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James Doyle Sell Mining Collection

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October 20, 1981

To: W. D. Payne

From: H. G. Kreis *H. G. Kreis*Johnson Property
Rare Metals Area
Pinal County, Arizona

The Johnson property is a porphyry copper prospect located near Kelvin, Arizona. It is apparently owned by John M. Johnson of Prescott, Arizona. According to Mr. Johnson, the property is leased to Wombat Mining Co., a subsidiary of Wallaby Enterprises.

The Johnson property has been drilled by Minbanco (nine hammer drill holes, 1968-1969), Tipperary Resources Corporation (two rotary drill holes, 1969-1970), Cyprus Mines Corporation (one core drill hole, 1972), Kerr-McGee (one core hole, 1973), Cities Service Minerals Corporation (six core holes, 1974-1977), and Coastal Mining Corporation (Dave Lowell, one core hole, 1978). Kerr-McGee, Occidental Minerals Corporation, and Consolidated Copper Mines have drilled to the east of the Johnson property.

A thick volume of information on the Johnson property was obtained from Wallaby Enterprises. This data will be added to Asarco's files on the property. A quick scan of the data was made to see if ore grade intercepts were made by Cities Service as reported by promoters of the Johnson property. Significant copper intercepts are listed in the following table (see attached map for drill hole location).

Significant Copper Intercepts

<u>Hole</u>	<u>From</u>	<u>To</u>	<u>Thickness</u>	<u>Cu(%)</u>	<u>Mo(%)</u>
J-1	1740	2100	360'	0.39*	0.0021
J-4	2300	2580	280'	0.28	0.0104
J-5	1930	2210	280'	0.33	0.0048

*Includes 10' at 2.94% Cu

The copper and molybdenum values in drill holes J-1, J-4, J-5, and surrounding drill holes are rather erratic. Grade variations appear to be due to major fault offsets, a "fringe" style of porphyry copper mineralization, and a post chalcopyrite intrusive (J-1). If the above listed copper intercepts are representative of one uniform body of mineralization, it would amount to 50 million tons of 0.33% Cu between the three drill holes. Highly anomalous copper and molybdenum values are present in all the surrounding drill holes.

Conceivably the copper mineralization in the Johnson property drill holes could tie in with a large porphyry copper deposit. However, the complexity of structure and mineralization would require a thorough examination of the core, the surface geology, and all the information generated by previous exploration programs before any drilling is considered. Based on present information, any exploration drill target is expected to be deep (plus 2000' depth) and of primary copper mineralization (0.5% to 0.8% copper).

An evaluation of the Johnson property would be enhanced by a similar evaluation of the former Consolidated Copper Mines property, located three to four miles east of the Johnson property. The former Consolidated Copper Mines property contains substantial evidence of porphyry copper mineralization dissected by complex faulting. Kerr-McGee drilled between the Johnson property and the former Consolidated Copper Mines property, and the results were discouraging.

The Johnson property does not have a drilled out ore body as claimed by promoters of the property. The Precambrian Oracle granite - Laramide granodiorite environment of the Johnson property is not conducive to the formation of large tonnages of plus 0.8% copper as chalcopyrite, and there is no substantial possibility for supergene enrichment. I suggest that you, Mr. Kurtz and myself discuss the merits of exploring for primary, 0.7% copper on a property that would require a long term exploration program with substantial land payments.

HGL/sk

attachments

ASARCO EXPLORATION RECORD

FIELD EXAMINATION
 LITERATURE SEARCH
 ASARCO FILE
 Submittal

Section I General Indexing

① Name(s) of Property or Area Johnson Property Riverside-Kelvin District, Pinal County				② Country USA		③ State or Province Arizona	
				④ USGS Quad. Grayback		⑤ File or Core No.	
⑥ Latitude 33°05'30"	⑦ Longitude 111°01'45"	⑧ AMS Sheet Mesa, AZ	Township 4S	Range 13E	Section 8,9 16,17	⑨ Examined by H.G. Kreis	
						⑩ Date 10/19/81	
						⑪ Office SWUS	
						⑫ Field Days none	

Section II Sources of Information

Date Typed 10/20/81

⑬ References	Author	Date	Title	Publications	Vol. No.
	Cities Service's logs and reports submitted by Wallaby Enterprises 10/19/81				
	Asarco files				
	Cornwall and Krieger, 1975, Geologic Map Grayback Quad GQ 1206				

Section III Appraisal

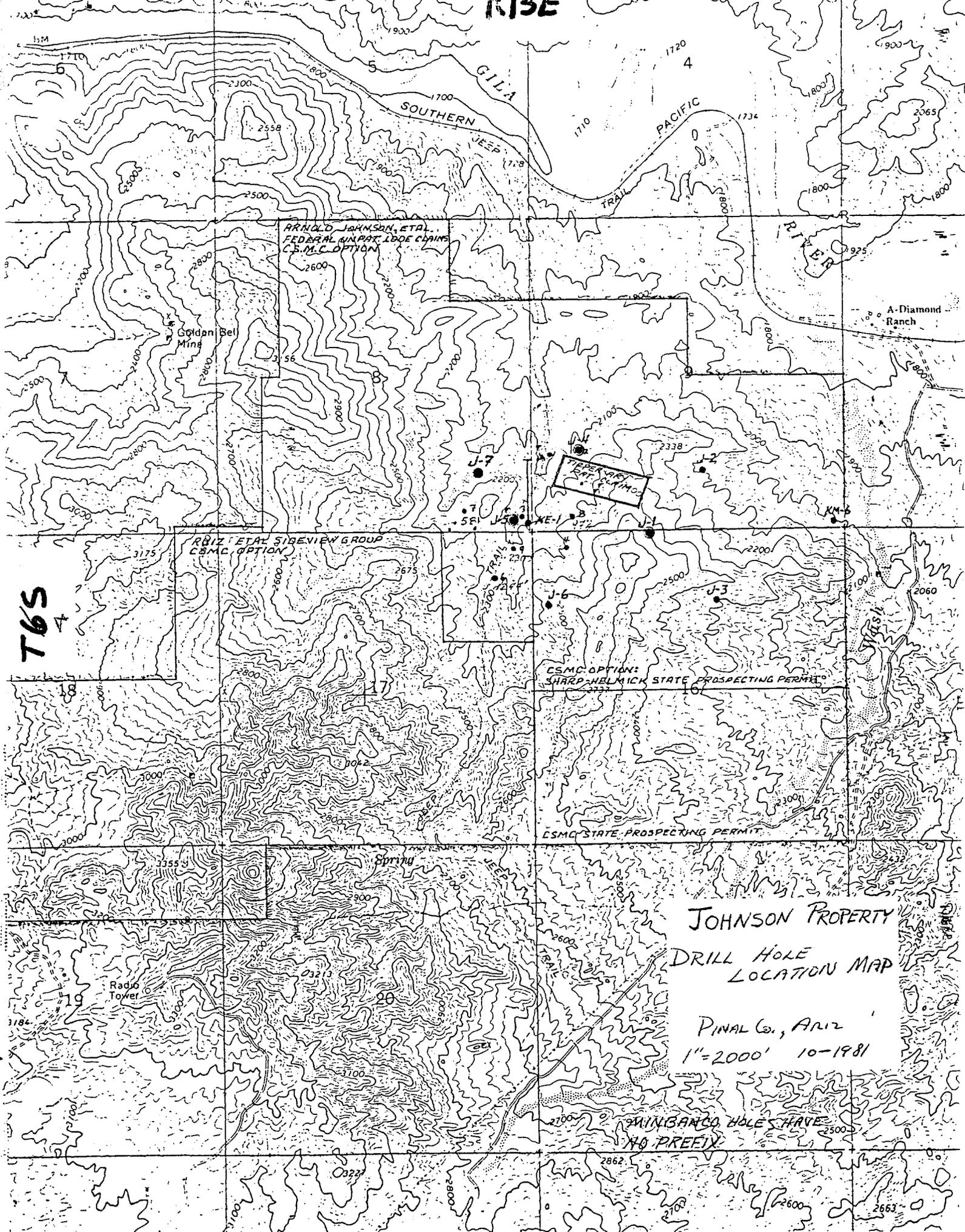
⑭ Recommendations <input type="checkbox"/> Action Now <input type="checkbox"/> Too Low Grade <input type="checkbox"/> Too Small <input type="checkbox"/> Ownership Problem <input type="checkbox"/> Access Problem <input checked="" type="checkbox"/> future consideration			⑮ <input type="checkbox"/> Post Producer <input type="checkbox"/> Producer <input type="checkbox"/> Mineral Deposit <input checked="" type="checkbox"/> Prospect			<input type="checkbox"/> Geologic Concept <input type="checkbox"/> Geochem Anomaly <input type="checkbox"/> Geophy Anomaly			⑯ Production Commodity Tons Grade Nil		
⑰ Num. Drill Holes <u>17</u> Approx Total Footage <u>25,000</u>			⑱ Excavations two 60' deep shafts			⑲ Reserves <input type="checkbox"/> Measured Commodity <input checked="" type="checkbox"/> Estimated Tons Grade copper 50mm(?) 0.33% Cu					
<input type="checkbox"/> Spectro. Analysis Attached			<input type="checkbox"/> Assays Attached			<input type="checkbox"/> Geochem Results Attached					

Section IV Geologic Data

⑳ Commodity or Contained Metals copper - molybdenum	
㉑ Ore Minerals-Major Chalcopyrite	Minor Molybdenite
㉒ Host Rocks-Major Oracle Granite	Minor Granodiorite
㉓ Age of Host Rocks Precambrian	61-63 m.y.
㉔ Nature of Exposures Extensive outcrops	
㉕ Alteration Propylitic, sericitic, and biotite-K-feldspar-sericite ㉖ Total Extent Needs future work.	
㉗ Structure E-W striking Laramide dikes and mineralized shears. Substantial evidence of rotation and low angle faulting.	
㉘ Ore Occurrence Disseminated and fracture-vein control.	
㉙ Age of Mineralization Approx. 60 m.y.	
㉚ Conclusions & Recommendations The Johnson property does not have a drilled out ore body as claimed by promoters of the property. The property is a good candidate for a hypogene copper target of 0.5 to 0.8% copper as chalcopyrite. A thorough examination of the alteration, mineralization and structure is recommended at a time when a 0.7% Cu target is more attractive than it is under today's depressed copper prices.	

(For additional space use extra sheets)

RIBE



T6S
4

JOHNSON PROPERTY DRILL HOLE LOCATION MAP

PINAL CO., ARIZ
1"=2000' 10-1981

SWINGANGO HOLE HAVE
NO PREVIEW

JDS - I phoned 10/27/92 and told them we would NOT make field examination. WBAK

JDSell - went to do this during your break from Matridad? 5 OCT 92 file

Medi-Tech
P.O. Box 1449
Kearny, AZ. 85237
(602) 363-5311
BRUCE B. GRIFFITH

FAX (602) 432-5036
BISBEE MINERALS COMPANY
P.O. Box 4177 • 10 Cochise Lane
Bisbee, Arizona 85603
TIM M. TUCKER
Archaeologist
(602) 432-3223

These two men have ± 60 claims in the Ketrin-Riverside area south of Ray

They say they have a zone of oxide copper ± 1 mile in length that is outside of any areas previously drilled.

Data in Kearny and available to look at and then visit area in field.

I told them we would have someone contact them to do just that.

Tentatively around the 1 Nov 92 time.

KURTZ

(*) Same area as in 14 from Johns to Sell Nov 19, 1991 where Johns outlines on Granddads Grand Ged Map the Ox zone

~~JDS~~ goes with Kelvin-Riverside FILE
note I sent you 5 OCT 92



BISBEE MINERALS COMPANY

10 Cochise Lane
Telephone (602) 432-3223

P. O. Box 4177

Bisbee, Arizona 85603
Fax (602) 432-5036

TIM M. TUCKER
Archaeologist

10 OCTOBER 1992

ASARCO INCORPORATED
POST OFFICE BOX 5747
TUCSON, ARIZONA 85703

ATTENTION: WM. L. KURTZ, MANAGER - WESTERN USA

RE: ANDREA MINERAL CLAIMS, PINAL COUNTRY, ARIZONA

DEAR MR. KURTZ:

IN OUR RECENT MEETING IN YOUR OFFICE (5 OCTOBER), WE APPRECIATED THE COURTESY EXTENDED TO BRUCE GRIFFITH AND ME, AND THE DISCUSSION WE HAD REGARDING THE PROPERTY.

DURING OUR MEETING, OUR CONVERSATION FOCUSED ON A COPPER ANAMOLY - OF WHICH WE BELIEVE HOLDS ECONOMIC POTENTIAL. THEREFORE, DURING THIS LAST AUGUST WHILE PERFORMING THE ANNUAL ASSESSMENT LABORS, A BULL-DOZER MADE ROADS AND MADE A "CUT" INTO MINERALIZED OUTCROPS THAT ARE MAINLY COPPER-BEARING ORES.

FROM THESE OUTCROPS, WE TOOK MORE (13) SAMPLES. PLEASE FIND ENCLOSED A COPY OF THE SKYLINE LABS REPORT. WE DID, OF COURSE, INDICATE THAT THE SAMPLES ARE HIGH-GRADED - YET IT TENDS TO SHOW A MINERALIZED AREA SOME 3000 FEET IN LENGTH.

APART FROM COPPER, YOU MENTIONED ANOTHER METAL - GOLD. AS I REMARKED TO YOU, WE CERTAINLY WELCOME THE POSSIBILITY OF A LOW-GRADE GOLD DEPOSIT - AND MOREOVER, WE WILL BE GRATEFUL FOR ANY GEOLOGICAL INFORMATION THAT COULD HELP US.

THANKYOU AGAIN FOR YOUR COOPERATION.

SINCERELY YOURS,

TIM TUCKER

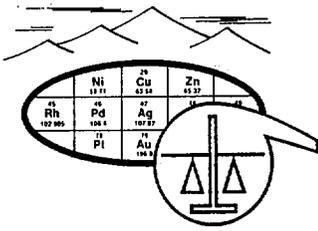
MINERALS

- Turquoise
- Azurite
- Malachite
- Chrysocolla
- Chalchihuites
- Onyx

RECEIVED

OCT 14 1992

EXPLORATION DEPARTMENT



SKYLINE LABS, INC.

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

REPORT OF ANALYSIS

JOB NO. WKK 001
 September 18, 1992
 1-13
 PAGE 1 OF 1

BISBEE MINERALS CO.
 Attn: Mr. Tim Tucker
 10 Cochise Lane
 Bisbee, AZ 85603

Analysis of 13 Rock Chip Samples

ITEM	SAMPLE NO.	Cu (%)
1	1	6.85
2	2	8.25
3	3	.16
4	4	9.95
5	5	.15
6	6	12.30
7	7	6.95
8	8	.06
9	9	3.80
10	10	1.30
11	11	9.15
12	12	4.15
13	13	9.50

RECEIVED

OCT 14 1992

EXPLORATION DEPARTMENT

REGISTERED ASSAYER
 CERTIFICATE NO. 9425
 WILLIAM L. LEHMBECK
 Manager
 11/8/92

ASARCO

JDS
Southwestern Exploration Division

January 29, 1991

M.A. Miller & J.J. Malusa

Kelvin Area
Section 12, T4S, R13E
Pinal County, Arizona

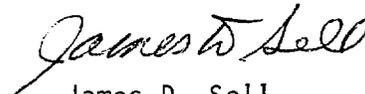
You are requested to take a day or so this week of January 28th and sample the Wilkins Kelvin area for gold-silver. As noted in Figures 1 and 2, the area expands into Section 7, T4S, R14E.

All shaft dumps should be sampled along with any obvious mineralized structures, and three or four traverses across the claim blocks on $\pm 100'$ centers.

This is a priority item of business and only needs to cover the outlined Kelvin Area.

To your 1-2 page report, attach your sample descriptions and a topo map showing the sample sites and sample lines.

JDS:mek


James D. Sell

cc: W.L. Kurtz

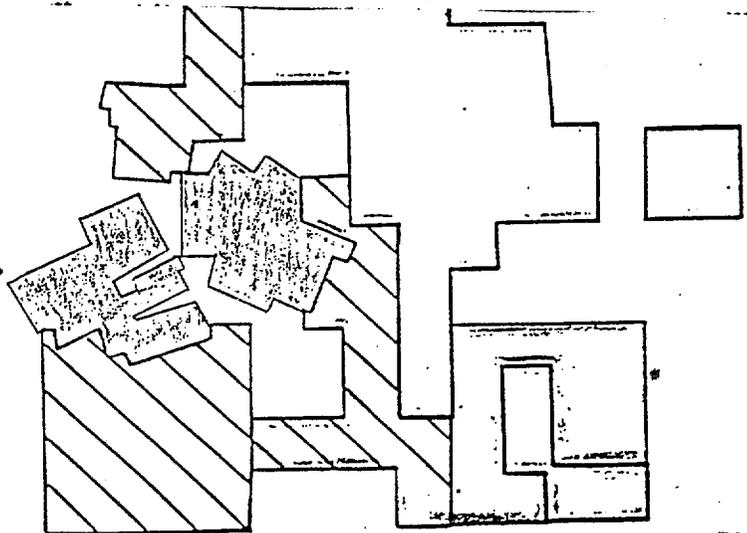
one mile

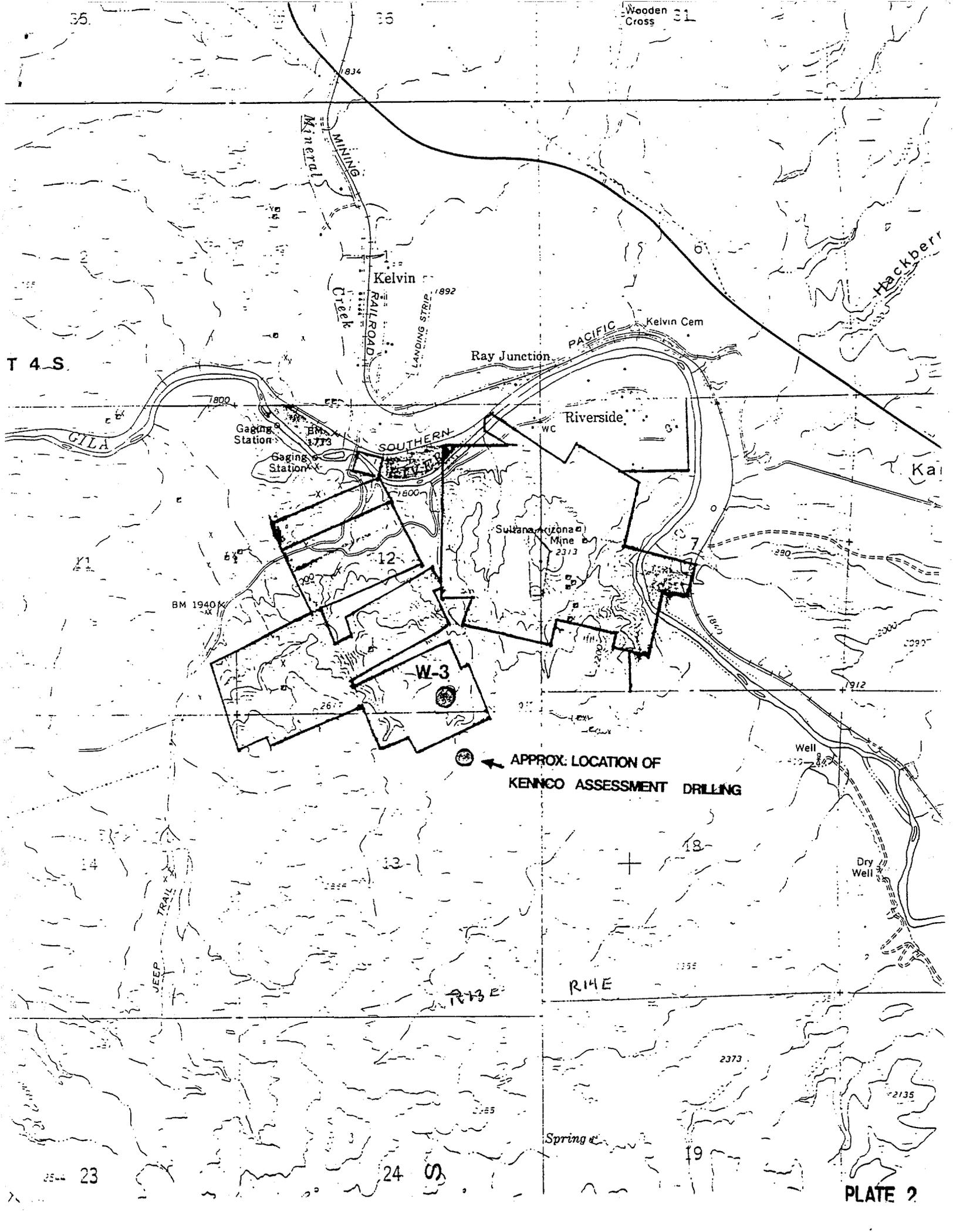


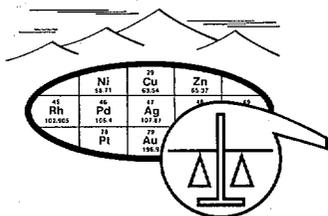
APPROX. LOCATION OF
WILKINS FAMILY KELVIN AREA
PATENTED CLAIMS



JOHN M JOHNSON
CLAIM GROUP







SKYLINE LABS, INC.

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

REPORT OF ANALYSIS

JOB NO. TAJ 713
 February 20, 1991
 PROJECT NAME: KELVIN
 WK-1, WK-29
 PAGE 1 OF 4

ASARCO INCORPORATED
 Attn: Mr. M.A. Miller
 Southwestern Exploration
 P.O. Box 5747
 Tucson, AZ 85703

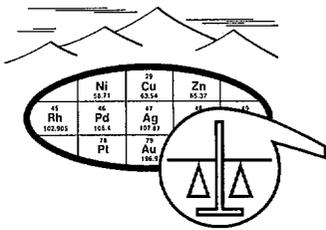
ASARCO I:

FEB 22 1991

SW Exploration

Analysis of 94 Rock Chip Samples

ITEM	SAMPLE NUMBER	FIRE ASSAY	
		Au* (ppm)	Ag (ppm)
1	WK-1	<.002	6.8
2	WK-2	<.002	3.8
3	WK-3	<.002	6.0
4	WK-4	.490	14.0
5	WK-5	<.002	2.8
6	WK-6	<.002	1.4
7	WK-7	<.002	3.0
8	WK-8	<.002	.4
9	WK-9	<.002	7.4
10	WK-10	<.002	.4
11	WK-11	<.002	2.8
12	WK-12	<.002	4.4
13	WK-13	<.002	10.0
14	WK-14	<.002	10.0
15	WK-15	<.002	.4
16	WK-16 4 E	<.002	.6
17	WK-16 6 E	<.002	.4
18	WK-16 8 E	<.002	.4
19	WK-16 10 E	<.002	1.4
20	WK-16 12 E	<.002	<.2
21	WK-16 14 E	<.002	.4
22	WK-16 16 E	<.002	.4
23	WK-16 18 E	<.002	<.2
24	WK-16 20 E	<.002	<.2
25	WK-16 22 E	<.002	.6

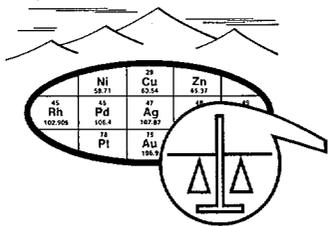


SKYLINE LABS, INC.

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 Tucson, Arizona 85703
 (602) 622-4836

JOB NO. TAJ 713
 February 20, 1991
 PAGE 2 OF 4

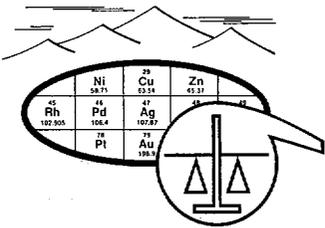
ITEM	SAMPLE NUMBER	FIRE ASSAY	
		Au* (ppm)	Ag (ppm)
26	WK-16 24 E	<.002	.2
27	WK-16 26 E	<.002	.4
28	WK-16 28 E	<.002	<.2
29	WK-18 0	.030	1.8
30	WK-18 2 E	<.002	.2
31	WK-18 4 E	<.002	<.2
32	WK-18 6 E **	.000	.0
33	WK-18 8 E	<.002	<.2
34	WK-18 10 E	<.002	<.2
35	WK-18 12 E	<.002	<.2
36	WK-18 14 E	<.002	<.2
37	WK-18 16 E	<.002	<.2
38	WK-18 18 E	<.002	<.2
39	WK-18 20 E	<.002	<.2
40	WK-18 22 E	<.002	<.2
41	WK-18 24 E	<.002	<.2
42	WK-18 26 E	<.002	<.2
43	WK-18 28 E	<.002	<.2
44	WK-19 2 S	<.002	1.2
45	WK-19 4 S	<.002	.2
46	WK-19 6 S	.520	.4
47	WK-19 8 S	.210	5.4
48	WK-19 8.8 S	.040	.8
49	WK-19 10 S	.006	.4
50	WK-19 12 S	<.002	<.2



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 Tucson, Arizona 85703
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JOB NO. TAJ 713
 February 20, 1991
 PAGE 3 OF 4

ITEM	SAMPLE NUMBER	FIRE ASSAY	
		Au* (ppm)	Ag (ppm)
51	WK-19 14 S	.006	.2
52	WK-19 16 S	<.002	<.2
53	WK-19 18 S	.002	<.2
54	WK-19 20 S	<.002	.6
55	WK-19 22 S	.004	<.2
56	WK-19 24 S	<.002	<.2
57	WK-19 26 S	<.002	<.2
58	WK-19 28 S	.006	<.2
59	WK-19 30 S	<.002	.6
60	WK-19 32 S	.004	<.2
61	WK-19 34 S	<.002	.6
62	WK-19 36 S	.006	<.2
63	WK-19 38 S	.010	<.2
64	WK-19 40 S	.014	<.2
65	WK-20 0	<.002	<.2
66	WK-20 2 N	<.002	<.2
67	WK-20 4 N	.020	<.2
68	WK-20 6 N	<.002	<.2
69	WK-20 8 N	<.002	<.2
70	WK-20 10 N	.004	<.2
71	WK-21 0 S	<.002	<.2
72	WK-21 2 S	.020	<.2
73	WK-21 4 S	<.002	<.2
74	WK-21 6 S	.006	.2
75	WK-21 8 S	.012	.2



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

JOB NO. TAJ 713
 February 20, 1991
 PAGE 4 OF 4

ITEM	SAMPLE NUMBER	FIRE ASSAY	
		Au* (ppm)	Ag (ppm)
76	WK-21 10 S	<.002	<.2
77	WL-21 12 S	<.002	<.2
78	WK-21 12.8 S D	1.100	30.0
79	WK-21 12.8 S V	8.000	150.0
80	WK-21 12.8 S W	.016	1.2
81	WK-21 14 S	.026	1.6
82	WK-21 16 S	.002	.6
83	WK-21 18 S	.006	<.2
84	WK-21 20 S	<.002	<.2
85	WK-22	.004	<.2
86	WK-23	.034	1.8
87	WK-24	<.002	.2
88	WK-25	<.002	.4
89	WK-26	<.002	.8
90	WK-27 **	.000	.0
91	WK-28	.020	.6
92	WK-29 2 E	<.002	<.2
93	WK-29 4 E	<.002	<.2
94	WK-29 5.1 E DUMP	<.002	4.2
95	WK-29 5.1 E P	.010	2.8
96	UNMARKED BAG	.004	2.2

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

**NOTE: Sample not received.

cc: Mr. J. D. Sell

3/1/91

FROM: J. D. SELL

To: MAMelle

Wilken Sengling
Ray-Kelvin Chase
Gen'l Co, AZ

Hold off on the detail
sengling, until I
get comments back
from others.

J. D. Sell

cc: W. H. Kearty

JDS

February 27, 1991

W.L. Kurtz

Assay Results
Wilkins Patented Claim Block
Ray-Kelvin Area
Pinal County, Arizona

I submit to you for distribution, the report by M.A. Miller on his and J.J. Malusa's sampling of the Wilkins block in the Kelvin Area.

As noted, the Miller-Malusa sampling returned zilch gold over most of the property. Several exceptions included high-grade dump and vein material from thin structures.

Also, drill hole 1012, drilled 1200 feet south of hole W-3 failed to return any values above 0.009 opt gold.

The reported values in hole W-3, 0.10 opt gold 95-175 feet, have not been confirmed either as to assayer or follow-up pulps/rejects. It is, of course, possible that the assays are in error.

Should the Asarco Ray unit drill an assessment hole along the boundary line within 600 feet of W-3, and fail to find any gold values, this would suggest that the total area is not highly gold anomalous.

The attached drill log of W-3 indicated widespread faulting and gouge zones, and as Miller suggests, the zone of mineralization, if high angled, should have been evident on the surface, and Miller-Malusa did not see such a zone.

The other alternative is that the shear-faulting is more subhorizontal, and, if so, should be evident around the hillside. Although the weak anomalous values along line WK-19, sample points 6S, 8S, 8.8S, and samples WK-23, -28, are the only suggestion of widespread values and are scattered over several hundred vertical feet, their distance (2500') from W-3 makes any correlation very tentative.

Based on the sample data available SWED has little interest in the property, and Anzalone/Scartaccini can so inform the party that submitted the package.

JDS:mek
Att.


James D. Sell

cc: R.L. Brown
T.E. Scartaccini M.A. Miller
S.A. Anzalone J.J. Malusa
E. John (Ray Mine)

February 22, 1991

J.D. Sell

Assay Results
Wilkins Patented Claim Block
Ray-Kelvin Area
Pinal County, Arizona

We have received assay results from 95 samples taken within the Wilkins claim block. The results of the sampling do not indicate the surface presence of a bulk tonnage gold deposit as suggested by Kennecott diamond drill hole W-3. This hole had an intercept of 125' @ 0.085 opt Au. The interval is based upon 30 to 50' composite samples and is broken out as follows:

50 - 90' @ 0.025 opt Au
90 - 120' @ 0.10 opt Au
120 - 175' @ 0.10 opt Au

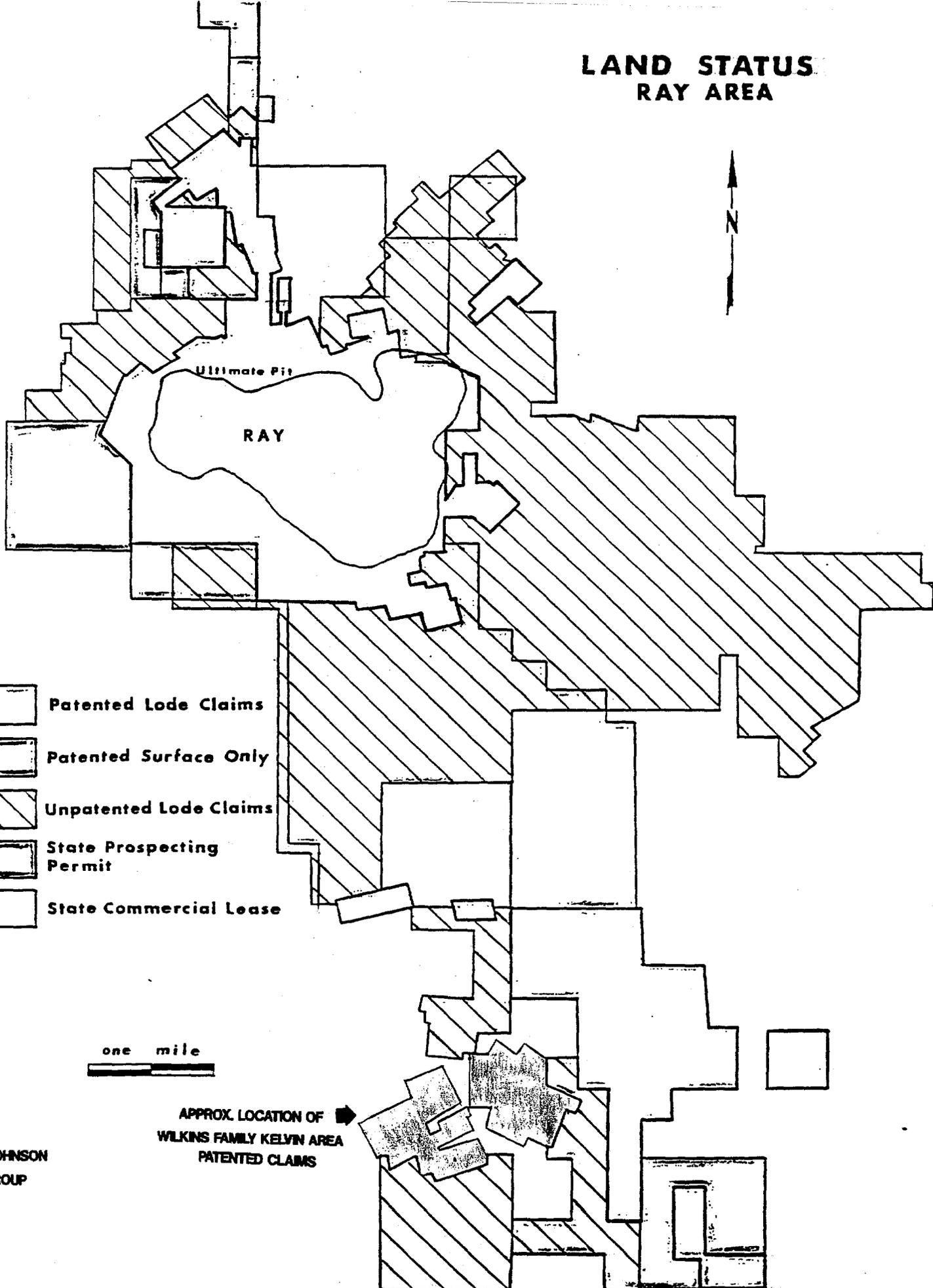
The hole was drilled at -60 from horizontal with a bearing of N10W. Further inspection and interpretation of the drill log revealed a number of high angle and subparallel faults and gouge zones within the mineralized zone. W-3 may have intersected a structure which is subparallel to the drill hole and is gold bearing. No such structure has been seen on the surface. Depending upon the orientation of the structure the thickness may range from 30' to +100'. This would be evident on the surface. Since the sample lines are essentially barren, there is a good chance that the drill hole has intersected a narrow structure and this is not a flat lying tabular zone as suggested by the intercept.

I would concur with Ed John's recommendation to drill a hole next to the Wilkins property line in his assessment drilling. This hole would be halfway between W-3 and 1012 which showed very spotty gold mineralization in the 0.00x opt range. In the meantime no further work is recommended on the property.

MAM:mek
Atts.


Mark A. Miller

LAND STATUS RAY AREA



-  Patented Lode Claims
-  Patented Surface Only
-  Unpatented Lode Claims
-  State Prospecting Permit
-  State Commercial Lease

one mile


APPROX. LOCATION OF
WILKINS FAMILY KELVIN AREA
PATENTED CLAIMS

JOHN M JOHNSON
CLAIM GROUP

35

36

Wooden Cross 31

834

MINING
Kelvin
Creek
RAILROAD
LANDING STRIP

Kelvin

892

Kelvin Cem

Ray Junction

PACIFIC

Riverside

T 4 S

Gaging Station
BM 3773
Gaging Station

SOUTHERN

Sulfana Arizona Mine
2373

Kar

BM 1940

12

W-3

APPROX. LOCATION OF 1012
KENNICO ASSESSMENT DRILLING

761, 194N
791, 823E
ELEV 2325

Well

Dry Well

TRAIL
JEEP

13

2373

2135

Spring

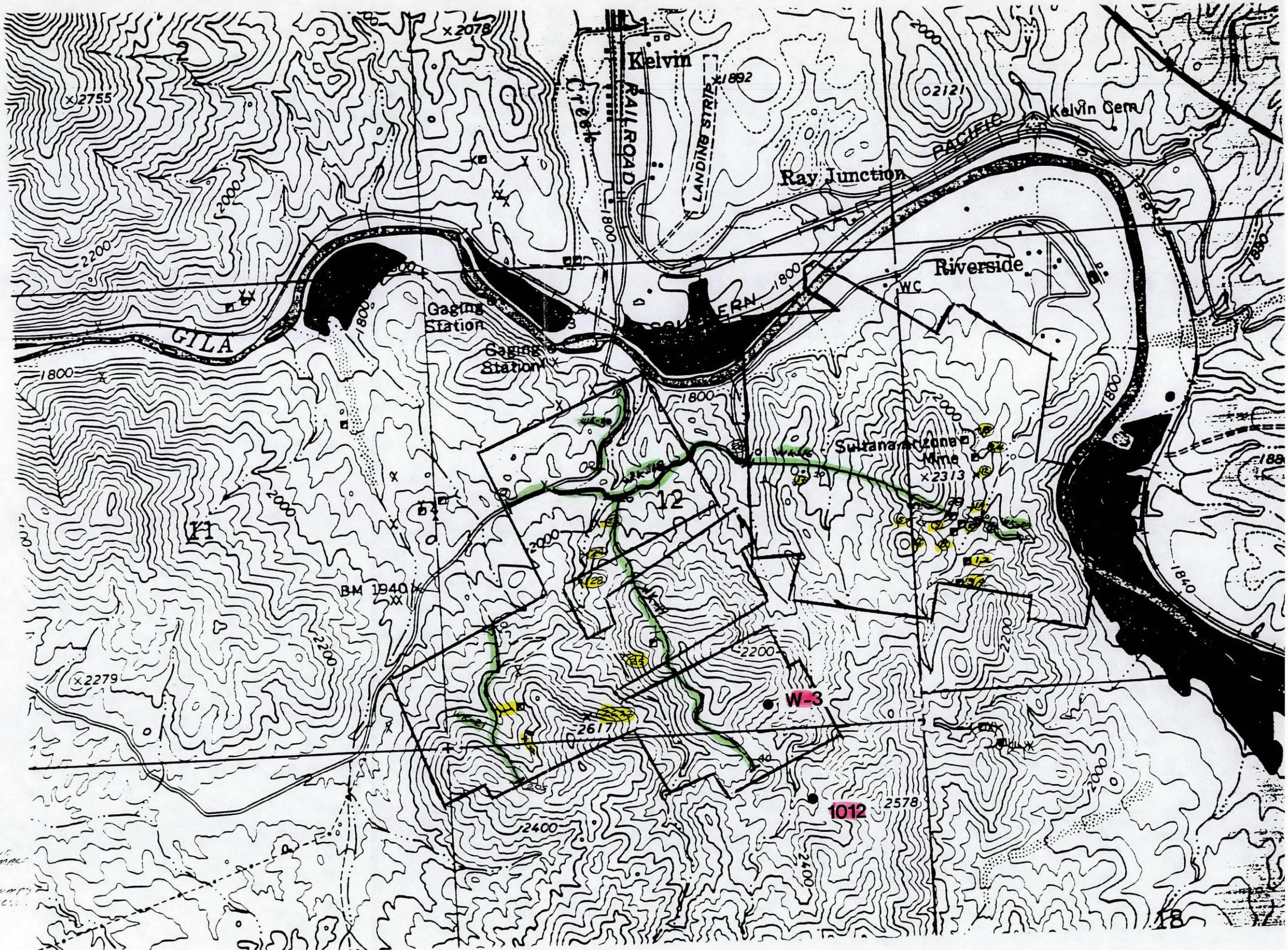
19

23

24

S

PLATE 2

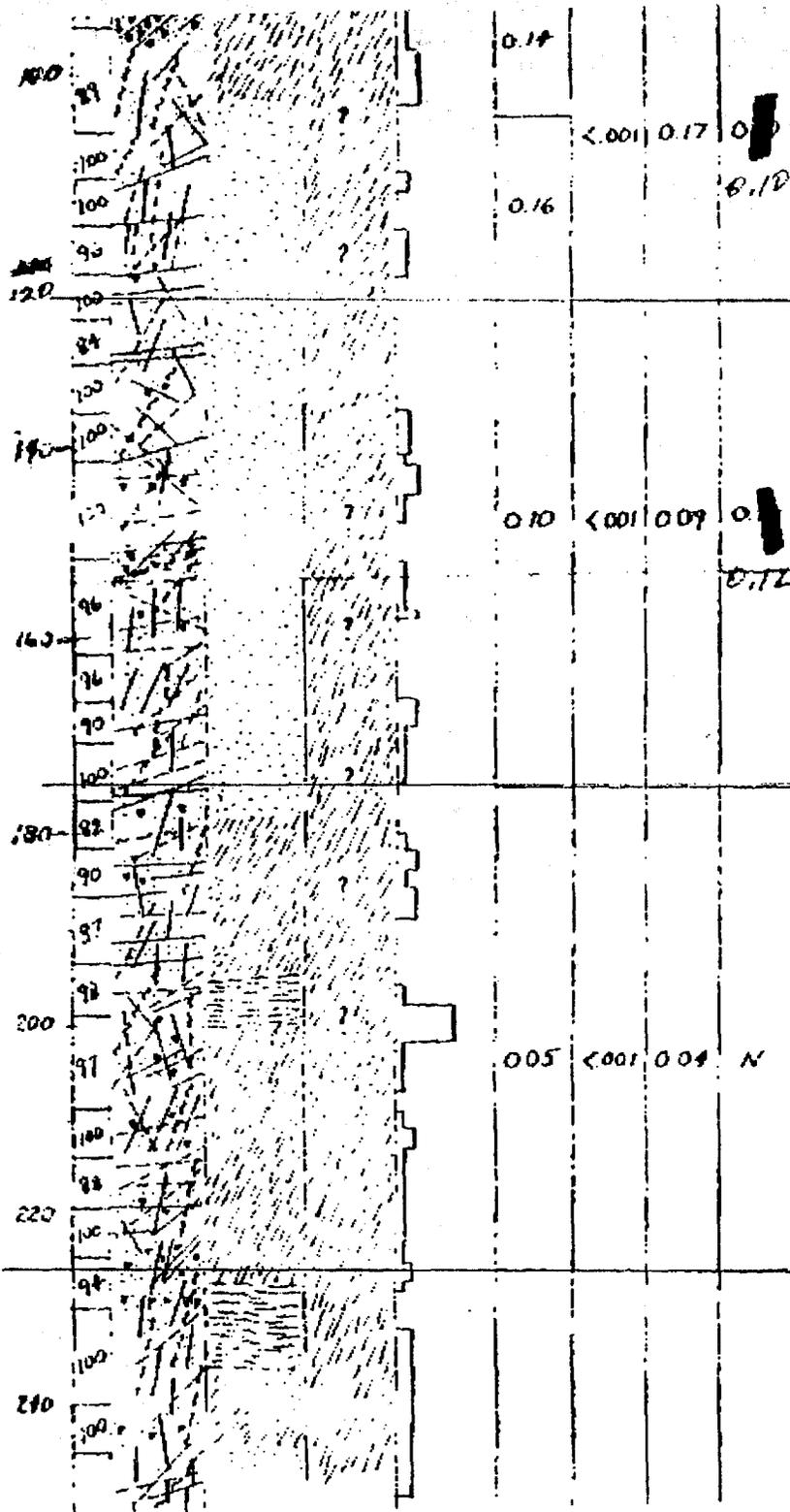


WK-19
 ct
 SAMPLE
 LINE w/ ENV.
 SAMPLE NUMBERS
 THOSE
 Sample Dumps
 STRIPED AREAS

V-3 Preliminary Log

Wilkins Location **Kelvin, Pinal County, Arizona, SW-SE Sec. 12, T4S, R13E.**
 Elevation **2280'** Direction **N10W** Plunge: **60°** Type: **NQ**
 Date **1/9-1/16/68** Logged by **W F Chester** Sampler **F Grigsby** Contractor **Longyear**

Interval	No. Samples	Grain Size	Structure	Alteration	Minerals	Notes
				Silicification	Qtz, Ser, Arg, Py, Chpy, Co, Cu, Ox, Mn, Mg	"Qtz Monz Porph" QM comp. Ser. calc. Porph. Qtz type. Prob. ...
						"Qtz Monz Porph", QM Composition, no core
30-38'						"Qtz Monz Porph", QM comp., mod. arg alt superimposed on wk qtz-ser veining, Plag hyp to clay + ser + Ep. Fe-magn. mod. to heavy chert may exp; weak limonite, mostly yellow-brn limonite with traces of blk-brn pitchy limonite. 36-38' is loose grit and angular fragments.
38-43'	<0.01	<0.001	0.06			"Qtz Monz Porph", variety here is more nearly a true porphyry, with phenos of Plag and lesser Orth in wk silicified matrix. Orth + Qtz matrix, bio necessary as final, well formed beans Plag + Orth strongly - clay + ser. Bio wk to strong - clay + chl and varies locally. Rock named "Porph, Qtz type" to distinguish from the coarser variety. Dip slicks at 38', 77' slicks at 41'
43-48'						Strongly silicified band, 43-48', resembles "Qtz Porph" type of transition rock.
48-55'						Same type of "QMP", strong arg alt; note bio preserved in arg alt but destroyed in qtz-ser zones; weakly foliated locally; most box works orange-red to yellow; fairly pervasive jarosit yellow staining. Slicks 40°-60° on shears around 51'
55-70'	<0.01	<0.001	0.23			<u>Fit zone 55'-70'</u> , hvy exotic clay, and gouge; Best-defined plane: dip 55°-65° with slicks taking 70°.
70-81'						Some few orth (unalt.) and sulfide pinches below 75'. Note Plag and bio inclusions in larger Orth phenos.
81-85.5'						81-85.5', solid bx and gouge between 50°-dip upper fit and 50°-dip lower. Fault at 88' has 50° slicks; 87-91' is solid breccia + gouge with best planes dipping 55°.
85.5-93'	0.14					Enter weakly oxidized sulfide zone at 90', common skins of cc and cov on py, note no chpy. 93'-96' is mainly soft gouge material and bit with prominent planes at 40°-50°.
93-103'	<0.001	0.17	0			Same type "QMP", med- to fine-grn matrix, weakly foliated; variable amounts of qtz-ser + sulfide cutting a pervasive wk to mod. arg alt matrix; Orth wk to clay; Plag strongly - clay; big wk - pale chl - ser + (rare Ep); Py is very pale, suited to subhedral, in units with a lesser but important share of jarosit as fine grains in the qtz-ser zones. Note greenish cast to alt. Plag below 103', but identify no Ep or Mn minerals. Oxidation persists as rims and films. Sev cov qzns. at 109'.
103-109'	0.16					



mainly orizes outside zone at 70', common skins of calc and cov on py note no chpy. 93'-96' is mainly soft gouge material and fit with prominent planes at 40°-50°.

Same type "QMP", med- to fn-grn matrix, weakly foliated; variable amounts of qtz-ser & sulfides cutting a pervasive wk. to mod. arg alt matrix; Orth wk → clay; Plaq strongly → clay; big wk → pale chl + ser + rare Ep?; py is very pale, anhedral to subhedral, in units with a lesser but important share dist. as fine grains in the qtz-ser zones. Note greenish cast to alt. Plaq. below 110's, but identify no Rb Cp. minerals. Oxidation persists as rims and films. Ser cov grns. at 109'.

Near vert fit at 113' has 15° slicks. Fit zone 115'-119' at 70°-90° has slicks striking 35° or less. Common gouge to 120'.

1st distinct epidote noted at 126', rock changing slightly with bio more as anhedral mats, somewhat coarser texture.

Fluorite grains in py-rare chpy unit at 136'

Same "Borph. QM type" QM comp, med-grn matrix; 142' is approx. change from white and alt. of Plaq. to a fair green (Lawsonite?) type. Orth very lightly alt, Plaq strongly altered. bio more with 13' mod → chl + mag + ser; wk amounts pale crystalline py. in the ser alt. units; many fractures. Conspicuous amphibole chpy with chlorite; clay fractures. Overall, rock is pervasively and fairly strongly altered.

151-153', 155-159', 162-166' are strong gouge and fit zone with combinations of flat-slip with mod. to heavy slip units. One set of slicks found, strike 35°-45°.

Below 160', note more qtz (silicification?) in rock matrix.

Slicks rake 70° at 178'.

Strike-slip movement on fit at 187'.

Fluorite grains at 188'; at 192' note single hairline chpy unit in matrix without alt; at 201' and 204' note sk. of chpy on clean fractures. Fit zone at 192'-195' in near-mylonite, soft, gougey, and shows 50° to strike-slip slicks.

Below 195' rock is a mixture of the normal "QMP" and the "Borph. QM type", never clearly one or the other over any significant interval.

Slicks rake 30° at 201', 10° at 203, 90° at 206.5'.

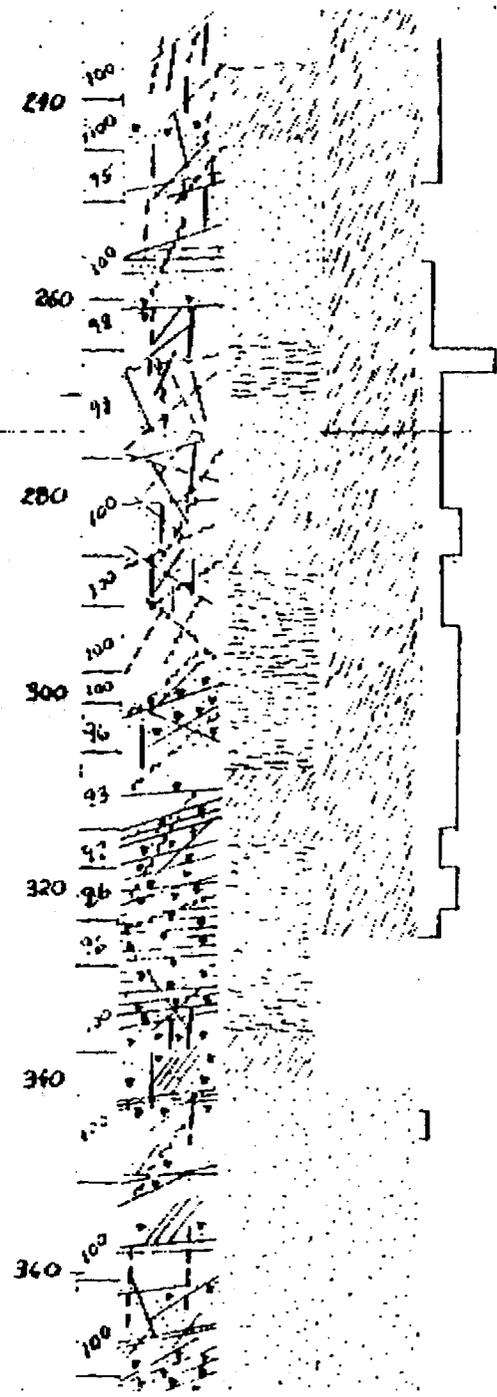
208'-213' is zone of ≈ 65°-dip crushed and sheared hard with common bx and gouge, heavy granulation. Solid gouge 218'-219'.

40° fit at 220' has 40° slicks.

Fit zone, 222'-226', hvy mylonite, gouge, and bx, dip 50°(?) to 75°(?)

Positive 70°-dip fit at 229' with one-foot gouge + bx. Strike-slip slicks overlain by 45° slicks at 230'.

From 232' to 250', note zones of what resembles qtz Borph. Transition rock next to qtz-ser-py units and bordered by chl alt. QMP on the outside. Several local bx comp. areas 232'-272'.



0.05 0.004 0.04 0.09

Very fine-grained diss. M_2S_2 along qtz-ser-py vult at 240'
Near-vertical, strike-slip fit at 253'

At 245' note two distinct py vults with strike divergence of 90° dipping in same quad
Steep fits, 260'-275', have slicks raking 0°-25°

0.06 0.001 0.07 N

Qtz Monz Porph. normal am comp type crs-grn; variable qtz-ser in vults cutting mod. to strong prop. at matrix. Local mafic-rich to areas. Moly-py vult (1/4") at 275'
Note that fit at 281' has slicks raking 40° in opposite directions.

Area 290'-300' has two opposing sets of qtz-ser-py-mechpy vults.

Enter first crushed + bx zone at 304'-306', begin arg. alt at 308'.
At 313' begins a fairly continuous crushed and brecciated, partially mylonitized interval which appears to "center" around 320'-330' and ends at 343'; most bands and fits dip 0°-25° with weaker steep structures which are often normal slicks 45° or steeper.

0.05 <0.001 0.23 N

Diabase?; dense, black mylonite at 325'
Most mylonite bands are subparallel to min vults but postdate most, and probably all, min.
Pass down into zone of steep fits with slicks raking 0°-45°

0.03 <0.001 N N

Qtz Monz Porph. Qm comp, crs-grn; trace qtz-ser only; weakly foliated locally along mod. to flat-dipping planes, local areas of porph. am type.
Most fits 350'-360' have slicks raking 0°-20°

Drill Hole 1012
LABORATORY REPORT
DAILY REPORT SHEET

DATE: 1/15/91

83 / ton

ft

SAMPLE Au Ag Pt SAMPLE

191-1					ES 91-20																
205-A	--	-		10/54	1005-T	--	--													756/765	
2 B	.004	.47		54/100	21																709/709
3 C	.007	.37		100/161	22																205/052
4 D	.005	.132		161/200	23																152/1103
5 E	--	--		229/250																	
6 F	--	-		242/273																	
7 G	--	-		504/312																	
8 H	--	-		349/357																	
9 I	--	-		573/303																	
10 J	--	-		410/410																	
11 K	--	-		117/454																	
12 L	--	-		110/450																	
13 M	.005	-		217/525																	
14 N	.005	-		520/524																	
15 O	--	-		529/594																	
16 P	--	-		620/620																	
17 Q	.003	-		651/623																	
18 R	.009	-		690/690																	
19				722/722																	

[Signature]

Assessment held
 adjacent to 421Kens
 properly

ASARCO HAYDEN PLANT ASSAY CERTIFICATE

DATE ASSAYED 12/30 1990

MARKED Ed John Hand Samples

LOT NO.	GOLD OUNCES PER TON	SILVER OUNCES PER TON	LEAD %	COPPER %	SiO ₂ %	Fe %	CaO %	Zn %	S %	Al ₂ O ₃ %
EI-90- #16	—		Wilkins Property							
#17	.002 <i>208 ppm</i>		Johnson Claims Block							<i>Grill with Samples 0.47 ppm</i>
#18	.006 <i>264 ppm</i>		Johnson Claims Block							<i>Two other Grill with Samples 0.7 ppm 0.8 ppm</i>

Injured Samples to get good Gold Collection. Silver indicates loss of oil or less

BY [Signature]

CHEM

→ JWS - I phone [unclear] and then we were [unclear] WBA
NOTT made field examination

JWSell - went to do this during
even break from Materidall? 5 OCT 92

Medi-Tech

BRUCE B. GRIFFITH

P.O. Box 1449
Kearny, AZ, 85237
(602) 363-3311

PAX (602) 432-5036

BISBEE MINERALS COMPANY

P.O. Box 4177 - 10 Cochise Lane
Bisbee, Arizona 85803

TIM M. TUCKER
Archaeologist

(602) 432-3223

From two men have ±60
claims in the Ketchikan-Records
area south of Ray

They say they have a zone
of oxide copper ± 1 mile in
length that is outside of any
areas previously drilled.

Data in Kearny and available
to look at and then visit area in field.

I told them we would
have someone contact them to do just that.
tentatively around the 1 Nov 92 time.

KURTZ

⊗ Same area as in [unclear] from Johns to Sells Nov 19, 1991 where
Johns outlines on Geological Quadr 560 Map the Cox zone

WK-8 → Sample of dump from large diameter shaft
unalt. diabase

WK-9 → Dump, same rock as 8 & 10, Fault
zone with Cu Oxides, Fe Ox in diabase,
structure orientated N45°W 60°SW, sulfides
present as cpy

WK-10 → Dump, same as 8 & 9,

WK-11 → Random chip across 20' of exposure,
Alt. Diabase structure N45°-60°W 90°,
some calcite veinlets, Cu Ox on joints

WK-12 → 10' channel taken from outcrop
adjacent to prospect pit, highly jointed diabase,
hematitic, tr Cu Ox, calcite veinlets, Mn

WK-13 → Dump, some sulfide, Cu Ox, host rock diabase

WK-14 → Same as 13

WK-15 → Random grab from main Sultana AZ
mine dump, mainly alt. diabase with some sulfides,
10% Alt. granite → red hem & sericite

WK-16 → 2800' transect labelled OE
thru 28 E, starting point at apex
of hair pin corner on map.

2E → well fractured slightly
alt. diabase

4E → Random chip, slightly alt diabase,
red hem, Mn., possibly just surface weathering

6E → same as 4E, some hematite on fractures

8.5E → 1/2 gtzite (dripping springs), 1/2 diabase
with granite & gtzite xenoliths, some limonite
along fractures

10E → Diabase with inclusions of gtzite, &
granite, little FeOx & CuOx on diabase
fractures

12E → unalt diabase - large feldspar laths

14E → weakly alt. granite

16E → weakly alt. granite / perhaps just weathered

18E → Fresh granite, major joint sets

N 70° W 30° NE

N 55° E 55° SE

20E → Fresh granite / maybe slightly alt.,
CuOx in float on hillside

22E → same as above

24E → same as above

26E → hematitic granite, no sign of structural control

28E → Diabase - end of transect

WK-17 → random chip of prospect pit, diabase
^{intrusive} contact with gtzite, frothy hematitic scoria
some gtz xtalls.

WK-18 → 2800' transect labelled OE thru
28E, starting point next to old VW bug
rear end and road pull off.

OE → strongly hematitic granite, possibly
propylitic, major joint set $N20^{\circ}W 40^{\circ}N$

2E → Same as above

4E → Same as above

6E → no sample

8E → hematitic granite, strongly fractured

10E → Diabase / Granite contact $N55^{\circ}W 30^{\circ}SW$
Diabase well alt. / Granite moderately alt.

12E → no description

14E → coarse grained granite, high biotite content slightly alt.

16E → highly fractured granite, coarse grained, large feldspar xtalls, sheared in some places

18E → same as above

20E → Diabase cutting across granite, zeoliths of granite within Diabase, Granite & Diabase strongly alt. near contact zones, magnetite in alt. granite

22E → Granite, plagioclase alt. to sericite

24E → Granite, highly jointed, ^{strong} alteration concentrated in highly fractured areas,

26E → Granite, strongly sheared, weak → moderate hematite staining, sericitic alteration

28E → Slightly to moderately alt. granite, low angle shear has majority of alteration.

2980' → at starting point of WK-16

Wk-19 → 4000' transect labelled 05
to 405, starting point at jeep trail intersection
with "Old Riverside Rd."

05 → no sample taken

25 → Fractured granite with weak alteration and
FeOx along joints

45 → as above

65 → as above with some minor qtz

85 → Alt granite, siliceous, hematitic, sericitic

8.85 → Alt. granite, silicified, strongly hematitic
outcrop orientated E-W 90° -
highly alt. zone approx. 1'-3' wide

105 → Strongly argillic granite, orientated
E-W dipping shallowly to the south

125 → fine grained granite, highly fractured
slightly to moderately alt.

145 → fine grained moderately alt granite
with small qtz veinlets

165 → same as above

185 → Alt. granite, feldspars replaced by
white clay, possible sulfide pseudomorphs,
qtz veinlets, major joint set

N 75° E 45° NW, N 15° W 15° SW

205 → same as above, major joint set $N70^{\circ}E$ $40^{\circ}SW$, increasing Fe Oxides, locally moderate to strong Mn Oxides or possibly Melanconite?

225 → increased qtz veining, secondary muscovite or coarse grained sericite??

245 → same as above, qtz veinlets with FeOx selvages

265 → Same as above

285 → increasing qtz veinlets

305 → first fresh sulfides seen, large qtz vein containing sulfides orientated $N70^{\circ}E$ $70^{\circ}SE$

325 → Fine grained granite, strongly sericitic, Cu Ox on fractures

345 → slightly to strongly alt. depending on concentration of joints.

365 → sulfide pseudomorphs in qtz veinlets, no biotite, sericitic & limonitic

385 → Slightly to moderately alt. coarse grained granite, Decreasing alteration relative to 400 ft. back — also a highly magnetic dike has intruded here

405 → Same as above.

WK-20 → 1000' transect along main road labelled ON to 10N,

ON → random chip on road-cut, fresh to slightly alt. - coarse grained granite, high biotite content (10-30%),

2N thru 10N → same as above

WK-21 → 2000' transect labelled OS thru 20S, starting point where jeep trail crosses into claim block / also includes 3 samples from an adit labelled 12.8 S. V, W & D.

OS → coarse grained granite, abundant biotite, some small gte veinlets with FeOx selvages

2S → same as above

4S → slightly sericitic, Mn, limonite.

6S → Moderately alt. Granite, increased quartz
veinlets, feldspars mostly alt. to sericite

8S → Mod. to Strongly alt Granite, secondary
muscovite, possible sulfide pseudomorphs.

10S → same as above

12S → Strongly Alt., feldspars completely
alt. to sericite, potassium feldspars remain
unaltered, sulfide pseudomorphs associated with
silica veinlets, secondary muscovite, Cu Ox and
Fe Ox

12.8S V → 8 to 12 inch thick mineralized
structure orientated N65°E 90°, this structure
is what the adit is driven on. Mineralization
includes silica, chrysocolla, red hem, limonite, &
Brochantite.

W → wall rock of adit, same minerals
intermingled with alt. granite.

D → dump sample from same adit.

14s → Alt. granite, sericite, qtz veinlets,
tr pyrite, CuOx

16s thru 20s → same as above

WK-22 → dump sample from prospect pit,
brecciated zone with two parallel
structures N40°W 70°NE,
CuOx staining

WK-23 → dump sample, alt coarse grained
granite, limonite, sericite, magnetite?,
silica, Mn with possible melacanthite

WK-24 → Random chip from creek bed, Alt. granite
with sulfides

WK-25 → Adit not on topo, highly fractured
Alt. granite, hematitic & argillic?

WK-26 → Adit not on topo, strongly
alt. granite, limonitic, sulfides in qtz veinlets,
sericitic

WK-27 → Dump from which 26 was taken

WK-28 → Random chip from creek bed,
Alt granite, sericite, limonite

Wk-29 → 510' transect labelled 2E thru
5.1E starting at the adit with sample
number Wk-7

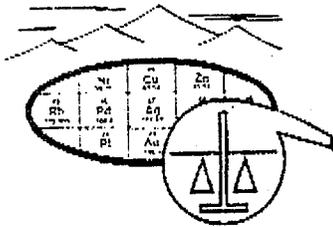
0E → no sample, starting point at adit

2E → weakly alt granite

4E → same as about

5.1E → small prospect pit, structure
N 70°W 70°NE, abundant CuOx,
Strongly Alt. granite.

5.1E → dump sample of prospect pit



SKYLINE LABS, INC.

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Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TAJ 713
February 20, 1991
PROJECT NAME: KELVIN
WK-1, WK-29
PAGE 1 OF 4

ASARCO INCORPORATED
Attn: Mr. M.A. Miller
Southwestern Exploration
P.O. Box 5747
Tucson, AZ 85703

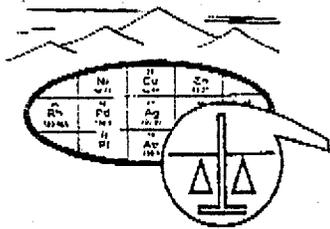
ASARCO Inc., P.

FEB 20 1991

SW Exploration

Analysis of 94 Rock Chip Samples

ITEM	SAMPLE NUMBER	FIRE ASSAY	
		Au* (ppm)	Ag (ppm)
1	WK-1	<.002	6.8
2	WK-2	<.002	3.8
3	WK-3	<.002	6.0
4	WK-4	.490	14.0
5	WK-5	<.002	2.8
6	WK-6	<.002	1.4
7	WK-7	<.002	3.0
8	WK-8	<.002	.4
9	WK-9	<.002	7.4
10	WK-10	<.002	.4
11	WK-11	<.002	2.8
12	WK-12	<.002	4.4
13	WK-13	<.002	10.0
14	WK-14	<.002	10.0
15	WK-15	<.002	.4
16	WK-16 4 E	<.002	.6
17	WK-16 6 E	<.002	.4
18	WK-16 8 E	<.002	.4
19	WK-16 10 E	<.002	1.4
20	WK-16 12 E	<.002	<.2
21	WK-16 14 E	<.002	.4
22	WK-16 16 E	<.002	.4
23	WK-16 18 E	<.002	<.2
24	WK-16 20 E	<.002	<.2
25	WK-16 22 E	<.002	.6



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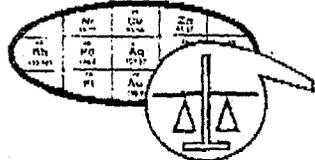
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JOB NO. TAJ 713
February 20, 1991
PAGE 2 OF 4

ITEM	SAMPLE NUMBER	FIRE ASSAY	
		Au* (ppm)	Ag (ppm)
26	WK-16 24 E	<.002	.2
27	WK-16 26 E	<.002	.4
28	WK-16 28 E	<.002	<.2
29	WK-18 0	.030	1.8
30	WK-18 2 E	<.002	.2
31	WK-18 4 E	<.002	<.2
32	WK-18 6 E **	.000	.0
33	WK-18 8 E	<.002	<.2
34	WK-18 10 E	<.002	<.2
35	WK-18 12 E	<.002	<.2
36	WK-18 14 E	<.002	<.2
37	WK-18 16 E	<.002	<.2
38	WK-18 18 E	<.002	<.2
39	WK-18 20 E	<.002	<.2
40	WK-18 22 E	<.002	<.2
41	WK-18 24 E	<.002	<.2
42	WK-18 26 E	<.002	<.2
43	WK-18 28 E	<.002	<.2
44	WK-19 2 S	<.002	1.2
45	WK-19 4 S	<.002	.2
46	WK-19 6 S	.520	.4
47	WK-19 8 S	.210	5.4
48	WK-19 8.8 S	.040	.8
49	WK-19 10 S	.006	.4
50	WK-19 12 S	<.002	<.2

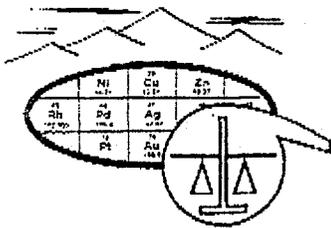
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JOB NO. TAJ 713
 February 20, 1991
 PAGE 3 OF 4

ITEM	SAMPLE NUMBER	FIRE ASSAY	
		Au* (ppm)	Ag (ppm)
51	WK-19 14 S	.006	.2
52	WK-19 16 S	<.002	<.2
53	WK-19 18 S	.002	<.2
54	WK-19 20 S	<.002	.6
55	WK-19 22 S	.004	<.2
56	WK-19 24 S	<.002	<.2
57	WK-19 26 S	<.002	<.2
58	WK-19 28 S	.006	<.2
59	WK-19 30 S	<.002	.6
60	WK-19 32 S	.004	<.2
61	WK-19 34 S	<.002	.6
62	WK-19 36 S	.006	<.2
63	WK-19 38 S	.010	<.2
64	WK-19 40 S	.014	<.2
65	WK-20 0	<.002	<.2
66	WK-20 2 N	<.002	<.2
67	WK-20 4 N	.020	<.2
68	WK-20 6 N	<.002	<.2
69	WK-20 8 N	<.002	<.2
70	WK-20 10 N	.004	<.2
71	WK-21 0 S	<.002	<.2
72	WK-21 2 S	.020	<.2
73	WK-21 4 S	<.002	<.2
74	WK-21 6 S	.006	.2
75	WK-21 8 S	.012	.2



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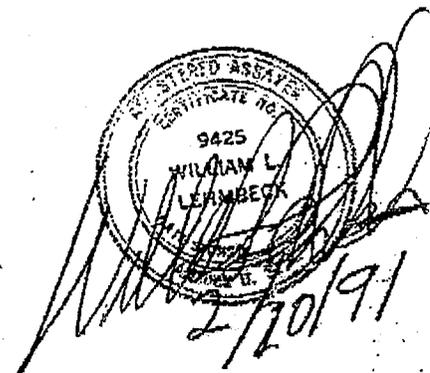
JOB NO. TAJ 713
 February 20, 1991
 PAGE 4 OF 4

ITEM	SAMPLE NUMBER	FIRE ASSAY	
		Au* (ppm)	Ag (ppm)
76	WK-21 10 S	<.002	<.2
77	WL-21 12 S	<.002	<.2
78	WK-21 12.8 S Dump	1.100	30.0
79	WK-21 12.8 S VEIN	8.000	150.0
80	WK-21 12.8 S WALL ROCK	.016	1.2
81	WK-21 14 S	.026	1.6
82	WK-21 16 S	.002	.6
83	WK-21 18 S	.006	<.2
84	WK-21 20 S	<.002	<.2
85	WK-22	.004	<.2
86	WK-23	.034	1.8
87	WK-24	<.002	.2
88	WK-25	<.002	.4
89	WK-26	<.002	.8
90	WK-27 **	.000	.0
91	WK-28	.020	.6
92	WK-29 2 E	<.002	<.2
93	WK-29 4 E	<.002	<.2
94	WK-29 5.1 E DUMP	<.002	4.2
95	WK-29 5.1 E Prospect	.010	2.8
96	UNMARKED BAG	.004	2.2

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

**NOTE: Sample not received. WK-16, 2E; WK-17 NOT SENT.

cc: Mr. J. D. Sell



ASARCO

Southwestern Exploration Division

JDS

February 5, 1991

J.D. Sell

*Not distributed separately
added to Feb 22 memo*

Gold Potential
Wilkins Patented Claim Block
Ray-Kelvin Area, Arizona

Per your request, John Malusa and I spent three days sampling within the Wilkins claim block. The claim block is underlain by the Ruin Granite which has been intruded by a series of diabase dikes. The claim block is also highly altered and mineralized. It contains the remains of a porphyry copper system which has been subsequently "sliced" up by numerous low angle faults. Alteration within the claim block ranges from propylitic to phyllic.

We sampled all the mine dumps along with any structures we saw of significance. We also ran three rock chip lines across the claim block taking samples every 200'. A map with sample locations is attached.

In addition, sample descriptions are attached for all samples taken. Results of all the samples are pending.

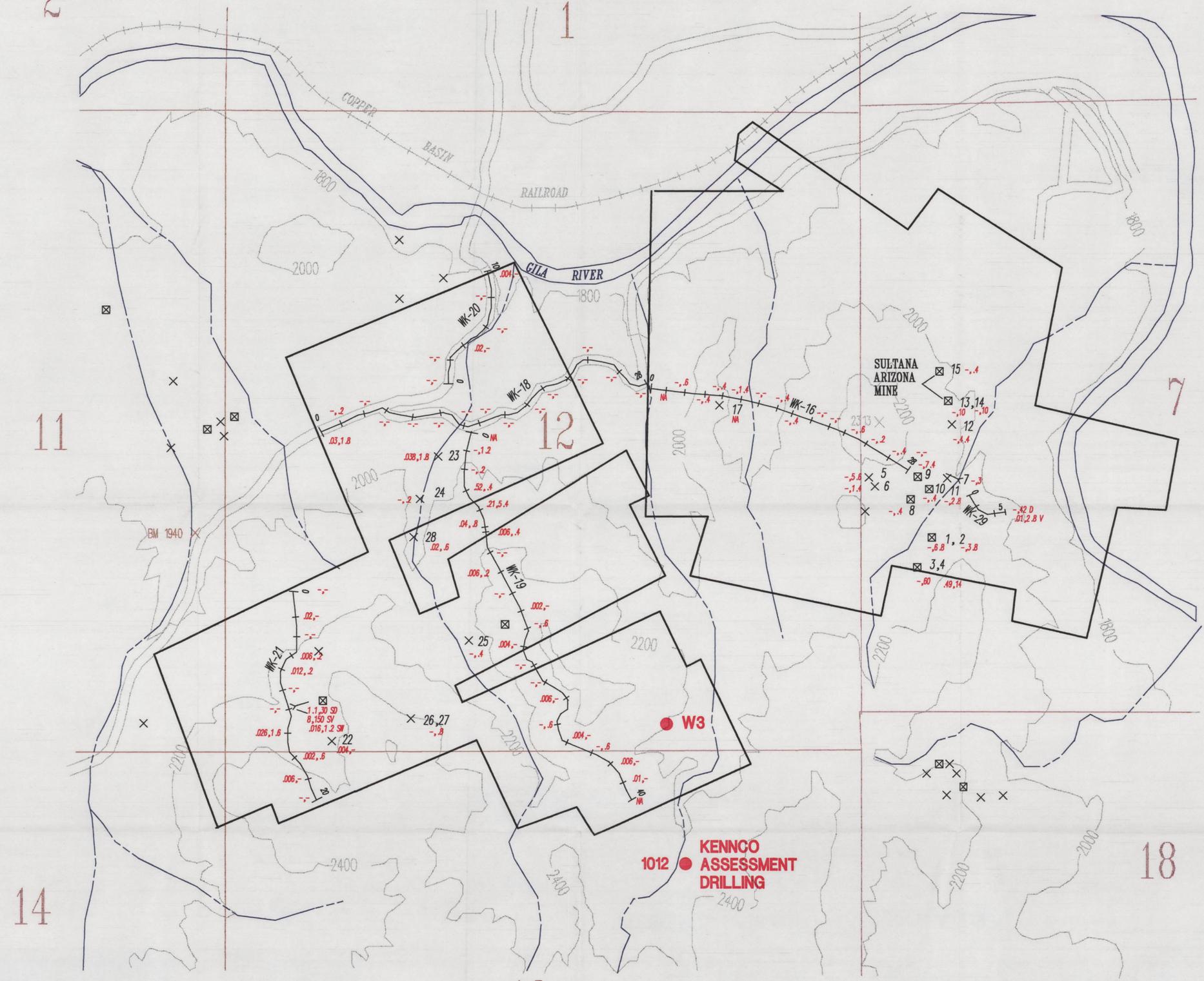
MAM:mek



Mark A. Miller

cc: W.L. Kurtz
J.J. Malusa

T. 4 S., R. 13 E. R. 14 E. 6



EXPLANATION

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*Sent to FIG — yes Sell did consider the
" " JDS ASARCO "flat" fault concept and
pointed out area in which RECEIVED
it might occur but we felt the "area"
was not sufficiently attractive to drill —
time may prove our conclusion incorrect*

MAR 25 1991
EXPLORATION DEPARTMENT

March 19, 1991

Kurtz 3/29/91

Exploration Department
Frederick T. Graybeal
Chief Geologist

Mr. J.D. Sell
Manager
Southwestern Exploration Division
Tucson Office

Wilkins Prospect Exam
Pinal County, Arizona

Dear Mr. Sell:

I reviewed this data and your summary to Mr. Kurtz dated February 27, 1991 and note that the only recommended follow-up is that the Ray Unit consider an assessment hole along the edge of this property. I have no problem with this or the work done. I do have some questions.

I would like to caution that the gold rush is over. If new gold deposits are to be found, it is likely that new approaches will be necessary. It looks like your approach (or Mr. Miller's) was rather traditional-sample the surface outcrops. Did Mr. Miller read the literature on this area which suggests that regional rotation of entire mountain-pediment blocks through 90 degrees has occurred? Did he (or you) consider that this could be a flat (detachment) fault environment in which traditional sampling might not sufficient and non-traditional thinking would be required? There is no evidence in Mr. Miller's work that anything but an entirely traditional approach was taken. If this target had been in SE California would you still be satisfied? If not perhaps further thought is necessary.

It is not easy to put the geographic location of this property out of your mind because geography does influence one's geological thinking (everybody knows there is no gold in the SE Arizona porphyry copper province).

Very truly yours,
F.T. Graybeal
F.T. Graybeal

cc: WLKurtz ✓



CORN & AHERN

**CONSULTING GEOLOGISTS
8425 Desert Steppes Dr.
Tucson, Arizona 85710
(602) 298-1770**

KELVIN PROSPECT

General Terms

1. Advance Royalty payments -\$15,000 on execution, \$15,000 on the 1st anniversary, escalating to \$20,000 on the second, \$30,000 on the 3rd, \$40,000 on the 4th, \$50,000 on the 5th and thereafter.
2. 5% NSR production royalty with advance royalty recoverable from production.
3. Payments indexed to CPI or similar index.
4. Assessment & Filing obligations.
5. Notification of termination six months prior to Sept. 1st or complete assessment requirements.
6. Supply geologic and drilling data upon termination.

Kelvin Porphyry Copper Prospect
Pinal County, Arizona

Exploration Potential:

The Kelvin prospect is a structurally-rotated porphyry copper alteration/mineralization system cut and displaced by low-angle faults similar to San Manuel-Kalamazoo with the majority of the system faulted down to the west and concealed beneath a relatively thin, structurally displaced cover consisting of shattered Precambrian granite and rotated Tertiary sedimentary rocks. Geologic data indicates that the displaced upper part of the porphyry copper system should be preserved beneath the structural cover and that there would be potential for higher-grade copper mineralization in reactive diabase and perhaps Paleozoic limestones. Geologic maps and the exposed breccia pipe at the Wooley Mine, indicate that the structural cover on the west side of Ripsey Wash may be relatively thin. Remnant, fault-bounded segments of the alteration system that are exposed near Kelvin and Riverside exhibit supergene chalcocite mineralization and a sharp zoning pattern in disseminated chalcopyrite mineralization to values that exceed .20 percent copper. Extensive oxidation and oxide copper mineralization characterize the brecciated granite at Ripsey Wash indicating the probability that oxide copper and/or chalcocite mineralization occur in the concealed alteration system at depth. The Riverside and Wooley breccia pipes have been structurally rotated to a sub-horizontal attitude and although exterior to the main alteration system, they do indicate that mineralized breccia pipes of interest should occur in the area. Exposures near Ripsey Wash represent an exterior segment of the alteration system that contains veins with interesting gold values and could have potential for a gold-bearing structurally-rotated, sub-horizontal breccia pipe.

Land:

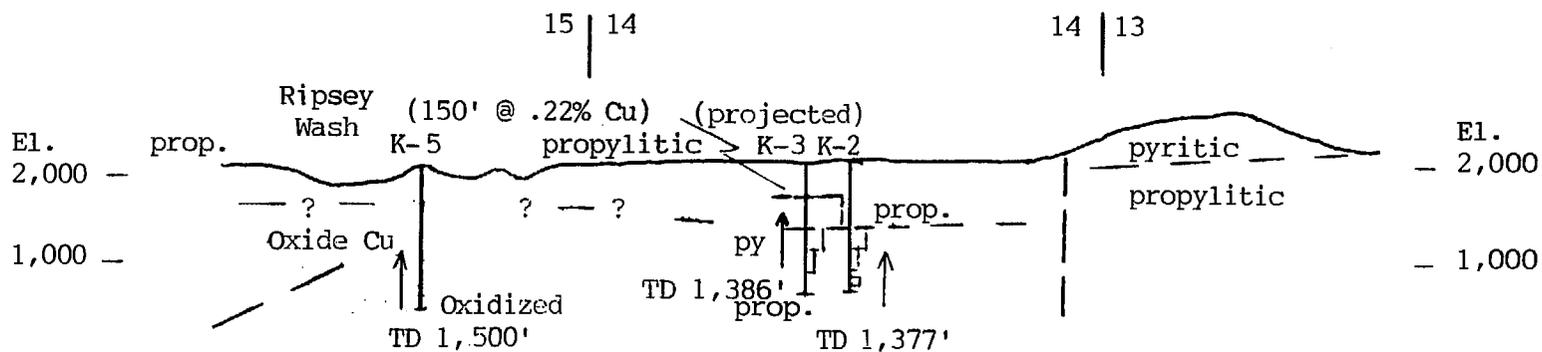
144 unpatented lode claims owned by Richard Ahern and Russell M. Corn in Secs 15, 21, 22, 27 & 28, T4S, R13E in the Riverside Mining District approximately 8 miles south west of Ray.

Geologic Setting:

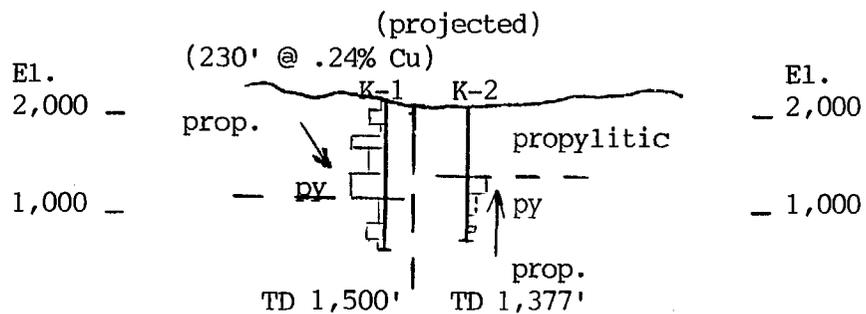
The Kelvin porphyry copper prospect is located at the north end of the Tortilla Mountains in the structurally rotated belt along the west side of the San Pedro Valley that is characterized by near-vertical Paleozoic sedimentary rocks and associated diabase sills. The repeated near-vertical diabase sills on the west side of Ripsey Wash south the prospect indicate displacement of the porphyry copper alteration system along low-angle faults two to three miles west of the exposures near Riverside.

Previous Exploration:

The chalcocite mineralization near Riverside was explored initially during the 1940's or earlier and since 1960 was drilled by Kennecott and Occidental. In the 1970's Kerr-McGee drilled several holes to the west on down-faulted segments of the alteration system and encountered significant primary copper values beneath unmineralized propylitic altered granite. Gulf Minerals also drilled several holes east of Ripsey Wash and encountered low-angle faults and sheared granite. In 1980 Exxon staked claims and carried out geophysical surveys near the Wooley Breccia Pipe and further south along Ripsey Wash but there is no indication of drilling on the west side of Ripsey Wash except at the Wooley Breccia Pipe.

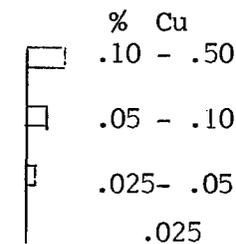


EAST - WEST SECTION THROUGH DRILL HOLES K-2 & K-5



NORTH - SOUTH SECTION THROUGH DRILL HOLES K-1 & K-2

↑
Indicated direction of
increasing intensity of
alteration and Cu mineralization

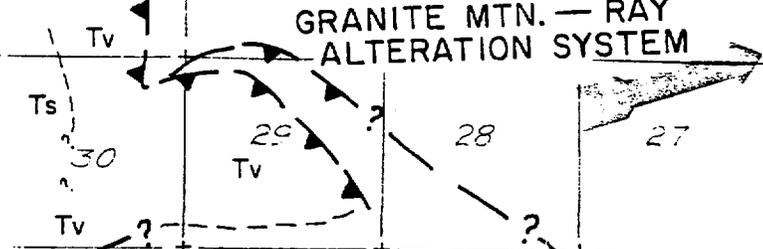


Scale: 1 inch = 2,000 feet
H = V

SECTIONS THROUGH DRILL HOLES AT KELVIN PROSPECT, PINAL COUNTY, ARIZONA

ILLUSTRATING ALTERATION AND COPPER MINERALIZATION

GRANITE MTN. — RAY ALTERATION SYSTEM



KE-1 °
KELVIN ALTERATION SYSTEM

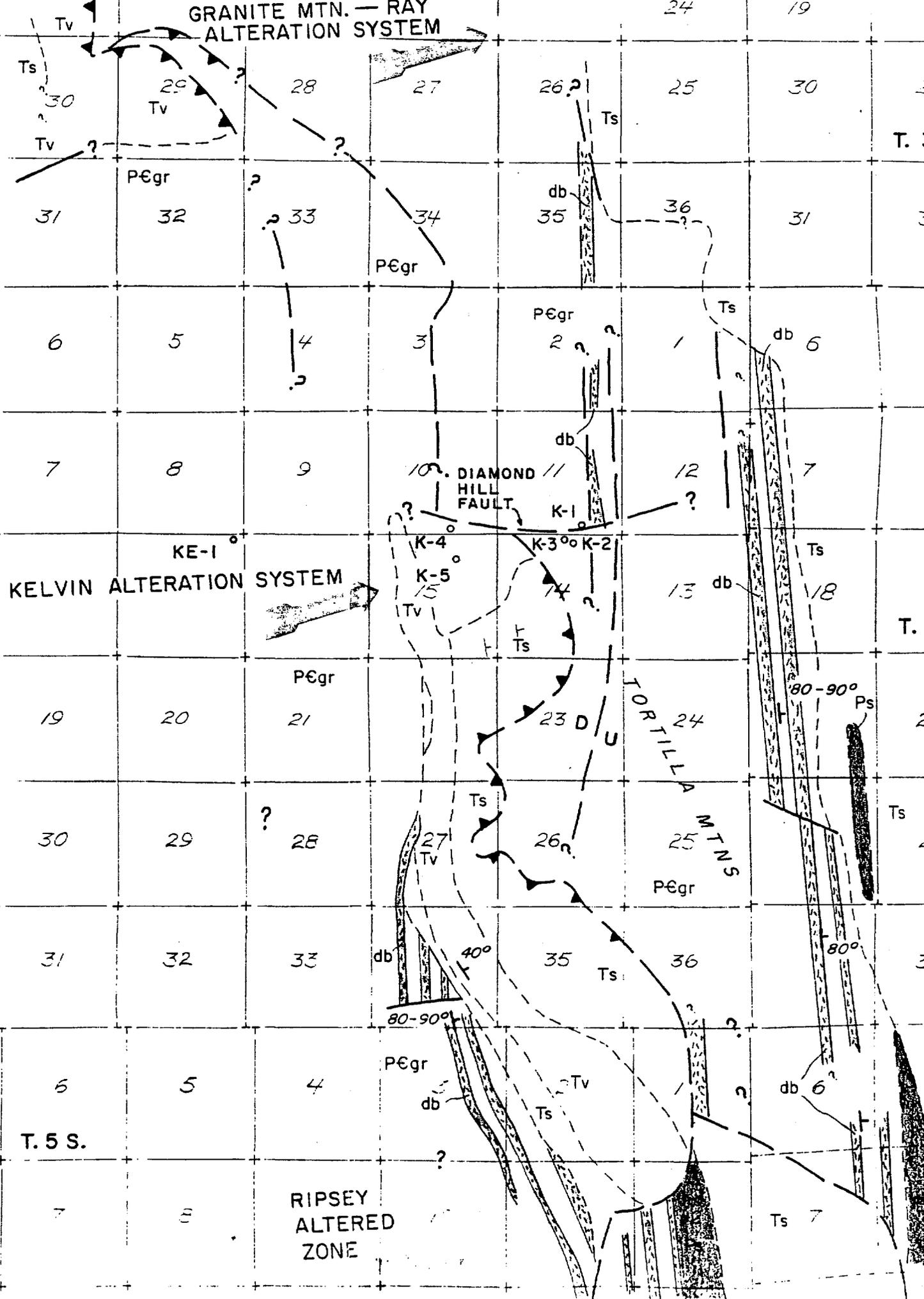


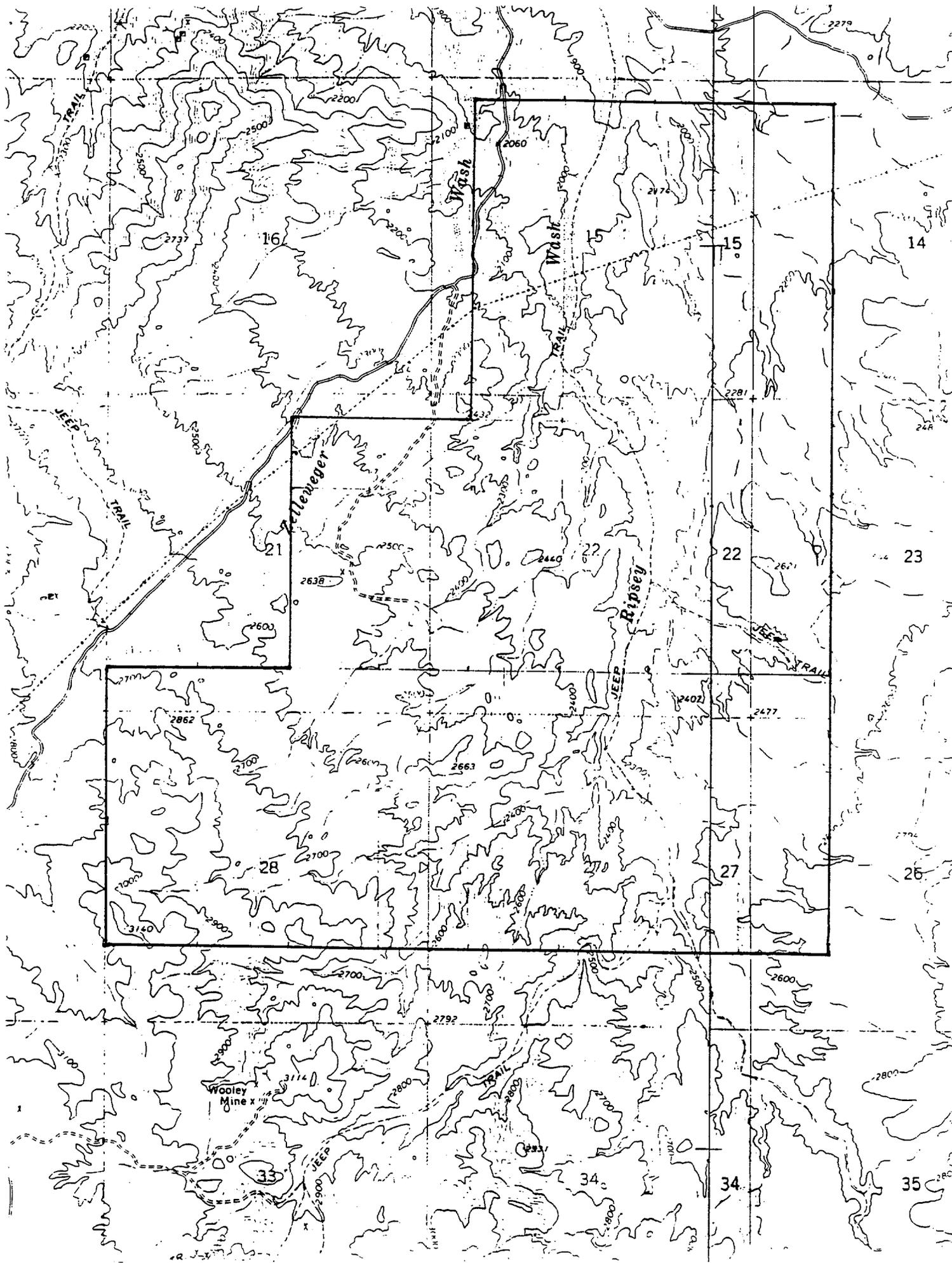
DIAMOND HILL FAULT

K-1
K-2
K-3
K-4
K-5

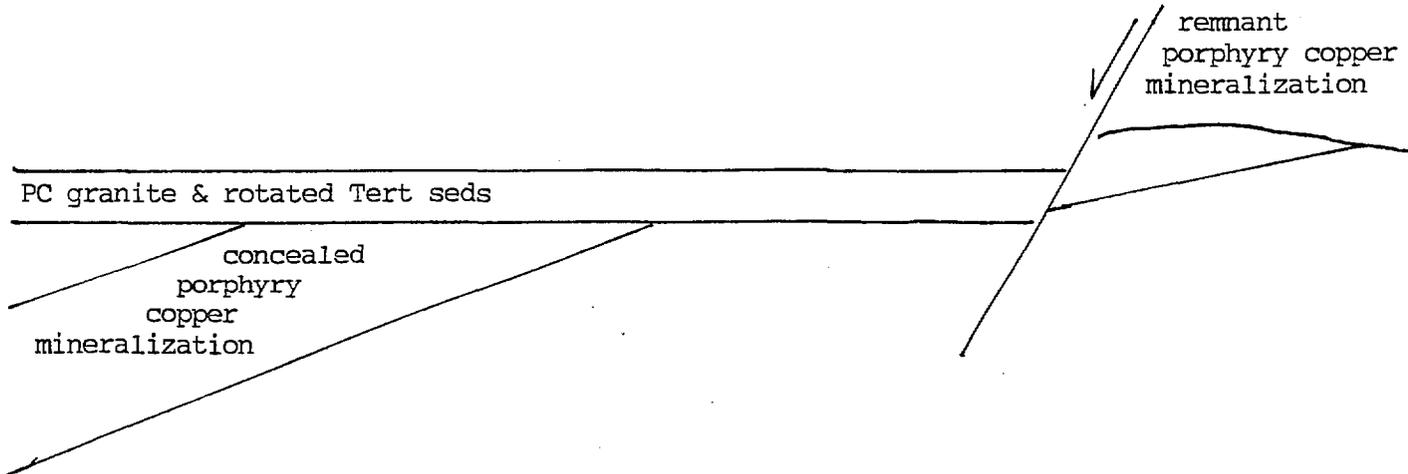
TORTILLA MOUNTAINS

RIPSEY ALTERED ZONE





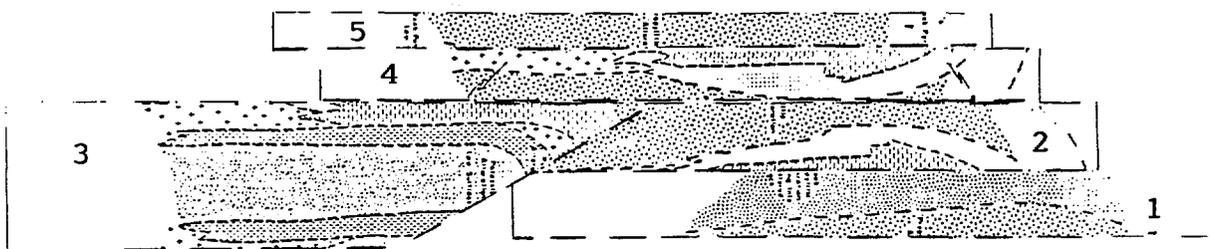
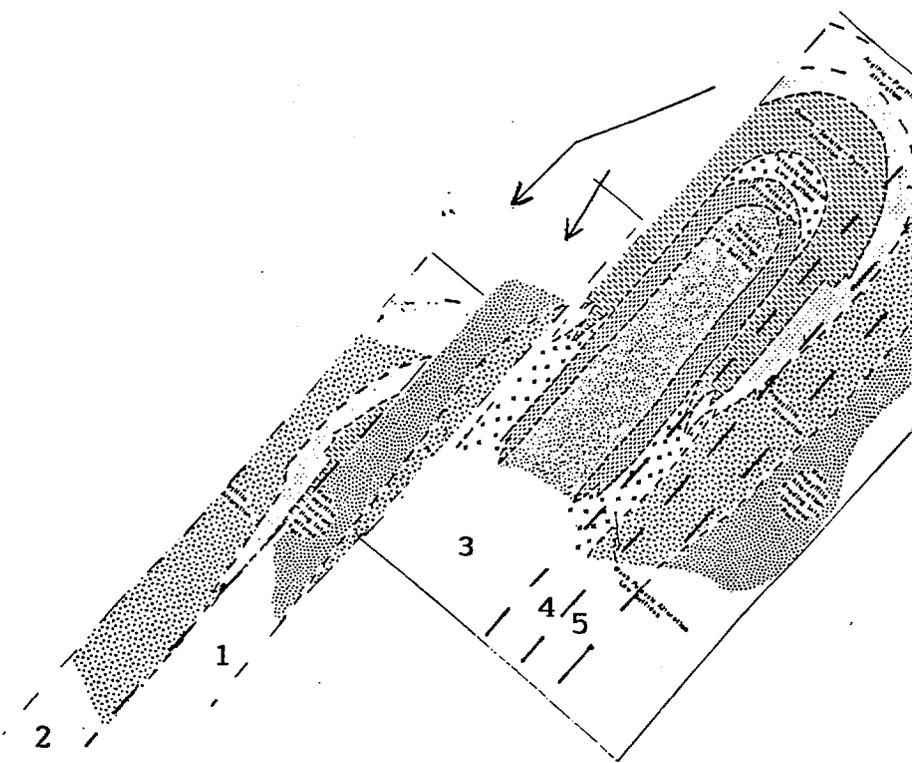
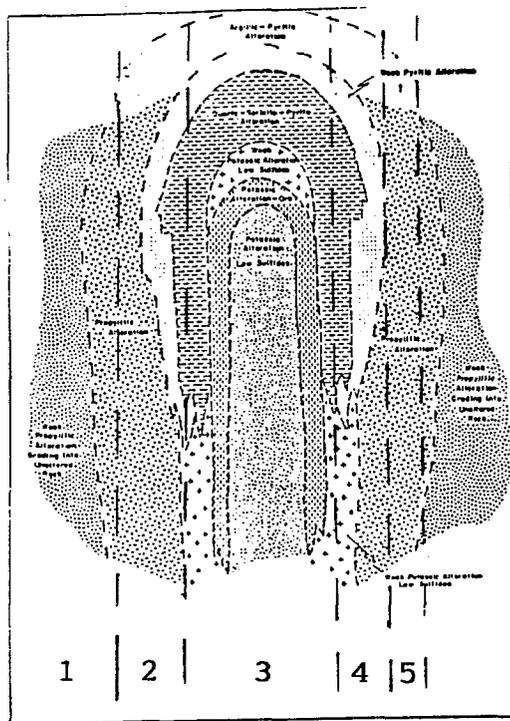
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SCHEMATIC DIAGRAM

ILLUSTRATING

THE DISPLACED AND CONCEALED KELVIN PORPHYRY COPPER SYSTEM



SUGGESTED STRUCTURAL DISRUPTION
 OF THE
 KELVIN PORPHYRY COPPER ALTERATION SYSTEM

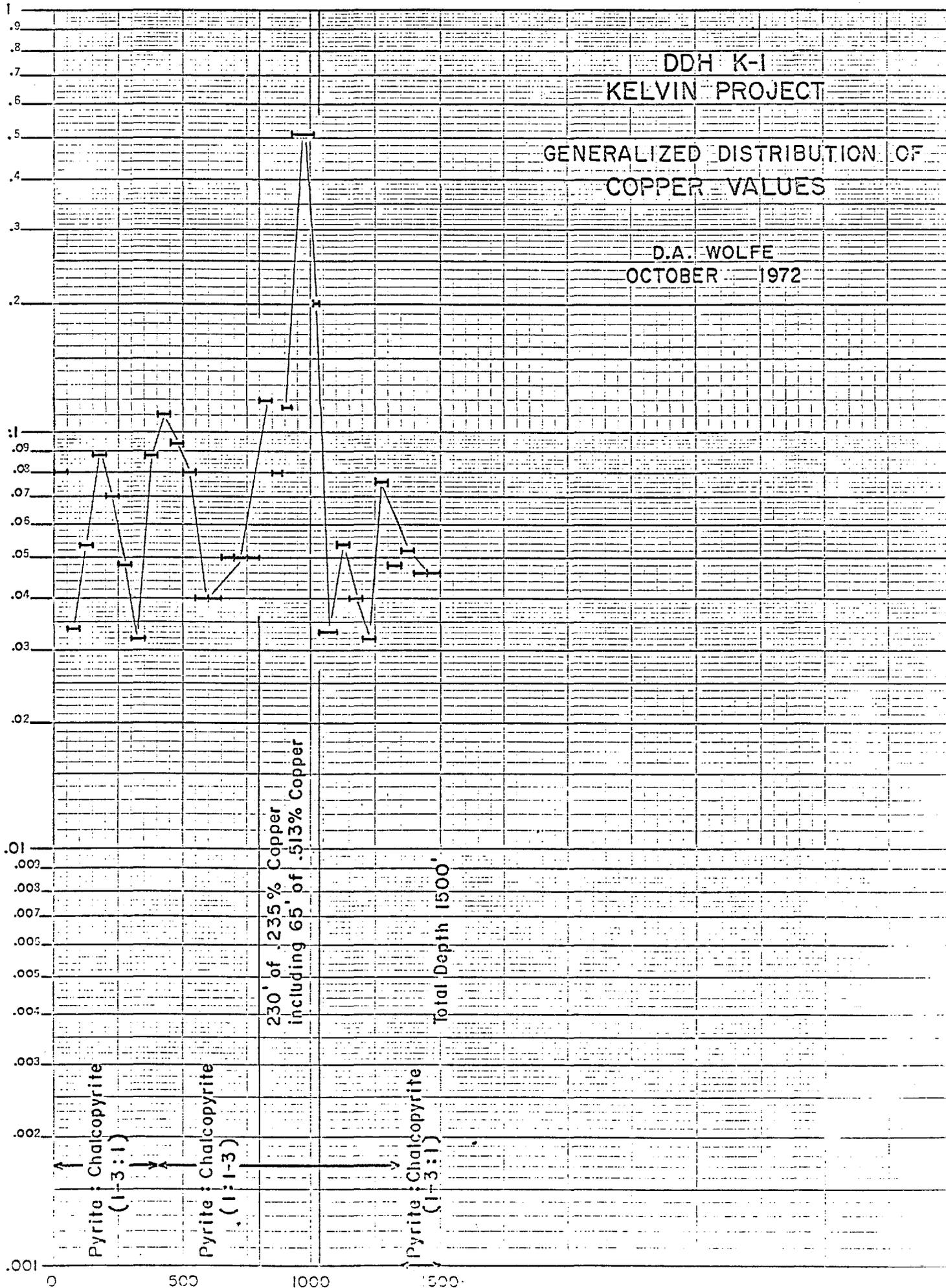
PERCENT
COPPER

DDH K-1
KELVIN PROJECT

GENERALIZED DISTRIBUTION OF
COPPER VALUES

D.A. WOLFE
OCTOBER 1972

SEMI-LOGARITHMIC 46 5490
3 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KLUFFEL & ESSER CO.



Pyrite : Chalcopyrite
(1-3:1)

Pyrite : Chalcopyrite
(1-1-3)

230' of .235% Copper
including 65' of .513% Copper

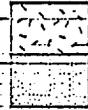
Pyrite : Chalcopyrite
(1-3:1)

Total Depth 1500'

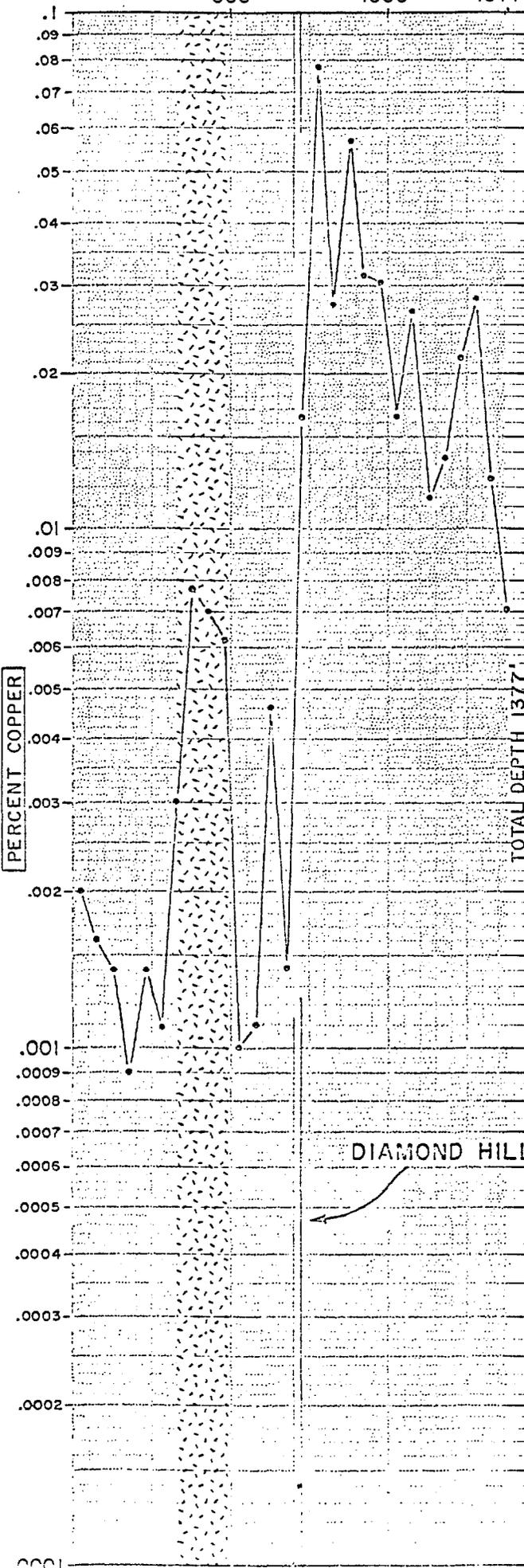
DEPTH IN FEET

500' 1000' 1377'

EXPLANATION



Diabase sill
Precambrian quartz monzonite
Diamond Hill fault



SEMILOGARITHMIC 46 5490
KERR-MCGEE CORPORATION
KELVIN PROJECT

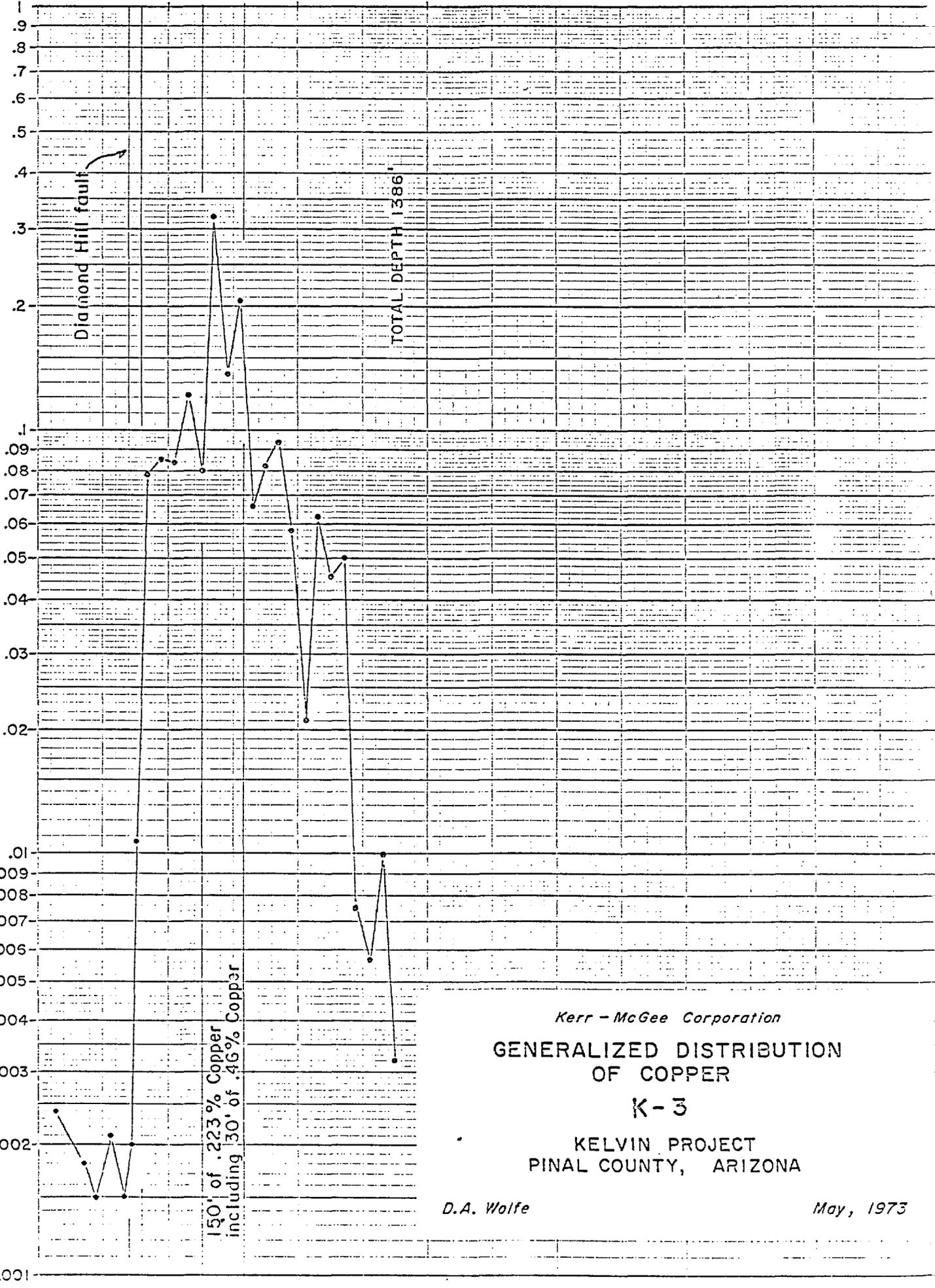
Kerr-McGee Corporation
GENERALIZED DISTRIBUTION
OF COPPER
K-2
KELVIN PROJECT
PINAL COUNTY, ARIZONA

D.A. Wolfe

May, 1973

DEPTH IN FEET

500 1000 1500



KERR-McGEE CORPORATION
 46 5490
 3 WYOMING ST. DIVISIONS
 WASHINGTON, D.C. 20004
 KERR-McGEE & ESSER CO.

PERCENT COPPER

Diamond Hill fault

TOTAL DEPTH 1386'

150' of .223% Copper including 30' of .46% Copper

Kerr - McGee Corporation
 GENERALIZED DISTRIBUTION
 OF COPPER

K-3

KELVIN PROJECT
 PINAL COUNTY, ARIZONA

D.A. Wolfe

May, 1973

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS					BASE METALS				SULFO-SALTS		PRECIOUS METALS		
	LEGAL	GEOGRAPHIC		LITHOLOGY AND MINERALIZATION	U ₃ O ₈	eU	eTh	W	AcceSoil, Ba	Total Ba %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag
4870	SEISE 50211 TAS, R13E	MOUTH OF GULCH RING SOUTH NEAR DRILL SITE	Cse gr granite por. granite phyllite & quartz alteration																.005	<2
4870-A	"	near gulch FX	Prop. altered granite																.002	<2
4870-B	"	Midway up gulch	Pyrite, argillite alt'd granite - near edge of alt.																.004	<2
4870-C	"	"	qtz - magnetite vein zone not 4870-B																.004	<2
4871	SEISE 50218 TAS, R13E	Rare Metals Mine vicinity.	Potassic altered granite																.007	0.4
4871-A	SW/30 50219 TAS, R13E	Shaft, 1000' N at Rare Metals	Potassic alt'd granite with abt chlorite																.001	1.4
4871-B	NE/30 50217 TAS, R13E	Wash	50 ft shear zone, K alt gr. with wk silic. py & Cu ox																.024	6.1
4884	NE/30 50231 TAS, R13E	Dump - West Shaft Peg Leg Mine	Select sample of 2-3 ft WW Venn; Bx qtz & lim alt'd cap. qtz																.015	5.6
4884-A	"	"	General Dump sample granite por & quartz																<.001	0.3
4884-B	"	cut adj. to E shaft	Sheared diabase? chlorite & sillite																.003	3.5
4884-C	"	Dump - North shaft	Silicified micro Bx quartz & diabase																.004	6.7
4884-D	SE NE/30 50216 TAS, R13E	West end WW Trailing ridge	Wk pyritic alt'd granite w/ qtz - UTS & minor chry.																.047	4.0

1 VALUES IN FPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS						BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		LITHOLOGY AND MINERALIZATION	U ₃ O ₈	eU	eTh	W	Acid Sol Bo	Total Bo %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag
4885	NE/NE S00 33 T45, R13E	West Cut Wooley Bx Pipe	Potassic alt. - py, clay & gte vugs in fragmental Bx															.005	3.6	
4885A	"	"	Soleat of interstitial gte, limonite & oxide Cu in Bx															.007	38.7	
4885B	SE/NE S00 32 T45, R13E	Val. pit near gate on road to Wooley	Sheared diabase - chlorite & siderite alteration															.076	120	
4909	SW/NE S00 32 T45, R13E	Old pit SE of road Fork	Potassic alt. granite - NW Trending shear w/ dissem. pyrite															.016	47.7	
4909-A	"	"	2 1/2 ft "lat" E-W shear in Bx granite w/ gte vugs & pyrite															.045	14.8	
4909-B	"	Val pit S of gate to Wooley	3 ft sample of sheared pink vein adj to diabase															.282	105	
4909-C	SE NE/NE S00 20 T45, R13E	Shaft dump	Chlorite alt. sheared diabase specularite & hematite stain															.004	4.2	
4909-D	NW/SE S00 20 T45, R13E	Ridge N/E of road	50 to 100 ft wide shear zone weak pyrite & sulfidation															.001	1.3	
4910	NE/NW S00 15 T45, R13E	Twin Adits W bank Ripsey Wash	Coely fragmental granite Bx chlorite yellow sandstone & Cu Ox.															.018	0.8	
4910-A	NE/SW S00 15 T45, R13E	Short Adit East Bank Ripsey Wash - 5 ft Pinky lumps	5 ft sample of shear Bx w. gte - pyrite - siderite - chlorite in adit															.185	116	
4910-B	SW/SW S00 23 T45, R13E	Wash w/ jeep road E side Ripsey	Granite Bx in road cut above & north of wash - silty clay & wk pyrite alteration																	
4910C	"	" North bank wash	Fine-gr granite - chlorite & weak hematite limonite															.001	4.2	
4910-D	"	"	100 ft sample of shaft Bx for granite - wk pyrite alteration															.004	4.2	

1 VALUES IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

SAMPLE NUMBER	LOCATION		DESCRIPTION LITHOLOGY AND MINERALIZATION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS					BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		U ₃ O ₈	eU	eTh	W	Acid Sol. Ba	Total Ba %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag
4910-E	SW/SD Sec 23 T45, R13E	Wash w/ jeep road E side Ripsey Wash	Shattered & Bx diabase at contact w/ granite - chlorite & wk lim. lin.														<.001	<.2	
4910-F	"	"	Chloritic alt. light green diabase west of Bx granite														.006	<.2	
4910-G	"	"	Sehat sample at contact w/ Carbonate alt. in diabase calcite & black calcite														.015	<.2	
4910-H	"	"	Shattered diabase - epidote, minor carbonate - west contact with vertical fault?														.001	<.2	
		Ripsey Area																	
4911	NW/SE Sec 10 T55, R13E	East-west Ridge E of B.M. 3339	Weak pyritic alt. porphyry														.015	0.2	
4911-A	"	Pit adjacent to North of road	Potassic alt. breccia Assem py & clay														.003	1.2	
4911-B	NE/SE Sec 11 T55, R13E	Bank of wash E of Ripsey Wash	Wk pyritic alt. Fault Bx														.005	<.2	
4911-C	SE/NE Sec 11 T55, R13E	Bluff E side wash S of Power lines	Pyritic-argillic alt. porphyry														.004	0.2	
4911-D	"	"	Shattered pyritic alt. Dipping Sog Quartz														.001	0.5	
4911-E	SE/SE Sec 11 T55, R13E	Cut above Ripsey Mill foundation	Shear zone at head of cut w/ qtz & pyrite														.002	<.2	
4911-F	"	"	Shattered diabase - chlorite & weak limonite														.009	<.2	
4911-G	"	E bank wash S of Mill	Pyritic altered brecciated granite														<.001	<.2	

1 VALUES IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

PROSPECT Kelvin - Ripsey
 COUNTY Pinal STATE Arizona

SAMPLE LOG

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS					BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		LITHOLOGY AND MINERALIZATION	U ₃ O ₈	eU	eTh	W	Acid Sol Ba	Total Ba %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au
4918	NE/5W Sec 15 T4S, R13E	Adit - E. Bank Ripsey Wash on S side Pwr Line	2.5 ft - vein hanging wall - Bx granite carbonate, minor Fe ₂ , lim. & MnOx															.262	0.4
4918-A	"	"	1.5 ft NW trending vein Fe ₂ , black hematite & MnOx															3.03	2.1
4918-B	"	"	2.5 ft on S side of vein sheared granite siderite, MnOx minor hematite limonite															5.60	1.8
4918-C	"	"	3 ft - from 2.5 to 5.5 ft on S side vein, sheared granite minor siderite															.063	0.2
4918-D	"	"	50 ft sample of wkly aft. sheared granite south of vein															4.00	2.2
4918-E	"	300 ft south	5 ft clay-sid. aft. low L shear ~ 300 ft south of adit															.001	<.2
4919	NW/4W Sec 15 T4S, R13E	Sharp ridge W bank Zellweger Wk	Wk pyritic granite cut by E-W gte with sil. to quartz zone															.011	0.7
4919-A	SE/SE Sec 9 T4S, R13E	First shaft N of ridge 300 ft from sec. cor. Dump	Select of 3 ft silic. Bx with wuggy gte - E-W.															.052	2.5
4919-B	"	"	Silicified dike - hematite limonite															.014	0.7
4919-C	NE/NE Sec 15 T4S, R13E	First wash East of Ripsey	3 ft pyritic granite in center of NW shear on S side granite por. dike															.384	12.2
4919-D	SE/NE Sec 15 T4S, R13E	2nd wash East of Ripsey	25 ft sample - NW trend - Wk pyritic granite															.054	1.3
4919-E	"	Old prospect cut	3 ft sample - NW trend shear gte - hem lim. & MnOx															14.4	86.1
4919-F	"	" Val pit under Pwr line	Prop adit granite ext. to vein N-S silic. with minor Fe & Mn															.176	21.0

... IS IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

PROSPECT Kelvin - Ripsey
 COUNTY Final STATE AZ

SAMPLE LOG

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS						BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		U ₃ O ₈	eU	eTh	W	Acid Sol. Ba	Total Ba %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag	
4949	NE/3W Sec 15 T4S, R13E	Adit 5 of Fair Line Ripsey Wash East Bank	10 ft sample Bx granite below 2.5x12.5 on vein 1/2 wall brecciated, MnOx - minor limonite														.020	0.7		
4949-A	"	" - 4 ft north	6 inch shear - clay & MnOx w/ .50 inch Qtz														.006	<.2		
4949-B	"	" 65 ft Not Adit	4 - 6 inch Qtz vein MnOx														.303	<.2		
4949-C	"	" 75 ft Not Adit	1.5 ft shear w/ 2 inch Qtz - carbonate veins														.007	0.4		
4949-D	"	" 300 ft Not Adit	35 ft sample of brecciated granite														.005	0.3		
4949-E	"	" 400 ft Not Adit	2 ft shear with 2-3 Qtz & MnOx veins														.008	0.2		
4949-F	"	" 500 ft "	1 ft wuggy Qtz-py vein with MnOx														.490	170		
4949-G	SE/1W Sec 15 T4S, R13E	West Bank Prop. Breccia Point	30 ft sample of Bx granite E-W shearing & MnOx														.153	2.3		
4950	SE/1W Sec 15 T4S, R13E	old shaft cut 2nd gulch E of Ripsey Wash	5 ft (vert) across low L shear in cut. 1-2 ft hem-lin Bx granite														.011	3.2		
4950-A	"	"	sample of 3 inch to 1 ft Qtz-py vein above low L shear														.329	2.3		
4950-B	"	" Southern vein	sample of 6 inch Qtz-py vein natural on ft wall														.111	3.3		
4950-C	"	"	3-4 in Qtz vein and 1 ft silic granite on ft wall														.091	2.3		
4950-D	"	"	3.5 ft sheared py with granite														.027	1.4		

PROSPECT Kelun - N. 2504
 COUNTY Pinal STATE AZ

SAMPLE LOG

PAGE 6 OF 8

SAMPLE NUMBER	LOCATION		DESCRIPTION LITHOLOGY AND MINERALIZATION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS					BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		U ₃ O ₈	eU	eTh	W	Acid Sol. Ba	Total Ba %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag
4950E	SE/NE Sec. 15 T4S, R13E	Old shaft 2nd Gulch E of X-fence	Sober sample of dark hematite (high Fe) gossan from N dump probably 3ft top py zone on hanging of N vein.														.001	3.8	
4950F	"	"	Dump - shaft on N vein 10-15 foot wide quartz granite															.012	1.4
4950G	"	Val cut on E side ridge west shaft	Deep red colored pyritic altd porphyry - red gte															.018	3.3
4951	"	Ridge above cut & shaft	20-30 ft zone of sheared Mn stained granite between veins Some thin gte & rock flour vits															.003	2.2
4951A	"	South vein E of cut	1 ft pyritic siliceous Bx with 2 inch deep siliceous gouge on foot wall															.009	2.4
4951B	"	Hill above shaft	15 ft low siliceous & pyritic Bx ~ 10 ft 5 at pyritic zone at shaft															.04	1.4
4951C	"	"	2 ft pyritic altd Bx above shaft															.003	1.3
4951D	"	W bank wash west of shaft	5 ft - E-W sheared pyritic altd granite															.002	2.1
4952	"	Adit E of Forks of wash	Dump - sober of replacement. Silty gte Bx															.067	1.0
4952A	"	Cut near top of ridge above adit	1 ft Bx, gte & hematite altd py N40W, 35 NE															.054	0.9
4952B	"	"	4 ft wk py, esp granite on Pt wall of vein															.006	2.2
4952C	"	"	3 ft "sanded" clay - chlorite altd porphyry on hill															.028	2.2

1 VALUES IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

PROSPECT Kelvin - Ripsey
 COUNTY Pinal STATE AZ

SAMPLE LOG

PAGE 7 OF 8

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS						BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		LITHOLOGY AND MINERALIZATION	U ₃ O ₈	eU	eTh	W	Acid Sol. Ba	Total Ba %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag
4952D	SE/NE Sec 15 T4S, R13E	Adit & cut at Wash Forks cut north of old dump	Select of bunch gtz-py vein															1.97	14.8	
4952E	"	"	FT wall of vein - 5ft of the st. sheared granite w/ few gtz stringers															1.72	3.0	
4953	"	E FK Wash at power line crossing Bx granite - Frag to East	50ft sample Bx granite w/ pyritic alt. - lower part of cliff on NE side wash															.07	0.2	
4953A	"	"	40 ft sample " about 53															.008	4.2	
4953B	"	" West side upper part cliff	4 ft vert sample of subhor. py-clay alt zone in Bx granite															.006	0.4	
4953C	" on sec line	Top of ridge ~500 ft North Wash	Float - gtz-spec-py veins in matrix granite															.072	0.6	
4954	"	SFK of end gully East Ripsey	W bank - green shaly granite with chert. W side															.010	0.2	
4954A	" ~500ft Sep adit	" E bank wash	25 ft sample of Bx granite Min. stain, minor gtz & py.															.026	0.4	
4954B	"	Prospect pit beneath power line	3ft of sheared siliceous granite, some gtz & lim. also quartz.															.84	78.9	
4955	SW/NE Sec 14 T4S, R13E	cut & adit S at power line on E side wash	.5 to 1 ft thin limonite shear zone															.002	5.5	
4955A	"	"	3ft clay-claystone alt granite w/ chert on S side of shear.															.007	5.2	
4955B	NE/SE Sec 11 T4S, R13E	West side wash @ BM 1940	Dump sample - select high pyrite 10% material															.015	3.2	

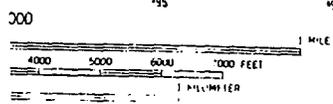
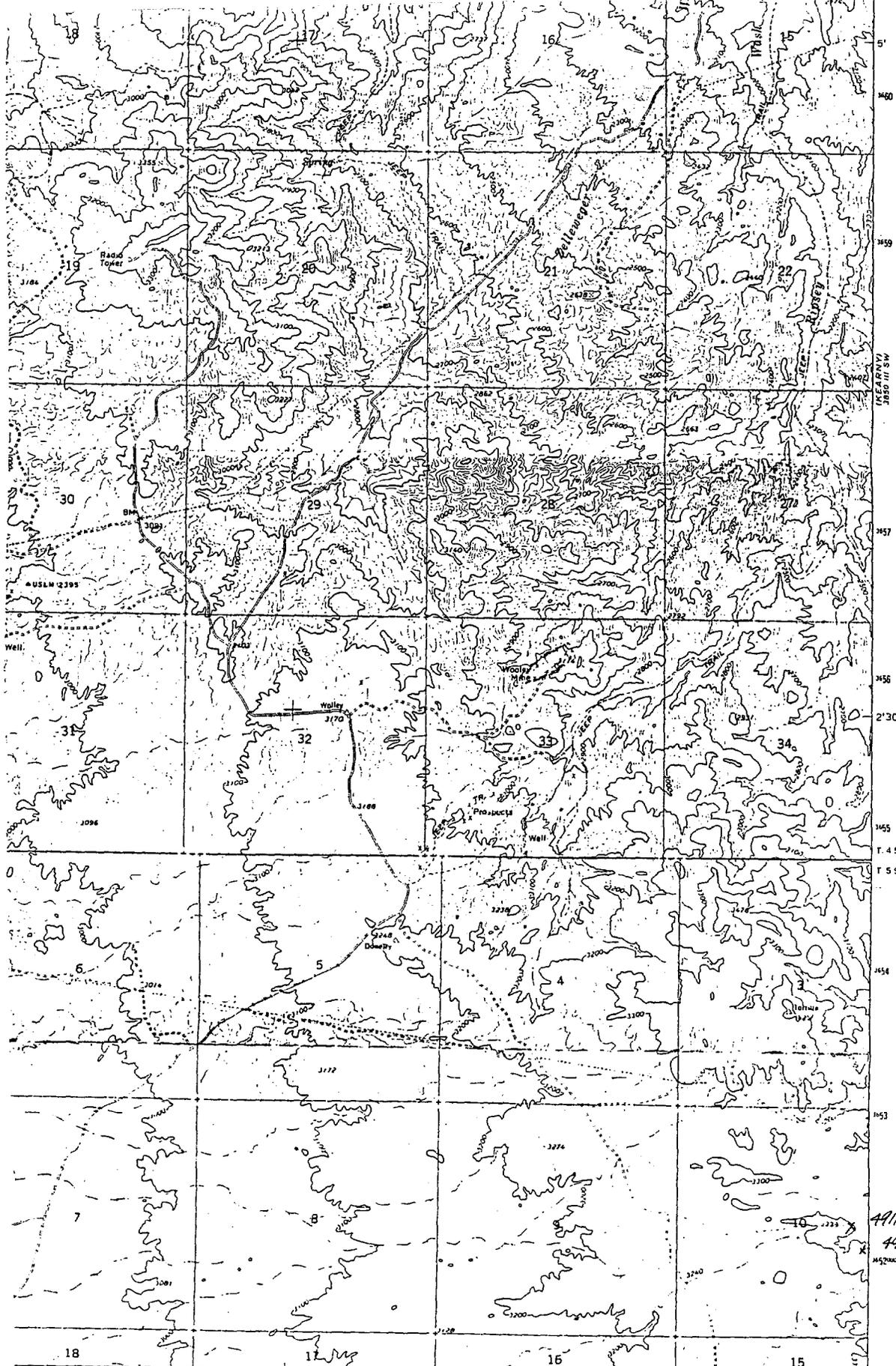
1 VALUES IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

PROSPECT Kelua - Ripsey
 COUNTY Final STATE AZ

SAMPLE LOG

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS						BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		LITHOLOGY AND MINERALIZATION	U ₃ O ₈	eU	eTh	W	Acid Sol Bo	Total Bo %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag
4956	NE/SE Sec 15 T4S, R13E	500 FT S of Taper line - 1st gulch E of Ripsey	4 ft Bx granite - limonite & MnOx																.013	0.2
4956A	NW/NW Sec 14 T4S, R13E	S bank of East Cvng	2 ft Bx granite w/ MnOx below Cvng																.065	1.0
4956B	NE/NW Sec 14 T4S, R13E	SFK of East wash	Bx granite - limonite & MnOx																.006	0.3
4956C	NE/NW Sec 15 T4S, R13E	Prospect on top of ridge	1.5 ft NW trend gtz - py vein - dip 25-30N																6.91	4.1
4956D	"	"	4 ft on ft wall of vein Clay alt granite w/ thin limonite seams																.076	0.9
4956E	"	N. slope Hill N of prospect	Bx granite, minor gtz vls MnOx																.074	1.2
4956F	NW/NW Sec 14 T4S, R13E	Wash E of Prospect	Bx weathered sericitic granite w/ lim structures																.003	0.7
4957	NW/NE Sec 26 T4S, R13E	Old prospect bottom of wash	West edge phyllic alt. Bx alt silica vls & thin limonite at top dissem pyrite																.002	4.2
4957A	"	N. of above wash	Alt. granite @ S end phyllic alt Bx; csc sericitic pyrite & some gtz																4.001	4.2
4957B	"	Mouth of adit bottom N wash	Phyllic alt. csc gr. granite dissem. pyrite & spars																.002	4.2
4958	SE/NW Sec 1 T5S, R13E	Val pit - S slope Hill on E side old road	Pyrite altered porphyry alt. to limestone																.381	2.5
4958A	"	Val pit on top of Hill	wk pyrite alt. diabase minor thin pyrite vls																.009	6.6

1 VALUES IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

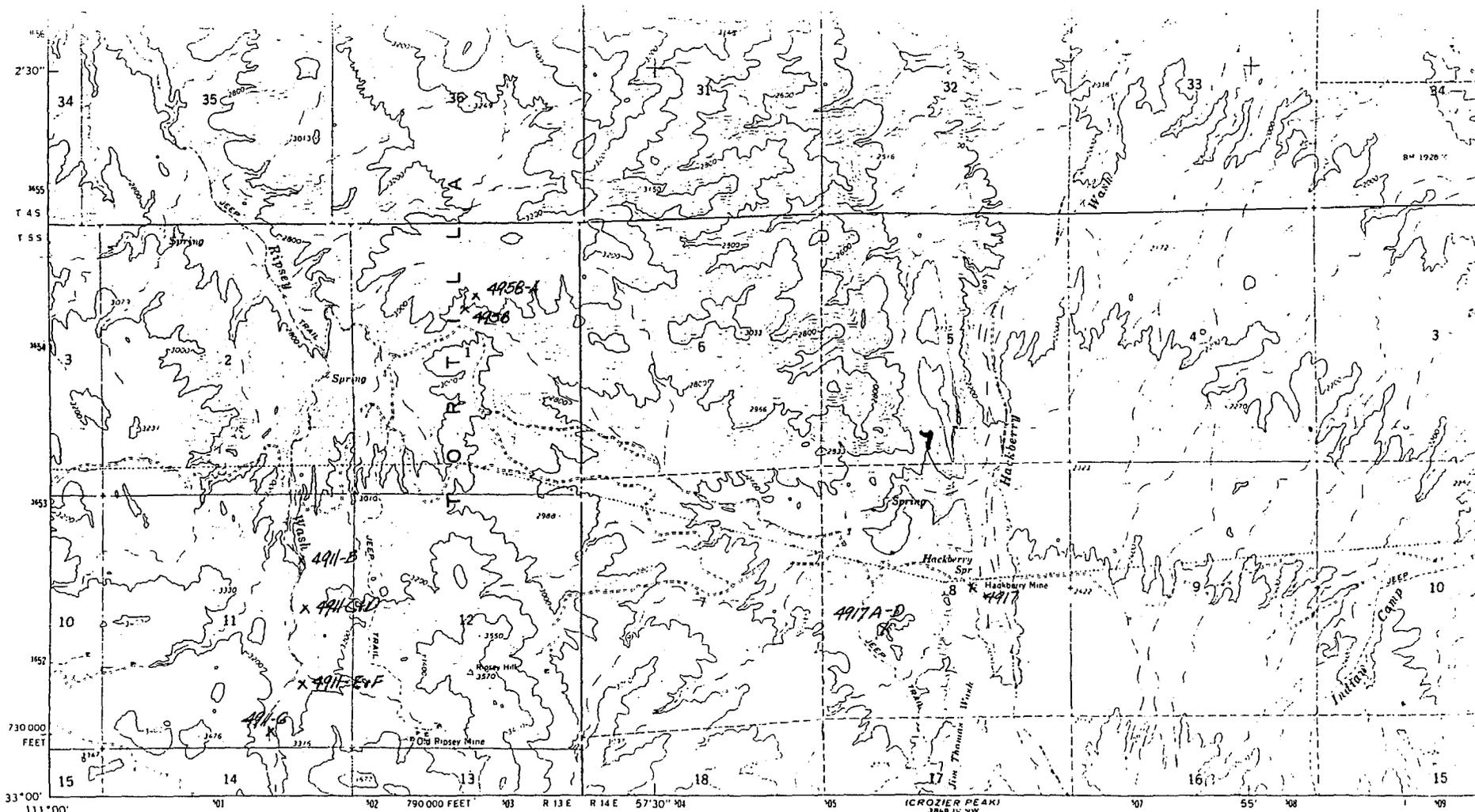


ROAD CLASSIFICATION

Light date
UTM zone 18 S 311

4911
4911-A
N 4525000

33° 00'
111° 00'



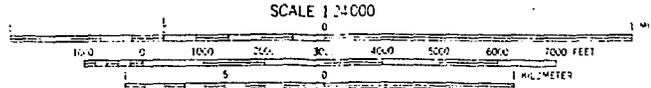
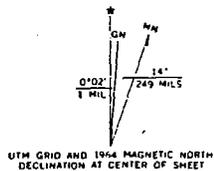
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Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1964

Polyconic projection. 1927 North American datum
10,000-foot grid based on Arizona coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue

Fine red dashed lines indicate selected fence lines



CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20 FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

3950 FEET
MINNETONKA HILLS
AGE 1

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS						BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC	LITHOLOGY AND MINERALIZATION	U ₃ O ₈	eU	eTh	W	Acid Sol Bo	Total Bo %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag	
4870	SE/SE Sec 11 T4S, R13E	Mouth of gulch Dike, S by head, drill site	Cse of granite por. granite pyrite, quartz alteration															.005	<L2	
4870-A	"	near gulch TX	Prop. altered granite															.002	<L2	
4870-B	"	Midway up gulch	Pyrite, argillite alt granite - near edge of alt.															.004	<L2	
4870-C	"	"	qtz-magnetite vein zone cut 4870-B															.004	<L2	
4871	SE/SE Sec 8 T4S, R13E	Rare Metals Mine vicinity	Potassic altered granite															.007	0.4	
4871-A	SW/SE Sec 9 T4S, R13E	Shaft 1000 N of Rare Metals	Potassic alt granite with abt chert															.001	1.4	
4871-B	NW/SD Sec 17 T4S, R13E	Wash	50 ft shear zone, K alt gr. with wk silo. py & Cd Ox															.024	6.1	
4884	NW/NW Sec 31 T4S, R13E	Dump - West shaft Peg Leg Mine	Select sample of 2-3 ft WWU min; Ex qtz & lim alt. sp & agl															.015	5.6	
4884-A	"	"	General Dump sample granite por & quartz															<.001	0.3	
4884-B	"	cut adj. to E shaft	Sheared diabase? chert & silicite															.003	3.5	
4884-C	"	Dump - North shaft	Silicified micro Ex quartz & diabase															.004	6.7	
4884-D	SE NE/SE Sec 16 T4S, R13E	West end WWU Trailing vein	Wk pyrite alt. granite w/ qtz, U13 & minor chert															.047	4.0	

1 VALUES IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS					BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		LITHOLOGY AND MINERALIZATION	U ₃ O ₈	eU	eTh	W	Acid Sol Bo	Total Bo %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au
4885	NE/NE S20 23 T45, R13E	West Cut Woolley Bx type	Potassic alt. - py, chrt & gte vugs in fragmental Bx															.005	3.6
4885A	"	"	Sample of interstitial gte, limonite & oxide Cu in Bx															.007	38.7
4885B	SE/NE S20 32 T45, R13E	Val. pit near gate on road to Woolley	Sheared diabase - chlorite & siderite alteration															.076	120
4909	SW/NE S20 32 T45, R13E	Old pit SE of road Fork	Potassic alt. granite - NW Trending shear w/ dissim. pyrite															.016	47.7
4909-A	"	"	2 1/2 ft "lab" E-W shear in Bx granite w/ gte veins & quartz															.045	148
4909-B	"	Val pit S of gate to Woolley	3 ft sample of sheared pyritic vein adj. to diabase															.282	105
4909-C	SE NE/NE S20 20 T45, R13E	Shaft dump	Chlorite alt. sheared diabase sericite & hematite stain															.004	4.2
4909-D	NW/SE S20 20 T45, R13E	Ridge NNE of road	50 to 100 ft wide shear zone weak pyrite & silicification															.001	1.3
4910	NE/NW S20 15 T45, R13E	Twin Adits W bank Ripsey Wash	Coely fragmental granite Bx chlorite yellow siderite & Cu ox.															.018	0.8
4910-A	NE/SW S20 15 T45, R13E	Short Adit East Bank Ripsey Wash - S of Pulley Wash	5 ft sample of shear Bx w/ gte - pyrite - siderite - chlorite in adit															.185	1.6
4910-B	SW/SW S20 23 T45, R13E	Wash w/ jeep road E side Ripsey	Granite Bx in road cut above & north of wash - sericite - clay & wk pyrite alteration																
4910-C	"	" north bank wash	Fine-gr granite - chlorite & weak hematite limonite															.001	4.2
4910-D	"	"	100 ft sample of shaft's Bx for granite - wk pyritic alteration															.004	4.2

1 VALUES IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS						BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		LITHOLOGY AND MINERALIZATION	U ₃₀₈	eU	eTh	W	Acid Sol Ba	Total Ba %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag
4910-E	SW/30 Sec 23 T4S R13E	Wash w/ jeep road E side Ripsey Wash	Shattered & Bx diabase at contact w/ granite - chlorite & wk hem. lim.															.001	<.2	
4910-F	"	"	Chlorite alt. light green diabase west of Bx granite															.006	<.2	
4910-G	"	"	Sebat sample of coarsest w/ carbonate alts in diabase calcite & black calcite															.015	<.2	
4910-H	"	"	shattered diabase - quartz minor carbonate - west contact with vertical fault?															.001	<.2	
		Ripsey Area																		
4911	NW/5E Sec 10 T5S R13E	East-West Rd. dip E of RM 3339	Weak pyritic alt. porphyry															.015	0.2	
4911-A	"	Pit adjacent SE North of road	potassic alt. breccia lenses py & chry															.003	1.2	
4911-B	NW/5E Sec 11 T5S R13E	Bank of wash E of Ripsey Wash	wk pyritic alt. Fault Bx															.005	<.2	
4911-C	SE/1NE Sec 11 T5S R13E	Bluff E side wash S of River lanes	Pyritic-argillic alt. porphyry															.004	0.2	
4911-D	"	"	shattered pyritic alt. Dipping SE of fault															.001	0.5	
4911-E	SE/5E Sec 11 T5S R13E	cut above Ripsey Mill foundation	shear zone at top of cut w/ qtz & pyrite															.002	<.2	
4911-F	"	"	Sheared diabase - chlorite & weak limonite															.009	<.2	
4911-G	"	E bank wash SE of Mill	Pyritic altered brecciated granite															<.001	<.2	

1 VALUES IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS						BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		LITHOLOGY AND MINERALIZATION	U ₃₀₈	eU	eTh	W	Acid Sol Ba	Total Ba %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag
4918	NE/SW Sec 15 T4S, R13E	Adit - E. Bank Ripsey Wash on S side Pur Line	2.5 ft - vein Hgmg well - Bx granite carbonate, minor Qtz, lm. & MnOx															.262	0.4	
4918-A	"	"	1.5 ft NW trending vein Qtz, black hematite & MnOx															3.03	2.1	
4918-B	"	"	2.5 ft on S side of vein sheared granite siderite MnOx minor hematite limonite															5.60	1.8	
4918-C	"	"	3 ft - from 2.5 to 3.5 ft on S side vein sheared granite minor siderite															.063	0.2	
4918-D	"	"	50 ft sample of wky aff. sheared granite south of vein															<.001	<.2	
4918-E	"	300 ft south	5 ft clay - silt. aff. low shear ~ 300 ft south of adit.															.001	<.2	
4919	NW/NE Sec 13 T4S, R13E	Sharp ridge W bank Zellerbach Wk	Wk pyritic granite cut by E-W Qtz with aff. to granite zone															.011	0.7	
4919-A	SE/SE Sec 9 T4S, R13E	First shaft N of ridge 300 ft from sec. cor. Dump	Section of 3 ft silic. Bx with waxy Qtz - E-W.															.052	2.5	
4919-B	"	"	Silicified dike - hematite limonite.															.014	0.7	
4919-C	NE/NE Sec 15 T4S, R13E	First wash East of Ripsey	3 ft pyritic granite in center of NW shear on S side granite por. dike															.394	12.2	
4919-D	SE/NE Sec 15 T4S, R13E	2nd wash East of Ripsey	25 ft sample - NW trend - red pyritic granite															.054	1.3	
4919-E	"	Old prospect cut	3 ft sample - NW trend shear Qtz - hemat. lim. & MnOx															14.4	86.1	
4919-F	"	1st pit under Pur line	Prop adit granite ext. to vein N-S shear with minor Qtz & Mn															.176	21.0	

VALUES IN PPB EXCEPT "TOTAL BARIUM" WHICH IS IN %

PROSPECT Kelvin - Ripsey
 COUNTY Pinel STATE AZ

SAMPLE LOG

SAMPLE NUMBER	LOCATION		DESCRIPTION LITHOLOGY AND MINERALIZATION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS						BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		U ₃ O ₈	eU	eTh	W	AcidSol Ba	Total Ba %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag	
4949	NE/SD 50215 T4S, R13E	Adjt 5 of Pier Lin Ripsey Wash East Bank	10 ft sample Bx granite exp. 2.5x12.5 on vein 1/2" wall. Bx granite, MnOx - minor limonite														.020	0.7		
4949-A	"	" - 4 ft north	6 inch shear - Clay & MnOx w/ .50 inch Qtz														.006	< .2		
4949-B	"	65 ft N of Adjt	4 - 6 inch Qtz vein MnOx														.303	< .2		
4949-C	"	75 ft N of Adjt	1.5 ft shear w/ 2 inch Qtz - carbonate veins														.009	0.4		
4949-D	"	300 ft N of Adjt	35 ft sample of brecciated granite														.005	0.3		
4949-E	"	400 ft N of Adjt	2 ft shear with 2-3 Qtz & MnOx veins														.008	0.2		
4949-F	"	500 ft "	1 ft vuggy Qtz-py vein with MnOx														.490	170		
4949-G	SE/NE Sec 15 T4S, R13E	W 45 ft Bank Ppt. Breccia Point	30 ft sample of Bx granite E-W shearing & MnOx														.153	2.3		
4950	SE/NE Sec 15 T4S, R13E	old shaft Ppt 2nd Gulch East Ripsey Wash	5 ft (vert) across low L shear in cut. 1-2 ft hem-lin Bx granite														.011	3.2		
4950-A	"	"	sample of 3 inch to 1 ft Qtz-py vein above low L shear														.329	7.3		
4950-B	"	" Southern vein	sample of 6 inch Qtz-py vein material on the wall														.111	3.3		
4950-C	"	"	sample of 3-4 in Qtz vein and 1 ft silic granite on Pt wall														.091	2.3		
4950-D	"	"	2.5 ft sheared py d/70 granite material on the wall														.027	1.4		

PROSPECT Kelvin - Ripsey
 COUNTY Pinal STATE AZ

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS						BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		LITHOLOGY AND MINERALIZATION	U ₃ O ₈	eU	eTh	W	Acid Sol Ba	Total Ba %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag
4950-E	SE/NE Sec 15 T4S, R13E	Old shaft, 2nd Gulch E of Ripsey	Spent sample of dark hematite (high Fe) gneiss from N. dump probably the 5ft zone on hanging of N vein.																.001	3.8
4950-F	"	"	Dump - shaft on N ₁ vein 10-15 foot wide quartz granite																.012	1.4
4950-G	"	Val cut on E side ridge Wat-shaft	Deep red colored pyrite, also porphyry - 40 gtz																.018	3.3
4951	"	Ridge above cut & shaft	20-30 ft zone of sheared Mn stained granite between veins some thin gtz & rock flour vits																.003	4.2
4951-A	"	South vein E of cut	1 ft pyrite siliceous Bx with zinc arsenic siliceous gouge on foot wall																.009	2.4
4951-B	"	Hill above shaft	1.5 ft low L siliceous pyritic Bx ~ 10 ft 5 ft pyrite zone at shaft																.04	1.4
4951-C	"	"	2 ft pyrite also Bx above shaft																.003	1.3
4951-D	"	W bank wash West of shaft	5 ft - EW sheared pyrite also granite																.002	2.1
4952	"	Adit E of Forks of Wash	Dump - section of redeposit. druse gtz Bx																.067	1.0
4952-A	"	Cut near top of ridge above adit	1 ft Bx, gtz & hematite atterpy N40W, 35 NE																.054	0.9
4952-B	"	"	4 ft wk py esp granite on ft wall at vein																.006	0.2
4952-C	"	"	3 ft "sanded" clay - chlorite also porphyry on hill																.028	4.2

1. VALUES IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS						BASE METALS				SULFO-SALTS		PRECIOUS METALS	
	LEGAL	GEOGRAPHIC		LITHOLOGY AND MINERALIZATION	U ₃ O ₈	eU	eTh	W	Acid Sol Bo	Total Bo %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag
4952D	SE/NE Sec 15 T4S, R13E	Adit & cut at Wash Forks cut north of mill dump	Select of pinch Qtz-py vein															1.97	14.8	
4952-E	"	"	FT wall of vein - 5ft of No. 11 - sheared granite w/ few Qtz stringers															.172	3.0	
4953	"	E. FX Wash at power line crossing Ex granite - trail to East	50ft sample Ex granite w/ pyritic alt. - lower part of cut on NE side wash															.017	0.2	
4953A	"	"	40 ft sample " about 53															.008	4.2	
4953B	"	" West side upper pit cut	4 ft vert sample of subhor. py-clay alt zone in Ex granite															.006	0.4	
4953C	" on sec 11E	Top of ridge ~ 500 ft Nat'l Wash	Float - Qtz-spar-py veins in "alt. granite"															.042	0.6	
4954	"	5th of 2nd gulch East Ripsey	W bank - gray shaft granite with chert. vein															.010	0.2	
4954A	" ~ 500ft set adit	" E bank wash	25 ft sample of Ex granite Mus. stain, minor Qtz & py.															.026	0.4	
4954B	"	Prospect pit beneath power line	3ft of sheared siliceous granite, same Qtz & lim. alt. granite															8.4	78.9	
4955	SW/NE Sec 14 T4S, R13E	cut & adit S of power line on E side wash.	.5 to 1 ft hem limonite chert zone															.002	5.5	
4955A	"	"	3 ft clay-chlorite alt granite w/ chert on S side of shear.															.007	5.2	
4955B	NE/SE Sec 11 T4S, R13E	West side wash @ BM 1940	Dump sample - select high pyrite vein material															.015	3.2	

1 VALUES IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

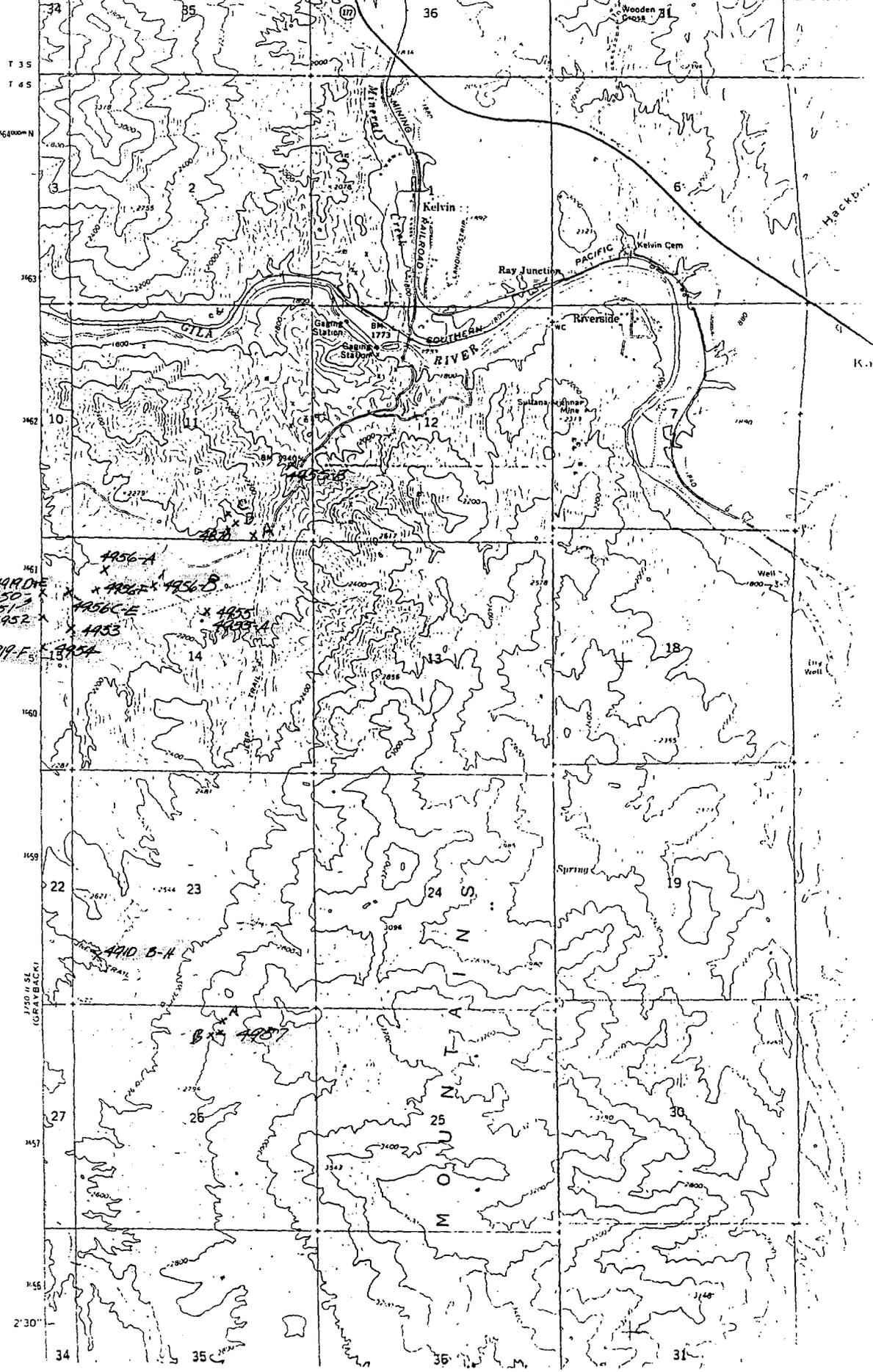
PROSPECT Kelvin - Ripsey
 COUNTY Coal STATE AZ

SAMPLE NUMBER	LOCATION		DESCRIPTION	RADIOACTIVE ELEMENTS			PATHFINDER ELEMENTS					BASE METALS				SULFO-SALTS		PRECIOUS METALS		
	LEGAL	GEOGRAPHIC		LITHOLOGY AND MINERALIZATION	U ₃ O ₈	eU	eTh	W	Acid Sol Ba	Total Ba %	F	Hg	Cu	Mo	Pb	Zn	As	Sb	Au	Ag
4956	NE/SE Sec 15 T4S, R13E	500 FT S of Fwyer line - 1st gulch E of Ripsey	4 ft Bx granite - limonite & MnOx																.013	0.2
4956A	NW/NW Sec 14 T4S, R13E	S bank of East dug	2 ft Bx granite w/ MnOx below clay																.065	1.0
4956B	NE/NW Sec 14 T4S, R13E	5 FK of East wash	Bx granite - limonite & MnOx																.006	0.3
4956C	NE/NE Sec 15 T4S, R13E	Prospect on top of ridge	1.5 ft NW trend gtz - py lim - dip 25-30W																6.91	4.1
4956D	"	"	4 ft on ft wall of vein clay alt granite w/ thin limonite seams																.076	0.9
4956E	"	N slope Hill N of Prospect	Bx granite, minor gtz w/ MnOx																.094	1.2
4956F	NW/NW Sec 14 T4S, R13E	Wash E of Prospect	Bx exfoliated sericitic granite w/ lim structures																.003	0.7
4957	NW/NE Sec 26 T4S, R13E	Old Prospect bottom of wash	West edge phyllite alt. Bx alt siliceous w/ thin limonite after dissem pyrite																.002	1.2
4957A	"	N of above wash	Alt granite @ S end phyllite alt Bx use sericitic pyrite & some gtz																.001	1.2
4957B	"	Mouth of adit bottom N wash	Phyllite alt use gr. granite dissem pyrite & Fe																.002	1.2
4958	SE/NW Sec 1 T5S, R13E	Val pit - S slope Hill on E side old road	Pyrite altered porphyry alt to limestone																.381	2.5
4958A	"	Val pit on top of Hill	wk pyrite alt diabase minor thin pyrite w/ Fe																.009	6.6

1 VALUES IN PPM EXCEPT "TOTAL BARIUM" WHICH IS IN %

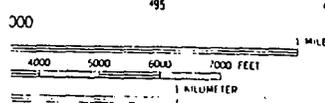
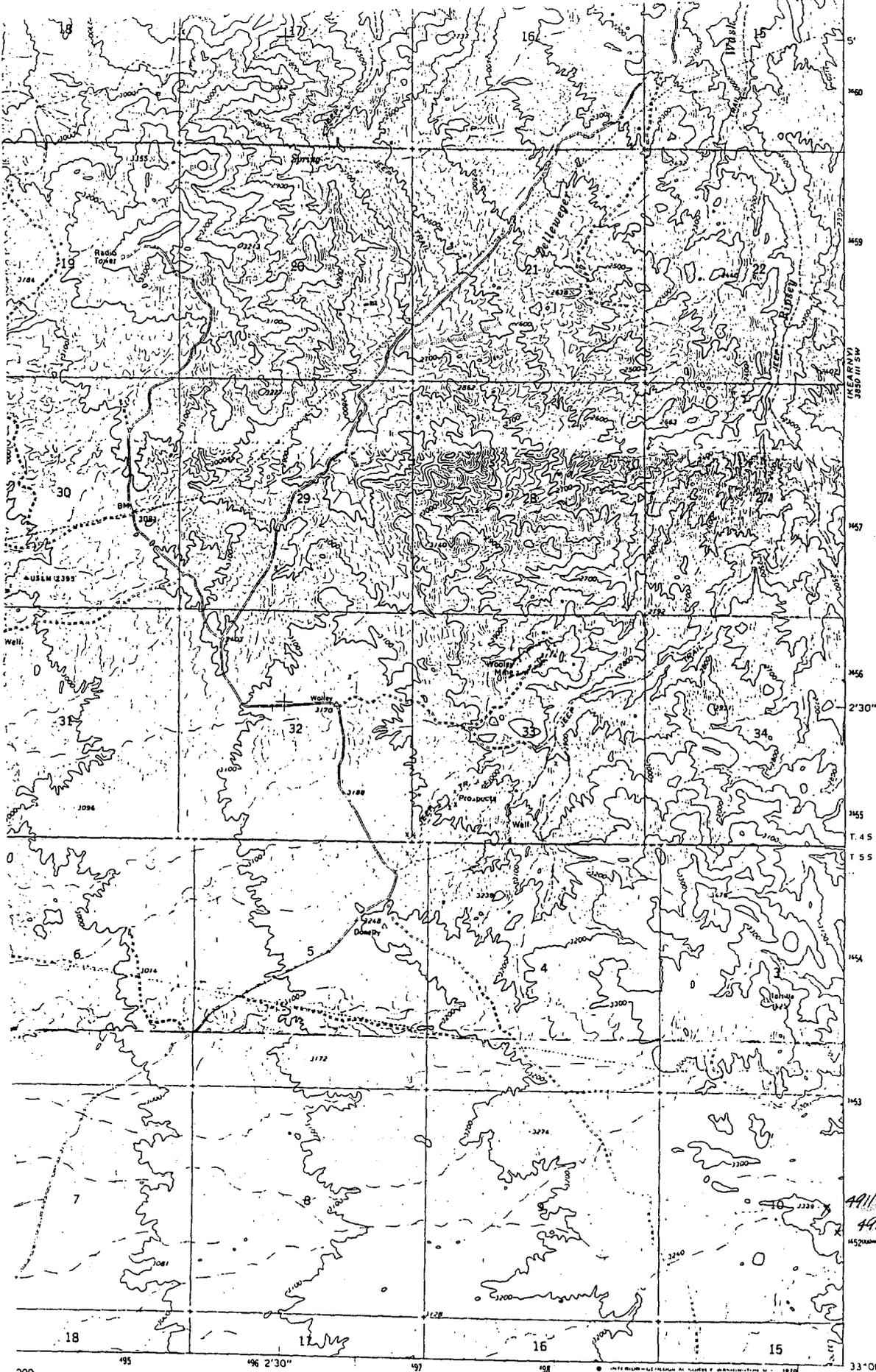
UNITED STATES
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GEOLOGICAL SURVEY

111°00' 33°07'30" 101000' E 102 PHOENIX 80 MI SUPERIOR 13 MI 103 R 13 E R 14 E 57°30' 50'



4950 A-G
4951 A-D
4952 A-E
4953 A-C
4954 A-B

1720 H SL
(GRAYBACK)



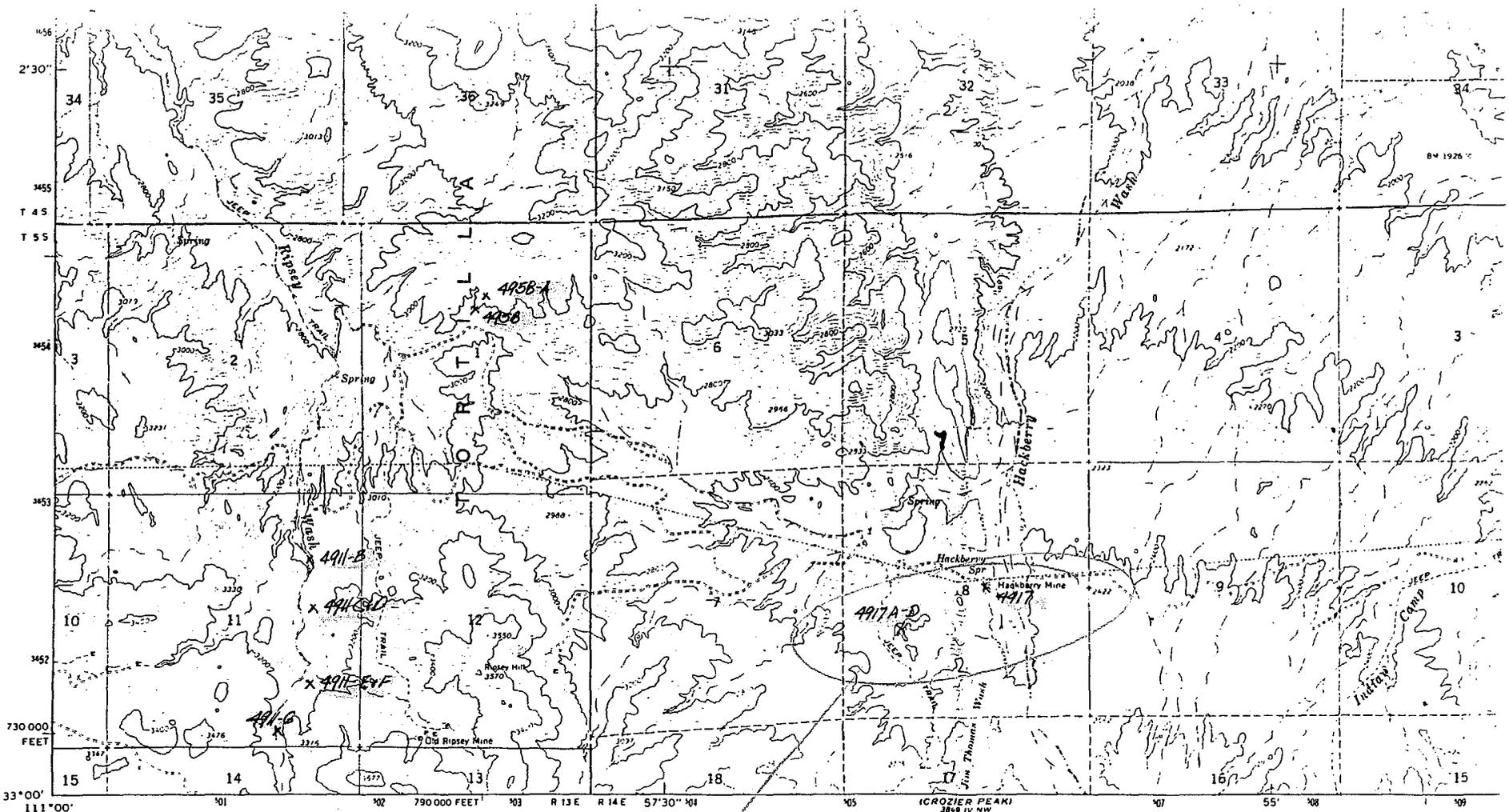
20 FEET

ROAD CLASSIFICATION

Light duty Unimproved dirt

4911
4911-A
4520000 N

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2791 ME
 11967702 ME
 ME

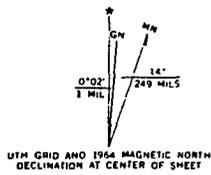
Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

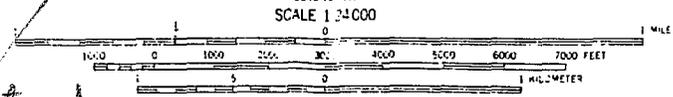
Topography by photogrammetric methods from aerial photographs taken 1962. Field checked 1964

Polyconic projection. 1927 North American datum
 10,000-foot grid based on Arizona coordinate system, central zone
 1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue

Fine red dashed lines indicate selected fence lines



not in list



CONTOUR INTERVAL 40 FEET
 DOTTED LINES REPRESENT 20 FOOT CONTOURS
 DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
 FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR WASHINGTON, D. C. 20242
 A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



2 APPROVED: 11/11/64

T 4 S

12 | 7

30° - 40° ←

9 | 10
16 | 15

Ripsey Wash K-4

Exotic Cu

K-5

Structurally Rotated PC granite & T seds.

pyritic K-1

K-3
K-2

Db

pyritic

Db

Db

Exterior pyritic

Struct. Rotated PC granite

Structurally Rotated PC granite & T seds.

R 13 E

Diabase Sills (Projected)

Detachment Breccia

21 | 22
28 | 27

23 | 24
26 | 25

Structurally Rotated T. Seds

Scale: 1 inch = 2,000 feet

15 - 20° ←

Woolley Breccia Pipe

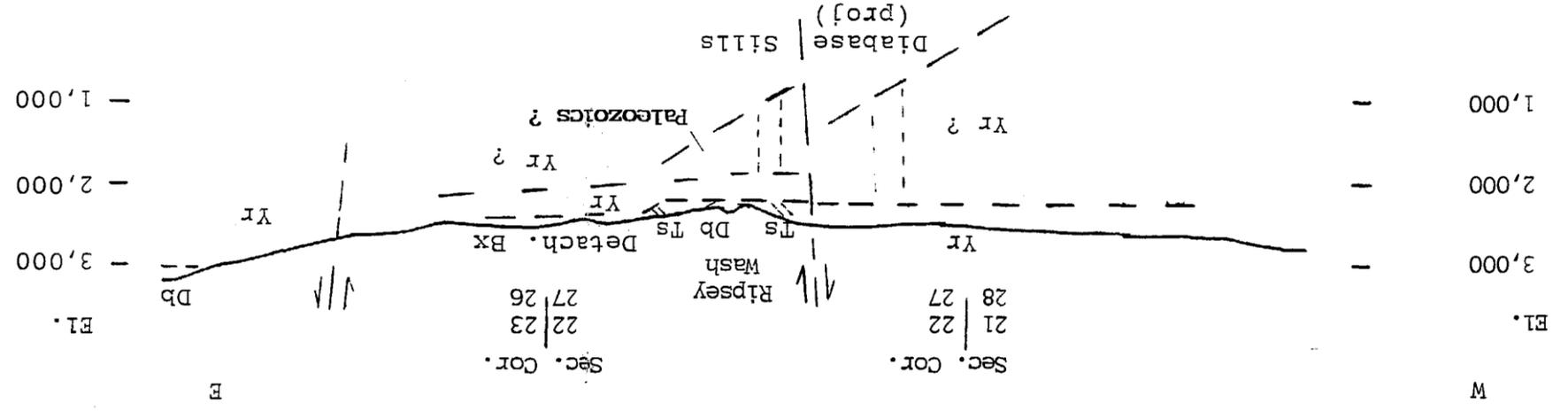
Diabase Sills

SKETCH MAP SHOWING MAJOR STRUCTURES
KELVIN PROSPECT, PINAL COUNTY, ARIZONA

Modified from: USGS Map GQ 1188
Map GQ 1206

R. M. Corn Feb., 1992

E - W GEOLOGIC SECTION, KELVIN PROSPECT, PINAL COUNTY, ARIZONA

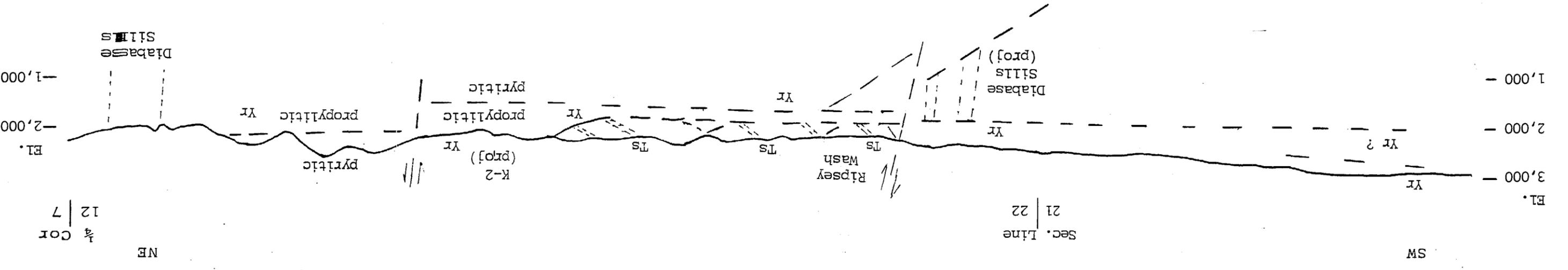


R. M. Corn Feb., 1992

Surface Geology From: USGS Map G0 1188
G0 1206

Scale: 1 inch = 2,000 feet
H = V

NE - SW GEOLOGIC SECTION, KELVIN PROSPECT, PINAL COUNTY, ARIZONA



NE

1/4 COR
12 | 7

SW

FINAL REPORT ON THE GEOLOGY AND
1978 DRILLING AT THE KELVIN (RIVERSIDE)
PORPHYRY CU-MO PROSPECT, PINAL COUNTY, ARIZONA

Tucson Area Office

Joe Wilkins
Tom L. Heidrick
Greg R. Wessel

February, 1979

INTRODUCTION AND GEOLOGY

Geologic mapping and geochemical sampling in the northern Tortilla Mountains (Fig. 1) during the summer of 1977 delimited a somewhat fragmented but basically upright porphyry copper system lying within the submitted Kerr-McGee claim block (Fig. 2). Detailed geologic mapping and subsequent cross section construction showed the system as emplaced into Precambrian Ruin granite, an aplitic phase of the Ruin, diabase "sills", and Laramide age dikes (Figs. 3 and 4). Alteration-mineralization studies, geochemical dispersion patterns, complex resistivity, and ground magnetometer data refined this interpretation and indicated that the system was largely centered in the SW $\frac{1}{4}$ of section 12, T4S, R13E (Fig. 3, DDH GK-2). The strongest alteration at the surface is pervasive quartz-sericite-pyrite showing marked enhancement along ENE-trending joint sets, veins, and fault-veins. The quartz-sericite-pyrite alteration is surrounded by an aureole of mixed phyllic-propylitic assemblages, which in turn grades laterally (outward) into a propylitic dominated assemblage and finally into relatively unaltered host rocks. Alteration was expected to change with depth to a low-sulfide potassic alteration assemblage associated with copper-molybdenum metallization. A weak but uneconomic chalcocite blanket outcrops locally at the surface.

An ENE-trending fracture set pervades the entire region and is best developed where alteration-mineralization intensifies (Fig. 3). Alteration and mineralization is well developed along coeval sets of subvertical ENE-trending veins and fault-veins. Numerous vertical to subvertical quartz monzonite, hornblende monzonite, quartz latite, and hornblende latite porphyries share the ENE azimuth.

The porphyry copper system appears to have been emplaced into a N- to NNW-trending, east-facing monoclinial fold (termed the Riverside monocline) which is defined on a regional scale by steeply dipping to overturned ridges of Precambrian Apache group and diabase sills, as well as Paleozoic sedimentary rocks. In the Kelvin (Riverside) area, the position of the fold is defined by a series of N- to NNW-trending axial plane faults, zones of intense cataclasis, and the overall monoclinial attitude of diabase sills (subhorizontal to the west and steep to overturned to the east).

Several low-angle decollement surfaces are recognized immediately west of the proposed prospect area (Fig. 3). In particular, the Ripsey Wash and Jeep Trail faults and their coextensive zones of post-mineral breccia are interpreted as marking the trace of significant westward propelled hanging-wall detachments. In addition, several small discontinuous gravity slide surfaces are present along the east side of the prospect area with indicated movement toward the east into the San Pedro rift valley. As for detachment faults beneath the proposed target, none are known to outcrop anywhere in the Kelvin (Riverside) prospect area. The presence of such low-angle structures were suggested by Kerr-McGee explorationists and were viewed as potentially underlying the entire prospect area. The presence of subvertical ENE-trending fracture and porphyry zones, flat lying diabase sheets, along with the near vertical contacts of the Riverside breccia pipe (Figs. 3 and 4) were interpreted by us as indicative of nonrotation. Figure 5 summarizes our pre-drilling interpretation of the Kelvin (Riverside) structure, alteration-mineralization zoning, and relative position of the high-grade protore Cu-Mo target sought.

1978 DRILLING RESULTS

Protore Cu-Mo metallization lying within reactive diabase sills showing potassic alteration comprised the exploration target at Kelvin (Fig. 5). Drill holes GK-1 and GK-2 were layed out so as to test the potassic core of the upright porphyry copper system. Hole GK-3 was an alternate site designed to test for high-grade Cu-metallization beneath outcropping pyritic crackle breccia. Hole GK-4 was drilled to perform the required maintenance work on an Arizona State mineral lease in section 10.

DDH GK-1 (Fig. 6) was designed to encounter the reactive diabase sill at the interface between the phyllic and potassic alteration zones. Our proposed target depth was between 1500 and 2000 feet. The hole was collared in mixed phyllic-propylitically altered Ruin granite containing moderate Cu dispersion and high Mo/Pb geochemical ratios just east of the Jeep Trail fault zone. Propylitically altered Ruin containing 100-400 ppm Cu and 2-5 ppm Mo was encountered between 0 and 360 feet. A flat-dipping (20°), propylitically-altered, and cataclastically deformed diabase sill was encountered from between 360 and 905 feet. As suspected, this diabase proved receptive and contained 2-3 times more Mo and Cu as the overlying or underlying Ruin granite. Between 905 and 2000 feet, the hole penetrated cataclastically deformed and propylitically altered to fresh Ruin granite with background levels of Cu, Mo, and Pb.

DDH GK-2 (Fig. 7) was placed at the eastern most boundary of the Gulf/Kerr-McGee joint claim block (Fig. 2) in order to test the proposed potassic altered core. The target depth was 1500 to 2000 feet deep. GK-2 was collared in phyllically altered Ruin granite associated with a strong Mo/Pb anomaly and moderate Cu geochemistry. Phyllically altered aplitic Ruin was present from collar to 860 feet. A 35 foot thick sheet of diabase was encountered overlying 45 feet of normal Ruin granite at 450 feet. Mixed phyllic-propylitically altered Ruin granite occurred between 860 and 1340 feet with a 25 foot thick diabase sheet at the base. From 1365 to 2260 feet the propylitically-altered Ruin granite gradually became fresher with the bottom of the hole in very weak propylitically altered to fresh Ruin granite. Within the phyllic zone, the Cu varied from 200 ppm to 0.12 - 0.14%, while Mo ranged from 25 to 167 ppm, and Pb from 7 to 508 ppm. No significant increase in metallization was encountered in either diabase. Very little variation in the Cu, Mo, or Pb was noted in the mixed phyllic-propylitic or propylitic-fresh alteration zones with Cu at 100 ppm, Mo at 1-5 ppm, and Pb at 10-15 ppm.

DDH GK-3 (Fig. 8) was an alternative test site collared within a "pipe-like" crackle breccia composed of phyllically altered fragments of Ruin granite and diabase containing 1-3% pyrite. Target depth was 500 to 1000 feet with protore chalcopyrite within phyllic-potassically altered breccia as the target. The hole was rotary drilled to 72 feet and surface casing set at that point. With increasing depth, the hole passed progressively from pyritic crackle breccia to sheared and propylitically altered Ruin granite. Total fracturing and veining decreased as well with depth and at 390 feet the Ruin granite appears relatively fresh and contains occasional veinlets of epidote calcite-chlorite-specularite. GK-3 was bottomed at 775 feet in relatively fresh unsheared Ruin granite. Cu, Mo, and Pb were relatively uniform with 25 ppm Cu, 1-5 ppm Mo, and 10-20 ppm Pb.

DDH GK-4 (Fig 8) was drilled to perform the required maintenance on Arizona State mineral lease in Section 10, T4S, R13E. The entire hole from 0 to 223 feet was in weakly propylitic Ruin granite containing less than 100 ppm Cu, 1-2 ppm Mo, and 7-15 ppm Pb.

GEOLOGIC SYNOPSIS

All 4 holes drilled at Kelvin show decreasing fracture intensities, alteration, and mineralization with increasing depth; phyllic alteration yields to propylitic and propylitic to fresh, total sulfides decrease from 1-2% to trace amounts, copper decreases from 0.2 - 0.14% to less than 100 ppm while molybdenum goes from +100 to less than 10 ppm at TD. As shown in Figure 9, this tendency for decreasing alteration, mineralization, geochemical dispersion, and the "floored" nature of crackle breccia zones suggest that the supposedly Kelvin(Riverside) porphyry system is rotated some 70-80° clockwise when looking NNW. Consequently, the alteration-geochemical dispersion patterns observed at the surface represent a sub-vertical slice from top to bottom through the systems rather than a horizontal slice across its top.

Since the ENE-trending dikes, veins, fault-veins and planar joint sets are subvertical and conform to well-established regionally controlled fracture trends, the rotation must have taken place along an axis perpendicular to this strike (i.e. NNW). Rotation of the system took place after Laramide time (55my) but before the deposition of the San Manuel formation (17-22my). Subsequent low-angle movement along the Jeep Trail and Ripsey Wash faults plus minor eastward movement into the San Pedro rift occurred after main stage rotation in Post-San Manuel time since large blocks of San Manuel are involved (Fig. 4). A major low-angle fault apparently terminates at the San Pedro rift as postulated in Figure 9.

The Riverside-Kelvin monocline originally defined by an east-facing monoclinical fold in the diabase, now appears to be a "∇" shaped configuration of sills (now sub-vertical) and their feeder dikes (now flat-dipping). The sill portion, originally thought to be the east-face of the monocline, dips steeply into the San Pedro, while the dike portion, originally thought to be the axial limb of the monocline, has a flat sill-like configuration.

As shown in the geologic cross-section (Fig. 9), post-Laramide rotation and subsequent denudational faulting along the Jeep Trail and Ripsey Wash faults have removed the productive portion of the Kelvin system, leaving a thin, nonproductive slice of phyllically and propylitically altered Ruin granite behind. The top and the proposed productive center of the system apparently has been transported to the west beyond Ripsey Wash, and if present occurs as complex slices beneath fresh unaltered rocks in the Greyback Peak area.

SUMMARY AND CONCLUSIONS

The areal geology, geochemical dispersion patterns, geophysical prospecting techniques, and a 4-hole drilling program totaling 5268 feet, have defined a rotated and complexly faulted porphyry copper system at Kelvin, Pinal County, Arizona. Drill holes GK-1 and GK-2 collared in an alteration patch associated with strong Cu and Mo but low Pb geochemical dispersion showed decreasing alteration (phyllic to weak propylitic) sulfide content, plus Cu-Mo metallization with increasing depth. Drill hole GK-3 collared in a pyritic crackle breccia likewise drilled out of the same with depth indicating a "floor" created by post-emplacement rotation.

Drill holes GK-1 and GK-2 have effectively eliminated the possibility of a deep protore porphyry copper system at Kelvin and GK-3 has eliminated the breccia pipe potential. Although Kerr-McGee's holes K-1 and K-3 intersected sub-ore grade copper in thin slices west of the Jeep Trail decollement, Kerr-McGee holes K-2 and K-4 thru K-8 have effectively negated the possibility of a large ore-grade slice existing between Ripsey Wash and the Jeep Trail fault.

It is possible that ore-grade slices of the Kelvin(Riverside) system exist on Kerr-McGee/Gulf joint venture ground in Section 21 and 22 (1 mile south of the Cities Services drilling). Potential targets however are quite deep, structurally complex, and not attractive enough to justify additional drilling at this time.

RECOMMENDATIONS

Compiled and synthesized geologic, geochemical, geophysical, and drilling information constitute a data base adequate to eliminate the existence of significant ore-grade Cu-Mo metallization within the Kelvin (Riverside) claim block (Fig. 2). It is recommended, therefore, that Gulf counsel notify our farmout partners (Kerr-McGee) that GMRC is no longer interested in pursuing metals exploration on subject property. Complete sets of factual data including drill logs, assays of core, and geophysical survey information with reports are included herewith should Kerr-McGee request the same (Appendices A, B, and C respectively).

Tucson Area Staff

TABLE I
DRILL-HOLE SUMMARIES

AREA WEST OF RIPSEY WASH					
<u>Cyprus DDH 1972</u>					
Hole no.	Attitude	Depth (ft)	Alteration	Average ppm Cu	Best Intercept
KE-1	60°N	2500'	strong phyllic & strong potassic	360 40ppm Mo	1750-2100' 948 Cu, 51 Mo
<u>Tipperary Land & Exploration RDH 1970</u>					
T-1	vert	1400'	N/A	N/A	N/A
T-2	vert	1635'	"	"	"
<u>Minbanco RDH Pre-1970</u>					
J3	vert	1165	N/A	N/A	N/A
J9	vert	2320'	"	"	"
AREA EAST OF RIPSEY WASH					
<u>Kerr-McGee DDH's 1972-1976</u>					
K-1	vert	1500'	st.phyllic-wk.pot.	890	800-1030', 0.26%
K-2	vert	1377'	propy-phyllic	188	775-920', 0.05%
K-3	vert	1386'	propy-phyllic	810	640-790', 0.26%
K-4	vert	875'	propylitic	470	150-190', 0.17%
K-5	vert	1497'	wk.phyllic-propy	130	20-120', 0.05%
K-6	vert	500'	weak propy	44	420-470', 0.01%
K-7	vert	1077'	weak propy	130	500-505', 400ppm
K-8	vert	802'	phyllic-propy	44	686-700', 150ppm
<u>Inspiration DH 1966</u>					
ICC-1	vert	400±'	N/A	N/A	N/A
ICC-2	vert	unk.-validation	"	"	"
<u>Occidental Minerals DDH's 1967-1968</u>					
OX-1	60°S	415'	N/A	N/A	N/A
OX-2	60°S25°E	500'	"	"	"
OX-3	60°S	396'	"	"	"
OX-4	60°S5°E	500' (unk)	"	"	"
<u>Pre-Occidental CDH's 1949</u>					
CDH-1	vert	520'	N/A	N/A	N/A
CDH-3	vert	735'	"	"	"
CDH-6	vert	457'	"	"	"
CDH-8	vert	352'	"	"	"
TOTAL FOOTAGE DRILLED					
Cyprus-Tipperary-Minbanco				8020 ft.	
Kerr-McGee				9014 ft.	
Inspiration				400 ft.	
Occidental				1811 ft.	
1949 CDH's				2064 ft.	
Total known Kelvin				22309 ft.	

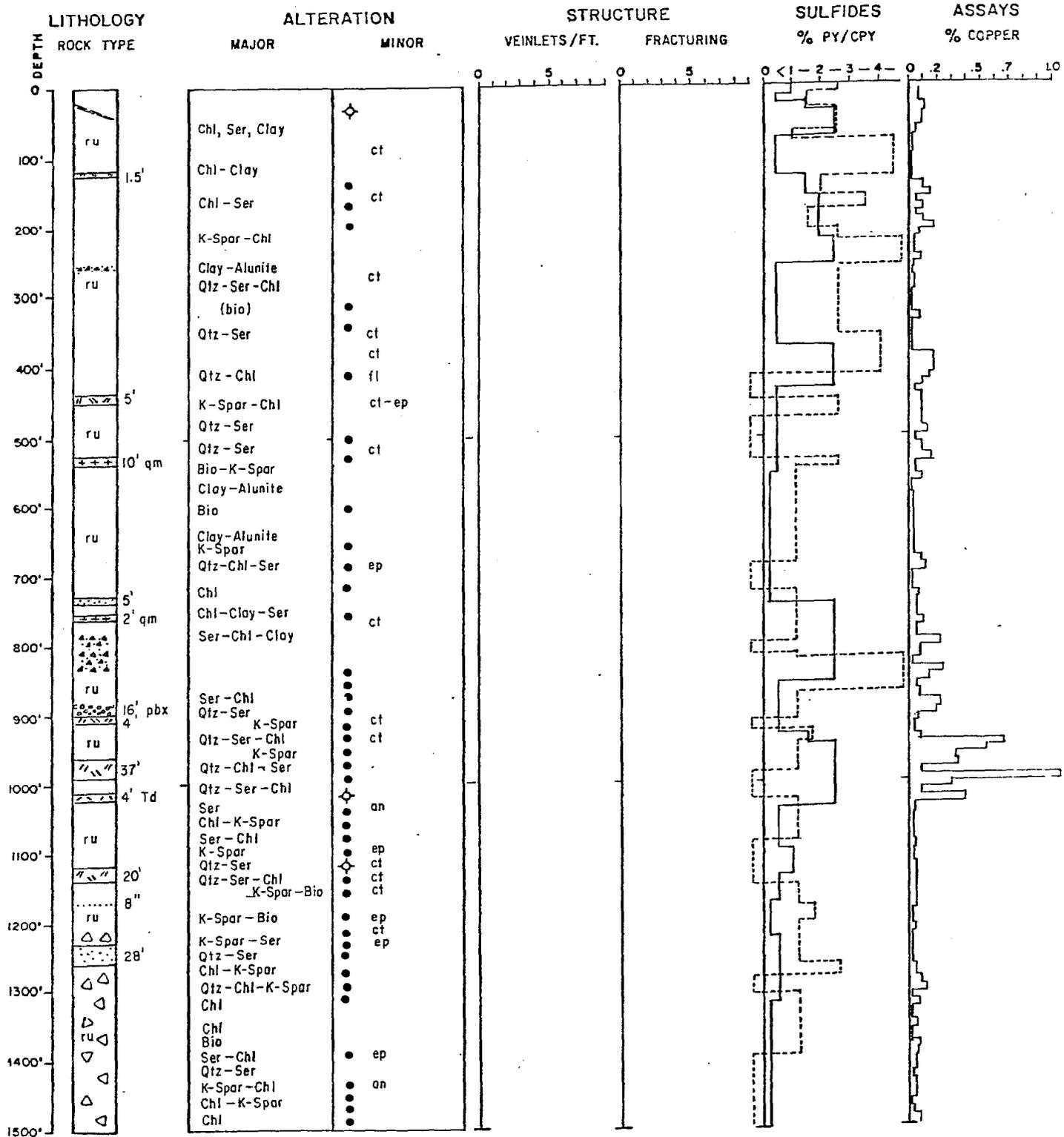
APPENDIX I

KERR-MCGEE DRILL LOG

SUMMARIES FOR K-1 THROUGH K-8

DDH SUMMARY
 KELVIN PROJECT
 PINAL COUNTY, ARIZONA

DDH- K-1
 T.D. 1500'

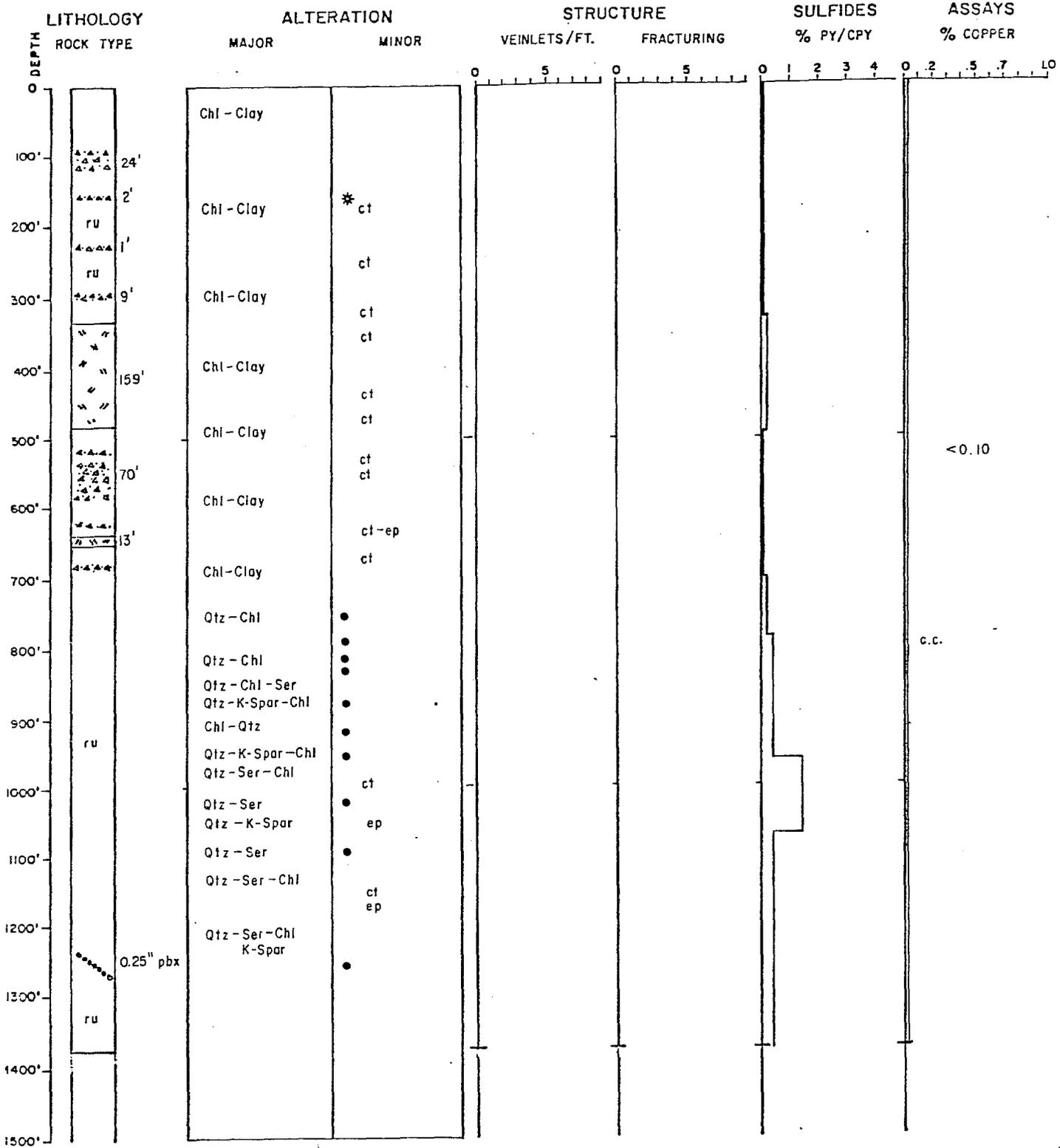


Dike, quartz monzonite; diorite
 Diabase
 Aplite
 Ruin granite

Total
 Py/cpy

DDH SUMMARY
 KELVIN PROJECT
 PINAL COUNTY, ARIZONA

DDH- K-2
 T.D. 1377'

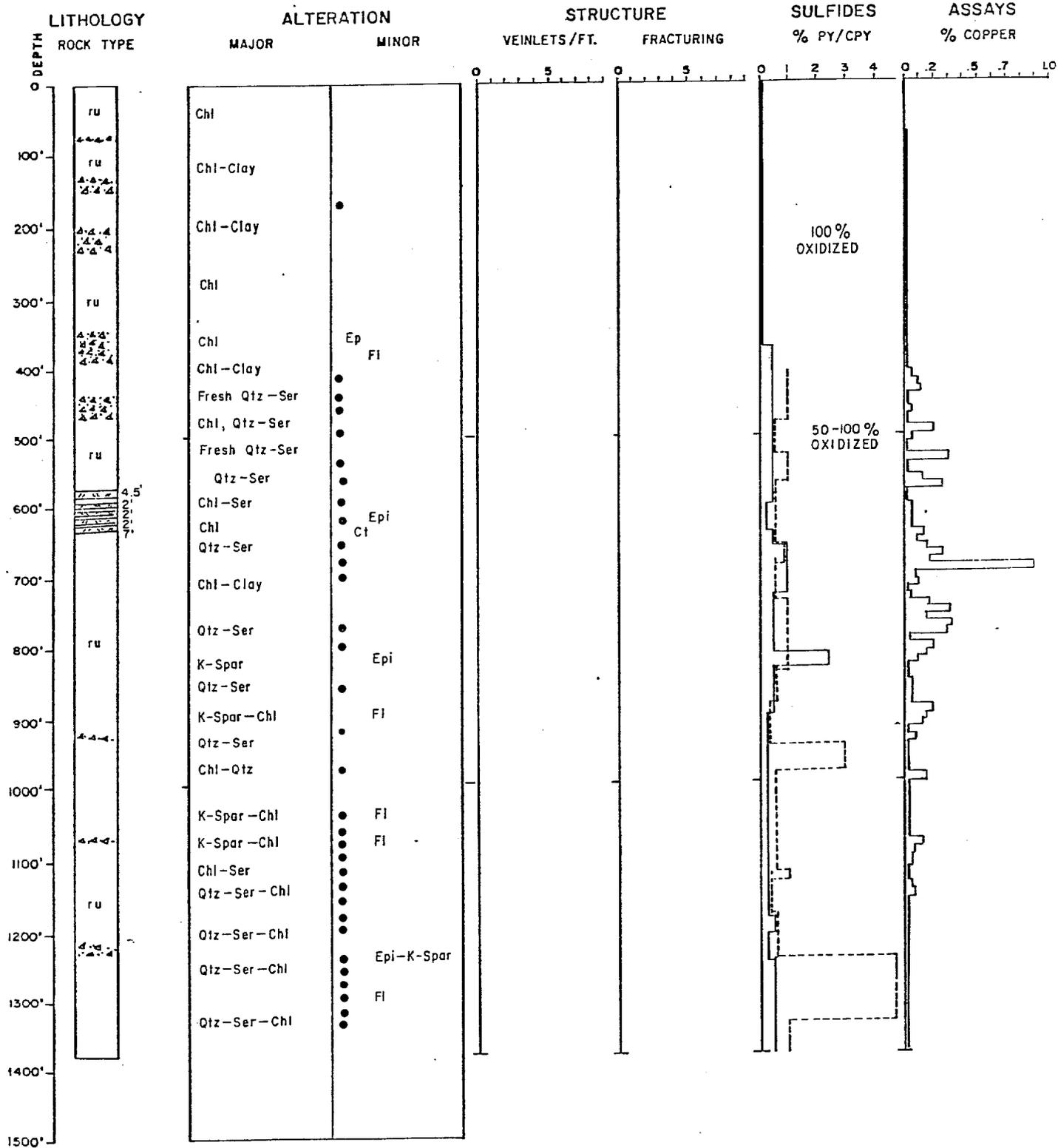


- Dike
- Diabase
- Aplite
- Ruin granite

- Total
- Py/cpy

DDH SUMMARY
 KELVIN PROJECT
 PINAL COUNTY, ARIZONA

DDH- K-3
 T.D. 1386'

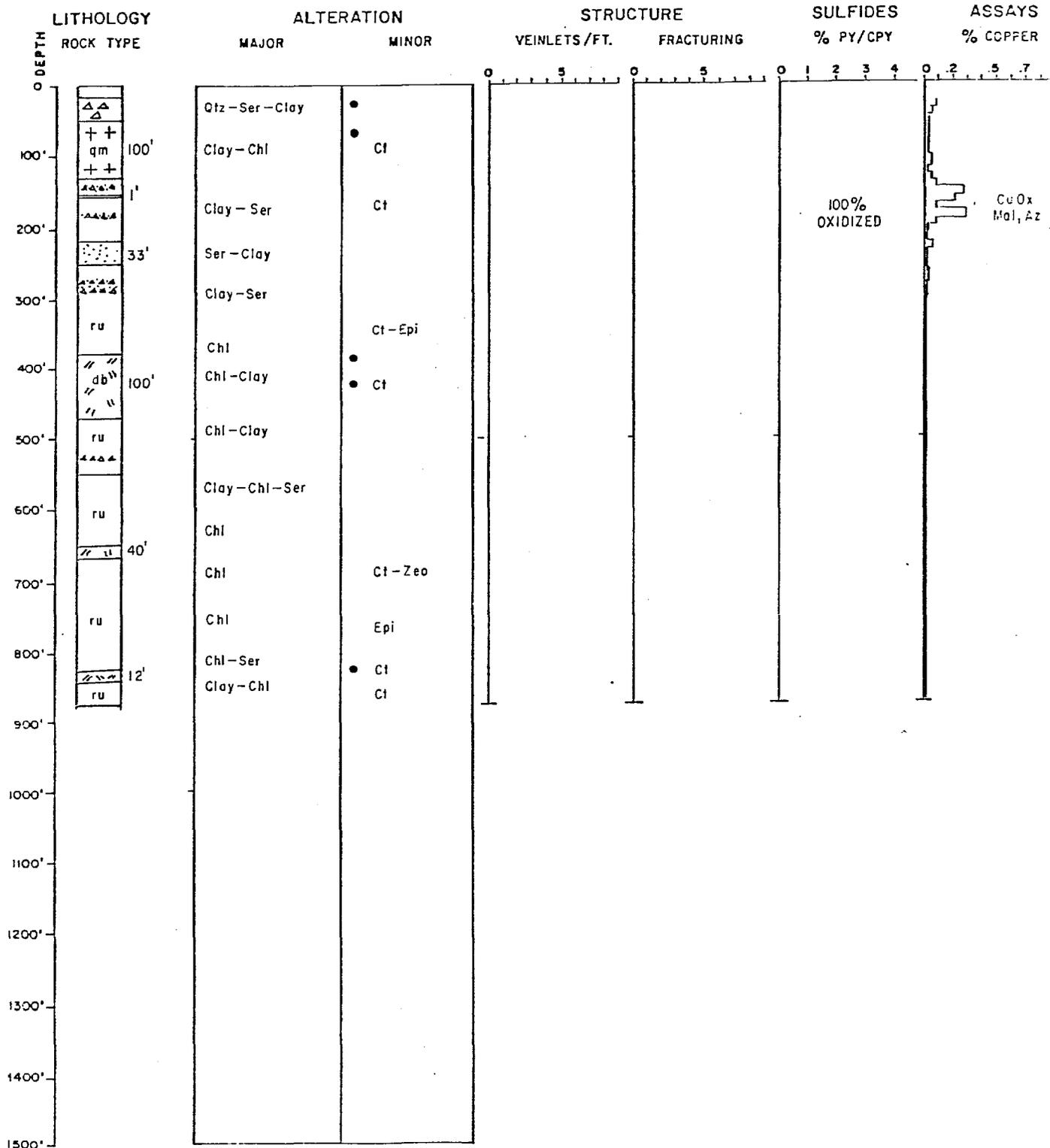


- Dike
- " " Diabase
- Aplite
- ru Ruin granite

- Total
- Py/cpy

DDH SUMMARY
 KELVIN PROJECT
 PINAL COUNTY, ARIZONA

DDH- K-4
 T.D. 875'

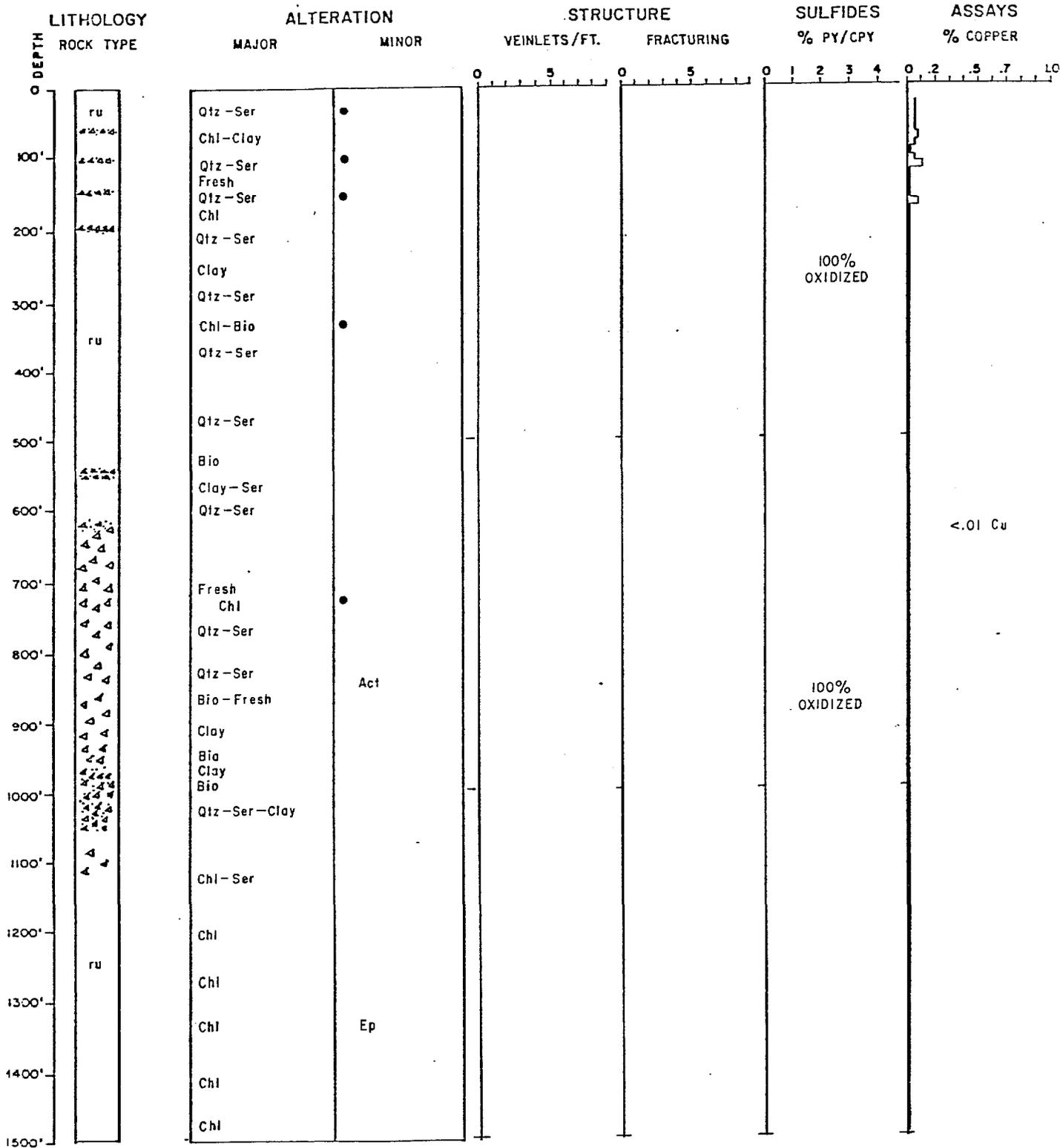


- Dike, quartz monzonite porphyry
- Diabase
- Aplite
- Ruin granite

- Total
- Py/cpy

DDH SUMMARY
 KELVIN PROJECT
 PINAL COUNTY, ARIZONA

DDH- K-5
 T.D. 1497'

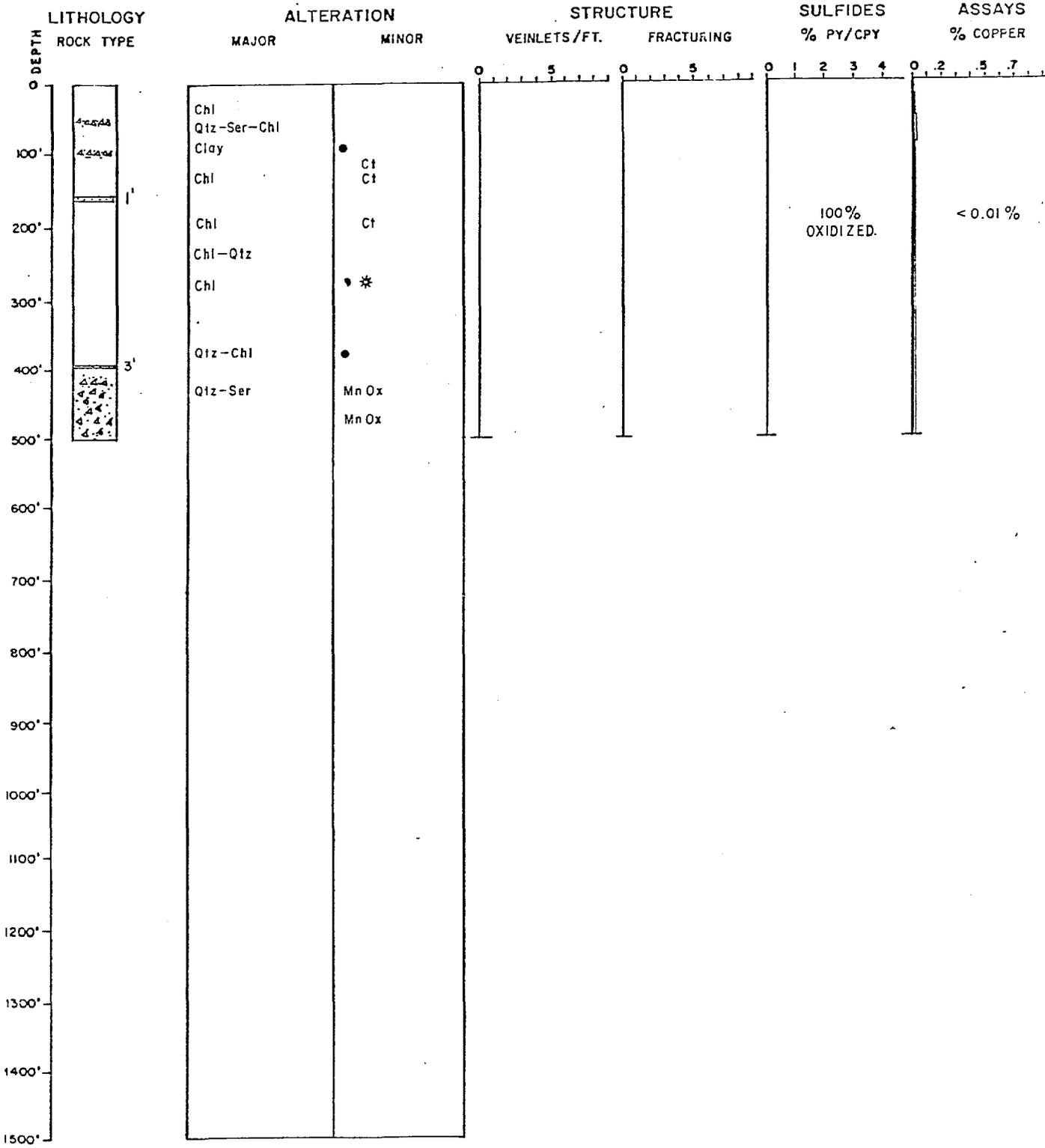


- Dike
- Diabase
- Aplite
- Ruin granite

- Total
- Py/cpy

DDH SUMMARY
 KELVIN PROJECT
 PINAL COUNTY, ARIZONA

DDH- K-6
 T.D. 500'

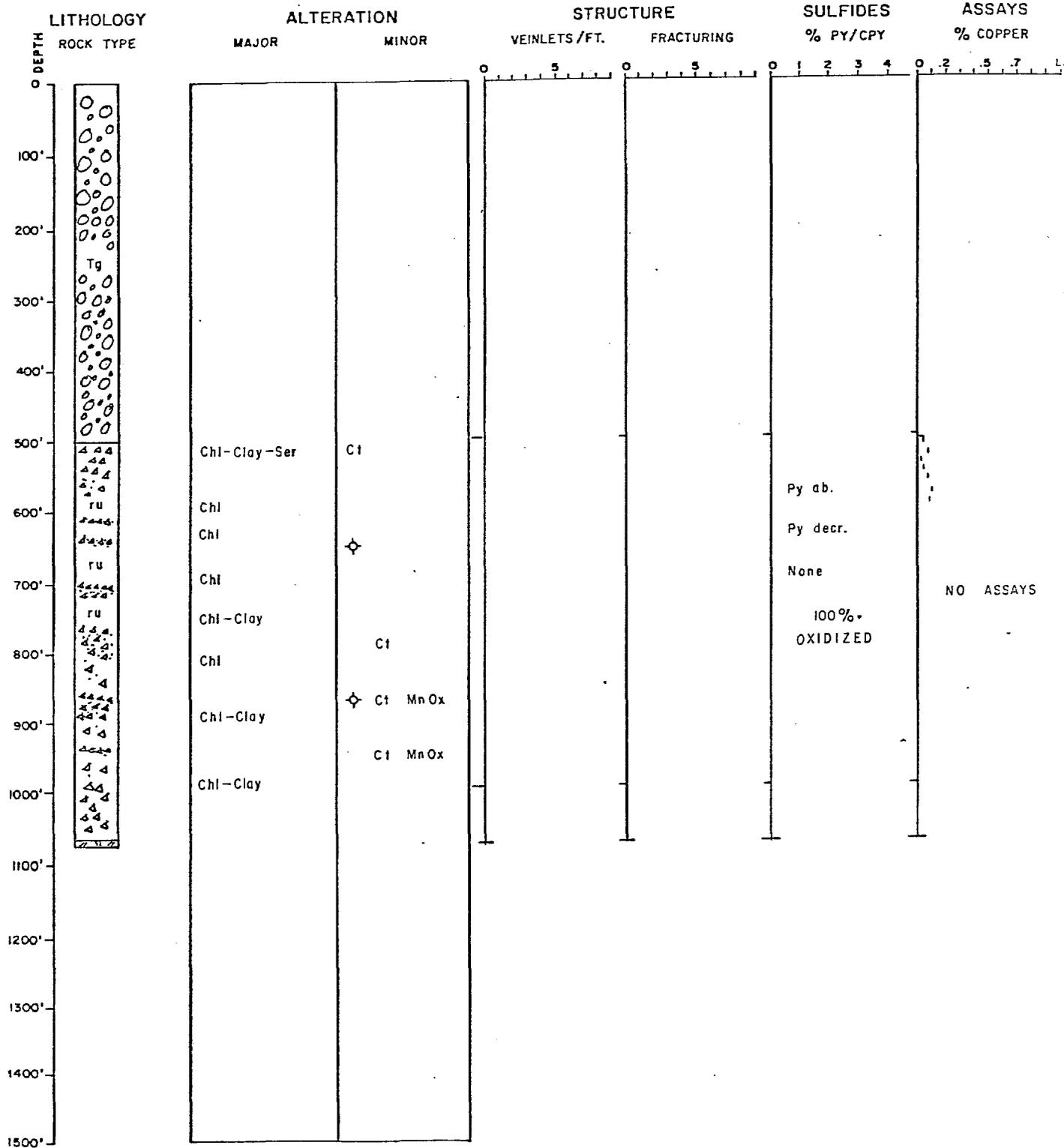


- Dike
- Diabase
- Aplite
- Ruin granite

- Total
- Py/cpy

DDH SUMMARY
 KELVIN PROJECT
 PINAL COUNTY, ARIZONA

DDH- K-7
 T.D. 1077'

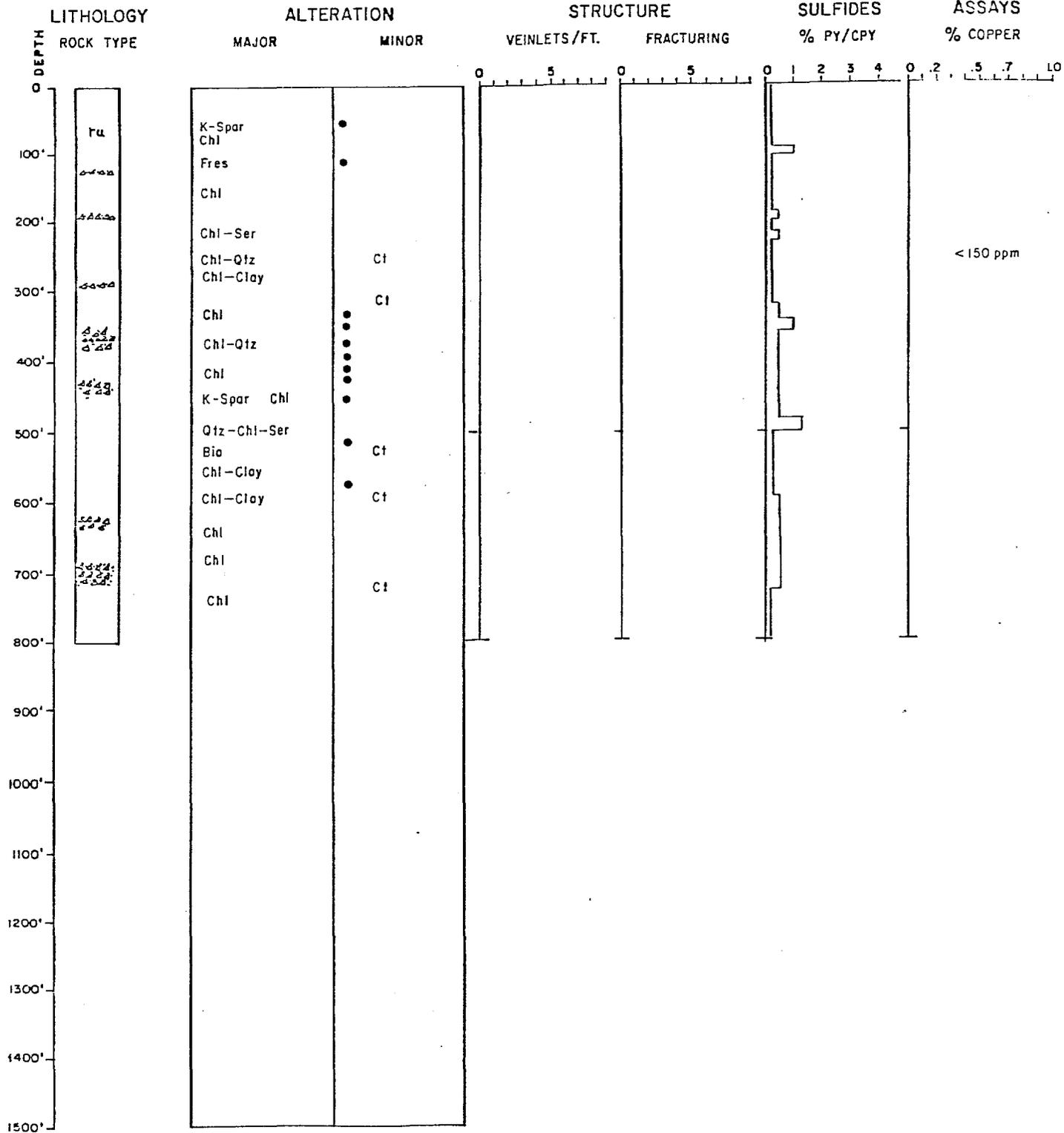


- Gila conglomerate
- Diabase
- Aplite
- Ruin granite

Total
 Py/cpy

DDH SUMMARY
 KELVIN PROJECT
 PINAL COUNTY, ARIZONA

DDH- K-8
 T.D. 802'



< 150 ppm

KELVIN DDH-1

	<u>Sample Number</u>	<u>Cu ppm</u>	<u>Pb ppm</u>	<u>Mo ppm</u>
AZ.KT-	19/50	205	15	-1
	50/100	120	15	-1
	100/150	50	10	5
	150/200	110	15	4
	200/250	400	15	3
	250/300	305	35	1
	300/350	20	15	-1
	350/400	295	20	11
	400/450	150	25	2
	450/500	95	25	-1
AZ.KG-	100/110	65	10	-1
	150/160	110	15	-1
	200/210	55	10	5
	290/300	275	10	1
	300/310	145	15	7
	400/410	155	20	-1
	440/450	195	15	-1
	500/510	145	20	21
COMPOSITES				
AZ.KJ-	50/80 80/100	130	20	-1
AZ.KG-	100/110	35	10	7
KJ-	110/120			
KJ	120/140			
KJ	140/150			
AZ.KG-	150/160	250	10	5
KJ	160/180			
KJ	180/200			



	<u>Sample Number</u>	<u>Cu ppm</u>	<u>Pb ppm</u>	<u>Mo ppm</u>
<u>COMPOSITES</u>				
AZ.KG-	200/210	230	15	1
KJ	210/230			
KJ	230/250			
AZ.KG-	290/300	205	10	-1
KJ	310/330			
KJ	330/350			
AZ.KG-	300/310	55	15	1
KJ	310/330			
	330/350			
AZ.KJ-	350/370	325	20	-1
	370/390			
	390/400			
AZ.KG-	400/410	175	20	2
KG	440/450			
KJ	410/425			
	425/440			
AZ.KJ	450/470	120	25	3
	470/485			
	480/490			
	490/500			

By: Parry D. Willard

Parry D. Willard



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY UTAH

RENO NEVADA

TUCSON ARIZONA



TUCSON OFFICE

ROCKY MOUNTAIN GEOCHEMICAL CORP.

2561 EAST FORT LOWELL ROAD · TUCSON, ARIZONA 85716 · PHONE: (602) 795-9780

Certificate of Analysis

Page 1 of3.....

Date: September 28, 1978

Client: Gulf Mineral Resources
2015 N. Forbes
Suite #105
Tucson, Arizona
85705

RMGC Numbers:

Local Job No.: ~~78-15-30~~

Foreign Job No.:

Invoice No.: T8294.

Client Order No.: 21148

Report On: 40 samples

Submitted by: Tom Heidrick

Date Received: September 7, 1978

Analysis: Cu, Pb, Mo

Analytical Methods: Determined by Atomic Absorption

Remarks: Kg and Kj samples assayed in 50' intervals.

cc: Enc: 2
RMGC/SLC
file

PDW/lb

All values are reported in parts per million unless specified otherwise. A minus sign (—) is to be read "less than" and a plus sign (+) "greater than." Values in parenthesis are estimates. This analytical report is the confidential property of the above mentioned client and for the protection of this client and ourselves we reserve the right to forbid publication or reproduction of this report or any part thereof without written permission.

ND = None Detected

1 ppm = 0.0001%

1 Troy oz./ton = 34.286 ppm

1 ppm = 0.0292 Troy oz./ton

SOUTHWESTERN ASSAYERS & CHEMISTS, Inc.

REGISTERED ASSAYERS

WIL WRIGHT
ARIZONA REG. NO. 5875

P.O. BOX 7517
TUCSON, ARIZONA 85725

710 E. EVANS BLVD.
PHONE 602-294-5811

Gulf Minerals Resources
Mr. Greg Wessel
2015 N. Forbes Blvd.-Suite 105
Tucson, Arizona 85705

JOB# 022225
RECEIVED 10-10-78
REPORTED 10-16-78

PO# 21164

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD PPM	COPPER PPM	ZINC %		MOLYBDENUM PPM
KEG-1-J;							
510-525			16	314			11
525-540			14	204			25
540-550			10	92			5
KE-1:							
550-600			9	220			7
600-650			10	101			2
650-700			11	174			10
700-750			12	312			19
750-800			10	199			9
800-850			12	227			9
850-901			18	361			3
901-950			7	56			< 1
950-1000			6	80			1
1000-1050			9	131			2
1050-1100			10	70			< 1
1100-1150			8	48			2
1150-1200			8	56			< 1
1200-1250			7	55			< 1
1250-1300			8	56			< 1
1300-1350			7	100			7
1350-1400			8	70			1
1400-1450			6	66			3
1450-1500			8	66			< 1
1500-1555			9	64			1
1550-1600			7	48			< 1
1600-1650			8	69			< 1
1650-1700			9	88			< 1
1700-1750			8	70			< 1
1750-1800			7	66			< 1

CHARGE _____

* Gold and Silver reported in tray oz. per 2,000 lb. ton.

INVOICE

SOUTHWESTERN ASSAYERS & CHEMISTS, Inc.

REGISTERED ASSAYERS

WIL WRIGHT
ARIZONA REG. NO. 5875

P.O. BOX 7517
TUCSON, ARIZONA 85725

710 E. EVANS BLVD.
PHONE 602-294-5811

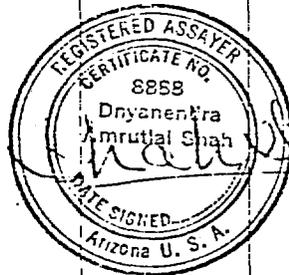
Gulf Minerals Resources
G. Wessel

Page 2 of 2

JOB# 022225 Continued

RECEIVED _____
REPORTED _____

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD PPM	COPPER PPM	ZINC %	MOLYBDENUM PPM
1800-1850			9	106		4
1850-1900			9	138		11
1900-1935			8	141		< 1
1935-1950			8	146		2
1950-1952			7	373		4
1952-1957			6	244		5
1957-1981			8	95		< 1
1981-1983			7	95		9
1983-1995			6	85		3
1995-1997			8	46		< 1
1997-2000			8	64		< 1



10-16-78

AFE # 8214

KEVIN

Customer Copy - Please pay from this

Pb-39 @ \$1.50, Cu-39 @ \$1.50, Mo-39 @ \$2.50, Prep-39 @ \$1.50

CHARGE \$ 273.00

* Gold and Silver reported in troy oz. per 2,000 lb. ton.

INVOICE

SOUTHWESTERN ASSAYERS & CHEMISTS, INC.

WIL WRIGHT
ARIZONA REG. NO. 5875

REGISTERED ASSAYERS
P. O. BOX 7517
TUCSON, ARIZONA 85725

710 E. EVANS BLVD.
PHONE 602-884-5811
884-5812

DNYANENDRA A. SHAH
ARIZONA REG. NO. 8888

Gulf Minerals Resources
Mr. Greg Wessel
2015 N. Forbes Blvd.-Suite 105
Tucson, Arizona 85705

JOB # 022513
RECEIVED 1-5-79
REPORTED 1-11-79

SAMPLE NUMBER	GOLD OZ.*	SILVER OZ.*	LEAD PPM	COPPER PPM	ZINC PPM	MOLYBDENUM PPM
KE-4:						
0-50			12	74		3
50-100			13	93		3
100-150			11	97		3
150-200			9	62		2
200-233			8	64		4

REGISTERED ASSAYER
CERTIFICATE NO.
8888
Dnyanendra
Amrutlal Shah
ARIZONA U. S.
1-11-79

1 ppm = 0.0001%

1 troy oz./ton = 34.286 ppm

1 ppm = 0.0292 troy oz./ton

* Gold and Silver reported in troy oz. per 2,000 lb. ton.

May 21, 1992

FILE NOTE

Kelvin Prospect
Sec. 10-11-12-13-14-15
T4S, R14E
Pinal County, Arizona

Porphyry coppers are being reviewed and a packet of data came in on the Kelvin Prospect near Riverside, Pinal County, Arizona.

The packet included reports now in the Kelvin file:

1. Geol. Report on Holes J-1 thru J-9, Tipperary Resources (Johnson Claim).
2. Summary report for Cities Services on the Tipperary drilling and several K-M holes in area.
3. Kerr-McGee data of 1972-1976.
4. Gulf Minerals Resource reports on 1977-1978 drilling.

JDS:mek


James D. Sell

cc: W.L. Kurtz

See File:

Geologic Report of the Kelvin Prospect, Pinal Co., AZ. June 1970, for Tepperary Resources Corp. logs & assays of hole J-1 thru J-9. (24 p + ^{8 maps} appendices)

The Kelvin Prospect, Pinal Co., AZ, - A Summary Geologic Report for Cities Service Mineral Contractors by J. P. Vaoman. 11/75. 11 p + maps (Review of Tepperary & several K-M holes in area).

Kelvin Porphyry Copper Report, Pinal County, AZ, Ken-McGee Date 1972-1974. Includes:

1. Indicated low-angle faults in the Kelvin Area, Pinal Co., AZ, and recommendation for additional Geologic Investigations, by R. M. Corn. July 20, 1973, 12 p., 3 maps (8 1/2 x 11).
2. DDH K-2 and K-3 Drilling Result with Recommendation for Additional Drilling, Kelvin Prospect, by D. A. Wolfe, June 1973, K-M. 9 p. plus drill loss - assays - ratios etc.
3. Evaluation of Cyprus' Drilling Result and Disseminated Copper Potential (Tepperary area). Johnson Claim Submitted, Kelvin Prospect, by D. A. Wolfe. Jan 10, 1973 - Hole KE-1. 4 pages + logs, assays, ratios etc.
4. Exploration Potential of the Porphyry Copper Alteration System, near Kelvin, Pinal Co.

Mining Post, by P.M. Conn. May 20, 1971. 170.
+ maps etc.

Kelvin Douglas Copper Project, Gulf Mineral Services
Report on Geology and 1978 Drillings Results. 1977
Report on the Geology, Geochemistry and Exploration
Potential of the Kelvin Douglas Copper Project.
Includes:

1. Final Report on the Geology and 1978 Drillings
at the Kelvin (Newlands) Douglas Co-Mo Project
by Staff Gulf Mineral, Feb. 1979. 4p intro
+ figs + parts of 30+ page report, with
Summary of K-M drill logs K-1 thru K-8,
geochem assays, Zonge Report, Maps, etc.

11/75

du Rare Metals area file

EE Jones from MLCOM July 20, 1973

Indicated towards fault in Kelvins area, etc

10 p. & maps

Final Report on the Oct 6 1978 drilling at the Kelvins etc.

Tuesday

Wednesday

Thursday

(only map & description)

Greg Menden Feb 1979

DDH K-2 & K-3 drill log

w/ record etc by David A Wolfe 9 p.

June 1973 drill logs & logs

DDH K2 & K3 drill logs June 23

RC from B.S. Mena Summary of Daily

result of the study 7 p.

Expl. Pot of Reddit Dept Kelvins ex 8 1/2 x 11
by MLCOM May 20 '71 20 p. (No maps)

K2 & K3 drill records May 20, 1971

RC B.S. Mena (No maps) 11 p. - Assen log

graphs of Cur vs Th vs U vs K

Kelvins Drilling Results w/ rec. Oct 72

RC from B.S. Mena (no maps) ex 8 1/2 x 11 2 p

Pot for RC Th Cur vs Kelvins by W.A. Wolfe Oct 72 17 p

March 5, 1992

J.D. Sell

Johnson Prospect
Ripsey District
Pinal County, AZ

One day, February 12, 1992. was spent sampling this prospect. The geologic and structural setting is extremely complex and the area is thought to be rotated up to 90° from its original position along a number of low angle gravity slide faults and later cut by high angle normal faulting. All of the dikes (sills?) seen are nearly vertical suggesting the possibility of rotation.

Mineralization as seen in surface exposures is associated with diabase dikes or sills and rhyodacite dikes in contact with the Ruin granite. The dikes appear to occur along faults. Mineralization consists of copper oxides, hematite, pyrite, and in the southern area, chalcopyrite and molybdenite. Depth to sulfides is probably less than 100'.

The northern area sampled (indicated by sample numbers 1-4) appears to be associated with an E-W trending nearly vertical quartz latite dike which has intruded the Ruin granite. Several shafts and pits have been dug on this contact zone. Mineralization as seen consists of copper oxides, hematite and manganese mostly confined to the very linear but narrow (<5') fault/contact zone. The hematitic color anomaly, however, extends away from the contact zone for a considerable distance. Of the four samples taken in this area of alteration, JO-1-3 showed the best gold, silver, and copper values across the main structure. Interestingly enough, some of the best looking sericitic alteration (JO-4) taken across a vertical fault zone 4' wide showed little base metals but the highest gold assays in any of the samples (.43 ppm Au).

The southern area appears to be in a different geologic regime with mineralization associated with the contact of a diabase dike/sill? with the Ruin granite. This is also the area indicated by Wombat Resources as having the highest gold potential. Several adits and shafts have been developed along the contact. In addition, the Ruin is altered and silicified within a 100' wide zone adjacent to the contact. Samples 5-7 were taken along the contact of the diabase/Ruin and samples 9-10 were taken across the altered zone of Ruin granite. Samples 8, 11 are select sulfide dump samples. The results of this sampling (5-11) showed high copper ranging from 0.12% to 0.52% Cu with locally high silver values (JO-10). Gold was only weakly anomalous in the sulfide dump samples (0.11, 0.23 ppm).

JOHNSON PROSPECT

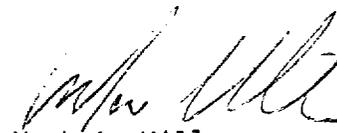
March 5, 1992

The results of the sampling seem to indicate that mineralization, especially in the northerly portion of the area, is strongly structurally controlled within narrow (1-3") structures. In the southern area, however, alteration and mineralization appears to be more widespread.

In reviewing the large amount of data in our files on this area, it is apparent that the near surface potential for economic copper/gold or just copper mineralization is very low. Ed John, in a memo, dated November 19, 1991, to J.D. Sell recognized the widespread but low grade nature of the area. Now we have some assay values to substantiate this. It does appear, however, that there is a good possibility of copper mineralization in the .3+ range 1800+' below the surface.

No further work is recommended by the Exploration Department on the prospect area for near surface mineralization.

MAM:mek
Att.



Mark A. Miller

cc: E. Johns - Ray Mine

JOHNSON PROPERTY
Rare Metals District
Pinal County, Arizona

<u>STATION NUMBER</u>	<u>LITHOLOGY</u>	<u>ALTERATION/ MINERALIZATION</u>	<u>BEDDING</u>	<u>COMMENTS</u>	<u>Au ppb</u>	<u>Cu %</u>
J0-1	Ruin Granite, porphyritic	Hematitic, siliceous in part, propylitic to weak sericite		Sample represents chip across 3' wide zone	8	.13
J0-2	Fault zone, between Ruin Granite and ryodacite dikes	Sericitic, abundant CuOx in fault zone	N60-70°W, 80°S	3' Horizontal chip	288 (379 ppm Ag)	1.05
J0-3	Ryodacite Dike, green aphanitic, subhedral quartz eyes	Porphyritic, slight silic but difficult to tell. Cu oxides on fracture surfaces		5' random chip sample	68	.60
J0-4	Sericite zone	Strongly sericitic, little silica	E-W, vertical		493	316
J0-5	Hematitic zone	Strong hematite and silica	E-W, 80°S	2' Chip sample at contact of diabase and Ruin Granite	33	1.53
J0-6	Ruin Granite	Weak propylitic, black manganiferous oxides, local strong magnetite		HW of J0-5 structure, weak altered Ruin Granite	9	.19
J0-7	FW diabase	Possibly weak sericitic but difficult to tell. 3% CuOx on fractures		Abundant Cu oxides on fractures for first 10' ten much less for remainder, 20' chip sample	17	.67
J0-8	Dump Sample	Select sulfide grab sample up to 10% pyrite		Chip sample select dump sample of fresh sulfide	115	.08
J0-9 & J0-10	Ruin Granite, variably altered	Altered zones within 50' outcrop, where altered is silic and sericitic	E-W, 80°S	50' Wide outcrop split equally between 9 & 10	5 14 (253 ppm Ag)	.12 .52
J0-11	Dump Sample	Fresh sulfides, Py, Cpy, MoS ₂		Hand picked dump sample from oxidized and sulfide dump	233 (62 ppm Ag)	.14

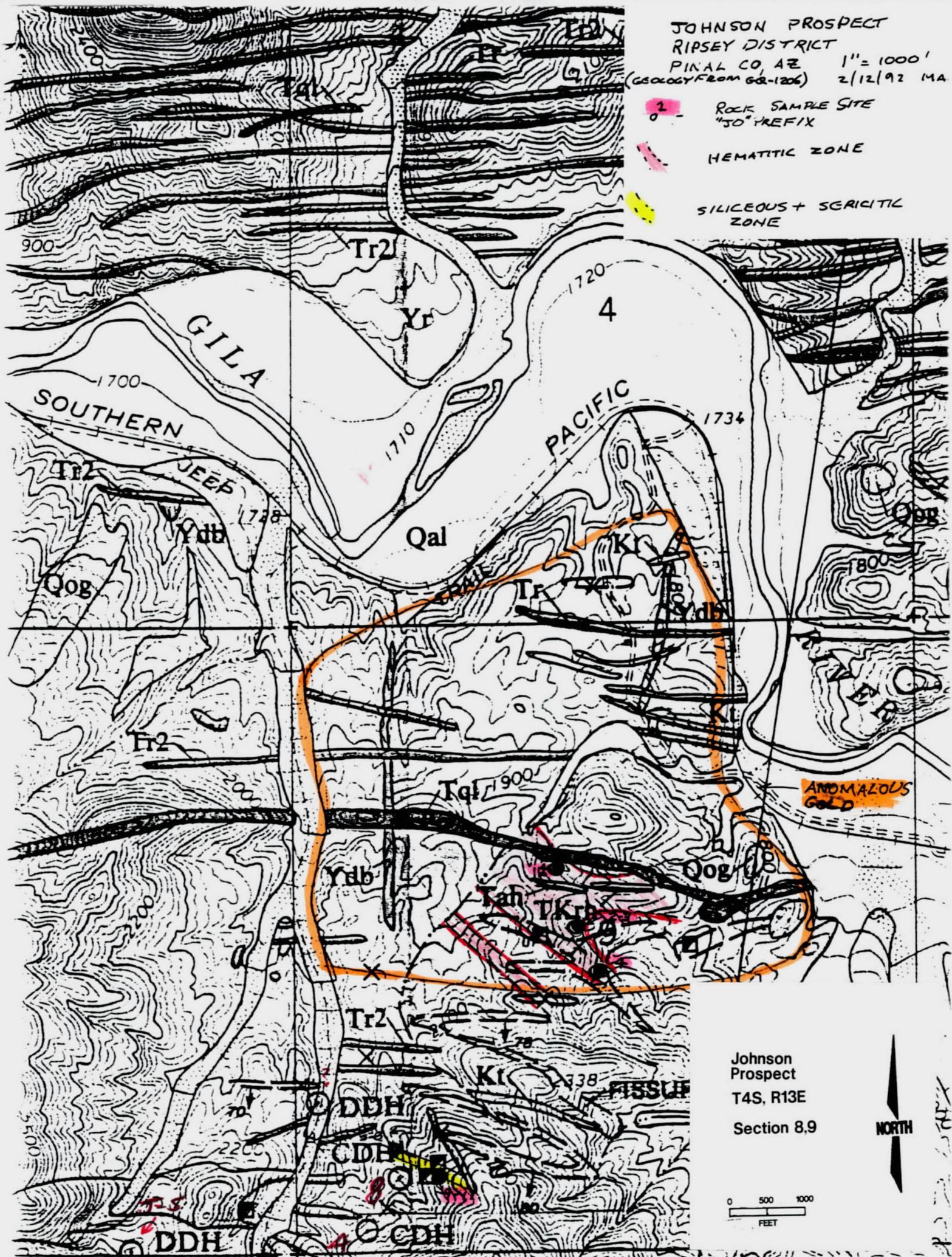
JOHNSON PROSPECT
RIPSEY DISTRICT

PINAL CO, AZ 1" = 1000'
(GEOLOGY FROM 62-1206) 2/12/92 MA

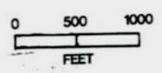
1 - ROCK SAMPLE SITE
"JO" PREFIX

HEMATITIC ZONE

SILICEOUS + SERICITIC ZONE



Johnson Prospect
T4S, R13E
Section 8.9



VII

PRELIMINARY REPORT

ASARCO

FEB 21 1992

SW

ASARCO, INC.

RENO: 1500 Glendale Ave, SPARKS 89431
 P.O. Box 71060, RENO 89570
 Ph (702)356 0606 Fax 3561413

REPORT : SP 015835 1 Page(s) Date : 02/20/92

Client reference : JO-1/11 Project : JOHNSON Cu-Au

Cost code :

Copies to : MARK MILLER (I)

J.D. SELL (R)

Samples : Type Preparation code
 Received : 02/18/92 -----

Analysis	Code	Quality Parameter	Detection	Units
Au	FA30	Acc. 15 %	5	ppb
Au(R)	FA30	Acc. 15 %	5	ppb
Ag	D210	Prec.10 %	0.5	ppm
Cu	D210	Prec.10 %	2	ppm

Signatory : Jorge Ugarte

PRELIMINARY REPORT

ASARCO Inc.

FEB 21 1992

REPORT : SP 015835

SW *Expenditure*

Page 1 of 1

Sample	Au ppb	Au(R) ppb	Ag ppm	Cu ppm
J0-1	8		1.6	1350
J0-2	288	284	379.5	1.05% ✓
J0-3	68	63	80.9	6046
J0-4	493		5.0	316
J0-5	33		7.7	1.53% ✓
J0-6	9		1.9	1928
J0-7	17		7.6	6760
J0-8	115		31.2	809
J0-9	5		13.1	1222
J0-10	14		253.0	5196
J0-11	233	219	62.3	1408

Please refer to the cover sheet for further analysis details.

CLIENT: ASARCO
 CLIENT REF: JOHNSON Cu-Au
 AAL REF: SP015835
 METHOD: AAL 01-0

1500 GLENDALE AVE. SPARKS
 NEVADA 89431
 TELEPHONE (702) 356 0606
 FACSIMILE (702) 356 1413

ELEMENT SAMPLES	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Hg ppm	K %	La ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P %	Pb ppm	Sb ppm	Sr ppm	Th ppm	Ti %	U ppm	V ppm	W ppm	Zn ppm
JO-3	96.5	1.9	16	5	22	1440	0.14	3.9	23	18	6564	8.71	2	0.29	11	0.5	5185	12	0.01	16	0.023	1388	2	23	2	0.01	6	24	1	4366
JO-7	12.8	2.75	2	2	33	31	0.13	0.6	113	42	7040	12.5	2	0.69	23	1.58	5806	128	0.01	38	0.075	325	2	15	2	0.04	5	65	1	1661
JO-9	14.5	0.61	3	2	120	12	0.08	0.5	14	17	1280	4.47	2	0.33	30	0.07	2403	114	0.01	8	0.075	120	2	10	17	0.01	5	16	6	354

DETECTION LIMIT 0.2 0.01 2 2 2 2 0.01 0.2 1 1 1 0.01 1 0.01 2 0.01 1 1 0.01 1 0.01 2 2 1 2 0.01 5 2 1 1

0.500 GRAMS OF PULP IS DIGESTED WITH HYDROCHLORIC AND NITRIC ACID AT 95 DEGREE CENTIGRADE FOR ONE HOUR.
 DIGEST IS PARTIAL FOR B Ba Ca Cr Fe La Mg Mn Sr Ti AND W
 DIGEST IS LIMITED FOR Al K AND Na

VII

PRELIMINARY REPORT

ASARCO Incorp

FEB 21 1992

SW Exploration

ASARCO, INC.

RENO: 1500 Glendale Ave. SPARKS 89431
 P.O. Box 71060, RENO 89570
 Ph (702)356 0606 Fax 3561413

REPORT	: SP 015835	1 Page(s)	Date : 02/20/92
Client reference	: JO-1/11	Project	: JOHNSON Cu-Au
Cost code	:		
Copies to	: MARK MILLER (I)		
	: J.D. SELL (R)		

Samples	Type	Preparation code
Received : 02/18/92		

Analysis	Code	Quality Parameter	Detection	Units
Au	FA30	Acc. 15 %	5	ppb
Au(R)	FA30	Acc. 15 %	5	ppb
Ag	D210	Prec.10 %	0.5	ppm
Cu	D210	Prec.10 %	2	ppm

Signatory : Jorge Ugarte

PRELIMINARY REPORT

ASARCO Inc.

FEB 21 1992

REPORT : SP 015835

SW Laboratory

Page 1 of 1

Sample	Au ppb	Au(R) ppb	Ag ppm	Cu ppm
J0-1	8		1.6	1350
J0-2	288	284	379.5	1.05%
J0-3	68	63	80.9	6046
J0-4	493		5.0	316
J0-5	33		7.7	1.53%
J0-6	9		1.9	1928
J0-7	17		7.6	6760
J0-8	115		31.2	809
J0-9	5		13.1	1222
J0-10	14		253.0	5196
J0-11	233	219	62.3	1408

Please refer to the cover sheet for further analysis details.

J.D. Sell

AS-100

FEB 27 1992

1500 GLENDALE AVE. SPARKS
NEVADA 89431
TELEPHONE (702) 356 0606
FACSIMILE (702) 356 1413

CLIENT: ASARCO
CLIENT REF: JOHNSON Cr-Mn
ANL REF: SP015835
METHOD: BAL 01-0

ELEMENT SAMPLES	Ag	Al	As	B	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	La	Mg	Mn	Mo	Nb	Ni	P	Pb	Sb	Sr	Tb	Tl	U	V	W	Zn
	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	%	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
JO-3	96.5	1.9	16	5	22	1440	0.14	3.9	23	18	6564	8.71	2	0.29	11	0.5	5185	12	0.01	16	0.023	1388	2	23	2	0.01	6	24	1	4366
JO-7	12.8	2.75	2	2	33	31	0.13	0.6	113	42	7040	12.5	2	0.69	23	1.58	5806	128	0.01	30	0.075	325	2	15	2	0.04	5	65	1	1661
JO-9	14.5	0.61	3	2	120	12	0.08	0.5	14	17	1280	4.47	2	0.33	30	0.07	2403	114	0.01	8	0.075	120	2	10	17	0.01	5	16	6	354

DETECTION LIMIT 0.2 0.01 2 2 2 2 0.01 0.2 1 1 1 0.01 1 0.01 2 0.01 1 1 0.01 1 0.01 2 2 1 2 0.01 5 2 1 1

0.500 GRAMS OF PULP IS DIGESTED WITH HYDROCHLORIC AND NITRIC ACID AT 95 DEGREE CENTIGRADE FOR ONE HOUR.
DIGEST IS PARTIAL FOR B Ba Ca Cr Fe La Mg Mn Sr Tl AND W
DIGEST IS LIMITED FOR AL K AND Na

1042120004 FILE
10
FROM HICKMAN, MOORE LABORATORY
FEB-27-1992 10:11

J.D. Sell

AS-40

FEB 27 1992

1500 GLENDALE AVE. SPARKS
NEVADA 89431
TELEPHONE (702) 356 0606
FACSIMILE (702) 356 1413

TOTAL P. 01

CLIENT: ASARCO
CLIENT REF: JOHNSON C1-20
ANAL REF: SP015835
METHOD: AAL 01-0

ELEMENT SAMPLES	Ag	Al	As	B	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	La	Mg	Mn	Mo	Nb	Ni	P	Pb	Sb	Sr	Tb	Ti	U	V	W	Zn
	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	%	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
JO-3	96.5	1.9	16	5	22	1440	0.14	3.9	23	18	6564	8.71	2	0.29	11	0.5	6185	12	0.01	16	0.023	1388	2	23	2	0.01	6	24	1	4366
JO-7	12.8	2.75	2	2	33	31	0.13	0.6	113	42	7090	12.5	2	0.69	37	1.56	5806	128	0.01	38	0.075	325	2	15	2	0.04	5	65	1	1661
JO-9	14.5	0.61	3	2	120	12	0.08	0.8	14	17	1280	4.47	2	0.33	30	0.07	2400	214	0.01	8	0.075	120	2	10	17	0.01	5	16	6	354

DETECTION LIMIT 0.2 0.01 2 2 2 2 0.01 0.2 1 1 1 0.01 1 0.01 2 0.01 1 1 0.01 1 0.01 2 2 1 2 0.01 5 2 1 1

0.500 GRAMS OF PULP IS DIGESTED WITH HYDROCHLORIC AND NITRIC ACID AT 95 DEGREE CENTIGRADE FOR ONE HOUR.
DIGEST IS PARTIAL FOR B Ba Ca Cr Fe La Mg Mn Sr Ti AND W
DIGEST IS LIMITED FOR AL K AND Na



*Accepted
AGS Spring
Field Trip
April 16, 1989*

STRUCTURAL ROTATION AND STRUCTURAL COVER
at the
KELVIN PORPHYRY COPPER PROSPECT, PINAL COUNTY, ARIZONA

Russell M. Corn and Richard Ahern

The Kelvin porphyry copper prospect is an example of a structurally rotated system of alteration and mineralization that has been displaced by faulting and concealed beneath superimposed "structural cover". It is located in the Riverside Mining District at the north end of the Tortilla Mountains, approximately six miles south of the Ray porphyry copper deposit.

REGIONAL SETTING

The Tortilla Mountains and the area to the north, including parts of Ray, are in a structurally rotated terrain characterized by steep, east dipping Tertiary, Paleozoic and Precambrian sedimentary rocks overlying Precambrian granite. Diabase sills that intruded the Precambrian sedimentary rocks and the underlying granite were also rotated and are now near vertical, appearing in outcrop as though they were dikes. These sills are prominent in the granite up to 3,000 feet below the base of the overlying Apache Series but are seldom found at depths of more than 5,000 feet below that paleo-erosion surface except for occasional feeder dikes generally trending east-west. Exposures of generally east-west trending Tertiary dikes cutting the granite are sub-parallel to the inferred direction of rotation.

This pattern of steeply dipping sedimentary rocks and near-vertical diabase sills in granite exposed along the east side of the Tortilla Mountains is repeated on the west side of Ripsey Wash indicating that there has been structural rotation of 60 to 90 degrees and westward movement. These rock units together with parts of the superimposed porphyry copper alter-

ation pattern observed at Ripsey Wash have been displaced laterally along a low-angle normal fault for as much as three miles to the west relative to those exposed along the east side of the Tortilla Mountains.

EXPOSED PYRITIC ALTERATION

The pyritic-phyllitic alteration exposed on top of the higher hills along the south edge of Section 12, south of the Gila River and west of Riverside occurs above propylitic altered unmineralized rocks and is interpreted as a remnant of the cylindrical zone of phyllic alteration that, after rotation, was the lower part of the now horizontal alteration system. A low-angle fault beneath the sub-horizontal zone of pyritic-phyllitic alteration on top of the hills exaggerates the change to propylitic alteration at lower elevations. In this area most of the central parts of the alteration system appears to have been removed by structural disruption and erosion. The vein-replacement deposits at Riverside represent exterior mineralization related to the rotated alteration system and the Riverside breccia pipe and pyritic breccias in Section 13 to the south, are interpreted as rotated exterior breccia pipes related to but outside the porphyry copper alteration center.

Supergene chalcocite mineralization is associated with the zone of pyritic-phyllitic alteration on top of the hills. The chalcocite mineralization was evaluated during the 1920's and probably drilled again during the 1940's. Several additional holes were drilled in the area during the 1960's and 1970's by Kennecott, Occidental and Gulf Minerals. Data is not available, but the remnant chalcocite min-

eralization appears to be noncommercial and to have been partially destroyed by oxidation, leaching and erosion. The exposed pyritic alteration is terminated on the west by a high-angle fault on the west flank of the Tortilla Mountains. Geologic data is limited and inconclusive but the repeated segments of diabase sills that extend northward toward Ray suggest that rocks exposed west of this fault are faulted down and were displaced approximately one mile westward from equivalent diabase sills to the east.

A narrow, elongate zone of pyritic-phyllitic alteration is exposed west of this fault at the base of the hill north of the Florence-Kelvin road. This small area of pyritic alteration is interpreted as a segment of the outer edge of the sub-horizontal shell of pyritic-phyllitic alteration. Exposures on the hill show a gradational but sharply zoned pattern of increasing intensity of alteration and mineralization, from propylitic alteration higher on the hill to phyllic alteration at the base of the hill. As shown on the accompanying section, this pattern of increasing intensity of alteration and copper mineralization continued with increasing depth in Kerr-McGee drill hole K-1 until terminated by a fault. An east-west trending high-angle fault that is located beneath alluvial cover, near the base of the hill, separates the phyllic alteration from unmineralized alteration to the south. The propylitic altered, unmineralized granite in exposures south of the road represents a "structural cover" of fault superimposed material derived from a position exterior to the pyritic-phyllitic alteration. The term "Structural cover" is used here to describe extensive, displaced upper plate rocks positioned above a low-angle fault that cover and conceal underlying rock units and mineralization.

KELVIN ALTERATION SYSTEM

The zoned porphyry copper alteration pattern exposed at Kelvin is a typical concentrically zoned, vertically extensive alteration system which has had the vertical axis rotated into a near-horizontal position and parts of the system displaced by low-angle faults during the period of listric faulting and structural rotation. This is similar to that described by others at San Manuel-Kalamazoo and on the west side of Ray. Alteration and mineralization effects related to the Kelvin system extend for more than 5 miles from the originally shallow and exterior vein and replacement mineralization at Riverside to the deep potassic alteration and molybdenum mineralization exposed in the Rare Metals Mine area, one and one half miles west of Ripsey Wash. The ground between these two end-members approximates the trace of the rotated axis of the alteration system along which fault slices of the alteration system and associated mineralization have been identified in outcrops and in drill hole intercepts.

EXPLORATION

Exploration of the Kelvin porphyry copper system during the 1970's by Kerr-McGee, Gulf Minerals and Cities Service was based on the geologic concept of a structurally-rotated alteration system that was displaced by low-angle faults with mineralization concealed beneath subsequent slide blocks of unmineralized granite and Tertiary sedimentary rocks originating from areas outside of the alteration pattern as is schematically shown Figure 2. Earlier Exploration by Occidental Petroleum, Kennecott, Tippetary Resources, Cyprus Minerals and others were probably directed toward extensions of exposed mineralization and surficial alteration features based on a much simpler structural model.

KERR-MCGEE DRILLING RESULTS

Geologic relationships at Kelvin are complicated by both high-angle and low-angle faults of unknown but substantial displacement. These structures are difficult to interpret since most of the faulting involves juxtaposing different blocks of Precambrian Ruin Granite against each other and lithologic markers are scarce in the granite which hosts the alteration and mineralization. The drill holes in this area encountered alteration features and disseminated copper mineralization similar to that observed in and adjacent to Ray, San Manuel, and other porphyry copper deposits. Except for a few thin intercepts of diabase, diorite porphyry and quartz monzonite porphyry, Precambrian granite was the only rock penetrated in the Kerr-McGee drill holes. Detailed descriptions of the Kerr-McGee drill holes are available at the Arizona Geological Survey and generalized results of their drilling are illustrated on the accompanying drill hole and geologic cross-sections (Figures 2 & 3) and summarized below.

DDH K-1, located near the edge of the pyritic-phyllitic alteration is near the base of the hill just north of the Florence-Kelvin road. The drill core exhibited a continuing increase in the intensity of pyritic-phyllitic alteration and increasing copper values with depth. This trend of increasing alteration intensity and mineralization terminates abruptly at a probable low-angle fault contact at a depth of 1,030 feet. Copper values above the fault were in excess of .40% copper and the 230 foot interval above the fault averaged .24% copper. Rocks beneath the fault are characterized by low-sulfide mineralization and mixed weak pyritic-potassic-propylitic alteration with values of .03% to .10% copper suggestive of a deep, exterior position within a typical zoned alteration system.

DDH K-2, collared in an area of outcropping weak propylitic altered unmineralized granite south of the Florence-Kelvin road, penetrated a low-angle(?) fault at a depth of 700 feet and encountered low-sulfide copper mineralization with values of .03% to .10% copper and weak pyritic-potassic-propylitic alteration similar to that noted in the lower part of DDH K-1.

DDH K-3, located near the road but west of K-1 and K-2, penetrated the high-angle fault at a depth of 350 feet with relatively strong mineralization beneath it. Below a second fault zone at a depth of 700 feet the intensity of alteration and mineralization diminished with increasing depth in a zone of low-sulfide potassic-propylitic alteration similar to that encountered at similar depths in drill hole K-2.

STRUCTURAL COVER AND MINERALIZATION NEAR RIPSEY WASH

Exposures to the west of the area of Kerr McGee drilling, toward Ripsey wash, are dominantly propylitic altered Precambrian granite and post mineral Tertiary sedimentary rocks. The propylitic altered granite is similar to and probably part of the same structural block as the unmineralized granite noted in the upper part of hole K-2. The Tertiary units dip to the east at from 20 degrees to more than 60 degrees and are underlain by shattered and brecciated granite and diabase indicative of detachment type rotation and displacement. An unusual zone of Precambrian granite is exposed on the west side of Ripsey Wash, extending north of the Wooley Breccia Pipe and bounded on the north and west by the Florence-Kelvin road. The Precambrian granite west of and underlying the up-ended blocks of Tertiary sedimentary rocks is intensely shattered and lacks the diabase sills and prominent porphyry dikes which characterize the granite elsewhere. This

zone appears to be a contiguous part of the same relatively thin structural slice as the adjacent rotated Tertiary units. The thickness of this structural cover is not known, but exposures of intensely brecciated granite and diabase beneath the Tertiary rocks on the east side of Ripsey Wash suggest that it may be relatively thin. In contrast, the Precambrian granite exposed north and south of this area hosts diabase sills and tertiary dikes but is not intensely shattered. Available geologic data, in particular the near-vertical diabase sills and the gently plunging Wooley breccia Pipe, indicate structural rotation of 90 degrees for rocks on the west side of Ripsey Wash. A major north-south trending low-angle fault, evident in the Teapot Mountain quadrangle to the north, is projected beneath the structural cover along Ripsey Wash.

Scattered prospects on both sides of Ripsey Wash explore narrow east-west trending shear zones in propylitic altered granite. The narrow mineralized shear zones exhibit introduced silica, specularite and abundant pyrite with gold and supergene copper values. Several prospects have gold values of .10 to .30 OPT gold over zones several feet wide. Twin adits on the west bank of Ripsey Wash 3,000 feet south of the Florence-Kelvin road, were driven to explore oxide copper mineralization. The oxide mineralization appears to be exotic, and is hosted by brecciated granite adjacent to the segment of rotated Tertiary sedimentary rocks.

The Wooley Breccia Pipe, on the west side of Ripsey Wash and south of the structural cover comprised of intensely shattered granite, is interpreted as an exterior breccia pipe related to the Kelvin porphyry copper center of alteration. The pipe, which is approximately 300 feet in diameter and is exposed over a distance of approximately 1,200 feet, appears to have been rotated into a nearly hori-

zontal position by the structural rotation which accompanied the listric faulting and now plunges 15 to 20 degrees to the west. Outcrops exhibit angular fragments cemented by quartz and sulfides in a fine grained matrix of granitic fragments with a pyrite to chalcopyrite ratio of approximately 3 to 1. The rock fragments and surrounding country rock lack pervasive or disseminated pyritic alteration. The Wooley Breccia Pipe was drilled prior to 1970 and although drill data are not available, the copper content of the entire mineralized breccia pipe was apparently sub-economic.

The mineralized breccia pipe now trends east-west indicating structural rotation from west to east and displacement in a west-southwest direction. It is located approximately 2,500 feet west of near-vertical diabase sills on the west side of Ripsey Wash. These geologic relationships indicate that the mineralized breccia pipe probably formed beneath similar diabase sills and in proximity to and at depths equivalent to the porphyry copper alteration and mineralization exposed and drilled at the north end of the Tortilla Mountains and was later displaced approximately three miles westward to its present position west of Ripsey wash.

The Rare Metals Mine area, approximately one mile south of the Gila River and one and one half miles west of Ripsey Wash is characterized by exposed potassic alteration and very low sulfides with a high chalcopyrite to pyrite ratio and relatively high molybdenum values suggestive of a position at substantial depth in a porphyry copper alteration system. The exposed copper-molybdenum mineralization was drilled by Cyprus and Tipperary Resources in the early 1970's. Reportedly, copper values encountered in their drill holes were similar to values in surface exposures, with larger intervals averaging less than .10% copper. Cities Service

less than .10% copper. Cities Service drilled the area in the early 1970's and encountered significant intervals of disseminated copper mineralization at depth in three holes located in the southwest quarter of Section 9, east of the Rare Metals Mine and approximately one mile west of Ripsey Wash. These intercepts were reportedly at depths of approximately 2,000 feet, averaged .40% to .50% copper, were associated with sericitic and potassic alteration and were separated from overlying propylitic altered granite by a major low angle fault.

SUMMARY

The Kelvin porphyry copper system is an example of large-scale structural rotation and associated complex displacement on low-angle and high-angle faults. It has been only partly explored and previous wide-spaced drilling was confined to the northern flank of the rotated alteration system where exposures are better. Subsurface geologic data is limited, structural relationships are not well defined and much of the area is concealed beneath an extensive, but perhaps relatively thin, structural cover of rotated Tertiary sedimentary rocks and shattered unmineralized granite. Exploration during the 1970's was based on a model of structural rotation of the alteration system with mineralization concealed beneath low-angle faults and unmineralized rocks. In spite of the geologic complexity and limited data the drilling did encounter substantial intervals of disseminated copper mineralization at depth beneath low-angle faults and unmineralized rocks.

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ROAD LOG

MILEAGE
Cum. Inc.
0.0 0.0

Junction of Highway 177 and Florence-Kelvin Road, approximately four miles south of Ray. Turn south on Florence-Kelvin road along the Copper Basin railroad grade, through an area of housing at the site of Kelvin, then cross the tracks and a bridge across the Gila River.

1.7 1.7 STOP 1 End of pavement on Florence-Kelvin Road

Exposures are of propylitic altered Precambrian granite cut by thin closely spaced carbonate stringers and narrow, siliceous, pyritic shear zones. The higher ridges to the south are capped by pyritic-phyllitic alteration with associated supergene chalcocite mineralization. The pyritic-phyllitic alteration is separated from the underlying propylitic altered rocks by a low angle fault and is interpreted as the outer and lower part of the structurally rotated alteration system.

2.5 0.8 STOP 2 Kerr-McGee drill holes K-1 and K-2

Exposures of Precambrian granite on the hill north of the road exhibit a sharply zoned pattern of increasing intensity of alteration from exterior propylitic alteration higher on the hill to pyritic-phyllitic alteration at the base of the hill. As shown on the accompanying section through drill holes K-1 and K-2, the intensity of alteration and copper mineralization continued to increase with increasing depth in drill hole K-1 until cut off by a low-angle fault at a depth of 1,030 feet. The exposures of shattered, weakly altered, unmineralized granite south of the road and in road cuts 100 to 200 yards west of the stop are representative of the unmineralized granite in the upper part of holes K-2 and K-3, above the low-angle fault.

Structurally rotated Tertiary sedimentary rocks are prominent along the west side of Ripsey wash several miles to the south and west and can be viewed from the road as it descends into Ripsey Wash. The drill road along the high ridge west of Ripsey Wash is in the area drilled by Cities Service, and the Rare metals Mine is in the wash to the west. These mineralized zones are situated along the margins of apophysis of the late Laramide Teacup granodiorite intruding Ruin granite. The contact forms much of the ridgecrest on the western skyline.

5.5 3.0 STOP 3 Rotated Tertiary Sedimentary Rocks and Precambrian Granite

The contact of the east-dipping sedimentary units and granite is just east of the road and a short walk of 100 yards provides another good view of the tilted Tertiary units. Granite cobbles near the base of the sedimentary rocks are identical to the underlying propylitic altered, unmineralized granite and are a further indication that the shattered granite south of the Florence-Kelvin road was structurally rotated and displaced together with the adjacent Tertiary sedimentary rocks.

OPTIONAL: A short drive of several miles up Ripsey Wash, 4WD required, provides excellent views of the rotated Tertiary units and shattered Precambrian granite.

ASARCO

Southwestern Exploration Division

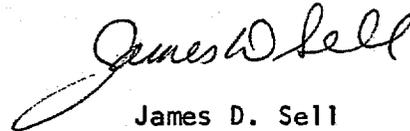
October 20, 1978

FILE MEMO

Kelvin Property
Pinal County, Arizona

It was reported by a Cities Service (Miami) geologist that Coastal Mining (Hanna) presently has a drill rig on "their old property" at Kelvin. This would be the northeast corner of the Kerr-McGee Kelvin-Riverside Project which Asarco looked at several years ago.

Vern England (Joy) is the driller.



James D. Sell

JDS:1b