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Subject: EXPLORATION RECORD SHEETS #4 (SWED)

TYPED

FROM: JANUARY 1983 TO: DECEMBER 1983

~~JHC~~ - ER File

ASARCO EXPLORATION RECORD

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [x] Submittal thru NY office

Section I General Indexing

① Name(s) of Property or Area: RUTH CLAIMS	② Country: Pinal Co.	③ State or Province: AZ	
A. Syndbad, Norwell Corp., Goldfield Expl. & Mining	④ USGS Quad.: Apache Jct. 7½'	⑤ File or Gore No.	

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
33°27'N	111°30.5'W	Mesa	1N	8E	NE/10 NW/8	FRKoutz/JDSell	11/17/83
						⑪ Office: Tucson	⑫ Field Days: ½

Section II Sources of Information

Date Typed 12/1/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Goldfield Expl. & Mining	1983	Prospectus with submittal data		
Tognoni, H. C.	1978	Affidavit before USDI Board of Land Appeals		
Syndbad, A. (1983) Assays (defense exhibits) and maps sent to Tucson Office.				

J. H. C.

MAR 16 1984

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [x] Too Low Grade
- [x] Too Small
- [?] Ownership Problem
- [ ] Access Problem
- [ ]

⑮
- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [x] Prospect (Raw)
- [x] Promotion

- [ ]
- [x] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [x] House site for Mr. Syndbad

⑯ Production

Commodity	Tons	Grade
None		

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade
None		

⑱ Num. Drill Holes 4
Approx Total Footage 4 x 100-200'

⑲ Excavations 6 x 40' shafts
Numerous backhoe trenches

⑳ [x] Spectro. Analysis Attached

㉑ [x] Assays Attached All Au <.02 ppm

㉒ [ ] Geochem Results Attached

Section IV Geologic Data

One hole cut 15' of 2.4 oz Ag/T between 65 & 95' depth.

㉓ Commodity or Contained Metals: Au, Ag, (Cu)

㉔ Ore Minerals-Major: Au°-Ag° BK Calcite Pyrite Minor Malachite Pb & Zn oxides

㉕ Host Rocks-Major: Whitetail Cgl. Andesite dikes Minor p€ granites, Paleozoic carbonates, p€

㉖ Age of Host Rocks: 37-33 m.y. 29-15 m.y. Apache Grp clasts in Whitetail

㉗ Nature of Exposures: 20-30%; dissected pediment: low hills, alluvium in arroyos. Most samples from dump of shafts. Water table: 30-60'; drill hole depths unconfirmed.

㉘ Alteration: Reduction of hem. stain, minor calcite, silica, clay a few feet from dikes & structures. Pyrite flooding/mostly oxidized.

㉙ Total Extent: 60-80 acres max. area of exposed dikes/veins

㉚ Structure: Shallow dipping Whitetail fanglomerate cut by N-trending faults & dikes (high angle), minor offset & shearing with <10 feet of brecciation.

㉛ Ore Occurrence: Veinlets (calc > qtz) and stringers in & around minor N-trending structures & andesite dikes w/local flooding into permeable zones of Whitetail Cgl. Au & Ag in pyrite; Ag in black calcite.

㉜ Age of Mineralization: Miocene?

㉝ Conclusions & Recommendations: The alteration-mineralization halos from the several dikes & veins noted are not wide enough & dikes are not numerous enough as now exposed to develop any kind of mineralized tonnage that would interest more than a small operator even if halos contained ore-grade Au-Ag mineralization. There is no evidence of better mineralization in p€ granites at depth although this environment has been productive in a minor way in Goldfields Dist. There is minor placer production in dist. but major present resource is sand & grave for the rapidly developing Apache Jct. area.

(For additional space use extra sheets)

Form Revised-June 1980-J.H.C. MVK-5193

ASARCO Southwestern Exploration Division

December 22, 1983

To: J. D. Sell

From: F. R. Koutz

Ruth Claims (Norwell-Goldfield
Exploration & Mining-A.Syndbad)
Goldfield Mining District
(Apache Junction)
Pinal County, AZ

Conclusions and Recommendations

Several of the eight Ruth claims contain spotty Ag and Au mineralization in and along narrow Miocene mafic dikes which cut Oligiocene Whitetail-type conglomerates. The mineralization consists of Au° (not detected by us) and Ag in black calcites (Mn-oxide bearing) with minor malachite and iron oxides after pyrite accompanying narrow reduction halos with chlorite, clays, calcite and weak silica flooding in the Whitetail conglomerate and in the dikes. The alteration/mineralization halos are not wide enough and the dikes not numerous enough to develop any kind of mineralized tonnage even for a small operator if he could find a method of beneficiating the Ag-bearing black calcite. Prospects at depth are limited since Ag would lack supergene enrichment. The environment of mid-Tertiary intermediate to mafic intrusions associated with ash flow tuff sheets and bearing precious metals, should be kept in mind, however, because in the right structural/stratigraphic situations in the region significant Ag-Au mineralization has been found.

— — — — — — — — — — — — — — — — — — —

On November 8 I received a prospectus packet from you which had filtered from John Norwell, one of the promoters of the "Goldfield Exploration and Mining Co.", through Merrill Lynch and down through the New York Office to Tucson. There is little geological information in the Prospectus except for the location of the 8 Ruth claims apparently under option to Mr. Norwell's company from Mr. Andy Syndbad who, it turned out, has been living on the claims for a number of years. It is significant that part of the packet includes a 1978 deposition in support of Mr. Syndbad's "discovery" by a local professional (registered) mining engineer before the Interior Board of Land Appeals. The U. S. Government may have been successful in invalidating Mr. Syndbad's claims as I do not find them listed on the current BLM microfiche (see attached notes).

On November 17 you and I visited the property for about 4 hours and walked all 8 claims discovering that the area was totally covered with Whitetail-type conglomerates and more recent alluvium with no outcropping Pre-Cambrian granite as with mineralized zones in the main Goldfield District 1-2 miles to the northeast. What apparently had been described as granite bedrock was large weathered boulders of granite or arkosic zones in the conglomerate.

Mr. Steven Barrick, one of the residents of the claims, led us around the various trenches and shaft sites on several of the claims in Mr. Syndbad's absence during which I collected 8 grab to representative dump samples as described in the attached field notes. All of the 8 samples contained <0.02 ppm Au although 2 samples contained about 1 oz Ag/T in black calcite vein material and malachite-stained arkose. The attached spectrographic analyses show anomalous amounts of Pb, Zn, Cu, Ba and Mn in these and some of the other samples collected as well as increased amounts of Co, Cr, Ni and V characteristic of the more mafic dike material. From the information told to us by Mr. Barrick and later sent to us by Mr. Syndbad the gold and silver on these claims is very spotty. The pyritized (propylitized) reduction-halos around the dikes into the locally hematitic conglomerates were not subsequently oxidized to any great depth because pyrite can easily be found on the dump of most of the shallow shafts. Therefore thick supergene Ag enrichment cannot be expected. Many of the vein zones show caliche-black calcite which appears to be much later than dike emplacement and supergene or at least post-sulfide and would not be expected to continue to significant depths. No shaly or other significantly impermeable zones were noted in the conglomerate that might have caused mineralization to spread laterally at shallow depths. Bedrock is probably at least at several hundred feet depth and there is no special reason to believe that what we are seeing is leakage from a higher-grade Au-Ag system at depth in granite or conglomerate.

One of the holes that Mr. Syndbad did have drilled in 1978 apparently to "prove" his discovery did intercept between 65-95 feet depth about 15 feet true thickness of dike-vein material averaging 2.4 oz Ag/T (no description of the material is available). Mr. Syndbad says he panned a several mm flake of free-gold from the cuttings of this hole although no Au assays are given. The other assays sent by Mr. Syndbad are obviously from grab/high-graded samples and most are not located. One could easily site a number of drill holes on the property that would produce interesting assays such as those above. However, there is no evidence of a significant number of dike/vein zones with significant-width mineralization halos that could ever be mined or beneficiated on a commercial basis in spite of spotty high-grade Ag and possibly Au assays. Therefore I do not believe it is worth us (nor anyone else) becoming involved in the property.

It is significant to note that mid-Tertiary mafic rocks in central and western Arizona are sometimes anomalous in gold and are spatially and probably genetically associated with a number of gold plays in the Mohave region of California and western Arizona associated with detachment/overthrust faults. The Mammoth Mine area (production +7100 T @ ½ oz Au/T) about one mile to the east of the Ruth claims with Au in narrow quartz and calcite structures in Pre-Cambrian granite just below the Whitetail conglomerate and mid-Tertiary dacites (same source as "andesite" dikes and part of the superstition ash-flow tuff sheets) was recently (7/83) sampled for "disseminated Au" by H. G. Kreis with negative overall results but spotty +1 ppm Au. Thus we should continue to be aware that there are significant occurrences of gold in this environment.

F. R. Koutz

F. R. Koutz

FRK/cg

Attachments (Field Notes/Assays TAJ-238)/Location & Syndbad Map)

F. R. Koutz
(J. D. Sell)
Nov. 17, 1983

Field Notes

Norwell Prospectus (NOR Samples)

33°27'N, 111°30.5'W, Pinal County, AZ, Goldfield District, Apache Junction 7½' Quad. A. Syndbad claims (8) W/2 NW/4 Sec. 11 and E/2, NE/4 Sec. 10, T1N, R8E. Just north of Arizona Route 88, 3.3 miles NE of Apache Junction.

"Goldfield Exploration and Mining, Inc."

Area is weakly dissected pediment of weakly hematite-stained Whitetail-equivalent conglomerate. Recent alluvium and cgl. in washes. Local N. and E. trending ± faulted (or intruded into faults) light greenish-grey to black andesite(?) dikes cut Whitetail Conglomerates with a reduction-halo into cgl (pyrite, chlorite, clays, calcite, weak silica flooding). Late calcite-(±MnOx) qtz veinlets in faults and andesite. Dikes are not numerous. Granitic, Apache Group and minor Paleozoic clasts in Whitetail with some arkosic zones which are confused by the local prospectors with granite. Area probably once covered by ash-flow tuff (dacite) sheet 2-3 miles to east. The alteration-mineralization halos from the several dikes noted are not wide enough and the dikes are not numerous enough as now exposed to develop any kind of a mineralized tonnage that would interest any more than a very small operator even if the reduction halos are of ore grade.

Assays and E-Spec; Skyline Labs - Tucson (TAJ-328) (all Au <.02 ppm)

NOR-1 (0.2 ppm Ag) (2 lb. samples). From road cut on State Rt. 88 (Ruth 7 claim). 5' dike of m-dk greenish grey porphyritic andesite. Trends NW with more N-S shearing and local, vertical calcite veins and stringers with minor silicification. Minor MnOx + goeth at margin of dike. Hematite soaked Whitetail cgl is reduced and bleached white to lt. greenish for 5 to 20' from dike. Dike intrudes one of several faults--shears in roadcut and is itself sheared.

NOR-2 (<.2 Ag) (on Ruth 3). N20W 75°E shear in 20' shaft with dk green sheared porphyritic andesite dike, 1-2% goethite + T MnOx. Sample (rep) of dump.

NOR-3 (<.2 Ag) 50' east of #2 in E-W dozer scrape. Cuttings: dk green andesite? + bleached-reduced granitic-arkose fragments, T pyrite, ½-1% goeth. Hole depth unknown--maybe 200' deep with 6" surface csg.

NOR-4 (<.2 Ag) 100' W of #3. From 6' pit in rotten goeth-stained, sheared andesite dike ± granite (cgl) fragments local calcite veins 3-4% goeth, partially from mafics. 200' W is 40' shaft on crest of hill (not sampled). Also 300' N of #3 is 40' shaft with concrete cap. The N-S dike zone cuts through the crest of the hill in the N-central part of the Ruth #3 claim. There are only a few backhoe cuts along this N-S dike zone and most are in caliche-cemented gravels.

NOR-5 (30 ppm Ag) Shaft 30' to water: (100-200 ton dump. Shaft & work said to be Syndbad's. Dump contains weathered granitic-arkosic fragments, T pyrite, silicification, local MnOx + malachite. West of road.

NOR-6 (40 ppm Ag) At bend in road - 50' shaft with cement cap + 200'(?) drill hole. Bk to tan (MnOx) calcite-calcite breccia (granitic-arkose fragments) with late calcedonic-caliche coatings. Said to be silver-rich.

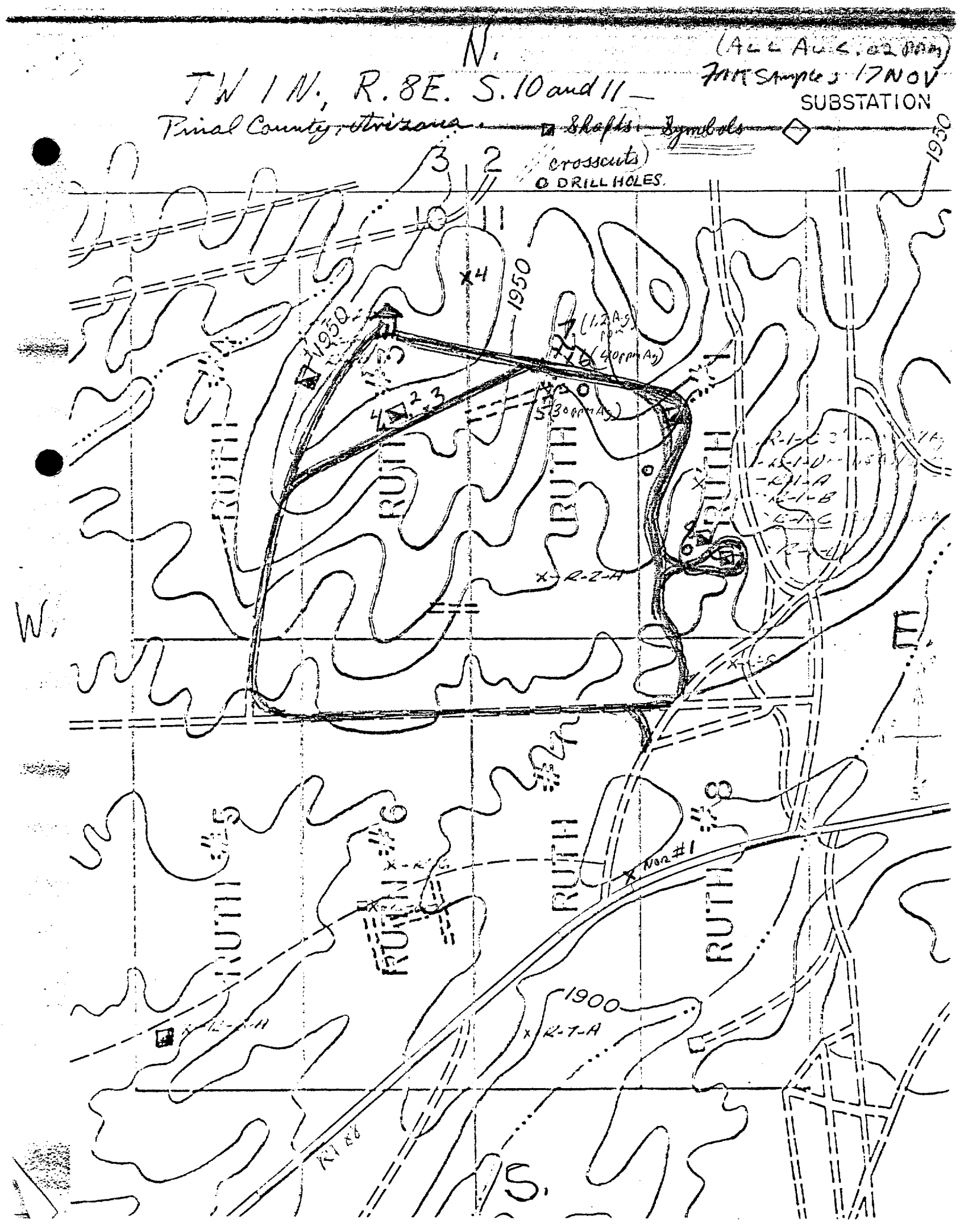
NOR-7 (1.2 ppm Ag) Disseminated and fracture-coating pyrite in sandy arkose-cgl from bottom of #6 shaft on dump. Fragments are mottled by reduction of hematite. Calcite-flooded with minor silica pyrite is 2-3% in sample and said to be high in Ag & Au. #5, 6 & 7 on Ruth #2.

NOR-8 (0.6 ppm Ag) Center of SE/4 Ruth #2. Two 40' cement capped shafts. Arkosic conglomerate with light grey-greenish-reduction mottling and 1-5% disseminated pyrite in arkose ("granite"). No evidence of pЄ granite outcrops in immediate area.

Claims 8 to 1 walked by FRK & JDS, corner posts & center posts (disc.) in place and many local backhoe cuts, esp. on Ruth 6 but only cut gravel and Whitetail cgl. Some gravel-placer(?) pits to 8' deep along stream cut along road but no evidence of significant workings. Outcrop in area 20-30%. Led around Ruth 2 & 3 by Steve Barick.

The 9/13/83 BLM microfiche lists only one claim in the vicinity of the Ruth claims by a Eliz. J. Clay (NE/4 Sec 10): "Cheyenne". It is possible that the Dept. of Interior was successful in invalidating the Ruth claims in 1978. According to the state surface minerals management map most of Sec. 10 is state not federal land and several of the western Ruth claims may be on state land although detailed plats would have to be consulted to confirm this. Syndbad, Steve Barick and several other friends are still living on the claims. FRK's business card was left with Mr. Barick in case he or Mr. Syndbad have any questions. The prospectus says that Goldfield Expl. & Mining obtained claims from Mr. Syndbad on April 22, 1983 but the particulars of the prospectus have not been investigated. Mr. Syndbad has only one "valid" placer claim about 6 miles SE of Goldfield listed under his name under BLM "claimant" microfiche.

Mr. Syndbad sent us a letter on Nov. 18 which I answered requesting additional information. Mr. Syndbad sent back Dec. 5 a letter and packet of assays and maps-exhibits probably from his court case. The assays show scattered Au and Ag values and most interesting is drill hole A on Ruth #2 claim which hit from 65-95' depth 15' (true thickness) of 2.4 oz Ag/T apparently in dike material with vein/contact zones. There was also 0.2-0.5 oz Ag/T disseminated for 10' into wall rock. Most of the other assays are not well located but from the complaints of Mr. Syndbad annotated on the assays sheets represent high-graded, picked samples. Mr. Syndbad apparently has had a running battle since at least 1965 to throw him off his claims. (FRK 16 Dec. 83)


N.
TW 1 N., R. 8E. S. 10 and 11
Pinal County, Arizona
(ALL Au < .02 ppm)
7 MK Samples 17 NOV
SUBSTATION
Shafts
Symbols
(crosscuts)
DRILL HOLES.
1950
1900
RUTH #3
RUTH #4
RUTH #5
RUTH #6
RUTH #8
(1.2 Ag)
(40 ppm Ag)
(30 ppm Ag)
R-2-A
R-7-A
Nor #1
W.
E.
S.

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 328
December 8, 1983
SHIPMENT NO. 1
NOR 1-8

Rita claims
Sec 10,11
TINAGE

ASARCO INCORPORATED
Attn: Mr. Fleetwood R. Koutz
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 7 Rock Chips and 1 Drill Cutting Sample

ITEM	SAMPLE NO.	Au (ppm)	Ag (ppm)
1	NOR 1	<.02	.2
2	NOR 2	<.02	<.2
3	NOR 3	<.02	<.2
4	NOR 4	<.02	<.2
5	NOR 5	<.02	30.0
6	NOR 6	<.02	40.0
7	NOR 7	<.02	1.2
8	NOR 8	<.02	.6

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. James D. Sell

William L. Lehmbeck
Manager

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED 12-13-83
Arizona

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 328
December 8, 1983
SHIPMENT NO. 1
NOR 1-8

ASARCO INCORPORATED
Attn: Mr. Fleetwood R. Koutz
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 6 Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

William L. Lehmbeck
Manager

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

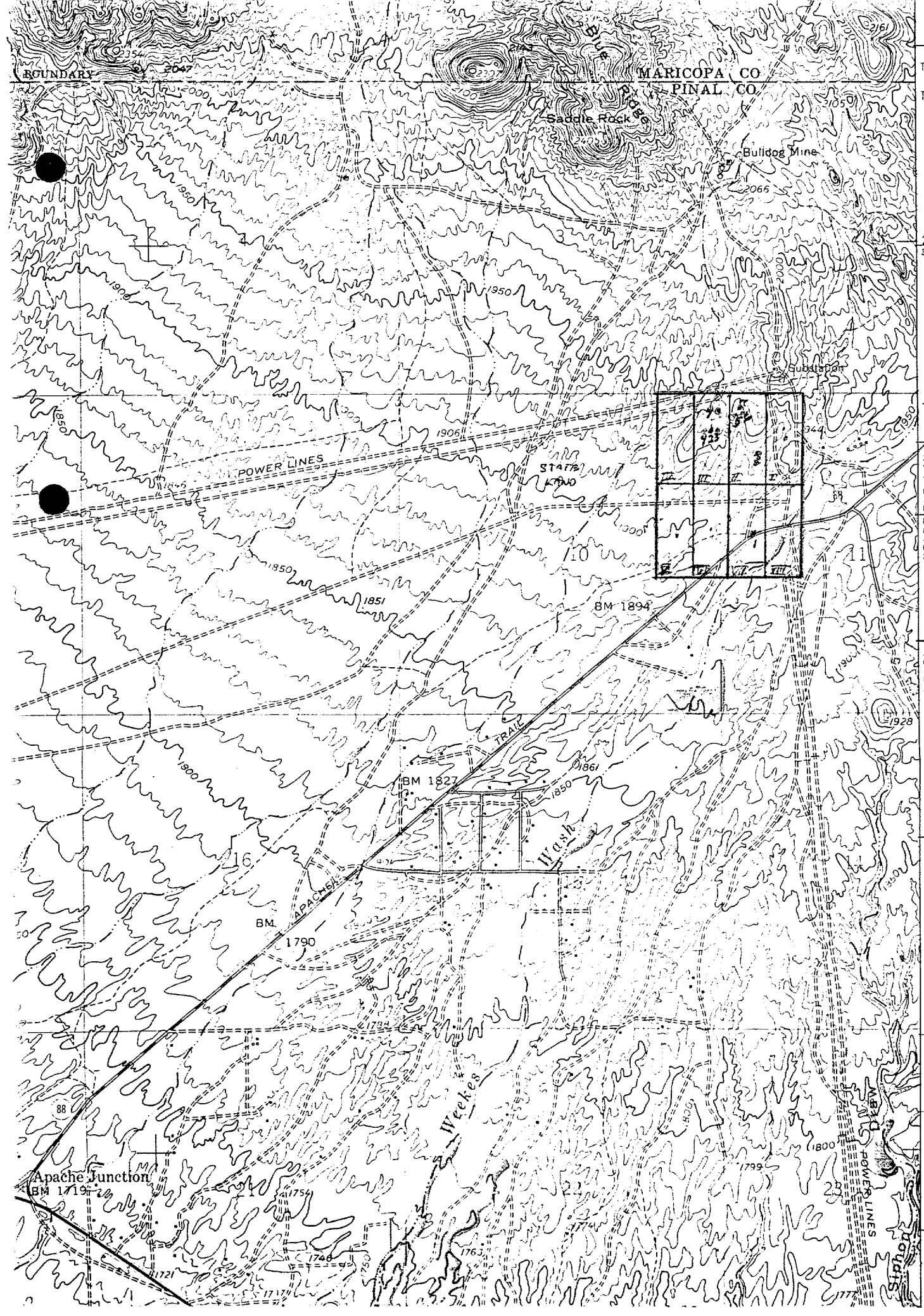
James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 328

ITEM NO.	SAMPLE NO.
1	NOR 1
2	NOR 2
5	NOR 5
6	NOR 6
7	NOR 7
8	NOR 8

ITEM	1	2	5	6	7	8
ELEMENT						
Fe	7%	10%	2%	.2%	3%	2%
Ca	>20%	5%	3%	>20%	7%	3%
Mg	3%	5%	.7%	.2%	1%	.5%
Ag	<1	<1	30	50	<1	<1
As	<500	<500	<500	<500	<500	<500
B	<10	<10	<10	<10	<10	<10
Ba	700	700	300	200	500	500
Be	<2	<2	<2	<2	<2	2
Bi	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50
Co	20	50	<5	<5	<5	<5
Cr	200	500	150	<10	150	150
Cu	30	100	1000	10	10	10
Ga	<10	15	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20
La	50	20	<20	<20	<20	<20
Mn	3000	700	1000	>10000	1000	700
Mo	<2	<2	<2	<2	<2	<2
Nb	<20	20	<20	<20	<20	<20
Ni	150	500	<5	<5	<5	<5
Pb	10	<10	20	700	15	15
Sb	<100	<100	<100	<100	<100	<100
Sc	15	30	<10	<10	<10	<10
Sn	<10	<10	<10	<10	<10	<10
Sr	300	500	<100	<100	<100	<100
Ti	5000	10000	2000	150	3000	2000
V	100	200	50	50	30	30
W	<50	<50	<50	<50	<50	<50
Y	15	15	10	10	<10	<10
Zn	<200	<200	200	1000	<200	200
Zr	50	100	100	<20	70	100


BOUNDARY
MARICOPA CO
PINAL CO
T 2 N
T 1 N
Blue Ridge
Saddle Rock
Bulldog Mine
27'30"
3702
Substation
T1N R8E
POWER LINES
STATE LAND
GOLDFIELD 1 MI
ROOSEVELT 44 MI
Ruth Claims #1-8
17 Nov 83
Stamples
FRMOTR
(JDSell)
Nor 1-8
Stamples
TAJ-328
BM 1894
(GOLDFIELD)
3750 IV NW
TRAIL
BM 1827
Wash
APACHE
BM
1790
Weekes
Apache Junction
BM 1719
POWER LINES
Pinal
3699
3698
25'
3697

JHC - ER FILE

ASARCO EXPLORATION RECORD

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [x] Submittal

FEB 27 1984

Section I General Indexing

① Name(s) of Property or Area: FRISCO CLAIMS OF WXW PARTNERS, San Francisco Mining District					② Country: USA	③ State or Province: Utah	
					④ USGS Quad.: Milford & Frisco	⑤ File or Gore No.: Beaver County	
⑥ Latitude: 38°28'	⑦ Longitude: 113°15'	⑧ AMS Sheet: Richfield	Township: 12W, 13W	Range: 27S, 27S	Section: 7,18, 12,13	⑨ Examined by: HGKreis/JDSell	⑩ Date: 1982
					⑪ Office: SWED Tucson	⑫ Field Days: 2	

Section II Sources of Information

Date Typed 9/9/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Welsh, J.,	1982,	Geology of Frisco Claim Area - verbal presentations & field maps		
Butler, B.S.,	1913,	Geol. and Ore Deposits of the San Francisco & Adjacent Districts; USGS PP #80.		

Section III Appraisal

⑭ Recommendations
- [x] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [x] Drill

⑮
- [x] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly

⑯ Production

Commodity	Tons	Grade
Beaver Carbonate Mine; Pb,Ag	30,000	8.8% Pb, 19 Oz.Ag

⑰ Reserves
[ ] Measured [ ] Estimated

Commodity	Tons	Grade
Beaver carbonate reserves are not known but are probably less than 15,000 tons at 5% Pb & 7 oz. Ag.		

⑱ Num. Drill Holes 4
Approx Total Footage ?

⑲ Excavations Several shafts, 700' max. depth.

⑳ [ ] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [ ] Geochem Results Attached (on file)

Section IV Geologic Data

㉓ Commodity or Contained Metals: Ag, Pb, minor Zn, minor Au

㉔ Ore Minerals-Major: Galena Minor:

㉕ Host Rocks-Major: Andesite Minor:

㉖ Age of Host Rocks: Tertiary

㉗ Nature of Exposures: There are sufficient outcrops in the Frisco claim area to delineate scattered altered areas. A thin layer of tallis and Qal separates outcrops.

㉘ Alteration: Approx. 10-15% of the andesite in the Frisco claim group is weakly to strongly altered to clay (cont.)

㉙ Total Extent: Approx. 10-15% of 2-3 sq. mile area

㉚ Structure: The only obvious fault structure is the Beaver carbonate fault-vein that strikes N85°E and dips 80°N. Faults offset the contact between the andesite (cont.)

㉛ Ore Occurrence: The above described patches of alteration were mineralized by disseminated pyrite, as interpreted from the capping; and the former pyrite content commonly varies from trace (cont.)

㉜ Age of Mineralization: Tertiary (Predates Needles Fm.)

㉝ Conclusions & Recommendations: The geology of the Frisco claim area suggests several environments for potential ore grade base and precious metal mineralization. These are summarized as follows: (continued)

(For additional space use extra sheets)

Form Revised June 1980 - HJC MUK-FIGX

28. Alteration (continued)

and/or sericite and/or advanced argillic alteration minerals (hand sample identification). Much of the alteration observed in outcrop may have been caused by the supergene oxidation and leaching of pyrite.

The alteration of andesite occurs in small patches that are circular to lenticular in shape and up to 10 acres in size. The patches of alteration are spotty-like throughout most of the claim area, and they probably exist along inconspicuous fractures and fracture intersections. They are leakage like in character, and they may reflect significant alteration-mineralization at depth.

Nearly all of Welsh's geochemical samples were taken in these patches of alteration (see maps on file), and Welsh is mapping these altered patches in detail. He may complete his mapping later this year.

Locally there are a few outcrops of jasperoid that are less than an acre in size, and it is not known if they formed from hypogene or supergene processes.

30. Structure (continued)

and the overlying Needles Formation; and, undoubtedly, these faults are also present, along with older faults, in the Frisco claim area. The overlying, postmineral Needles Formation dips 10-15° to the southeast.

The andesite of the Frisco claim area is underlain by the granodiorite of the Cactus Stock and/or Paleozoic sediments. The thickness of the andesite is not known, but a 2300' deep drill hole near the east quarter corner of Section 7 (see map) bottomed in andesite. At the Beaver Carbonate Mine, skarn on the dump suggests that the base of the andesite may be only 600' to 700' deep.

31. Ore Occurrence (continued)

to a few percent by volume. Locally, as at the Frisco Contact Mine and in the large altered area in Section 12 (see map), the former pyrite content is 5 to 10%. None of the pyritization and associated alteration is obviously related to any vein mineralization except for a narrow zone of moderate chlorite-sericite-clay alteration and weak pyritization that follows the trace of the Beaver carbonate vein.

Welsh geochem sampled nearly every altered-mineralized patch in the Frisco claim area (analytical sheets and maps on file). Areas of anomalous Pb, Mo, Hg, and As were found; and Welsh's most meaningful anomaly is a Pb anomaly in Section 13. This Pb anomaly, located immediately southeast of the center of Section 13 (see attached map), occurs in an altered-mineralized area roughly 200' by 1500'. The average Pb content of the anomaly is approximately 150 ppm, and anomalous Mo, As, and Hg values occur with the anomalous Pb values.

The only known ore grade mineralization within the limits of WXW's Frisco land package occurs at the Beaver Carbonate Mine. Adjoining WXW's land is the Horn Silver Mine which produced 160,000 tons of Pb, 14 million ounces of Ag, 6.8 thousand ounces of Au, 3,700 tons of Cu, and 4800 tons of Zn from 475,000 tons of ore.

From descriptions in the literature, the Beaver Carbonate Mine is a mineralized fault zone. Several small, lenticular ore shoots of galena with silver were discovered in the underground workings, and a couple of these accounted for the small production from the Beaver carbonate. Both the footwall and the hanging wall of the vein are composed of andesite; however, several pieces of skarn with sphalerite from the Quad Metal's dump suggest mineralized sediments are present in one of the walls in the deepest part of the Beaver Carbonate Mine (maximum of 700' depth).

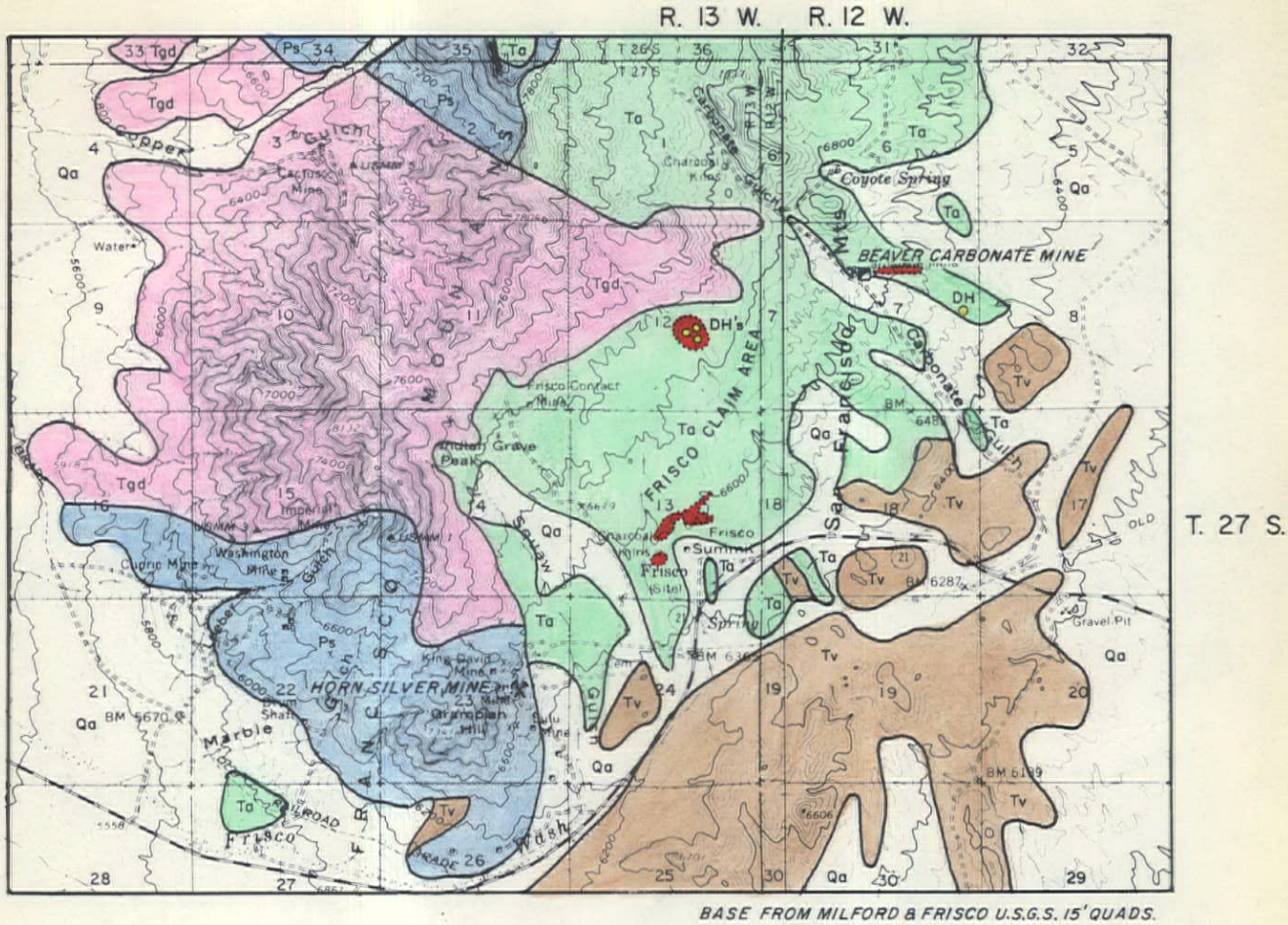
33. Conclusions & Recommendations (continued)

(1) There is an excellent potential for at least small ore shoots on the downward and lateral projections of the Beaver carbonate fault-vein. Furthermore, there is a potential for bedded-replacement mineralization in the underlying hypothesized sediments.

(2) Beaver Carbonate-Horn Silver Mine type mineralization may exist beneath the patches of alteration and mineralization. Such mineralization may exist either in the andesite or in the underlying hypothesized carbonates. The best potential for this mineralization is beneath the very strong pyritization-alteration in Section 12 (see map) or beneath the anomalous Pb mineralization-alteration in Section 13.

(3) Beneath the volcanics, the sediments at the contact with the Cactus Stock may be selectively replaced by chalcopyrite-specularite-magnetite-skarn type mineralization. Coexisting with this copper mineralization or peripheral to it (to the east), there may be fracture controlled or bedded Pb-Zn-Ag-Au mineralization.

The potential for ore along the Beaver carbonate fault-vein is worthy of exploration drilling by Asarco. The risks and the costs involved in drilling the other areas of potential are too high for Asarco to consider at this time. It is recommended that Asarco continue negotiations for WXW's land position so that a couple of 1,200 to 2,000' deep rotary drill holes can test the Beaver carbonate fault-vein.



BASE FROM MILFORD & FRISCO U.S.G.S. 15' QUADS.

This geologic map is a simplified version of geologic maps by Lemmon & Morris, 1979, U.S.G.S. Open File 79-724 & 79-1471.

EXPLANATION

POST MINERAL

Qa	Alluvium
Tv	Extrusive Volcanic Rock

PRE MINERAL

Tgd	Tertiary Granodiorite Of The Cactus Stock
Ta	Tertiary Andesite (Horn Silver Andesite)
Ps	Paleozoic Carbonate Formation

Altered - Mineralized Area Of Interest

TO ACCOMPANY Exploration Record Sheet
DATED 9-9-83
BY H. G. Kreis

Geologic Map

SAN FRANCISCO MINING DISTRICT

BEAVER COUNTY, UTAH

SCALE: 1" = 1 MILE

H.G. Kreis

January, 1983
Rev. Oct., 1983

MVK-5471

~~JHC~~ - ER

J. H. C.

ASARCO EXPLORATION RECORD

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] FEB 27 1984

Section I General Indexing

① Name(s) of Property or Area: Stream Sediment Sampling West Side Tushar Mountains					② Country: USA	③ State or Province: Utah	
					④ USGS Quad.: Beaver to Marysvale	⑤ File or Gore No.: Beaver & Piute Cos.	
⑥ Latitude: 38°15' to 38°30'	⑦ Longitude: 112°13' to 112°40'	⑧ AMS Sheet: Richfield	Township: 27S to 29S	Range: 3W to 6W	Section: -=	⑨ Examined by: HGKreis	⑩ Date: 1982
						⑪ Office: SWED Tucson	⑫ Field Days: Not determined

Section II Sources of Information

Date Typed 9/8/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Cunningham & Others	1981	Prelim. Geol. Map... Tushar Mtns.	USGS Open File Rept.	81-831
Callaghan & Parker	1961	Geol. Map of Part of Beaver Quad	USGS MF-202	
H. Kreis, 9/83, Stream Sed. Sampling, Tushar Mountains, Asarco Memo				

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [x] Low priority work

⑮
- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ]

- [x] Stream Sed. Sampling
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
No significant mining production in sampled area. Marysvale Mining Dist. to the east.		

⑰ Reserves
- [ ] Measured
- [ ] Estimated

Commodity	Tons	Grade
None known		

⑱ Sec.28;27S,6W } DRILL HOLES
Sec.6;28S,5W

⑲ Excavations Couple shafts along west margin of sampled area.

⑳ [ ] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Au-Ag reconnaissance stream sediment sampling

㉔ Ore Minerals-Major: Minor:

㉕ Host Rocks-Major: Bullion Canyon Volcanics Minor:

㉖ Age of Host Rocks: Miocene-Oligocene

㉗ Nature of Exposures: Mountain terrain with brushy, wooded slopes. Substantial postmineral cover (postmin. volc., land sides, basin fill) at margins of sampled area.

㉘ Alteration: Local areas, up to 3 sq.mi., of argillic and advanced argillic alteration

㉙ Total Extent: Altn.covers approx. 10% of premin.rocks.

㉚ Structure: NNW striking and NE striking faults appear to control some of the alteration.

㉛ Ore Occurrence: Minor, spotty Au-Ag mineralization in discontinuous qtz-carbonate veins controlled by faults in Sheep Rock Mine-Rob Roy Mine area of Newton Mining District.

㉜ Age of Mineralization: Tertiary

㉝ Conclusions & Recommendations: Anomalous gold values, worthy of low priority follow-up, were found in the stream sediments of the Pole Creek-South Fork North Creek area and the Merchant Creek area. Additional stream sediment samples should be taken to check for the possibility of higher grade gold values upstream & to further delineate the probable source area(s) of the gold mineralization. The probability of finding outcroping ore-grade mineralization is remote. However, there is a reasonable potential of locating anomalous gold outcrops in a large area of alteration, & this could lead to the development of a gold vein target.

(For additional space use extra sheets)

Form Revised June 1980 - H.C. MUK-5-82

ANALYTICAL VALUES

STREAM SEDIMENT SAMPLES

TUSHAR MOUNTAINS

Beaver and Piute Counties, Utah

Sample Number	Au in -80 Mesh (ppb, Western)	Duplicate Au in -80 Mesh (ppb, Skyline)	Ag in -¼, +10 (ppm)	As -¼, +10 (ppm)	Hg -¼, +10 (ppm)
BUB- 1	3		<.2	20	.03
- 2	4		.2	90	.04
- 3	3		<.2	10	.03
- 4	7		<.2	<10	.03
- 5	6		<.2	<10	.01
- 6	7		<.2	<10	.03
- 7	8		<.2	10	.01
- 8	7		<.2	<10	.01
- 9	7		<.2	<10	.01
-10	5		<.2	30	.01
-11	8		<.2	<10	.05
-12	6		<.2	<10	.03
-13	20	26	<.2	20	.07
-14	4		<.2	30	.03
-15	7		<.2	<10	.03
-16	4		<.2	<10	.03
-17	4		<.2	20	.03
-18	3		<.2	<10	.03
-19	17	14	<.2	<10	.01
-20	8	8	<.2	<10	.03
-21	30	10	<.2	<10	.01
-22	10	19	<.2	<10	.05
-23	8	15	<.2	<10	.01
-24	12	8	<.2	<10	.01
-25	11	7	<.2	20	.01
-26	14	8	<.2	50	.01
-27	10	10	<.2	<10	.01
-28	14	7	<.2	<10	.03

Sample Number	Au in -80 Mesh (ppb, Western)	Duplicate Au in -80 Mesh (ppm, Skyline)	Ag in -¼, +10 (ppm)	As -¼, +10 (ppm)	Hg -¼, +10 (ppm)
BUB-29	14	24	<.2	10	.01
-30	15	11	<.2	10	.03
-31	25	18	.2	10	.01
-32	17	26	<.2	10	.01
DPB- 1	20	16	<.2	<10	.01
- 2	13	8	<.2	<10	.03
- 3	25	15	<.2	<10	.01
- 4	56	4	<.2	<10	.03
- 5	50	4	<.2	10	.01
- 6	25	15	<.2	10	.01
- 7	10	6	<.2	10	.01
- 8	10	10	<.2	30	.01
- 9	3	2	.4	100	.03
-10	3		<.2	30	.05
-11	3		<.2	30	.01
-12	<3		<.2	10	.04
-13	4		.6	10	.02
-14	3		<.2	20	.06
-15	7		<.2	10	.03
-16	<3		<.2	20	.02
-17	<3		<.2	20	.03
-18	<3		<.2	10	.03
-19	4		<.2	10	.05
-20	5		<.2	20	.02
-21	6		<.2	20	.03
-22	7		<.2	30	.04
-23	9		<.2	30	.02
-24	8		<.2	20	.03
-25	3		<.2	20	.04
-26	75	15	<.2	20	.02
-27	10	11	<.2	20	.04

Sample Number	Au in -80 Mesh (ppb, Western)	Duplicate Au in -80 Mesh (ppb, Skyline)	Ag in -¼, +10 (ppm)	As -¼, +10 (ppm)	Hg -¼, +10 (ppm)
DPB-28	8	24	<.2	30	.04
-29	4	8	<.2	30	.02
-30	14	10	<.2	20	.04
-31	4	5	<.2	30	.02
-32	7	3	<.2	30	.04
-33	3	3	<.2	30	.04
MVB- 1	<3		1.4	50	.06
- 2	3		<.2	50	.02
- 3	<3		<.2	20	.02
- 4	12		<.2	20	.04
- 5	<3		<.2	20	.01

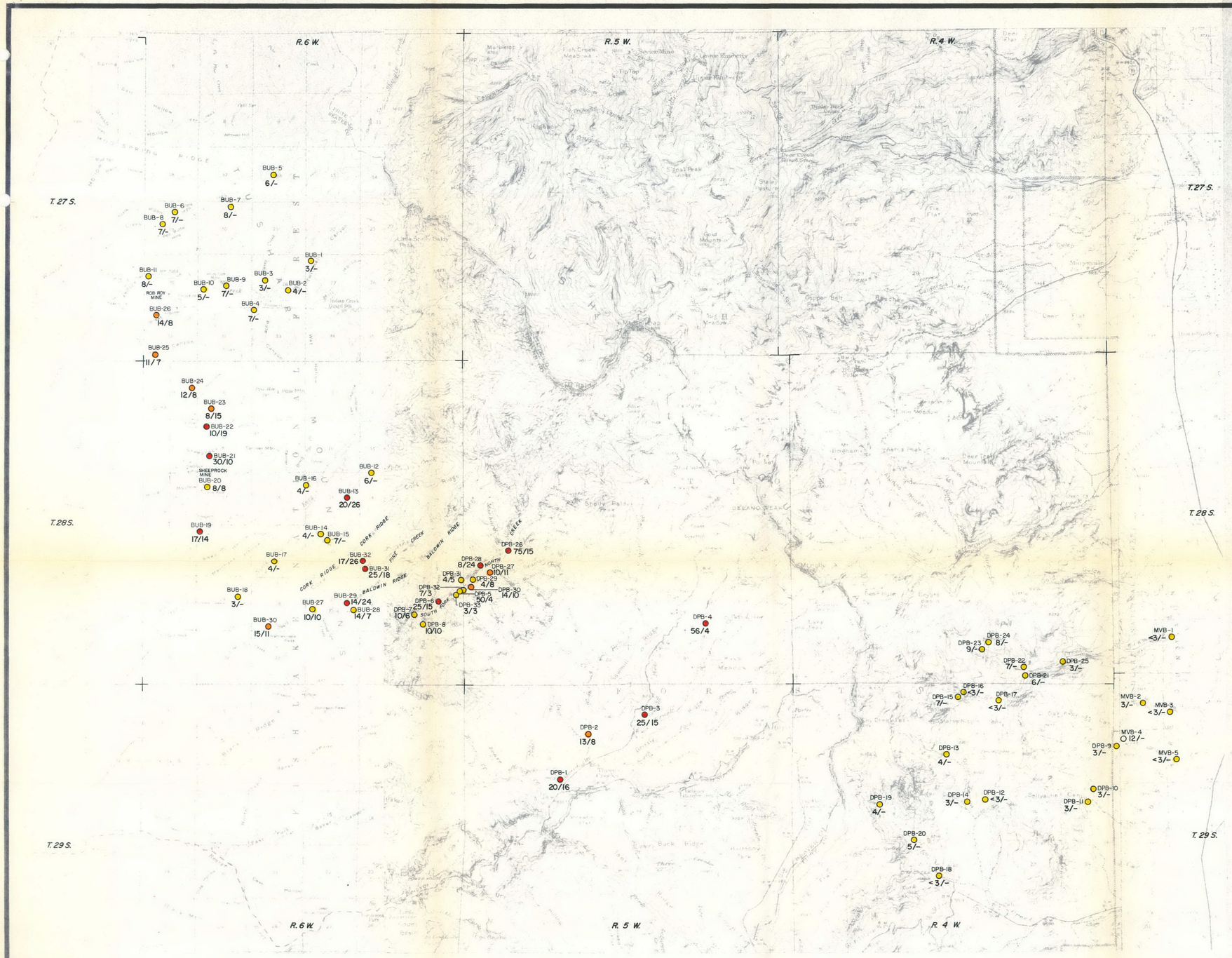
Also see emission spectrographic analysis of seven composite samples.

Emission Spectrographic Analyses (Job TAJ-302) attached to H. G. Kreis report dated September 8, 1983.

Stream Sediment Sample Map 5590 attached to H. G. Kreis report of September 8, 1983.

XTRA

TO ACCOMPANY Report To J.D. Sell
DATED 9/8/83
BY H.G. Kreis



EXPLANATION

BUB-15
12/8 Stream sediment sample site with gold value (ppb) of -80 mesh portion of sample. ppb Western Analytical / ppb Skyline

- Anomalous, >12ppb Au
- Marginal, 9-12ppb Au
- Background, <9ppb Au

REMARKS:

For bedrock geology and areas of argillic and advanced argillic alteration see Cunningham and others, 1981, USGS Open-File Report 81-831. Also Callaghan, E., and Parker, R., 1961, USGS Mineral Investigations Field Studies Map MF-202.

TUSHAR MOUNTAIN STREAM SEDIMENT SAMPLES

BEAVER AND PIUTE COUNTIES, UTAH

ASARCO Incorporated

H.G.Kreis and T.C.Benavidez — September, 1983

1" equals 1mile

mn 5590 dom 10/83

ASARCO

Southwestern Exploration Division

September 8, 1983

To: J. D. Sell

From: H. G. Kreis

Stream Sediment Sampling
Tushar Mountains
Beaver & Piute Counties, Utah

A reconnaissance stream sediment sampling program was run on the west side of the Tushar Mountains, 10 miles southwest of Marysvale, Utah. This program was designed to evaluate the potential for gold-silver mineralization along the mineral belt that extends westwardly out of Marysvale (Mt. Baldy, Ohio, Gold Mountain and Henry Mining Districts). Furthermore, this location was chosen because it has large areas of extensive alteration that occur in rugged, brushy and wooded, mountainous terrain. A stream sediment approach was chosen rather than a bedrock examination because of the availability of field technician help, the lack of available geologic help, and the relatively low potential for discovery.

Premineral bedrock in the sampled area consists of the Bullion Canyon Volcanics of intermediate composition and Miocene-Oligocene age. Roughly 10% of the Bullion Canyon Volcanics in the sampled area is altered by argillic and advanced argillic alteration that occurs in scattered patches that range up to three square miles in area. The Bullion Canyon Volcanics and the argillic alteration are mapped and described by Cunningham and others in USGS Open File Report 81-831 (1981); Callaghan and Parker, 1962, Geology of the Delano Peak Quadrangle, USGS GQ-153; and Callaghan and Parker, 1961, Geologic Map of part of the Beaver Quadrangle, USGS MF-202. The alteration and host rocks in the sampled area are the westward extent of the precious and base metal mineralization in the Marysvale area. However, the only known metal mineralization in the sampled area is the gold mineralization of the Sheeprock Mine and Rob Roy Mine area (see attached map and Stathis's 11/28/67 report, Asarco files). The entire Tushar Mountains area has been of interest to uranium prospectors in the recent past.

The stream sediment sampling was done in the late summer and fall of 1982, and the sampling was snowed out a week before the sampling was to be terminated. The program was designed by the author, and T. Benavidez did the sampling and screening. The sampling, screening, and assaying techniques (to be described) were recommended by G. Stathis. Sampling was done by taking grab samples at a specified locality, and the samples were screened using ¼" mesh, 10 mesh, and 80 mesh screens. The -80 mesh fraction was saved for gold determination and the -¼", +10 mesh fraction was saved for silver, arsenic, and mercury determinations.

Gold determinations were done by Western Analytical using fire-fusion digestion, one assay ton sized samples, and atomic absorption. Repeat gold determinations were done by Skyline Labs (Tucson) using the same method. Silver, mercury, and arsenic determinations were done by Skyline Labs. The gold, silver, arsenic, and mercury values are shown in the attached table, and the gold values are plotted on the attached map.

Visual inspection of the gold values shows that gold values <9 ppb are background, 9 to 12 ppb are marginally anomalous, and >12 ppb are anomalous. Gold values along the line of prospect pits from the Rob Roy Mine to south of the Sheeprock Mine are commonly marginal or anomalous and reflect known gold mineralization in that area. North and east of the Rob Roy Mine the gold values are background. Likewise, there is a twenty square mile area of background gold values in the southeast corner of the sampling program.

There are significant anomalous gold values and marginal gold values in the center of the sampling program: SE/4, T28S & R6W and W/2 SW/4, T28S & R5W (see attached map). Most of these anomalous gold values and the known locations of alteration suggest the gold comes from a source(s) on Cork Ridge and/or Baldwin Ridge. Additional reconnaissance stream sediment sampling in Pine Creek and South Fork North Creek and their tributaries will be necessary to refine the probable location(s) of anomalous gold in bedrock.

Significant anomalous gold values also occur in tributaries of Merchant Creek, N/2 T29S and R5W. Unfortunately these are only a few areas of outcropping premineral Bullion Canyon Volcanics, some of which are altered, in the Merchant Creek drainage. The remainder of the drainage area is postmineral volcanics, landside debris, and alluvium. Additional stream sediment sampling and inspection of the premineral outcrops would be the next step in determining the source of these anomalous gold values.

The Tushar Mountain stream sediment sampling program has located anomalous gold mineralization in the sediment of several streams that are not associated with the known gold mineralization in the Rob Roy Mine and Sheeprock Mine area. The potential for finding outcropping ore grade mineralization that would be of interest to Asarco is deemed to be remote. However, there is a potential for locating outcrops of anomalous gold values within a large altered area, and this could lead to the development of a suitable gold vein target. Additional stream sediment sampling is recommended to check the possibility of higher grade gold samples upstream and to further delineate the probable gold source area(s). This is a low priority situation that would involve a few weeks of field technician time.

H. G. Kreis

H. G. Kreis

HGK/cg

Attachments: Analytical Value List
Plan Map
Assay Sheets

ANALYTICAL VALUES

STREAM SEDIMENT SAMPLES

TUSHAR MOUNTAINS

Beaver and Piute Counties, Utah

Sample Number	Au in -80 Mesh (ppb, Western)	Duplicate Au in -80 Mesh (ppb, Skyline)	Ag in -¼, +10 (ppm)	As -¼, +10 (ppm)	Hg -¼, +10 (ppm)
BUB- 1	3		<.2	20	.03
- 2	4		.2	90	.04
- 3	3		<.2	10	.03
- 4	7		<.2	<10	.03
- 5	6		<.2	<10	.01
- 6	7		<.2	<10	.03
- 7	8		<.2	10	.01
- 8	7		<.2	<10	.01
- 9	7		<.2	<10	.01
-10	5		<.2	30	.01
-11	8		<.2	<10	.05
-12	6		<.2	<10	.03
-13	20	26	<.2	20	.07
-14	4		<.2	30	.03
-15	7		<.2	<10	.03
-16	4		<.2	<10	.03
-17	4		<.2	20	.03
-18	3		<.2	<10	.03
-19	17	14	<.2	<10	.01
-20	8	8	<.2	<10	.03
-21	30	10	<.2	<10	.01
-22	10	19	<.2	<10	.05
-23	8	15	<.2	<10	.01
-24	12	8	<.2	<10	.01
-25	11	7	<.2	20	.01
-26	14	8	<.2	50	.01
-27	10	10	<.2	<10	.01
-28	14	7	<.2	<10	.03

Sample Number	Au in -80 Mesh (ppb, Western)	Duplicate Au in -80 Mesh (ppm, Skyline)	Ag in -¼, +10 (ppm)	As -¼, +10 (ppm)	Hg -¼, +10 (ppm)
BUB-29	14	24	<.2	10	.01
-30	15	11	<.2	10	.03
-31	25	18	.2	10	.01
-32	17	26	<.2	10	.01
DPB- 1	20	16	<.2	<10	.01
- 2	13	8	<.2	<10	.03
- 3	25	15	<.2	<10	.01
- 4	56	4	<.2	<10	.03
- 5	50	4	<.2	10	.01
- 6	25	15	<.2	10	.01
- 7	10	6	<.2	10	.01
- 8	10	10	<.2	30	.01
- 9	3	2	.4	100	.03
-10	3		<.2	30	.05
-11	3		<.2	30	.01
-12	<3		<.2	10	.04
-13	4		.6	10	.02
-14	3		<.2	20	.06
-15	7		<.2	10	.03
-16	<3		<.2	20	.02
-17	<3		<.2	20	.03
-18	<3		<.2	10	.03
-19	4		<.2	10	.05
-20	5		<.2	20	.02
-21	6		<.2	20	.03
-22	7		<.2	30	.04
-23	9		<.2	30	.02
-24	8		<.2	20	.03
-25	3		<.2	20	.04
-26	75	15	<.2	20	.02
-27	10	11	<.2	20	.04

Sample Number	Au in -80 Mesh (ppb, Western)	Duplicate Au in -80 Mesh (ppb, Skyline)	Ag in -¼, +10 (ppm)	As -¼, +10 (ppm)	Hg -¼, +10 (ppm)
DPB-28	8	24	<.2	30	.04
-29	4	8	<.2	30	.02
-30	14	10	<.2	20	.04
-31	4	5	<.2	30	.02
-32	7	3	<.2	30	.04
-33	3	3	<.2	30	.04
MVB- 1	<3		1.4	50	.06
- 2	3		<.2	50	.02
- 3	<3		<.2	20	.02
- 4	12		<.2	20	.04
- 5	<3		<.2	20	.01

Also see emission spectrographic analysis of seven composite samples.

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 248
January 14, 1983
H.G. KREIS--DPB-4

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 11 Pulp Samples

ITEM	SAMPLE NO.	Au * ppm
1	DPB-4	.004
2	DPB-5	.004
3	DPB-9	.002
4	DPB-26	.015
5	DPB-27	.011
6	DPB-28	.024
7	DPB-29	.008
8	DPB-30	.010
9	DPB-31	.005
10	DPB-32	.003
11	DPB-33	.003

*NOTE: Method of analysis by combination fire assay and atomic absorption.

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED 1-14-83
ARIZONA U.S.A.

William L. Lehmbeck
Manager

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 303
September 1, 1983
DPB-1 TO MVB-5

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 51 Pulp Samples

ITEM	SAMPLE NO.	Au ppm	Ag ppm
1	DPB-1	.016	N/R
2	DPB-2	.008	N/R
3	DPB-3	.015	N/R
4	DPB-6	.015	N/R
5	DPB-7	.006	N/R
6	DPB-8	.010	N/R
7	DPB-26*	.000*	0.0*
8	BUB-13	.026	N/R
9	BUB-19	.014	N/R
10	BUB-20	.008	N/R
11	BUB-21	.010	N/R
12	BUB-22	.019	N/R
13	BUB-23	.015	N/R
14	BUB-24	.008	N/R
15	BUB-25	.007	N/R
16	BUB-26	.008	N/R
17	BUB-27	.010	N/R
18	BUB-28	.007	N/R
19	BUB-29	.024	N/R
20	BUB-30	.011	N/R
21	BUB-31	.018	N/R
22	BUB-32	.026	N/R
23	DPB-9	N/R	.4
24	DPB-10	N/R	<.2
25	DPB-11	N/R	<.2

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 303
September 1, 1983

ITEM	SAMPLE NO.	Au ppm	Ag ppm
26	DPB-12	N/R	<.2
27	DPB-13	N/R	<.2
28	DPB-14	N/R	<.2
29	DPB-15	N/R	.6
30	DPB-16	N/R	<.2
31	DPB-17	N/R	<.2
32	DPB-18	N/R	<.2
33	DPB-19	N/R	<.2
34	DPB-20	N/R	<.2
35	DPB-21	N/R	<.2
36	DPB-22	N/R	<.2
37	DPB-23	N/R	<.2
38	DPB-24	N/R	<.2
39	DPB-25	N/R	<.2
40	DPB-26	N/R	<.2
41	DPB-27	N/R	<.2
42	DPB-28	N/R	<.2
43	DPB-29	N/R	<.2
44	DPB-30	N/R	<.2
45	DPB-31	N/R	<.2
46	DPB-32	N/R	<.2
47	DPB-33	N/R	<.2
48	MVB-1	N/R	1.4
49	MVB-2	N/R	<.2
50	MVB-3	N/R	<.2

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 303
September 1, 1983
PAGE 3

ITEM	SAMPLE NO.	Au ppm	Ag ppm
51	MVB-4	N/R	<.2
52	MVB-5	N/R	<.2

NOTE: N/R denotes analysis not requested.

*NOTE: Item 7 DPB-26 not received. (Done previously)

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. James D. Sell

William L. Lehmbeck
Manager

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED 9/1/83 Arizona U.S.A.

WESTERN ANALYTICAL INC.
2417 South 2700 West
Salt Lake City, Utah 84119
(801) 973-9238

CERTIFICATE OF ANALYSIS

Oct. 20, 1982
P82-303

ASARCO, INCORPORATED
Mr. H. Kreis
P. O. Box 5747
Tucson, Arizona 85700

Dear Mr. Kreis:

Transmitted herewith is the analytical data for the 44 samples delivered to our laboratory for Au, Ag* analysis. These are the samples that were delivered to our laboratory Monday, September 20, 1982, by Harold Stone.

Sample Number	Ag* (PPM)	Au (PPM)

Sample Number	Ag* (PPM)	Au (PPM)
		(PPB)
BUB- 1		3
BUB- 2		4
BUB- 3		3
BUB- 4		7
BUB- 5		6
BUB- 6		7
BUB- 7		8
BUB- 8		7
BUB- 9		7
BUB-10		5
BUB-11		8
BUB-12		6
BUB-13		20
BUB-14		4
BUB-15		7
BUB-16		4
BUB-17		4
BUB-18		3

*Background Corrected

E. H. Phillips
Laboratory Director

Charges: $439.90

EHP/kh

cc: Mr. James Sells
Tucson, Arizona

WESTERN ANALYTICAL INC.
2417 South 2700 West
Salt Lake City, Utah 84119
(801) 973-9238

CERTIFICATE OF ANALYSIS

Dec. 3, 1982
P82-369

ASARCO, INC.
Mr. H.G. Kreis
P.O. Box 5747
Tucson, Arizona 85703

Dear Mr. Kreis:

Transmitted herewith are the analytical data for the 36 samples delivered to our laboratory by Tony Benaueder on November 18, 1982 for Fire Assay Fusion AA Au analysis.

Sample Number	Au (PPB)
DPB 9	3
DPB 10	3
DPB 11	3
DPB 12	<3
DPB 13	4
DPB 14	3
DPB 15	7
DPB 16	<3
DPB 17	<3
DPB 18	<3
DPB 19	4
DPB 20	5
DPB 21	6
DPB 22	7
DPB 23	9
DPB 24	8

Dec. 3, 1982
P82-369

Sample Number	Au (PPB)
DPB 25	3
DPB 26	75
DPB 27	10
DPB 28	8
DPB 29	4
DPB 30	14
DPB 31	4
DPB 32	7
DPB 33	3
MVB 1	<3
MVB 2	3
MVB 3	<3
MVB 4	12
MVB 5	<3

Mark R. Craven

Mark R. Craven
for E.H. Phillips
Laboratory Director

Charges: $471.60

MRC/kc

WESTERN ANALYTICAL INC.
2417 South 2700 West
Salt Lake City, Utah 84119
(801) 973-9238

CERTIFICATE OF ANALYSIS

Oct. 25, 1982
P82-327

ASARCO, INC.
Mr. H.G. Kreis
P.O. Box 5747
Tucson, Arizona 85703

Dear Mr. Kreis:

Transmitted herewith are the analytical data for the 22 samples delivered to our laboratory for Fire Assay Fusion Au analysis.

	Sample Number	Au (PPB)
BUB #	19	17
	20	8
	21	30
	22	10
	23	8
	24	12
	25	11
	26	14
	27	10
	28	14
	29	14
	30	15
	31	25
	32	17
DPB #	1	20
	2	13
	3	25
	4	56
	5	50
	6	25
	7	10
	8	10

E.H. Phillips
Laboratory Director

Charges: $288.20

EHP/kh

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 240
November 23, 1982

ASARCO INCORPORATED
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 5 Soil Samples

ITEM	SAMPLE NO.	As ppm	Hg ppm
1	MVB-1	50.	.06
2	MVB-2	50.	.02
3	MVB-3	20.	.02
4	MVB-4	20.	.04
5	MVB-5	20.	.01

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. H.G. Kreis

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED
Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 224
October 29, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 40 Stream Sediment Samples

ITEM	SAMPLE NO.	As ppm	Hg ppm	Ag ppm
1	BUB-1	20.	.03	<.2
2	BUB-2	90.	.04	.2
3	BUB-3	10.	.03	<.2
4	BUB-4	<10.	.03	<.2
5	BUB-5	<10.	.01	<.2
6	BUB-6	<10.	.03	<.2
7	BUB-7	10.	.01	<.2
8	BUB-8	<10.	.01	<.2
9	BUB-9	<10.	.01	<.2
10	BUB-10	30.	.01	<.2
11	BUB-11	<10.	.05	<.2
12	BUB-12	<10.	.03	<.2
13	BUB-13	20.	.07	<.2
14	BUB-14	30.	.03	<.2
15	BUB-15	<10.	.03	<.2
16	BUB-16	<10.	.03	<.2
17	BUB-17	20.	.03	<.2
18	BUB-18	<10.	.03	<.2
19	BUB-19	<10.	.01	<.2
20	BUB-20	<10.	.03	<.2
21	BUB-21	<10.	.01	<.2
22	BUB-22	<10.	.05	<.2
23	BUB-23	<10.	.01	<.2
24	BUB-24	<10.	.01	<.2
25	BUB-25	20.	.01	<.2

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 224
October 29, 1982

ITEM	SAMPLE NO.	As ppm	Hg ppm	Ag ppm
26	BUB-26	50.	.01	<.2
27	BUB-27	<10.	.01	<.2
28	BUB-28	<10.	.03	<.2
29	BUB-29	10.	.01	<.2
30	BUB-30	10.	.03	<.2
31	BUB-31	10.	.01	.2
32	BUB-32	10.	.01	<.2
33	DPB-1	<10.	.01	<.2
34	DPB-2	<10.	.03	<.2
35	DPB-3	<10.	.01	<.2
36	DPB-4	<10.	.03	<.2
37	DPB-5	10.	.01	<.2
38	DPB-6	10.	.01	<.2
39	DPB-7	10.	.01	<.2
40	DPB-8	30.	.01	<.2

REGISTERED ASSAYER
9425
WILLIAM L. LEHMBECK
DATE SIGNED
ARIZONA U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 238
November 24, 1982

ASARCO INCORPORATED
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 25 Soil Samples

ITEM	SAMPLE NO.	As ppm	Hg ppm
1	DPB-9	100.	.03
2	DPB-10	30.	.05
3	DPB-11	30.	.01
4	DPB-12	10.	.04
5	DPB-13	10.	.02
6	DPB-14	20.	.06
7	DPB-15	10.	.03
8	DPB-16	20.	.02
9	DPB-17	20.	.03
10	DPB-18	10.	.03
11	DPB-19	10.	.05
12	DPB-20	20.	.02
13	DPB-21	20.	.03
14	DPB-22	30.	.04
15	DPB-23	30.	.02

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 238
November 24, 1982

ITEM	SAMPLE NO.	As ppm	Hg ppm
16	DPB-24	20.	.03
17	DPB-25	20.	.04
18	DPB-26	20.	.02
19	DPB-27	20.	.04
20	DPB-28	30.	.04
21	DPB-29	30.	.02
22	DPB-30	20.	.04
23	DPB-31	30.	.02
24	DPB-32	30.	.04
25	DPB-33	30.	.04

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. H.G. Kreis

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
STATE OF ARIZONA, U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 302
September 1, 1983
BUB-27 TO DPB-28
COMPOSITES

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 7 Composite Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
DATE SIGNED
Arizona

William L. Lehmbeck
Manager

*NOTE: DPB-5,6,7,8 for composite not received.

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. James D. Sell

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 302
PAGE 2

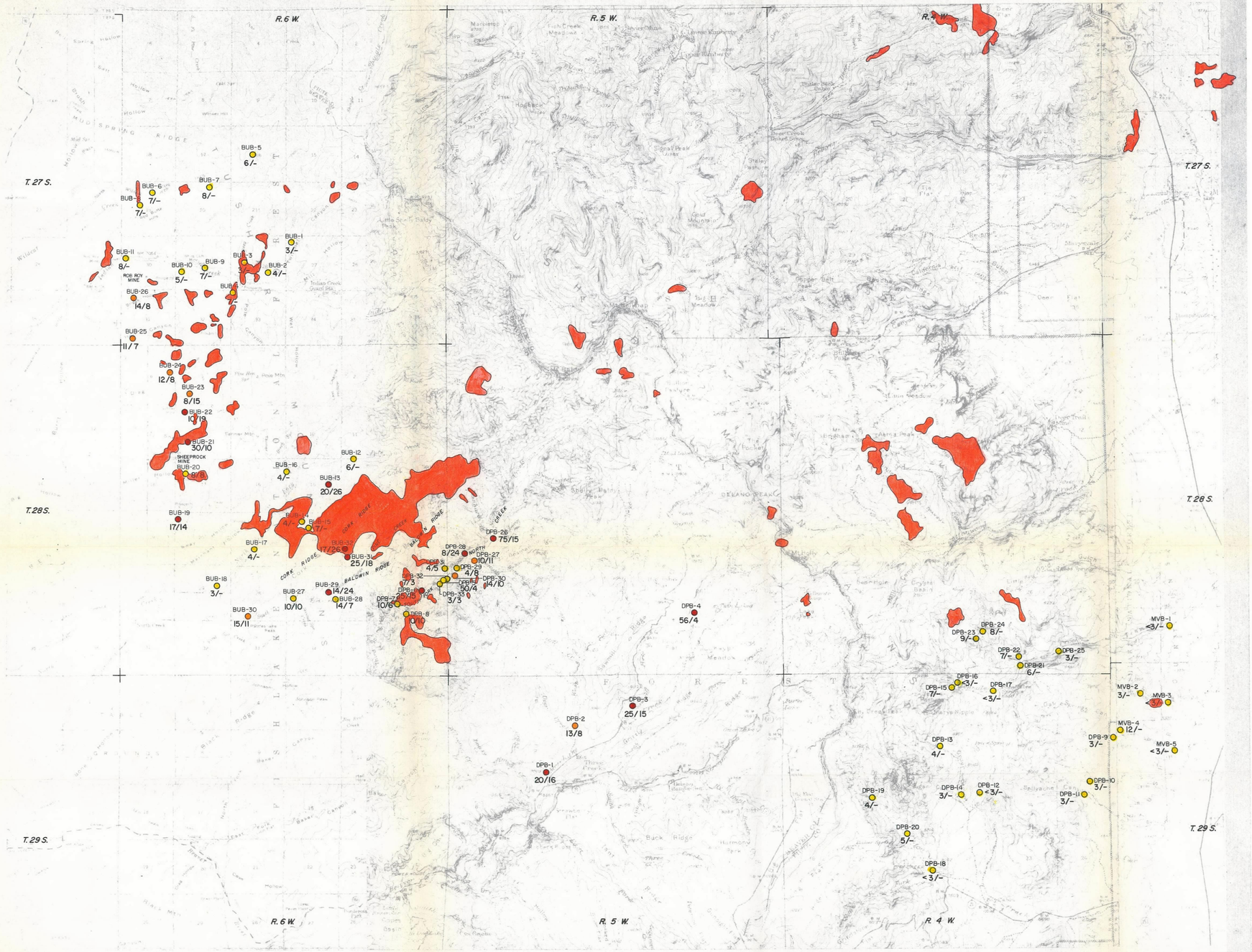
ITEM NO.		SAMPLE NO.
28	=	COMP(BUB-27,28,30)
29	=	COMP(BUB-29,31,32)
30	=	COMP(BUB-5,7)
31	=	COMP(BUB-1,2,3,4,9)
32	=	COMP(BUB-19,20,21)
33	=	COMP(BUB-22,23,24,25)
34	=	COMP(DPB-5,6,7,8)
35	=	COMP(DPB-26,27,28)

ITEM	28	29	30	31	32	33	34 *	35
ELEMENT								
Fe	3%	2%	5%	3%	5%	5%	******%	5%
Ca	.5%	.07%	.3%	.2%	2%	.2%	******%	.2%
Mg	.5%	.3%	1%	.3%	1%	.3%	******%	.5%
Ag	<1	<1	<1	<1	<1	<1	******	<1
As	<500	<500	<500	<500	<500	<500	******	<500
B	15	20	10	10	<10	10	******	15
Ba	300	300	300	150	500	300	******	300
Be	3	3	<2	5	2	3	******	5
Bi	<10	<10	<10	<10	<10	<10	******	<10
Cd	<50	<50	<50	<50	<50	<50	******	<50
Co	7	7	15	10	15	7	******	5
Cr	30	10	30	50	70	20	******	30
Cu	15	20	30	20	50	30	******	30
Ga	10	10	15	15	15	10	******	15
Ge	<20	<20	<20	<20	<20	<20	******	<20
La	50	30	20	20	<20	30	******	30
Mn	300	300	500	500	500	300	******	500
Mo	7	10 ←	<2	<2	<2	<2	******	2
Nb	30	20	20	50	20	30	******	30
Ni	20	15	50	50	200	30	******	20
Pb	20	20	15	70 ←	15	15	******	20
Sb	<100	<100	<100	<100	<100	<100	******	<100
Sc	<10	<10	10	<10	10	<10	******	<10
Sn	<10	<10	<10	<10	<10	<10	******	<10
Sr	300	150	200	150	500	300	******	200
Ti	5000	3000	5000	3000	7000	5000	******	5000
V	70	50	100	50	100	50	******	50
W	<50	<50	<50	<50	<50	<50	******	<50
Y	<10	<10	<10	20	10	10	******	10
Zn	<200	<200	<200	<200	<200	<200	******	<200
Zr	300	300	150	200	200	200	******	300

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122



TO ACCOMPANY Report To J.D. Sell
DATED 9/8/83
BY H.G. Kreis

EXPLANATION

BUB-15
12/8 ○ Stream sediment sample site with gold value (ppb) of -80 mesh portion of sample. ppb Western Analytical / ppb Skyline

- ● Anomalous, >12ppb Au
- ● Marginal, 9-12ppb Au
- ● Background, <9ppb Au

REMARKS:

For bedrock geology and areas of argillic and advanced argillic alteration see Cunningham and others, 1981, USGS Open-File Report 81-831. Also Callaghan, E., and Parker, R., 1961, USGS Mineral Investigations Field Studies Map MF-202.

ALTERATION

Argillic and advanced argillic alteration (Cunningham and others, 1981)

TUSHAR MOUNTAIN STREAM SEDIMENT SAMPLES

BEAVER AND PIUTE COUNTIES, UTAH

ASARCO Incorporated

H.G.Kreis and T.C.Benavidez

September, 1983

1" equals 1mile

mn 5590 dam 10/83

ASARCO EXPLORATION RECORD

~~THC~~ - FR

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] _____

J. H. C.

FEB 2 7 1984

Section I General Indexing

① Name(s) of Property or Area: Recon of Northern Part of JARLOOSE MINING DISTRICT					② Country: USA	③ State or Province: Utah	
					④ USGS Quad.: Minersville, UT	⑤ File or Gore No.: Beaver County	
⑥ Latitude: 38°11'30"	⑦ Longitude: 112°52'	⑧ AMS Sheet: Richfield	Township: 30S	Range: 9W	Section: 8, 15, 16, 17, 21, 22	⑨ Examined by: HGKreis	⑩ Date: 9 & 10/82
					⑪ Office: SWED Tucson	⑫ Field Days: 6	

Section II Sources of Information

Date Typed 9/7/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Landwehr	4/14/38	Roosevelt Group Jarloose or Black Mtn. Dist., Asarco Files.		
Erickson & Dasch	1968	Volc. Strat., Mag. Data, & Altn., Geol. Map & Section of the Jarloose Mining Dist.; UT Geol. & Min. Survey Map No. 26		

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [x] Future work

⑮
- [ ] Post Producer
- [ ] Producer
- [x] Mineral Deposit
- [ ] Prospect
- [x] Recon
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
Ag (&Au?)	Probably less than 10,000 tons for the entire Jarloose Dist.	

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade
None known		

⑱ Num. Drill Holes 3 @ Lookout Mine; Approx Total Footage ?

⑲ Excavations Few pits & one 50' shaft.

⑳ [x] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Ag and minor Au

㉔ Ore Minerals-Major: Ag mineral not identified Minor:

㉕ Host Rocks-Major: Andesite Minor:

㉖ Age of Host Rocks: Tertiary

㉗ Nature of Exposures: Good exposures; commonly steep terrain with over 1000' of relief.

㉘ Alteration: District wide, there is commonly weak clay-celadonite type alteration and quartz micro veining, all of (Cont) ㉙ Total Extent: Not determined

㉚ Structure: Strongly developed structural control of quartz-Ag veins and calcite veins. Veins strike N-S (±10°) to locally N30W and are vertical to 30°W dipping. (Cont.)

㉛ Ore Occurrence: Silver mineralization occurs in quartz veins and not in the nearby, parallel calcite veins. The calcite veins are well defined, fracture filling vein structures that are up to (Cont.) ㉜ Age of Mineralization: Tertiary(?)

㉝ Conclusions & Recommendations: The north end of the Jarloose Mining District was chosen for reconnaissance because Landwehr reported (1938) a 50' width of 3 oz. Ag and 0.02 oz. Au on the Roosevelt claim group. After a substantial amount of research in the Beaver County Courthouse, Asarco's files, and field reconnaissance, it was determined that the Roosevelt claims covered the Ag-quartz mineralization in the northeast corner of Sec. 22 (T30S, R9W; see attached map). In addition to the work (Continued)

(For additional space use extra sheets)

28. Alteration (Continued)

which appear to be a form of volcanic deuteric alteration-mineralization (devitrification, vapor phase, degassing, or whatever). Moderate clay-celadonite (bluish color) occurs along several of the Ag-quartz veins, but there is no indisputable genetic relationship between such alteration and the Ag-quartz mineralization.

30. Structure (Continued)

Faults strike N0-10°E and N60°E.

31. Ore Occurrence (Continued)

4' thick and at least a hundred feet in strike length. The Ag-quartz veins are a different story. They vary from a zone of open space filled veinlets to replacement-like veins to massive replacement, all of which pinch and swell from nothing up to 15' in width. The quartz veins are generally narrow and discontinuous, and it is difficult to follow a particular vein for more than 200'. The true length and width of the vein structures are masked because they often "grade out" into a background of quartz microveinlets that appear to be of volcanic deuteric origin (see alteration section).

Several detailed sample traverses (MV-6, -9, and -12) were run across some of the better looking vein structures that were encountered on very widely spaced geologic reconnaissance traverses. Grades of 0.2 to 3 oz. Ag and less than 0.03 oz. Au were encountered, and it appears from samples at MV-6 and MV-12 that thicknesses of 50-70' might average 0.4 oz. Ag when barren interval waste is included.

The thickest and most continuous quartz filled structure occurs in the area of samples MV-22 to MV-26. Here quartz vein structures are so abundant they form a near solid mass of quartz 100' wide and 1000' long. Unfortunately, the quartz carries less than 0.2 ppm Ag, less than 0.003 ppm Au, and no anomalous base metals. In several veins on the fringes of the quartz mass, the quartz is a clear gray to white color; and the quartz appears on the verge of being opalite. The quartz of this mass is probably of volcanic deuteric origin (previously defined).

33. Conclusions & Recommendations (Continued)

in the Roosevelt claim area, a couple of traverses were run along the north side of the Jarloose District to see if better mineralization existed in the direction of the Lincoln and Bradshaw Mining Districts, but the results of these traverses were negative.

Several reconnaissance traverses across the Ag-quartz mineralization on the Roosevelt claim group showed discontinuous vein structures having barren wall rock ($<$ 4 ppm Ag) between veins less than 50' apart. The nature of the hydrothermal mineralization is such that there were instances of varying degrees of certainty distinguishing between it and the volcanic deuteric alteration and quartz veining.

33. Conclusions & Recommendations (Continued)

The nature of all the mineralization-alteration, including the Ag-quartz mineralization, is such that a volcanic deuteric origin is a reasonable hypothesis. The calcite veins appear totally epigenetic to the volcanic pile, but the calcite was probably derived from the underlying limestone beds and mobilized by the volcanic deuteric activity.

A potential for silver ore mineralization that would be of current interest to Asarco was not readily apparent from the reconnaissance traverses across the mineralization. But, in the general area of MV-1 to -12 there may be a number of spotty outcrops that will run 0.1 to 0.3 oz. Ag (3 to 10 ppm Ag) with a few of the better looking outcrops running up to 3 oz. Ag. The abundance of such anomalous mineralization might be 5-10% of the outcrop area. If after a month or so of detailed mapping-sampling such is found to be true, perhaps a deep target might be indicated; e.g., the coalescing of mineralization at depth into a well defined Ag vein or a large, low grade Ag deposit. In view of the risk involved and our current manpower and financial situation, this prospect is not worthy of further work at this time; however, it is worthy of future review.

SUMMARY OF RECON. GEOCHEM SAMPLES

JARLOOSE MINING DISTRICT

Beaver County, Utah

Sample Number		Ag (ppm)	Au (ppm)	Rock Type				Alteration	Mineralization		
				Andesite	Other Volcanic	Sed.	Vein	Clay-Celad.	Quartz (%)	Calcite (%)	Former Sulfides (%)
MV- 1	0- 10'	0.7	<0.05	X				M			
	10- 14'	0.7	<0.05				X		10	90	
	14- 22'	1.0	<0.05	X				M		15	
	22- 32'	3.9	<0.05	X				M		15	
	32- 39'	0.9	<0.05	X				MS		5	
	39- 53'	1.2	<0.05	X				MS	Tr	5	
	53- 80'	1.3	<0.05					MS	Tr	Tr	
MV- 2		7.2	<0.05	X				MS	5		
MV- 3		1.1	<0.05				X			100	
MV- 4		34.5	0.17	X			X		Stg		
MV- 5		80.0	0.40	X			X		Stg		
MV- 6	0- 12'	23.1	0.22	X(Bxa)				M	5		
	12- 24'	6.2	0.17	X				M	5		
	24- 36'	2.4	0.05	X				M	5		
	36- 50'	30.1	0.45	X				M	15		
MV- 7		1.9	<0.05	X				M	2	1	
MV- 8		1.4	<0.05	X				M	2		
MV-9	0- 15'	2.8	0.05	X				M	3		
	15- 30'	1.4	<0.05	X				M	3		
	30- 45'	1.6	0.05	X				M	3		
	45- 60'	5.2	0.05	X				M	5		
MV-10		1.2	<0.05	X				S			
MV-11		1.0	<0.05	X				W to F	2		

Sample Number		Ag (ppm)	Au (ppm)	Rock Type				Alteration	Mineralization		
				Andesite	Other Volcanic	Sed.	Vein	Clay-Celad.	Quartz (%)	Calcite (%)	Former Sulfides (%)
MV-12	0- 10'	12.0	0.220	X				M	8		
	21- 29'	1.8	0.035	X				M	5		
	54- 58'	2.0	0.060	X				M	5		
	58- 69'	28.0	0.970	X				M	8		
	69- 85'	1.0	0.020	X				M	8		
	85-125'	1.8	0.050	X				M	5		
MV-14		0.2	0.007		X				8*		
MV-15		0.4	<0.002		X				4*		
MV-16		0.8	0.005		X				4*		
MV-17		0.2	<0.002		X			M			
MV-18		<0.2	<0.002				X		<10	>90	
MV-19		<0.2	<0.002		X				10		
MV-20		85.0	0.070	X					Stg		1
MV-21		5.6	0.026	X					5		0.5
MV-22		1.6	0.003				X		100(*?)		
MV-23		2.4	<0.002				X		200		
MV-24		0.2	<0.002				X		100		
MV-25		1.8	0.003	X			X		70		
MV-26		1.2	0.004	X			X		80		
MV-27		0.8	0.002				X		100		
MV-29		1.0	0.003			Qtzite Bxa			10		
MV-30		0.2	<0.002				Gossan				Gossan**
MV-31		<0.2	<0.002			Ss					
MV-32		<0.2	<0.002			Conglom.					

*Volcanic origin (devitrified glass); includes some opalite.

**0.1% Ni

H. G. Kreis
Sept. & Oct. 1982

Sample Descriptions

RECONNAISSANCE OF NORTHERN PART OF
JARLOOSE MINING DISTRICT

MV-1 Location 30'-80' elevation below top of ridge, east side of canyon, ridge of rock above waterfall. N80E-S80W (starting from east end) across alt. andesite with calcite veins.

0-10' Wall rock. Ande. w/mod. clay - chlor(?) altn., trace qtz-calcite, tr CuOx(?), FeOx stain.

10-14' 3-4' thick, N-S to N10°E vert. to str. east dip vein. Calcite (brown) vein w/10-20% white quartz.

14-22' Calcite veining, up to 2" thick, weaves through silicified-altered ande. Approx. 15% of sample is calcite (brown) vein material.

22-32' Same as 14'-22'.

[Note: 32'-34' is a rib after traversing 0-32' across smooth slope.]

32-39' Mod.-strong clay alt. ande. w/local minor silicification and trace qtz. veining from 32' to 36'. From 36 to 39' is mixture of calcite veins and alt. ande.

39-53' Alt. ande. as described from 32' to 36'. Contains about 5% calcite veining.

53-80'± Scattered chips collected of alt. ande. as described w/local minor silicification, traces of qtz & calcite veins (couple 6" calcite veins).

Note: Clay altn is locally greenish blue (probably celadonite).

MV-2 Taken on mineralized structure on west side of wash at wash level. Sample length 23', horizontal, more or less perpendicular to strike. Mineralized structure strikes ± N35°W and dips 50-60° to SW. One foot thick brown calcite vein at wash elevation strikes N-S± and dips ±40° to west. Sample of mod-stgly clay (locally bluish to greenish color) altered ande. w/5% qtz veining (1/8") and 5%(?) patches to vein like silicification. Rock is moderately hard as if more silicification may be present. Weakly iron stained from mafics and possible trace former pyrite.

MV-3 1' thick brown calcite vn (N-S 40°W) as was noted in MV-2.

MV-4 10' long adit. Sample of "ore pile" on dump. Mod. to strongly silicified and qtz. veined ande. Adit appears to be at south end (narrow end) of a silicified zone that averages 20'± thick (across slope), trends N-S, and appears to have a mod to mod-steep W dip.

MV-5 15' trench above adit (same silicified zone as MV-4). 15' approximates horizontal width across silicified zone. Variably silicified and quartz veined ande. that averages mod. stg. abundance of silica.

MV-6 To find start of MV-6, go S70°E, 45'± to top edge of ridge from east end of MV-5. Start of MV-6 is ±200' N40W, up 20°, from MV-2. MV-6 series taken starting at top of ridge and going down slope at 35°±, N75°E.

0-12' Mod. alt. (clay) ande. w/red (FeOx stain) & bluish colors (celadonite? after plag.). Approx. 3-5% qtz veins, locally with crystals developed from each side of vein; qtz veins typically 1/8" thick and form a stockwork. Host rock originally brecciated.

12-24' Same as from 0-12'.

24-36' Same as from 0-12'.

36-50' Same as 0-12', but with 10-15% qtz veining and local minor silicification. Qtz veins typically have traces of a black mineral.

MV-7 30' chip sample start at so. end of MV-2 and continuing (30') SSW along west edge of wash. Mod. clay alt. ande., brown to gray to loc. bluish; local FeOx stain after mafics and possibly some FeOx after minor, local, fract. controlled former sulfides. Approx 2% qtz veining (<1/8" thick) and a couple calcite vns, 2-4" thick, N-S (±10°), & vertical.

MV-8 20-30' chip sample continuing northerly from north end of MV-2. No calcite veins and less FeOx but otherwise like MV-7.

MV-9 To find point of beginning start at bottom point of MV-6 (36-50') and go 75'±, N60°W, along base of cliff (top of tallis) to a small cut at base of cliff. From this cut go 30'± due north to 1' thick, 10' long dead tree. MV-9 starts at this dead tree and goes down slope, -33°, N65°E.

0-15' Mod. clay alt. ande., gray to bluish gray color. Local minor FeOx stain. ≈3% qtz vein stockwork (<1/8" thick vein).

15-30' Same as 0-15'.

30-45' Same as 0-15'.

45-60' Same as 0-15, but w/3-5% qtz. veins. Local schistose texture.

MV-10 Character sample. Small 2' x 2' outcrop in tallis cover up slope, due NW from bottom of MV-9 (45-60'), a distance of an est. 200'. Bright blue colored rock; 70% of rock (andesite) is celadonite(?).

MV-11 N45'E and 150-200' from bottom of MV-9 (45-60'). Prominent ridge that comes up slope from boulders in wash. 30' E-W chip sample. Ande., weak chlor.-clay altn. to nearly fresh appearing. 0-3% qtz. vns, local spotty green color, locally former sulfides appear to have been present; locally the green color is closely assoc. w/grains of former sulfide.

MV-12 Sampling. Starting point at rock monument (Silverton-1 or 2(?) claim notice) w/vague diggings at base of monument. Go north N30°W, 25'± to 2' high Pinion pine which is the 0' starting point. N42°E traverse from 0' point.

0-10' N-S rib which monument stands on. Ande. w/5% to locally 10% quartz veining. Possible minor local silica replacement. Trace of black crystalline mineral in qtz. veins; locally there appears to be limonite pseudomorphs of pyrite. The ande. is a pale green color and appears to be mod. clay altered.

10-21' No sample; covered.

21-29' Same geol. as 0-10'.

21-54' Covered.

54-58' Siliceous(?), 4' thick rib.

58-69' Alt. ande. w/5-10% qtz. veining.

69-85' Same as for 58-69'. (At 85' offset 30' to north then continue N75°E traverse)/

85-125' Alt. and. w/5% qtz. veining/

MV-13 No sample taken. Prospect pit & claim monument (700' E of Goules Shaft). Goldski #12 [1980; also 1970 both by Louis Lessing; also 1963, Goldbraid #1 by L. Lessing].

MV-14 Sampled. N10°W, 50-70°E bedding-flow structure in extrusive volcanic (lithic tuff; eutaxitic texture); alternating bands of red & gray. Gray color is quartz that has replaced elongated-flattened formerly glass (?) shards. Quartz is 5-10% of rock and probably of devitrification origin.

MV-15 Sampled. White, bleached and partially silicified volc. (crystal tuff?) Local magnetite, weakly iron stained (from mafics and magnetite).

MV-16 Sampled. Prominent knob 400'N'ly of MV-15 (paced in thick fog & rain). Same as description MV-15.

MV-17 Sample. 200' chip traverse. Supergene and vapor phase(?) alt. in volc. rock.

MV-18 Sample. Calcite vein w/v. minor qtz. Bended, brown-white-minor red 8' thick, N15W, vert. to stp. W dip.

MV-19 Sample. Oxidized basalt w/locally strong silica (nearly opalite) flooding.

MV-20 Sampled dump of 15' deep shaft on 1-2' wide mineralized shear zone, N-S & near vertical attitude. Breccia fragments cemented by silica and FeOx, red-brown (pyrite). Est. 2% qtz and 1-2% FeOx after 1% former total sulfides. Nearby outcrops show a breccia texture but the cementing material is very inconspicuous. Sample is 1/2 FeOx-silica bxa & 1/2 silica bxa w/o FeOx.

MV-21 Float sample taken horizontally for 80'; 100' NE of shaft (MV-20) and on north face, 30-50' below crest of saddle. 3% FeOx stained [hem., goe., & jarosite (xyls)] after ½% FTS; 2-6% qtz veining.

MV-22 Sample of vein. White to clear gray opalite-like and crytocrystalline silica; 3' thick vein, N10°W and appears to dip 50-80°W. Rather uniform layered texture.

MV-23 Sample of vein. White to smokey to red (FeOx stained) quartz vein, crytocrystalline to almost opalite-like. Complex texture from crenulated layering to breccia (vein qtz and volc. rock fragments). Thickness varies, 2-4'; and beneath is 2-4' of wkly silicified ande. fragments then another 2' of vein quartz. Attitude approx. N20°E, 40-60°W.

MV-24 Sample. Same qtz. vein type material as MV-22 & -23. Sample taken from a couple of complex-discontinuous veins 6"-2' thick. Numerous outcrops in the MV-22 to -24 area are separated by tallis. Outcrops suggest numerous erratically distributed quartz veins in brecciated and faulted ande. host rock. To the south only a few widely spaced, 6"-2', veins persist.

MV-25 Chip sample ≈ENE (up-down slope), approx. 100-150' long. Approx. 100 x 150' area of 40-70% quartz veining of the type sample at MV-22 to -24. Sample probably 75% qtz. vein material and 25% ande. The ande. between this system of gash veins does not appear signif. alt. Qtz. protrudes between tallis and suspect a higher percentage of volc. is covered by tallis than qtz. is covered by tallis.

MV-26 Same as MV-25, 85% qtz. veining & 15% ande. 100' width reasonably established w/qtz. vn. > volc. Another 50-100' of width (down slope) with low degree of certainty because of slumping & tallis cover. MV-26 is 500'± north of MV-25 and the intervening distance is tallis covered (80%).

MV-27 Sample. Narrow 50' long E-W rib protruding into base of wash. Qtz vn-bxa w/accumulative total thickness of 10'-15' of N-S striking carbonate vns. (up to 3' wide). Sampled only qtz. vn-breccia. Local minor former pyrite replaced by trans. > indig. FeOx. There are several 1" to 5' thick qtz. vn-bxa structures up slope, above sample MV-27.

MV-28 No sample. Metaquartzite is the undifferentiated Paleoz. in this area. Quartz veining (w/crystals) is common through area. Only rarely do some of the qtz. vns. appear hydroth. in origin.

MV-29 Sample. Qtzite breccia; gray colored qtzite fragments set in qtz w/a white color. No evidence of pervasive metallic mineralization; however, locally FeOx stained & pitted as if pyrite (v. minor) were present.

MV-30 >25' steeply inclined (westerly) shaft collared in conglom. "Bucket full" of gossan scattered on dump. Took sample at prospect pit 100' to west (up slope); goeth-hem. gossan.

MV-31 Sample. Buff colored, f.g. sandstone (qtz. rich) with goethite stained fractures that are more resistant to erosion than ss itself. Took sample next to prospect pit of sample MV-30. Locally conglomeritic.

MV-32 Sample. Very strongly hematite stained local conglomerate-dominantly sandstone unit. Stratigraphically beneath buff sandstone of MV-31. In this area sed. dip mod. to east end strike ≈N-S.

WESTERN ANALYTICAL INC.
2417 South 2700 West
Salt Lake City, Utah 84119
(801) 973-9238

CERTIFICATE OF ANALYSIS

Sept. 22, 1982
P82-303

ASARCO, INCORPORATED
Mr. H. Kreis
P. O. Box 5747
Tucson, Arizona 85700

Dear Mr. Kreis:

Transmitted herewith is the partial analytical data for the 44 samples delivered to our laboratory for Au, Ag* analysis. These are the samples that were delivered to our laboratory Monday, September 20, 1982, by Harold Stone.

Sample Number	Ag* (PPM)	Au (PPM)
MV- 1		
0-10	0.7	<.05
10-14	0.7	<.05
14-22	1.0	<.05
22-32	3.9	<.05
32-39	0.9	<.05
39-53	1.2	<.05
53-80	1.3	<.05
MV- 2	7.2	<.05
MV- 3	1.1	<.05
MV- 4	34.5	0.17
MV- 5	80.	0.40

Sept. 22, 1982
P82-303

Sample Number	Ag* (PPM)	Au (PPM)
MV- 6		
0-12	23.1	0.22
12-24	6.2	0.17
24-36	2.4	0.05
36-50	30.1	0.45
MV- 7	1.9	<.05
MV- 8	1.4	<.05
MV- 9		
0-15	2.8	0.05
15-30	1.4	<.05
30-45	1.6	0.05
45-60	5.2	0.05
MV-10	1.2	<.05
MV-11	1.0	<.05
MV- A	9.7	0.12
MV- B	5.3	0.18
MV- C	5.2	<.05

Sept. 22, 1982
P82-303

Sample Number	Ag* (PPM)	Au (PPM)

*Background Corrected

E. H. Phillips
Laboratory Director

cc: Mr. James Sells
Tucson, Arizona

Charges: $

EHP/ch

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 222
October 21, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 25 Rock Chip Samples

ITEM	SAMPLE NO.	Au ppm	Ag ppm
1	MV-12 0-10	.220	12.0
2	MV-12 21-29	.035	1.8
3	MV-12 54-58	.060	2.0
4	MV-12 58-69	.970	28.0
5	MV-12 69-85	.020	1.0
6	MV-12 85-125	.050	1.8
7	MV-12B 54-58	.100	4.4
8	MV-14	.007	.2
9	MV-15	<.002	.4
10	MV-16	.005	.8
11	MV-17	<.002	.2
12	MV-18	<.002	<.2
13	MV-19	<.002	<.2
14	MV-20	.070	85.0
15	MV-21	.026	5.6
16	MV-22	.003	1.6
17	MV-23	<.002	2.4
18	MV-24	<.002	.2
19	MV-25	.003	1.8
20	MV-26	.004	1.2
21	MV-27	.002	.8
22	MV-29	.003	1.0
23	MV-30	<.002	.2
24	MV-31	<.002	<.2
25	MV-32	<.002	<.2

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK ARIZONA U.S.A.

William L. Lehmbeck
Manager

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
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Tucson, Arizona 85703
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REPORT OF ANALYSIS

JOB NO. TAJ 222A
October 29, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 3 Samples

ITEM	SAMPLE NO.	Hg ppm	As ppm
19	MV-25	.14	10.
20	MV-26	.08	30.
26	COMP(MV-23+MV-24)	.16	20.

William L. Lehmbeck
Manager

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No 11122

SKYLINE LABS, INC.
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Tucson, Arizona 85703
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REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 222A
October 29, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 4 Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
DATE SIGNED
Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 222A
PAGE 2

ITEM NO. SAMPLE NO.
19 = MV-25
20 = MV-26
23 = MV-30
26 = COMP(MV-23+MV-24)

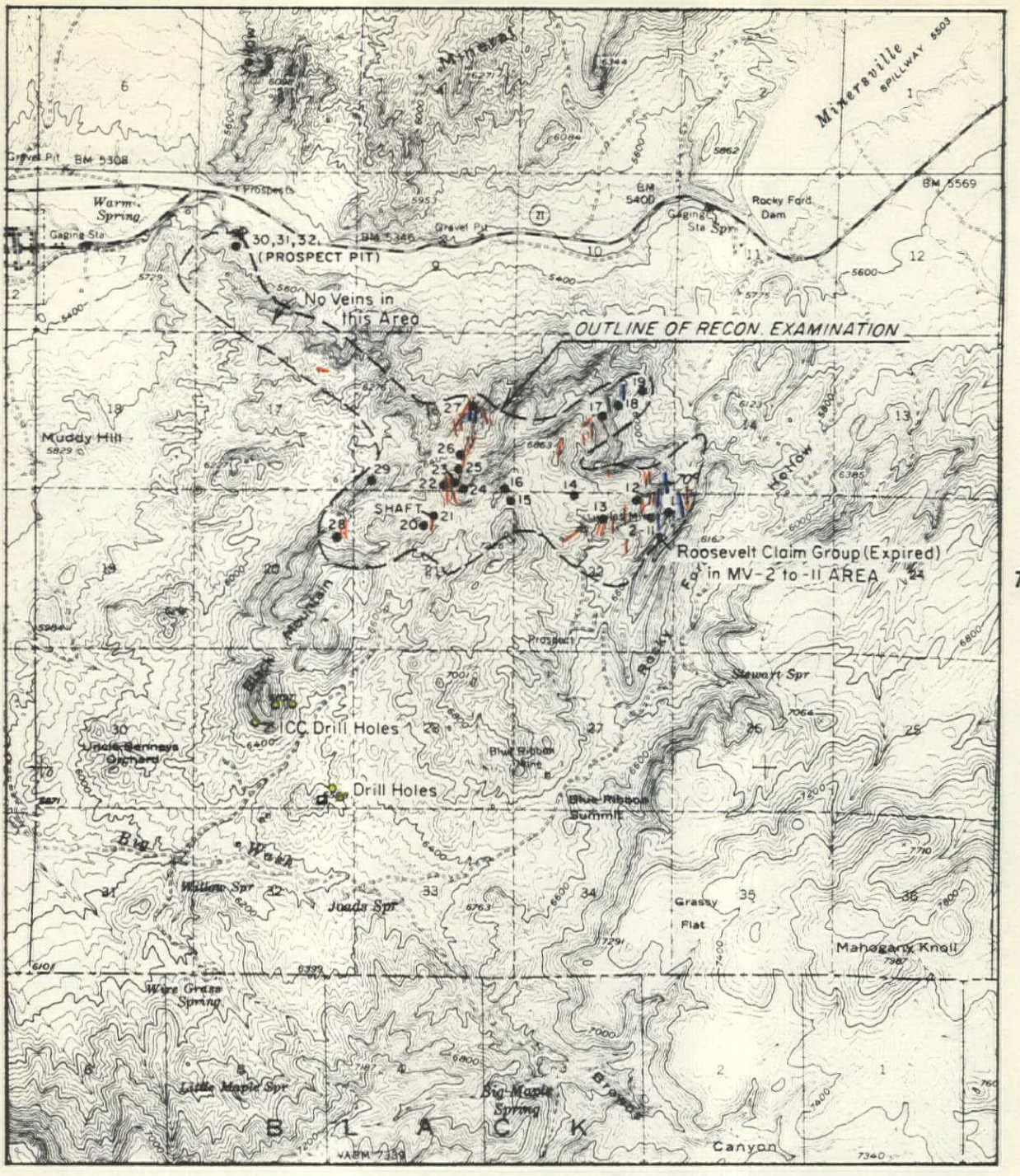
ITEM	19	20	23	26
ELEMENT				
Fe	1%	.7%	10%	5%
Ca	1.5%	1%	.07%	.07%
Mg	.1%	.07%	.15%	.1%
Ag	<1	<1	<1	<1
As	<500	<500	<500	<500
B	<10	<10	<10	<10
Ba	50	10	<10	<10
Be	3	3	3	<2
Bi	<10	<10	<10	<10
Cd	<50	<50	<50	<50
Co	<5	<5	15	10
Cr	70	30	10	50
Cu	<2	<2	30	15
Ga	<10	<10	<10	<10
Ge	<20	<20	<20	<20
La	<20	<20	<20	<20
Mn	100	100	30	15
Mo	<2	<2	2	3
Nb	<20	<20	20	20
Ni	5	<5	1000	50
Pb	<10	<10	<10	<10
Sb	<100	<100	<100	<100
Sc	<10	<10	<10	<10
Sn	<10	<10	<10	<10
Sr	<100	<100	<100	<100
Ti	500	200	500	500
V	15	10	10	10
W	<50	<50	<50	<50
Y	<10	<10	<10	<10
Zn	<200	<200	<200	<200
Zr	<20	<20	<20	100

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

R. 9 W.



N

T. 30 S.

BASE FROM U.S.G.S. MINERSVILLE 15' QUAD.

EXPLANATION

- Quartz Vein
- Carbonate Vein
- "MV" Series of Samples

TO ACCOMPANY Exploration Record Sheet
DATED 9/7/83
BY H.G. Kreis

Geologic Reconnaissance Map

NORTH PART OF
JARLOOSE MINING DISTRICT
Beaver County, Utah

SCALE: 1" = 1 Mile

See Erickson & Dasch, 1968, U.G.M.S. Map No. 26, for the Geology Of The Jarloose District.

H.G. Kreis Sept. 1983

MVK-6011

~~JHC~~ - ER

ASARCO EXPLORATION RECORD

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] J. H. C.

FEB 27 1984

Section I General Indexing

① Name(s) of Property or Area	② Country	③ State or Province
BRADSHAW MINING DISTRICT RECON.	USA	Utah
	④ USGS Quad. Cave Canyon	⑤ File or Gore No. Beaver County

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
38°18'	112°55'30"	Richfield	29S	10W	12	HGKreis	11/82 & 3/83
						⑪ Office SWED Tucson	⑫ Field Days 7

Section II Sources of Information

Date Typed 9/1/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Butler & Others	1920	The Ore Deposits of Utah	USGS PP 111, p. 530-531	
Huntley, D.B.,	1885,	The Mining Industry of Utah: Tenth Census U.S., Vol. 13, Statistics and Technology of Precious Metals, p. 474-475.*		

*Could not locate this publication in Tucson.

Section III Appraisal

⑭ Recommendations

- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [x] Future Interest

⑮

- [x] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ] Geol. Recon.
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly

⑯ Production

Commodity	Tons	Grade
Au, Ag, Pb	Not known but probably <50,000 tons	Not known

⑰ Reserves

[ ] Measured Commodity	[ ] Estimated Tons	Grade
None known		

⑱ Num. Drill Holes None known

Approx Total Footage ---

⑲ Excavations Underground mines

⑳ [x] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals Au, Ag, Pb, Minor Cu

㉔ Ore Minerals-Major Oxides of Cu,Pb,Ag in limonite gossan

㉕ Host Rocks-Major Lms. & Dolo. of Redwall Fm. Minor Latite porphyry

㉖ Age of Host Rocks Mississippian Not known

㉗ Nature of Exposures Excellent exposures on steep mountain side with 2000' of relief; westward extent of district covered by Qal basin fill.

㉘ Alteration Variable degrees of bleaching (weak to strong) in limestone & dolomite. Local clay-chlorite alteration of latite porphyry. ㉙ Total Extent 3/4 sq. mile, open to west.

㉚ Structure Carbonate and overlying quartzite beds strike N5°-25°E and dip 35°-45°E. Structural control of mineralization described below.

㉛ Ore Occurrence There are three types of sulfide occurrences in the Bradshaw Mining District: (1) pods of gossan that were mined for ore, (2) limonite blebs (<¼" diameter), and (3) syngenetic pyrite. (Cont.) ㉜ Age of Mineralization Not known.

㉝ Conclusions & Recommendations The Bradshaw District mineralization consists of small pod-like masses of gossan after pyrite with minor galena and chalcopyrite. These gossans contain up to several ounces of gold and silver. They are enriched in gold by virtue of the leaching of sulfur and minor iron during oxidation (i.e., the specific gravity of the massive sulfide mineralization was much greater than the porous gossan). (Continued)

(For additional space use extra sheets)

31. Ore Occurrence (continued)

In the area shown on the attached map, there are "pods" of porous limonite gossan. These pods are commonly less than a few feet in at least two dimensions, but apparently they were of room size in the Cave Mine. The larger pods of gossan have been dug on and show as pits and mine workings on the topographic map.

Judging from the gossans and the contained metals (Au, Ag, Pb, and Cu), the original sulfide mineralization consisted of nearly all pyrite with very minor amounts of galena and chalcopyrite. Although no detailed evaluation of the gold content in the gossans was made, the higher gold values appear to occur on the north side of the sampled area (see attached map and analytical results). The gold rich gossans carry 300 to 500 ppm As, less than 0.07 ppm Hg, and a Au:Ag ratio of 1:1.

The pods of gossan occur along through going fractures, and they are typical of "leakage" type mineralization. The degree to which favorable beds may have controlled the pods of mineralization was not readily discernable.

In the north area, the area of most abundant sampling, the gossan pods are controlled by fractures striking N.20° to 35°E with a 20° to steep dip and N.15° to 45°W with a steep dip. Nearly all of these pods were less than two feet in diameter.

Blebs of limonite up to pea size occur in trace amounts. The limonite blebs could be after pyrite of syngenetic or epigenetic origin, but an apparent spacial relationship to gossan pods and porphyry dikes suggests the latter interpretation.

The syngenetic pyrite is finely disseminated, and it is present in abundances of up to 5%. The pyrite is closely associated with fine grained black carbonaceous material (graphite?) and both are stratabound in beds commonly less than ten feet thick. The pyritic-carbonaceous beds appeared to be good potential host rocks for gold mineralization so a dozen samples were collected across the Bradshaw District knowing that gold occurred in the pods of gossan. Anomalous gold values at stations BD-W to BD-Z were followed up with the less than encouraging results of Traverses I and II (see attached traverse map). A third traverse, south of Traverse I, was planned at the time Traverse I and II were done, but the snow was too deep to take samples.

Sampling of the carbonate units about the higher grade gold gossans of the north area was done to check if the gold values ever had a tendency to permeate into the carbonate wall rocks. Geochemically and visually there was no evidence of any gold or other mineralization permeating into the wall rocks.

33. Conclusions & Recommendations (continued)

The Bradshaw District mineralization is leakage-like in character, and it is of the type one would expect on the fringes, lateral or above, of mineralization such as occurs in the Lincoln District, two miles to the southeast. The mineralization in the Lincoln District is contact metasomatic replacement of selected beds in Permian carbonate rocks. The carbonate beds are replaced by skarn, magnetite, hematite, chalcopyrite, and pyrite; and there is some sphalerite, galena, and pyrite vein-replacement mineralization. Both types of mineralization carry substantial gold (≤0.1 oz.) and silver (couple of ounces). Conceivably, the Bradshaw District mineralization is on the fringes of contact metasomatic mineralization at depth or to the west under postmineral cover.

Sampling in the north part of the Bradshaw District demonstrated that the gold mineralization is confined to the pods of gossan, and background gold values occur within a few feet of the gossan pods.

The potential of the Bradshaw Mining District is not of current interest, but it and the Lincoln Mining District are worthy of future review.

REMARKS ON GEOCHEM SAMPLES

BRADSHAW DISTRICT

Beaver County, Utah

Samples BD-F, -G, -J, -K, -L, -M, -N, -O, -W, -X, -Y, -Z, -AB are of limestone and/or dolomite containing finely disseminated pyrite and/or finely disseminated carbonaceous material.

Sample No.	Pyrite (%)	Carbonaceous Material (%)	Gold (ppb)
BD- F	2-5		<2
- G		3	3
- J	1-5		<2
- K		0.5	5
- L	2		<2
- M	2		<2
- N	0.7	2	<2
- O	0.2	5-10	8
- W	0.5		150
- X	2	2	140
- Y	3		44
- Z	5		30
-AB	1?	5	17

Traverses I and II were run to check the area of anomalous gold values in samples BD-W, -X, -Y, and -Z. All the samples of these two traverses are of limestone and/or dolomite, and the traverses are nearly perpendicular to the strike of the bedding (see attached plot of traverse).

Samples BD-1 to -30, -EA, -EC, -EF, -EI, -EW, -EX, and -DW are of gossan and/or strongly iron stained carbonate rock found on the dumps of adits and prospect pits. In the north end of the district many of these samples contained highly anomalous gold values (up to 2 oz. Au), as expected from reports in the literature. Samples of the unmineralized limestone/dolomite host rocks were collected off the dumps and outcrops within fifty feet of the anomalous gold gossan samples, and the results of these samples are compared to those of the gossan in the attached table.

GOSSAN SAMPLES AND CARBONATE HOST ROCK SAMPLES

BRADSHAW DISTRICT

Beaver County, Utah

Gossan Sample		Carbonate Host Rock		Remarks
Sample Number	Au (oz.)	Sample Number	Au (ppb)	
BD-14	1.270	BD-EL	<2	From dump
		BD-EM	<2	50' NNE of shaft
		BD-EN	<2	20' SE of shaft
		BD-EO	2	40' S of shaft
BD-15	0.175	BD-EP	30	Between BD-14 & -15
		BD-EQ	2	Off dump
BD-17	0.560	BD-FE	<2	1' above gossan
BD-18	1.440	BD-EY	<2	10' from gossan
BD-EW	0.250*	BD-EZ	50	10' from gossan
BD-EX	0.010**	BD-FA	3	Dump
		BD-FB	4	FeOx stained, 7' from gossan
BD-DW	2.000	BD-DX	<2	2' from gossan
		BD-DY	<2	30' from gossan
BD-EA	1.580	BD-EB	<2	30' from gossan
BD-EC	0.015**	BD-ED	<2	30' from BD-EC
BD-EF	0.085	BD-EG	9	From dump
		BD-EH	40	30' from gossan
BD-EI	0.020	BD-EJ	<2	From dump
		BD-EK	<2	30' from shaft

* 30% gossan, 70% FeOx stained carbonate.

** FeOx stained carbonate

SKYLINE LABS, INC.
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REPORT OF ANALYSIS

JOB NO. TAJ 236
November 30, 1982

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 61 Rock Chip Samples

ITEM	SAMPLE NO.	Au ppm	Au ppm*
1	BD-1	.90	N/R
2	BD-2	<.02	N/R
3	BD-3	.49	N/R
4	BD-4	.03	N/R
5	BD-5	1.40	N/R
6	BD-6	.76	N/R
7	BD-7	.10	N/R
8	BD-8	<.02	N/R
9	BD-9	.44	N/R
10	BD-10	.50	N/R
11	BD-11	.42	N/R
12	BD-12	.86	N/R
13	BD-13	.73	N/R
14	BD-14	>10.00	N/R
15	BD-15	6.00	N/R
16	BD-16	.54	N/R
17	BD-17	>10.00	N/R
18	BD-18	>10.00	N/R
19	BD-19	.10	N/R
20	BD-20	1.00	N/R
21	BD-21	.07	N/R
22	BD-22	.26	N/R
23	BD-23	.52	N/R
24	BD-24	1.60	N/R
25	BD-25	.13	N/R

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JOB NO. TAJ 236
November 30, 1982

ITEM	SAMPLE NO.	Au ppm	Au ppm*
26	BD-26	.11	N/R
27	BD-27	.18	N/R
28	BD-28	.13	N/R
29	BD-29	.95	N/R
30	BD-30	.11	N/R
31	BD-31	2.10	N/R
32	BD-32	.58	N/R
33	BD-33	.19	N/R
34	BD-34	.04	N/R
35	BD-39	.10	N/R
48	BD-CM	N/R	.005
49	BD-F	N/R	<.002
50	BD-G	N/R	.003
51	BD-J	N/R	.002
52	BD-K	N/R	.005
53	BD-L	N/R	<.002
54	BD-M	N/R	<.002
55	BD-N	N/R	<.002

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JOB NO. TAJ 236
November 30, 1982
PAGE 3

ITEM	SAMPLE NO.	Au ppm	Au ppm *
56	BD-O	N/R	.008
57	BD-W	N/R	.150
58	BD-X	N/R	.140
59	BD-Y	N/R	.044
60	BD-Z	N/R	.030
61	BD-AB	N/R	.017

*Gold reported at 0.002 ppm level.

NOTE: N/R denotes analysis not requested.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
SIGNED
Arizona

William L. Lehmbeck
Manager

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REPORT OF ANALYSIS

JOB NO. TAJ 236A
December 11, 1982

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 13 Pulp Samples

ITEM	SAMPLE NO.	FIRE ASSAY Au oz/t	Ag oz/t	As ppm	Hg ppm
13	BD-13	N/R	N/R	400.	.05
14	BD-14	1.270	1.67	420.	.04
15	BD-15	N/R	N/R	290.	.05
16	BD-16	N/R	N/R	30.	.03
17	BD-17	.560	.56	310.	.04
18	BD-18	1.440	1.40	460.	.07
49	BD-F	N/R	N/R	<10.	.02
50	BD-G	N/R	N/R	10.	.04
56	BD-O	N/R	N/R	20.	.04
57	BD-W	N/R	N/R	10.	.04
58	BD-X	N/R	N/R	10.	.02
59	BD-Y	N/R	N/R	<10.	.04
60	BD-Z	N/R	N/R	<10.	.04

NOTE: N/R denotes analysis not requested.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
DATE SIGNED
Arizona, U.S.A.

William L. Lehmbeck
Manager

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REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 236
November 30, 1982

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 26 Rock Chip Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED
Arizona, U.S.A.

William L. Lehmbeck
Manager

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JOB NO. TAJ 236
PAGE 3

ITEM NO. SAMPLE NO.

48 = BD-CM
49 = BD-F
50 = BD-G
51 = BD-J

ITEM	48	49	50	51
ELEMENT				
Fe	.7%	3%	1%	2%
Ca	.07%	>20%	>20%	20%
Mg	.15%	7%	15%	1.5%
Ag	<1	<1	<1	<1
As	<500	<500	<500	<500
B	<10	<10	10	20
Ba	70	<10	<10	15
Be	<2	<2	<2	<2
Bi	<10	<10	<10	<10
Cd	<50	<50	<50	<50
Co	<5	5	<5	5
Cr	70	<10	<10	<10
Cu	2	2	2	3
Ga	<10	<10	<10	<10
Ge	<20	<20	<20	<20
La	<20	<20	<20	<20
Mn	15	1500	70	200
Mo	2	<2	<2	<2
Nb	20	<20	<20	<20
Ni	7	15	5	15
Pb	15	<10	<10	<10
Sb	<100	<100	<100	<100
Sc	<10	<10	<10	<10
Sn	<10	<10	<10	<10
Sr	<100	<100	<100	<100
Ti	700	1500	500	1000
V	<10	30	10	15
W	<50	<50	<50	<50
Y	<10	<10	<10	<10
Zn	<200	<200	<200	<200
Zr	50	20	<20	30

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

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JOB NO. TAJ 236
PAGE 4

ITEM NO.	SAMPLE NO.
52	BD-K
53	BD-L
54	BD-M
55	BD-N
56	BD-O
57	BD-W
58	BD-X
59	BD-Y

ITEM	52	53	54	55	56	57	58	59
ELEMENT								
Fe	2%	1%	.7%	.5%	.5%	.5%	.7%	1%
Ca	10%	10%	15%	20%	15%	20%	20%	20%
Mg	7%	10%	7%	15%	10%	15%	15%	7%
Ag	<1	<1	<1	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	<500	<500	<500	<500
B	50	15	<10	<10	20	<10	<10	<10
Ba	30	10	<10	<10	<10	<10	<10	<10
Be	<2	<2	<2	<2	<2	<2	<2	<2
Bi	<10	<10	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<50
Co	5	5	<5	<5	<5	<5	<5	7
Cr	10	<10	<10	<10	<10	<10	<10	<10
Cu	7	<2	2	<2	<2	70	15	20
Ga	<10	<10	<10	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20	<20	<20	<20
Mn	200	150	200	100	300	500	300	700
Mo	<2	<2	<2	<2	<2	<2	<2	<2
Nb	<20	<20	<20	<20	<20	<20	<20	<20
Ni	15	5	<5	<5	<5	<5	7	30
Pb	<10	10	<10	<10	<10	<10	<10	<10
Sb	<100	<100	<100	<100	<100	<100	<100	<100
Sc	<10	<10	<10	<10	<10	<10	<10	<10
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	<100	<100	<100	<100	<100	<100	<100	<100
Ti	1500	1000	500	200	500	150	500	1500
V	30	10	<10	<10	20	<10	15	20
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	<10	<10	<10	<10	<10	<10	<10	<10
Zn	<200	<200	<200	<200	<200	<200	<200	<200
Zr	50	50	<20	<20	<20	<20	<20	30

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JOB NO. TAJ 236
PAGE 5

ITEM NO. SAMPLE NO.
60 = BD-Z
61 = BD-AB

ITEM	60	61
ELEMENT		
Fe	1.5%	1%
Ca	20%	15%
Mg	5%	15%
Ag	<1	<1
As	<500	<500
B	<10	15
Ba	<10	<10
Be	<2	<2
Bi	<10	<10
Cd	<50	<50
Co	10	<5
Cr	<10	<10
Cu	3	7
Ga	<10	<10
Ge	<20	<20
La	<20	<20
Mn	2000	300
Mo	<2	<2
Nb	<20	<20
Ni	30	10
Pb	<10	<10
Sb	<100	<100
Sc	<10	<10
Sn	<10	<10
Sr	<100	<100
Ti	1000	700
V	15	15
W	<50	<50
Y	<10	<10
Zn	<200	<200
Zr	30	50

BRADSHAW DIST.
BEAVER CO. UT.

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REPORT OF ANALYSIS

JOB NO. TAJ 267
April 26, 1983
H.G. KREIS
DB-DA

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 54 Rock Chip Samples

ITEM	SAMPLE NO.	Au (ppm)
1	BD-DA	<.002
2	BD-DB	<.002
3	BD-DC	.030
4	BD-DD	<.002
5	BD-DE	<.002
6	BD-DF	<.002
7	BD-DG	.004
8	BD-DH	.012
9	BD-DI	.007
10	BD-DJ	<.002
11	BD-DK	<.002
12	BD-DL	<.002
13	BD-DM	<.002
14	BD-DN	<.002
15	BD-DO	<.002
16	BD-DP	<.002
17	BD-DQ	.020
18	BD-DR	<.002
19	BD-DS	<.002
20	BD-DT	<.002
21	BD-DU	<.002
22	BD-DV	<.002
23	BD-DX	<.002
24	BD-DY	<.002
25	BD-DZ	<.002

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 267
April 26, 1983

ITEM	SAMPLE NO.	Au (ppm)
26	BD-EB	<.002
27	BD-ED	<.002
28	BD-EE	<.002
29	BD-EG	.009
30	BD-EH	.040
31	BD-EJ	<.002
32	BD-EK	<.002
33	BD-EL	<.002
34	BD-EM	<.002
35	BD-EN	<.002
36	BD-EO	.002
37	BD-EP	.030
38	BD-EQ	.002
39	BD-ER	<.002
40	BD-ES	<.002
41	BD-ET	<.002
42	BD-EU	<.002
43	BD-EV	.003
44	BD-EY	<.002
45	BD-EZ	.050
46	BD-FA	.003
47	BD-FB	.004
48	BD-FC	<.002
49	BD-FD	<.002
50	BD-FE	<.002

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JOB NO. TAJ 267
April 26, 1983
PAGE 3

ITEM	SAMPLE NO.	Au (ppm)
51	BD-FF	<.002
52	BD-FG	.013
53	BD-FH	<.002
54	BD-R	<.002

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED
Arizona U.S.A.

William L. Lehmbeck
Manager

53

SKYLINE LABS, INC.
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Tucson, Arizona 85703
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REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 267
April 26, 1983
H.G. KREIS
DB-DA

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 11 Rock Chip Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
DATE SIGNED
Arizona U.S.A.

William Lehmbeck
Manager

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JOB NO. TAJ 267
PAGE 2

ITEM NO.	SAMPLE NO.
1 =	BD-DA
2 =	BD-DB
3 =	BD-DC
4 =	BD-DD
5 =	BD-DE
6 =	BD-DF
7 =	BD-DG
8 =	BD-DH

ITEM	1	2	3	4	5	6	7	8
ELEMENT								
Fe	.5%	1%	1.5%	3%	.5%	.2%	.3%	.3%
Ca	>20%	>20%	>20%	>20%	>20%	>20%	>20%	>20%
Mg	5%	2%	2%	3%	15%	15%	15%	15%
Ag	<1	<1	<1	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	<500	<500	<500	<500
B	<10	<10	<10	<10	<10	<10	<10	<10
Ba	<10	<10	<10	<10	<10	<10	<10	<10
Be	<2	<2	<2	<2	<2	<2	<2	<2
Bi	<10	<10	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	<5	<5	<5	<5
Cr	<10	<10	<10	<10	<10	<10	<10	<10
Cu	<2	<2	<2	<2	<2	5	<2	<2
Ga	<10	<10	<10	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20	<20	<20	<20
Mn	500	300	2000	1500	300	100	100	70
Mo	<2	<2	<2	<2	<2	<2	<2	<2
Nb	<20	<20	<20	<20	<20	<20	<20	<20
Ni	<5	<5	<5	<5	<5	<5	15	<5
Pb	<10	<10	10	<10	<10	<10	<10	<10
Sb	<100	<100	<100	<100	<100	<100	<100	<100
Sc	<10	<10	<10	<10	<10	<10	<10	<10
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	<100	<100	<100	<100	<100	<100	<100	<100
Ti	500	700	1000	2000	70	<20	<20	50
V	<10	10	<10	15	<10	<10	<10	<10
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	<10	<10	<10	<10	<10	<10	<10	<10
Zn	<200	<200	<200	<200	<200	<200	<200	<200
Zr	<20	<20	<20	<20	<20	<20	<20	<20

SKYLINE LABS, INC.
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JOB NO. TAJ 267
PAGE 3

ITEM NO. SAMPLE NO.
9 = BD-DI
10 = BD-DJ
11 = BD-DK

ITEM	9	10	11
ELEMENT			
Fe	.15%	.3%	.15%
Ca	>20%	>20%	>20%
Mg	15%	20%	20%
Ag	<1	<1	<1
As	<500	<500	<500
B	<10	<10	<10
Ba	<10	<10	<10
Be	<2	<2	<2
Bi	<10	<10	<10
Cd	<50	<50	<50
Co	<5	<5	<5
Cr	<10	<10	<10
Cu	<2	<2	<2
Ga	<10	<10	<10
Ge	<20	<20	<20
La	<20	<20	<20
Mn	30	30	30
Mo	<2	<2	<2
Nb	<20	<20	<20
Ni	<5	<5	<5
Pb	<10	<10	<10
Sb	<100	<100	<100
Sc	<10	<10	<10
Sn	<10	<10	<10
Sr	<100	<100	<100
Ti	<20	<20	<20
V	<10	<10	<10
W	<50	<50	<50
Y	<10	<10	<10
Zn	<200	<200	<200
Zr	<20	<20	<20

SKYLINE LABS, INC.
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REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 269
April 21, 1983
H.G. KREIS BD-DW

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 7 Rock Chip Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED 4-27-83
Arizona U.S.A.

William L. Lehmbeck
Manager

BRADSHAW DIST.
BEAVER CO. UT

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REPORT OF ANALYSIS

JOB NO. TAJ 269
April 21, 1983
H.G. KREIS BD-DW

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 7 Rock Chip Samples

ITEM	SAMPLE NO.	FIRE ASSAY Au (oz/t)
1	BD-DW	2.000
2	BD-EA	1.580
3	BD-EC	.015
4	BD-EF	.085
5	BD-EI	.020
6	BD-EW	.250
7	BD-EX	.010

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
STATE OF
Arizona U.S.A.

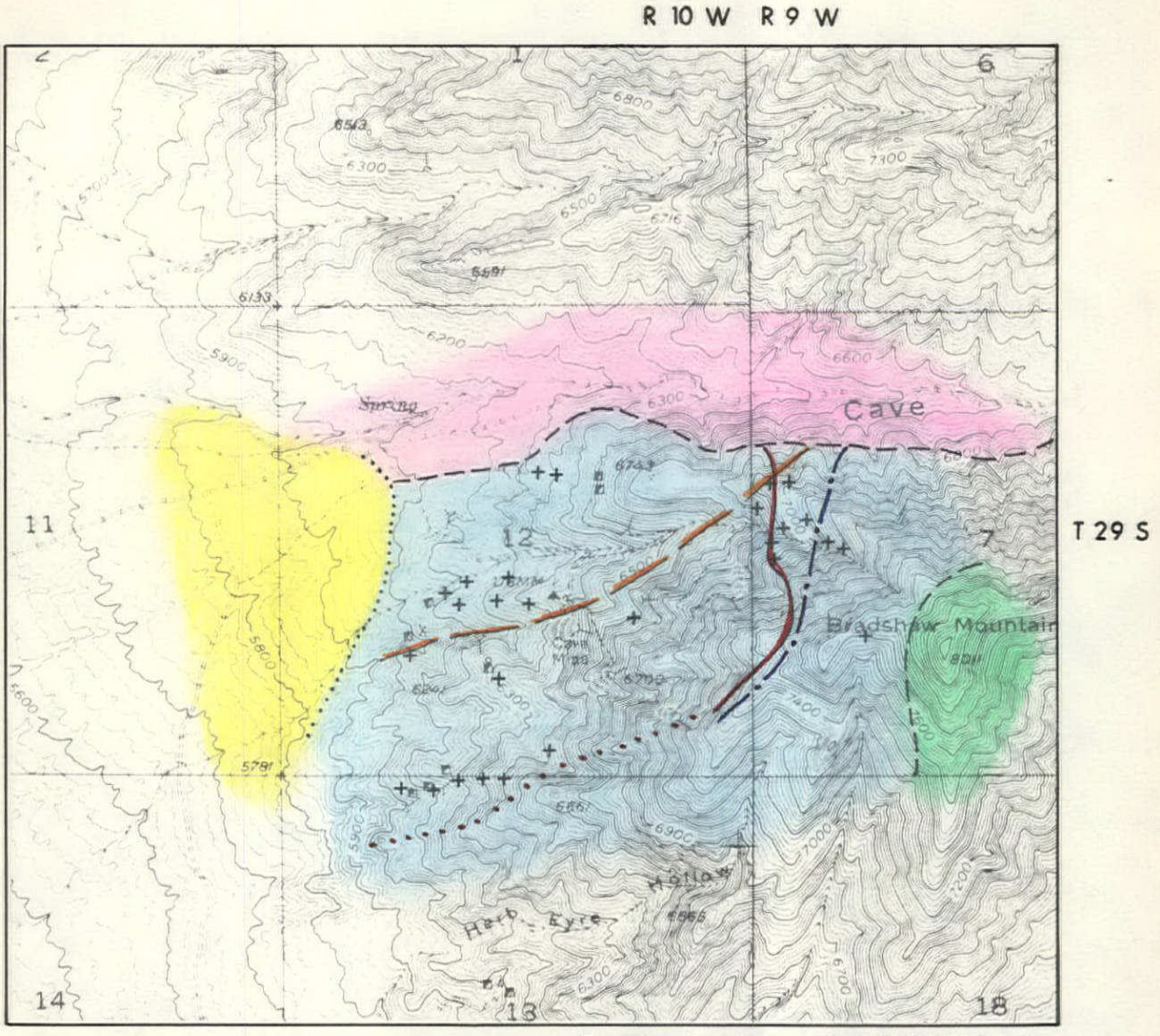
William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 269
PAGE 2

ITEM NO.	SAMPLE NO.
1	BD-DW
2	BD-EA
3	BD-EC
4	BD-EF
5	BD-EI
6	BD-EW
7	BD-EX

ITEM	1	2	3	4	5	6	7
ELEMENT							
Fe	>20%	>20%	15%	>20%	>20%	>20%	.7%
Ca	2%	.7%	3%	2%	.07%	15%	>20%
Mg	.2%	.3%	7%	3%	1.5%	3%	15%
Ag	300	30	<1	3	10	3	<1
As	500	700	<500	<500	<500	<500	<500
B	<10	<10	100	<10	<10	<10	<10
Ba	<10	<10	15	<10	<10	<10	<10
Be	<2	<2	<2	<2	<2	<2	<2
Bi	500	200	<10	<10	30	70	<10
Cd	<50	<50	<50	<50	<50	<50	<50
Co	30	<5	5	<5	<5	<5	<5
Cr	<10	<10	15	<10	<10	<10	<10
Cu	>10000	>10000	200	3000	3000	7000	30
Ga	20	15	10	15	15	10	<10
Ge	<20	<20	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20	<20	<20
Mn	70	30	200	70	150	300	150
Mo	200	70	<2	20	7	30	<2
Nb	30	30	20	50	50	50	<20
Ni	50	20	150	<5	<5	<5	<5
Pb	700	300	30	100	700	200	<10
Sb	<100	<100	<100	<100	<100	<100	<100
Sc	<10	<10	10	<10	<10	<10	<10
Sn	50	30	<10	30	30	20	<10
Sr	<100	<100	<100	<100	<100	<100	<100
Ti	50	200	10000	50	100	20	<20
V	150	200	150	200	70	1000	<10
W	<50	<50	<50	<50	<50	<50	<50
Y	<10	15	30	<10	10	10	<10
Zn	<200	<200	<200	<200	<200	<200	<200
Zr	<20	<20	300	<20	<20	<20	<20



Base from Cave Canyon, Utah 7.5 U.S.G.S Quad.

EXPLANATION

- QUATERNARY ALLUVIUM
- LATITE PORPHYRY DIKES
- TERTIARY MINERAL MOUNTAIN BATHOLITH
- PERMIAN TALISMAN QUARTZITE
- PER.-PENN. CALLVILE LIMESTONE & MISSISSIPPIAN REDWALL LIMESTONE & DOLOMITE. BEDS STRIKE N 5-25°E & DIP 35-45°E

- SE limit of moderate to strong bleaching in carbonate rocks
- SE limit of bleaching in carbonate rocks
- SE limit of scattered sulfide mineralization in carbonate rocks

TO ACCOMPANY *Exploration Record Sheet*
DATED *9/1/83*
BY *H.G. Kreis*

N

ASARCO INC.

Geologic Reconnaisance

BRADSHAW MINING DISTRICT

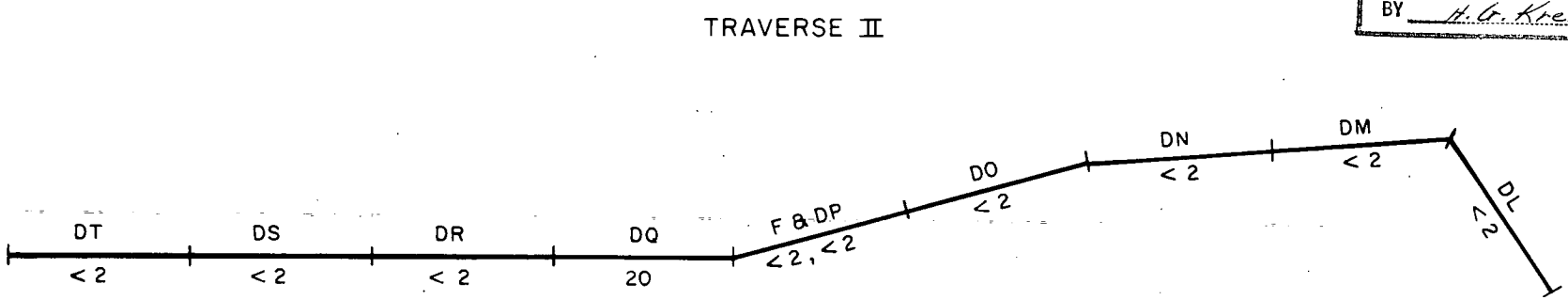
BEAVER COUNTY, UTAH

SCALE : 1" = 2000'

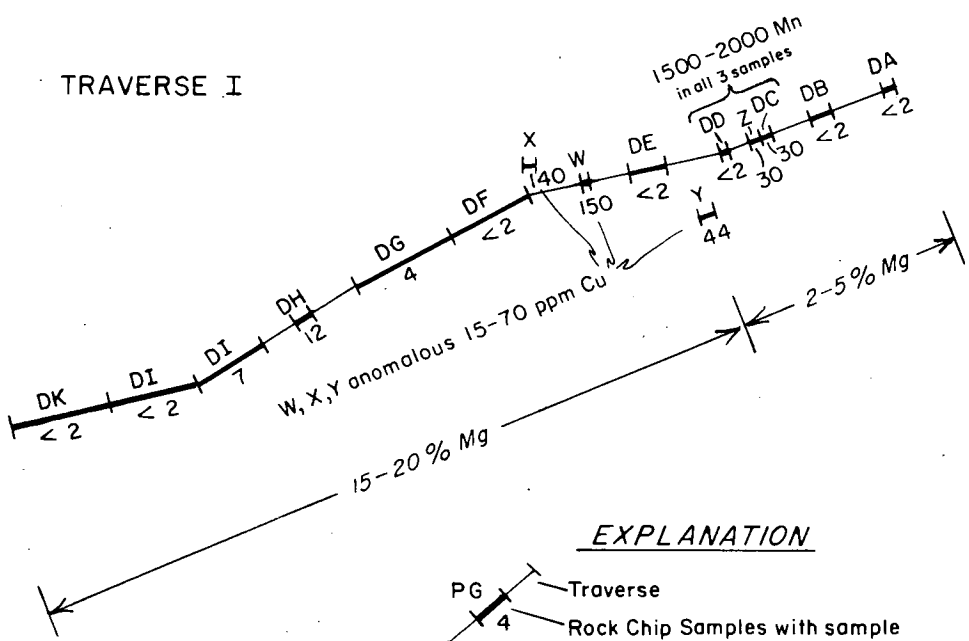
H.G. Kreis Aug., 1983

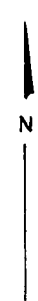
MVK-5599

TO ACCOMPANY Exploration Record Sheet
DATED 9/1/83
BY H. G. Kreis



All samples along Traverse I and Traverse II are of limestone and/or dolomite of Mississippian Redwall Formation.





EXPLANATION

Traverse

Rock Chip Samples with sample numbers and gold value in ppb.

SCALE ALONG TRAVERSES, 1" = 100'

ASARCO INC.

Sample Map

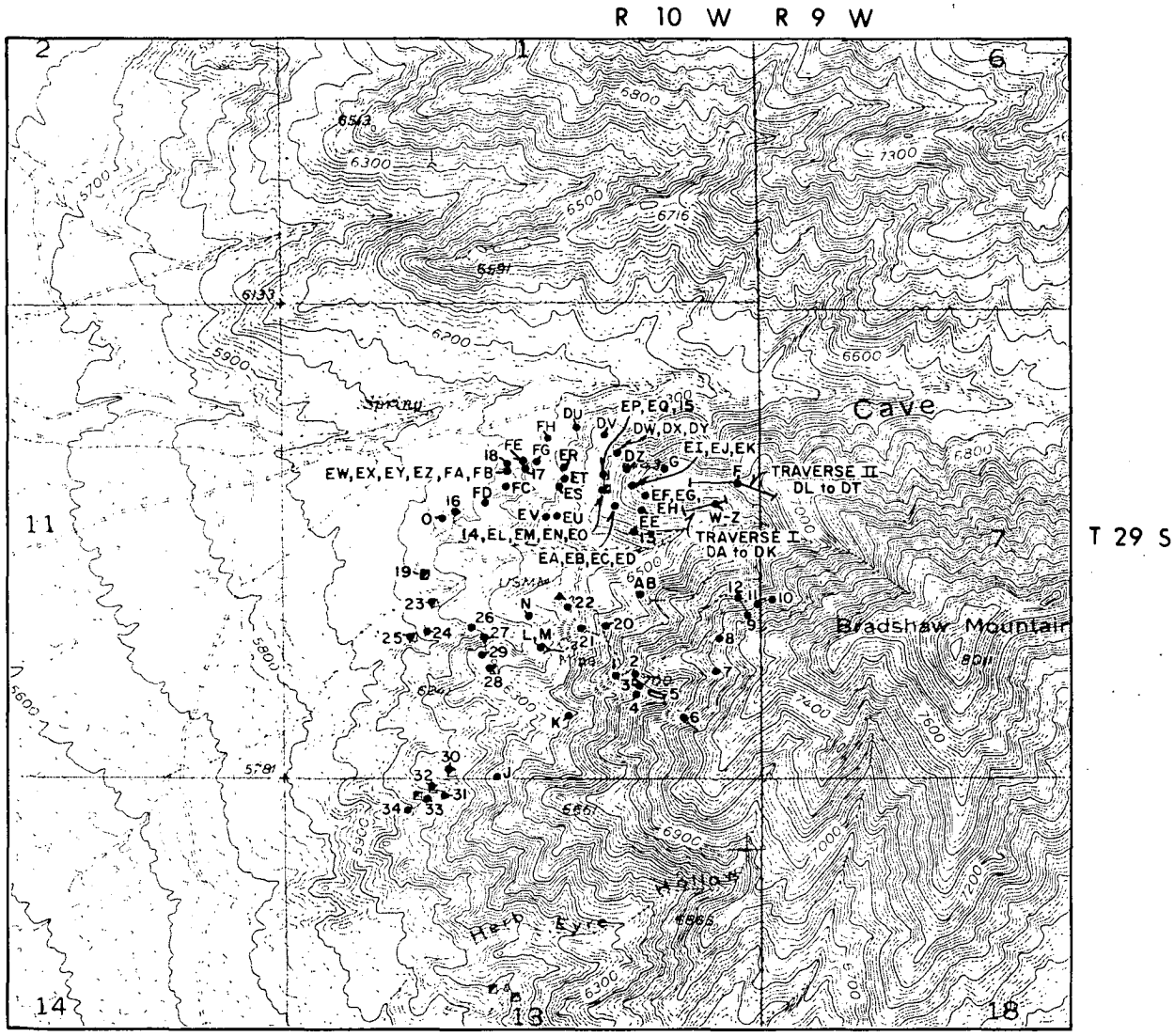
TRAVERSES I AND II

BRADSHAW MINING DISTRICT

Beaver County, Utah

H.G. Kreis Aug. 1983

MVK-5596-A



Base from Cave Canyon, Utah 7.5 U.S.G.S. Quad.

EXPLANATION

AB ● Geochem Sample Site with Sample Identification (BD Prefix Omited)

N

TO ACCOMPANY *Exploration Record Sheet*
DATED *9/1/83*
BY *H. G. Kreis*

ASARCO INC.

Geochem Sample Locations

BRADSHAW MINING DISTRICT
BEAVER COUNTY, UTAH

SCALE : 1" = 2000'

H.G. Kreis &
T.C. Benavides

Aug., 1983

MVK-6000

~~JHC~~ ER File

J. H. C.

FEB 27 1984

ASARCO EXPLORATION RECORD

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] _____

Section I General Indexing

① Name(s) of Property or Area: ATWOOD CLAY QUARRY AREA, Oro Grande Mining District					② Country: USA	③ State or Province: Calif.	
					④ USGS Quad.: Helendale, CA 7½'	⑤ File or Gore No.: San Bernardino Co.	
⑥ Latitude: 34°38'	⑦ Longitude: 117°16'	⑧ AMS Sheet: San Bernardino	Township: 6N	Range: 4W	Section: S/2 2	⑨ Examined by: HGKreis	⑩ Date: 8/16-17/82
						⑪ Office: Tucson	⑫ Field Days: 2

Section II Sources of Information

Date Typed 8/31/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Bowen, O.E., & VerPlanck, 1965, Strat., Struct., & Min. Dep. in the Oro Grande Series Near Victorville, CA; Special Report 84 of Cal. Div. of Mines & Geol.				
Watson, B.N., 1968, Reconn. of Oro Grando Dist.; ASARCO files.				

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [x] No action

⑮
- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [x] Recon
- [ ]
- [x] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
Clay & Alunite		

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade

⑱ Num. Drill Holes 3
Approx Total Footage Not known

⑲ Excavations Couple short adits

⑳ [x] Spectro. Analysis Attached

㉑ [ ] Assays Attached

㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Clay & alunite; No precious or base metals; Anomalous V; Minor Nb, Sc, Y.

㉔ Ore Minerals-Major _____ Minor _____

㉕ Host Rocks-Major: Tuffaceous unit of Sidewinder Volcanics

㉖ Age of Host Rocks: Triassic(?)

㉗ Nature of Exposures: Abundant outcrops

㉘ Alteration: Strong sericite-kaolinite-alunite alteration & strong silicification in tuffaceous appearing aphanitic volcanic rock.

㉙ Total Extent: 1000' x 2,000'

㉚ Structure: Strongly altered and silicified rock of this evaluation may be a fault block (up to 200' thick) resting on a N30°E striking, 20° west dipping fault (Cont.)

㉛ Ore Occurrence: The altered and silicified rock displays a well developed jarosite-alunite capping after 1-5% former pyrite mineralization. Only rare occurrences of pyrite remnants were (Cont.)

㉜ Age of Mineralization

㉝ Conclusions & Recommendations: The lack of substantially anomalous gold, silver, and indicator metal values was discouraging. There is no significant indication of base or precious metal mineralization associated with these strongly altered, silicified, & pyritized outcrops. Perhaps this alteration-mineralization is of a different age than the gold, silver, copper, and lead mineralization occurring elsewhere in the Oro Grande Mining District. No further work is recommended.

(For additional space use extra sheets)

Form Revised June 1980 - HJC

30. Structure (Continued)

and underlain by propylitically altered dacite. The west side of this alteration-silicification appears truncated by a N65°E striking fault.

31. Ore Occurrence (Continued)

observed in outcrop. The abundance of former pyrite mineralization varied from outcrop to outcrop and was often difficult to estimate because of the strong leaching of iron from the original pyrite sites. The pyrite was disseminated but often exhibited fracture control of the disseminated pyritization (i.e., bands of disseminated pyrite). Silicification occurs in spotty, pod-like masses but a few vein-like structures of massive silica replacement were noted. These vein-like structures of silica replacement are up to three feet thick and at least 200' long, and a couple of them were observed to strike E-W (±20°) and dip 40-60° to the north.

Slightly anomalous gold values were obtained from a few of the samples (see attached list and map). The highest gold value, 0.068 ppm in sample VV-29, occurred in the most strongly pyritized sample (8% former total sulfides).

GOLD VALUES (ppm)

ATWOOD QUARRY AREA

San Bernardino County, California

Sample No.	Representative Sample	Selective Sampling: Silicified	Selective Sampling: Host Rock w/o Silicif.	Selective Sampling: Vein Like Silicification	Stg. Ser-Clay Altn. in Atwood Adits
VV-15					.009
-16				<.002	
-17					<.002
-18		<.002			
-19			.008		
-20				.003	
-21	.002				
-22	.002				
-23	<.002				
-24			.008		
-25		.044			
-26*	<.002				
-27*	.003				
-28	.003				
-29	.068				
-30	.003				
-31	.004				
-32	<.002				
-33	<.002				
-34				.009	
-35			.009		
-36	.002				
-37	<.002				
-38	.016				
-39	.005				
-40	.020				

*Drill Hole Cuttings

COMPOSITE GEOCHEM VALUES

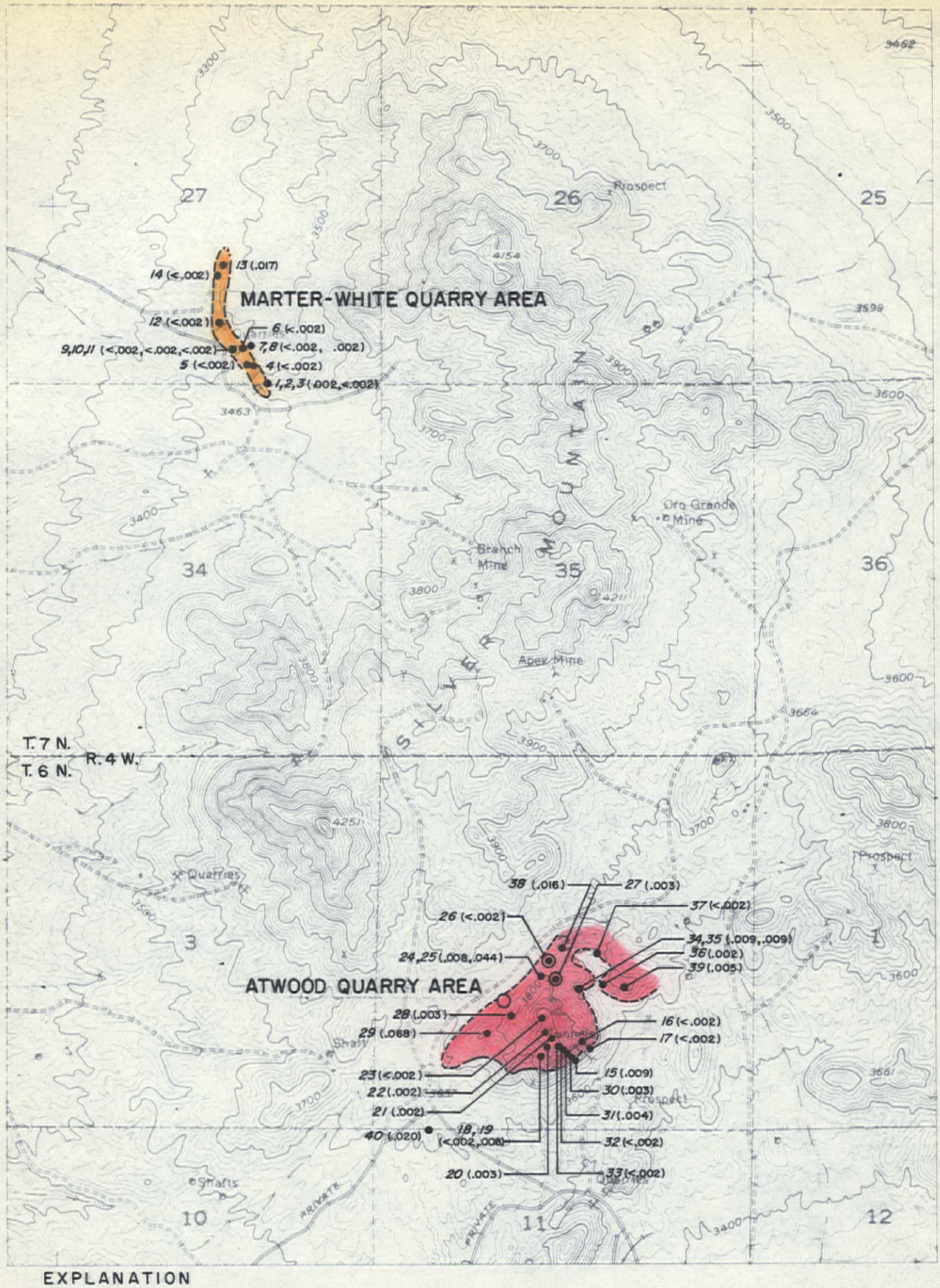
ATWOOD QUARRY AREA

San Bernardino County, California

(All values in ppm)

Composite (VV-Series)	Au*	Se	U	Nb	Sc	V	Y	Remarks
15,17	.005	<2	<2	<20	10	50	<10	Footwall qtz-ser. alteration w/little mineralization
18,25	.022	2	<2	20	20	200	30	Selective samples of silicification
16,20,34	.006	<2	<2	30	20	200	50	Vein like structures of silicification
30,31,32,33	≤.002	<2	<2	<20	20	200	30	Continuous series of chips uphill from adits
36,37,38,39	.006	<2	<2	20	50	300	20	Northeast area of mineralization
21,22,23	≤.002	<2	<2	20	15	200	<10	Top of hill area
28,29	.035	<2	<2	20	20	200	<10	Southwest area
26,27	.002	<2	<2	20	20	300	<10	Drill holes

*Average of individual determinations



EXPLANATION

16 (.002) ● Sample site and gold content in ppm (VV series prefix omitted)

Strong sericite-pyrophyllite of the Marter-White Quarry area

Strong sericite-kaolinite-alunite, silicification, and pyritization of the Atwood Quarry area

○ Rotary drill hole

TO ACCOMPANY Exploration Record Sheet

DATED 8-31-83

BY H. G. Kreis

ASARCO Incorporated

MARTER-WHITE AND ATWOOD QUARRIES

SAN BERNADINO CO., CALIF.

H.G. Kreis Aug, 1983

1" = 2000'

mn 5593 dam 10/83

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 202
August 27, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 40 Rock Chip Samples

ITEM	SAMPLE NO.	Au ppm	Ag ppm
15	VV-15	.009	<.2
16	VV-16	<.002	<.2
17	VV-17	<.002	<.2
18	VV-18	<.002	<.2
19	VV-19	.008	<.2
20	VV-20	.003	.4
21	VV-21	.002	.4
22	VV-22	.002	<.2
23	VV-23	<.002	<.2
24	VV-24	.008	<.2
25	VV-25	.044	.6

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 202
August 27, 1982
PAGE 2

ITEM	SAMPLE NO.	Au ppm	Ag ppm
26	VV-26	<.002	<.2
27	VV-27	.003	.2
28	VV-28	.003	<.2
29	VV-29	.068	.2
30	VV-30	.003	<.2
31	VV-31	.004	<.2
32	VV-32	<.002	<.2
33	VV-33	<.002	.2
34	VV-34	.009	<.2
35	VV-35	.009	.2
36	VV-36	.002	<.2
37	VV-37	<.002	<.2
38	VV-38	.016	<.2
39	VV-39	.005	<.2
40	VV-40	.020	<.2

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. F.A. Michel

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 206
September 2, 1982

ASARCO INCORPORATED
Attn.: Mr. F.A. Michel
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 11 Composite Samples

ITEM	SAMPLE NO.	As ppm	Sb ppm	Hg ppm
4	COMPO VV-15,17	30.	2.	.03
5	COMPO VV-18,25	30.	<2.	.03
6	COMPO VV-16,20,34	30.	<2.	.03
7	COMPO VV-30,31,32,33	20.	4.	.03
8	COMPO VV-36,37,38,39	20.	<2.	.04
9	COMPO VV-21,22,23	<10.	<2.	.02
10	COMPO VV-28,29	20.	4.	.10
11	COMPO VV-26,27	10.	4.	.02

cc: Asarco Incorporated
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. H.G. Kreis

cc: Asarco Incorporated
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. F.R. Koutz

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
DATE SIGNED
Arizona U.S.A.

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 206A
October 7, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 8 Pulp Samples

ITEM	SAMPLE NO.	Se ppm	U ppm
4	COMPO VV-15,17	<2.	<2.
5	COMPO VV-18,25	2.	<2.
6	COMPO VV-16,20,34	<2.	<2.
7	COMPO VV-30,31,32,33	<2.	<2.
8	COMPO VV-36,37,38,39	<2.	<2.
9	COMPO VV-21,22,23	<2.	<2.
10	COMPO VV-28,29	<2.	<2.
11	COMPO VV-26,27	<2.	<2.

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. Fleetwood R. Koutz
and Mr. F.A. Michel

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
STATE OF ARIZONA U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 206
September 2, 1982

ASARCO INCORPORATED
Attn.: Mr. F.A. Michel
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 11 Composite Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED
Arizona U.S.A.

William L. Lehmbeck
Manager

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 206
PAGE 2

ITEM NO. SAMPLE NO.

4 = COMPO VV-15,17
5 = COMPO VV-18,25
6 = COMPO VV-16,20,34
7 = COMPO VV-30,31,32,33
8 = COMPO VV-36,37,38,39

ITEM	4	5	6	7	8
	15,17	18,25	16,20, 34	30,31 32,33	36,37 38,39
ELEMENT					
Fe	3%	7%	7%	5%	5%
Ca	.7%	.07%	.15%	.1%	.15%
Mg	.3%	.2%	.15%	.3%	.5%
Ag	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	<500
B	20	70	20	20	30
Ba	300	500	300	500	1000
Be	<2	<2	<2	<2	<2
Bi	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	<5
Cr	10	20	50	30	30
Cu	70	50	50	50	10
Ga	<10	15	<10	<10	15
Ge	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20
Mn	20	30	15	15	100
Mo	<2	<2	10	<2	10
Nb	<20	20	30	<20	20
Ni	15	<5	7	<5	<5
Pb	<10	<10	15	<10	<10
Sb	<100	<100	<100	<100	<100
Sc	10	20	20	20	50
Sn	<10	<10	<10	<10	<10
Sr	150	300	500	300	300
Ti	7000	5000	7000	5000	7000
V	50	200	200	200	300
W	<50	<50	<50	<50	<50
Y	<10	30	50	30	20
Zn	<200	<200	<200	<200	<200
Zr	200	150	200	150	200

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 206
PAGE 3

ITEM NO.	SAMPLE NO.
9 =	COMPO VV-21,22,23
10 =	COMPO VV-28,29
11 =	COMPO VV-26,27

ITEM	9	10	11
	21,22 23	28,29	26,27
ELEMENT			
Fe	3%	5%	5%
Ca	.07%	.07%	.02%
Mg	.3%	.3%	.5%
Ag	<1	<1	<1
As	<500	<500	<500
B	30	70	20
Ba	700	300	500
Be	<2	<2	<2
Bi	<10	<10	<10
Cd	<50	<50	<50
Co	<5	<5	<5
Cr	30	20	20
Cu	30	20	50
Ga	<10	<10	10
Ge	<20	<20	<20
La	<20	<20	<20
Mn	30	20	70
Mo	<2	<2	5
Nb	20	20	20
Ni	<5	<5	<5
Pb	15	10	10
Sb	<100	<100	<100
Sc	15	20	20
Sn	<10	<10	<10
Sr	200	100	150
Ti	7000	5000	7000
V	200	200	300
W	<50	<50	<50
Y	<10	<10	<10
Zn	<200	<200	<200
Zr	150	100	150

JHC - ER File

ASARCO EXPLORATION RECORD

J. H. C.

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ]

FEB 27 1984

Section I General Indexing

① Name(s) of Property or Area	② Country	③ State or Province
MARTER-WHITE CLAY QUARRY	USA	Calif.
	④ USGS Quad. Helendale, CA 7½'	⑤ File or Gore No. San Bernardino Co.

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
34°39'30"	117°17'	San Bernardino	7N	4W	SE/4 27	HGKreis	7/14/82
						⑪ Office Tucson	⑫ Field Days 1

Section II Sources of Information

Date Typed 8/29/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Wright & others	1953	Mines & Mineral Deposits of San Bernardino Co., Calif.;		
		Calif. J. of Mines & Geol., Vol. 49, Nos. 1 & 2, p. 242.		

Section III Appraisal

⑭ Recommendations

- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [x] No action

⑮

- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ]
- [ ]
- [x] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
"Clay" (sericite and/or pyrophyllite)		

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade
No metal reserves		

⑱ Num. Drill Holes None known

Approx Total Footage

⑲ Excavations Open pits

⑳ [x] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals Sericite and/or Pyrophyllite

㉔ Ore Minerals-Major No metallic mineralization Minor

㉕ Host Rocks-Major Andesite of the Sidewinder volcanic group. The original (Cont.)

㉖ Age of Host Rocks Triassic(?)

㉗ Nature of Exposures Excellent exposures in faces of open pits.

㉘ Alteration Most all of the andesite in the open pits is totally altered to sericite and/or pyrophyllite. Strongly (Cont) ㉙ Total Extent 2000' long & roughly 50-150' wide.

㉚ Structure The Marter-White alteration zone is elongated north-south, and Wright (1953) says it is in a belt of altered zones 1000' wide and nearly 3 miles long.

㉛ Ore Occurrence No significant sulfide mineralization exists in the quarry area. Only local, rare traces of former sulfide mineralization were present (limonite pseudomorphs after pyrite cubes). (Cont.) ㉜ Age of Mineralization Not known

㉝ Conclusions & Recommendations The strong sericite-pyrophyllite alteration of the Marter-White Quarry is not associated with anomalous precious-base metal mineralization even though such mineralization exists in the adjoining Oro Grande Mining District. No further work is recommended.

(For additional space use extra sheets)

25. Host Rocks (Continued)

texture is locally completely destroyed, but it can be seen that the original rock texture consisted of 10-15% phenocrysts (1-2 mm diameter) set in an aphanitic or fine-grained groundmass.

28. Alteration (Continued)

altered rocks have a chalk white color and less altered rocks are greenish in color. The altered rock is very soft and powdery. Locally within the most intense alteration, masses of silicification developed. The masses of silicification are one to ten feet in diameter and vary in shape. Most masses of silicification exhibit a concentrically layered, modular texture.

31. Ore Occurrence (Continued)

Brown calcite veins, 0.1" to 2" thick, are present in an abundance of 2 to 5%. Veins of quartz with minor brown calcite are 0.1" to 3" thick and have an abundance of 1 to 3%.

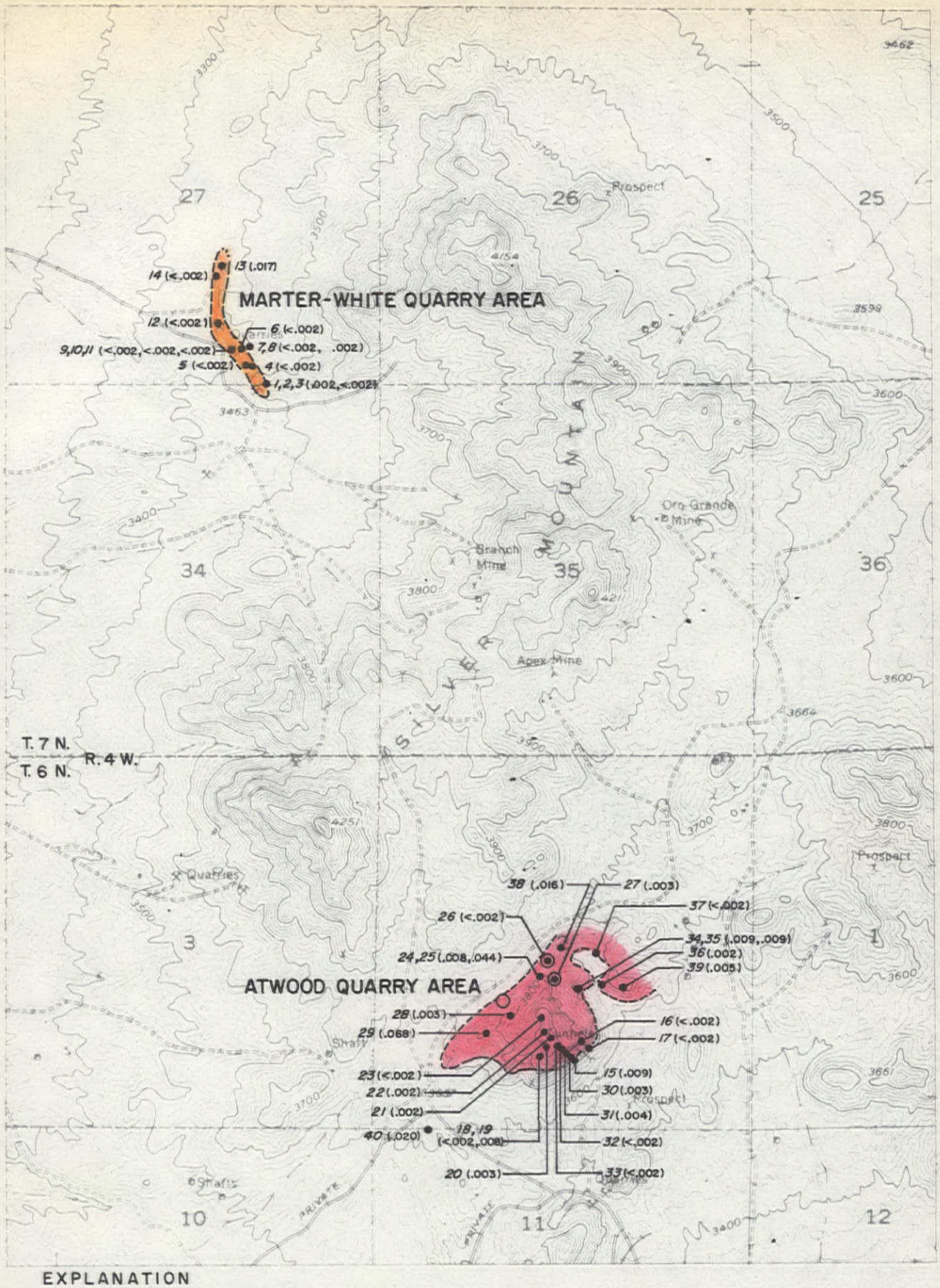
Geochem analyses were made on all the various degrees of alteration, various degrees of silicification, and of both types of vein mineralization. A total of fourteen samples were collected and analyzed. Only one sample, VV-13, contained an anomalous gold value, 0.017 ppm. Sample VV-13 consisted of very strongly sericite altered volcanic rock with 2% brown calcite veins, 0.5% quartz veins, and traces of former pyrite cubes. All the samples showed no anomalous values for As, Sb, Hg, or base metals. The Marter-White sericite-pyrophyllite alteration has no significantly anomalous base or precious metal values.

GOLD VALUES (ppm)

MARTER-WHITE QUARRY

San Bernardino County, California

Sample	Altered Andesite				Vein Mineralization	
	Strongly Silicified	Strong Sericite	Moderate Ser.-Clay?	Weak Ser.-Clay	Quartz	Quartz & Calcite
VV- 1						.002
VV- 2		<.002				
VV- 3			<.002			
VV- 4		<.002				
VV- 5	<.002					
VV- 6				<.002		
VV- 7				<.002		
VV- 8					<.002	
VV- 9	<.002					
VV-10		<.002				
VV-11						<.002
VV-12	<.002					
VV-13		.017				
VV-14	<.002					



EXPLANATION

16 (.002) ● Sample site and gold content in ppm (VV series prefix omitted)

Strong sericite-pyrophyllite of the Marter-White Quarry area

Strong sericite-kaolinite-alunite, silicification, and pyritization of the Atwood Quarry area

O Rotary drill hole

TO ACCOMPANY Exploration Record Sheet
DATED 8-29-83
BY H. G. Kreis

ASARCO Incorporated

MARTER-WHITE AND ATWOOD QUARRIES

SAN BERNADINO CO., CALIF.

H.G. Kreis Aug, 1983

1" = 2000'

mn 5593 dam 10/83

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 202
August 27, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 40 Rock Chip Samples

ITEM	SAMPLE NO.	Au ppm	Ag ppm
1	VV-1	.002	<.2
2	VV-2	<.002	<.2
3	VV-3	<.002	<.2
4	VV-4	<.002	<.2
5	VV-5	<.002	<.2
6	VV-6	<.002	<.2
7	VV-7	<.002	<.2
8	VV-8	<.002	<.2
9	VV-9	<.002	<.2
10	VV-10	<.002	<.2
11	VV-11	<.002	<.2
12	VV-12	<.002	<.2
13	VV-13	.017	<.2
14	VV-14	<.002	<.2

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 206
September 2, 1982

ASARCO INCORPORATED
Attn.: Mr. F.A. Michel
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 11 Composite Samples

ITEM	SAMPLE NO.	As ppm	Sb ppm	Hg ppm
1	COMPO VV-1,8,11	10.	2.	.03
2	COMPO VV-5,9,12,14	20.	4.	.03
3	COMPO VV-2,4,10,13	10.	<2.	.02

cc: Asarco Incorporated
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. H.G. Kreis

cc: Asarco Incorporated
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. F.R. Koutz

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED 9/2/82
Arizona U.S.A.

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 206
September 2, 1982

ASARCO INCORPORATED
Attn.: Mr. F.A. Michel
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 11 Composite Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or − 1 step of the range reported at the 68 % confidence level and within + or − 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED 9/8/82
Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
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JOB NO. TAJ 206
PAGE 2

ITEM NO. SAMPLE NO.
1 = COMPO VV-1,8,11
2 = COMPO VV-5,9,12,14
3 = COMPO VV-2,4,10,13

ITEM	1	2	3
ELEMENT			
Fe	2%	1.5%	2%
Ca	10%	1.5%	2%
Mg	.2%	.3%	.5%
Ag	<1	<1	<1
As	<500	<500	<500
B	<10	20	20
Ba	300	200	700
Be	<2	<2	<2
Bi	<10	<10	<10
Cd	<50	<50	<50
Co	<5	<5	<5
Cr	100	30	15
Cu	20	15	20
Ga	<10	<10	<10
Ge	<20	<20	<20
La	<20	<20	<20
Mn	10000	300	700
Mo	<2	<2	<2
Nb	<20	<20	<20
Ni	15	10	10
Pb	10	10	<10
Sb	<100	<100	<100
Sc	<10	<10	<10
Sn	<10	<10	<10
Sr	150	100	<100
Ti	700	1500	2000
V	15	10	15
W	<50	<50	<50
Y	50	<10	20
Zn	<200	<200	<200
Zr	<20	100	150

JHC - ER File

ASARCO EXPLORATION RECORD

J. H. C.

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ]

FEB 27 1984

Section I General Indexing

① Name(s) of Property or Area: CAVE CANYON AREA, Bradshaw Mining District					② Country: USA	③ State or Province: UTAH	
					④ USGS Quad.: Cave Canyon	⑤ File or Gore No.: Beaver Co.	
⑥ Latitude: 38°18'40"	⑦ Longitude: 112°55'30" to 112°56'	⑧ AMS Sheet: Richfield	Township: 29S	Range: 10W	Section: S/2 SW/4 1	⑨ Examined by: HGKreis	⑩ Date: 11/6/82
						⑪ Office: Tucson	⑫ Field Days: 1

Section II Sources of Information

Date Typed 8/26/83

⑬ References

Author	Date	Title	Publications	Vol. No.

Section III Appraisal

⑭ Recommendations

- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [x] No action

⑮

- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ]

- [x] Geol. Recon.
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
None		

⑰ Reserves

[ ] Measured [ ] Estimated

Commodity	Tons	Grade
None		

⑱ Num. Drill Holes: None

Approx Total Footage:

⑲ Excavations: None

⑳ [x] Spectro. Analysis Attached

㉑ [ ] Assays Attached

㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: None

㉔ Ore Minerals-Major: None Minor:

㉕ Host Rocks-Major: See attached sheet Minor:

㉖ Age of Host Rocks: Tertiary

㉗ Nature of Exposures: Excellent exposures along ridge crest.

㉘ Alteration: In Area A the quartz monzonite is fresh to weakly sericitized and the underlying quartz diorite (Cont.)

㉙ Total Extent: Confined to outlines of Areas A & B.

㉚ Structure: Area A is underlain by a 6" to 2' thick low angle "flat" fault. The siliceous rock of Area B dips 15° to the west, but is locally horizontal.

㉛ Ore Occurrence: Area A contains 0 to locally 2% fracture and disseminated former pyrite. In the west end of Area A there are several 6" to 6' thick, white bull quartz veins. The veins (Cont.)

㉜ Age of Mineralization: Tertiary?

㉝ Conclusions & Recommendations: Areas A and B were sampled because of their anomalous geologic and topographic features. Both areas have bold relief and "crown" the ridge on which they occur. Neither of the two sampled areas have a potential for either precious or base metal mineralization.

(For additional space use extra sheets)

25. Host Rocks (Continued)

The examined area is divided into two areas for purposes of discussion. Area A consists of the environment sampled at sites BD-CA to BD-CD, and Area B consists of the area at sites BD-CF to BD-CM (see attached map).

Area A is a small erosional remnant (200' x 1500') of a medium grained, hypidiomorphic granular, quartz monzonite slide block. This slide block forms a prominent "crown" on a ridge of less resistant quartz diorite.

Area B is a silica cap rock composed of moderately to strongly silicified quartz monzonite, quartzite, and possibly conglomerate. Locally a breccia and/or conglomerate texture is apparent. This siliceous cap rock appears to be up to 100' thick, and it covers an area of 300' x 1500'. This cap rock appears to have formed at the contact between the quartz monzonite and overlying quartzite-conglomerate (now eroded off). It probably represents cupola silica accumulation or the assimilation of siliceous sediments by the quartz monzonite.

28. Alteration (Continued)

is propylitically altered with 3 to 10% combined chlorite and epidote.

In Area B the quartz monzonite and siliceous sediments commonly are so strongly silicified that the rock can hardly be broken with a hammer. Weak to moderate sericitization is locally present in areas of less intense silicification.

31. Ore Occurrence (Continued)

are en echelon and gash-like dipping at a shallow angle to the east. A couple of samples from the quartz veins showed no anomalous base or precious metal values. The only anomalous base and precious metal values were in one sample of quartz monzonite (BD-CD) between the quartz veins: 10 ppm Ag, 0.07 ppm Au, 700 ppm Cu, and 10,000 ppm Pb.

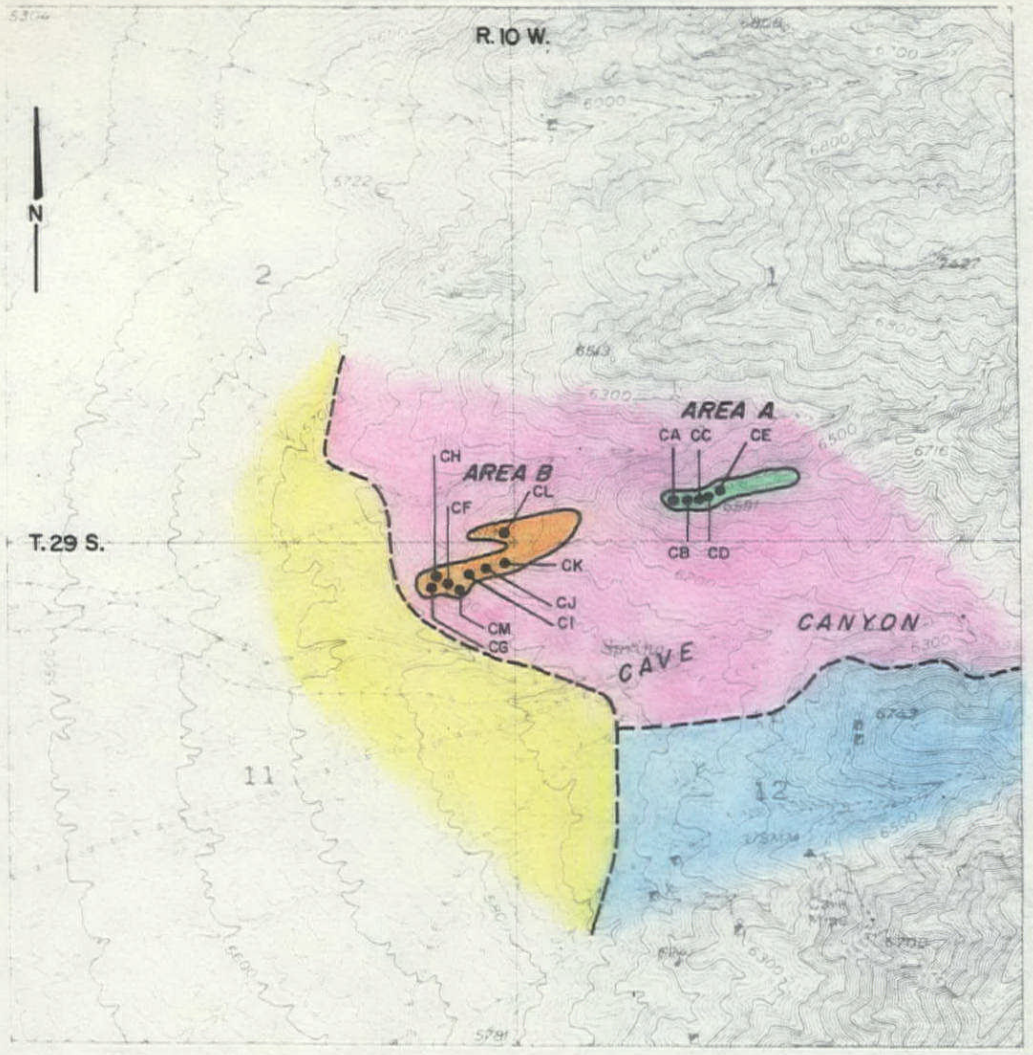
The siliceous rocks of Area B are commonly veined with 2-5% quartz. Locally there are traces of limonite that may be after magnetite and/or pyrite. None of the geochem samples contained anomalous gold or silver mineralization, and only a couple of samples showed anomalous, but insignificant, base metal values: 200 ppm Zn and 150 ppm Pb in BD-CF, 150 ppm Pb in BD-CI, and 15 ppm Mo in BD-CL.

GEOLOGIC SUMMARY OF GEOCHEM SAMPLES

CAVE CANYON AREA

Beaver County, Utah

Sample Number	AREA A		AREA B		
	Quartz Monzonite; qtz. vns. & local up to 1% F.T.S.	Quartz Vein	Quartz Monzonite; silicified, local sericite	Silicified Breccia or Conglomerate	Meta Quartzite
BD-CA	X				
BD-CB	X				
BD-CC		X			
BD-CD	X				
BD-CE		X			
BD-CF			X		
BD-CG					X
BD-CH				X	
BD-CI			X		
BD-CJ			X(1% F.T.S.)		
BD-CK				X	
BD-CL			X		
BD-CM			X		



EXPLANATION

CB ● Geochemical sample site (BD prefix omitted)

- Quaternary alluvium
- Tertiary Mineral Mountain batholith
- Quartz monzonite of AREA A
- Silicified quartz monzonite and siliceous sediments of AREA B
- Paleozoic carbonate sediments

Geology with slight modification from Steven, T.A., and others, 1978, Preliminary Geologic Map of the Richfield 1°x 2° Quadrangle; USGS Open File Report, 78-602.

TO ACCOMPANY Exploration Record Sheet
DATED 8-26-83
BY H.G. Kreis

ASARCO Incorporated

CAVE CANYON AREA

BEAVER COUNTY, UTAH

H.G. Kreis 8/83

1" = 2000'

mn 5591 dam 10/83

SKYLINE LABS, INC.
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JOB NO. TAJ 236
November 30, 1982
PAGE 2

	ITEM	SAMPLE NO.	Au ppm	Au ppm*
	~~26~~	~~BD-26~~	~~.11~~	~~N/R~~
	27	BD-27	.18	N/R
	28	BD-28	.13	N/R
	29	BD-29	.95	N/R
	30	BD-30	.11	N/R
	31	BD-31	2.10	N/R
	32	BD-32	.58	N/R
	33	BD-33	.19	N/R
	34	BD-34	.04	N/R
	~~35~~	~~BD-39~~	~~.10~~	~~N/R~~
AREA A	36	BD-CA	N/R	.005
AREA A	37	BD-CB	N/R	.005
AREA A	38	BD-CC	N/R	.014
AREA A	39	BD-CD	N/R	.070
AREA A	40	BD-CE	N/R	.003
AREA B	41	BD-CF	N/R	.004
AREA B	42	BD-CG	N/R	.006
AREA B	43	BD-CH	N/R	.007
AREA B	44	BD-CI	N/R	<.002
AREA B	45	BD-CJ	N/R	.003
AREA B	46	BD-CK	N/R	.005
AREA B	47	BD-CL	N/R	.002
AREA B	48	BD-CM	N/R	.005
	~~49~~	~~BD-F~~	~~N/R~~	~~<.002~~
	50	BD-G	N/R	.003
	51	BD-J	N/R	.002
	52	BD-K	N/R	.005
	53	BD-L	N/R	<.002
	54	BD-M	N/R	<.002
	~~55~~	~~BD-N~~	~~N/R~~	~~<.002~~

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 236
November 30, 1982

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 26 Rock Chip Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or − 1 step of the range reported at the 68 % confidence level and within + or − 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED
Arizona, U.S.A.

William L. Lehmbeck
Manager

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(602) 622-4836

JOB NO. TAJ 236
PAGE 2

ITEM NO.	SAMPLE NO.
36	BD-CA
37	BD-CB
38	BD-CC
39	BD-CD
40	BD-CE
41	BD-CF
42	BD-CG
43	BD-CH

ITEM	36	37	38	39	40	41	42	43
	AREA A					AREA B		
ELEMENT								
Fe	1.5%	1.5%	.5%	1.5%	.5%	.7%	.5%	.5%
Ca	.05%	.3%	.02%	.05%	.02%	.07%	.05%	.2%
Mg	.2%	.1%	.03%	.1%	.03%	.3%	.2%	.15%
Ag	<1	<1	<1	10	<1	<1	<1	<1
As	<500	<500	<500	<500	<500	<500	<500	<500
B	<10	<10	<10	<10	<10	<10	<10	<10
Ba	30	20	<10	50	<10	15	<10	<10
Be	2	<2	<2	2	<2	<2	<2	<2
Bi	<10	100	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	<5	<5	<5	<5
Cr	50	30	70	30	100	50	50	70
Cu	30	20	2	700	15	20	7	7
Ga	<10	<10	<10	10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20	<20	<20	<20
Mn	15	100	30	30	20	200	30	30
Mo	<2	2	<2	15	7	10	<2	<2
Nb	20	20	<20	30	<20	20	<20	<20
Ni	7	7	15	7	20	10	7	10
Pb	50	100	<10	10000	10	150	<10	<10
Sb	<100	<100	<100	<100	100	<100	<100	<100
Sc	<10	<10	<10	<10	<10	<10	<10	<10
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	100	<100	<100	100	<100	<100	<100	<100
Ti	1000	700	100	700	50	150	300	200
V	<10	<10	<10	<10	10	10	15	10
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	<10	10	<10	10	<10	<10	<10	<10
Zn	<200	<200	<200	<200	<200	200	<200	<200
Zr	70	70	30	100	20	50	100	20

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JOB NO. TAJ 236
PAGE 3

ITEM NO.	SAMPLE NO.
44	= BD-CI
45	= BD-CJ
46	= BD-CK
47	= BD-CL
48	= BD-CM
~~49~~	= ~~BD-F~~
~~50~~	= ~~BD-G~~
~~51~~	= ~~BD-J~~

AREA B

ITEM / ELEMENT	44	45	46	47	48	49	50	51
Fe	.7%	.7%	.3%	1.5%	.7%	3%	1%	2%
Ca	.02%	.03%	.15%	.07%	.07%	>20%	>20%	20%
Mg	.1%	.1%	.2%	.15%	.15%	7%	15%	1.5%
Ag	<1	<1	<1	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	<500	<500	<500	<500
B	<10	<10	<10	<10	<10	<10	10	20
Ba	70	100	<10	150	70	<10	<10	15
Be	<2	<2	<2	<2	<2	<2	<2	<2
Bi	<10	<10	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	<5	5	<5	5
Cr	50	30	70	30	70	<10	<10	<10
Cu	7	7	2	2	2	2	2	3
Ga	<10	<10	<10	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20	<20	<20	<20
Mn	15	30	50	50	15	1500	70	200
Mo	3	2	<2	15	2	<2	<2	<2
Nb	<20	<20	<20	20	20	<20	<20	<20
Ni	7	7	10	5	7	15	5	15
Pb	150	50	10	50	15	<10	<10	<10
Sb	<100	<100	<100	<100	<100	<100	<100	<100
Sc	<10	<10	<10	<10	<10	<10	<10	<10
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	<100	<100	<100	<100	<100	<100	<100	<100
Ti	700	700	150	1000	700	1500	500	1000
V	10	<10	20	<10	<10	30	10	15
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	<10	<10	<10	<10	<10	<10	<10	<10
Zn	<200	<200	<200	<200	<200	<200	<200	<200
Zr	30	30	<20	50	50	20	<20	30

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

~~JHC~~ - ER File

2-27-84

ASARCO EXPLORATION RECORD

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] _____

Section I General Indexing

① Name(s) of Property or Area: AMERICAN MINE AREA					② Country: USA	③ State or Province: ARIZONA	
					④ USGS Quad.: Dragoon	⑤ File or Gore No.: Cochise County	
⑥ Latitude: 32°13'	⑦ Longitude: 110°15'	⑧ AMS Sheet: Tucson	Township: 14S, 14S	Range: 21E, 20E	Section: 18,19, 13,24	⑨ Examined by: HGKreis	⑩ Date: 4/29/82
						⑪ Office: Tucson	⑫ Field Days: 2

Section II Sources of Information

Date Typed 8/25/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Cooper & Silver, 1964, Geol. & Ore Dep. of Dragoon Quad; USGS P.P. 416, p.162-163.				
Beverly, C.E., April 1970, Winchester Mtn. Recon Project; Asarco report.				

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [x] Future Review

⑮
- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ]
- [ ]
- [x] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
Nil		

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade
None		

⑱ Num. Drill Holes: None

Approx Total Footage: _____

⑲ Excavations: Pits, trenches, shafts

⑳ [ ] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Cu

㉔ Ore Minerals-Major: CuOx after chalcopyrite or bornite Minor: _____

㉕ Host Rocks-Major: Granodiorite Minor: _____

㉖ Age of Host Rocks: Precambrian

㉗ Nature of Exposures: Abundant outcrops & excavations in area of sampling north of Cascabel Road. Scattered outcrops in area of sampling south of Cascabel Road.

㉘ Alteration: District wide, spotty epidote in patches and veins. Weak to moderately strong clay-sericite alteration (Cont.) ㉙ Total Extent

㉚ Structure: In the American Mine area N35°E striking veins hosted in Precambrian granodiorite are in hanging wall of moderate to low angle ESE dipping faults.

㉛ Ore Occurrence: Copper oxide mineralization occurs in specularite and quartz-specularite veins that strike N35°E and dip steeply to the southeast. These veins with (Cont.)

㉜ Age of Mineralization: Laramide??

㉝ Conclusions & Recommendations: This evaluation was done, in part, to evaluate the precious metal potential of the American Mine, a property submittal. Also, it was done to review the porphyry copper potential of the area and to expand upon the reconnaissance sampling done by Beverly (1970).

The area sampled in this evaluation has no potential for precious metal mineralization, but the vein mineralization and pervasive mineralization in the AM-9 to AM-14 (Continued)

(For additional space use extra sheets)

28. Alteration (Continued)

in the pit area of samples AM-9 to AM-14. This pervasive alteration covers roughly two acres of outcrop, and its extent to the west and southwest is undeterminable because of postmineral gravel cover. The specularite-CuOx veins in the American Mine area are not accompanied by visual wall rock alteration.

31. Ore Occurrence (Continued)

CuOx mineralization and similar veins without visible copper mineralization reach up to a couple feet in thickness. Most of these veins are confined to a quarter square mile area about the American Mine, but thin veins are present as far south as the sample AM-9 to AM-14 area. In the area of samples AM-9 to AM-14 there is about two acres of outcrop exhibiting 1 to 2% disseminated former total sulfides (pyrite) and 2 to 6% veinlets composed of quartz, specularite, quartz-specularite, and rare calcite. Geochem samples of the rock in this area of veinlets ranges from 30 to 110 ppm Cu, and a heavily iron stained sample carried 580 ppm Cu. No anomalous molybdenum values occur in any of the AM-9 to AM-14 samples. The mineralization in the AM-9 to AM-14 area is covered to the west and southwest.

An attempt was made to locate any gold or silver mineralization that might be present in the mineralized areas (see Cooper and Silver's remarks on possible gold mineralization in the American Mine area, 1964, p. 162). At least one sample of every different type of mineralization was taken, but not a single sample carried anomalous gold or silver mineralization.

The age of the mineralization encountered in this evaluation is not known and is not readily determinable. If it is of Laramide age, it could represent the distant fringes of a porphyry copper sulfide system. The specularite-chalcopyrite-bornite vein system of the old Dominion Mine at Globe is an excellent example of specularite-copper veins on the fringes of a porphyry copper sulfide system.

Unfortunately, the mineralization of this evaluation lacks such supporting evidence of porphyry copper mineralization as anomalous Au-Ag-Mo-Mn mineralization, porphyry dikes, or a Laramide stock. Nonetheless, the mineralization of this evaluation could be evidence of porphyry copper mineralization buried under postmineral cover to the west.

33. Conclusions & Recommendations (Continued)

area could be the fringes of a porphyry copper sulfide system. The pediment to the west of the AM-9 to AM-14 area should be considered for drilling some day when the Pediment Drill Program is reactivated; but, before it is seriously considered for drilling, additional geologic reconnaissance and geophysical work should be done to map the limits of mineralization, depth to bedrock, etc.

GEOCHEM SAMPLE SUMMARY

AMERICAN MINE AREA

Cochise County, Arizona

	Rock Type				Mineralization						Analytical Determinations		
Sample	Granodiorite	Sedimentary	Fault Gouge	Vein	Spec. Qtz-CuOx	Qtz. Vns.	Blk. Qtz.-Spec. Bxa.	Limonite after Sulfides	Fluorite	Epidote	Gold,Silver	Cu,Pb,Zn	Mo
AM- 1				X			X		X		✓	✓	
AM- 2	X							X	Tr		✓	✓	
AM- 3	X									X		✓	
AM- 4	X											✓	
AM- 5	X					X				X		✓	
AM- 6	X									X		✓	
AM- 7	X									X		✓	
AM- 8	X											✓	
AM- 9	X				X	X		X			✓	✓	✓
AM-10	X				X						✓	✓	✓
AM-11				X	X						✓	✓	✓
AM-12	X				X			X			✓	✓	✓
AM-13	X							X			✓	✓	✓
AM-14				X			X				✓	✓	
AM-15	X											✓	
AM-16	X									X		✓	
AM-17	X									X		✓	
AM-18	X									X		✓	
AM-19	X						(X)					✓	
AM-20	X				Tr							✓	
AM-22		Qtzite									✓	✓	
AM-23		Ss									✓	✓	
AM-24		Qtzite									✓	✓	
AM-28				X	X						✓	✓	
AM-29				X	X	X					✓	✓	
AM-31		Qtzite	X								✓	✓	
AM-32			X								✓	✓	
AM-33	X					Tr					✓	✓	
AM-34	X					X					✓	✓	
AM-35				X	X						✓	✓	
AM-36				X	X						✓	✓	
AM-38	X					X					✓	✓	
AM-39				X		X					✓	✓	

H. G. Kreis
4/29/82
5/03/82

GEOCHEM SAMPLE DESCRIPTIONS

AMERICAN MINE AREA

Sec. 13,24 T14S, R20E
Sec. 18,19 T14S, R21E

Cochise County, Ariz.

AM- 1 6" - 1' thick vein-breccia of quartz and black mineral (specularite?) that colors the vein black. Fragments of quartz and wall rock. ½% purple fluorite and trace CuOx. N45°E & vertical. Vein is on both sides of road. Sampled NE corner of pit on north side.

AM- 2 In pit 20' west of AM-1. High graded strongly FeOx (after 1%? F.T.S) stained, Gd. Fractured controlled mineralization. Tr. fluorite. Specularite(?) oxidized to limonite. Biotite of Gd is weathered and releasing FeOx. Plag. appears weakly clay-ser. altered and iron stained.

AM- 3 100' SSW of AM-1. South of road. Gd. w/3% vn-diss. epid. and wkly. chlor. bio. and wkly. clay-ser. alt. plag.

AM- 4 Southern side of road cut 200' W of AM-1. Taken 1' below top of bedrock. Strongly decomposed Gd. strongly FeOx stained. No evid. of hydro. alt.-min.

AM- 5 Road cut across from AM-4. Rib of stgly epidotized Gd [similar to AM-3 but a few white qtz vns (<1" thick) and more epidote are in AM-5].

AM- 6 Wash along road; 1000' So. of windmill. Gd w/½% diss. epid. and ½% vn. epid. (½" calcite vein nearby; not sampled). Fresh. 1-2' thick, strong FeOx stained, decomposed Gd cap on top of fresher Gd -- sampled underlying fresh Gd.

AM- 7 200' S of AM-6. Gd suboutcrop. Gd w/10% epidote -- probably a local "pod" of epidotization.

AM- 8 South of windmill. F-g, gray colored, water well cuttings. "465' pipe" printed on tower.

AM- 9 150' long outcrop chip sample taken 30-70' north of and paralleling the fence that is on south side of pit. Gd w/stg. R.B. FeOx stain, 1-2% F.T.S. (leached pits), 1-2% white qtz. vns., 3% spec(?)-qtz. vns. (black), MW clay-ser. alt.

AM-10 East side of pit. Hanging wall of a flt (30' to west). Gd w/wkly. chloritized bio. Somewhat crumbly (weathered & broken). Av. of 1-¼" to ½" thick black spec. vns. (N30-45E, 55E) per 2'.

AM-11 Sample of ½" thick spec. vns. of AM-10.

AM-12 Footwall of flt. (noted in AM-10). Fault: N30±E, 45°-80°E dip. Sample of Gd w/stg. FeOx (R-B) stain, 1-2% F.T.S., ½% spec., variable wk. to MS clay-ser. alt. Sample taken between 8 to 30' west of flt. (CuOx in and along flt.).

AM-13 Grab sample of stgly FeOx stained Gd <u>from dump</u> on north side of pit.

AM-14 NE corner of pit area. 1' vein (pod?) of black qtz-spec. breccia. (Same type as AM-1.)

AM-10 to AM-14 pit area <u>general remark</u> on Gd located on west side of fault mentioned at site AM-12: Gd w/variable wk. to MS clay-ser. alt. and 1% F.T.S. (pyrite); local CuOx; ≈1% specularite vns. w/local CuOx; one black, qtz-spec. vn; one qtz-cpy (oxid. to CuOx) vein; ≈1% vuggy qtz. veins; 1-½" thick calcite vein; 1% qtz. veinlets; and ≈2% reddish brown, transported limonite stain.

AM-15 Gd: fresh, weakly FeOx stained on fract., weathered.

AM-16 270' down wash (west) of AM-15. Gd w/4% vn.-diss. epid. Check for possible 2nd K-feld. in thin section.

AM-17 600' down wash from AM-15. Gd w/1-2% vn.-diss. epid.

AM-15 to AM-17 remark: General lack of veins except for epidote.

AM-18 Gd, 1% vn.-diss. epid., V. wk. chlor. of biot. (on dirt rd. 50-100' N of power line).

AM-19 Dozer cut 50' W of deep dozer cut having substantial alt.-min.(CuOx). Gd w/V. wk. chlor-epid. (<2%). Approx. 1% spec. vns. ≈ ¼" thick having N30-50E stk., stp SE'ly dip, & a spacing of 1 vn. per 1-2'. <u>No spec. vns. in sample.</u>

AM-20 Dozer cut 100' E of AM-19 and on E side of road (50' from road). Gd. with wk. FeOx and wk. thin spec. on very widely spaced (2') fractures.

AM-21 No sample taken. Stockpiles of Cu rich Gd from unknown source (same type of mineralization as seen in previous AM samples and in pits ≈1 mi. to east). Found no mine workings or rock in place.

Small hills to east (≈100') and to NE (≈2000') are unmineralized and unaltered lms.

AM-22 Qtzite, f-g, reddish brown. 2% hematite diss. and on fract. Does <u>not</u> appear to be mineralized. Bedding(?) N60W, 45°N dip.

AM-23 2' x 4' bright red outcrop. Siliceous conglomeratic sandstone. Bright red hematite coating on weathered surfaces (mineralized?).

AM-24 30' west of AM-23. Iron stained quartzite(?).

AM-25 No geochem sample. Hand samples 25a (no veins) and 25b (w/spec. vn.). Gd has N30-80°E striking, steeply dipping veins of specularite, spec. > qtz., spec. ≫ cpy (oxid.) (+py?), qtz. ≈ 100' of outcrop perpendicular to strike has 2-3% spec., ½% qtz., 0.1% CuOx. No pervasive alt. or diss. sulf. Wk. chlor. of biotite. No alt. along veins. Local apparent supergene altn. by CuOx (cpy) mineralization.

AM-26 Pit 200-300' NE of AM-25. No samples taken. 1/6th the abundance of veins as in AM-25. Pit 50' E of AM-26 has 1% epidote and wk. chlor. altn. of bio. (veining like AM-26).

AM-27 Outcrop 50' south of road. Gd w/diabase dike. 1% epidote locally scattered in Gd.

AM-28 North side of wash and west side of road. 1" qtz-spec. vn.

AM-29 50' E of AM-28. Qtz. vn. (1" to 1' thick) & replacement with local ¼" spec. veins (later than qtz?).

AM-31 to 34. Small island of outcrop in middle of large wash. Contact (fault) between p€gd and qtzite is a fault striking N50°E and dipping 45°SE.

AM-31 5' broken gougey fault material--mostly qtzite (mineralized?).

AM-32 1' thick, dense, fault gouge-bxa. Brown FeOx stain.

AM-33 First 1-2' of Gd above AM-32.

AM-34 Gd 2-15' from fault. Local qtz. & FeOx stain.

AM-35 American Mine. High grade CuOx - specularite from wall of inclined shaft. 1" to 4" thick (variable) vein(s) of specularite and qtz-spec. totalling about 4" in thickness. The dump to the American Mine has been dozed off and is no longer identifiable.

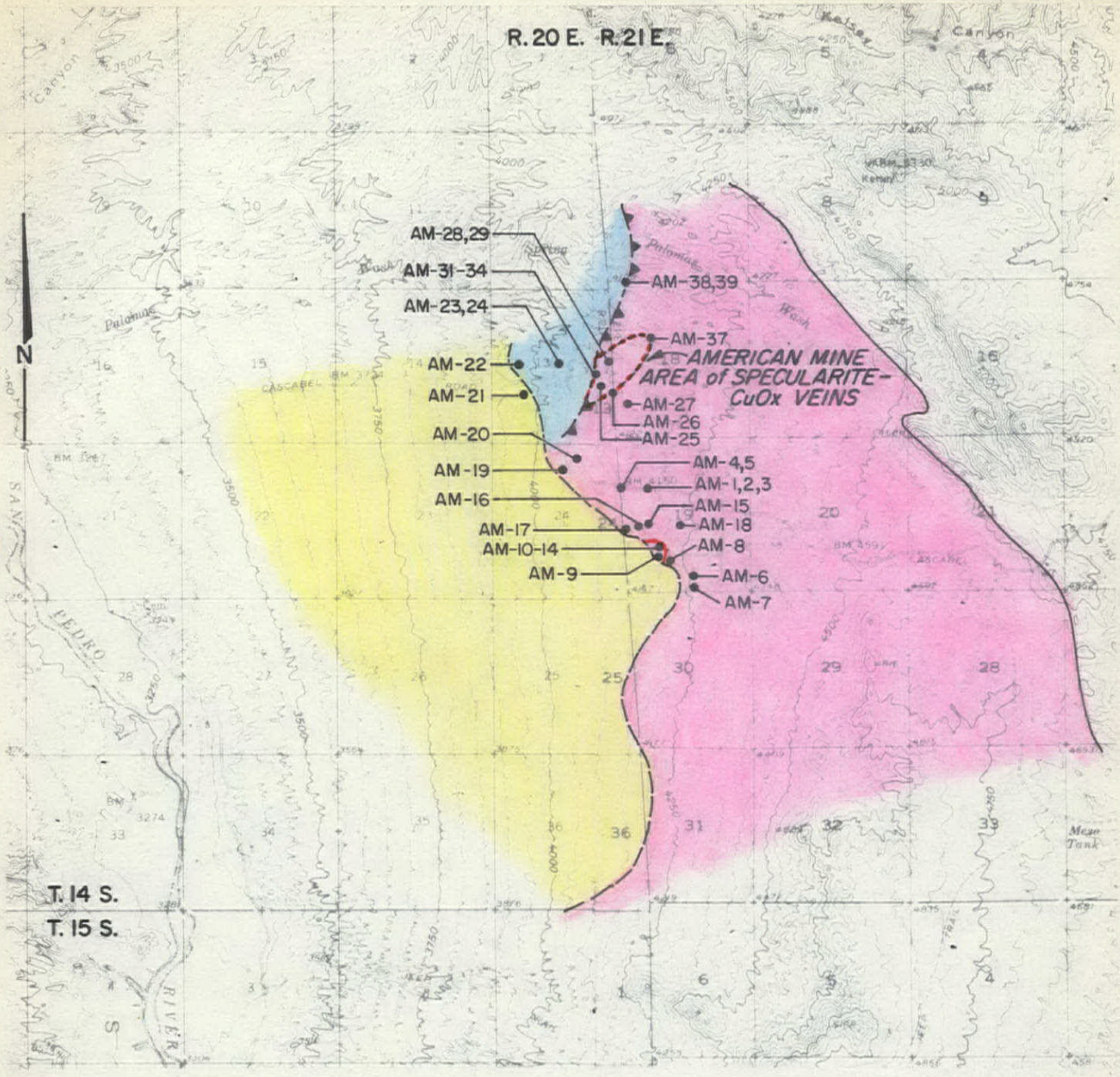
AM-36 Dozer cut 50-100' NE of AM-35. Gd w/¼" - 4" thick veins of qtz-spec-local CuOx (after cpy) striking N20-40°E w/stp dip (vert. to E'ly). Veins aggregate 1' in thickness across strike. Sample entirely of vein material.

AMERICAN MINE ZONE: N35°±E, Brunton shot on dumps.

AM-37 1/8" thick vns. of qtz.-silicate (blk.-grn. color)-tr. CuOx after cpy. Possibly some epid.(?) in vn. Suspect this type of vn. is NE "tail" of qtz-spec. vns. to SW.

AM-38 Gd w/in 100' of contact w/p€pi. Gd is FeOx stained; ½ to 1% qtz. vn. Sample of Gd w/out qtz. vns.

AM-39 Same location as AM-38. Sample of dominantly qtz. vns. & masses.



EXPLANATION

AM-7 • Geochemical sample site

Quaternary alluvium

Limestone, sandstone, schist (undifferentiated)

Precambrian Johnny Lyon Granodiorite

Moderate to low angle fault

Geology taken with modification from Copper and Silver, 1964, USGS PP 416

TO ACCOMPANY Exploration Record Sheet
DATED 8-25-83
BY H.G. Kreis

ASARCO Incorporated

GEOCHEMICAL SAMPLE LOCATION MAP

AMERICAN MINE AREA

COCHISE CO., ARIZONA

H.G.Kreis 1" = 1 mile Aug, 1983

mn 5594 dam 10/83

AMERICAN MINE AREA

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 169
May 21, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 32 Rock Chips and 1 Drill Cutting Sample

ITEM	SAMPLE NO.	Au ppm	Ag ppm	Cu ppm
1	AM-1	<.02	<.2	185.
2	AM-2	<.02	<.2	490.
3	AM-3	N/R	N/R	10.
4	AM-4	N/R	N/R	20.
5	AM-5	N/R	N/R	10.
6	AM-6	N/R	N/R	15.
7	AM-7	N/R	N/R	5.
8	AM-8	N/R	N/R	15.
9	AM-9	<.02	<.2	30.
10	AM-10	<.02	<.2	35.
11	AM-11	<.02	<.2	630.
12	AM-12	<.02	<.2	110.
13	AM-13	<.02	.2	580.
14	AM-14	<.02	.2	490.
15	AM-15	N/R	N/R	10.

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 169
May 21, 1982

ITEM	SAMPLE NO.	Au ppm	Ag ppm	Cu ppm
16	AM-16	N/R	N/R	10.
17	AM-17	N/R	N/R	20.
18	AM-18	N/R	N/R	10.
19	AM-19	N/R	N/R	50.
20	AM-20	N/R	N/R	20.
21	AM-22	<.02	.2	5.
22	AM-23	<.02	<.2	10.
23	AM-24	<.02	<.2	15.
24	AM-28	<.02	<.2	60.
25	AM-29	<.02	<.2	25.
26	AM-31	<.02	<.2	25.
27	AM-32	<.02	<.2	75.
28	AM-33	<.02	<.2	15.
29	AM-34	<.02	<.2	15.
30	AM-35	.04	.2	57000.
31	AM-36	<.02	<.2	1700.
32	AM-38	<.02	<.2	250.
33	AM-39	<.02	<.2	95.

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 169
May 21, 1982
PAGE 3

ITEM	SAMPLE NO.	Pb ppm	Zn ppm	Mo ppm
1	AM-1	<5.	5.	N/R
2	AM-2	5.	15.	N/R
3	AM-3	<5.	45.	N/R
4	AM-4	<5.	35.	N/R
5	AM-5	<5.	40.	N/R
6	AM-6	<5.	50.	N/R
7	AM-7	<5.	5.	N/R
8	AM-8	<5.	40.	2.
9	AM-9	<5.	10.	<2.
10	AM-10	<5.	45.	<2.
11	AM-11	<5.	95.	2.
12	AM-12	<5.	10.	<2.
13	AM-13	10.	5.	2.
14	AM-14	<5.	65.	N/R
15	AM-15	<5.	35.	N/R

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Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 169
May 21, 1982
PAGE 4

ITEM	SAMPLE NO.	Pb ppm	Zn ppm	Mo ppm
16	AM-16	<5.	40.	N/R
17	AM-17	5.	55.	N/R
18	AM-18	<5.	45.	N/R
19	AM-19	5.	30.	N/R
20	AM-20	<5.	35.	N/R
21	AM-22	5.	50.	N/R
22	AM-23	15.	495.	N/R
23	AM-24	10.	65.	N/R
24	AM-28	<5.	30.	N/R
25	AM-29	5.	30.	N/R
26	AM-31	5.	70.	N/R
27	AM-32	25.	175.	N/R
28	AM-33	5.	70.	N/R
29	AM-34	<5.	75.	N/R
30	AM-35	<5.	55.	N/R
31	AM-36	<5.	30.	N/R
32	AM-38	<5.	5.	N/R
33	AM-39	65.	5.	N/R

NOTE: N/R denotes analysis not requested.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
STATE OF ARIZONA

William L. Lehmbeck
Manager

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

~~JHC~~ - ER File

ASARCO EXPLORATION RECORD

J. H C.

[X] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ]

SEP 29 1983

Section I General Indexing

① Name(s) of Property or Area: PALOMAS WASH PROSPECT					② Country: USA	③ State or Province: ARIZ	
					④ USGS Quad.: Dragoon	⑤ File or Gore No.: Cochise County	
⑥ Latitude: 32°14'	⑦ Longitude: 110°13'	⑧ AMS Sheet: Tucson	Township: 14S	Range: 21E	Section: SE/4 8	⑨ Examined by: HGKreis	⑩ Date: 4/29/82
						⑪ Office:	⑫ Field Days: 1 Hour

Section II Sources of Information

Date Typed 8/25/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Cooper, J. R., Silver, L. T., 1964, Geol. & Ore Dep. of Dragoon Quad; USGS P.P. 416				

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [x] No action

⑮
- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [x] Prospect
- [ ]

- [x] Drilling Activity
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
None Known		

⑰ Reserves
- [ ] Measured
- [ ] Estimated

Commodity	Tons	Grade
None Known		

⑱ Num. Drill Holes: Approx. 38
Approx Total Footage: 10,000 ??

⑲ Excavations: Very shallow caved shaft(?)

⑳ [x] Spectro. Analysis Attached

㉑ [ ] Assays Attached

㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Uranium

㉔ Ore Minerals-Major: Minor:

㉕ Host Rocks-Major: Bolsa & Abrigo Fms. Minor: Diabase

㉖ Age of Host Rocks: Cambrian

㉗ Nature of Exposures: Outcrops and road cuts yield good exposures

㉘ Alteration: Supergene oxidation

㉙ Total Extent:

㉚ Structure: Bedded sedimentary rocks, diabase sills, and faults.

㉛ Ore Occurrence: In sedimentary rocks above diabase sill.

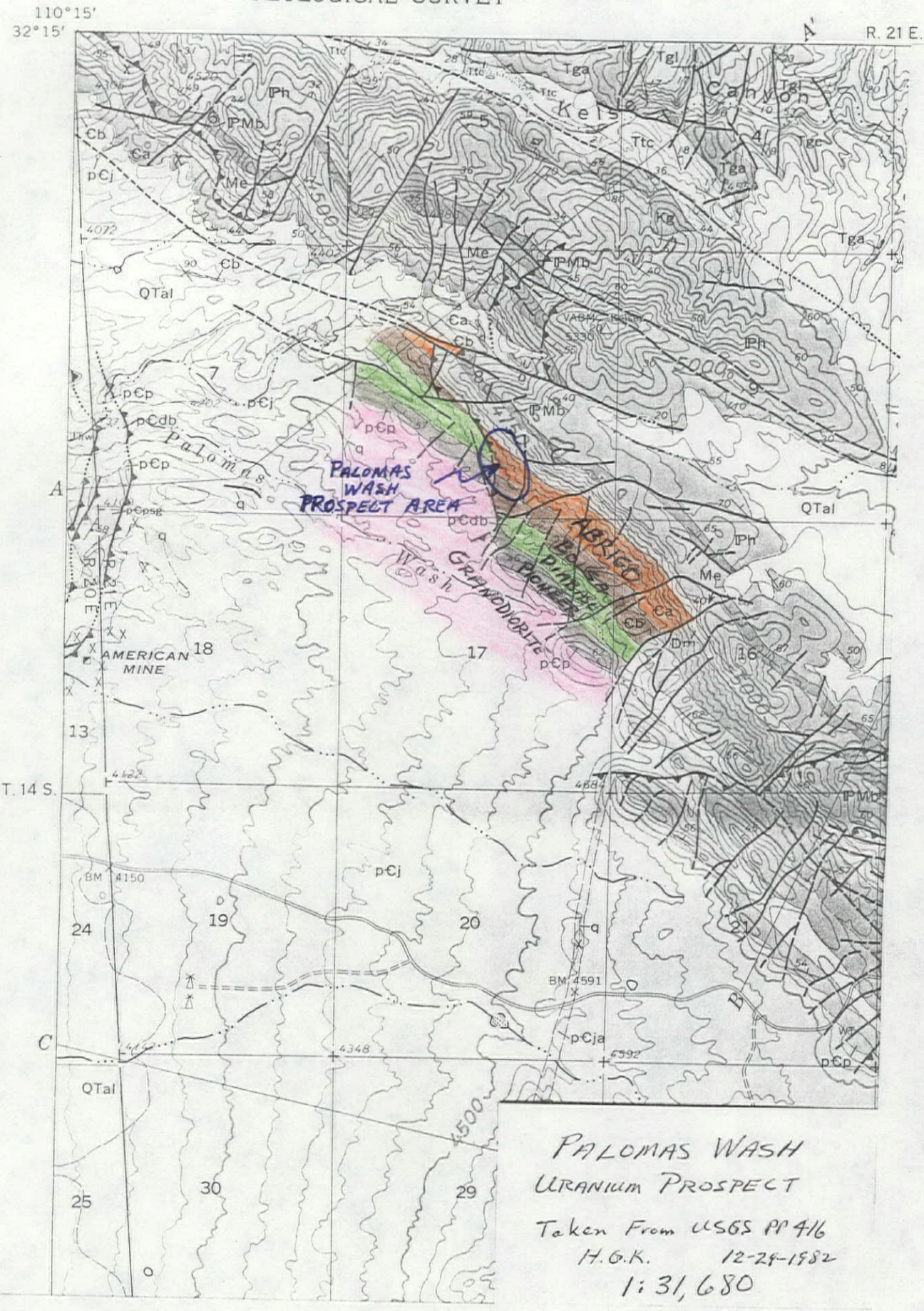
㉜ Age of Mineralization: Not known.

㉝ Conclusions & Recommendations: Casual examination to determine reason for drilling activity. "Western Nuclear" name noted on drill holes spaced 50' apart and having designations as high as #38. Uranium values of 3 to 145 ppm obtained on composite samples of cuttings from about drill hole collars. Complete lack of anomalous base and precious metals. No further interest.

(For additional space use extra sheets)

(REDINGTON)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



PALOMAS WASH
URANIUM PROSPECT

Taken From USGS PP 416
H.G.K. 12-29-1982
1:31,680

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

PALOMAS WASH PROSPECT
Cochise Co., Ariz

REPORT OF ANALYSIS

JOB NO. TAJ 168
May 21, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 4 Cuttings and 1 Rock Chip Sample

ITEM	SAMPLE NO.	U ppm	Au ppm
1	R.D.H-30	11.	<.002
2	RDH-34-38	3.	<.002
3	RDH-MISC	36.	<.002
4	RDH-25-27	12.	<.002
5	SHAFT	145.	<.002

RDH-30 cuttings of single drill hole.
RDH-34-38 composite of RDH's 34,35,36,37, & 38 (all in a row).
RDH-Misc. 5 unidentified drill holes along a road (two roads below RDH-34-38).
RDH-25-27 R.D.H.'s -25, -33, -27, and an unidentified hole (all in a row).
SHAFT Appears to be dump of old shaft.

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK SIGNED Arizona

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 168
May 21, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 4 Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
ARIZONA U.S.A.

William L. Lehmbeck
Manager

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JOB NO. TAJ 168
PAGE 2

ITEM NO.	SAMPLE NO.
2	= RDH-34-38
3	= RDH-MISC
4	= RDH-25-27
5	= SHAFT

ITEM	2	3	4	5
ELEMENT				
Fe	2%	2%	2%	3%
Ca	7%	3%	5%	.07%
Mg	7%	2%	3%	.3%
Ag	<1	<1	<1	<1
As	<500	<500	<500	<500
B	20	30	20	20
Ba	<10	100	70	700
Be	<2	<2	<2	2
Bi	<10	<10	<10	<10
Cd	<50	<50	<50	<50
Co	<5	10	7	150
Cr	<10	15	10	<10
Cu	10	20	20	30
Ga	<10	<10	<10	<10
Ge	<20	<20	<20	<20
La	<20	30	<20	50
Mn	700	700	700	10000
Mo	<2	<2	<2	<2
Nb	<20	<20	<20	20
Ni	10	15	15	150
Pb	<10	50	15	30
Sb	<100	<100	<100	<100
Sc	<10	<10	<10	<10
Sn	<10	<10	<10	<10
Sr	300	2000	1000	1500
Ti	1000	3000	2000	5000
V	15	20	15	50
W	<50	<50	<50	<50
Y	10	50	20	70
Zn	<200	<200	<200	700
Zr	70	200	200	500

~~JHC~~ - ER
J. H. C.

ASARCO EXPLORATION RECORD

[x] FIELD EXAMINATION [x] LITERATURE SEARCH [ ] ASARCO FILE [ ]

FEB 27 1984

Section I General Indexing

① Name(s) of Property or Area	② Country	③ State or Province
ROOSEVELT HOT SPRINGS DEPOSITS	USA	Utah
	④ USGS Quad. Adamsville	⑤ File or Gore No. Beaver Co.

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
38°30'	112°52'	Richfield	26S 27S	9W 9W	34 3,9,& 16	HGKreis	2
						⑪ Office Tucson	⑫ Field Days 9/30/82 11/18/82

Section II Sources of Information

Date Typed 8/24/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Sibbett & Nielson	1980	Geol. Central Mineral Mtns.	DOE/ET/28392-40	
Bamford, et al. 1980, Multiele. Geochem of Solid Materials in Geothermal Systems & its Appl.; Part 1: Hot-Water Sys. at Roosevelt Hot Spgs. KGRA			DOE/ET/27002-7.	
Numerous other publications on Roosevelt Hot Springs KGRA.				
H. Kreis, 1983, Roosevelt Hot Springs; Asarco Memo				

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [x] No action

⑮
- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [x] Hot Springs Deposits

- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly

⑯ Production

Commodity	Tons	Grade
None		

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade
None		

⑱ Num. Drill Holes >10
Approx Total Footage >10,000

⑲ Excavations Few trenches & dozer cuts

⑳ [x] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Slightly anomalous gold values

㉔ Ore Minerals-Major: Minor:

㉕ Host Rocks-Major: Alluvium Silica Sinter Minor:

㉖ Age of Host Rocks: Quaternary Quaternary

㉗ Nature of Exposures: Small but good outcrops of silica sinter & silicified conglomerate occur in Qal covered area along trace of Opal Mound Foult.

㉘ Alteration: Varying degrees of silica-clay alteration replace alluvium matrix and clasts.

㉙ Total Extent: Obscured by Qal; possibly 1000' x 3 mi.

㉚ Structure: Subsurface geology demonstrates low angle gravity faults offset by NNE striking high angle fault (Opal Mound Fault).

㉛ Ore Occurrence: Deposits of silica sinter & silicified alluvium with anomalous As, Sb, Hg & locally weakly anomalous Au (up to 0.290 ppm Au) occur along the trace of the Opal Mound Fault.

㉜ Age of Mineralization: Quaternary

㉝ Conclusions & Recommendations: The low gold values & the lack of a favorable host rock indicate there is little, if any, potential for an open pitable gold reserve associated with the sampled outcrops. Furthermore, there is not sufficient encouragement to recommend following the southern projection of this mineralization beneath the alluvium. No further work is recommended.

(For additional space use extra sheets)

ASARCO

Southwestern Exploration Division

August 24, 1983

To: J. D. Sell

From: H. G. Kreis

Roosevelt Hot Springs
Mineral Mountain Area
Beaver County, UT

The Roosevelt Hot Springs are located on the west side of the Mineral Mountains, ten miles northeast of Milford. Active hot springs and fumaroles are present in the area. Present and past hot spring activity has produced quartz sinter deposits and silica-local FeOx-local MnOx cemented conglomerate. Phillips Petroleum is developing the geothermal resource for the production of electricity.

The geology of the Roosevelt Hot Springs area, surface and subsurface, has been mapped and described in several publications. A concise geologic summary is attached, and good information on subsurface rock geochemistry is available in the library (Bamford, R. W., and others, 1980, "Multielement Geochemistry of Solid Materials in Geothermal Systems and its Applications Part 1: The Hot-Water System at the Roosevelt Hot Springs KGRA, Utah": University of Utah Research Institute, DOE-ET-27002-7, ESL-30).

Initially, fifteen reconnaissance rock chip samples were taken to check the gold-silver content of the alteration-mineralization caused by the hot spring and fumarole activity. Six of the fifteen samples contained weakly anomalous gold mineralization, and none of the fifteen samples contained anomalous silver mineralization (all were 0.2 ppm Ag or less). Five of the six anomalous gold samples were taken in one area, the NW/4 of Section 16 (T27S, R9W). These five samples averaged 0.034 ppm Au (0.009 to 0.060 ppm range), and they were taken in quartz sinter and silicified conglomerate. Several anomalous values for As, Hg, and Sb were obtained from these five samples (see attached listing of geochem values).

The sixth anomalous gold sample, AV-12, contained 0.170 ppm Au. Sample AV-12 was taken from the only outcrop of MnOx cemented conglomerate, and it is located in the extreme NW corner of Section 3, T27S, R9W. Anomalous As, Ba, Cu, Mn, Mo, Sb, V, and W are associated with the anomalous Au in sample AV-12. The AV-12 outcrop of MnOx cemented conglomerate is small (20' x 20') and thin (<10'); and the lack of similar MnOx cemented conglomerate outcrops suggests it is a very localized occurrence. Samples AV-17 to AV-24 were taken in the AV-12 area to check for further evidence of anomalous gold mineralization, but no such evidence was found. In addition, several samples of the alluvium were taken to see if the AV-12 gold and tungsten values were possibly of placer origin, but no such evidence of placer origin was found.

The Roosevelt Hot Springs deposits of silica sinter and silicified conglomerate carry locally weakly anomalous gold values and anomalous amounts of key gold indicator elements, arsenic, antimony, and mercury. However, the gold values are too low to be of economic interest, and the potential for finding an open pitable, large tonnage reserve is too low to be of interest to ASARCO.

H. G. Kreis

H. G. Kreis

HGK/cg

Attachments

GEOCHEM VALUES OF

ROOSEVELT HOT SPRINGS DEPOSITS

Beaver County, Utah

Sample No.	Au (ppm)	As (ppm)	Hg (ppm)	Ag (ppm)	Sample Description
AV- 1	.060	10	>5.00	<.2	White opalite, vertical feeder
AV- 2	.009	<10	.26	<.2	White opalite, horizontal bedding
AV- 3	.032	50	.13	<.2	Red opalite, horizontal bedding
AV- 4	.050	300	1.20	<.2	Multicolored opalite beds, horizontal
AV- 5	.020	80	.42	<.2	Silicified conglom.; minor white silica sinter
AV- 6	<.002	<10	.85	<.2	Massive white clay (altered granite or grus)
AV- 7	.004	20	.14	<.2	Partially silicified conglom. (100' above AV-6)
AV- 8	<.002	30	3.00	.2	Massive gray clay with native sulfur
AV- 9	<.002	<10	.32	<.2	V. wkly. silicified, clayey Qal
AV-10	<.002	<10	.38	<.2	White, silicified conglom. above AV-8 & -9
AV-11	<.002	<10	.13	<.2	Red FeOx stained silicified conglom.
AV-12	.170	1000	.02	.2	5% MnOx cementing Qal
AV-13	.003	<10	1.40	<.2	Silicified Qal and silica sinter (fumarole)
AV-14	<.002	20	.26	<.2	Clayey, silicified Qal, red and white
AV-15	<.002	40	.18	<.2	Weakly silicified Qal
AV-16	<.002	10	.48	<.2	Wkly silicified, clay-ser. alt. granite or grus
AV-17	<.002	<10	.13	<.2	Magnetite rich sand-soil
AV-18	<.002	<10	.19	.2	Grus-soil
AV-19	<.002	<10	1.50	<.2	Weakly silicified, altered conglom.
AV-20	<.002	20	.17	<.2	Clayey, red stained soil just above AV-12
AV-21	.290	750	.03	.2	5% MnOx cementing Qal (resampled AV-12)
AV-22	<.002	10	.19	<.2	Sand of Negro Mag Wash
AV-23	<.002	<10	.03	<.2	Sand (50' E and 150' N of AV-12)
AV-24	<.002	<10	.05	<.2	Fresh gneiss
AV-25	<.002	<10	.03	<.2	Sand of Negro Mag Wash
AV-26	<.002	<10	.05	.2	Sand of Negro Mag Wash
AV-27	<.002	<10	.03	<.2	Sand near Negro Mag Wash
AV-28	<.002	<10	.04	.2	Sand near Negro Mag Wash
AV-29	<.002	<10	.03	<.2	Sand of Negro Mag Wash

GEOLOGIC SUMMARY - Taken directly from Bamford, et al., February 1980, "Multielement Geochemistry of Solid Materials in Geothermal Systems and its Applications Part 1: The Hot-Water System at the Roosevelt Hot Springs KGRA, Utah." DOE-ET-27002-7, ESL-30.

GEOLOGIC CHARACTERISTICS OF THE GEOTHERMAL SYSTEM

General Geology

The geology of the Roosevelt Hot Springs area has been mapped and discussed by Nielson et al. (1978). The bedrock geology of the area is dominated by felsic plutonic phases of the Tertiary Mineral Mountains Pluton as well as metamorphic and plutonic rocks of Precambrian age. Rhyolite flows, domes, and pyroclastics reflect igneous activity between 0.8 and 0.5 million years ago (Evans and Nash, 1978). Hot spring deposits, fumaroles, and hydrothermal alteration (related to the present geothermal system) occur within alluvium on the western margin of the Mineral Mountains.

The Roosevelt Hot Springs KGRA contains a structurally controlled hot-water geothermal system (Nielson et al., 1978). There are no lithologic units, except the Recent alluvium, which possess sufficient primary permeability to serve as productive aquifers. Four major fault trends are described by Nielson et al. (1978). These include large-scale north-south-trending, low-angle normal faults which have produced low-angle westward-dipping mylonite zones; numerous steeply dipping northwest-trending faults present only in the hanging wall of the major low-angle fault and also commonly marked by silicified mylonite zones; and steeply dipping east-west-trending and north-northeast-trending normal faults that cut both the hanging and foot walls of the low-angle normal faults and extend to an unknown depth. The low-angle and related high-angle northwest-trending fault zones are commonly the site of microdiorite dikes. Often both brecciated and nonbrecciated dikes occupy the same zone, suggesting several periods of dike intrusion and

implying several periods of movement on the same faults. Nielson et al. (1978) propose that structural permeability present in strongly fractured rocks adjacent to mylonite zones or developed by fracturing of brittle silicified mylonite zones during recurrent fault movement exerts an important control on the location and configuration of the geothermal reservoir.

Two major structures are exposed in the study area (Figures 1 and 8A): the Opal Mound Fault, in the northern half of T27N, R9W, is a well defined north-northeast-trending, east-dipping normal fault; and the Negro Mag Wash Fault, in the northeast corner of T27N, R9W, is an east-west-trending fault with an inferred extension to the west. Hot spring deposits and fumarolic activity occur along or near the trend of the Opal Mound Fault near its proposed intersection with the poorly defined westward extension of the Negro Mag Wash Fault, indicating that the Opal Mound Fault or both faults have been zones of fluid discharge from the hot-water hydrothermal system. Lenzer et al. (1976) have suggested that the Opal Mound Fault is a major controlling structure for the subsurface hydrologic regime in the area. Reports on the subsurface relationships (Koenig and Gardner, 1977) show that the Opal Mound Fault is an eastward-dipping normal fault bounding a graben on the east and a narrow horst on the west. As presently known, the geothermal field at Roosevelt Hot Springs is bounded by the range front on the east and the Opal Mound Fault on the west (Nielson et al., 1978). Present drilling data indicate that the geothermal field may be terminated to the south between geothermal wells Utah State 52-21 and 72-16. The northern limits of the field are currently not defined.

Surface hydrothermal alteration is minimal or not readily detected and confined to areas of recent hot spring activity, fault zones, joint surfaces, and zones of base metal mineralization. Alteration in many of the holes drilled in the district and surface alteration associated with hot spring activity have been discussed by Bryant and Parry (1977), Ballantyne and Parry (1978), Parry (1978), Parry et al. (1978), Rohrs and Parry (1978), Nielson et al. (1978), Ballantyne (1978), and Hulen (1978). Hulen has documented the coexistence in alluvium of unaltered Pleistocene pumice and obsidian clasts with altered clasts of Tertiary intrusive rock and Precambrian gneiss, indicating that hydrothermal processes have been active within the general area prior to deposition of the alluvium.

Hot spring deposits in the Roosevelt thermal area consist of opaline and chalcedonic sinter and hematite, silica, calcite, or manganese-oxide cemented alluvium. Gypsum, opal, kaolinite and native sulfur occur in fumarole vent areas. Alluvium, felsic plutonic rocks, and amphibolite facies gneiss have been altered by acidic sulfate water to alunite and opal at and near the surface, and commonly to kaolinite, alunite, and montmorillonite between the surface and the top of the water table (depth about 100 feet). Marcasite and pyrite occur below the water table. Deeper alteration sampled to a maximum depth of about 7400 feet consists of muscovite, chlorite, calcite, K-feldspar, albite, and epidote with pyrite and sparse chalcopyrite (Parry et al., 1978).

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 221
October 25, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 15 Rock Chip Samples

ITEM	SAMPLE NO.	Au ppm	As ppm	Hg ppm	Ag ppm
1	AV-1	.060	10.	>5.00 *	<.2
2	AV-2	.009	<10.	.26	<.2
3	AV-3	.032	50.	.13	<.2
4	AV-4	.050	300.	1.20	<.2
5	AV-5	.020	80.	.42	<.2
6	AV-6	<.002	<10.	.85	<.2
7	AV-7	.004	20.	.14	<.2
8	AV-8	<.002	30.	3.00	.2
9	AV-9	<.002	<10.	.32	<.2
10	AV-10	<.002	<10.	.38	<.2
11	AV-11	<.002	<10.	.13	<.2
12	AV-12	.170	1000.	.02	.2
13	AV-13	.003	<10.	1.40	<.2
14	AV-14	<.002	20.	.26	<.2
15	AV-15	<.002	40.	.18	<.2

*NOTE: Greater than normal geochemical range. Please advise if further assay is needed.

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED
Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 243
December 8, 1982

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 17 Samples

ITEM	SAMPLE NO.	Au ppm	As ppm	Hg ppm	Ag ppm
1	AV-16	<.002	10.	.48	<.2
2	AV-17	<.002	<10.	.13	<.2
3	AV-18	<.002	<10.	.19	.2
4	AV-19	<.002	<10.	1.50	<.2
5	AV-20	<.002	20.	.17	<.2
6	AV-21	.290	750.	.03	.2
7	AV-22	<.002	10.	.19	<.2
8	AV-23	<.002	<10.	.03	<.2
9	AV-24	<.002	<10.	.05	<.2
10	AV-25	<.002	<10.	.03	<.2
11	AV-26	<.002	<10.	.05	.2
12	AV-27	<.002	<10.	.03	<.2
13	AV-28	<.002	<10.	.04	.2
14	AV-29	<.002	<10.	.03	<.2

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. J.D. Sell

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED
ARIZONA U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 221
October 25, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 5 Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED
Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 221
PAGE 2

ITEM NO.	SAMPLE NO.
5	= AV-5
12	= AV-12
16	= COMP(AV-1,2,4)
17	= COMP(AV-6,8)
18	= COMP(AV-10,11)

ITEM	5	12	16	17	18
ELEMENT					
Fe	.5%	1%	.2%	1%	3%
Ca	.2%	.1%	.1%	.02%	.3%
Mg	.1%	.03%	.03%	.2%	.15%
Ag	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	<500
B	50	<10	150	<10	<10
Ba	100	>10000	<10	150	100
Be	2	10	30	<2	<2
Bi	<10.	<10.	<10.	<10.	<10.
Cd	<50	<50	<50	<50	<50
Co	<5	30	<5	<5	<5
Cr	20	30	70	15	30
Cu	<2	200	3	5	10
Ga	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20
Mn	30	>10000	300	50	20
Mo	<2	150	<2	<2	<2
Nb	<20	<20	<20	<20	20
Ni	<5	<5	10	<5	5
Pb	<10	20	<10	10	<10
Sb	<100	200	300	<100	<100
Sc	<10	<10	<10	<10	<10
Sn	<10	<10	<10	<10	<10
Sr	<100	150	<100	<100	100
Ti	700	700	30	3000	1500
V	<10	200	<10	30	15
W	<50	3000	<50	<50	<50
Y	<10	<10	<10	<10	<10
Zn	<200	<200	<200	<200	<200
Zr	100	20	<20	200	200

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

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REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 243
December 8, 1982

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 4 Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
DATE SIGNED
Arizona

William Lehmbeck
Manager

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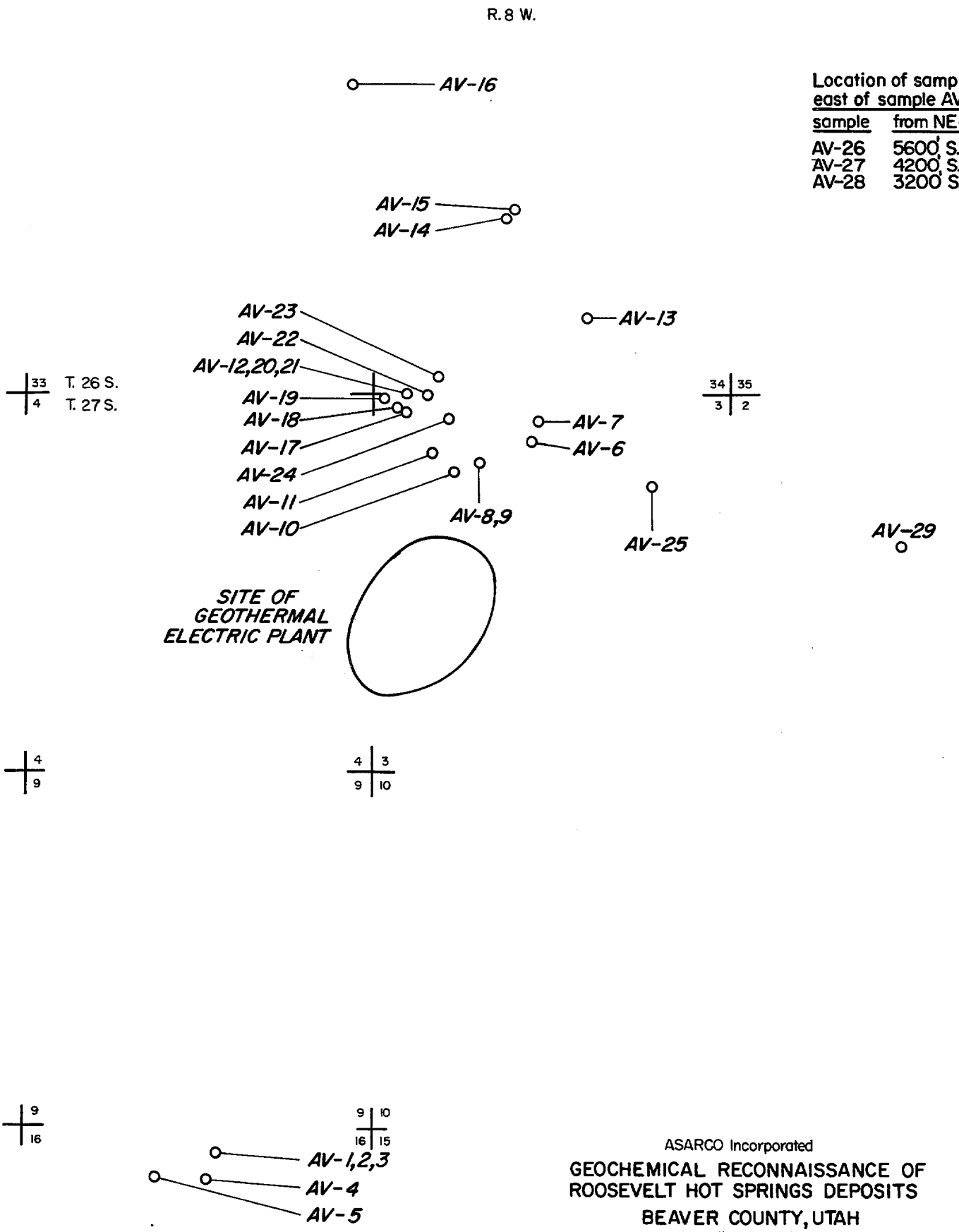
JOB NO. TAJ 243
PAGE 2

ITEM NO.	SAMPLE NO.
4 =	AV-19
15 =	COMP(AV-17,18,20)
16 =	COMP(AV-22,23)
17 =	COMP(AV-25,29)

ITEM	4	15	16	17
ELEMENT				
Fe	.7%	7%	10%	3%
Ca	.1%	.5%	.7%	1%
Mg	.2%	.7%	.7%	1%
Ag	<1	<1	<1	<1
As	<500	<500	<500	<500
B	<10	10	10	10
Ba	200	50	70	150
Be	<2	3	2	<2
Bi	<10	<10	<10	<10
Cd	<50	<50	<50	<50
Co	<5	5	7	7
Cr	15	10	10	20
Cu	2	15	30	70
Ga	<10	<10	10	<10
Ge	<20	<20	<20	<20
La	<20	70	100	50
Mn	20	700	700	1000
Mo	<2	<2	<2	<2
Nb	<20	50	50	20
Ni	5	30	50	20
Pb	<10	10	10	10
Sb	<100	<100	<100	<100
Sc	<10	10	15	<10
Sn	<10	<10	<10	<10
Sr	100	<100	<100	100
Ti	1500	5000	7000	7000
V	10	100	150	50
W	<50	<50	<50	<50
Y	<10	30	50	15
Zn	<200	<200	<200	<200
Zr	100	1500	2000	1000



Location of samples 1 mile east of sample AV-29

sample	from NE cor. sec. 2
AV-26	5600' S.43°E.
AV-27	4200' S.58°E.
AV-28	3200' S.64°E.

ASARCO Incorporated

GEOCHEMICAL RECONNAISSANCE OF ROOSEVELT HOT SPRINGS DEPOSITS

BEAVER COUNTY, UTAH

1" = 2000'

H.G.Kreis

Oct, 1983

mn 5595 dam

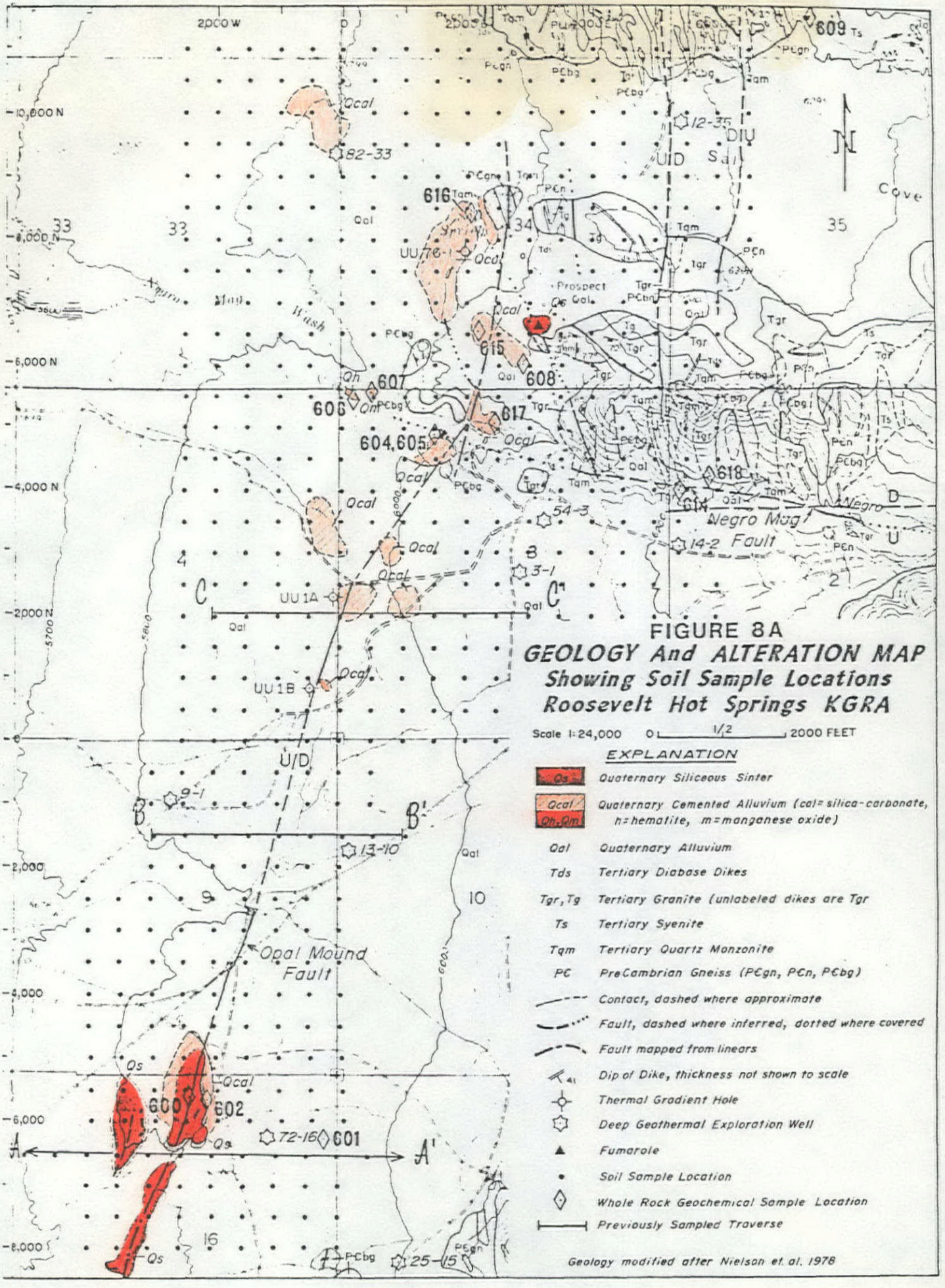


FIGURE 8A

GEOLOGY And ALTERATION MAP
Showing Soil Sample Locations
Roosevelt Hot Springs KGRA

Scale 1:24,000 0 1/2 2000 FEET

EXPLANATION

Qs	Quaternary Siliceous Sinter
Qcal / Qh, Qm	Quaternary Cemented Alluvium (cal = silica-carbonate, h = hematite, m = manganese oxide)
Qal	Quaternary Alluvium
Tds	Tertiary Diabase Dikes
Tgr, Tg	Tertiary Granite (unlabeled dikes are Tgr
Ts	Tertiary Syenite
Tqm	Tertiary Quartz Monzonite
PC	PreCambrian Gneiss (PCgn, PCn, PCbg)

Contact, dashed where approximate

Fault, dashed where inferred, dotted where covered

Fault mapped from linears

Dip of Dike, thickness not shown to scale

Thermal Gradient Hole

Deep Geothermal Exploration Well

Fumarole

Soil Sample Location

Whole Rock Geochemical Sample Location

Previously Sampled Traverse

Geology modified after Nielson et. al. 1978

~~JHC~~-ER File
J. H. C.

ASARCO EXPLORATION RECORD

[x] FIELD EXAMINATION [x] LITERATURE SEARCH [x] ASARCO FILE [ ] ~~SEP 20 1983~~

Section I General Indexing

① Name(s) of Property or Area	② Country	③ State or Province
PEQUOP WEST	USA Elko Co.	Nevada
	④ USGS Quad. Pequop Summit 7½'	⑤ File or Gore No.

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
41°04'N	114°36½'W	Wells	37N	65E	27	JDSell	7/7/83
						⑪ Office Tucson	⑫ Field Days ½

Section II Sources of Information

Date Typed 8/12/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Erickson, R. L., et al., 1966, Geochemical Reconnaissance in the Pequop Mountains and Wood Hills, Elko Co., NV: USGS Bull 1198-E.				
Stathis, G. J., 1969, Asarco Exploration Note File - Reconnaissance				

Section III Appraisal

⑭ Recommendations

- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [x] Cont. Recon.

⑮

- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [x] USGS Recon.
- [ ]
- [x] Geologic Concept
- [x] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
Not known		

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade
Not known		

⑱ Num. Drill Holes --
Approx Total Footage --

⑲ Excavations Not known

⑳ [x] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Gold-silver-lead-zinc expected

㉔ Ore Minerals-Major: ---- Minor:

㉕ Host Rocks-Major: Guilmette & Simson Dolomite Minor:

㉖ Age of Host Rocks: Devonian

㉗ Nature of Exposures: Brush covered but apparently adequate

㉘ Alteration: Carbonate replacement recrystallization

㉙ Total Extent:

㉚ Structure: NE trending fault structures

㉛ Ore Occurrence: Along structures and favorable beds

㉜ Age of Mineralization: Unknown

㉝ Conclusions & Recommendations: Continued evaluation of area of anomalous samples in zones of excellent carbonate recrystallization.

(For additional space use extra sheets)

Form Revised June 1980 - J.H.C. MW-5187

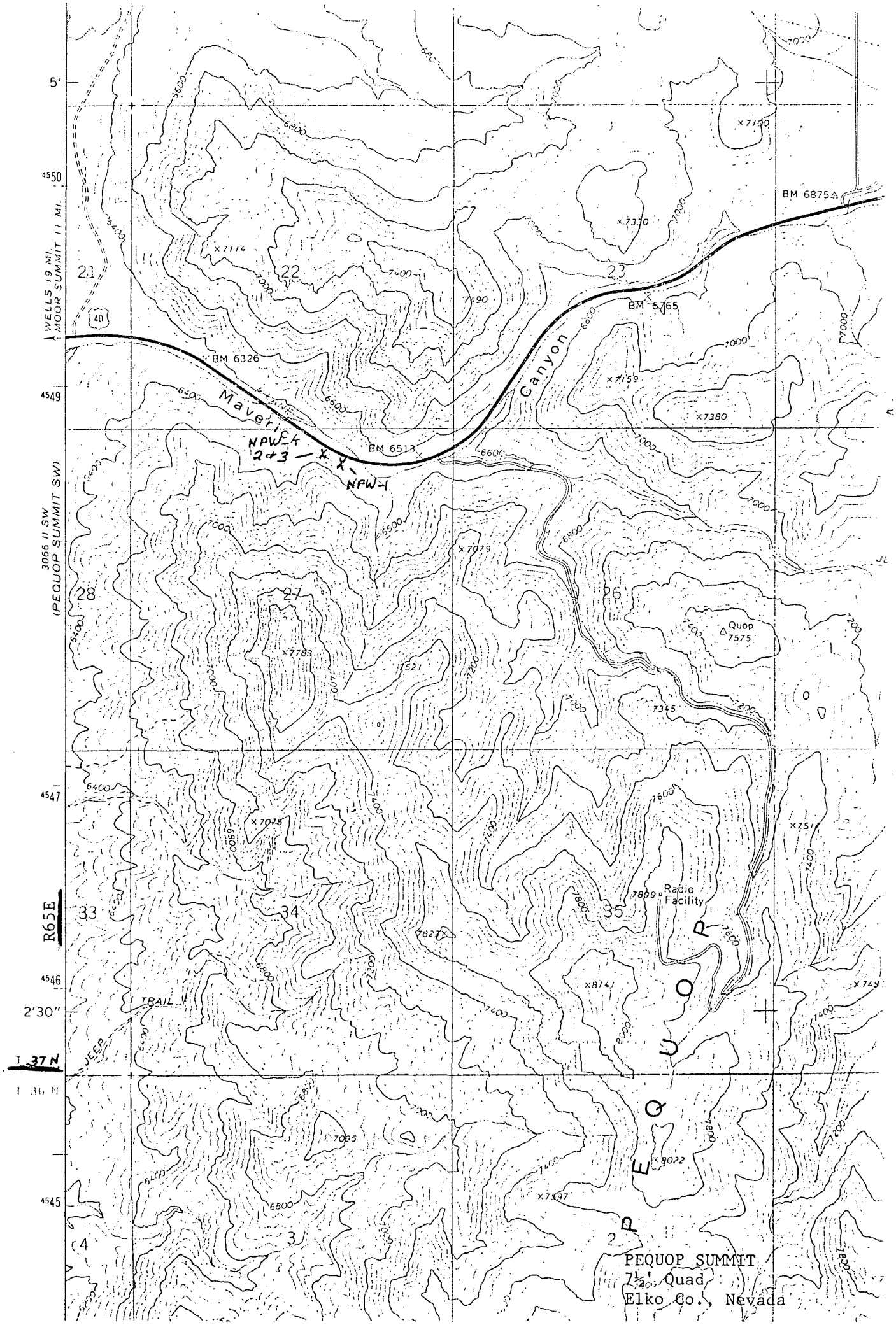
J. D. Sell - July 7, 1983
Description of Nevada Pequop West (NPW) Series 1 thru 3.
Pequop Summit, NV 7½' Quad
Sec. 27, T37N, R65E, Elko County, NV

About 2½ miles west of Pequop Summit, some 20 miles east of Wells on Interstate Highway - south side. Carbonate alteration is exposed with variable textures, some zones of yellow to red FeOx from 0.6 miles west of summit to 3.0 miles west of summit.

NPW-1. Road level, dark grey dolomite, recrystallized with dolomite-filled fragment zones and fossil trash. Some secondary dolomite vugs. Very fine textured, very thin-bedded, breaks hackly and into 1" blocks. Underlies a more massive overhanging unit.

NPW-2. Several hundred feet west. Same unit as #1 with replacement flare of dense brown silica, jasperoid, with surface coating of orange-brown ochre. Top of zone is at contact with overhanging unit.

NPW-3. Wall rock of #2, zebra textured lenses of secondary dolomite diminishing outward in both directions, from contact with #2 above, outward to type #1. About a 3 foot unit under overhang and equivalent to widest part of flare.



PEQUOP SUMMIT
7½' Quad
Elko Co., Nevada

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 294
July 27, 1983
JAMES D. SELL
NPW-1 THRU 3

ASARCO INCORPORATED
Attn: Mr. James D. Sell
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Nevada Pequop W. Zone
Elko Co, NV

Analysis of 3 Rock Chip Samples

ITEM	SAMPLE NO.	Au (ppm)
1	NPW-1	<.02
2	NPW-2	<.02
3	NPW-3	<.02

RECEIVED
JUL 29 1983
EXPLORATION DEPARTMENT

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
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Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 294
July 27, 1983
JAMES D. SELL
NPW-1 THRU 3

ASARCO INCORPORATED
Attn: Mr. James D. Sell
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 3 Rock Chip Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
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JOB NO. TAJ 294
PAGE 2

ITEM NO.	SAMPLE NO.
1 =	NPW-1
2 =	NPW-2
3 =	NPW-3

ITEM	1	2	3
ELEMENT			
Fe	.15%	>20%	.05%
Ca	>20%	.3%	>20%
Mg	>20%	.15%	>20%
Ag	<1	<1	<1
As	<500	<500	<500
B	<10	<10	<10
Ba	<10	>10000	<10
Be	<2	<2	<2
Bi	<10	<10	<10
Cd	<50	<50	<50
Co	<5	15	<5
Cr	<10	30	<10
Cu	2	70	<2
Ga	<10	15	<10
Ge	<20	<20	<20
La	<20	<20	<20
Mn	150	100	100
Mo	<2	15	<2
Nb	<20	50	<20
Ni	<5	300	<5
Pb	<10	500	<10
Sb	<100	150	<100
Sc	<10	<10	<10
Sn	<10	30	<10
Sr	<100	1000	<100
Ti	100	50	<20
V	15	300	10
W	<50	<50	<50
Y	<10	<10	<10
Zn	<200	5000	<200
Zr	<20	<20	<20

~~JHC~~ - ER

J. H C.

ASARCO EXPLORATION RECORD

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] _____

SEP 29 1983

Section I General Indexing

① Name(s) of Property or Area: MAMMOTH MINE Goldfield (Superstition) Mining District						② Country: USA	③ State or Province: ARIZONA
						④ USGS Quad.: Goldfield	⑤ File or Gore No.: Pinal County
⑥ Latitude: 33°27'30"	⑦ Longitude: 111°29'	⑧ AMS Sheet: Mesa	Township: 1N	Range: 8E	Section: 1	⑨ Examined by: HGKreis	⑩ Date: 7/7-8/83
						⑪ Office: Tucson	⑫ Field Days: 2

Section II Sources of Information

Date Typed 8/22/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Kruttschnitt, J.,	2/6/25	Prelim. Exam. Mammoth Mine	ASARCO Files	
Stuckless, J.S.,	1971,	Petrol. & Petrog. of Volc. w/Super. Caldera,	Stanford Ph.D. Diss.	

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [x] Too Low Grade
- [x] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [ ]

⑮
- [x] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ]
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
Au, Ag	7,100	Not reported

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade
Nil		

⑱ Num. Drill Holes 20(guess)
Approx Total Footage < 2000'

⑲ Excavations Open pit, trenches, dozer cuts

⑳ [x] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Au, Ag

㉔ Ore Minerals-Major: Native Au Minor:

㉕ Host Rocks-Major: Conglomerate Minor: Granite, Dacite

㉖ Age of Host Rocks: Tertiary (Cretaceous?) Precambrian, Tertiary(?)

㉗ Nature of Exposures: Thin gravel cover obscures most of the bedrock in the immediate area of interest. Good exposures in pits & trenches (see sample map).

㉘ Alteration: Generally weak clay-chlorite alteration; but locally, as at GF-4 to -8, there is moderately weak to (Cont.) ㉙ Total Extent: 1'-30' from mineralized structure.

㉚ Structure: On a district scale northwesterly striking, northeast dipping conglomerate and volcanics rest on p€ granite. These rocks have been offset by a series (Cont.)

㉛ Ore Occurrence: Mineralization consists of quartz and calcite veinlets, MnOx blebs and veinlets, and oxidized disseminations of pyrite. All the mineralization is strongly structurally (Cont.) ㉜ Age of Mineralization: Mid-Tertiary or younger.

㉝ Conclusions & Recommendations: The Mammoth Mine area was sampled because old mine maps suggested the possibility of large tonnages of 0.01 to 0.05 oz Au throughout the underground workings. Furthermore, a large pit (100' x 300' x 40' deep) was dug to mine low grade ore along the Mammoth vein outcrop. (Cont.)

(For additional space use extra sheets)

Form Revised: June 1960, JHC MHF-5/83

28. Alteration (continued)

moderately strong clay-sericite alteration. The conglomerate is often weathered and oxidized with a red stain from the mafic minerals. Precambrian granite on the mine dump near the Mammoth Mine shaft is fresh to strongly propylitically altered with up to 15% chlorite-epidote.

30. Structure (continued)

of parallel normal faults striking northeast and dipping to the west. In the immediate area of sampling, there are north-south striking, steeply dipping faults; and, to a lesser degree, steeply dipping cross faults.

31. Ore Occurrence (continued)

controlled by the north-south faults and the minor cross faults. Distinct, continuous vein filling mineralization, such as at GF-26, is not common. Most of the mineralization is "spotty-like" and occurs as discontinuous veinlets, blebs, and disseminations. The strongest alteration-mineralization, the areas of GF-4 to -7, appears to be caused by the intersection of a north-south fault(s) with cross faults.

Quartz veinlets are present in the conglomerate faces of the large pit. Its abundance ranges from trace to locally 3%, and it is most abundant (0.2-1%) along the east and southeast walls. Black calcite is locally present in veinlet form and is most abundant (3%) at GF-43.

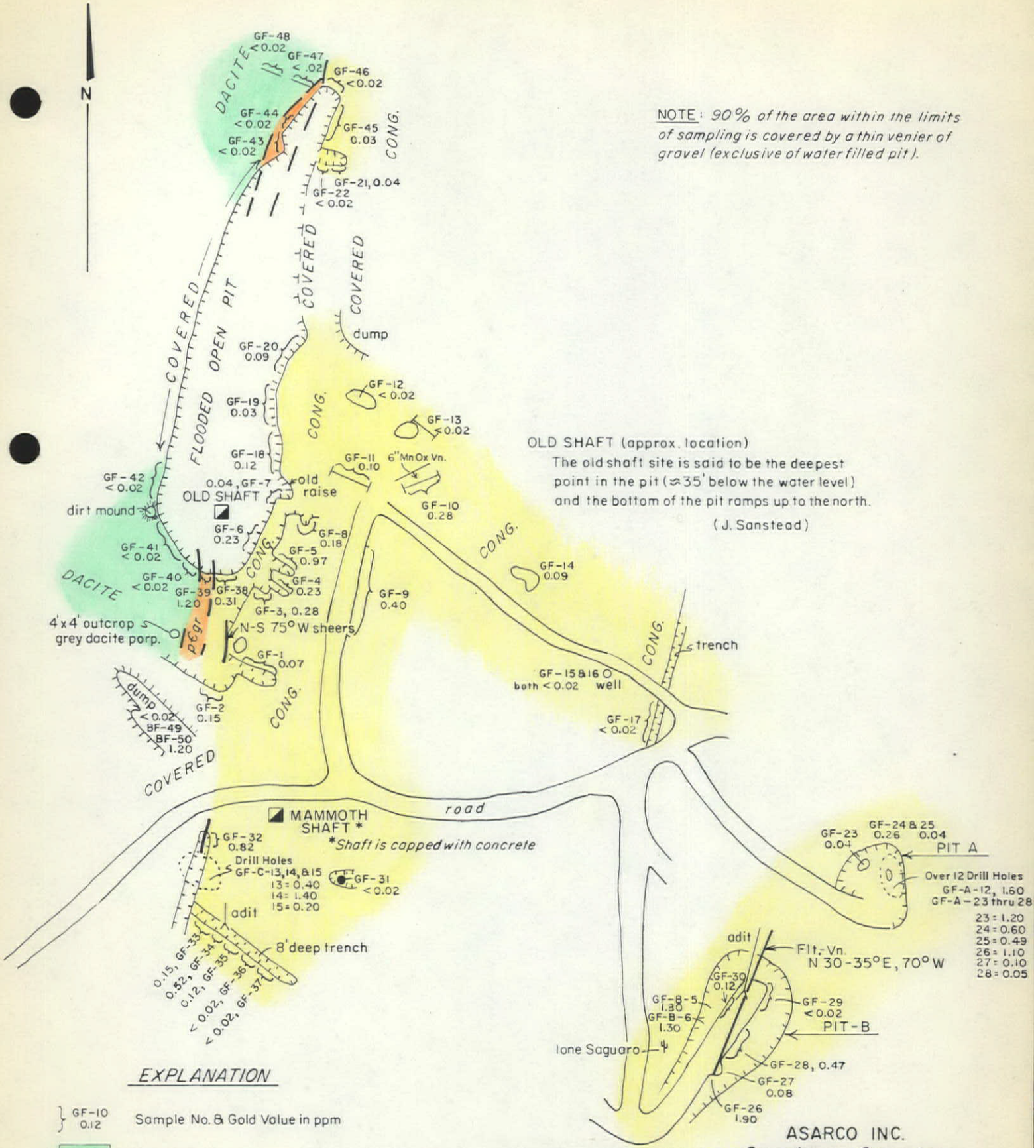
The abundance of former pyrite is difficult to estimate because of the local oxidation of magnetite. The area of GF-4 to -7 contained the highest former pyrite content with 1 to 5% (vol.).

MnOx as a weak (<0.2%) stain is common in oxidized conglomerate. Massive MnOx occurs as pods and vein mineralization in the area of samples GF-4 to -7 where it is locally present in amounts of up to 0.7%. A 6" thick fault-vein with MnOx is present near sample GF-10.

33. Conclusions & Recommendations (Continued)

Geochem sampling (see attached map) results show anomalous gold values in and near the mineralized fault structures. The gold values are too low to be of interest, and there is no reason to believe higher gold values in a large tonnage can be found on the property. There is no large tonnage potential, and the potential for significant vein mineralization is too small to be of interest to even a small operator.

SEC. 1 T. 1 N. R. 8 E.



TO ACCOMPANY Exploration Record Sheet
DATED Aug. 29, 1983
BY H. G. Kreis

ASARCO INC.
Geochem Samples
MAMMOTH MINE
PINAL COUNTY, ARIZONA
BRUNTON – PACE MAP
Scale: 1" = 100'

H. G. Kreis July 7 & 8, 1983

MVK-5522

MAMMOTH MINE

GOLDFIELD DISTRICT

Pinal County, Arizona

Sample #	Sample Length & Site (6 lb. Samples)	Rock Type	Alteration*	% Quartz Veining	% FeOx (Reddish Brown)	% Former Sulfides	% MnOx	Gold (ppm)	Remarks
GF- 1	40', E-W trench	Cong.	W	0	0.5	0	0.1	.07	
- 2	30', E-W trench	p€gr(?)	W,B	0.2	1	0	0.1	.15	Highly fractured.
- 3	20', E-W face	Cong.	W,B	0.2	1	Tr	0.1	.28	Steep fracturing.
- 4	25', E-W trench	Cong.	C	0.5	2-3	2-3	0.3	.23	
- 5	25', E-W trench	Cong.	C	0.5	3	2-3	0.7	.97	
- 6	30', N-S face	Cong.	C	3	5	5	0.5	.23	
- 7	30', face	Cong.	B-C	0.5	1	1	0.2	.04	Variable alt.-min.
- 8	10' x 10' trench	Cong.	B-C	0.5	1	1	0.2	.18	
- 9	70', gully in road	Cong.	W	0	1	0	0.1	.40	
-10	10' x 30', dozer scrape	Cong.	W,B	0	2	Tr	Tr	.28	20' east of MnOx vn.
-11	5' x 25', dozer scrape	Cong.	W	0	1	0	Tr	.10	
-12	20' x 20', dozer scrape	Cong.	W	0	0.5	0	Tr	<.02	
-13	15' x 10', dozer scrape	Cong.	W	0	0	0	0	<.02	
-14	20' x 10', dozer scrape	Cong.(?)	W	0	0.5	0	0	.09	
-15	Cuttings, So. row	Cong.(?)	-	-	Tr	-	-	<.02	
-16	Cuttings, No. row	Cong.(?)	-	-	-	-	-	<.02	
-17	30', trench	Cong.	W	0	0	0	0	<.02	

Sample #	Sample Length & Site (6 lb. Samples)	Rock Type	Alteration*	% Quartz Veining	% FeOx (Reddish Brown)	% Former Sulfides	% MnOx	Gold (ppm)	Remarks
GF-18	30', face	Cong.	B	1	1	1	0.2	.12	
-19	40', face	Cong.	B	1	1	1	0.1	.03	
-20	30', face	Cong.	B	0.1	1	0.5	Tr	.09	
-21	10', trench	Cong.	B	1	0.5	0.3	Tr	.04	
-22	15', trench	Cong.	B	0.2	0.5	Tr	0.1	<.02	
-23	10' x 10', dozer scrape	Cong.	B	0.2	2	0.2	0.1	.04	
-24	2' x 20', dozer scrape	Cong.	B	0.2	3	0.2(?)	0.1	.26	Rib between drill holes.
-25	Dozer piles	Cong.	B	0.2	3	0.2(?)	0.1	.04	Dozer cut debris of GF-24.
-26	3' thick vein	Cal.>Qtz>MnOx	-	-	-	Tr	8	1.90	N10°E, 60°W vein.
-27	5' x 5', face	Cong.	A	0	Tr	Tr	0.1	.08	F.W., 3' from CF-26.
-28	5' x 30', face	Cong	A	Tr	Tr	0	0	.47	5'-10' from vein.
-29	5' x 20', face	Cong.	A	Tr	Tr	0	0	<.02	20'-30' from vein.
-30	5' x 20', face	Cong.	B	Tr	2	0	0	.12	H.W., 10' from vein.
-31	3' x 4', dozer scrape	Cong.	W	0	0	0	0	<.02	
-32	4' x 6', face	Cong.	C-D	Tr	4	1(?)	Tr	.82	Along flt.-vn.
-33	15', trench	Cong.	B	Tr	Tr	0	Tr	.15	
-34	5', trench	Cong.	C	Tr	4	1	Tr	.52	3' wide, N-S, 75°W, flt.-vn.
-35	15', trench	Cong.	A	0	Tr	0	0.1	.12	
-36	20', trench	Cong.	A	0	0	0	0	<.02	Large clasts excluded.
-37	20', trench	Cong.	A	0	0	0	0.1	<.02	
-38	15', face	Cong.>porph.	C	2	2	0.5	0.1	.31	
-39	5', face	p€gr.	B	1	Tr	0	Tr	1.20	

Sample #	Sample Length & Site (6 lb. Samples)	Rock Type	Alteration*	% Quartz Veining	% FeOx (Reddish Brown)	% Former Sulfides	% MnOx	Gold (ppm)	Remarks
GF-40	20', face	Dac.	C	0	5	0.5-5	Tr	<.02	
-41	35', face	Dac.	C	Tr	1	<0.5	Tr	<.02	
-42	40', face	Dac.	C	Tr	1	<0.5	Tr	<.02	
-43	15', face	p€gr.	W,B-C	Tr	2	<0.5	1	<.02	3% blk. calcite.
-44	20', face	p€gr.	W,B	Tr	2	<0.5	0.5	<.02	1% blk. calcite.
-45	30', face	Cong.	A	0	0.5	0	0	.03	
-46	20', face	Cong.	A	Tr	0.5	0	0	<.02	
-47	15', outcrop	Dac.	W,C	Tr	2	<1	Tr	<.02	
-48	15', outcrop	Dac.	W,C	Tr	2	<1	Tr	<.02	
-49	Dump sample	p€gr.	E	Tr	Tr	0	0	<.02	Selected pieces.
-50	Dump sample	p€gr.	-	-	-	-	-	1.20	30', 2" below surface.
GF-A-12	Percussion drill cuttings**							1.60	
GF-A-23	" " "							1.20	
GF-A-24	" " "							.60	
GF-A-25	" " "							.49	
GF-A-26	" " "							1.10	
GF-A-27	" " "							.10	
GF-A-28	" " "							.05	
GF-B- 5	" " "							1.80	
GF-B- 6	" " "							1.30	
GF-C-13	" " "							.40	
GF-C-14	" " "							1.40	
GF-C-15	" " "							.20	

*Alteration Explanation:

W = Strongly weathered.

A = Nill alteration.

B = Weak clay-chlorite alteration of biotite and plagioclase.

C = Moderate clay-chlorite-sericite alteration of biotite and plagioclase.

D = Strong clay-sericite alteration of biotite, plagioclase, and K-feldspar.

E = Strong propylitic alteration.

**Remark: Percussion drill holes were either set up in fault-vein structures or set to one side but angled toward the fault-vein structures.

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 291
July 26, 1983
H.G. KREIS
GF-1 THRU GF-C-15

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 50 Rock Chips and 12 Drill Cutting Samples

ITEM	SAMPLE NO. (All samples ±6 lbs.)	Au (ppm)
1	GF-1	.07
2	GF-2	.15
3	GF-3	.28
4	GF-4	.23
5	GF-5	.97
6	GF-6	.23
7	GF-7	.04
8	GF-8	.18
9	GF-9	.40
10	GF-10	.28
11	GF-11	.10
12	GF-12	<.02
13	GF-13	<.02
14	GF-14	.09
15	GF-15	<.02
16	GF-16	<.02
17	GF-17	<.02
18	GF-18	.12
19	GF-19	.03
20	GF-20	.09
21	GF-21	.04
22	GF-22	<.02
23	GF-23	.04
24	GF-24	.26
25	GF-25	.04

SKYLINE LABS, INC.
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Tucson, Arizona 85703
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JOB NO. TAJ 291
July 26, 1983
PAGE 2

ITEM	SAMPLE NO.	Au (ppm)
26	GF-26	1.90
27	GF-27	.08
28	GF-28	.47
29	GF-29	<.02
30	GF-30	.12
31	GF-31	<.02
32	GF-32	.82
33	GF-33	.15
34	GF-34	.52
35	GF-35	.12
36	GF-36	<.02
37	GF-37	<.02
38	GF-38	.31
39	GF-39	1.20
40	GF-40	<.02
41	GF-41	<.02
42	GF-42	<.02
43	GF-43	<.02
44	GF-44	<.02
45	GF-45	.03
46	GF-46	<.02
47	GF-47	<.02
48	GF-48	<.02
49	GF-49	<.02
50	GF-50	1.20

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 291
July 26, 1983
PAGE 3

ITEM	SAMPLE NO.	Au (ppm)
51	GF-A-12	1.60
52	GF-A-23	1.20
53	GF-A-24	.60
54	GF-A-25	.49
55	GF-A-26	1.10
56	GF-A-27	.10
57	GF-A-28	.05
58	GF-B-5	1.80
59	GF-B-6	1.30
60	GF-C-13	.40
61	GF-C-14	1.40
62	GF-C-15	.20

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. James D. Sell

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 291
July 26, 1983
H.G. KREIS
GF-1 THRU GF-C-15

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 6 Composite Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
DATE SIGNED
Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 291
PAGE 2

ITEM NO.	SAMPLE NO.
63	= COMP(GF-1,2)
64	= COMP(GF3,4,38,39,40)
65	= COMP(GF-21,22,46,47)
66	= COMP(GF-33,34,35,36,37)
67	= COMP(GF-28,29,30)
68	= COMP(GF-23,24,25)

ITEM	63	64	65	66	67	68
ELEMENT						
Fe	2%	3%	3%	3%	3%	3%
Ca	.15%	1%	3%	.7%	2%	2%
Mg	1%	1.5%	3%	1%	1.5%	.7%
Ag	1.5	3	5	<1	1.5	5
As	<500	<500	<500	<500	<500	<500
B	<10	<10	<10	<10	<10	10
Ba	500	500	500	500	500	500
Be	<2	<2	<2	<2	<2	<2
Bi	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50
Co	<5	15	15	5	10	7
Cr	50	70	150	50	50	100
Cu	70	70	20	70	30	70
Ga	<10	<10	10	10	10	10
Ge	<20	<20	<20	<20	<20	<20
La	<20	30	20	<20	<20	<20
Mn	2000	3000	2000	2000	2000	700
Mo	7	2	<2	<2	<2	<2
Nb	<20	20	20	20	20	20
Ni	20	200	300	30	50	50
Pb	3000	2000	50	1500	200	3000
Sb	<100	<100	<100	<100	<100	<100
Sc	<10	10	10	10	<10	<10
Sn	<10	<10	<10	<10	<10	<10
Sr	<100	300	150	150	150	200
Ti	3000	3000	3000	3000	3000	3000
V	70	70	70	100	70	100
W	<50	<50	<50	<50	<50	<50
Y	15	10	10	20	10	10
Zn	3000	1500	200	1000	500	1000
Zr	100	70	100	100	100	100

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

~~JHC~~ - ERS File

ASARCO EXPLORATION RECORD

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] J. H C.

SEP 26 1983

Section I General Indexing

① Name(s) of Property or Area	② Country	③ State or Province
BRUNEAU MINE	USA Elko County	Nevada
	④ USGS Quad. Rowland 15'	⑤ File or Gore No.

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
N41°56'	W115°41'	Wells	47N	56E	29	JDSell	7/6-7/83
						⑪ Office: Tucson	⑫ Field Days: 2

Section II Sources of Information

Date Typed 8/10/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Bushnell, K. O., 1967, Geol. of the Rowland Quad, Elko Co., NV: Nev. Bur. Mines Bull.56, 38 p. (Not available in Tucson office)				

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [x] Too Low Grade
- [x] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [ ]

⑮
- [x] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ]
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
Have not checked reference		

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade

⑱ Num. Drill Holes _____ Approx Total Footage _____

⑲ Excavations: Small surface stopes

⑳ [x] Spectro. Analysis Attached ㉑ [x] Assays Attached ㉒ [x] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Gold-silver

㉔ Ore Minerals-Major: Unknown Minor:

㉕ Host Rocks-Major: Limestone Minor:

㉖ Age of Host Rocks: Devonian-Mississippian

㉗ Nature of Exposures: Good bedrock exposures being covered by late welded ash-flow tuffs and basalts burying ridges of sediments.

㉘ Alteration: Weak recrystallization

㉙ Total Extent: One mile, strike length

㉚ Structure: Massive 1000±' wide quartz-quartzite bx striking N30°E, with subparallel shears in adjacent limestone.

㉛ Ore Occurrence: Shears in limestone mineralized with some stoping.

㉜ Age of Mineralization: Unknown

㉝ Conclusions & Recommendations: Interesting values in small shears and shoots in limestone, no values in large massive, brecciated silica units capable of tonnage. Other FeOx zones in district may be related to ring structures.

(For additional space use extra sheets)

Form Revised-June 1980-J.H.C. MVK-5193

ASARCO

Southwestern Exploration Division

August 10, 1983

File Memorandum

Bruneau Mine Area
NBR-Series
Elko County, NV

Mr. George Morse, prospector-mine hopeful, had been in touch with me regarding the gold placer which he was working on Meadow Creek near bridge 5099, S½, Sec. 5, T47N, R56E, Elko County, Nevada.

George apparently has a small set-up and had reported gold-platinum in the recovered black sands. In April he was in Reno "working" with the U. S. Bureau of Mines on running some platinum group analyses. The promised results have not yet arrived at this office.

On July 6 & 7, I visited the area and found that Morse and the equipment had been moved out. In talking with the people at the Ken Howard Ranch (Budge Rizzi on map) it seems that the Morse group pulled out around June 22, the date on a paper left in one of the sagging tents.

Figure 1 is the topo of the area, showing the rock chip sample sites. Descriptions of these eight samples follow as Attachment A. The gold-silver assays on all eight are on Attachment B as well as the spectrographic analysis of the first four NBR-series samples.

As noted, the first two samples collected in the iron oxide masses from the Bruneau Mine area show detectable gold and silver and also have interesting arsenic, bismuth, moly, nickel, and zinc geochemical values. The material was collected from relatively narrow vein structures in limestone (sample 3). A massive silica-quartzite-quartzite breccia mass up to 1200 feet wide extends for over a mile before being covered on both ends by late basaltic volcanics. Sample 4 was collected uphill from the mine workings, and samples 5 thru 8 were collected along a 750 foot traverse across the siliceous mass where the Bruneau River has cut through. Though iron oxide is present as shear-fillings and rambling cross-cutting features, almost no gold or silver was reported from the samples.

The ERS is attached.

James D. Sell

JDS/cg

Attachments

Attachment A

J. D. Sell - July 6, 1983
Description of Nevada Bruneau Rowland (NBR) Series 1 thru 8.
Rowland, Nevada-Idaho Quad (15')
Sec. 29, T47N, R56E, Elko County, NV

NBR-1. In upper (middle) adit workings dump (first above map symbol). Hi-grade stockpile at dump, pulverulent, red-brown, some orange, FeOx; some dense masses, as replacement of sandy, silicified limestone (looks like quartzite in hand specimen). Some white-clear stubby crystals (zinc?) in ¼", or less, vugs.

NBR-2. Sandy FeOx pods and seams (as #1 above), left on walls of stope-vein striking N30°E, 80°W dipping; cutting N30°E, 65°W dipping limestone beds which have seams of FeOx. Some quartz breccia pods. Stope cut is 2' wide by 50-60' long. Vein is variable in dip (but more or less conformable to bedding shear) and thickness and on south end pinches(?) to 2"-4" wide.

NBR-3. Some 25' of FW of vein structure, sandy limestone with few FeOx seams, becomes quite sandy near stope wall, then silicified somewhat. Also medium recrystallized lens in vicinity of stope. (±100 feet east to limestone-quartzite contact.)

NBR-4. Quartzite, mostly white, with weak yellow-brown FeOx coloration. Note, this unit to south on hill 5767 has sharp color contrast to east of peak, extending to west 200-400 feet, and cut by many wandering zones of yellow FeOx.

NBR-5. At junction of road-river at bridge. Starting on west. Quartzite breccia with NE shears, some FeOx and seam-bx filling (6' cut).

NBR-6. About 250 feet east, up-river, from #5. Sample of massive rock fall of brecciated quartzite and intrabedded slate(?) (or finely sheared quartzite) with red-orange-yellow FeOx stains, pods, and in matrix.

(Note: Along this section of river shows a set of N45°W shears, but these appear to be clean and do not rebrecciate the quartzite but does displace the NE zones somewhat.)

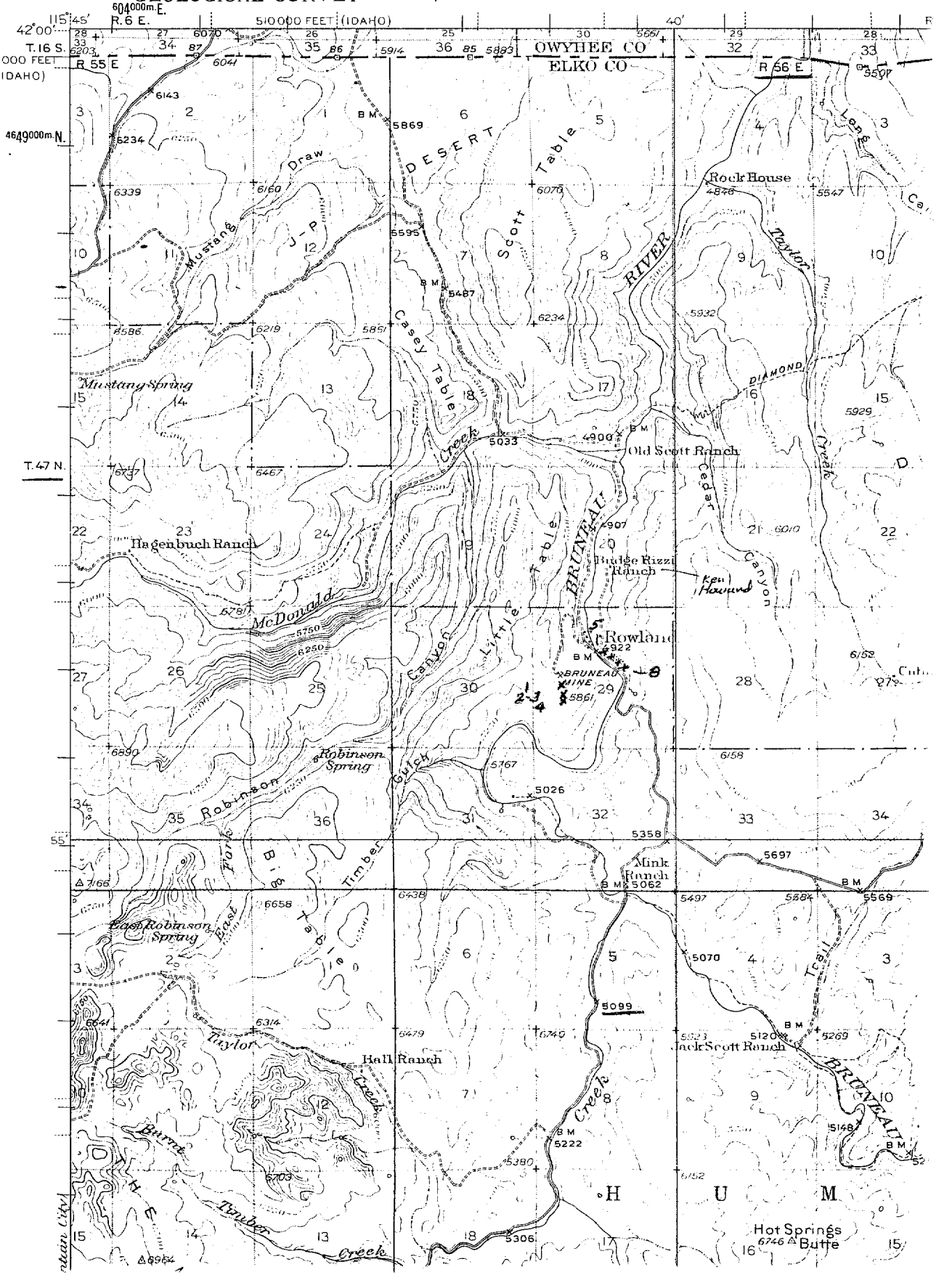
NBR-7. About 500 feet east, up-river, from #5. Outcrop sample of rubblized quartzite with FeOx stain and filling.

NBR-8. About 750' east, up-river, from #5. (Ends just west of cattleguard, but outcrops continue to east on up the hillside.) Sample of FeOx in quartzite breccia, some FeOx stain, with white quartz veins cutting.

FIGURE 1

Rowland 15' Quad.
Nevada - Idaho

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



Attachment B

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

INVOICE
NET 30 DAYS

JOB NO.TAJ 295
August 4, 1983
JAMES D. SELL
NBR-1 THRU 8

ASARCO INCORPORATED
Attn: Mr. James D. Sell
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 8 Rock Chip Samples

8 Au(ppm)	@ $ 3.69**.....$	29.52
8 Ag(ppm)	@ $ 2.34**.....$	18.72
4 SPEC	@ $14.40**.....$	57.60
8 Samples crushed, split and pulverized	@ $ 2.20.$	17.60

TOTAL $ 123.44

** Quantity discount

INVOICE COPY

signed for 8/8/83
to accounting

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 295
August 4, 1983
JAMES D. SELL
NBR-1 THRU 8

ASARCO INCORPORATED
Attn: Mr. James D. Sell
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Nevada Primeau Lowland Area
Elko Co, NV

Analysis of 8 Rock Chip Samples

ITEM	SAMPLE NO.	Au (ppm)	Ag (ppm)
1	NBR-1	>10.00 *	1.4
2	NBR-2	>10.00 *	1.4
3	NBR-3	<.02	.2
4	NBR-4	<.02	<.2
5	NBR-5	<.02	.2
6	NBR-6	<.02	3.0
7	NBR-7	<.02	<.2
8	NBR-8	<.02	<.2

*NOTE: Fire assay results to follow as TAJ 295-A.

REGISTERED ASSAYER CERTIFICATE NO. 9427 CHARLES E. THOMPSON DATE SIGNED 8/5/83 Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 295
August 4, 1983
JAMES D. SELL
NBR-1 THRU 8

ASARCO INCORPORATED
Attn: Mr. James D. Sell
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 4 Rock Chip Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER CERTIFICATE NO. 9427 CHARLES E. THOMPSON DATE SIGNED 8/5/83 Arizona U. S. A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 295
PAGE 2

ITEM NO.	SAMPLE NO.
1	NBR-1
2	NBR-2
3	NBR-3
4	NBR-4

ITEM	1	2	3	4
ELEMENT				
Fe	>20%	15%	1%	.5%
Ca	.3%	7%	>20%	.02%
Mg	.07%	.07%	.2%	.05%
Ag	2	3	<1	<1
As	1500	500	<500	<500
B	10	20	<10	<10
Ba	70	150	100	<10
Be	15	7	<2	<2
Bi	200	150	<10	<10
Cd	<50	<50	<50	<50
Co	70	20	<5	<5
Cr	30	50	30	150
Cu	300	150	5	3
Ga	15	10	<10	<10
Ge	30	20	<20	<20
La	<20	<20	<20	<20
Mn	500	300	200	15
Mo	20	7	<2	<2
Nb	30	20	<20	<20
Ni	700	300	15	15
Pb	100	50	<10	<10
Sb	300	150	<100	<100
Sc	<10	<10	<10	<10
Sn	30	15	<10	<10
Sr	<100	<100	<100	<100
Ti	1000	1500	1500	300
V	300	150	50	50
W	200	70	<50	<50
Y	70	30	15	<10
Zn	3000	1500	<200	<200
Zr	30	30	<20	50

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 295A
August 10, 1983
JAMES D. SELL
NBR-1 THRU 8

ASARCO INCORPORATED
Attn: Mr. James D. Sell
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 2 Pulp Samples

ITEM	SAMPLE NO.	FIRE ASSAY Au (oz/t)	FIRE ASSAY Ag (oz/t)
1	NBR-1	1.000	<.01
2	NBR-2	1.260	.10

REGISTERED ASSAYER CERTIFICATE NO. 9427 CHARLES E. THOMPSON DULY SIGNED Arizona U.S.A.

William L. Lehmbeck
Manager

RECEIVED
AUG 12 1983
S. W. U. S. EXPL. DIV.

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2)

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ek in NW¼ sec. 29
6 E. The Star Metal
the Gribble Quartz
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letal mine has pro-
, the Gribble Quartz
etal mine, stibnite is
e fault. Some schee-
to 1.5 percent tung-
ntimony, and small
Gribble Quartz mine,
ue.

n (3)

ims on the peak and
ain (secs. 16 and 17,
are held by Messrs.
n City. Active pros-
e carried out during

Tennessee Gulch (7)

This mining district was once active but is now abandoned. It lies north of Tennessee Mountain and includes several mines and prospects. Some gold was produced from fissure veins in the Coffeepot stock and placer deposits. A mill was constructed and is still present near Parks Cabin.

Bruneau Mine (8)

This mine is located near Rowland, in NW¼ sec. 29, T. 47 N., R. 56 E. Two tunnels were excavated along fissure veins in the Diamond A Formation, and a mill and barracks were constructed. A small amount of gold was produced.

Deep Creek (9)

Several tunnels were driven in the Diamond A Formation on the east side of Deep Creek (SE¼ sec. 24, T. 47 N., R. 56 E.). The claims are now abandoned and the tunnels have caved. Perhaps a minor amount of gold was produced.

Bearpaw Mountain (10)

Several tunnels were driven along quartz fissure veins in the Diamond A Formation and unit Pza, (SW¼ sec. 17, T. 47 N., R. 57 E.). The claims have been abandoned after a minor amount of gold was produced.

Copper Mountains (11)

Several tunnels were excavated in the Prospect Mountain(?) Quartzite on the west side of peak 9146. A mill was constructed so presumably some ore was produced.

Mineral
NW Sec Mon
Bull. 56

JHC → ER File
J. H. C.

ASARCO EXPLORATION RECORD

[X] FIELD EXAMINATION [ ] LITERATURE SEARCH [X] ASARCO FILE [ ] SEP 29 1983

Section I General Indexing

① Name(s) of Property or Area: ANNIE LAURIE MINE and Sevier Mine Area Gold Mountain Mining District					② Country: Piute Co.	③ State or Province: UTAH	
					④ USGS Quad.: Delano Peak, NW	⑤ File or Gore No.	
⑥ Latitude: 38°29'	⑦ Longitude: 112°24'	⑧ AMS Sheet: Richfield	Township: 27S	Range: 5W	Section: 2,3, 4,9 10,11	⑨ Examined by: HGKreis/JDSell	⑩ Date: 6/28/83
					⑪ Office: SWED Tucson	⑫ Field Days: 1	

Section II Sources of Information

Date Typed 6/29/83

⑬ References

Author	Date	Title	Publications	Vol. No.
ASARCO File Reports by Zalinski (1915), Clement (1922), Young (1930), Schrader (1935,1936), Kennedy (1968,1975), and Park (1981,1982).				
Callaghan,E., 1973, Mine Res. Potential of Piute Co.,UT, G.& M.S. Bull. 102				

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [X] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [ ]

⑮
- [X] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ]
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
Au-Ag	570,000	0.28*oz. Au & 1.03*oz. Ag

*Grade based on ounces produced

⑰ Reserves
- [ ] Measured
- [X] Estimated

Commodity	Tons	Grade
Au-Ag	400,000(possible) (See Clements report)	0.26 oz Au & 3.0 oz Ag

⑱ Num. Drill Holes 9
Approx Total Footage 4300

⑲ Excavations UG Workings, pits, and trenches.

⑳ [ ] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [ ] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Gold-silver

㉔ Ore Minerals-Major: Native Au, Ag-MnOx; Minor:

㉕ Host Rocks-Major: Qtz. monz. porp.; Minor:

㉖ Age of Host Rocks: Miocene & Oligocene

㉗ Nature of Exposures: Glacial till covers nearly all of the Annie Laurie vein. In the Sevier vein area the wall rock is well exposed but the vein(s) was extensively covered by talis and snow.

㉘ Alteration: Weak to strong pervasive propylitic alt. and strong clay-chlorite next to veins.

㉙ Total Extent: Not determined.

㉚ Structure: Annie Laurie vein: N20-25°W, 55-65°SW dip; and ore rakes 40° to north. Sevier vein: N30-40°W, 50-65°E dip. Former mining widths av. 12' or less.

㉛ Ore Occurrence: Gold and silver occur in partially oxidized quartz-calcite veins with 0.5% MnOx, 1% total sulfides, and local barite.

㉜ Age of Mineralization: Oligocene

㉝ Conclusions & Recommendations: The Annie Laurie vein mineralization thins and loses continuity to the south as reported in descriptions of the underground mine geology and in geologic logs of recent drill holes (KC-1 to KC-6). Likewise, 0.1-0.3 oz. gold mineralization within the vein mineralization becomes less common to the south. The best potential for finding ore is along its northerly rake beneath the 4th level. However, the negative results of drill hole KC-9, a rotary drill hole to test this

(continued on attached sheet)

(For additional space use extra sheets)

ANNIE LAURIE MINE (continued)

potential, substantially reduces the potential of finding gold reserves of interest to Asarco.

The potential for ore in the Sevier area is minimal and not of interest to Asarco. The old mining records suggested there was no ore in the lower workings of the Sevier Mine and this was confirmed by the lack of vein mineralization in KC-8, a core hole to test the Sevier vein projection at depth.

The property is currently leased by a group of private investors that is headed by Sam Arentz of Salt Lake City, Utah. Arentz is conducting a VLF survey over the Sevier vein area and is planning core drill holes to test the Annie Laurie vein beneath the 4th level and the downward projection of the Grasshopper Mine. Drilling of the Mammoth Mine area is also planned.

The potential of the Annie Laurie-Sevier area is not sufficient to warrant ASARCO interest at this time. The property will be reevaluated if Arentz's drill holes indicate a substantial improvement of gold mineralization at depth.

~~JHC~~ → ER FILE
J. H. C.

ASARCO EXPLORATION RECORD

[X] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] ~~SEP 29 1983~~

Section I General Indexing

① Name(s) of Property or Area: UNNAMED (Fish Springs Section 1)						② Country: USA Juab Co.	③ State or Province: UT
						④ USGS Quad: Fish Springs SW	⑤ File or Gore No.
⑥ Latitude: 39° 48'N	⑦ Longitude: 113°29½'W	⑧ AMS Sheet: Fish Springs SW	Township: 12S	Range: 15W	Section: E½ 1	⑨ Examined by: JDSell	⑩ Date: 5/15/83
						⑪ Office: Tucson	⑫ Field Days: ¼

Section II Sources of Information

Date Typed 5/20/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Hintze, L. F., 1980, Prel. Geol. Map of Fish Springs NW and Fish Springs SW Quads, Utah. USGS MF-1148 map series.				

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [X] Status Inves

⑮
- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [X] Favorable Jasperoid Cove

- [X] Map symbol + adjacent Crypto group
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly

⑯ Production

Commodity	Tons	Grade
None visible		

⑰ Reserves
- [ ] Measured
- [ ] Estimated

Commodity	Tons	Grade

⑱ Num. Drill Holes: None known
Approx Total Footage:

⑲ Excavations: None Seen

⑳ [X] Spectro. Analysis Attached ㉑ [X] Assays Attached ㉒ [ ] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals

㉔ Ore Minerals-Major: Sampled for gold-silver Minor: ½° pyrite as FeOx

㉕ Host Rocks-Major: Silicified dolomite & jasperoid Minor:

㉖ Age of Host Rocks: Silurian Laketown dolomite (undivided).

㉗ Nature of Exposures: Triangular 1600' base by 700' height pointing to alluvium on all sides but base. Good, low hills & ridges, exposures.

㉘ Alteration: Silica replacement, addition, and jasperoid development along N-S faults, some NW-NE cross-links

㉙ Total Extent: Triangular 1600'h x 700'h

㉚ Structure: A number of N-S faults and shear structures. Basin-&-Range?

㉛ Ore Occurrence: Being tested, sample FS- Sec.1-1.

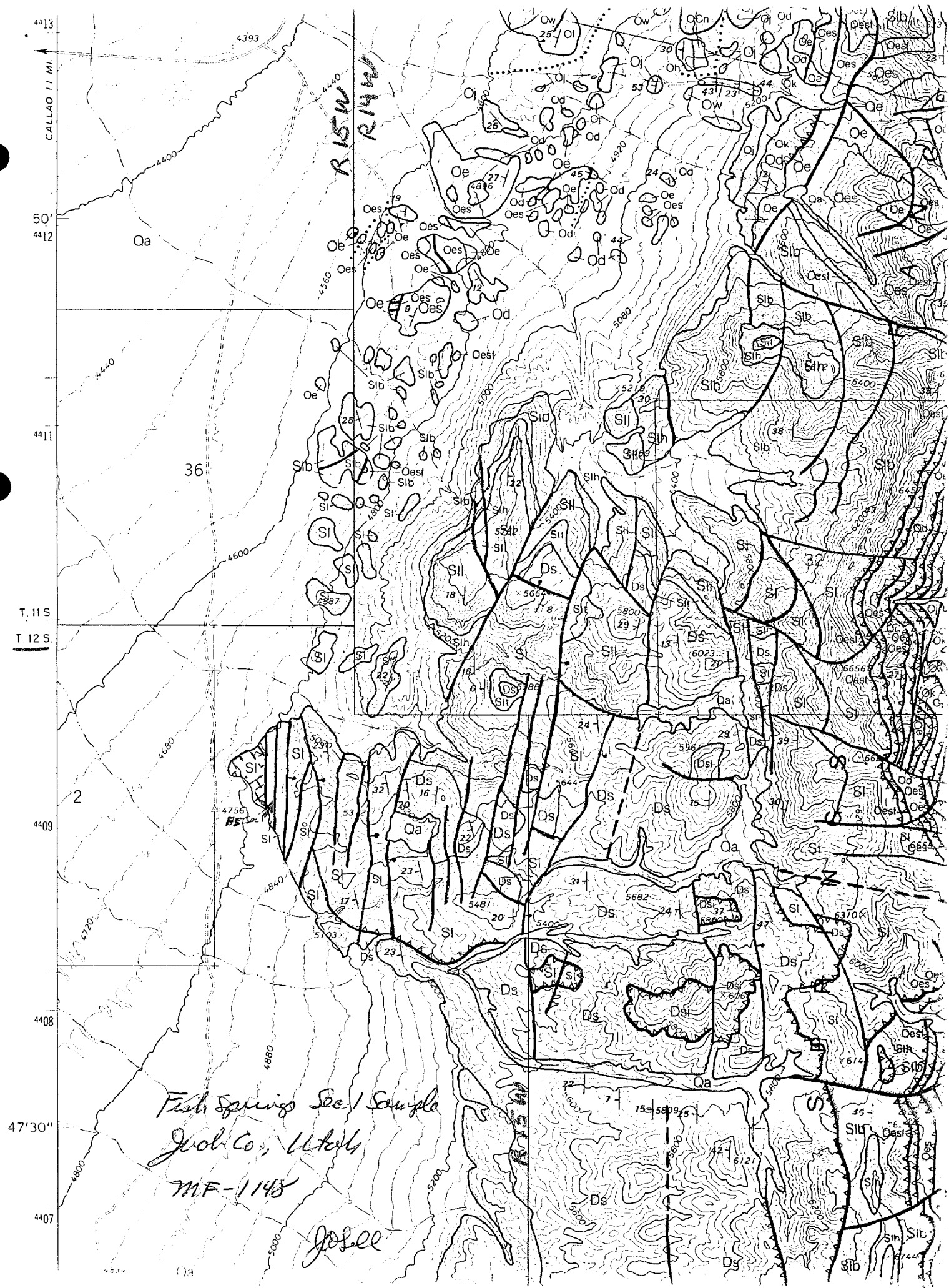
㉜ Age of Mineralization

㉝ Conclusions & Recommendations: Comprehensive sampling if initial sample warrants. Land status has been requested. Possible staking of surrounding area.

?

(For additional space use extra sheets)

Form Revised-June 1980-J.H.C. MVK-5193


CALLAO 11 MI.
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Fish Springs Sec 1 Sample
Juab Co., Utah
MF-1148
Josell

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 281
June 10, 1983
SHIPMENT NO. ONE
JAMES D. SELL
CRYPTO-1

ASARCO INCORPORATED
Attn: Mr. James D. Sell
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 3 Rock Chip Samples

ITEM	SAMPLE NO.	Au (ppm)	Ag (ppm)	SiO2 (%)
1	CRYPTO-1 *	<.02	<.2	<.2
2	CRYPTO-2 *	.02	<.2	56.5
3	FSSEC1-1	<.02	<.2	33.1

*NOTE: Sample bags end with "FS".

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
DATE SIGNED
Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 281
June 10, 1983
SHIPMENT NO. ONE
JAMES D. SELL
CRYPTO-1

ASARCO INCORPORATED
Attn: Mr. James D. Sell
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 3 Rock Chip Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L. LEHMBECK
STATE OF ARIZONA U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 281
PAGE 2

ITEM NO.	SAMPLE NO.
1 =	CRYPTO-1
2 =	CRYPTO-2
3 =	FSSEC1-1

ITEM	1	2	3
ELEMENT			
Fe	.3%	.7%	.5%
Ca	>20%	5%	20%
Mg	>20%	1.5%	15%
Ag	<1	<1	<1
As	<500	<500	<500
B	<10	<10	<10
Ba	<10	<10	<10
Be	<2	<2	<2
Bi	<10	<10	<10
Cd	<50	<50	<50
Co	<5	<5	<5
Cr	<10	70	70
Cu	<2	3	2
Ga	<10	<10	<10
Ge	<20	<20	<20
La	<20	<20	<20
Mn	300	30	100
Mo	<2	<2	<2
Nb	<20	<20	<20
Ni	<5	15	7
Pb	<10	<10	<10
Sb	<100	<100	<100
Sc	<10	<10	<10
Sn	<10	<10	<10
Sr	<100	<100	<100
Ti	150	300	70
V	30	30	30
W	<50	<50	<50
Y	<10	<10	<10
Zn	<200	<200	<200
Zr	<20	<20	<20

JHC-ER File

ASARCO EXPLORATION RECORD

[X] FIELD EXAMINATION [X] LITERATURE SEARCH [ ] ASARCO FILE [X] Information from Vancouver Office

Section I General Indexing

LaPaz Co. N of T1S

① Name(s) of Property or Area: OAKLAND MINE AREA Lincoln Resources, Rea Petro, Verdestone, B.V.O.Cl.		② Country: Yuma Co. USA	③ State or Province: AZ
		④ USGS Quad: Little Horn Mtns.15'	⑤ File or Gore No.

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
35°22'N	113° 43'W	Phoenix	1S	14W	10	FRKoutz	3/1/83
						⑪ Office: Tucson	⑫ Field Days: 1 Hr

Section II Sources of Information

Date Typed 5/25/83

⑬ References

Author	Date	Title	Publications	Vol. No.
NBCousins	1973	Black Calcite-Au-Ag Mineralization - Sheep Tanks Dist.	M.S. Thesis ASU	
Lincoln Resources	1983	Filing Data w/Vancouver Stock Exchange - Asarco Files		

Various clippings & press releases in Asarco Files (G.Cross Newsletter, etc.) See also: FRK, Sheep Tanks Memo 5/19/83; Wilson (1933) AZ Bur. Mines Bull 134.

Section III Appraisal

⑭ Recommendations
- [X] Action Now
- [?] Too Low Grade
- [?] Too Small
- [?] Ownership Problem
- [ ] Access Problem
- [X] Contact Owners

⑮
- [X] Post Producer
- [ ] Producer
- [X] Mineral Deposit
- [X] Prospect
- [ ]
- [ ] Geologic Concept
- [X] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production 1941-1950

Commodity	Tons	Grade (oz/T)
Au/Ag	15	12.5 Au/3.7 Ag
1940 (Hayden Shipment)	28.5	.46 Au/4.7 Ag

⑰ Reserves [?] Measured [ ] Estimated

Commodity	Tons	Grade (oz/T)
Au-Ag (4/83)	115,000	0.30 Au/2.3 Ag
Au-Ag (1/83)	30,000	0.37 Au/4.0 Ag

⑱ Num. Drill Holes 30+
Approx Total Footage 5000'

⑲ Excavations 8+ shafts, Shallow 40-100'

⑳ [ ] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [ ] Geochem Results Attached

J. H. C.

Section IV Geologic Data

JUL 18 1983

㉓ Commodity or Contained Metals: Au-Ag (Cu, Pb, Zn) Mn

㉔ Ore Minerals-Major: Au° Ag in Mn-oxides +-Halides — Minor: Pyrite

㉕ Host Rocks-Major: Ash flow tuffs and breccias — Minor: Late cappling basalts

㉖ Age of Host Rocks: Mid- to-Late-Tertiary — Pliocene - Pleistocene

㉗ Nature of Exposures: Fair. Late capping basalt, thin Qal at Oakland Mine and to NW rubble on north slopes.

㉘ Alteration: Jasperoid (green-yellow)-black calcite veins. Strong clay-sericite over veins & in wall rocks. District propylitization.

㉙ Total Extent: 400' SSW x 200' E-W. Drilled & mineralized area.

㉚ Structure: 10-30° S to SSW dipping structural/vein zone - probably controlled by SSW fault. Similar to Sheep Tanks Mine 4 miles NW

㉛ Ore Occurrence: Au in pyrite & brecciated pyrite-jasperoid±black calcite (Ag-bearing Mn oxides dispersed in calcite). Vein zones shallow & may be related to stratigraphy or low angle thrusts.

㉜ Age of Mineralization: Mid-to-Late Tertiary

㉝ Conclusions & Recommendations: "Reserves" are probably accurate & may be easily doubled. Some Canadian interpretations of geology/alteration misleading & inaccurate. One of probably several structurally controlled mineralized zones in Sheep Tanks Dist. which will probably make a good small operation. With other possibilities in District the mineralization is of the size which should interest Asarco. Contacting owners, examining data, core and the surface would be in order.

(For additional space use extra sheets)

Form Revised June 1980 - JHC MVK-5187

ASARCO

Southwestern Exploration Division

May 25, 1983

To: J. D. Sell

From: F. R. Koutz

Oakland Mine Area
(Sec. 3,10; T1S, R14W)
Lincoln Resources Drilling
(Rea Petro, Verdestone, B.V.O.)
Yuma County, AZ

While at the Sheep Tanks Mine on March 1 (memo of May 20, 1983) besides the rumble of bombs being dropped on the Yuma Proving Ground I noted the unmistakable sound of a drill running plus heavy trucks when the winds blew from the east. On my way out from the Sheep Tanks Mine I drove east along the Hovatter and Cementosa Tanks Roads studying the volcanics and black calcite-barite veins and noted a yellowish drill running and a water truck about a mile NNW of the Oakland Mine. Because of the late hour, a two-hour drive out to I-10,and an approaching storm, I left the area planning to return next day but the storm prevented the trip.

On my return to Tucson I contacted Mr. Robert Litch of L.A., owner of the Hovatter Millsites concerning the Sheep Tanks Mine who told me of the drilling of Rea Petro of Vancouver, directed by Marshall Smith (Geologist), with a rig out of Reno. At the same time you passed on the "Statement of Material Facts" for the Vancouver Stock Exchange for Lincoln Resources which now has the option and is drilling the Oakland Mine area with some success. I requested additional material on Lincoln Resources from our Vancouver Office and they sent considerable information, mostly on stock, etc. plays and mostly from the George Cross Newsletter which I attach for the general files. Lincoln Resources has a number of small-scale mining plays in Nevada and California, some of which have operated,as well as several oil plays. Lincoln's Pres., Robert Hunter,was a participant in the Asamera-Breakwater-Wenatchee gold discovery in Washington and Lincoln now has a square mile of land 5 km NW of the discovery - on strike.

I have carefully reviewed the Lincoln Resources/Rea Petro data for which they report a mineralized zone with 150' strike, 275' dip length of 30,000 tons grading 0.37 oz Au/T and 4.0 oz Ag/T. Eleven of 16 holes (HQ-1924' total) intercepted an average of 11 feet (true thickness) of mineralization of +0.1 oz Au/T within 100 feet of the surface. An independent consultant estimated 25,000 tons of 0.326 oz Au and 3.6 oz Ag/T from the same data as of early 1982. Seven of 11 more holes drilled this year to the south and west have raised indicated reserves to 115,000 tons grading 0.30 oz Au and 2.33 oz Ag/T stepping out an additional about 300' SSW of the original area.

I am a little puzzled by some of the geology mentioned by Mr. F. M. Smith in his report of April 20, 1982 in the prospectus. I do not know what he refers to by the "weathered Jurassic age granodiorite" unconformably below andesitic basal units. I noted no granodiorites in the area nor did Cousins (1972) or Wilson (1933). Smith may be referring to Precambrian rocks in the Quartzite area. The intrusive quartz monzonite ("rhyolite") is that referred to by Cousins (1972, p. 12) but I don't understand what: "Thin rhyolite tuff beds are interbedded with exhalite chemical horizons on top of a few of the low pH caps. The tuffs and oscillating chert/lime chemical sediments are horizontal and intimately related to large patches of yellow-green altered andesite or latite" means (underlining mine). I suspect the "exhalite chemical horizons" and "oscillating chert-lime chemical sediments" are buzzwords that investors in Canadian gold properties like to hear. The "chert-lime" is probably low-angle alteration jasperoid cut by low-angle calcite veins ± caliche. The "low pH cap" probably refers to the high pyrite-clay alteration zones over marginal to epithermal mineralization which do occur in the Sheep Tanks District. The yellow-green alteration probably refers to greasy-green yellow jasperoids, yellowish montmorillonites and jarosites (and other limonites) and possibly to local chloritic "propylitic" rocks.

The description of alteration-mineralization given by Smith (1982, p. 3) from drill holes is quite similar to that at the Sheep Tanks Mine with illite/kaolinite with kaolinite increasing with depth, hematitic clay plus black calcite ± Au° grading into green brecciated jasperoid with veinlet stringers below in brecciated wall rock. Generally the highest grade Au° zones have high black calcite and only minor pyrite while lower-grade silver and lower Ag/Au ratio has less Mn-calcite, more pyrite and visible gold. The SW to SSW rake of the better gold mineralization is interesting and may correspond to the SSW fault on the attached map copied from Cousins. There is nothing on the "Rea Petro Geology and Drill Hole Map" (1" = 75') that can exactly be tied into the attached USGS Little Horn Mountain map, the GLO Grid or the Verdestone claim boundaries except that initial drilling started on the Verdestone claim on the S/2 Sec. 3 and NE/4 Sec. 10 and has probably extended off the claim to the SW.

I would expect that the Au-Ag assay results and the reserves calculated from them are reasonably accurate, especially considering that Rea Petro had gone to some trouble to collect sludges and compare results to core assays in low core-recovery areas. Values such as Lincoln/Rea Petro obtained in the Verdestone area could be easily obtained at the Sheep Tanks Mine and a number of small shallow orebodies, each of several hundred thousand tons at several tenths oz Au and 5 oz Ag, probably remain to be discovered in the belt covered by Cousins' mapping and extensions to the NW and SE.

The 115,000 tons @ 0.3 oz Au/T is beginning to get into the range that should interest this company especially considering that other bodies of similar size probably exist in the district. The 100 to 200' depth range of holes more recently drilled are probably too deep to be open-pitable although little information on grades (leachable) in the upper portions

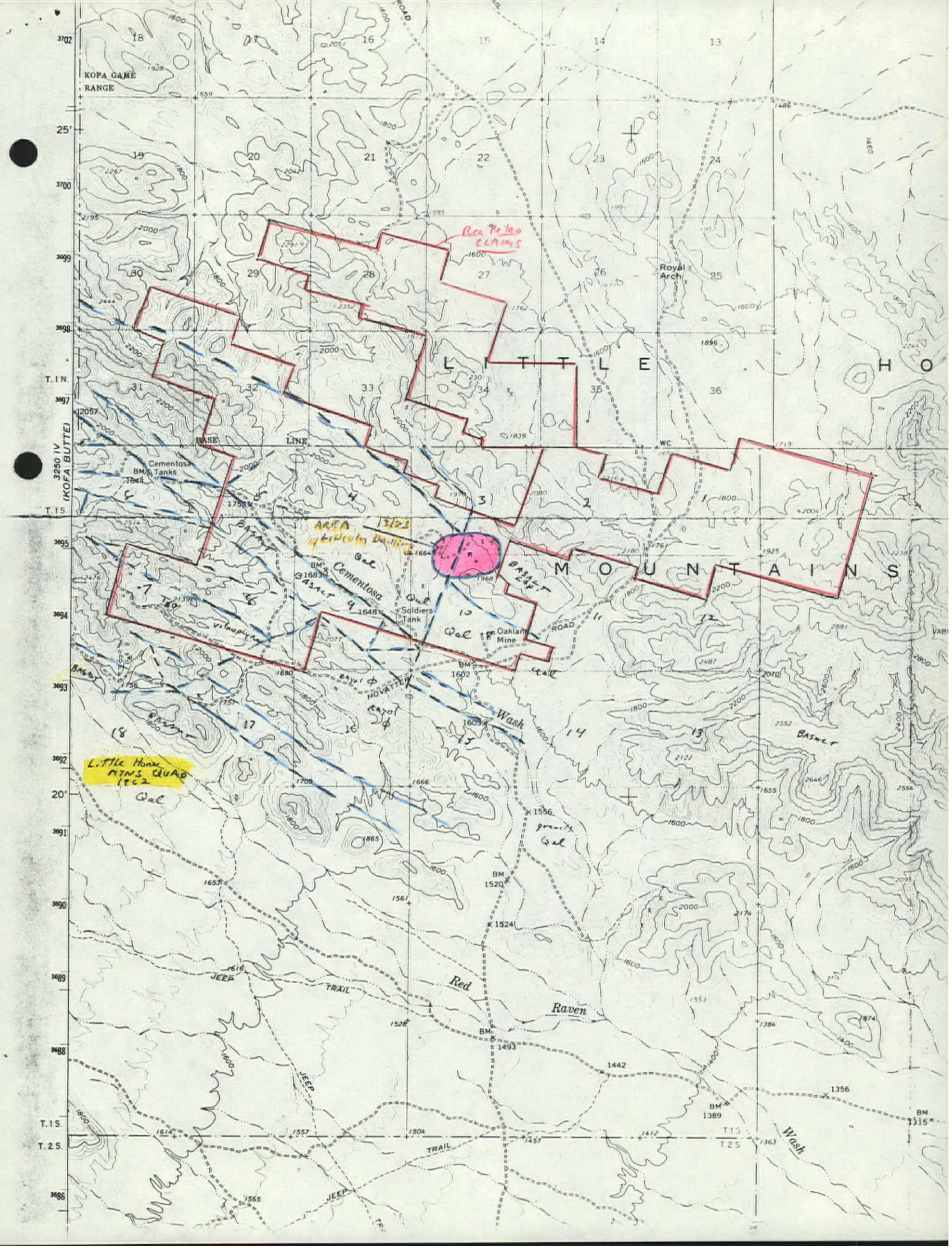
of the holes is given. Mr. Litch had not made a deal with anyone as of two months ago on "his 28 claims" (much less than this under his name on BLM microfiche) but he sounds like an expensive seller. There are a number of other claims in the area but unfortunately much of the region is covered by basalt or other volcanic caprock.

I would suggest that we keep track of Lincoln's progress and over the long run become familiar with the geology and mineralization of the region. I also wonder if there are other properties in the region not on game or bombing ranges that would "justify capital development expenditure" @ $400/oz Au referring to W. E. Saegart's 1967 comment on the Sheep Tanks Mine that 130,000 tons of 0.8-1 oz Au/T rock was too small for Asarco.

Fleetwood R. Koutz

FRK/cg

Attachments: ERS - Suggests contacting owners, examining data, and examining surface!
Map - Little Horn Mtns. 1:62,500


KOFA GAME RANGE
Red Pelao CLAIMS
Royal Arch
L I T T L E H O
M O U N T A I N S
BASE LINE
Cementosa BM Tanks 1844
3250 IV (KOFA BUTTE)
T. 1 N.
T. 1 S.
T. 2 S.
AREA of Lincoln Drilling 12/23
Qal
Cementosa
Soldiers Tank
Oakland Mine
ROAD
HOVATTER
Wash
Little Horn MTNS QUAD 1962
Red
Raven
JEEP TRAIL
granite
BASALT

JHC-ER File

ASARCO EXPLORATION RECORD

[X] FIELD EXAMINATION [X] LITERATURE SEARCH [X] ASARCO FILE [ ] _____

Section I General Indexing

La Paz County N of T1S

① Name(s) of Property or Area	② Country	③ State or Province
SHEEP TANKS MINE Little Horn Mountains Area	USA - Yuma Co.	AZ
	④ USGS Quad. Kofa Butte 15'	⑤ File or Gore No.

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
33°20'N	113°46'W	Phoenix	1S	15W	1	FRKoutz	3/1/83
						⑪ Office: Tucson	⑫ Field Days: 1

Section II Sources of Information

Date Typed 5/20/83

⑬ References

Author	Date	Title	Publications	Vol. No.
NBCousins, 1973, Black Calcite-Au-Ag Mineralization, Sheep Tanks Dist. (ASU M.S.Thesis)				
EDWilson, 1933, Geol.& Min. Deposits of S.Yuma Co., AZ Bur Mines Bull.134, p.131-141.				
Also Ariz. Bur. Mines Bull.192 (1978) p.174,175; Bull.137, p.143-147.			J.H.C.	

Section III Appraisal

Asarco file data 1927-1967.

JUL 18 1983

⑭ Recommendations
- [ ] Action Now
- [±] Too Low Grade
- [±] Too Small
- [±] Ownership Problem
- [±] Access Problem
- [X] Ascertain Status

⑮
- [X] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [X] Regional Recon Recom.

Look between high-grade structures.
- [ ] Geologic Concept
- [X] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
Au/Ag/Mn	17,373	0.35 oz/T Au/5.5 Ag/4-5% Mn
	Grades to 1.6 oz Au/ 5 oz Ag	

⑰ Reserves ( ) = Realistic figures. +4-5% Mn

Commodity	Tons	Grade
[ ] Measured / [X] Estimated		
Tails	15,000	.15(.02-.03?) oz/T Au/6.0 Ag
50 Samples	120,000	.26(.08)/4.5 Ag
"Partially Dev"	600,000	.15(.03-.05) Au/4.0 Ag

⑱ Num. Drill Holes 3+
Approx Total Footage X000'?

⑲ Excavations X000' of work
1450' Haulage Tunnel

⑳ [X] Spectro. Analysis Attached
㉑ [X] Assays Attached
㉒ [ ] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Au, Ag, Mn (Pb, Zn, Cu)

㉔ Ore Minerals-Major: Au°; Ag in MnOx + halides, cerussite Minor: galena,pyrite (Au°), barite, CuOx

㉕ Host Rocks-Major: Ash flow tuffs and breccias Minor: Late capping Basalts

㉖ Age of Host Rocks: Mid- to Late-Tertiary Pliocene - Pleistocene

㉗ Nature of Exposures: Fair - More rubble on north slopes - very rugged topography. Underground access very good. Old stopes not examined (alone). 4WD/slow access in and out.

㉘ Alteration: Jasperoid - Sericite-clay (includes some montmorillonite)-chlorite: all fracture controlled. Local alunite & ~~adularia.~~ ㉙ Total Extent: 100 acres. Best zone; 200-300' thick 2000' E-W by 1500' N-S.

㉚ Structure: Low angle (10-40°) N dipping jasperoid zones, pervasively fractured strongly control mineralization. Strong NW regional structure, block faulting + possible slip-strik

㉛ Ore Occurrence: Best mineralization in low angle, N dipping structures w/hanging wall splits, locally offset. Au w/limonite in fractures in jasperoid+ x.g. qtz, much Ag in MnOx & later than qtz;discontinuous stringers. ㉜ Age of Mineralization: Mid- to Late-Tertiary

㉝ Conclusions & Recommendations: Probably too small & too overall low grade to make anything besides a minor leach operation. Some 0.1-.2 oz Au + 4-5 oz Ag material probably remaining but metallurgical problems & only of interest to pocket-miners. Probably difficult to operate with environmental problems. Similar Au deposit being drilled 4 miles SE suggest region worth a significant amount of recon. work.

(For additional space use extra sheets)

Form Revised June 1980 - JHC MVK-5183

ASARCO

Southwestern Exploration Division

May 20, 1983

To: J. D. Sell

From: F. R. Koutz

Sheep Tanks Mine (Au-Ag)
Sec. 1, T1S, R15W
Yuma County, AZ

During a review of areas of critical mineral potential under executive withdrawals for Southern Arizona (memo to WLK Feb. 22), I noted the Sheep Tanks Mine which was just off the Yuma Proving Grounds apparently just inside the Kofa Game Range which appeared to have significant Au-Ag potential. Keith (1978 - Yuma Co. Index of Mining Properties, Ariz. Bureau of Mines Bull. 192, p.175) lists production at 17,400 tons @ 1.2 oz Au and 2.3 oz Ag/T which could suggest major unrecognized potential for greater tons at lower grades - with possibilities off the Game Range. You suggested that I look into the area.

We have a file (1928-1967) on the Sheep Tanks Mine which lists actual production at 17,373 tons @ 0.35 oz Au and 5.5 oz Ag/T - about 1/3 the total gold listed by Keith but still substantial - with partially developed zones suggesting up to 600,000 tons @ .15 Au and 4.0 Ag although a 120,000 tons @ 0.26 oz Au figure contained only .08 oz Au when checked by the R.F.C. (see attached file summary sheet). W. E. Saegart reviewed the property including additional submittal data in 1967 and suggested that the better 1928 reserves of 13,200 tons developed @ $43.75/T and possible @ 130,000 tons @ $26-35/ton ($35.00 Au - 0.57 Ag) were too small to justify any capital expenditure. The property consisted of 14 unpatented (but surveyed for patent) claims (as of 1967) which do not appear on the current BLM microfiche - which suggests they may have reverted for our lifetime to the Desert Bighorn Sheep-if not patented since 1967.

Our files and an article by Wilson (1934, Az. Bureau of Mines Bull. 134, p.131-141) contain a fairly complete description of the geology and mineralization. In addition I obtained a xerox of much of an M.S. Thesis by N. B. Cousins (now with St. Joe American) from ASU (1973) on the geology and mineralization in the area.

On March 1 I spent a long day at the Sheep Tank Mines and vicinity. The route I took in - the Vicksburg road south from I-10 - (the Manganese Road on the Kofa Butte 15' Quad) took 1 3/4-2 hours to traverse the 35 miles to the Mine via the southern route along Red Raven Wash. The Sheep Tank Mine road from the north had been blocked by the U. S. Fish and Wildlife Service and roads on the Kofa Game Range are very rutted, water-barred and in poor shape. The Hovatter Road in from the east and south may be slightly shorter and in better shape.

Mr. Robert Litch of L.A. (213-336-0052) has a trailer camp on 8 unpatented millsites and 3 lode claims (all valid and grandfathered) N & E of the landing strip (he's not allowed to use it anymore) in Sec. 11,12 and 1. This was the well field for the Sheep Tanks Mill. Mr. Litch mentioned that numerous companies have sampled the Sheep Tanks Mine (including Occidental) over the last ten years and some deep (+1000') drilling was done in the late 1960's-early 1970's (several capped casings in the camp area). He believes the Sheep Tank claims are patented but is not sure. Mr. Litch mentioned that he has 28 claims in the Oakland Mine area now being drilled by Rea Petro of Vancouver (Marshal Smith Corp. of Reno). They had spent $85,000 so far and have about 350 claims but have not offered enough for his 28 claims yet (he doesn't trust their stock deals). They have shown him assays and numerous drill intercepts with visible gold.

I collected 18 samples at the Sheep Tanks Mine, 9 of them underground, which are shown on the attached sample map and described with assays on the attached blackline. I walked through the 1450 foot Resolution lower haulage tunnel from south to north and returned south on the surface over the ridge. I did not spend much time trying to differentiate the various rock types but it was very clear that the rocks were all ash flow tuffs and breccias of several stages and generally steeply dipping with a number of angular unconformities or faults between units and also with significant faults bounding units and locally offsetting mineralization. The higher hills in the surrounding area are covered with basalt flows.

The rocks were pervasively fractured or weakly brecciated and usually stained with hematite and manganese oxides in the more heavily mineralized and excaved areas. The area outlined on the map had a distinct hematitic color anomaly. The major alteration was chlorite after mafics in the volcanics and clay-sericite after feldspars and flooding the groundmass both of which increased, especially sericite-clay, toward heavily silicified zones. The best-looking alteration was heavy silicification (jasperoid) with minor local alunite and probable adularia - especially in the old workings along the ridge crest, in the camp-mill area, on the north side of the hill and underground. The thicknesses of the multiple zones of jasperoid were not readily apparent but were less than a few tens of feet and not pervasive, and were controlled by fracturing - especially low angle fracturing with very strong clay-sericite in interveinlet blocks. The jasperoid and some faulting seemed to dip 10-30° to the N to NE almost following flow banding-bedding in some of the ash-flow tuff breccias with local splaying or horsetailing of higher-angle fractures into the hanging wall. There is strong NW block faulting limiting mineralization.

Mineralization is closely associated with iron and manganese oxides with the most extensive workings in areas of distinctive greasy-green-yellow jasperoid and alunite. Much of the manganese oxide and black and white banded calcite is later than the jasperoid and is locally associated with late barite veinlets and stringers. Drusy quartz and sulfide silica boxwork is intermediate in paragenesis between jasperoid and manganese oxides. Although the ores contained low original total sulfides, minor amounts of pyrite are still preserved in silicified zones and bleed jarosite. Minor

amounts of anglesite-cerussite after galena and malachite and other blue-green oxidized copper minerals were noted. High zinc assays suggest minor former sphalerite. Limited lighting made it difficult to determine the intermediate-scale extent of alteration/mineralization underground but it is clear that previous development work and production concentrated in broken, jasperoid-rich, Fe- and Mn-oxide stained areas.

At least 4 generations of extensive channel sampling and probable bulk sampling were evident with dates on the sample tags from 1972 to 1977. Although the surface outcrops (in part paralleling the slope) and some underground areas are impressively fractured, altered, and mineralized, it is clear that the 250 some odd feet of material between the tunnel level and the ridge crest and for large areas underground are relatively fresh and probably only weakly mineralized. An extensive channel sampling program would be needed to confirm this. Many of my outlying samples (STM-1, 2, 4, 9, 11, and 14), although strongly anomalous in one or more of Zn, Pb, Cu, Hg, and Ba besides Fe and Mn, have low Ag and very low Au values. Samples such as STM-5, 7, 15, and 16 are probably typical of former production @ .1-.13 oz Au with 2-6 oz Ag/T and were obviously marginally economic from reading the files. My sample from the 15,000 tons of tails, although far from representative, ran only .02 oz/T - far below the 0.15 oz Au reported in the former owner's (E. W. Mills) reserves. Most Au figures for Mill's sampling appear to be at least 2-3X too high although Ag numbers are fairly representative.

It is clear that there is not enough tonnage of mineralization left, or was ever present, at Sheep Tanks to make much more than pocket-high grading or a relatively small leach operation if the more moderately mineralized material could be separated from the bulk of the low grade to barren material present. The metallurgical problems with the ores - particularly Ag in Mn oxides problems - were never completely solved. Nevertheless I believe we should ascertain the property status of the Sheep Tanks Mine and keep it and others in the area in mind if Au and Ag prices get significantly higher.

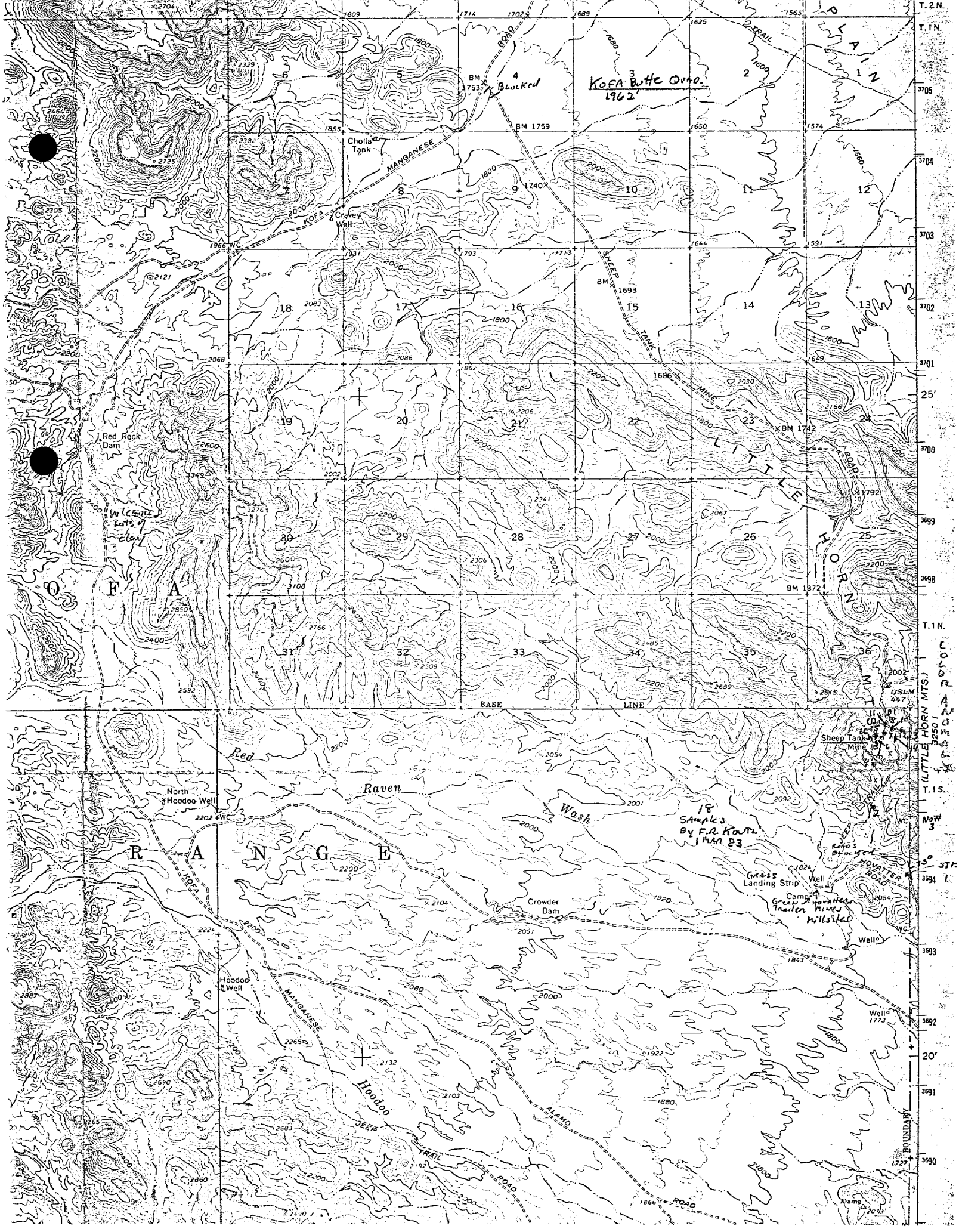
I also believe that the belt running southeast from Quartzite through the Sheep Tanks, as described in Cousin's work, still has a fair potential for finding a significant Au-Ag deposit discounting that already tied up in Game and Bombing Ranges and the considerable work by the competition. Some of the work in Cousin's thesis is a little farfetched (he believes the black calcite and base and precious metals were remobilized from replacement deposits in carbonate rocks which may occur at depth) considering present knowledge. (I will review his thesis separately.) Cousin's volcanic-stratigraphic and structural work appears to be very good. A considerable amount of stratigraphic/tectonic work has recently been done by students of the University of Arizona, San Diego State and others, especially in light of "detachment/overthrust tectonics."

The work in the Oakland Mine area 4 miles SE of Sheep Tanks by Rea Petro/ Lincoln Resources confirms that the belt has additional potential. Their shallow reserves are reportedly up to 115,000 tons @ 0.30 oz Au and 2.3 oz Ag as they follow structure south and west of outcropping mineralization in similar host rocks, alteration and mineralization to that at the Sheep Tanks Mine. I believe the region deserves a significant amount of reconnaissance work. We should keep up on developments at the Oakland Mine and examine their data if the deposit grows further and the owners are receptive.

F. R. Koutz

FRK/cg

Attachments: Sample Map
Sample Descriptions + Assays
Old-style ERS
New ERS


KOFA RANGE
LITTLE HORN MTS.
Kofa Butte Quad.
1962
Blocked
Cholla Tank
Cravey Well
Red Rock Dam
Volcanic Lots of clay
Red Raven Wash
North Hoodoo Well
Hoodoo Well
Crowder Dam
Grass Landing Strip
Well
Camp
Green Mountain Trailer Ranch Hillsides
Sheep Tank Mine
Alamo
MANGANESE ROAD
KOFA
SHEEP TANK MINE ROAD
HOVATTER ROAD
JEEP TRAIL
ALAMO ROAD
BASE LINE
T. 2 N.
T. 1 N.
T. 1 S.
COLORADO RIVER BOUNDARY
18 Samples By F.R. Kautz 1 Mar 83

~~DRILLING~~ ASSAY INFORMATION

Contractor: SKYLINE LABS
Date drilled: MAY 29, 1983
Hole diameter: TAJ-260
Inclination:
STM-SERIES

PROJECT: SHEEP TANKS MINE ~~HOLE~~ NO. STM

34 miles By Road S of I-10 (1½-4T mins)
Collar elev. 2000-2400' El. Final depth:
Coord. N/S: T1S R15W Coord. E/W: SEC 1 (GBL+M)
Logged by: F.P. KUNTZ Date logged: 1 MARCH 83

DEPTH from	DEPTH to	int'vl	ppm ASSAY Au	Ag	Hg	% Ba/Mn	ppm Pb	ppm Zn	ppm Cu	% Fe/Ca	ppm Mo	% MnOx	FeOx	silica			Rock Type	REMARKS STRUNTZ
1A	GRAB	ONE pile	<.02	<1	.80	.2/>1.	<10	500	3	.1/>20	10	+20	T	T			calc. VN	Banded tan+wh, 1-4', N10W to N35W (to NW) 75°N, In HW N15E 20°S flat-banded Volc (Ash
outlying		vein	to SE	of	S.T.	Mine												flow tuff Bx) - wkly Bx'd - more near Bend, in VN. 150' long, 60' max deep. T Barn?
1B	chip	5'	<.02	<1	.22	.3/>1.	<10	300	5	.5/>20	10	10	T+	T			BK+wh calc. VN	Bx'd wall rock frags in VNS - crust. fried + Banded BK+wh. - Several stages Bx
	ADIT TO		S of	S.T.	Mine													
2A	chip	5'	<.02	5	.19	.015/.3	50	<200	<2	.7/2.	<2	1/2	6 Hem	20			volc.	N70W, 70N Fy, well silicif. Volc. (Bx?) - 75' IN ADIT
2B		6'	<.02	3	.05	.3/>1.	300	300	15	1./>20	5	1	1-2%	20			Volc. Bx	N70W ±10 ADIT, cut across Back, 30' In, vuggy, sotty - calc + silica Manganese Bx - VN
2C		Dump	.06	2	.04	1/>1.	150	700	70	.5/>20	<2	10-15	1-2	15			Vein Sandstone	Vein material: Hi grade from Dump. T+ Barite, Bx'd silicif. Volc.
No #3																		
4		1'	<.02	<1	.10	.07/.7	<10	<200	2	1.5/2.	100 56	1	6 Hem	50			Bx'd Volc.	N10E, 80NW, vuggy Qtz - Jasp VN, minor Qtz clause, well Mx Bx'd Volc. A stringer VN - on wall to line
TUNNEL		IS	ABOUT		1300'	(long					N20	E	- main	Haulage				x.c. to SHAFT where #5+6 to Hem ~500+50 in from S. Tunnel 6+40' wide + high, Trans
5	grab	one chute	3.40	200	.22	.05/>1.0	50	1000	10	2/.15	2	3	5	15			Volc.	Sheared, clayey. Qtz stringers. Rep. GRAB from one chute @ Bottom of SHAFT
6	vertical	6'	<.02	1	.14	.005/.10	70	<200	2	1.5/.05	<2	T	3	5			volc.	Bx'd - white, clayey Hem. stringers @ Alt tag, 74SH453. 50' from main Tunnel on x.c.
7	Horiz	10'	4.40	100	.09	.1/>1.	200	1500	150	5/.7	2	2-3	3-5	20			volc	Bx'd, silicif + bleached. - Low angle - From Bank of fault of RAISE up 40° to S.
8	TAILS	~50'	.70	200	.10	.5/>1.	200	2000	100	5/1.	2	10%	5%	20			SANDY TAILS	From pile of 15,000 tons. Local Bedrock, is Bx'd + Fe>Mn stained ON Fx
9	Horiz	20'	<.02	5	.01	.5/.3	70	500	10	3/1.5	<2	1/4	HEM 1-2	10			Volc Bx	Porphyritic, From Road cut to W of tails (50'), weakly Bx'd - Shattered
10	100T	one pile	.03	<1	.11	.2/>1.	30	800	50	1./>2.	<2	15-20	1/2	T			BK calc	Banded Black + wh. calc. - crustiform, ~10% late wh. calc., minor siderite
11	cut	5'	.03	5	.05	.2/.2	150	700	15	3/5.	<2	1/2	5	5		Porphyrd	Volc Bx	N70W 30-60° shears @ N. Portal of Main Tunnel. 15% wh. calc; 2-6% phenocrysts
(NE of main		TUNNEL)				ADIT	TO	N	-	MOST	DRIFTS	RUN	N70W					#12 = 3 sample 74SH38 - ~1200' of main Kings, little stopings
12	Horiz	6'	.40	20	.10	.7/>1.	200	700	30	5/.15	3	5	5	20			Sec. Volc Bx	@ End of N50E X.C.: N30W shear @ 90° bleached Volc. Bx, T Box, BK + wh calc
13	vert.	6'	.26	7	.24	.1/>1.	70	1000	5	7/1.5	<2	15	10	10			Volc. Bx'd	N70W, 20N, Bedded Mn shears., Bleach + Bx'd Volc. w/ Goeth + Mnox staining, Shattered
14	Horiz	120'	<.02	3	.26	.05/.15	70	700	5	3./5.	<2	1	Hem 3-8	10			Purple Volc-Bx	N70W From Road (RA?) - between NE Adit + N. Portal of Main Tunnel; sheared.
15	Horiz	20'	4.40	50	.04	.07/.3	100	1000	50	2/.3	<2	1/2	3	20			bleached volc.	N20W, 60°N shear. 25' down MAIN? - SHAFT - From intermediate levels., Shattered +
													PROB	minor alunite			→	locally silicif; Anapaite(?) xtals - Fe, clause. @ Alt tag: 74SH434
16	-	GRAB	4.30	150	.04	.5/.7	100	700	15	1.5/1.	<2	1/2	2-3 Hem 6 G.	60			JASPEROID	greasy green-Yellow, late wh. silica - calc. clause, Looks juicy. From 5000 TON
																		Surface stone - glory hole @ Main SHAFT (JUST Below). Local Alunite.
																		(x.g. jasperoid - multiple events + alunite in thin sections).
	ORIGINAL	in	GENERAL	FILES	+	ORIGINAL	ASSAY	CERT	FICATE.									2555frk

Assays - E-SPEC.

CONCLUSIONS BY FILE REVIEWER: (Classify as "A"—Active interest; "B"—Moderate interest; "C"—Not definitely disproved; "D"—Of no interest. Give reasons and sign name. Leave space for later reviews.)

Class "D". Production from the main fracture zone has amounted to some 18,000 tons, 15,000 of which were mill ore unprofitably treated. While similar deposits might be found along other fracture zones in the andesite the outlook for a large low-grade deposit is poor. Property not considered of interest.

F. M. STEPHENS, 7/28/47

CONCLUSIONS BY EXAMINING ENGINEERS:

J. Kruttschnitt, Jr., Nov. 1928. He concluded that even if the expectation of additional tonnage realized, the estimated profit was not attractive after paying for property and a mining and milling plant.

R. F. C. Engineers, 1941. Could not check Mills' sampling. They were decidedly pessimistic regarding possibilities of property.

J. H. Courtright, 5/30/45. He thought the property warranted a more thorough investigation.

SUMMARY OF DATA IN FILE ON WHICH CONCLUSIONS ARE BASED

PROPERTY: (Claims, acreage, etc.)

123 claims. 14 are surveyed for patent.

NEARBY PROPERTIES:

Davis prospect 5 miles east of Sheep Tanks Mine.
Allison Claims 4 miles " " "

PLEASE KEEP ON TOP OF FILE

OWNER: (Last known name and address)

1947 - Edwin Walter Mills, Salome, Arizona.

HISTORY: (First exploration, periods of operation and extent thereof)

1909- Located by J. G. Wetterhall.
1926-27 Sheep Tanks Mines Co. of Nevada opened up Resolution vein.
1928- Examined by J. Kruttschnitt, Jr.
1929- Ibex Mines Co., C. M. d'Autremont, Mgr. operated property. F. Donlemon
1931-32 Anozira Mining Co., Dr. H. D. Lloyd, Pres., Edwin Mills, Manager, carried on extensive prospecting and development and built a 100-ton cyanide mill. Whittaker and Schlereth examined property. They thought property a good little mine if efficiently managed but no chance for a large operation.
Mar., 1935 - Operation closed down. Property and equipment offered for sale. Operating Company, Sheeptanks Consolidated Mines Company.

PRODUCTION:

17,373 total .35 5.48 - Ave

		Tons	Au	Ag	
Ibex Mines Co.	1929	801	1.63	15.63	Crude shpts
Anozira M & M Co.	1933	121	1.17	13.31	" "
" " " "	"	15,167	.29	4.90	Mill Ore
E. W. Mills	1939	508	.49	6.84	Crude shpts
" " "	1940	776	.19	4.20	" "

MINE DEVELOPMENT: (Shafts, inclines, adits, etc., with lateral development)

Lower tunnel 1450 feet through the ridge. Several hundred feet laterals.

Tunnels 170', 183', 200', 237' and 243' above lower tunnel have several hundred feet of workings.

Black Eagle Claim has 225' of tunnels.

Many other short tunnels and shallow pits on property.

AUG -4 REC'D

cc: WHLoerpabel

L. F. W.

NAME SHEEP TANKS MINE

LOCATION 25 miles south of Vicksburg Yuma County, Arizona. Sec. 31 T 1 N, R 14 W

FILE NO. Aa-25A.22.19

Au oz.	Ag oz.	Pb %	Cu %	Zn %	Mn.
Tr. 1.5 Av. 1.5	4.0				4.0

DISTRICT GEOLOGY: (Predominant rocks, faults, dikes, ore controls, etc.)

Volcanic flows, breccias, tuffs and intrusive porphyry; evidences of complex faulting, regional fracturing and brecciation are abundant. Rhyolite flows strike eastward and dip steeply or nearly vertically.

MINE GEOLOGY: (Type orebody, oxidation, features which may limit or cut off ore occurrence, probable depth, etc.)

The gold bearing vein occupies a low angle north-dipping fault zone and has been offset by later faults. Vein filling consists of irregular masses and streaks of limonite, pyrolusite, quartz and calcite with more or less silicified porphyry. Gold occurs as thin flakes in iron-stained fractures and vugs in quartz.

ORE RESERVES: (Positive, probable, possible. If formal estimate not made, give best guess, with suitable comment as to degree of certainty.) Estimated by Mr. E. W. Mills.

	Tons	Au	Ag	Mn%
Tailings	15,000	.15	6.3	5.6
50 face samples	120,000	.26	4.5	4.0
Partly developed	600,000	.15	4.0	4.0
R. F. C. check samples for 120,000-ton area,		.08	4.8	

EXPLORATION POSSIBILITIES: (State objectives, method and approximate cost of work.)

Property has been well explored. Lower tunnel development failed to find anything worthwhile some 240 feet below main workings. No new development recommended.

PROPERTY SUBMITTED BY: (Names and dates)

Earl Hyde 7/19/28
Harry G. Hendrix 6/25/35

REPORTS IN FILE: (With date of last examination by Company Engineer)

J. Kruttschnitt, Jr.	Nov. 1928.
Edwin Walter Mills	8/27/40. Brief report.
B. N. Rickard	7/26/41. Memo to W.H. Loerpabel. Gives history.
F. M. Stephens	5/10/44. File Memo.

MISCELLANEOUS: (Other comment where above space not sufficient)

References: Univ. of Ariz. Bulletin 134, page 132.

JHC - ERS File

ASARCO EXPLORATION RECORD

[X] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE

Submittal by:
[X] W. Christensen, Sand
WECourtney (Burbank) U
PCooley (Long Beach)

Section I General Indexing

① Name(s) of Property or Area: Morning Star Claims (William E Claims) - Riggs ("Alta") Mine					② Country: USA San Bernardino Co	③ State or Province: Calif.	
					④ USGS Quad.: Silurian Hills 15'	⑤ File or Gore No.	
⑥ Latitude: 35°32'N	⑦ Longitude: 116°6'W	⑧ AMS Sheet: Trona	Township: 16N	Range: 8E	Section: 2	⑨ Examined by: FRKoutz	⑩ Date: 3/11/83
						⑪ Office: Tucson	⑫ Field Days: 1

Section II Sources of Information

Date Typed 5/18/83

⑬ References

Author	Date	Title	Publications	Vol. No.
DHKupfer, 1960, Thrust Faulting & Chaos Structure, Silurian Hills, Bull GSA v.71,n2,p.181				
CA J. of Mines/Geology, v49, n1,2, 1953, p.105 (includes ref. list).				

Section III Appraisal

Riggs Mine listed as "1st order expl. target" in GJS 5/4/83 memo.

⑭ Recommendations
- [ ] Action Now
- [X] Too Low Grade
- [X] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [X] Recon Range

⑮
- [X] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ]

- [ ]
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [?] Geophy Anomaly VLF EM-16 (data not presented)
- [ ]

⑯ Production

Commodity	Tons	Grade
Ag	$200,000 (??) Probably overstated; Mill & aerial tramway prob. cost more than production.	

⑰ Reserves
- [ ] Measured
- [ ] Estimated

Commodity	Tons	Grade
NONE		

⑱ Num. Drill Holes ± 5
Approx Total Footage Shallow air-trak

⑲ Excavations Several thousand feet old workings

⑳ [X] Spectro. Analysis Attached

㉑ [X] Assays Attached

㉒ [ ] Geochem Results Attached

J. H. C.
JUL 18 1983

Section IV Geologic Data

㉓ Commodity or Contained Metals: Ag, Au, Zn, Pb, Cu Reported Pt not present

㉔ Ore Minerals-Major: Silver Halides, Ag°, Au°, Cerussite Minor: Sphalerite Galena-Cpy

㉕ Host Rocks-Major: Marble, Granodiorite, Qtz Monzonite Minor: Quartzite Siltstone

㉖ Age of Host Rocks: PZ (Permian?) Laramide? PZ PZ

㉗ Nature of Exposures: Good - very rugged topography near old workings; poor on pediment to south. Underground workings mostly open-stopes to 4'. 1700' lower tunnel not found.

㉘ Alteration: Carbonates pervasively tectonically marbleized, narrow dolomitiz.,zebra, siderite±calc-silicates & jasperoid along structure.

㉙ Total Extent: 50 acres (Dikes to clay+carbonate)

㉚ Structure: NNW striking 40-80°S dipping marbles with N & NNE faults, fractures & bedding-plane faults. Overthrust chaos at several hundred ft. depth. Deformation during intrusion.

㉛ Ore Occurrence: Narrow pods, streaks & stringers of sl-gn+Ag-Au in high angle fractures - mostly oxidized/supergene silver - usually at or near intrusive contacts - intrusives into structures. Parallel fracture-veins in bedding/foliation.

㉜ Age of Mineralization: Laramide??

㉝ Conclusions & Recommendations: Too small & spotty. All mineable Ag was supergene & extends only to minor depth (distance from cliff faces). Detachment/thrust structure at shallow depth & resulting chaos not favorable for continuous orebodies in tight marble. The Silurian Hills have widespread spotty mineralization & is probably worth at least several days recon to examine relationship of mineralization to chaos-thrust structures. Owners are promotors of the worst sort, but not experienced or knowledgeable enough to be dangerous.

(For additional space use extra sheets)

Form Revised June 1980 - JHC MVX-5193

ASARCO

Southwestern Exploration Division

May 17, 1983

To: J. D. Sell

From: F. R. Koutz

Morning Star Claims
(Gold-Silver-"Platinum")
Sec. 2, T16N, R8E)
Riggs (Silurian Hills) District
San Bernardino County, CA

Summary: The Morning Star claims consist of steeply dipping marbles and clastics intruded by local thin intermediate dikes with narrow calc-silicate/silica/siderite selvages. Spotty sphalerite and galena contain small amounts of Au and Ag. Mineralization is too low grade and limited to be of interest in the structural environment present.

- -

On February 24 you asked that I examine the 16 Morning Star claims presented by Willard Christensen of Sandy, UT. Mr. Christensen sent a rough claim map, 2 xeroxes from Calif. Division of Mines Reports, and 2 assays showing up to 1.45 oz Au, 2.4 oz Ag and 1.0 oz Pt per ton. We had nothing in the files on these claims but the nearby Copper Reef claims (Sec. 36, T17N, R8E) and Silver Hill Mine (Silver Lake) (Sec. 21, T16N, R9E) show high values of Au, Ag and sometimes Pt which we have never checked out. I was very skeptical of Pt values in this environment but Pt is apparently found in tactites in the Goodsprings District, Nevada. The only geologic information on the Silurian Hills was a Ph.D. dissertation by D. H. Kupfer published in Bull. GSA (v. 71, p.181, 1960)-"Thrust Faulting and Chaos Structure, Silurian Hills." The environment looked interesting especially in light of precious metals recently being found in association with detachment structures in the Mohave and worth a look.

After contacting Mr. Christensen in early March from Barstow, I received little new geologic information except of a wild promotional nature and schemes between the partners. The weather and the flu prevented Mr. Christensen from showing me around the property but he put me in touch with Mr. William Courtney, an owner of the claims (since 1958?) - a retired (80 years old) backyard refiner of precious metals (and graduate(?) of CSM) and Mr. Perry Cooley, a (medically) retired ironworker. Mr. Willard escorted me around the property on March 11. I will spare you the various wild tales the 3 owners told about the property and each other. However the property was, apparently, picked up (i.e. jumped) from the Eisenhauer Estate. Mr. Eisenhauer and relatives, assayers, in later years were notorious for high precious metal values (including Pt) in almost any sample submitted. I spent 2/3 of a day with Mr. Cooley and collected 10 samples on the property and another several hours on my own.

Assays are presented with sample descriptions on the attached blackline. Several pages from Kupfer's work are also attached.

Basically the area in the upper thrust plate consists of WNW striking, 50-80°S dipping interbedded Paleozoic(?) marbles with minor siltstones and quartzites which have been intruded along the bedding and cross fractures by quartz monzonite porphyry to equigranular quartz monzonite to granodiorite dikes usually narrow but up to 100' wide. Skarn and silicified zones limited to a few inches to several feet halo the intruded structures with later veinlet and disseminated sulfides (sl>gn>py>cpy) generally limited to a few feet from the contacts or along structures (also thin brecciated bedding planes). The marble is coarse to very coarse-grained and locally exhibits zebroid textures. Some of the fractures show selvages up to a foot of ankeritic carbonate ± local barite crystals. Zones are present - generally following bedding planes - which are primarily dolomite but not necessarily hydrothermal dolomite. The margins of many of the granodiorite intrusions are schistose and it is clear that at least some intrusion and alteration took place before, during, and after deformation. Thin sections show that except for minor carbonate and clay that alteration is weak or non-existent in the intrusives. Plagioclase and biotite are fresh - even if deformed.

Deformation increases with loss of elevation and attitudes become more chaotic but the base of the Riggs Thrust is not well exposed in the area examined. The pediment to the south is composed of equigranular quartz monzonite to granodiorite which, though well weathered and decomposing, is not altered.

Mr. Cooley had blasted (self-taught) open a few of the old adits along skarn-vein structures behind the old mill site for better exposure. I high-graded a 6" sheared stringer of sphalerite-galena which Mr. Cooley indicated had contained 1 oz Pt and 1.4 oz Au/T (SILH-1) but assayed at <.02 ppm Pt and 0.93 ppm Au. A more representative 5' sample (#2) between marble walls also contained <.02 ppm Pt but 1.5 ppm Au. The same zone up the hill (SILH-3) contained <.02 ppm Pt and 0.6 ppm Au. Two other thin zones on the flat ridge above the mill contained 0.52 and 0.24 ppm Au but Mr. Cooley promised they would "pan free gold." Several flecks of "gold" pointed out to me were tarnished pyrite and chalcopyrite. The material which Mr. Cooley said that Mr. Courtney had identified as platinum was almost certainly silvery blue-black late manganese oxide.

Several other samples taken in structures up the hill and in the old underground workings at the upper end of the aerial tramway contained less than .02 ppm Au and a maximum of 7 ppm Ag. The several thousand tons of tails contained only 30 ppm Ag but it was obvious that at least several thousand tons of tails had been washed away to the west.

The old oxidized workings are much as described in the Calif. Div. of Mines notes with only several hundred feet of crosscuts and drifts on each of 3 to 5 levels. The crosscuts - parallel to the cliff face with more workings toward the top of the hill - suggest that the silver mineralization

is strongly supergene enriched and does not extend to depth. The sulfide samples (SILH-1 to 3) also have a low Ag content per total sulfides, suggesting that silver grades will not be high unless enriched. The dikes in this area are more strongly weathered and sheared with increasing elevation. From the extent of the workings, dumps and tailings, the mineralization would have to have been at least 50-100 oz Ag/T to produce $200,000 which I believe is exaggerated.

No sign was noted of the 1700 ft. 1939 crosscut (with 5 ft. fissure with 11% Pb and 5 oz Ag) tunnel mentioned in the Calif. Div. of Mines reports. Mr. Cooley had never heard of it and Christensen and Courtney had previously been evasive or said it had caved. There may be some confusion as this mine is not the Alta Mine as reported in earlier Calif. Div. of Mines reports.

I believe the Riggs Mine area has very small potential for a limestone replacement or other deposit of any size. The stopes along structure are narrow, limited to a few feet with clean marble or quartz monzonite walls; the marble in the wall rock is also extremely tight. The Riggs Thrust lies a maximum of several 100 feet below the base of the hill at the Riggs mill and the Pahrump coarse clastics in the footwall would, in general, not make a good ore host. Mr. Courtney apparently talked an employee of the Calif. Div. of Mines into running a VLF-EM-16 survey over part of his ground which shows a "major" anomaly ("orebody") at 200-400'. He was unwilling to send a copy of the data and wanted me to come to Burbank to examine and make an offer for the property (outright buy-out, with NSR residuals, at several tens of thousands of dollars per partner). I don't believe the instrument can reach this depth and is seeing structure such as the Riggs Thrust, if anything at all, in this chaotic terrain.

Whether any other possibilities exist in the Silurian Hills would take several days to a week of careful reconnaissance - given the complexity of the geology and structure presented by Kupfer. There may well be some zoning present with depth (elevation) in the samples collected. Barium is less common on the lower parts of the hill while Mo, Cu and Au are more common. Calc-silicate and silica zones are a little more common in structures lower on the hill also - all suggesting a mineralizing source at depth. However the section is strongly broken up and discontinuous near the Riggs Thrust which would make prospecting extremely difficult. Additional work may be justified in the range - mostly to understand the overthrust processes and its relationship to mineralization but the Morning Star property, in itself, is of little or no value - especially with its present "ownership." The owners were informed that we are not further interested in their claims.

F. R. Koutz

FRK/cg

Attachments: Sample Map
Assays/Descriptions
Kupfer's Abstract
ERS

Assay ~~DRILLING~~ INFORMATION

Contractor SILLINE - TUCSON
Date drilled 24 MAR 83
Hole diameter TAT-259
Inclination

SILH-SERIES ↓ E-SAC

MORNING STAR CLAIMS "ALTA" PAGE 1 OF 1

PROJECT SILURIAN HILLS, RIGGS, CALIF. MINE HOLE NO. SILH 1 to 10

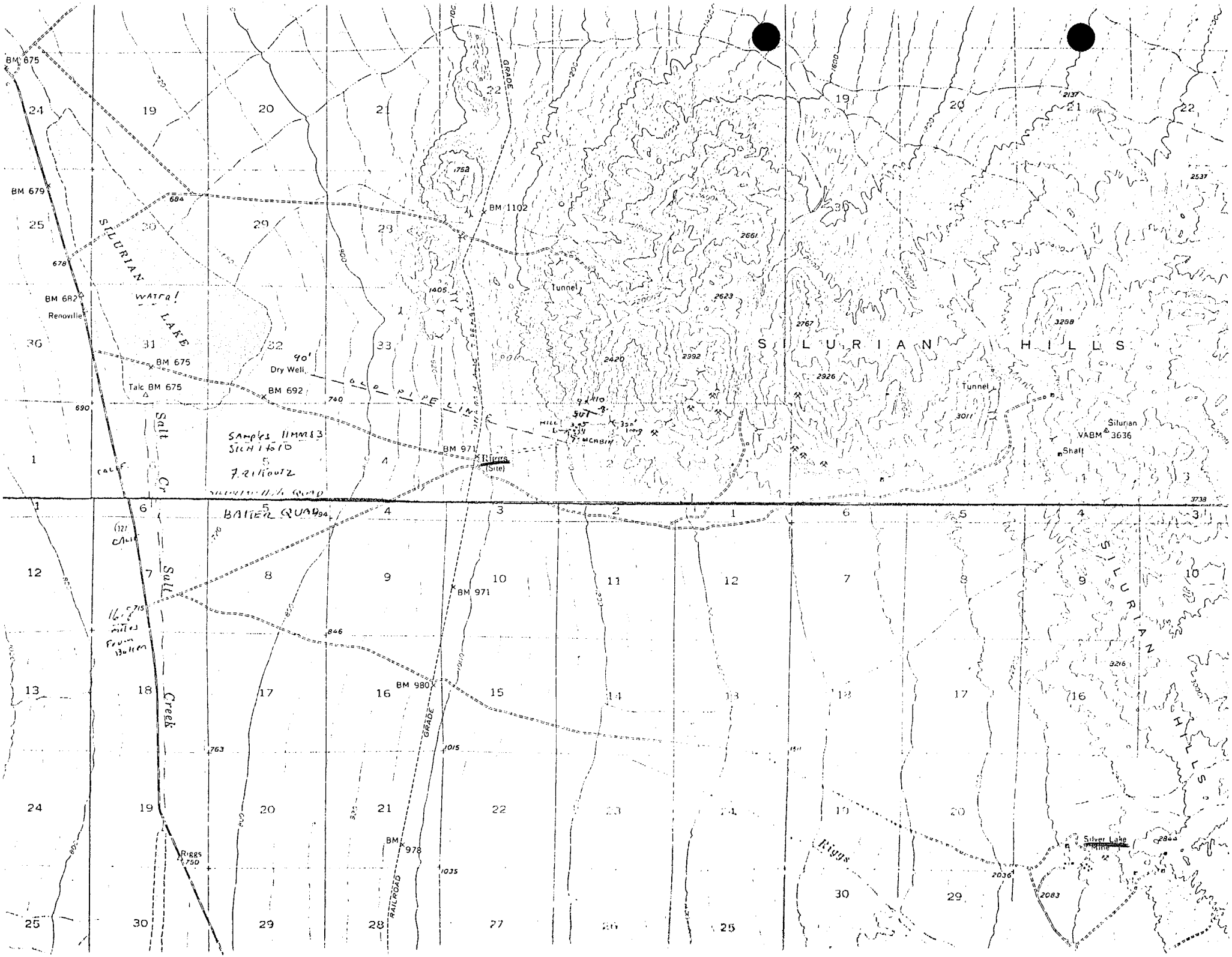
Claims of William E. COURTNEY Collar elev 1200-200' ELEV Final depth
Perry Cooley Coord. N/S SEC 2 T16N, R8E Coord. E/W SBBLM, CA.
Willard Christensen Logged by F. R. KOUTZ Date logged 11 MAR. 83
20 miles N. of BAKER, CA

DEPTH from	DEPTH to	int'vl	ALL ASSAY Au	Ag	Pb	Zn	Cu	Mo	Fe	Mn	As	Pyrite	Hematite/Limonite	Silica	Ba	Calcite 10%	Rock Type	REMARKS
			Assays															
1	Hi-graded	6"	.93	20.	7% MAJ	7% MAJ 150 ppm Cd	1000	20	2	1000	<500	1/2	1/2/1	20	<10	TRAN DISP.	SKARN	STRUCTURE: N10E, 40°W FW FX ZONE, EQUIGRAN. MONZ. TOE/MARBLE TO W. S1 > GN > CPY ≥ PYR. IN silicified SKARN 10-20% marble/lick CO_2 = vn 1/3. 20% 10% S1 is Brown
2	chip	5'	1.50	5	7% SPESTIM.	1%	150	100	10	2000	3000	2	3/2	15	<10		SILICIF. MARBLE	Minor garnet dispers. SKARN, Zone w/ARNES shaft. 3ft wide w/ dissem S=, Reportedly does Ron Hill - HAS Zn outcrop on N side of Hill (Prob. just another stringer)
			20 ppm Co ∴ Cooley's "cobalt mine"															
3		3'	.60	7	3000	1%	150	70	7	2000	1500	3	3/4	25	<10		marble	Another "high Pt" sample - Dissem. S1 > GN stringers
4		2'	.52	<1	2000	1500	50	20	1.5	50	<500	oxide T	1/4-1 Limo	20	<10		Brec'd marble	N10W zone Fx! leached QTZ marble in marble (E-W 10-20'S) Zone "PANS FREE AU" - 3 AIR-TRACK holes in cut 12' x 4' x 30'
5		3'	.24	1.5	2000	7%	200	20	7	1000	500	gone	H=4 J=3	10	<10		gg zone	SOFT ochreous, Dike zone? in Marble N45W 1-3 gg zone in ADIT 10' BACK Oxidiz zone in SKARN MARBLE. "Promising high-grade Au"
6	TO	Rest	<.02	30	5000	1500	70	<2	2	5000	<500	gone	T/1	20?	1500		TAILS	SEVERAL 1000 TONS - Much WASHED away. V. light tan, sandy. V. STRONG REACTION TO HCl Probably mostly marble
7		10'	<.02	<1	30	200	50	<2	3	700	<500	—	T/1/2	T	200		GRO?	EQUIGRANULAR ±, 3-4 mm QTZ phenocrysts, 3-10 Fx/Fy with 1-3 mm gouge SEAMS But Wx but NOT ALTERED - 50' Below marble contact. Intrusive.
8		3'	<.02	7	1500	2000	2000	10	5	7%	<500	T+	1/2	8	70		Banded MARBLE	N40E, 70E. ZONE: GRO Dike 10'W, 1/2% sideritic silica w/ malach. + limonite + tlm. ↑ retraction steam from Dike. MARBLE is V. tight. Little strong alt. away from
9	RAISE	3'	<.02	<1	70	<200	2	<2	0.5	300	<500	—	T/2	10	10		SILICIF. marble	N30E, 80E Shears, WK Bx'd e.g. silicif marble. Middle level (SEPT 30, 1981 powder BOX) SAMPLE // to N60W 65S foliation in marble in RSE + ⊥ to shears.
10		ONE CHUTE	<.02	3	100	700	30	<2	2	300	<500	—	1/2/3	10	1000		Rotten grd-	UPPER tunnel level, ONE SAMPLE from chute. Banded sideritic? granodiorite (rotten) dike material. V. clayey

<.02 ppm PT in SILH 1, 2 + 3
#1 + #2 above
#3
previously reported:
Au Ag Pt
1.45 .15 1.0
1.20 2.34 nil
} Assays by DAVID M. BAUER, LA.

ORIGINAL Assay certificates in General file.

OWLS HEAD MTNS, CA
1979 Bon sheet
R8E
"William E. Claims (Part in Vol 10) (Courtney)
2555 frk


BM 675
BM 679
BM 682
Renoville
SILURIAN
WATER!
LAKE
BM 675
Talc BM 675
40'
Dry Well
BM 692
Salt
Creek
SAMPLES 11MM13
SILICIFIED
J. Rillouz
BATTER QUAD
BM 1102
Tunnel
SILURIAN HILLS
Tunnel
Silurian
VABM 3636
Shaft
BM 971
Riggs
(Site)
BM 971
BM 980
GRADE
RAILROAD
BM 978
Riggs
Silver Lake
Mine

BULLETIN OF THE GEOLOGICAL SOCIETY OF AMERICA
VOL. 71, PP. 181-214, 11 FIGS., 3 PLS. FEBRUARY 1960

2000 0 2000 4000 FEET
SCALE
40 000
30 000
20 000
10 000
116 00'
35°30'
Riggs
Riggs Mine
Magnetic North
Pediment on gr
CENOZOIC
Qal Alluvium
Qt Terrace gravels
UNCONFORMITY
g Older gravels (Tertiary)
UNCONFORMITY
br Megabreccia
UNCONFORMITY
v Volcanic and sedimentary rocks
UNCONFORMITY
PALEOZOIC (?)
Riggs formation, mainly recrystallized carbonate rock
UNCONFORMITY
PRE-CAMBRIAN
PAPHOUNDI GROUP
p Undifferentiated units
pl Quartzite and siltstone (26-35)
pe Mixed sediments (19-25)
pd Conglomerate and tanglomerate (17-18)
pc Well-bedded sediments (13-16)
pb Quartzite with carbonate rocks (7-12)
pa Mixed sediments (1-6)
UNCONFORMITY
m Metamorphic rocks
gr Granitic rock and inclusions
Geologic contact
Fault, showing dip
Riggs thrust fault
(Dashed where approximate dotted where hypothetical)
Dip and strike of inclined and vertical bedding
Overturned bedding
Dip and strike of foliation
Synclinal axis showing plunge
PT: fold does not affect thrust plate
Anticlinal axis
Dome in thrust plate
SECTION K-K'
SECTION J-J'
LOGE OF
SECTION M-M'
F'
G
Through Canyon
Ore horizon
Citadel Ridge
SECTION H-H'
SECTION J-J'
G'
chaos
Riggs Thrust fault
H
Jeep Valley
SECTION F-F'
Silurian Peak
SECTION N-N'
SECTION G-G'
Citadel Ridge
Through Canyon
H'
Silver Lake Fault
dolomite
SECTION H-H'
SECTION G-G'
J'
SPECIAL SYMBOLS FOR SECTIONS
(See also plate one)
Alluvium, talluses, gravels
Inclusions
Metamorphic rock
Riggs thrust fault

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 259
March 24, 1983
SHIPMENT NO. SILH
FLEETWOOD R. KOUTZ
SILH-1 THRU WAT TAILS-W

ASARCO INCORPORATED
Attn: Mr. Fleetwood R. Koutz
Southwestern Exploration.
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 9 Rock Chips and 3 Tailing Samples

done by Skyline at No charge Because of bad initial E-spec Ag-values

ITEM	SAMPLE NO.	Ag (AA)	Au ppm
1	SILH-1	29	.93
2	SILH-2	8.2	1.50
3	SILH-3	6.0	.60
4	SILH-4	2.0	.52
5	SILH-5	4.6	.24
6	SILH-6	30	<.02
7	SILH-7	<.2	<.02
8	SILH-8	7.4	<.02
9	SILH-9	1.0	<.02
10	SILH-10	3.0	<.02
11	WAT TAILS-E	>95	.09
12	WAT TAILS-W	>100	<.02

– Watanamo Mine Tailings (Barstow)

NOTE: Platinum results to follow as TAJ 259-A.

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. J.D. Sell

REGISTERED ASSAYER CHARLES E. THOMPSON 9427 WILLIAM L. LEHMBECK DATE SIGNED 3-24-83 Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 259A
April 8, 1983
SHIPMENT NO. SILH
FLEETWOOD R. KOUTZ
SILH-1 THRU WAT TAILS-W

ASARCO INCORPORATED
Attn: Mr. Fleetwood R. Koutz
Southwestern Exploration.
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 3 Pulp Samples

ITEM	SAMPLE NO.	Pt ppm
1	SILH-1	<.01
2	SILH-2	<.01
3	SILH-3	<.01

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. J.D. Sell

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED 4-8-83
Arizona U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

reported 24 March Had all <1 As values By E Spec!

CORRECTED REPORT
JOB NO. TAJ 259
March 29, 1983
SHIPMENT NO. SILH
FLEETWOOD R. KOUTZ
SILH-1 THRU WAT TAILS-W

ASARCO INCORPORATED
Attn: Mr. Fleetwood R. Koutz
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 9 Rock Chips and 3 Tailing Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED
Arizona U.S.A.

William L. Lehmbeck
Manager

cc: Asarco Incorporated
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703
Attn.: Mr. J.D. Sell

SKYLINE LABS, INC.
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JOB NO. TAJ 259
PAGE 2

ITEM NO.	SAMPLE NO.
1	SILH-1
2	SILH-2
3	SILH-3
4	SILH-4
5	SILH-5
6	SILH-6
7	SILH-7
8	SILH-8

ITEM	1	2	3.	4	5	6	7	8
ELEMENT								
Fe	2%	10%	7%	1.5%	7%	2%	3%	5%
Ca	5%	10%	15%	7%	7%	>20%	7%	>20%
Mg	.5%	1%	1.5%	.1%	.3%	3%	.7%	3%
Ag (AA)	20 (29)	5 (8.2)	7 (6.0)	<1 (2.0)	1.5 (4.6)	30 (30.0)	<1 (4.2)	7 (7.4)
As	<500	3000	1500	<500	500	<500	<500	<500
B	<10	<10	<10	<10	20	20	10	<10
Ba	<10	<10	<10	<10	<10	1500	200	70
Be	<2	<2	<2	<2	<2	<2	<2	<2
Bi	<10	<10	<10	<10	<10	<10	<10	10
Cd	150	<50	<50	<50	<50	<50	<50	<50
Co	<5	20	7	<5	<5	<5	<5	<5
Cr	<10	<10	<10	<10	<10	<10	<10	<10
Cu	1000	150	150	50	200	70	50	2000
Ga	<10	<10	<10	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20	<20	<20	<20
Mn	1000	2000	2000	50	1000	5000	700	>10000
Mo	20	100	70	20	20	<2	<2	10
Nb	<20	30	<20	<20	<20	<20	<20	<20
Ni	<5	30	10	<5	<5	<5	<5	<5
Pb	>10000	10000	3000	2000	2000	5000	30	1500
Sb	<100	100	<100	<100	<100	<100	<100	500
Sc	<10	<10	<10	<10	<10	<10	<10	<10
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	<100	<100	<100	<100	<100	<100	100	150
Ti	<20	<20	<20	<20	300	1000	2000	<20
V	<10	<10	<10	<10	<10	<10	10	10
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	<10	<10	<10	<10	<10	<10	<10	<10
Zn	>10000	10000	10000	1500	>10000	1500	200	2000
Zr	<20	<20	<20	<20	<20	<20	70	<20

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

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JOB NO. TAJ 259
PAGE 3

ITEM NO.	SAMPLE NO.
9 =	SILH-9
10 =	SILH-10
11 =	WAT TAILS-E
12 =	WAT TAILS-W

Watmore mine tails (Bonston)

ITEM	9	10	11	12
Au (ppm-AA)			.09	<.02
ELEMENT				
Fe	.5%	2%	7%	7%
Ca	>20%	3%	.7%	1%
Mg	2%	1.5%	.15%	.15%
Ag (AA)	<1 (1.0)	3 (2.0)	70 (>65)	100 >> (100)
As	<500	<500	<500	<500
B	<10	15	200	100
Ba	10	1000	>10000	>10000
Be	<2	<2	7	7
Bi	<10	<10	<10	<10
Cd	<50	<50	<50	<50
Co	<5	<5	15	20
Cr	<10	<10	<10	<10
Cu	2	30	300	300
Ga	<10	<10	<10	<10
Ge	<20	<20	<20	<20
La	<20	<20	<20	<20
Mn	300	300	2000	2000
Mo	<2	<2	<2	<2
Nb	<20	<20	20	20
Ni	<5	<5	7	10
Pb	70	100	150	70
Sb	<100	<100	<100	<100
Sc	<10	<10	<10	<10
Sn	<10	<10	<10	<10
Sr	<100	300	1000	1500
Ti	20	1500	500	700
V	<10	15	<10	<10
W	<50	<50	<50	<50
Y	<10	<10	<10	<10
Zn	<200	700	<200	<200
Zr	<20	50	<20	70

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
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James A. Martin
Arizona Registered Assayer No. 11122

JHC - ER File

ASARCO EXPLORATION RECORD

☒ FIELD EXAMINATION ☐ LITERATURE SEARCH ☒ ASARCO FILE ☐ _____

Section I General Indexing

① Name(s) of Property or Area	② Country	③ State or Province
MAZATZAL MERCURY DISTRICT	Maricopa Co. USA	Arizona
	④ USGS Quad. Reno Pass; Lion Mtn.	⑤ File or Gore No.

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
33°57'30"	111°29'30"	Mesa	T7N	8,9 E	Not Surv.	HGKreis	4/1983
						⑪ Office SWED	⑫ Field Days 2

Section II Sources of Information

Date Typed 4/27/83

⑬ References

Author	Date	Title	Publications	Vol. No.
ASARCO File		Mazatzal Hg District		
ASARCO File		Tri Metals Mine (Story Mine)		

J. H. C.

Section III Appraisal

JUL 18 1983

⑭ Recommendations
- ☐ Action Now
- ☐ Too Low Grade
- ☐ Too Small
- ☐ Ownership Problem
- ☐ Access Problem
- ☒ See below

⑮
- ☐ Post Producer
- ☐ Producer
- ☒ Mineral Deposit
- ☒ Prospect
- ☐
- ☐
- ☒ Geologic Concept
- ☒ Geochem Anomaly
- ☐ Geophy Anomaly
- ☐

⑯ Production

Commodity	Tons	Grade
Mercury	2000(?) flasks	

⑰ Reserves ☐ Measured ☐ Estimated

Commodity	Tons	Grade
Not known but 0.17 oz Au, 7 oz Ag and 11% Pb occurs in a 2'-3' thick vein(s) (Tri Metals Mine).		

⑱ Num. Drill Holes Not known

Approx Total Footage _____

⑲ Excavations Roads, pits, underground workings

⑳ ☒ Spectro. Analysis Attached ㉑ ☐ Assays Attached ㉒ ☒ Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals Mercury (widespread), gold (local), silver (local), and lead (local).

㉔ Ore Minerals-Major Cinnabar Minor

㉕ Host Rocks-Major Meta sed. Meta volc. Minor

㉖ Age of Host Rocks P€ P€

㉗ Nature of Exposures Best exposures in road cuts and washes; also outcrops on steep, brushy slopes.

㉘ Alteration The minerals of hydrothermal origin are not readily distinguished from those of metamorphic origin.

㉙ Total Extent Not known.

㉚ Structure Northeasterly striking quartz veins in northeasterly striking, steeply dipping metasediments.

㉛ Ore Occurrence Numerous qtz-carbonate-cinnabar veins in Sunflower area and qtz-Au-Ag-Pb-As veins in Tri Metals area. Veins are conformative to bedding-schistosity.

㉜ Age of Minerolization Not known.

㉝ Conclusions & Recommendations The Mazatzal Mercury District is a Precambrian "pile" of volcanic and sedimentary rocks that include such rocks as rhyolite porphyry, iron rich jasperoid lenses, carbonate lenses, schist, and shale. The environment is one in which volcanigenic massive sulfide or volcanigenic exhalative gold deposits might occur. The association of Hg and Au with this environment presents an area of exploration interest. Consequently, ASARCO's pulps from a 1966 evaluation of

(continued on attached sheet).

(For additional space use extra sheets)

MAZATZAL MERCURY DISTRICT

Conclusions & Recommendations Con't.

the Sunflower mercury mineralization were run for gold (see attached analyses). The location and geology of these samples are described in the report "Big Sam (National Mine), Sunflower Mercury Group, Mazatzal Mountains" by R. H. Luning (May 10, 1966). All of the gold analyses are 20 ppb or less, and the values are not anomalous. Additional research indicates the general region has been explored for gold by government and industry. Texas Gulf is rumored (R. Lundin promotional information) to have some disseminated gold at the Story Mine (Tri Metals Mine), and Tenneco's Houston International Minerals Corporation is currently sampling the general area.

The Mazatzal Mercury District has a potential for gold in the Tri Metals Mine area and peripheral (or at depth?) to the gold barren outcrops sampled by ASARCO in 1966. Considering the strong competitive activity the area has received, ASARCO's lack of funds, and the lack of available geologists, no further work is recommended at this time.

MAZATZAL HG DIST.

SKYLINE LABS, INC.
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(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 244
December 21, 1982
H.G. KREIS

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 97 Samples

ITEM	SAMPLE NO.	Au ppm
11	8-65-10	<.002
12	8-65-11	<.002
13	8-65-12	<.002
21	8416A	<.002
24	L-1	.006
25	L-2	<.002
26	L-3	.003
27	L-4	<.002
28	L-5	.008
29	L-6	.007
30	L-7	<.002
31	L-8	<.002
32	L-9	<.002
33	L-10	<.002
34	L-11	<.002
38	L-18	<.002
39	L-19	<.002
40	L-20	<.002
41	L-21	<.002
42	L-22	<.002
45	L-26	<.002
46	L-27	<.002
52	L-37	<.002
53	L-38	<.002
54	L-39	<.002

samples taken 8-18-65. "8-65" prefix added by HK.

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(602) 622-4836

JOB NO. TAJ 244
December 21, 1982
PAGE 2

ITEM	SAMPLE NO.	Au ppm
55	L-40	<.002
56	L-41	.003
57	L-42	<.002
58	L-44	<.002
59	L-45	.005
60	L-46	<.002
61	L-47	<.002
62	L-48	<.002
63	L-49	<.002
64	L-50	<.002
65	L-51	<.002
66	L-52	<.002
67	L-53	<.002
68	L-54	<.002
69	L-55	<.002
70	L-56	.020
71	L-57	.005
72	L-58	<.002
73	L-59	<.002
74	L-60	<.002
75	L-61	.014
76	L-62	<.002
81	L-67	<.002
82	L-68	<.002
83	L-69	<.002

SKYLINE LABS, INC.
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Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 244
December 21, 1982
PAGE 3

ITEM	SAMPLE NO.	Au ppm
84	L-70	.003
85	L-71	<.002
86	L-72	<.002
87	L-73	<.002
88	L-74	<.002
89	L-75	<.002
90	L-76	.002
91	L-77	<.002
95	L-81	<.002
96	L-82	<.002
102	L-88	<.002
103	L-89	.012
104	L-90	<.002
105	L-91	<.002
106	L-92	<.002
107	L-93	<.002
110	L-96	<.002
111	L-97	<.002
112	L-98	<.002
113	L-99	<.002
114	L-100	<.002
115	3559	<.002
116	3560	<.002
117	3561	<.002
118	3562	<.002

Could not find the old pulps so used character samples saved from old rejects

ORD MINE

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
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Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 244
December 21, 1982
PAGE 4

	ITEM	SAMPLE NO.	Au ppm
ORD MINE	119	3563	<.002
	120	3564	<.002
	121	3565	<.002
	122	3566	<.002
	123	3567	<.002
	124	3568	.005
	125	COMP(8-65-1,2,3,4)	<.002
	126	COMP(8-65-5,6)	<.002
	127	COMP(8-65-6A,7,8,9)	<.002
	128	COMP(8402,04,06,08)	<.002
	129	COMP(8412,8414,8416)	<.002
	130	COMP(8420,8426)	<.002
	133	COMP(L-13,14,15)	<.002
	134	COMP(L-24,25)	<.002
	135	COMP(L-30,31,32)	<.002
	136	COMP(L-33,34)	.007
	137	COMP(L-65,66,94)	.003
	138	COMP(L-63,64,95)	.004
	139	COMP(L-78,87)	<.002
	140	COMP(L-79,84)	<.002
	141	COMP(L-80,83)	<.002
	142	COMP(L-85,86)	<.002

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED 12/21/82
ARIZONA U.S.A.

William L. Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 244
December 21, 1982
H.G. KREIS

ASARCO INCORPORATED
Attn: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 16 Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED 12/23/82 ARIZONA U.S.A.

William Lehmbeck
Manager

SKYLINE LABS, INC.
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JOB NO. TAJ 244
PAGE 2

ITEM NO. SAMPLE NO.
125 = COMP(8-65-1,2,3,4)
127 = COMP(8-65-6A,7,8,9)
131 = COMP(8-65-10,11,12)
132 = COMP(8420 THRU 8416)**
135 = COMP(L-30,31,32)
136 = COMP(L-33,34)
139 = COMP(L-78,87)
140 = COMP(L-79,84)

ITEM	125	127	131	132	135	136	139	140
ELEMENT								
Fe	5%	10%	5%	5%	5%	7%	7%	5%
Ca	3%	2%	10%	7%	7%	2%	2%	1%
Mg	3%	.7%	1.5%	2%	1.5%	5%	5%	1%
Ag	<1	<1	<1	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	<500	<500	<500	<500
B	30	500	300	30	50	<10	<10	100
Ba	30	<10	<10	<10	10	<10	<10	70
Be	<2	<2	<2	<2	<2	<2	<2	<2
Bi	<10	<10	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<50
Co	30	20	30	30	30	30	30	5
Cr	10	<10	10	30	30	50	30	<10
Cu	70	30	50	50	50	50	50	20
Ga	<10	<10	<10	<10	<10	<10	<10	10
Ge	<20	<20	<20	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20	<20	<20	<20
Mn	700	3000	1000	500	1000	1000	1000	2000
Mo	<2	<2	<2	<2	<2	<2	<2	<2
Nb	20	30	<20	<20	20	20	20	30
Ni	50	50	50	70	70	70	70	5
Pb	<10	<10	<10	<10	<10	<10	<10	<10
Sb	100	<100	<100	<100	<100	<100	<100	<100
Sc	30	<10	15	20	20	30	30	<10
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	<100	<100	100	<100	<100	<100	<100	<100
Ti	3000	2000	1500	1500	2000	3000	3000	7000
V	150	30	100	70	100	150	150	20
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	<10	<10	<10	<10	<10	<10	<10	15
Zn	<200	<200	<200	<200	<200	<200	<200	<200
Zr	<20	50	<20	<20	<20	<20	20	100

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JOB NO. TAJ 244
PAGE 3

ITEM NO. SAMPLE NO.
141 = COMP(L-80,83)
143 = COMP(L-88,89,90)
144 = COMP(L-63 THRU 66,94,95)
145 = COMP(L-49,50,51,52)
146 = COMP(L-15,22,24,25,26)
147 = COMP(L-4,10,11,13,14,27)
148 = COMP(3559,3560,3561)
149 = COMP(3562,3563)

ITEM	141	143	144	145	146	147	148	149
ELEMENT								
Fe	5%	7%	7%	5%	7%	7%	5%	5%
Ca	1.5%	2%	2%	.7%	7%	10%	10%	2%
Mg	.7%	.3%	.3%	1%	2%	2%	10%	1.5%
Ag	<1	<1	<1	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	<500	<500	<500	<500
B	100	150	150	50	100	100	10	70
Ba	20	50	50	50	50	<10	<10	50
Be	<2	<2	<2	<2	<2	<2	<2	<2
Bi	<10	<10	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<50
Co	5	15	20	20	20	30	50	15
Cr	20	<10	<10	15	<10	<10	1000	20
Cu	30	50	100	70	70	70	30	10
Ga	<10	<10	<10	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20	<20	<20	<20
Mn	1500	3000	5000	1000	1500	1500	1000	1500
Mo	<2	<2	<2	<2	<2	<2	<2	<2
Nb	<20	20	30	20	20	20	<20	20
Ni	30	20	30	50	30	50	1000	70
Pb	<10	15	20	<10	<10	<10	<10	<10
Sb	<100	<100	<100	<100	<100	<100	<100	<100
Sc	<10	<10	10	15	10	30	<10	<10
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	<100	<100	<100	<100	100	<100	150	<100
Ti	1500	2000	3000	3000	7000	7000	2000	5000
V	30	50	70	100	70	200	50	50
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	<10	<10	<10	<10	<10	<10	<10	<10
Zn	<200	<200	<200	<200	<200	<200	<200	<200
Zr	30	50	50	70	30	20	<20	70

~~JHL~~ → ER File

ASARCO EXPLORATION RECORD

☐ FIELD EXAMINATION ☐ LITERATURE SEARCH ☐ ASARCO FILE ☒ Submittal

Section I General Indexing

① Name(s) of Property or Area: WHITE GOLD PROJECT, Oro Blanco District					② Country: Santa Cruz Co.	③ State or Province: ARIZONA	
					④ USGS Quad.: Ruby, AZ (7½')	⑤ File or Gore No.	
⑥ Latitude: 32°24'	⑦ Longitude: 111°14'30"	⑧ AMS Sheet: Nogales	Township: 23S	Range: 11E	Section: 20 & 29	⑨ Examined by: HGKreis	⑩ Date: 6/30/83
						⑪ Office: SWED Tucson	⑫ Field Days: 0

Section II Sources of Information

Date Typed 7/1/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Jay W. Santos	3/18/83	NCA Minerals Inc. report on above property.		
ASARCO files on Oro Blanco District				

Section III Appraisal

JUL 11 1983

⑭ Recommendations
- ☐ Action Now
- ☒ Too Low Grade
- ☒ Too Small
- ☐ Ownership Problem
- ☐ Access Problem
- ☐

⑮
- ☐ Post Producer
- ☐ Producer
- ☒ Mineral Deposit
- ☐ Prospect
- ☐
- ☐ Geologic Concept
- ☒ Geochem Anomaly
- ☐ Geophy Anomaly
- ☐

⑯ Production

Commodity	Tons	Grade

⑰ Reserves ☐ Measured ☒ Estimated

Commodity	Tons	Grade
	Possible 100,000 tons	0.04-0.08 oz.Au

⑱ Num. Drill Holes 48
Approx Total Footage 4300

⑲ Excavations: Road cuts, pit, trench

⑳ ☐ Spectro. Analysis Attached ㉑ ☒ Assays Attached Drill Hole ㉒ ☐ Geochem Results Attached Map on file

Section IV Geologic Data

㉓ Commodity or Contained Metals: Gold with minor silver

㉔ Ore Minerals-Major: Native gold, silver mineral(s) unknown Minor:

㉕ Host Rocks-Major: Rhyolite, Andesite, Conglomerate Minor:

㉖ Age of Host Rocks: Mesozoic(?)

㉗ Nature of Exposures: Not known, but there is sufficient cover to interfere with surface evaluations of the mineralization.

㉘ Alteration: Not known

㉙ Total Extent: Not known

㉚ Structure: Not known

㉛ Ore Occurrence: Apparent NW trending, northeasterly dipping zone of imbricate quartz veining.

㉜ Age of Mineralization: Mesozoic(?)

㉝ Conclusions & Recommendations: The above Santos report claims this property has an indicated reserve of 500,000 tons at 0.07 oz Au. The drill results suggest a small tonnage and lower grade (discounting a high grade sample or two), say 100,000 tons with an average grade of 0.04-0.06 oz. Au. The results of 48 drill holes that tested three separate areas of mineralization are not encouraging enough to warrant Asarco interest at this time.

(Continued on following page)

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Conclusions & Recommendations (continued)

The following is a synopsis of Santos' report on the White Gold property. Santos described four separate areas of imbricate quartz veining.

Area D (zone is centermost area of claim group):

NW-SE strike, 35°N dip.
100' thickness, extends >160' down dip, >400' along strike.
0.07 oz. Au, average grade of indicated 500,000 tons.
Similar quartz veining occurs for 400' to the southeast.
8 holes, No. 13-16 and 45-48, were drilled in this area.
Only 4 holes were in the quartz zone (probably holes No. 13,14,16, and 47).

Area A (Eastern Zone):

12 holes were drilled, 7 of which were in the quartz rich portion.
Best intercept, 13' at surface of 0.035 oz. Au.
Thickest intercept with 0.01 oz. cut off: Hole 11, 27'-90', 63' @ 0.024 oz. Au.
None of the other holes have a thickness and grade approaching that in hole 11.

Area H (Northwestern Zone), 800' NW of center zone:

28 holes drilled, 11 of the holes in quartz rich zone.
These holes had the most silver of all the zones.
Apparently these holes were drilled on a gold in soil anomaly; Coplen panned gold in holes dug above the anomaly.
Best hole: 58' at 0.036 oz. Au and 1.16 oz. Ag (this must be hole 22).
Hole 48 bottomed in 8' @ 0.335 oz. Au at 49'.
Hole 25 bottomed in 48' at 0.013 oz. Au and 1.92 oz. Ag.

Farthest Northwest Zone:

0.01 oz. Au geochem anomaly with values up to 0.02 oz.
Not drilled.

Area not examined:

Coplen panned gold from an area of similar geology 2000' SW of the easterly most zone.

"A" Area
White Gold Claims
Arivaca Project
Drilled February 5 and 6, 1982

	Sample No.	From	To	Feet	oz/ton Au	oz/ton Ag	
Hole 1 3718 El.	1	1	14	13	0.035	1.60	
	2	14	27	13	0.005	0.40	
	3	27	40	13	0.007	0.35	
	4	40	53	13	0.028	0.90	
	5	53	66	13	0.004	2.00	
	6	66	78	12	0.007	0.45	
	7	78	90	12	0.012	0.50	
	8	90	101	11	0.008	0.50	
Hole 2 3721 El.	1	5	14	9	0.046	0.60	
	2	14	27	13	0.009	0.15	
	3	27	40	13	0.011	0.50	
	4	40	53	13	0.008	0.40	
	5	53	66	13	0.005	0.30	
	6	66	78	12	0.010	0.40	
	7	78	90	12	<0.001	0.40	
	8	90	101	11	0.006	0.65	
Hole 3 3707 El.	1	5	14	9	0.010	0.30	
	2	14	27	13	0.008	0.30	
	3	27	40	13	0.009	0.15	
	4	40	53	13	0.002	0.05	
	5	53	66	13	0.006	0.15	
	6	66	78	12	<0.003	0.11	
	7	78	81	3	<0.003	1.33	Rods dropped 81' cave 'c' workings
Hole 4 3700 El.	1	2	14	12	0.010	0.65	
	2	14	27	13	0.009	0.30	
	3	27	40	13	0.005	0.40	
	4	40	53	13	<0.003	0.07	
	5	53	66	13	0.005	0.15	
	6	66	78	12	0.010	0.50	
	7	78	90	12	0.002	0.30	
	8	90	101	11	0.015	0.40	

"A" Area
White Gold Claims
Arivaca Project
Drilled February 6 and 7, 1982

	Sample No.	From	To	Feet	oz/ton Au	oz/ton Ag
Hole 5 3700 El.	1	3	14	11	0.004	0.30
	2	14	27	13	0.002	0.25
	3	27	40	13	<0.003	0.05
	4	40	53	13	0.005	0.05
	5	53	66	13	0.005	0.35
	6	66	78	12	0.005	0.30
	7	78	90	12	0.003	0.40
	8	90	101	11	0.002	0.45
Hole 6 3728 El.	1	2	14	12	0.001	0.25
	2	14	27	13	<0.001	0.40
	3	27	40	13	0.002	0.40
	4	40	53	13	0.013	0.50
	5	53	66	13	0.023	0.65
	6	66	78	12	0.005	0.50
	7	78	90	12	0.003	0.15
	8	90	101	11	0.001	0.20
Hole 7 3774 El.	1	4	14	10	0.005	0.75
	2	14	27	13	0.014	0.90
	3	27	40	13	0.017	0.90
	4	40	53	13	0.003	0.50
	5	53	66	13	0.001	0.60
	6	66	78	12	0.004	0.70
	7	78	90	12	0.013	0.60
	8	90	101	11	0.011	0.55
Hole 8 3771 El.	1	3	14	11	0.003	0.40
	2	14	27	13	0.002	0.15
	3	27	40	13	0.002	0.30
	4	40	53	13	0.002	0.30
	5	53	66	13	0.002	0.30
	6	66	78	12	0.002	0.40
	7	78	90	12	0.006	0.45
	8	90	101	11	0.002	0.20

"A" Area
White Gold Claims
Arivaca Project
Drilled February 7, 9 and 10, 1982

	Sample No.	From	To	Feet	oz/ton Au	oz/ton Ag		
Hole 9	1	3	14	11	0.008	0.40		
3762 El.	2	14	27	13	0.011	0.15		
	3	27	40	13	0.007	0.45		
	4	40	53	13	0.022	0.60	.018	0.55
	5	53	66	13	0.012	1.00		
	6	66	71	5	0.002	0.90		
Hole 10	1	3	14	11	0.007	0.88		
3774 El.	2	14	27	13	0.017	1.20		
	3	27	40	13	0.024	1.10	.019	0.97
	4	40	53	13	0.023	1.05		
	5	53	65	12	0.011	0.60		
Hole 11	1	3	14	11	0.007	0.95		
3745 El.	2	14	27	13	0.006	0.50		
	3	27	40	13	0.040	0.65		
	4	40	53	13	0.010	0.20		=
	5	53	66	13	0.012	0.10	.024	.5
	6	66	78	12	0.029	0.30		
	7	78	90	12	0.032	0.35		
	8	90	101	11	0.009	0.20		
Hole 12	1	3	14	11	0.038	0.70	.025	.64
3750 El.	2	14	27	13	0.014	0.60		
	3	27	40	13	0.002	0.70		
	4	40	53	13	0.014	0.30		
	5	53	66	13	0.005	0.35		
	6	66	78	12	0.002	0.30		
	7	78	90	12	<0.001	0.10		
	8	90	101	11	<0.001	0.20		

"D" Area
White Gold Claims
Arivaca Project
Drilled February 10 and 12, 1982

	Sample No.	From	To	Feet	oz/ton Au	oz/ton Ag	
Hole 13 3774 El.	1	3	14	11	0.015	0.35	
	2	14	27	13	0.007	0.30	
	3	27	40	13	0.010	0.30	
	4	40	53	13	<0.001	0.35	
	5	53	66	13	0.021	0.20	
	6	66	78	12	0.013	0.25	
	7	78	90	12	0.022	0.20	
	8	90	101	11	0.021	0.30	
Hole 14 3783 El.	1	3	14	11	0.030	0.70	Oxidized to end
	2	14	27	13	0.042	0.65	
	3	27	40	13	0.068	1.40	
	4	40	53	13	0.132	1.25	
	5	53	66	13	0.018	0.85	
	6	66	78	12	0.015	0.40	
	7	78	90	12	<0.003	0.26	
	8	90	101	11	0.022	1.00	
Hole 15 3762 El.	1	2	14	12	0.006	0.15	
	2	14	27	13	0.004	0.20	
	3	27	40	13	0.002	0.25	Oxidized
	4	40	53	13	<0.001	0.30	Unoxidized to end
	5	53	66	13	0.012	0.55	
	6	66	78	12	0.006	0.04	
	7	78	90	12	0.006	<0.05	
	8	90	101	11	0.018	0.15	
Hole 16 3756 El.	1	3	14	11	0.030	0.29	
	2	14	27	13	0.030	0.21	
	3	27	40	13	0.070	0.29	
	4	40	53	13	0.040	0.16	
	5	53	66	13	0.030	0.37	
	6	66	78	12	0.020	0.34	
	7	78	90	12	0.045	0.42	
	8	90	101	11	0.080	0.30	

"H" Area
White Gold Claims
Arivaca Project
Drilled April 13 and 14, 1982

	Sample No.	From	To	Feet	oz/ton Au	oz/ton Ag	
Hole 17	1	2	14	12	<0.005	<0.01	
3735 El.	2	14	27	13	<0.005	0.06	
	3	27	40	13	<0.005	<0.01	Oxidized to 40'
	4	40	52	12	<0.005	<0.01	Unoxidized
	5	52	64	12	<0.005	<0.01	Unoxidized
	6	64	76	12	<0.005	0.10	Mixed
	7	76	88	12	<0.005	0.10	Mixed
	8	88	100	12	<0.005	0.10	Unoxidized
Hole 18	1	2	14	12	<0.005	0.14	
3736 El.	2	14	27	13	<0.005	0.10	
	3	27	40	13	0.160	3.08	Oxidized
	4	40	52	12	0.100	<0.01	Mixed
	5	52	64	12	0.005	<0.01	Mixed
Hole 19	1	2	13	11	0.010	<0.01	
3732 El.	2	13	26	13	0.010	0.07	
	3	26	38	12	0.005	0.26	
	4	38	50	12	0.005	<0.01	Oxidized
	5	50	62	12	0.010	0.09	Mixed
	6	62	74	12	<0.005	<0.01	Unoxidized
	7	74	86	12	<0.005	0.10	Mixed
	8	86	97	11	<0.005	0.08	Unoxidized to end
	9	97	102	5	0.020	0.08	
Hole 20	1	3	13	10	0.005	<0.01	
3729 El.	2	13	26	13	<0.005	0.06	
	3	26	38	12	<0.005	0.08	
	4	38	50	12	<0.005	0.10	
	5	50	58	8	<0.005	0.06	Oxidized
Hole 21	1	2	13	11	<0.005	<0.01	
3727 El.	2	13	26	13	0.005	0.10	
	3	26	38	12	<0.005	0.12	
	4	38	50	12	<0.005	<0.01	
	5	50	62	12	<0.005	0.04	Oxidized to 56'
	6	62	74	12	<0.005	0.14	Unoxidized
	7	74	86	12	0.005	0.06	Unoxidized
	8	86	97	11	<0.005	0.04	Mixed
	9	97	102	5	<0.005	<0.01	Unoxidized

"H" Area
White Gold Claims
Arivaca Project
Drilled April 15, 1982

	Sample No.	From	To	Feet	oz/ton Au	oz/ton Ag	
Hole 22 3723 El.	1	4	13	9	0.070	2.99	
	2	13	26	13	0.025	0.66	
	3	26	38	12	0.015	0.53	
	4	38	50	12	0.050	1.41	
	5	50	62	12	0.030	0.75	
	6	62	74	12	0.015	0.63	
	7	74	86	12	0.010	0.15	Oxidized to 76'
	8	86	97	11	0.010	0.43	Unoxidized to end
	9	97	102	5	0.010	0.29	
Hole 23 3719 El.	1	3	14	11	0.005	0.32	
	2	14	27	13	0.015	0.83	
	3	27	40	13	0.005	0.06	
	4	40	52	12	0.010	<0.01	
	5	52	64	12	0.010	0.11	
	6	64	76	12	0.090	0.93	
	7	76	88	12	0.010	<0.01	Oxidized to 82'
	8	88	100	12	0.010	0.23	Unoxidized
Hole 24 3775 El.	1	3	14	11	0.002	<0.01	
	2	14	27	13	0.002	0.11	
	3	27	40	13	0.001	0.19	
	4	40	52	12	0.001	0.13	
	5	52	64	12	0.002	0.11	
	6	64	76	12	0.001	0.37	Oxidized to 70'
	7	76	83	7	0.006	0.87	Mixed to end
	8	83	88	5	0.004	0.50	
	9	88	100	12	0.003	0.37	
Hole 25 3775 El.	1	3	14	11	0.002	0.18	
	2	14	27	13	0.005	0.27	
	3	27	40	13	0.002	0.47	
	4	40	52	12	0.002	0.53	
	5	52	64	12	0.017	2.20	
	6	64	76	12	0.014	1.95	
	7	76	88	12	0.016	1.62	Oxidized
	8	88	100	12	0.007	1.93	Mixed

"H" Area
White Gold Claims
Arivaca Project
Drilled April 15, 16 and 17, 1982

	Sample No.	From	To	Feet	oz/ton Au	oz/ton Ag	
Hole 26 3773 El.	1	3	14	11	0.002	0.22	
	2	14	27	13	0.003	0.09	
	3	27	40	13	0.002	0.13	
	4	40	52	12	0.003	0.13	
	5	52	64	12	0.003	0.16	
	6	64	76	12	0.006	0.22	
	7	76	80	4	0.002	0.10	
Hole 27 3758 El.	1	3	13	10	0.002	0.10	
	2	13	26	13	0.002	0.03	
	3	26	38	12	0.001	0.08	
	4	38	50	12	0.001	0.03	
	5	50	62	12	0.003	0.23	Oxidized
	6	62	74	12	0.003	0.17	Mixed to end
	7	74	86	12	0.002	0.16	
	8	86	97	11	0.002	0.11	
	9	97	102	5	0.002	0.08	
Hole 28 3756 El.	1	3	13	10	0.004	0.06	
	2	13	26	13	0.003	0.15	
	3	26	38	12	0.003	0.22	
	4	38	50	12	0.002	0.01	
	5	50	62	12	0.002	0.06	
	6	62	74	12	0.023	0.23	
	7	74	86	12	0.004	0.27	Oxidized to 80'
	8	86	97	11	0.003	0.14	Mixed to end
	9	97	107	10	0.002	0.18	
Hole 29 3689 El.	1	3	13	10	0.002	0.01	
	2	13	26	13	0.001	0.07	
	3	26	38	12	0.001	0.06	
	4	38	50	12	0.001	0.06	
	5	50	62	12	0.002	0.06	Oxidized
	6	62	74	12	0.002	0.14	Mixed
Hole 30 3690 El.	1	3	13	10	0.002	<0.01	
	2	13	26	13	0.002	0.09	
	3	26	38	12	0.002	<0.01	
	4	38	50	12	0.008	0.12	
	5	50	62	12	0.003	0.06	Oxidized to 60'
	6	62	74	12	0.002	0.01	Mixed
	7	74	86	12	0.002	0.01	Unoxidized to end
	8	86	97	11	0.001	0.05	
	9	97	102	5	0.010	0.04	

"H" Area
White Gold Claims
Arivaca Project
Drilled April 17, 1982

	Sample No.	From	To	Feet	oz/ton Au	oz/ton Ag	
Hole 31	1	3	13	10	0.001	<0.01	
3686 El.	2	13	26	13	0.006	0.26	
	3	26	38	12	0.005	0.06	
	4	38	50	12	0.002	0.03	
	5	50	62	12	0.005	0.07	
	6	62	74	12	0.004	0.06	Oxidized to 70'
	7	74	86	12	0.004	0.15	Mixed
	8	86	97	11	0.003	0.01	Unoxidized to end
	9	97	102	5	0.002	0.01	
Hole 32	1	3	13	10	0.019	0.27	
3686 El.	2	13	26	13	0.011	0.29	
	3	26	38	12	0.005	0.18	
	4	38	50	12	0.001	<0.01	
	5	50	62	12	0.007	0.01	
	6	62	74	12	0.002	0.02	Oxidized to 64'
	7	74	86	12	0.008	0.09	Unoxidized to end
	8	86	97	11	0.007	<0.01	
Hole 33	1	3	13	10	0.006	0.09	
3683 El.	2	13	26	13	0.008	<0.01	
	3	26	38	12	0.016	0.07	
	4	38	50	12	0.009	0.07	
	5	50	62	12	0.004	0.02	Oxidized to 56'
	6	62	74	12	0.005	0.07	Unoxidized to end
	7	74	86	12	0.003	0.02	
	8	86	97	11	0.003	0.01	
Hole 34	1	3	13	10	0.004	0.07	
3684 El.	2	13	26	13	0.031	0.19	
	3	26	38	12	0.011	0.11	
	4	38	50	12	0.016	0.10	Oxidized to 49'
	5	50	58	8	0.003	<0.01	Mixed
Hole 35	1	3	13	10	0.002	0.04	Mixed 3' to 48'
3685 El.	2	13	26	13	0.001	0.01	
	3	26	38	12	0.005	0.05	
	4	38	50	12	0.002	<0.01	Unoxidized to end
	5	50	62	12	0.002	<0.01	
	6	62	74	12	0.008	0.02	
	7	74	86	12	0.004	<0.01	
	8	86	97	11	0.021	0.09	

"H" Area
White Gold Claims
Arivaca Project
Drilled April 19 and 20, 1982

	Sample No.	From	To	Feet	oz/ton Au	oz/ton Ag	
Hole 36	1	3	15	12	0.010	0.52	
3635 El.	2	15	28	13	0.059	0.47	
	3	28	41	13	0.006	0.08	Oxidized
	4	41	53	12	0.002	0.06	Unoxidized to end
	5	53	63	10	0.005	<0.01	
Hole 37	1	3	15	12	0.012	<0.01	Oxidized to 21'
3634 El.	2	15	28	13	0.006	0.02	Mixed
	3	28	41	13	0.007	0.07	Oxidized to 57'
	4	41	53	12	0.003	<0.01	
	5	53	65	12	0.008	0.09	Unoxidized to end
	6	65	77	12	0.003	0.05	
	7	77	89	12	0.008	<0.01	
	8	89	101	12	0.003	0.08	
Hole 38	1	3	15	10	0.010	<0.01	
3637 El.	2	15	28	13	0.020	0.17	
	3	28	41	13	0.006	0.01	Oxidized to 40'
	4	41	53	12	0.003	0.07	Mixed 40' to 45'
	5	53	65	12	0.003	<0.01	Unoxidized to end
	6	65	77	12	0.005	0.08	
	7	77	89	12	0.009	0.04	
	8	89	101	12	0.005	0.05	
Hole 39	1	3	15	12	0.006	<0.01	
3640 El.	2	15	28	13	0.005	0.04	Oxidized to 26'
	3	28	41	13	0.011	<0.01	Unoxidized to end
	4	41	53	12	0.008	0.08	
Hole 40	1	3	15	12	0.003	<0.01	Mixed
3644 El.	2	15	28	13	0.003	0.04	Oxidized
	3	28	41	13	0.006	0.01	Unoxidized to end
	4	41	53	12	0.006	0.04	
	5	53	65	12	0.010	<0.01	
Hole 41	1	8	15	7	0.003	0.03	Unoxidized to end
3587 El.	2	15	28	13	0.012	0.02	

"H" Area
White Gold Claims
Arivaca Project
Drilled April 21, 1982

	Sample No.	From	To	Feet	oz/ton Au	oz/ton Ag	
Hole 42	1	5	15	10	0.009	0.02	Oxidized to end
3589 El.	2	15	28	13	0.007	0.09	
	3	28	35	7	0.003	0.04	
Hole 43	1	15	28	13	0.002	0.08	Oxidized to end
3589 El.	2	28	41	13	0.010	0.03	
	3	41	49	8	0.335	0.09	
Hole 44	1	6	15	9	0.011	<0.01	Oxidized to end
3595 El.	2	15	28	13	0.002	<0.01	
	3	28	37	9	0.003	0.03	

"D" Area
White Gold Claims
Arivaca Project
Drilled April 21 and 22, 1982

	Sample No.	From	To	Feet	oz/ton Au	oz/ton Ag	
Hole 45 3772 El.	1	3	15	12	0.012	0.09	
	2	15	28	13	0.005	0.16	
	3	28	41	13	0.006	0.17	
	4	41	53	12	0.006	0.05	
	5	53	65	12	0.003	0.04	
	6	65	77	12	0.002	0.06	
	7	77	89	12	0.003	0.14	
	8	89	101	12	0.008	0.31	
	9	101	112	11	0.008	0.22	
	10	112	122	10	0.005	0.21	Oxidized to end
Hole 46 3780 El.	1	3	15	12	0.003	0.01	
	2	15	28	13	0.002	0.03	
	3	28	41	13	0.006	0.12	
	4	41	53	12	0.005	<0.01	
	5	53	65	12	0.016	0.22	
	6	65	77	12	0.015	0.11	
	7	77	89	12	0.003	0.14	
	8	89	101	12	0.028	0.16	
	9	101	112	11	0.007	0.02	Oxidized to end
Hole 47 3760 El.	1	3	15	12	0.001	0.05	
	2	15	28	13	0.030	0.05	
	3	28	41	13	0.032	<0.01	
	4	41	53	12	0.027	<0.01	
	5	53	65	12	0.035	0.14	Oxidized to 63'
	6	65	77	12	0.186	<0.01	Mixed
	7	77	89	12	0.741	0.45	Mixed
	8	89	101	12	0.043	<0.01	Mixed
	9	101	107	6	0.016	<0.01	Hard unoxidized
Hole 48 3749 El.	1	3	15	12	0.002	0.01	
	2	15	28	13	0.002	<0.01	
	3	28	41	13	0.003	<0.01	
	4	41	53	12	0.001	<0.01	
	5	53	65	12	0.002	<0.01	Oxidized
	6	65	77	12	0.006	<0.01	Mixed
	7	77	89	12	0.006	<0.01	Mixed
	8	89	101	12	0.003	<0.01	Mixed
	9	101	112	11	0.002	<0.01	Mixed

92'd 1446 oz/T

JHC - ER File

ASARCO EXPLORATION RECORD

[X] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] _____

Section I General Indexing

① Name(s) of Property or Area: LADY JEANNE					② Country: USA San Bernardino Co	③ State or Province: CA	
					④ USGS Quad.: Essex 15'	⑤ File or Gore No.	
⑥ Latitude: 34°33½'N	⑦ Longitude: 115°10'W	⑧ AMS Sheet: Needles	Township: 5N	Range: 17E	Section: N Cent 2	⑨ Examined by: JDSell	⑩ Date: 2/15/83
						⑪ Office: Tucson	⑫ Field Days: 1

Section II Sources of Information

Date Typed 4/8/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Phone call from Willard Christensen of Sandy, Utah, representing owner(?). BLM records (12/9/82) shows J. Rommell, et al. as claimants				

J. H. C.

APR 22 1983

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [X] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [ ]

⑮
- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [X] Prospect
- [ ]
- [ ] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade

⑱ Num. Drill Holes _____ Approx Total Footage _____

⑲ Excavations: 50' shaft; 10' cut

⑳ [ ] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [ ] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Ag

㉔ Ore Minerals-Major: qtz-pyrite, trace copper Minor: Tactite in section to north as pendants in granite

㉕ Host Rocks-Major: granite Minor:

㉖ Age of Host Rocks: Mesozoic

㉗ Nature of Exposures: Excellent in high valley cut into granite

㉘ Alteration: 1"-2" qtz-sericite borders on 2-4 foot qtz vein-pod

㉙ Total Extent: 150 feet

㉚ Structure: N30-35°W; 75° S.-dipping qtz vein-pod.

㉛ Ore Occurrence: Massive qtz vein-pod with oxidized FeOx (pyrite)

㉜ Age of Mineralization: Mesozoic, post-granite

㉝ Conclusions & Recommendations: Small, limited, although ore pile sample (CLJ-1) shows 2 ounce silver values. Wall rock sample (CLJ-2) and field examination show no dispersion of values. No further interest.

(For additional space use extra sheets)

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 253
February 24, 1983
SHIPMENT NO. 1
JAMES D. SELL
CLJ-1 & 2

ASARCO INCORPORATED
Attn.: Mr. James D. Sell
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 2 Rock Chip Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK STATE OF Arizona 1983

William L. Lehmbeck
Manager

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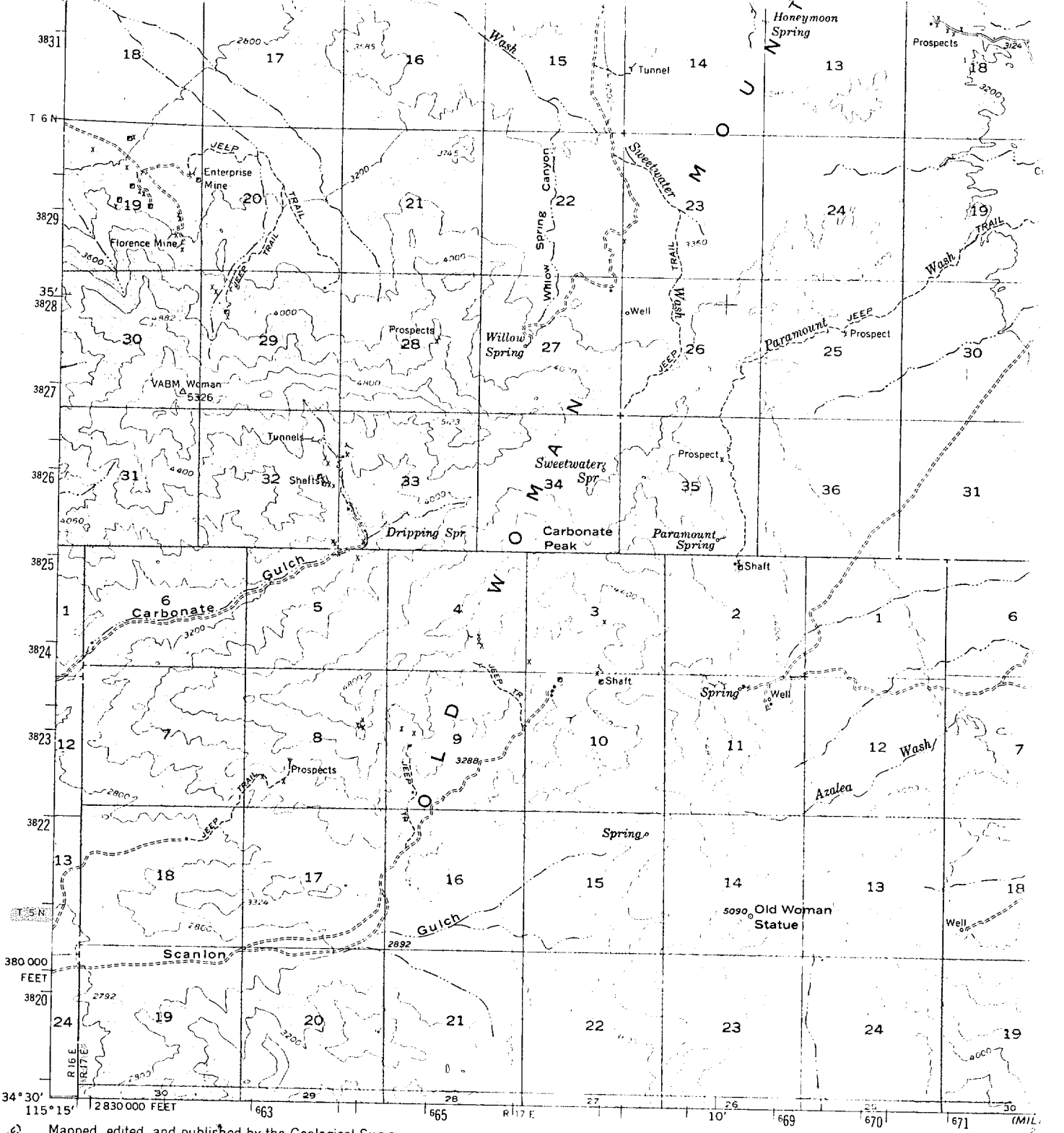
JOB NO. TAJ 253
PAGE 2

ITEM NO. SAMPLE NO.
1 = CLJ-1 ore-pile
2 = CLJ-2 wallrock granite

ITEM	1	2
ELEMENT		
Fe	3%	1.5%
Ca	.07%	.5%
Mg	.5%	.2%
Ag	50	<1
As	<500	<500
B	15	<10
Ba	<10	700
Be	<2	<2
Bi	<10	<10
Cd	<50	<50
Co	<5	<5
Cr	<10	<10
Cu	200	<2
Ga	<10	<10
Ge	<20	<20
La	<20	<20
Mn	10	30
Mo	15	<2
Nb	<20	<20
Ni	7	<5
Pb	200	<10
Sb	<100	<100
Sc	<10	<10
Sn	<10	<10
Sr	<100	<100
Ti	1500	700
V	15	<10
W	<50	<50
Y	<10	<10
Zn	700	<200
Zr	50	<20



(CADIZ LAKE) 2952 IV

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by multiplex methods
Aerial photographs taken 1953. Advance field check 1956

Polyconic projection. 1927 North American datum
10,000-foot grid based on California coordinate system, zone 5
1000-meter Universal Transverse Mercator grid ticks, zone 11, shown in blue

Dashed land lines indicate approximate locations

Unchecked elevations are shown in brown

GN MN
1°04' 19 MILS
15° 267 MILS
UTM GRID AND 1956 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE

1 ½ 0 1

3000 0 3000 6000

1 .5 0 1

CONTOUR I
DATUM IS

Essex 15' Topo Quad.
San Bernardino Co, Calif
CLJ-1 & 2 Samples

FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVE
A FOLDER DESCRIBING TOPOGRAPHIC MA

Gator Mining: Contact John Smilde, 3901 71st St. W, Bradenton, FL 33529; 813-792-7678 (home)

ER File

J. H. C.

ASARCO EXPLORATION RECORD

[X] FIELD EXAMINATION [X] LITERATURE SEARCH [X] ASARCO FILE [ ]

APR 22 1983

Section I General Indexing

① Name(s) of Property or Area: "Old" Goldstone District "Gator Mining Co."					② Country: USA - San Bernardino Co.	③ State or Province: CA	
					④ USGS Quad.: Goldstone & Lane Mtn. 15'	⑤ File or Gore No.	
⑥ Latitude: 35°17'N	⑦ Longitude: 116°55'W	⑧ AMS Sheet: Trona	Township: 14N	Range: 1E	Section: Esp. 18,19	⑨ Examined by: FRK, FAM, JDS WLK & FTG	⑩ Date: 3/31/83*
					⑪ Office: Tucson	⑫ Field Days: 1 1/4	

*Brief visit 8/4/82 Mohave Recon with F.A.Michel

Section II Sources of Information

Date Typed 4/8/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Miller, E.L. & Sutter, J.F.,	1982,	Structural Geol....Goldstone-Lane Mtn. Area.	Bull. GSA	V.93, p.1191-1207
Asarco Goldstone Dist. Gen. File (1931-68); Tucson Off., esp. BWatson & JBriscoe				
Ca J. Mines & Geo..	1953,	Mineral Deposits of San Bernardino Co., CA		V.49, n.2

Section III Appraisal

⑭ Recommendations
- [X] Action Now
- [?] Too Low Grade
- [ ] Too Small
- [?] Ownership Problem
- [?] Access Problem
- [X] Contact Gator Mining

⑮
- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [X] Prospect
- [ ]

Potential Carlin Environment
- [ ] Geologic Concept
- [X] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
Au-Ag	X0,000 on dumps	?
Leach Pad	700	.03 oz Au

⑰ Reserves None
- [ ] Measured
- [ ] Estimated

Commodity	Tons	Grade

⑱ Num. Drill Holes 47+ Air track
Approx Total Footage 1000'

⑲ Excavations Numerous shafts (to 300'), pits, trenches

⑳ [X] Spectro. Analysis Attached ㉑ [X] Assays Attached ㉒ [X] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Au-Ag Local Hg, As anomalies (strong Cu, Ni, Co, Cr anomal. in mafics)

㉔ Ore Minerals-Major: Electrum Pyrite-Goethite-Hematite Minor: Cpy? MnOx

㉕ Host Rocks-Major: Pelitic schist/thin bedded carbonates Minor: diabase sills and dikes

㉖ Age of Host Rocks: Permian Ordovician(?) Mesozoic(?) Jurassic & Cretaceous plutons/batholiths

㉗ Nature of Exposures: Low rolling hills, pediments in metasediments, good to fair outcrop, thin gravel cover, granites and hornfels form ranges. 30-50% outcrop in range.

㉘ Alteration: Calc-silicate hornfels/upper greenschist facies metamorphism, epidote-chlorite after biotite bleaching/FeOx associated with Au mineralization.

㉙ Total Extent: Metaseds 1-4 mi x 10 mi; better zones narrow.

㉚ Structure: Metaseds. are large roof pendant in granitic batholith. Thin-bedded metaseds. Isoclinally folded w/NW-strike, NE dip A.P. - several other periods of folding. Small scale drag, crenulation cleavage.

㉛ Ore Occurrence: Narrow quartz veins & veinlets plus Fe-Ox stained shattered zones in thin bedded metaseds. Better mineralization associated with diabase dikes and sills, granitic contacts.

㉜ Age of Mineralization: 74-81m.y. metamorph. (85-95 granites)??

㉝ Conclusions & Recommendations: Some metaseds. (Ordov.?) are "Valmy" (upper plate Roberts Mtns. thrust, NV). Equivalents, maybe potential for Carlin-type environment in metaseds. Contact zones w/granites & diabases prob. only have minor potential for a significant Au-Ag deposit--greenstone belt related. Owners of Gator Mining should be contacted to ascertain land status, obtain previous data & if feasible, a limited recon of the range initiated.

Also El Paso Mtns near Garlock should be recon target.

(For additional space use extra sheets)

Form Revised June 1980 - J.H.C. MVE-5193

X

ASARCO Southwestern Exploration Division

April 7, 1983

To: J. D. Sell

From: F. R. Koutz

Gator Mining Company
Goldstone District (T14N, R1E)
San Bernardino County, CA

The following are the notes obtained from "Trapper John" during our (JDS, FRK, WLK, FTG) brief visit to the Goldstone District on the afternoon of March 31 and some additional material from the files and literature. The Gator Mining Co. contact for additional work was:

John Smilde
3901 - 71st St., W.
Bradenton, FL 33529
813-792-7678 (home)

The BLM microfiche lists a number of claimants (and Johns) in the Goldstone area including John and Matthew Smilde, Robert John & Ella Louise Hall, John H. and Bruce J. Wetley, and a John Galbraith among others including a Jim Brehenney (Gold Crown claims). The leach pad was 700 tons and contains (ed?) about 0.03 oz/T Au. The local dumps and tailings contain 0.08 - 1.5 oz Ag/T. The gold is generally .700-.800 fine and locally contains minor Cu (as at Coolgardie Camp). About 47 holes 20-30' deep were drilled in the Gold Crown area with 2" airtrack for Freeport-Reno ("Min Ma Young" - Thai geologist). The mineralized zone is 1200-1500' wide and "7 miles" long.

Calif. J. of Mines & Geol., V. 49, No. 2 (1953) lists 7 properties in the Goldstone District all with only minor production from narrow quartz veins and shattered stringer zones in shale, schist and shaley limestone to 300' maximum depth.

Our files show that Watson and Briscoe collected 48 samples in the district in 1967. Only the Victor area (NW of road to the "Navy Ditch") with only 3 of 20 values >0.5 ppm and 7 of 20 between 0.1 and 0.5 ppm Au seemed to have any potential. The area SE of the road tended to be a little higher in Ag with 13 of 28 values >1 ppm (1.9 ppm mean) but no Au values over 0.08 ppm. J. H. Courtright also visited the Victor-Big 4 (Red Bridge) area of the Goldstone District in 1945 with 28 samples only showing a "few cents/T in Au & Ag". Older reports and correspondence on the Belmont, Carlton, Carlton Crown and Victor are mostly promotional in nature.

There has been no major geologic work in the Goldstone area until recently. Some USGS reconnaissance work was published as part of USGS Water Supply Paper 1460-F on Ft. Irwin and vicinity (1959). This data was included on the Trona AMS geologic sheet (1962).

A recent paper by Miller and Sutter (Bull. GSA, Dec. 82, p. 1191-1207), details the lithology, structure, and geochronology of the Goldstone-Lane Mountain area. The metasedimentary rocks in ascending structural order at Goldstone consist of 3 units: (1) calc-silicate hornfels (Mesozoic?); (2) quartzite, schist and radiolarian chert (Lower Paleozoic eugeosynclinal-partially Ordovician); and (3) a (Permian) calcareous and pelitic sequence of rocks (the ones we observed on March 31) with minor basaltic to andesitic dikes, sills and flows (noted in Aug. 1982).

Au mineralization in the Victor, Goldstone Mine, and Montana Mine (visited Aug. 82) areas is closely spatially associated with these mafic rocks.

The rocks are strongly deformed and isoclinally folded about NW-striking fold axes and NE-dipping axial planes (the compositional layering - S1 - transposed bedding we noted in the field). Tectonic transport was toward the SW. The sequence was intruded in the Late Jurassic (148 m.y.) and now is essentially a roof pendant in a Late Cretaceous (85-90 m.y.) granitic batholith forming the pediments and ranges we drove through on Ft. Irwin and the Goldstone Tracking Station.

Interestingly Miller correlates the unit 2 eugeosynclinal Lower Paleozoic rocks with the Valmy sequence in the Roberts Mountains allochthon, Nevada as well as the El Paso Mountains SW of Ridgecrest, CA, north of the Garlock fault. Unit 3 would correlate with the basinal Permian sequence in the El Paso Mountains and probably the metavolcanic-sedimentary sequence at Hobo as mapped by McCulloh (1960, USGS OFR). These units appear to be good hosts for Au mineralization.

I believe these rocks have some potential for a disseminated Au deposit (even a Carlin-type) which probably does not outcrop and the area is worth further study. According to the BLM microfiche almost all available ground is staked and overstaked but microfiche evidence of recent assessment work is not shown for a number of claims. The metasediments extend a mile or two to the NW onto the China Lake Naval Test Station before they are covered by Tertiary basalts.

I suggest we contact Mr. Smilde of Gator Mining to ascertain present property status , whether they have additional data available (especially reports, drilling data from the competition) and would permit a number of days of "free" looking and sampling on their claims. For the files you might note any additional names and companies I missed below (Jim Gutry, Freeport, Fremont-Felmont-Newmont(?), Larry MacIntosh-Gardnerville).

F. R. Koutz

FRK/cg

~~J.H.C.~~ - ER File

ASARCO EXPLORATION RECORD

[X] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] J. H. C.

APR 22 1983

Section I General Indexing

① Name(s) of Property or Area	② Country	③ State or Province
No Prospect - Color Zone	Inyo Co., USA	CA
	④ USGS Quad. Eagle Mtn. 15'	⑤ File or Gore No.

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
36°12'N	116°21'W	Death Valley	24N	6E	20	JDSell	2/16/83
						⑪ Office: Tucson	⑫ Field Days: 1

Section II Sources of Information

Date Typed 4/8/83

⑬ References

Author	Date	Title	Publications	Vol. No.

Color zone observed from highway.

(Call from Marvin Schneider, Gullfiber International AB, 1062 Lancaster Ave., Rosemont, PA 19010, on "Silver Brine No. 10" claims sparked interest.)

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [X] N. END RECON.

⑮
- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [X] Color zone on bedding
- [ ]
- [ ] Geologic Concept
- [ ] Geochem Anomoly
- [ ] Geophy Anomoly
- [X] Visual

⑯ Production

Commodity	Tons	Grade

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade

⑱ Num. Drill Holes _____ Approx Total Footage _____

⑲ Excavations

⑳ [X] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [ ] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: None apparent

㉔ Ore Minerals-Major: None Minor:

㉕ Host Rocks-Major: Carbonates and quartzites Minor:

㉖ Age of Host Rocks: Probably Paleozoic

㉗ Nature of Exposures: Bold, steep dipping

㉘ Alteration: None

㉙ Total Extent: Throughout range.

㉚ Structure: Tilted fault block

㉛ Ore Occurrence: None

㉜ Age of Mineralization: ----

㉝ Conclusions & Recommendations: Coloration from a distance but appears to be surface weathering in outcrop. Zebra textured carbonate float from north end of range not found in south. North end should be checked on ground, but traverse not made during this date. (Silver Brine No. 10 and numerous others are 160 acre placer claims for borate in valley, claimed also by Amer. Borate Co.)

(For additional space use extra sheets)

Form Revised-June 1980-J.H.C. MVK-5193

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 254
February 24, 1983
SHIPMENT NO. 1
JAMES D. SELL
CEM-1 THRU CEM-3

ASARCO INCORPORATED
Attn.: Mr. James D. Sell
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 3 Rock Chip Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER CERTIFICATE No. 9425 WILLIAM L. LEHMBECK DATE SIGNED Arizona U.S.A.

William Lehmbeck
Manager

RECEIVED
FEB 25 1983
S. W. U. S. EXPL. DIV.

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 254
PAGE 2

ITEM NO. SAMPLE NO.
1 = CEM-1
2 = CEM-2
3 = CEM-3

ITEM	1	2	3
ELEMENT			
Fe	1%	.5%	.3%
Ca	>20%	15%	20%
Mg	.7%	2%	10%
Ag	<1	<1	<1
As	<500	<500	<500
B	<10	10	<10
Ba	10	70	<10
Be	<2	<2	<2
Bi	<10	<10	<10
Cd	<50	<50	<50
Co	<5	<5	<5
Cr	<10	<10	<10
Cu	5	<2	<2
Ga	<10	<10	<10
Ge	<20	<20	<20
La	<20	<20	<20
Mn	30	70	20
Mo	<2	<2	<2
Nb	<20	<20	<20
Ni	<5	<5	<5
Pb	<10	<10	<10
Sb	<100	<100	<100
Sc	<10	<10	<10
Sn	<10	<10	<10
Sr	<100	<100	<100
Ti	2000	2000	500
V	<10	<10	<10
W	<50	<50	<50
Y	<10	<10	<10
Zn	<200	<200	<200
Zr	50	100	<20

Units strike N5°W, dip 75° East.

CEM-1. Two foot bed of grey limestone silt with siliceous clay partings. Brown-orange FeOx stain on weathered surface.

CEM-2. (30' stratigraphic below CEM-1). Three foot bed of limey silty sandstone-quartzite with pink coloration.

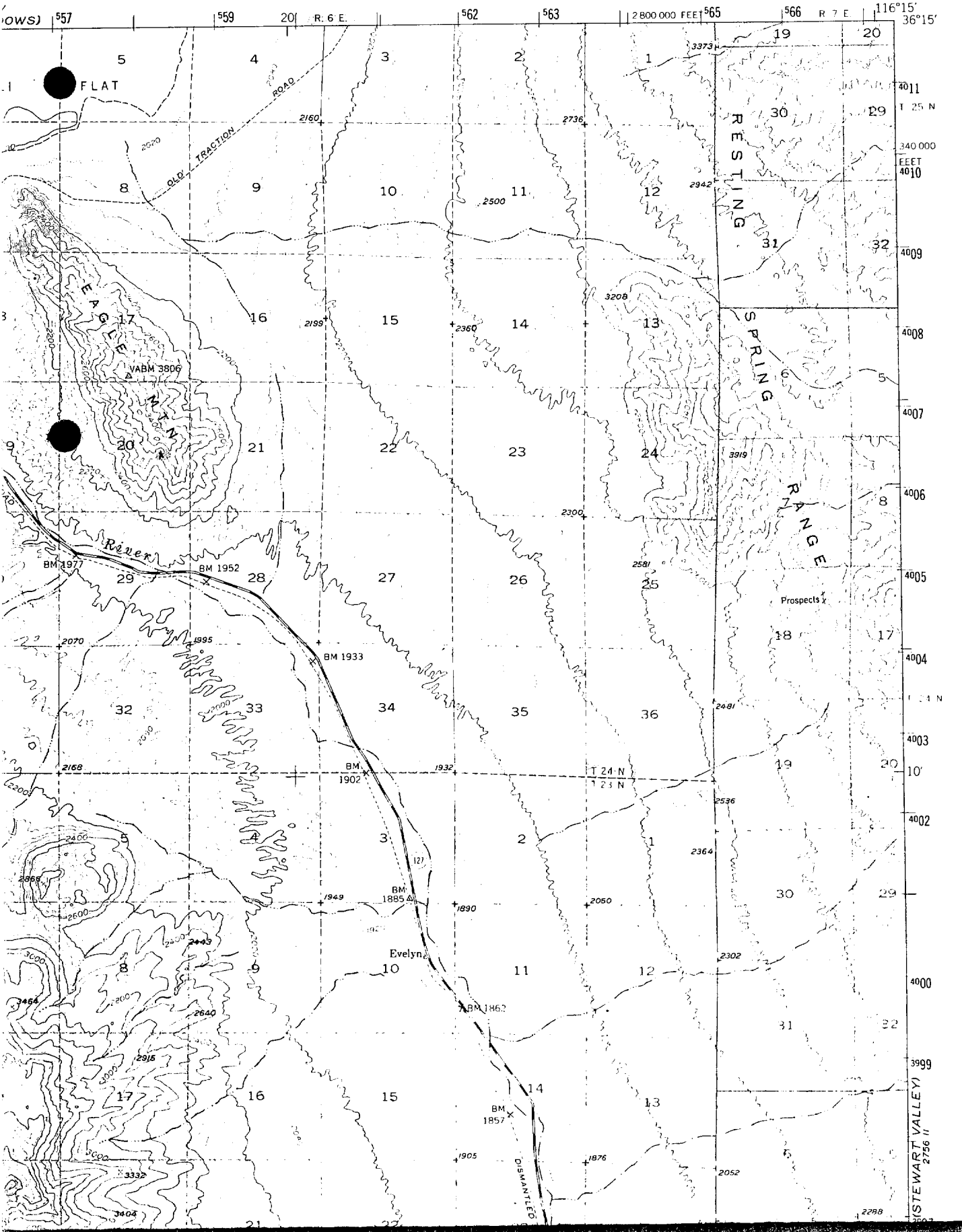
CEM-3 (unit below CEM-2) "Bleached", fine, sandy dolomitic carbonate unit with fine seams of black coloration.

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

EAGLE MTN. QUADRANGLE
CALIFORNIA-INYO CO.
15 MINUTE SERIES (TOPOGRAPHIC)



~~JHC~~ - ER file

ASARCO EXPLORATION RECORD

☐ FIELD EXAMINATION ☐ LITERATURE SEARCH ☐ ASARCO FILE ☒ Submittal

Section I General Indexing

① Name(s) of Property or Area: BALD MOUNTAIN PROSPECT						② Country: Grant Co.	③ State or Province: New Mexico	
						④ USGS Quad.: Tyrone, NM	⑤ File or Gore No.	
⑥ Latitude: 32°40'	⑦ Longitude: 108°21'	⑧ AMS Sheet: Silver City	Township: 19S 19S	Range: 15W 14W	Section: 1,12 6,7	⑨ Examined by: H. G. Kreis		⑩ Date: 3/16/83
						⑪ Office: Tucson		⑫ Field Days: None

Section II Sources of Information

Date Typed 3/30/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Drill logs and reports submitted by Leonard Minerals Co. (Dec. 1982)				
Kreis, H. G.,	2/16/83	Bald Mountain Prospect, ASARCO memo		

J. H. C.

APR 22 1983

Section III Appraisal

⑭ Recommendations

- ☐ Action Now
- ☐ Too Low Grade
- ☐ Too Small
- ☒ Ownership Problem
- ☐ Access Problem
- ☒ Possible Future Interest

⑮

- ☐ Post Producer
- ☐ Producer
- ☒ Mineral Deposit
- ☐ Prospect
- ☐
- ☐ Geologic Concept
- ☐ Geochem Anomaly
- ☐ Geophy Anomaly
- ☐

⑯ Production

Commodity	Tons	Grade
Property adjoins P.D.'s Tyrone Cu Mine		

⑰ Reserves

☐ Measured ☒ Estimated

Commodity	Tons	Grade
Cu	150 million	0.16% Cu

⑱ Num. Drill Holes 7

Approx Total Footage 20,000'

⑲ Excavations: None known

⑳ ☐ Spectro. Analysis Attached ㉑ ☐ Assays Attached ㉒ ☐ Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Copper

㉔ Ore Minerals-Major: Chalcopyrite Minor: Molybdenite

㉕ Host Rocks-Major: Granite, And.-Latite Minor: Porphyry

㉖ Age of Host Rocks: Precambrian, Cretaceous Cretaceous

㉗ Nature of Exposures: No premineral outcrops (AMAX interpretation) within ½ mile of >0.09% Cu drill hole intercepts.

㉘ Alteration: Sericite-clay alteration with peripheral propylitic alteration

㉙ Total Extent: Prob. 5-10 sq. mi. (including Tyrone)

㉚ Structure: 20° east dipping volcanic rocks cut by steeply dipping NW and NE striking faults.

㉛ Ore Occurrence: Disseminated, hypogene chalcopyrite mineralization in a porphyry copper sulfide system

㉜ Age of Mineralization: 50-60 million years.

㉝ Conclusions & Recommendations: Drill holes NXBM-1 and -2 penetrated 500-600' of 0.15 to 0.18% Cu (chalcopyrite). Drill holes to the NE encountered <0.05% Cu. Best potential is on Phelps Dodge ground to the southwest. Possibility of 0.4 to 0.9% Cu as chalcopyrite at depths >2500' on the Bald Mtn. Prospect, but the exploration risk is high and the land position is poor. No further work is recommended at this time.

(For additional space use extra sheets)

ASARCO

Southwestern Exploration Division

February 16, 1983

To: J. D. Sell

From: H. G. Kreis

Bald Mountain Prospect
Burro Mountain District
Grant County, NM

Mr. Ben Donegan of Leonard Minerals Co. submitted the accompanying data on the Bald Mountain Prospect to ASARCO. This data package consists of two geologic maps, a property map, a set of cross sections, geologic logs (holes NXBM-1, -2, -3, -4, -5, -6, and ASARCO's BM-1), a few letters of correspondence, a geophysical report, and a couple drilling summary reports. The drill logs were reviewed and the best pervasive copper mineralization averages 0.1% Cu.

The best copper and sulfide mineralization was encountered in drill holes NXBM-1 and -2. These two holes penetrated 1 to 3% pyrite with 0.10-0.15% Cu as chalcopyrite. This mineralization occurs in Precambrian granite and Laramide dike rocks between depths of 2000' and 3127'. In both drill holes, this copper mineralization is overlain by pyritized andesitic and latitic volcanic rocks with less than 0.07% Cu (chalcopyrite and trace chalcocite). Drill hole NXBM-1 drilled through the 0.1% Cu mineralization and bottomed in 0.05% Cu mineralization at a depth of 3127'. Drill hole NXBM-2 bottomed in 0.11% Cu mineralization at a depth of 2528'. Unfortunately, NXBM-1 and -2 are located within 1500' of Phelps Dodge's Tyrone property. In fact, NXBM-2 is located in a small "peninsula" of claims that juts into Phelps Dodge property.

Two drill holes, NXBM-3 and NXBM-4, were drilled to the north end east of NXBM-1. Both of these holes bottomed at depths of 3100' to 3200' in Laramide andesitic and latitic volcanic rocks with 1 to 3% pyrite and less than 50 ppm Cu.

Drill hole NXBM-5 was drilled a mile to the northeast of NXBM-3 and NXBM-4 in hopes of discovering better copper grades between ASARCO's BM-1 drill hole and the NXBM-1 to -4 group of drill holes. Drill hole NXBM-5 bottomed at 3323', and the last 300' averaged less than 5 ppm Cu (no mention of sulfide mineralization). It is possible that NXBM-5 bottomed in post-mineral cover.

The best potential for ore grade copper mineralization is to the southwest of NXBM-1 and NXBM-2, the two most encouraging drill holes. This potential is based on increasing copper and molybdenum grades from NXBM-4 to

NXBM-1 and -2. Chalcocite enrichment associated with 0.3 to 1% Cu hypogene mineralization could exist under the gravel covered area between the Mangas Fault and the Tyrone orebody. Phelps Dodge has drilled in this area of potential and controls all the land so there is no target southwest of NXBM-1 and -2 that ASARCO could pursue.

The sulfide system has not been followed to the northeast, east, and southeast of NXBM-2. East and southeast of NXBM-2, the land is controlled by Phelps Dodge. Northeast of NXBM-2 a drill hole, NXBM-6, was bottomed in postmineral volcanics (Danley of AMAX interpretation) at a depth of 1378'.

Deepening of drill hole NXBM-6 to premineral bedrock is not an attractive proposition at this time. NXBM-6 is located to the northeast of NXBM-2 rather than to the southwest, the more favorable direction. Furthermore, the hole is located immediately adjacent to Phelps Dodge property.

The Bald Mountain Prospect is not recommended at this time because of (1) the marginally favorable geology, (2) the prospect's difficult land position adjoining Phelps Dodge, and (3) the availability of more favorable porphyry copper prospects.

H. G. Kreis

H. G. Kreis

HGK/cg

Accompaniments

~~JNC~~ ER File

ASARCO EXPLORATION RECORD

[X] FIELD EXAMINATION [X] LITERATURE SEARCH [X] ASARCO FILE [ ] _____

Section I General Indexing

① Name(s) of Property or Area: TREASURE HILL AREA — South or SW Tintic District		② Country: Juab Co. USA	③ State or Province: UTAH
		④ USGS Quad.: Eureka 7½'	⑤ File or Gore No.

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
39°53'30"N	112°06'W	Delta	11 S	2 W	NE/4 6+	FRKoutz/HGKreis/BCSpencer	9/23/82
						⑪ Office: Tucson	⑫ Field Days: 1/3

Section II Sources of Information

APR 22 1983

Date Typed 2/22/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Morris, H.T.,	1964,	Geology of Eureka & Tintic JCT Quads	USGS Bull.	1142K & L
Morris, H.T. & Lovering, T.S,	1979,	Geol. & Mines - E.Tintic	USGS Prof. Paper	1024
Cook, D.R.,	1957,	Geol. & Ore Deposits - E.Tintic Mtns.	Ut. Geol. Surv. Guidebook	12

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [?] Too Small
- [X] Ownership Problem
- [ ] Access Problem
- [X] Sample

⑮
- [X] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ]

Au-Ag Disseminations between major veins?
- [X] Geologic Concept
- [?] Geochem Anomaly
- [ ] Geophy Anomaly
- [?] NE Extension into CO_3 rocks

⑯ Production — Guess for area - see Guidebook 12

Commodity	Tons	Grade
Au/Ag	10-20,000	.03-.2/5-20 oz
Cu/Pb		.2-.5/1-8%
Zn		.1-.5 %

⑰ Reserves NONE
- [ ] Measured
- [ ] Estimated

Commodity	Tons	Grade
Probably good silica flux		
60-70% Insol.	1-15% Fe and S	

⑱ Num. Drill Holes 3+?
Approx Total Footage 2500'?

⑲ Excavations Numerous old vein workings, shafts to 250'

⑳ [ ] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [ ] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Au, Ag, Cu (Pb, Zn, Ba)

㉔ Ore Minerals-Major: Au°, Acanthite, Galena, Enargite, Pyrite Minor: Sphalerite

㉕ Host Rocks-Major: Latitic ash-flow tuffs, sills, lava flows? Minor: Minor plugs Hill is a ~~breccia~~

㉖ Age of Host Rocks: 39-31 m.y. K/Ar - mostly around 32 m.y.: Middle Oligocene

㉗ Nature of Exposures: Good: Silica caprock holds up hill; silicified veins have good exposures on hills, strong argillic areas especially on N slopes do not outcrop well. ±6 mos. snow, 6200-6800' elev.

㉘ Alteration: Mod. to extreme advanced argillic/silicification - strong clays. Major amounts of alunite, jarosite.

㉙ Total Extent: Vein Zone: 9-12000' NE, 100-600' wide, +700' deep

㉚ Structure: Breccia pipe or mass on Treasure Hill, cornflake breccia margins. NE trending strong fissure jasperoid-quartz veins, steep dip. Main veins 2-20 feet wide, average 2-4'.

㉛ Ore Occurrence: Crustiform, banded vein & breccia matrix fillings in vein structure but widespread disseminated pyrite-jarosite with possible precious metal values. Well oxidized except for heavily silicified zones. Siliceous Au-Ag, Pb-Cu ores.

㉜ Age of Mineralization: Oligocene: 31.5 ± .9 m.y. Bio.-K/Ar

㉝ Conclusions & Recommendations: Excellent example of cornflake breccias & advanced argillic alteration. Probably too small total tonnage but high pyrite-alunite-clay zones should be sampled away from major veins for Au-Ag dissem. The vein is an "ore run" & environment to the NE should be investigated for possible replacements of carbonates under volcanics in the Silver Pass area. The Trixie Mine is 3 miles NE of Treasure Hill on the projection of the fissure.

(For additional space use extra sheets)

ASARCO

Southwestern Exploration Division

February 22, 1983

To: J. D. Sell

From: F. R. Koutz

Cornflake Breccias - Exploration Potential, Treasure Hill (SE/4 Sec. 6, T11S, R2W) Tintic (South) District Juab County, Utah

During a tour on Sept. 23, 1982 of the south-southwest Tintic District by John Welsh with H. G. Kreis and B. C. Spencer we encountered one of the better examples of "cornflake breccias" I have ever seen. H. G. Kreis plans a general memo on the tour and the S. W. Tintic porphyry copper mineralization drilled by Bear Creek Mining.

Cornflake breccias contain tabular often crenulated breccia clasts which float in a rock flour or secondary-mineral matrix often with considerable tabular or triangular open space. The overall appearance in the rock is of "sheeting" and is the result of rapid pressure loading and unloading. Often the more spectacular examples show flowage, streaming and folding of breccia clasts so that the rock almost looks like an intrusive thin-bedded sediment or viscous lava-flow dome (with which cornflake breccia bodies are often confused). One reason for the great interest in cornflake breccias is that the vugs are often filled with one's favorite ore minerals. Another reason is that cornflake breccias usually form on the margins and especially the roofs of breccia pipes and masses during explosive decompression and venting and provide visual evidence of the process of breccia pipe formation. I believe this has been well documented in the study of underground nuclear tests.

Cornflake breccias occur on the upper 100-300 feet of Treasure Hill (attached map from U.S.G.S. Bull.1142-K). Treasure Hill is the high point (6860') on a two mile long east-west ridge with 500-600 feet of relief between Ruby Hollow and Diamond Gulch.

The ridge consists of latite tuffs and flows (Pinyon Queen Latite) of the Laguna Springs Latite intruded by a portion of the Sunrise Peak Stock (or the Monzonite Porphyry of Gough Sill (500-1000' thick) of the North Standard Latite of U.S.G.S. Professional Paper 1024). John Welsh (and BCMC?) would interpret some of these units differently in the Silver City area and east with the Sunrise Peak consisting of a vent and flow (ash-flow) facies with distinct lapilli tuffs at Treasure Hill. Welsh fairly convincingly showed

us that the Swansea Quartz Monzonite (Bull. 1142 K & L) between Mammoth and Silver City is actually a welded tuff - probably Packard Quartz Latite. He suggests that much of what is mapped as Silver City Stock (Biotite Monzonite Porphyry) NE of Silver City and south of the Dragon Mine is actually well-altered Laguna Springs Tuff often overlying Paleozoic sediments. Whether the outcrops of "Silver City Monzonite" ½ to 1 mile west of Treasure Hill are actually intrusive is uncertain.

We visited Treasure Hill from the south side and decided to climb to the top to examine the jasperoid caprock armouring the summit. On the south slopes at 6500-6600 feet elevation were several old dumps and shafts with recent drill pads and a few core blocks indicating depths in the 600-800 foot range. As of February 1982 Steve Potter of Bear Creek Mining swore he had spent $27,000 in the vicinity according to the posted notice.

Several major rock types are evident on Treasure Hill. What was mapped as Sunrise Peak is a dark greyish to greyish-green, fine-grained porphyry with 50-70%, 1-3 mm needle-like former plagioclase phenocrysts. What was mapped as Laguna Springs is also a porphyry but a crystal lithic tuff to tuff breccia. The rocks are so strongly clay, alunite and silica bleached and altered on Treasure Hill that the only consensus for many outcrops was that the rock was porphyritic.

Climbing Treasure Hill it is obvious that the rock is a breccia pipe or mass (and also in part a volcanic breccia) with angular to subrounded clasts which vary in clast/matrix ratio and degree of rounding both vertically and laterally. Several high-angle, tabular-fluidized breccia zones were noted with better rounded, onion-skin exfoliating silicified clasts - essentially incipient pebble-dikes. On the upper part of the hill the clasts and vugs become more tabular grading into cornflake breccias but by angular and more rounded-clast breccias. Near and on the summit the breccia is well silicified and better sheeted with fewer vugs. Off the summit, especially near the margin of the heavily silicified zone on the SE side of the hill, the breccia is flow-contorted with more drag toward the margin. The sheeting, flow and folding of the cornflake zones are shown on the attached photos.

The rocks on Treasure Hill are very strongly altered and belong to the advanced argillic-silica and argillic alteration facies. Treasure Hill lies on the NE Trixie-Treasure Hill fissure zone (p. 169, PP 1024) which provides conduits for monzonite porphyry plugs and dikes of the Silver City Stock and satellite intrusives with accompanying pebble dikes and a strong halo of silicic, advanced argillic, pyritic and argillic alteration. Treasure Hill is cut by a major silicified, mineralized fissure vein system which trends about N40E and dips steeply E at 80-90°. The structure is about 9000' long and continues for at least another 3000' across Ruby Hollow. The structure is identical to other <u>en echelon</u> structures to the NW which form the major ore runs of the Main Tintic District. The Treasure Hill fissure is aligned with replacement mineralization in the East Tintic District along the Eureka Standard and Apex Standard right-lateral shear

trends but exact connections south of the E-W Sioux-Ajax fault covered by volcanics have not(?) been explored. Jasperoid silica outcrops, crackle zones and breccias and NE pebble dikes, however, are common along the Trixie-Treasure Hill zone.

Little information is readily available on the Treasure Hill Mines. Professional Paper 107, p. 258 (1919) says that the veins trend N to NE and consisted of pyrite-enargite and some galena (and their oxidized products) in a siliceous gangue. The Treasure Hill shaft was 225' deep with the sulfide zone and water table about 250 feet below the collar. An additional 475' to the top of Treasure Hill to the south would have the mineralized vein extending over a +700' range. The Treasure Hill vein (in the Treasure Hill Mine) was listed as having a N30W and steep NE dip with the vein 2-4' wide. The strike was mentioned as being an unusual direction as most veins here trend NNE - this could be a typographic error. We have no information on Treasure Hill in our files except for the parallel Showers Vein about 3500 feet east with production of several thousand tons of 0.03 oz Au/T, 17 oz. Ag/T, 0.37% Cu, 5% Pb, and 0.3% Zn. Plate 3 from UGS Guidebook 12 suggests similar grades and a few thousand tons maximum for each of the veins in the immediate area.

The veins and dumps on the north side of Treasure Hill were not examined but those from the summit south showed massive jasperoid and alunite with later fine to coarse grained quartz with 3-20% pyrite (often almost white rather than yellow), minor barite, a few percent gray sulfide - mostly galena but some probable enargite, traces of chalcopyrite and sphalerite and minor sooty grey chalcocite with covellite. The wall rocks were very strongly flooded and bleached with alunite, jasperoid, white clays and disseminated and veinlet pyrite. The rocks were strongly oxidized with much jarosite and goethite, minor hematite after sulfides, trace cerussite, Zn oxides(?) and malachite. The terminated vein quartz crystals are strongly growth-zoned but are shattered and rehealed and probably packed with fluid inclusions.

Besides the cornflake breccias the most impressive feature about the area was the massive amounts of <u>alunite</u> - often completely replacing phenocrysts and lithics in the host rocks. If the rocks were x-rayed a wide variety of clay minerals and secondary ore minerals would probably be identified. Possible adularia rhombs were noted in several vein-wall rock samples.

Only a few hand samples were taken during the tour and the hunting season, snow and more pressing ongoing projects prevented sampling on my 3rd tour in Utah in Oct.-Nov. I believe that the Treasure Hill cornflake breccia and advanced argillic locality is well worth visiting on any tour of the Tintic District. It would be well worth our time to do some sampling in this and other advanced argillic-silicified areas nearby. John Welsh suggested that local Au-Ag-Cu and As anomalies are probably what brought Steve Potter back into the area after it had been dropped. Several

ex-Kennecott Exploration types (D. Norton and G. McKelvey) had also spoken highly of the precious metal potential of the area while the "SW Tintic porphyry copper" was being drilled and studied.

It is clear that Treasure Hill is a zone of catastrophic hydrothermal venting of a near surface intrusive - probably an apophysis of the Silver City Stock with accompanying rapid deposition of jasperoid and alunite with precious metals. The environment is very similar to the Trixie Mine to the NE but without(?) carbonate wall rocks. I suggest that we investigate this environment - especially to the NE in the Silver Pass area toward carbonates - further when the snow melts. Ownership is uncertain but John Welsh mentioned that almost all the old workings have been patented. There are a number of fairly recent drill pads in the Silver Pass area so this environment may already have been tested - but it is worth investigating.

F. R. Koutz

F. R. Koutz

FRK/cg

cc: HGK
JHC

Attachments

References

ASARCO Files: Tintic South District, Showers Standard Mining.

Cook, D. R. (ed), 1957, Geology of the East Tintic Mountains and Ore Deposits of the Tintic Mining Districts: Guidebook to the Geology of Utah, No. 12, Utah Geol. Soc. 183p.

Lindgren, W. and Loughlin, G. F., 1919, Geology and Ore Deposits of the Tintic Mining District: U.S. Geol. Surv. Prof. Paper 107, 282p.

Morris, H. T., 1964a, Geology of the Eureka Quadrangle, Utah and Juab Counties, Utah: U.S. Geol. Surv. Bull. 1142K, 29p.

_____, 1964b, Geology of the Tintic Junction Quadrangle, Tooele, Juab and Utah Counties, Utah: U.S. Geol. Surv. Bull. 1142-L.

_____, 1968, The Main Tintic Mining District, Utah: in Ridge, J.D. (ed), Ore Deposits in the United States 1933/1967; AIME, p. 1043-1073.

Shepard, W.M., Morris, H.T., and Cook, D.R., 1968, Geology and Ore Deposits of the East Tintic Mining District, Utah: in Ridge, J. D.(ed), Ore Deposits in the United States 1933/1967; AIME, p. 941-965.

Morris, H.T. and Lovering, T.S., 1979, General Geology and Mines of the East Tintic Mining District, Utah & Juab Counties, Utah: U.S. Geol. Surv. Prof. Paper 1024, 203p.

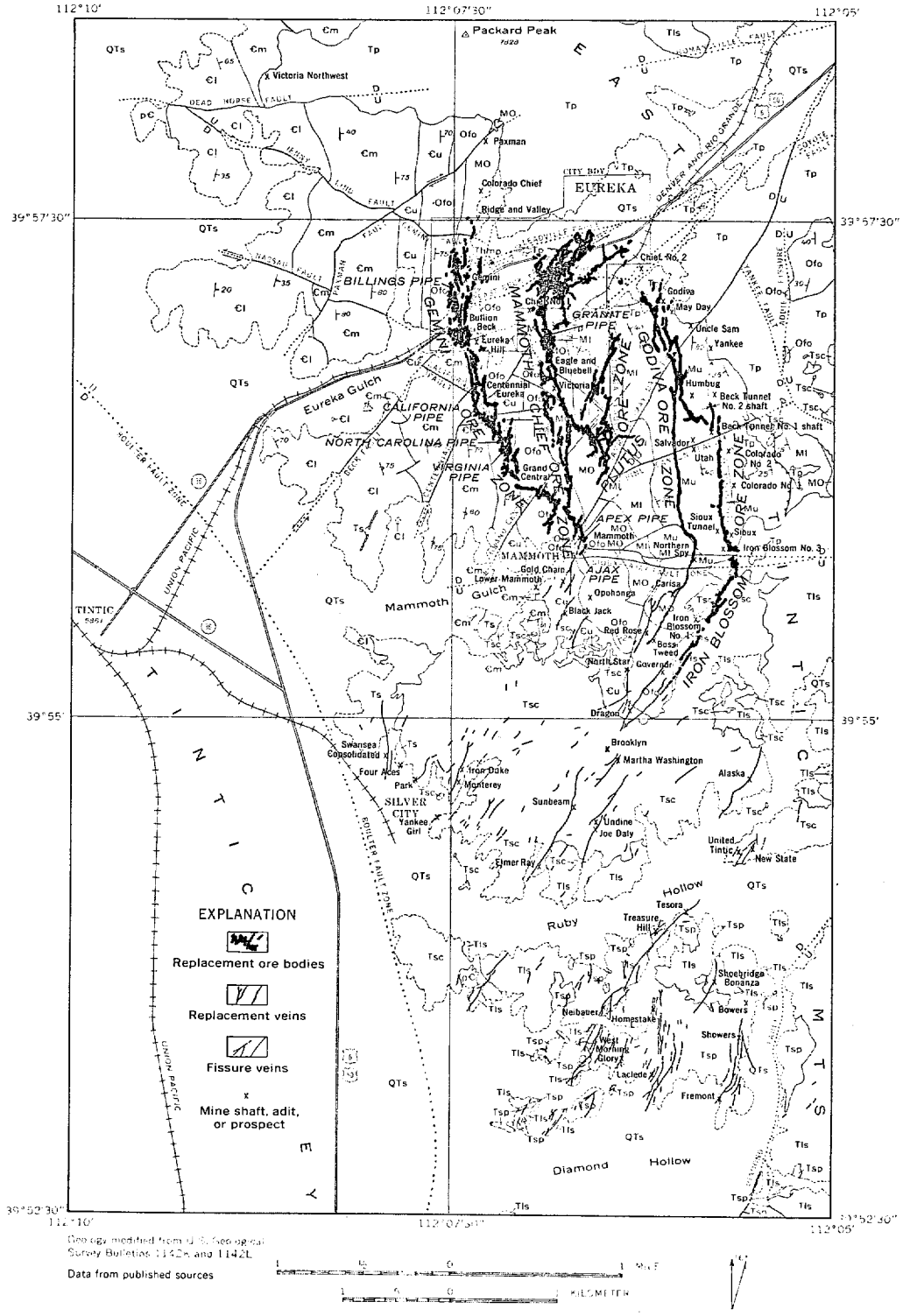
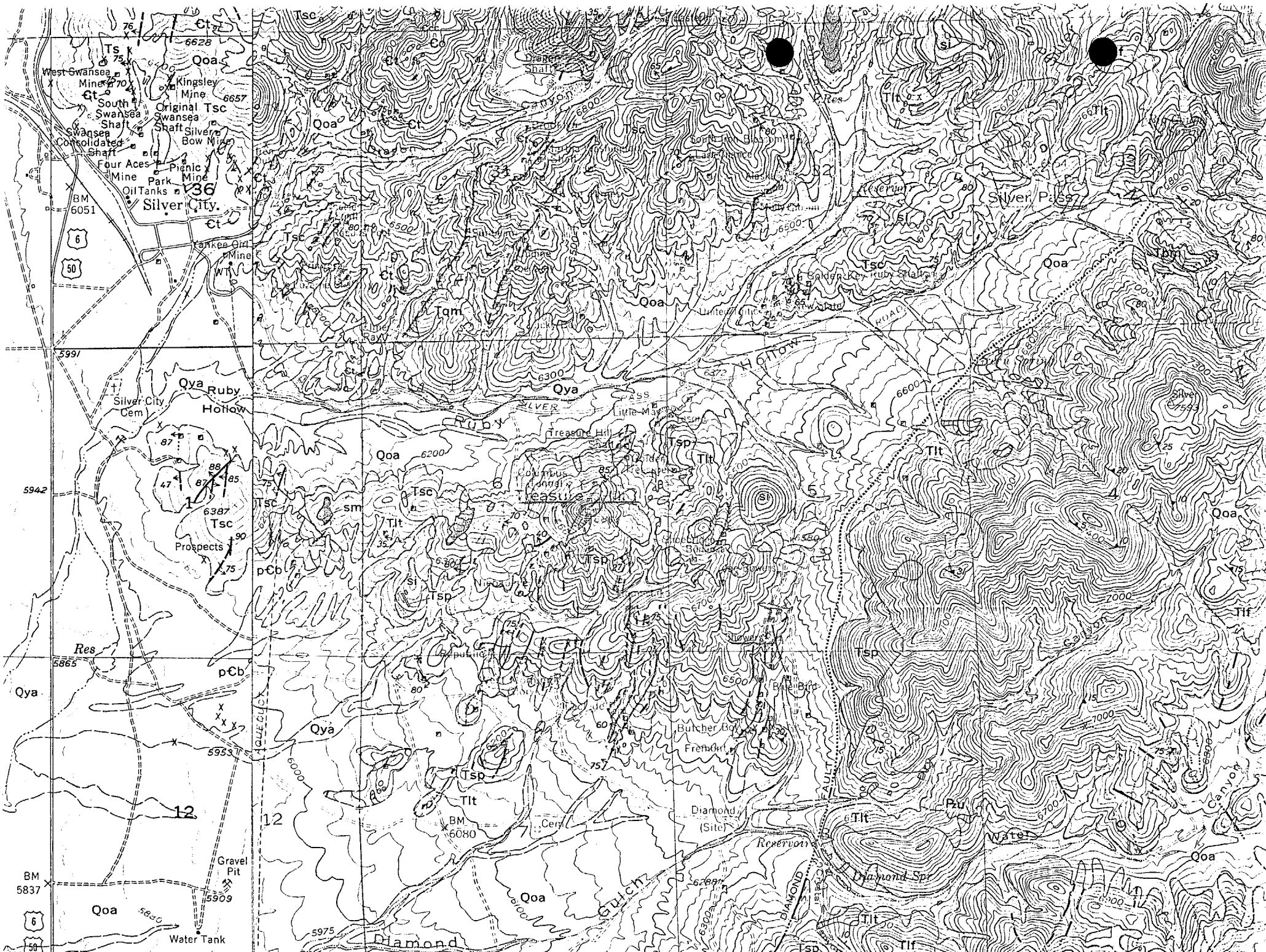


FIG. 2. *Vertical Projection of Ore Bodies, Main Tintic Mining District.*



WASHINGTON, D. C.—G 62189 1142-L 112°07'30" USGS Bul 1142-K R. 3 W. R. 2 W. 5'

Tlt = Laguna Springs Tsp = Sunrise Peak Tsc = Silver City Monz. Si = Jasperoid

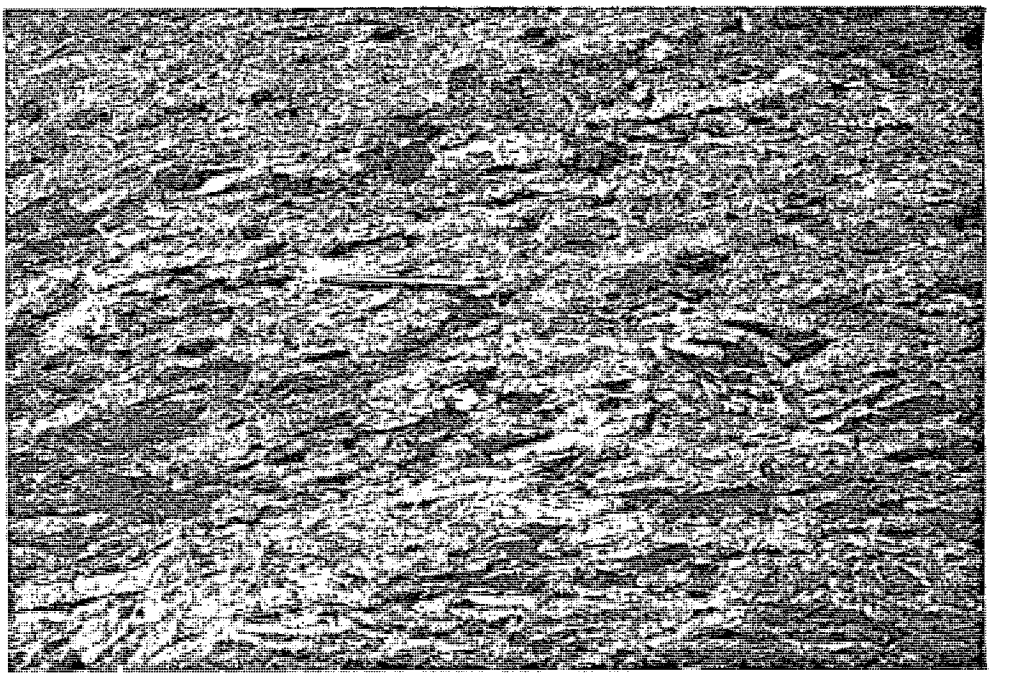


Photo 1: Sheeted cornflake breccias with a low matrix percentage near the top of Treasure Hill. This is the top of the breccia pipe and can be considered shattered wall rock. The rock, a probable original ash-flow tuff, is well silicified and alunitized especially greyish area. Goethite and jarosite are after disseminated pyrite.

Photo 2: Contorted well-silicified cornflake breccias with flow/fracture lines indicated, east summit of Treasure Hill.

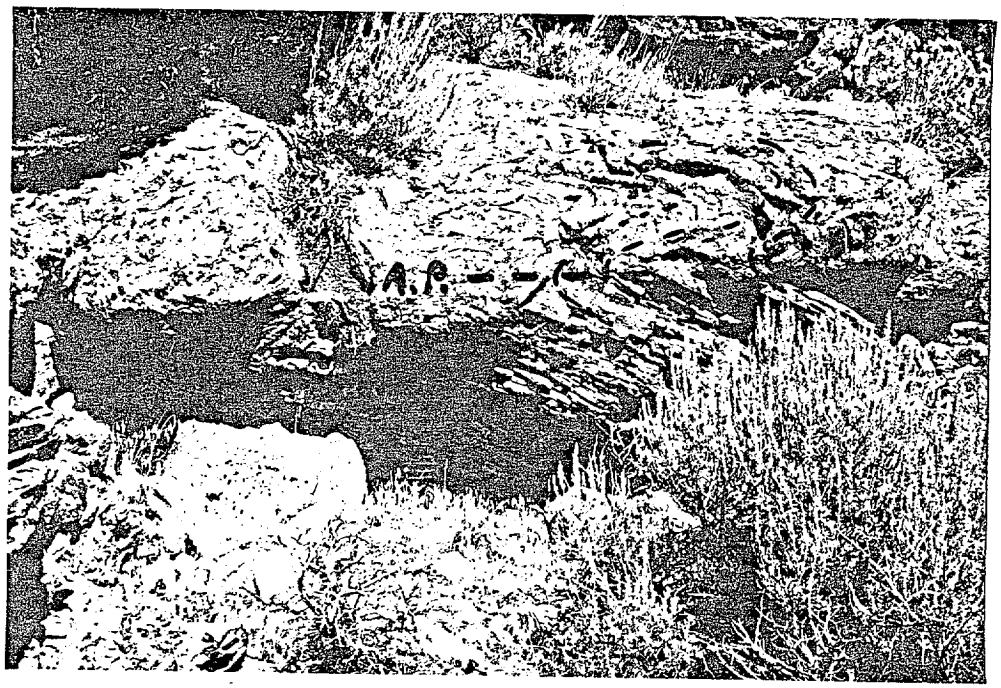


Photo 3: Sheeted and folded cornflake breccias on the SE side of Treasure Hill. Flow/fracture lines and axial plane (A.P.) of apparent fold indicated.

Photo 4: Close-up of photo 3 showing sheeting and rotation of breccia clasts at fold axes (A.P. indicated). Note jarositic weathering of silica-pyrite-alunite soaked breccia.

3 semi-conflicting groups of claims in Sec. 2: Cannon Estate patented (best area) and unpat; I.T.L. Corp. unpat. claims; Micah Mines/Up-In-Smoke (Killian-Candelaria) unpat. claims and occupants of ground.

ASARCO EXPLORATION RECORD

Limestone Replacemer

[X] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [X] Recon. - 1982

ER FILE

Section I General Indexing

① Name(s) of Property or Area	② Country	③ State or Province
Yellow Jacket-Buckhorn-Nautilus	USA Tooele Co.	Utah
	④ USGS Quad. Dugway Range 7½'	⑤ File or Gore No.

⑥ Latitude	⑦ Longitude	⑧ AMS Sheet	Township	Range	Section	⑨ Examined by	⑩ Date
39°59'N	113°11'W	Delta	10S	12W	2 & Vicin.	Koutz/Spencer/Sell	Oct/Nov 82
						⑪ Office Tucson	⑫ Field Days 12

Section II Sources of Information

Date Typed 1/21/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Staatz,M.H. & Carr,W.J.,	1964,	Geol. & Min. Dep. Thomas & Dugway Ranges,	USGS PP	415
Asarco File Data - Dugway Range, Tooele & Juab Cos., Utah				
BLM Microfiche Claim File - Cannon Claim Map in Asarco Dugway Files				

J.H.C.

APR 22 1983

Section III Appraisal

⑭ Recommendations
- [X] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [X] Ownership Problem
- [ ] Access Problem
- [X] 2nd Class target

⑮
- [X] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [ ] Prospect
- [ ]

Favorable beds or struct. at depth
- [ ]
- [X] Geologic Concept
- [X] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Local Tons	District Grade
Pb	1-2000? Max	7.7%
Zn		10.1%
Ag/Au	1-2 oz/.007 oz	

⑰ Reserves [ ] Measured [ ] Estimated None known

Commodity	Tons	Grade
District production	12000 tons	
above grade		

⑱ Num. Drill Holes 4
Approx Total Footage 721'

⑲ Excavations Several 1000' old workings to 100-200' depth; numerous pits & trenches.

⑳ [X] Spectro. Analysis Attached ?

㉑ [X] Assays Attached ?

㉒ [X] Geochem Results Attached ?

Section IV Geologic Data

㉓ Commodity or Contained Metals Pb, Zn, Ag, Au, Cu, Ba, CaF_2 / Pb, Zn, Mo, Ag, Ba, Mn, Fe anomalous

㉔ Ore Minerals-Major Gn, sl, cpy, barite, cerussite, Zn_{ox} Minor Au°, malachite, fluorite

㉕ Host Rocks-Major Dolomitized Ls, limestone & Dol. Minor Siltstone-sandstone-rhyodacite

㉖ Age of Host Rocks Cambrian Fandangle Ls & Lamb Dol.(Lower Plate); Madison Ls (Upper Plate)

㉗ Nature of Exposures Good except silt & soil covered on N slopes. Most of area above 5200 Lake Bonneville shoreline. Thin Qal covers thrust & fills valleys. "Chocolate Rock" color anomaly prob. shallow.

㉘ Alteration Pervasive dol. of Ls away from thrust & high-angle faults, weak local recryst., local minor jasperoid & sanding. Zebra in orig. dol//Perv.calc. vn

㉙ Total Extent Heaviest Fe-Mn Stain: 1500'N-S x 1000'E-W

㉚ Structure Mineraliz. in high-angle veins away from NW Buckhorn Thrust, local strong crushed dol. in FW. Best min. at fracture-fault intersection. Stratig. dips W to SW at 10-50°.

㉛ Ore Occurrence Vein mineraliz. w/ore shoots/chimneys formed at intersection fracture zones. Minor replacement in thin bedded Ls. High concentration of fracturing/veins +rhyodacite sills in FW of Buckhorn Thrust. Sulfides,+$BaSO_4$+CaF_2 associated with late stage quartz-calc. vn.

㉜ Age of Mineralization Mid-Tertiary? Rhyodacite = 13-22m.y.

㉝ Conclusions & Recommendations Surface color anomaly in part exotic & FW slopes exposed parallel to former Buckhorn Thrust trace--i.e. thrust is locus of alteration-mineralization and rhyodacite intrusives/extrusives. Vn outside of Yellow Jacket area too small/low grade; Ag-Au? supergene but still low grade. Yellow Jacket-Nautilus claim area and several mineralized structures cutting upper plate deserve a limited air-hammer drill test to 300-500' for swarms of well mineralized fractures and/or replacement of favorable horizons. Suggest low-key inquiry to Cannon Estate; owners(?) of Saddle Rock-Yellow Jacket-Nautilus pat. claims covering heaviest Fe-Mn-Pb-Zn soaked area.

(For additional space use extra sheets)

Form Revised-June 1980-J.H.C. MVK-5193

X

COMPLETE COPY OF THIS ERS/REPORT FILED IN:

1. DUGWAY RANGE FILE (FOLDER 2), TOOELE COUNTY, UTAH

2. LIMESTONE REPLACEMENT PROGRAM (W. UTAH/E. NEVADA) in UTAH GENERAL FILE

JHC - ER FILE

ASARCO EXPLORATION RECORD

[x] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] _____

Section I General Indexing

① Name(s) of Property or Area "SP" Claim Group Sugarloaf Peak Area; Dome Rock Mountains Middle Camp Mining District					② Country La Paz County	③ State or Province Arizona	
					④ USGS Quad. 7½' Middle Camp Mtn.	⑤ File or Gore No. Sugarloaf Peak	
⑥ Latitude 33°38'	⑦ Longitude 114°20'	⑧ AMS Sheet Salton Sea	Township 3,4 N	Range 20W	Section See Plate 1	⑨ Examined by G. J. Stathis	⑩ Date 1/5-6/1983
						⑪ Office Tucson	⑫ Field Days 2

Section II Sources of Information

Date Typed March 29, 1983

⑬ References

Author	Date	Title	Publications	Vol. No.
a) Stathis, G.J.	Feb. 12, 1979	Kerr-McGee Corp.'s Sugarloaf Peak Project, ASARCO ERS		
b) 500' scale map with gold assay data from Wallaby Enterprises, Inc.				

J.H.C. MAR 30 1983

Section III Appraisal

⑭ Recommendations
- [x] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [x] Ownership Problem
- [ ] Access Problem
- [ ]

⑮
- [ ] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [x] Prospect
- [ ]

- [ ] Geologic Concept
- [x] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
Placer gold	12,000 oz	(Dist)
Silver	1,500 oz	(Dist)
Copper	103 tons of 1.6%	(Hancock Wash)

⑰ Reserves [ ] Measured [ ] Estimated

Commodity	Tons	Grade
None		

⑱ Num. Drill Holes See Ref. a)
~~Approx. Total Footage~~

⑲ Excavations Many shallow pits & trenches; some shafts & adits

⑳ [ ] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [x] Geochem Results Attached Plate 1

Section IV Geologic Data

㉓ Commodity or Contained Metals Au

㉔ Ore Minerals-Major Auriferous Pyrite Minor

㉕ Host Rocks-Major Rhyolite Por. Minor Aplite

㉖ Age of Host Rocks Late Mesozoic or early Tertiary?

㉗ Nature of Exposures Good, pediment cover N½ Sec. 33, T4N, R20W

㉘ Alteration Quartz-sericite, pervasive, weak to strong. Intensity increases as rock becomes more platy (continued) ㉙ Total Extent

㉚ Structure Sampled area appears to be at interface of flow rock and vent or feeder zones. Suspect a fair amount of the flow rock cover has been eroded off. (Contined)

㉛ Ore Occurrence Gold is probably derived from pyrite which accompanied the quartz-sericite alteration.

㉜ Age of Mineralization Tertiary

㉝ Conclusions & Recommendations

a) Sampling and evaluation of this prospect was terminated by events described in my Jan. 13, 1983 File Memorandum.

b) Widespread and rather strong geochem gold values have been found. Twenty seven of the 31 sample sites collected from had >0.020 ppm threshold anomalous gold and 14 of the 27 samples ran >0.100 ppm gold (strongly anomalous). (Continued on attached sheet)

(For additional space use extra sheets)

Form Revised-June 1980-J.H.C. MVK-5193

?

"SP" Claim Group (continued)

28. (foliated). Increase of pervasive pyrophillite alteration eastward from sample sites 30 and 31. Sparse alunite veinlets noted at area of sample sites 14 and 21. Pervasive, east-west quartz sericite alteration extends under gravel cover to the north and fades out south of sample sites 27-29 across the gravel wash.

30. The area around sample site 9 and to the north may contain an east-west and northwest trending trough of reworked volcaniclastic sediments.

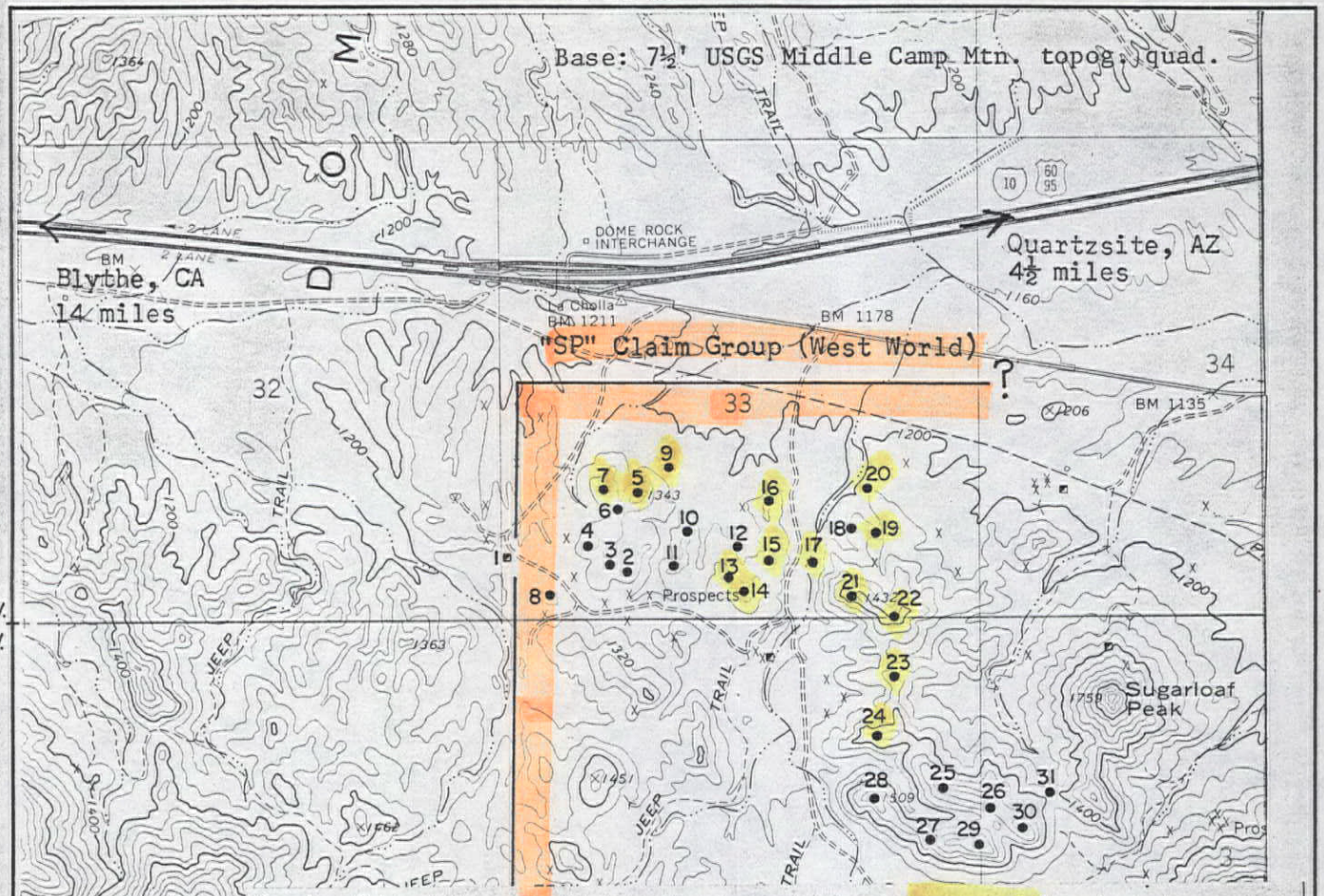
33. c) Gold mineralization is probably related to disseminated pyrite which accompanied the quartz-sericite alteration. The rhyolite for the most part is a dense rock with shallow surface ($<$ 1'-2') oxidation and leaching of the pyrite. Pyrite mineralization is very erratic. Ore can go from a trace to 3-5 volume percent within 10 to 20 feet. Overall content appears to be under 1 percent (volume).

d) Hematitic surface staining appears to be due to local oxidation of finely disseminated magnetite.

e) The presence of permeable volcaniclastic rock at sample site 9, which goes under shallow gravel cover towards the interstate highway, makes this a very attractive area for follow-up sampling and evaluation. However the BLM records show at least 61 valid lode (mostly) and placer claims here! (Section 33) of a highly mixed ownership.

More work (sampling and mapping) is certainly needed and is justified for this area; however, it appears that the tangle of private ownership, overstaking, litigation will be insurmountable obstacles to overcome.

R. 20 W.



Sample Number	Gold ppm	Description
MCM-1	.070	Dump grab, 50'? shaft, qtz-sercite schist, strong hematite stn.
-2	.080	Qtz-sericite schist, local relic porphyritic text.,hem. st.,5% cav. (py-mgt?)
-3	-.002	Bull qtz lens, 2' x 50', metamorphic.
-4	.005	Dump grab, 5' pit, rock as no. 2.
-5	.220	Silicif. granitic rock, mod. goeth. & hem. sth., cav. after mgt, wk. shist.
-6	.032	Rock as no. 5, +8% leach. cavitites/hem. stn.
-7	.180	Aplite dike or sill, 20-30' wide, 200'+? long, 4% dissem. fresh pyrite.
-8	.070	Rock as no. 1 & 2, qtz-sercite schist, +5% leach. cavities/hem. stn.
-9	.220	Tertiary? volcaniclastic sed. (ss like), flat lying, goeth. stn. on bedding.
-10	.040	Devitrified qtz. por. or aplite, wk, surface goeth. stn., schistose.
-11	.080	As no. 10.
-12	.004	Bull qtz lens, approx. 50' x 100'.
-13	.370	Devitrified rhyolite?, locally platy, wk. surf. goeth. stn.
-14	.120	Rhyolite por., siliceous, platy, alunite vnlts, tr-2% dissem leach. py.
-15	.280	Bleached, sericitized rhy. por., -1% leached py?
-16	.380	Strong qtz-ser. alt., aplite-like rk, 1-2% dissem. fr. mgt., local hem. stn.
-17	.190	Similar to no. 16, some flowage text., light-mod. surf. goeth.
-18	.002	Bull qtz. lens, approx. 30 x 80'.
-19	.660	Platy rhy., bleach.,silicif., light surf. goeth. stn., abund. cav. after ?
-20	.450	As no. 19, overall rk vuggy, some hem. in leached cavts.
-21	.190	Platy rhy., devit., bleached, wk. goeth. stn., minor alunite vnlts.
-22	.110	Massive to platy rhy, bleached, 2-3% dissem. fresh py., mod. goeth. stn.
-23	.530	Platy rhy, devit., bleached, mod. to str. qtz.-ser. alt., -1%? leach. py.
-24	.130	Platy to massive rhy, qtz.-ser. alt (mod to strong), 3-4% dissm. fine mgt.
-25	.036	Platy rhy., as above, trace to 8% dissem. fresh py.
-26	.070	Platy rhy, wkly argillized., no. sulf.
-27	.070	Platy rhy. por., siliceous, bleached, 3-5% dissem. fresh py.
-28	.026	As no. 27, trace to 5% dissem. fresh pyrite, mod. to str. surf. goeth. stn.
-29	.024	Very platy rhy. por.,mod. to str. goeth. & goeth-hem. stn. 5% hem. aft. mgt.
-30	.034	Very platy rhy. alt to pyrophyllite (wk to str. replacement).
-31	.038	As above, strongly alt. and drop in specific gravity., tr. goeth. stn.

Note: Atomic Absorption gold analysis by Skyline Labs,Inc;Tucson,AZ (Job no. TAJ 249)

ASARCO INCORPORATED

area: Sugarloaf Peak Area, Dome Rock Mountains	data by	state: Arizona	township-range	revisions-date
		county: LaPaz	map number	PLATE 1
title: Sample Location Map	drawn by: GJS			
mining district: Middle Camp (Oro Fino)	date: Feb. 1983	contour interval: 40ft.		

~~JHC~~ - ERS File

J. H. C.

JAN 27 1983

ASARCO EXPLORATION RECORD

[X] FIELD EXAMINATION [ ] LITERATURE SEARCH [ ] ASARCO FILE [ ] _____

Section I General Indexing

① Name(s) of Property or Area: JACOB LAKE (Apex Copper)					② Country: USA Coconino County	③ State or Province: Arizona	
					④ USGS Quad.: Jacob Lake & Warm Springs	~~⑤ File or Core No.~~	
⑥ Latitude: 36°43'	⑦ Longitude: 112°15'	⑧ AMS Sheet: Grand Canyon	Township: 38N	Range: 1E	Section: 11,12 13,14	⑨ Examined by: H. G. Kreis	⑩ Date: Summer 82
						⑪ Office: Tucson	⑫ Field Days: 1

Section II Sources of Information

Date Typed 1/14/83

⑬ References

Author	Date	Title	Publications	Vol. No.
Jennings, E.P.	1904	Cu-Deposits of Kaibab Plateau	AIME Transactions	34
Tainter, S.L.	1947	Apex Copper Property	USBM R.I. 4013	
Kreis, H.G.	1983	Jacob Lake Copper		

Section III Appraisal

⑭ Recommendations
- [ ] Action Now
- [ ] Too Low Grade
- [ ] Too Small
- [ ] Ownership Problem
- [ ] Access Problem
- [X] No action

⑮
- [X] Post Producer
- [ ] Producer
- [ ] Mineral Deposit
- [X] Prospect
- [ ]

- [ ]
- [X] Geologic Concept
- [ ] Geochem Anomaly
- [ ] Geophy Anomaly
- [ ]

⑯ Production

Commodity	Tons	Grade
Pre 1940	Minor	
1940-1944	17,000	7% Cu
Post 1944	Minor	

⑰ Reserves
- [ ] Measured
- [X] Estimated

Commodity	Tons	Grade
	20,000-100,000	1-6% Cu

⑱ Num. Drill Holes 17
Approx Total Footage 4000±

⑲ Excavations: Several dozer cuts

⑳ [ ] Spectro. Analysis Attached ㉑ [ ] Assays Attached ㉒ [ ] Geochem Results Attached

Section IV Geologic Data

㉓ Commodity or Contained Metals: Copper, silver (0.2 - 0.5 oz/ton)

㉔ Ore Minerals-Major: Malachite, Azurite; Minor: Chalcopyrite, Chalcocite

㉕ Host Rocks-Major: Kaibab Lms; Minor:

㉖ Age of Host Rocks: Permian

㉗ Nature of Exposures: Good in Lambs Lake area; otherwise, there is extensive, thin soil cover.

㉘ Alteration: Silicification along vein like fractures and in beds in limestone adjoining the fractures.

㉙ Total Extent: Up to 1000' long and up to 100' wide.

㉚ Structure: Widely spaced, NE'ly striking fracture zones in shallow dipping, bedded carbonate rocks.

㉛ Ore Occurrence: Quartz-copper oxide (formerly chalcopy.) replacement of narrow fracture zones and replacement of selective carbonate beds adjoining mineralized fractures.

㉜ Age of Mineralization: Post Permian

㉝ Conclusions & Recommendations: Entire area staked by Pathfinder Mines and drilling was in progress during 1982. Tonnage near surface is too small to be of interest to ASARCO. The Cu-Ag may represent leakage from deeper mineralization, but the Jacob Lake area is not of interest to ASARCO at this time.

(For additional space use extra sheets)

Form Revised-June 1980-J.H.C. MVK-5193

ASARCO

Southwestern Exploration Division

January 14, 1983

To: J. D. Sell

From: H. G. Kreis

Copper at Jacob Lake
Warm Springs District
Coconino County, AZ

On my way to Utah last summer I made a one day reconnaissance (in the rain) of the copper mineralization located one to two miles southwest of the town of Jacob Lake. I was curious about the nature of the copper mineralization and what precious metal content was associated with it. Unfortunately, the area is mostly covered by a thin soil layer. The best exposures are in the Lambs Lake area, but competitive activity (drilling, etc.) prevented an examination of most of the Lambs Lake outcrops. Twenty-six geochem samples were collected from dozer cuts, outcrops, and a pile of rotary cuttings from a recent drill hole.

Mineralization in the Jacob Lake area consists of vein-like fracture zones with selective bedding replacement in the Permian Kaibab Formation. The mineralized fracture zones are 5' to 20' wide, apparently steeply dipping, and northeasterly striking. Quartz and chalcopyrite, judging from the capping and copper oxides, replaced the sedimentary rocks along the fractures and in certain beds. Tainter (1947, "Apex Copper Property"; USBM R.I. 4013) describes the mineralized beds as being up to 14' thick and 10' to 50' wide. The distribution of the mineralization and the results of drilling in 1 to 8% Cu are available in Tainter's report (see attached geologic map).

The quartz-chalcopyrite (oxidized) mineralization contains anomalous silver, molybdenum, and nickel as shown in the attached chart and analytical reports. The highest silver value was 3.6 ppm, but ASARCO file data indicates up to 0.5 oz/ton Ag is associated with 7% Cu mineralization. The highest gold value was 0.016 ppm.

Geochem samples were taken from obviously mineralized rock and from various host rocks in the vicinity. No significant metal values were found in the host rocks. The "silica sponge" noted in the attached chart appears to be a cherty-siliceous limestone with the lime leached out by supergene solutions. The "silica sponge" has a vuggy, sponge texture and a light brown iron stain. In the mineralized areas it is often difficult to distinguish between supergene leached, cherty-siliceous limestone ("silica sponge") and silica-goethite (after chalcopyrite) replaced limestone.

The entire Jacob Lake area is covered by unpatented mining claims belonging to the Pathfinder Mines Corporation (claims dated November 21, 1981). One drill hole (HKJL-12) was completed just prior to the time of examination, and a drill rig was operating immediately southeast of Lambs Lake at the time of this examination.

The copper-silver mineralization at Jacob Lake could reflect similar mineralization in some other geologic environment at depth, and it would be interesting to know the results of the current exploration program in that area. In view of the speculative nature of a deep target and the current exploration activity in the area, no further work is recommended at this time.

H. G. Kreis

H. G. Kreis

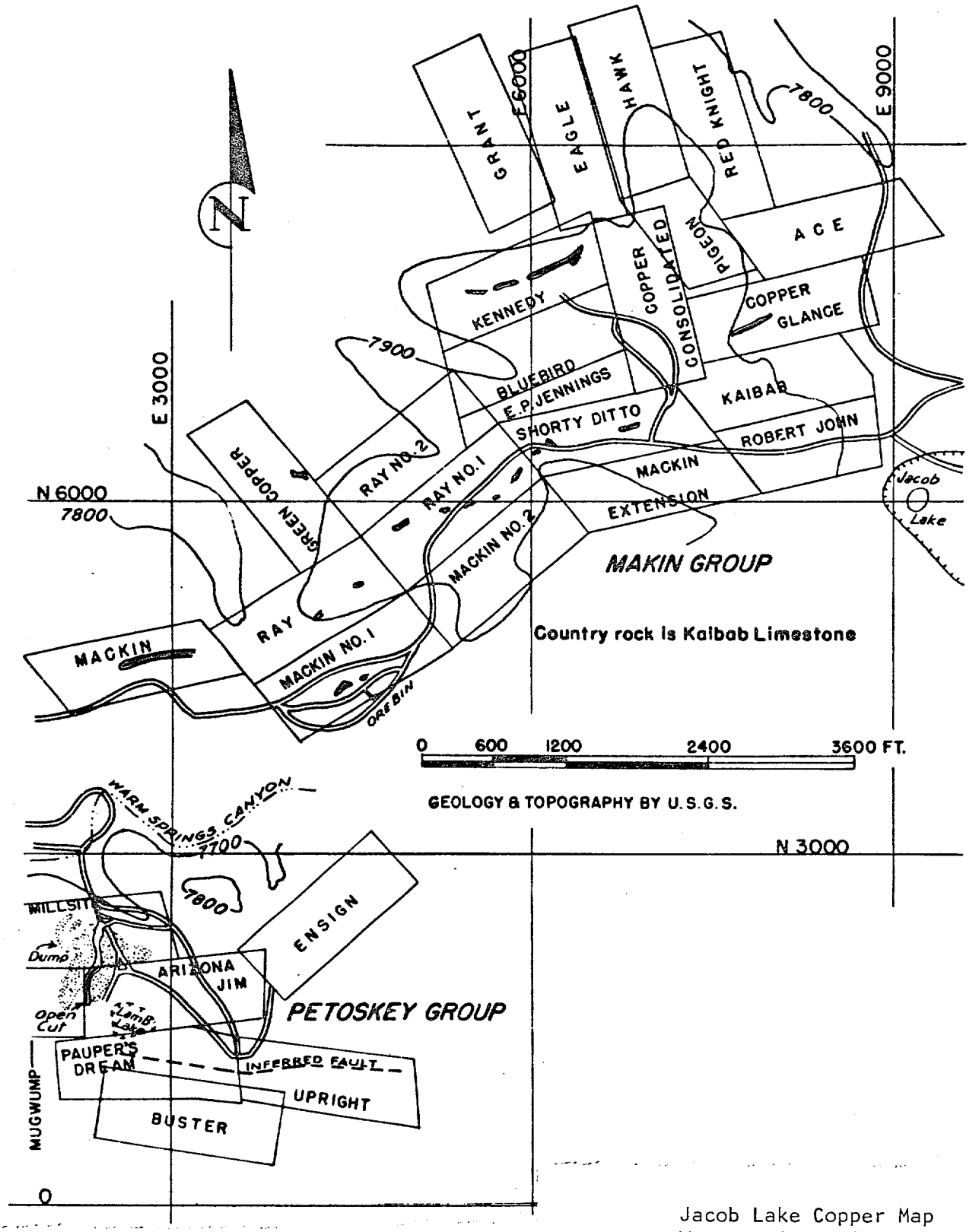
HGK/cg

Attachments

H.G.K.
November 1982

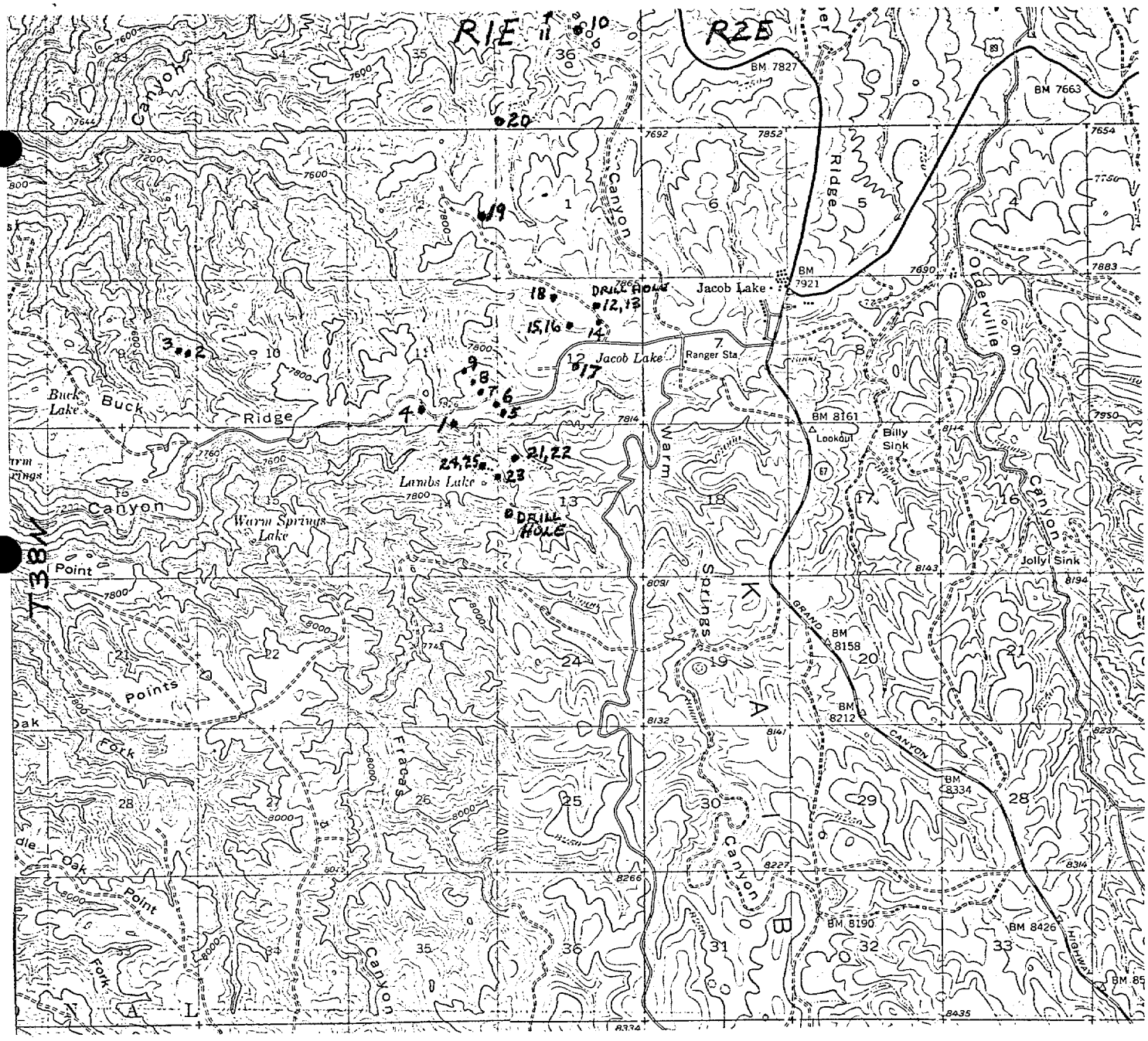
JACOB LAKE GEOCHEMISTRY

	Geochem Values (ppm)					Rock Type							
	Cu	Ag	Au	Mo	Ni	"Silica Sponge"	Quartz & CuOx Mineralization	Silicified Bed	Siliceous & Cherty Lms.-Dolo.	Carbonate Breccia (Sink Hole)	Muddy D.H. Cuttings	Qtz.-Calcite Bed(?)	Buff Sandstone
HKJL- 1	15	.4	<.002	70	50			X					
- 2	--	<.2	<.002	2	--				X				
- 3	--	<.2	<.002	2	--				X				
- 4	--	<.2	.008	8	--	X							
- 5	2,000	3.2	<.002	50	500		X						
- 6	--	.2	<.002	2	--	X							
- 7	--	1.0	<.002	8	--	X							
- 8	--	<.2	<.002	<2	--	X							
- 9	--	<.2	<.002	<2	--	X							
-10	70	.2	<.002	30	150		X						
-11	--	<.2	.008	<2	--					X			
-12	100	<.2	<.002	<2	50						X		
-13	1,000	2.0	<.002	70	300		X						
-14	--	3.6	<.002	200	--	X	X						
-15	--	<.2	<.002	2	--							X	
-16	--	<.2	<.002	<2	--								X
-17	--	<.2	<.002	<2	--	X							
-18	--	1.2	<.002	24	--	X	X						
-19a	--	.2	<.002	2	--			X					
-19b	--	.2	<.002	2	--								X
-20	--	<.2	<.002	<2	--	X							
-21	--	<.2	<.002	2	--	X							
-22	--	2.0	<.002	6	--		X						
-23	10,000	1.4	.016	150	300		X						
-24	--	.6	<.002	14	--				X				
-25	--	<.2	<.002	2	--				X				



Jacob Lake Copper Map
Warm Springs District
Coconino Co., Arizona

Map by S. L. Tainter,
1947, USBM R.I. 4013.



Geochem Sample
Location Map

Jacob Lake Area
Warm Springs District
Coconino Co., Arizona

H. G. Kreis Jan. 1983
1" = 1 Mile

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TAJ 204
September 20, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 6 Rock Chip Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED
Arizona U.S.A.

William Lehmbeck
Manager

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

JOB NO. TAJ 204
PAGE 2

ITEM NO.	SAMPLE NO.
1	HKJL-1
5	HKJL-5
10	HKJL-10
12	HKJL-12
13	HKJL-13
23	HKJL-22

ITEM	1	5	10	12	13	23
ELEMENT						
Fe	2%	1.5%	2%	.7%	1%	2%
Ca	.2%	.15%	.15%	10%	.5%	.15%
Mg	.05%	.03%	.03%	5%	.15%	.03%
Ag	<1	1	<1	<1	1.5	1
As	<500	<500	<500	<500	<500	500
B	70	50	70	20	100	50
Ba	15	<10	<10	15	200	<10
Be	<2	<2	<2	<2	<2	<2
Bi	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50
Co	<5	70	5	<5	70	30
Cr	30	50	50	20	70	30
Cu	15	2000	70	100	1000	10000
Ga	<10	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20	<20
Mn	100	30	15	100	30	15
Mo	70	50	30	<2	70	150
Nb	<20	<20	<20	<20	<20	<20
Ni	50	500	150	50	300	300
Pb	<10	<10	<10	<10	<10	20
Sb	<100	<100	<100	<100	<100	<100
Sc	<10	<10	<10	<10	<10	<10
Sn	<10	<10	<10	<10	<10	<10
Sr	<100	<100	<100	<100	<100	<100
Ti	200	300	150	500	200	100
V	15	20	50	10	15	15
W	<50	<50	<50	<50	<50	<50
Y	<10	<10	<10	<10	<10	<10
Zn	<200	700	<200	<200	<200	<200
Zr	20	70	70	20	50	30

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
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REPORT OF ANALYSIS

JOB NO. TAJ 204
September 20, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 25 Rock Chips and 1 Drill Cutting Sample

ITEM	SAMPLE NO.	Au ppm	Ag ppm	Hg ppm
1	HKJL-1	<.002	.4	.09
2	HKJL-2	<.002	<.2	.04
3	HKJL-3	<.002	<.2	.04
4	HKJL-4	.008	<.2	.04
5	HKJL-5	<.002	3.2	.05
6	HKJL-6	<.002	.2	.01
7	HKJL-7	<.002	1.0	.09
8	HKJL-8	<.002	<.2	.10
9	HKJL-9	<.002	<.2	.07
10	HKJL-10	<.002	.2	.07
11	HKJL-11	.008	<.2	.04
12	HKJL-12	<.002	<.2	.05
13	HKJL-13	<.002	2.0	.04
14	HKJL-14	<.002	3.6	.10
15	HKJL-15	<.002	<.2	.04

SKYLINE LABS, INC.
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JOB NO. TAJ 204
September 20, 1982
PAGE 2

ITEM	SAMPLE NO.	Au ppm	Ag ppm	Hg ppm
16	HKJL-16	<.002	<.2	.07
17	HKJL-17	<.002	<.2	.05
18	HKJL-18	<.002	1.2	.07
19	HKJL-19A	<.002	.2	.03
20	HKJL-19B	<.002	.2	.03
21	HKJL-20	<.002	<.2	.01
22	HKJL-21	<.002	<.2	.03
23	HKJL-22	<.002	2.0	.07
24	HKJL-23	.016	1.4	.07
25	HKJL-24	<.002	.6	.07
26	HKJL-25	<.002	<.2	.01

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
DATE SIGNED
Arizona

William Lehmbeck
Manager

SKYLINE LABS, INC.
1775 W. Sahuaro • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 204A
October 25, 1982

ASARCO INCORPORATED
Attn.: Mr. H.G. Kreis
Southwestern Exploration
P.O. Box 5747
Tucson, Arizona 85703

Analysis of 20 Pulp Samples

ITEM	SAMPLE NO.	Mo ppm
2	HKJL-2	2.
3	HKJL-3	2.
4	HKJL-4	8.
6	HKJL-6	2.
7	HKJL-7	8.
8	HKJL-8	<2.
9	HKJL-9	<2.
11	HKJL-11	<2.
14	HKJL-14	200.
15	HKJL-15	2.
16	HKJL-16	<2.
17	HKJL-17	<2.
18	HKJL-18	24.
19	HKJL-19A	2.
20	HKJL-19B	2.
21	HKJL-20	<2.
22	HKJL-21	2.
24	HKJL-23	6.
25	HKJL-24	14.
26	HKJL-25	<2.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
DATE SIGNED
Arizona U.S.A.

William L. Lehmbeck
Manager