

This comprises 111 feet of drift averaging 0.634 ounces of gold per ton. These were daily car samples taken as the drift advanced, perhaps as representative samples as could be obtained.

A limited amount of such "black ore" has been encountered in the Wasp open pit to date. However, in the entrance ramp to the pit, near the south end of the mined ore shoot, the operators discovered a filled-in shaft. The patent survey plat of the Wasp indicates all the shallow prospect holes, but this shaft is not shown, nor is there any known record of it. Its purpose is a matter of conjecture.

This is a 4 x 6 foot shaft, cribbed solid with modern mill-sawed timbers, but with short lengths of hand chopped ironwood timbers laid just outside the modern timbers. None of the ironwood timbers are much over three feet long. It appears the early Anglos found an old timbered Mexican shaft, which they reopened and retimbered. The shaft is still evident at the 40 foot level on the entrance ramp. It seeps groundwater.

The shaft is filled with black material, which may be ash. The shaft is located directly above the south end of the vein of "black ore" disclosed at the 1,000 ft. level. No attempt to clean it out has been made, as it is in the center of the ramped roadway into the open pit, and opening it would block access to the pit.

Of significance is that a 12-inch width on the final face of the completed drift at the 1,000 ft. level still averaged 3.60 ounces of gold per ton [81]. Obviously, the drift was not discontinued due to a lack of values; it was discontinued due to the death of the operator. Accordingly, the actual southerly extent of the Wasp ore shoot at the 1,000 ft. level, and its gold values, are totally unknown.

Gold values in the Wasp open pit are not as clearly defined. No assay records of the upper 45 feet survived the original lessee's office fire.

At the 53 foot level in the open pit, assays exist only for the south end of the ore shoot, where an average width of 5.25 ft. averaged 2.20 oz. gold per ton for 30 lineal feet. At the north end of this 30 feet, an 8.2 ft. width averaged 3.48 oz. gold per ton, of which the 3.9 ft. next to the fault contact averaged 7.68 oz. gold per ton.

Usually, the highest values lie in the first two feet of granite next to the hanging wall contact. As an experiment, a 40-ft. hole was drilled in the bottom of the pit, starting one foot out into the hanging wall from the fault contact. The drill rig was "eyeball" inclined to attempt following this two-foot high-grade width downward. Samples were taken at five-foot intervals.

These samples assayed 8.7, 4.2, 3.65, 2.15, 1.90, 1.05, 0.90 and 0.75 ounces of gold per ton. This hole averaged only 2.91 ounces. It proves nothing, as it cannot be known whether the values in this two-foot width actually decreased with depth, or whether the drill hole drifted out of its estimated one-foot width tolerance. There would seem a remote chance of drilling 40-feet with an air-track drill and staying within a one-foot width tolerance, with only an estimated drill inclination on an unproven dip. The only assurance was that the upper five feet averaged 8.7 ounces of gold per ton.

To interpolate values between the present 60-ft. level in the open pit and the drift at the 1,000-ft. level involves conjecture. The point of highest value in the open pit at the 53 foot level was 3.48 ounces 8.2 ft. wide. Directly down the dip of the vein, 90 degrees to the strike, you intercept the point of highest value at the 1,000 ft. level, 1.60 ounces of gold. Accordingly, the values at this point at the 1,000 ft. level are 54% less than directly above this point in the open pit.

The most complete assay records are those at the 1,000 ft. level, where 111 feet of drift averaged 0.634 ounces. If you split the 54% variation in half for an average, a 17% increase in value in the portion of the vein overlying the 1,000 ft. level would be 0.805 ounces of gold per ton. An ore shoot 111 feet long by 8 feet wide by 940 feet deep contains about 38,400 tons of material. At an average assay of 0.805 ounces, there would be 30,912 ounces of gold, at $289.50 an ounce, worth $8,949,000. 30922.6912

8,952,112.711

However, the south terminus of the 1,000 ft. drift still assayed 3.60 ounces 12-inches wide, so the values should not be expected to end at that point. Also, having proved only that values persist to the 1,000 ft. level, there is no reason to assume they end at that depth. With only a probable increase of 10% in length and 10% in depth, both very reasonable presumptions, the shoot would contain about $11 million in gold values.

The foregoing arithmetic is really only conjecture, but there is no better existing data. Only a drilling program will delineate and evaluate the existing ore shoot. The remainder of the unexplored Mammoth Fault contact across the Wasp may reveal additional ore bodies.

The Wasp ore shoot ought to be drilled. Three slant bore-holes, calculated to cut the Wasp shoot at the 250 ft., 500 ft., and 750 ft. levels, would give a general idea of what values lie throughout the shoot. The outcome of that drilling may encourage additional drilling to further delineate the ore body.

The 250 ft. intercept would require 320 ft. of hole; the 500 ft. intercept would require 640 ft. of hole; the 750 ft. intercept would require 865 ft. of hole, a total of 1,825 feet of borehole; see the cross-section plan enclosed [41]. These really should be cored.

These slant holes ought to be drilled from the footwall side rather than the usual hanging wall side for several reasons. The dip of the Mammoth Fault contact throughout the Mammoth Mine is a quite consistent 87 degrees west, but therein a problem arises.

There were two different surveys of the 1,000 ft. level in 1925; one in August [80] and a resurvey in October [81]. Apparently a mistake of exactly ten degrees was made in a deflection at station 1008 on the August map, and a corrected map was drawn in November.

2,000 ÷ 92 = 21.739 cf/t

111 x 8 x 94 = 834720 cf/ore ÷ 21.739 = 38397.35 t

38397.35t x .805 = 30909.867 oz

This results in an ambiguity between the two maps of 83 ft. laterally in the location of the Wasp ore shoot at the 1,000 ft. level. The October resurvey is presumed correct.

If the drilling is done from the footwall side, and that presumption is wrong, no harm is done; the vein would just be intercepted sooner than expected. However, if it were drilled from the usual hanging wall side, and the presumption proved wrong, the vein would be intercepted much deeper. It might be missed altogether at the 750 ft. level. This is illustrated by the enclosed drilling plan [41].

The footwall of the Mammoth Fault has never been identified on the Wasp claim. In the Wasp open pit, the Mammoth Fault hanging wall contact between the altered latite (dacite?) on the west and the granite on the east is sharply defined. There is a two-inch seam of red fault gouge at the contact. The gold values lie eastward in the adjacent brecciated, silicified granite. The highest values lie in the first two to three feet against this contact. Then the values simply grade out eastward into the harder granite dike, without a definite cutoff.

There is a further reason for slant-hole drilling from the footwall side. In 1983, Wayne Blood, while drilling for the then operator, recovered 7-oz. and 10 oz. assays from 25-ft. depth from two vertical boreholes about 25 ft. out in the intruded granite, near the path of the proposed slant holes.

They tried to intercept these values by horizontal drilling from within the pit, but failed. These two drill holes did not define any particular structure as Blood advised there were a couple holes between them that were "down in the tenths of an ounce." However, they might be intercepted by the proposed slant holes if drilled from the footwall side. Also, the topography makes a drill setup far easier on the footwall side. There are no records of the prior operator's drilling. They had a fire about the time we called for an accounting and terminated their lease for failure to pay royalties.

The high-grade ore shoot then averaged six to eight feet in width, averaged 13 ounces of gold per ton, and was encountered under only four feet of overburden. It was five miles from town, had paved-road access, water, electricity, and an owner/lessor who was totally occupied elsewhere. It was a poor miner's dream come true. They should have started sinking a shaft on it, but chose to begin a surface mine.

They must have known that pursuing a 13-ounce eight-foot wide vein as a surface mine would quickly result in a stripping ratio that would end their operation, but would be immensely profitable initially. This evidently caused them to "grab the easy pickings" and not pay royalties as promised, knowing their plan would eventually be discovered and their lease terminated.

When we called for an accounting, the operator reported $200,020. in smelter returns, all from one refinery. We determined an actual total of $536,369., which included sales to six other refineries, which the operators finally admitted. It may be presumed there were other sales that were never disclosed. With a shortage of $50,452. in our royalty account, we terminated their lease. None of the royalty shortage was ever paid.

Since a 20% deduction was taken for refining the “black sand” concentrates, the gross production had to have exceeded $670,000., taken from the top 45 feet of the Wasp pit. It may have been twice that amount. Their employees have estimated $1.2 to $1.5 million, and we are advised one of the lessees boasted of $1.5 million.

We then entered an agreement with a second operator. They removed some 10,000 tons of low grade material to lower the ramp to the pit. During this process they dozed out about 1,560 tons of mixed lower grade ore.

Some of this material was processed at a small mill they built on a nearby leased property. The mill was junk. Due to heavy down time they averaged only about two tons throughput per 8-hour shift. The result was that with this primitive plant they recovered about one ounce of gold per ton, probably not over a 50% recovery, since the head ore averaged close to two ounces. They were losing the fine gold.

Their tails were never assayed. Their millsite was later leased to another operator who just hauled the tailings away and then abandoned his lease.

Smelter returns from the sale of concentrates and dore' during that operation were $47,832. It was obvious that this mill could not show a profit on two-ounce mill heads. We also discovered that two of our then associates were involved in the non-payment of royalties during the previous operation. We terminated the second operation.

We were left with $28,528 in unpaid bills, owed $22,342 in wages, and owed for $42,000 worth of ore shipped from the property. None of this was ever recovered. If we sound a bit paranoid, it is based on bitter experience.

The Wasp was inactive from 1985 until 1992 other than sampling and assaying by ourselves. The last channel sample taken across the vein at the bottom of the pit then assayed 7.68 oz. Au/ton 3.9 ft. wide, and 3.48 oz. Au/ton 8.2 ft wide.

In May 1992, as an experiment, we set up Rex Thompson's spiral classifier, actually a placer machine, on the Wasp. No head ore was available, as the pit was then filled with water, so we ran samples of stripping waste from eight random locations around the Wasp pit. We recovered gold from every sample. There was nothing quantitative learned, since this was lode material that was never crushed or ground to liberate the gold. It only evidenced that even the stripping waste contained considerable values in the fines. A color photograph [43] of the gold buttons recovered is included with this report.

Additional mining of the Wasp shoot as a surface operation is limited by increasing stripping ratios. However, there appear to be at least five other development options for the Wasp.

The first option would be sinking an inclined shaft, following the ore shoot itself down the 87 degree dip. This would have the advantage of sinking in pay ore with its attendant cash flow.

Sinking a shaft in the bottom of the open pit would require some means of excluding surface water runoff. One might extend a watertight collar upward from the bottom of the pit, aligned with the 87 degree dip of the vein to a point safe from surface flooding. It could even be extended to the original surface, as almost the entirety of the material excavated from the pit is stockpiled adjacent and available for use as backfill. Also, the removal of these stockpiles would greatly increase the area available for other surface activity.

The second development option would be to go east into the solid granite that intruded the fault and sink a vertical shaft. Then crosscut about every 100 feet of depth to intercept the Wasp shoot, then stope. Fortunately, the vein dips only three degrees off vertical, so the crosscuts would remain short, even at depth.

A disadvantage is that you would probably be sinking and crosscutting in lower grade material, reducing the cash flow. However, the possibility exists of encountering the 9 and 10 ounce ore disclosed there by Wayne Blood's drilling.

A third development option involves an electromagnetic survey we conducted with induced currents on the northeast part of the Wasp claim, near the open pit. We discovered four anomalies [42], all within 30 feet of each other.

We had only a percussion air-track drill and 60 feet of steel. We drilled the first anomaly, and only averaged 0.10 ounces for the top 40 feet. Between 40 and 50 feet we averaged 0.70 ounces. It should be noted that a loss of 50% of precious metal values in an uncased percussion drill hole is common, due to the values getting hung up in the cavities and rough walls of the borehole. Even reverse circulation drilling with a rotary Tricone bit has resulted in a 51% loss of metal values remaining in the drill hole (*California Mining Journal,* Jan. 1988).

At 50 feet the drill hammer broke down, and we could neither continue nor withdraw the drill steel. We had the hammer repaired and managed to salvage the drill steel, but the borehole had caved beyond salvage. We do plan to redrill this anomaly, plus the remaining three. We also plan to complete the electromagnetic survey of the area surrounding the pit, as there may be other anomalies.

If drilling these anomalies discloses another major ore shoot, the third development option would be to sink on this shoot in pay ore, and then crosscut 190 ft. to intercept the original Wasp shoot at depth.

A fourth development alternative would be to set a crane at the surface on the granite footwall side, and continue mining the Wasp shoot with a clamshell. The vein is sufficiently brecciated and friable at that point that no blasting has been required. All mining there has been done with a trackhoe and skidloader. Only one round of blast holes has been fired in the pit, this on the north wall where harder material is encountered.

A fifth alternative would be to begin a circular decline, using rubber-tired equipment underground.

The Wasp pit makes about 1,500 gallons of water per day. A two-inch pump handles the inflow at less than a 5% duty cycle. If not pumped, the static water level in the Wasp pit stabilizes at about the 20-foot level.

However, it is doubtful if this shallow water table existed at Goldfield prior to the construction of Mormon Flat Dam, and the resulting Canyon Lake, to the north. Bedford [12], in 1923, and others, state that the 1,000 ft. level in the Mammoth Mine still had not reached what they called "the constant water table."

Following his report on the 1,000 ft. level, Bedford states, "Anticipating that the water level will be constant at about the 1,200 level, and that the nature of the mineral deposition will change as outlined under Historical Geology and that ore deposits of economical importance will be proven to be greater in extent, and better in average values than those deposits now developed, I would strongly advise that your main shaft be sunk an additional 450 feet from its present (1,000ft.) bottom." If Bedford is correct, the true zone of secondary enrichment, with the richest ore, may lie even deeper than the 1,000 ft. level.

A final point on the Wasp ore shoot: There were individual high grade pods encountered in the Wasp pit; these pods ran several hundred ounces of gold to the ton. They carried heavy galena and malachite (lead and copper), while the surrounding gold-bearing vein itself carried much less of either. The most recent of these pods weighed about 300 pounds and assayed 244 ounces of gold and 56 ounces of silver to the ton. However, assay records of the 1,000 ft. level indicate the gold-bearing vein itself carried substantial lead and copper.

We have no geologist's opinion as to how these high-grade pods were created and got where they were. But if the Wasp shoot at some depth were an actual vein of this material, from which these pods were detached and relocated, and that spot could be found, it could be very profitable.

We have a complete laboratory for both fire assay and wet chemical analysis, and small batch refining. I am not a registered assayer, but took a course in fire assaying at the Mackey School of Mines, University of Nevada / Reno, and have some college level chemistry.

There is a 3-phase electrical distribution line to the mill, but we had access to cheap diesel fuel, so we are running a GM 480-volt 60-kW generator with a freshly overhauled GMC 6-71 engine. With the entire mill running, it pulls about 30 kW, so the generator has plenty of reserve capacity for additional equipment. 120-240 volt single phase current is supplied from a public utility, but is also available from the generator. There is bulk storage for 3,000 gallons of fuel. The Wasp mill was built with new and used materials, and excellent used machinery, no junk.

The mill is designed to process about 10 tons of head ore per 8-hour shift. The mill flowsheet is a simple wet gravity process. The head ore is dumped on a 3-in. grizzly; 95% passes. The 3-inch minus is then hauled with a front-end loader up a ramp and dumped into an elevated 5.5 x 7.5 ft. bin.

We have a Syntron apron feeder for this bin, not yet installed. Ore then drops into a 6" x 8" jaw crusher which takes it to about 3/4 minus, then into a 12" x 18" roller mill which takes it to about 3/8 minus.

Then up a 16" x 35' belt conveyor to a 5' x 7.5' bin with vibrator feeder. Then up a 12" x 10' belt conveyor to a 4 ½ foot Hardinge conical ball mill with a four-foot long cylindrical screen on the discharge. We are currently using a 30-mesh screen. Oversize is passed under a magnet to remove tramp iron, then returned to the ball mill intake via a sand screw in closed circuit. The 30-minus discharge goes to a distributor, where it is split between two Stephens (4' x 8') rougher tables, which have new sand decks. Concentrate from the rougher tables go to a single Stephens (4' x 8') finishing table, with new deck.

There are also two Tri-R reverse spiral concentrators in the circuit. Rougher table tailings go to the first Tri-R Spiral. The cons from the first Tri-R Spiral and the tailings from the finishing table go to the second Tri-R Spiral. Cons from the second Tri-R Spiral, and the middlings from the finishing table, go to a sump where they are pumped back to the feed end of the finishing table.

Tails from both 3-R Spirals go to a sluice box, then to a dewatering sand screw. Sand from this screw is elevated by a 16" x 25' belt conveyor into a dump truck.

Tail water goes through two 1,000 gallon steel settling tanks in series, then to a 25,000 gallon mill pond with plastic liner. From there a 2-inch pump recirculates the clarified water back to the mill. Mine water supplies all needs for the mill. A 2-inch service line from a 6-inch domestic water main at the Wasp boundary supplies any supplemental water, which is used only for cleanup.

The roller mill and ball mill are in new condition; the jaw crusher, conveyors, tables, and other equipment are in excellent shape. All motors except the tables and Tri-R Spirals are 480 volt, 3-phase, powered by the generating plant. The three table motors are 240 volt, single phase, and can be operated on either public utility power or the generator. The Tri-R spirals have DC motors with rectifiers and speed controls, which operate off one leg of the 3-phase generator.

Each sand screw has its own independent hydraulic motor, pump and controls. Almost all wiring is in conduit, most of it underground.

Concentrates from the finishing table are amalgamated, the amalgam retorted, and a dore' bar poured. The Wasp refinery can produce a 995 fine gold bar, but chooses to market the 750 fine dore', since the smelter charges only 4% for refining. Since the Wasp cannot hallmark, even their 995 fine bar would entail this 4% refining charge, so refining to 995 fine would be pointless.

The Wasp mill's capacity is limited by the ball mill, which the manufacturer rates at one ton per hour, grinding ½-inch hard quartz to 100 mesh. However, Wasp ore is very easy milling, the ball mill feed averages finer than ½-inch, and already has a high percentage of fines. The mill is currently fed 1.3 tons per hour, which is 10.4 tons per 8-hour shift, or 31 tons per 24-hour day.

The mill is just being placed in production as of this writing, so no current production figures are yet available.

As owners, we have never and will never solicit nor accept investment money from anyone, which eliminates any possibility of adverse claimants against our clear title.

Regarding an exploration license and purchase option, the owners would require the three drill holes mentioned earlier, aligned to intercept the Wasp ore shoot at depth at it's known point of highest assay. Calculations for this alignment will be agreed upon prior to any license. After these three boreholes, the developer may drill anywhere he wishes.

We require the results of the developer's assay reports as they are developed, and the right to sample drill cuttings and split drill cores. The capacity of the Wasp lab will not handle the work of two operators. Unless otherwise agreed, We retain sole control of the Wasp laboratory until any sale is funded and closed. We also require evidence of the operator's prior experience and financial ability to develop an underground mine in the event that it appears warranted by the drilling program.

The Old Wasp Mine is offered for sale for U.S.$2,200,000. This includes the 9.51 acres including the mine, mill, shop, lab, office, owner's residence and all real property improvements. Alternatively, it is available for U.S.$2,060,000 including the mineral estate to the entire 9.51 acres, but with us retaining the surface rights to only the 1.25 acres which includes our home, shop, lab and office, with the right of ingress and egress. This 1¼-acres is across the highway from, and would not interfere with, the mining operation. The mineral estate underlying this 1¼-acres would be conveyed to the buyer, who must warrant us against damage from blasting or subsidence.

Residential land in the area, with utilities available, runs from $30,000 to $50,000 per acre, some as high as $100,000 per acre.. This can be verified by contacting any area real estate broker.

The owner's residence on 1 1/4 acres was FHA appraised five years ago at $92,000. and is currently rated for insurance purposes at $140,000, which is the price reduction stipulated above in the event we retain surface title to our home. With the mill, residence, laboratory and outbuildings included, just the surface estate of the claim ought to be worth $750,000.

If drilling indicates there actually is $11 million in the Wasp ore shoot, the entire property ought to be worth the asking price of $2.2 million. This is attributing only $1.45 million to the mineral estate, as the buyer would still have the remaining value of the surface estate after the mine is depleted, which value should by then be substantially appreciated.

Some speculative value must be attributed to the fact that in 1893-1895, within pistol-shot distance, $34 million (at today's gold prices) was taken out of two ore shoots on the adjacent claim, on a continuation of this same geological structure.

If a drilling program indicates the property is worth less than we now presume, we may consider a downward adjustment in the price, however such adjustment must be solely our prerogative. We will not index the price to drilling results in advance, as this excessively transfers control of the price to the buyer. If the developer abandons the project after the drilling program, he retains no residual earned equity in the property.

We are not soliciting lease offers, having already sustained losses of $143,000 from the infidelity of lessees. In any lease event, the existing Wasp ore shoot may not be additionally mined by surface methods without our consent. Due to the history of prior operators taking the "easy pickings" and walking, the granting of such consent is questionable. Neither will we accept any investment money nor sell any fractional interests.

If a buyer/developer has other ideas, we will listen, but may not depart far from the outline offered here. Meanwhile, until someone makes a proposal, we will continue with exploration and development, during which the price and terms may be adjusted either way depending on the results of the work.

If the buyer requires the entire property, we will need a 6-month leaseback on the owner's residence to permit our orderly departure from the premises.

Clay Worst, owner